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Journal of Aquaculture Research & Development	J Aquacult Res Dev	0.62	5.15
Journal of Allergy & Therapy	J Allergy Ther	1.07	4.47
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Journal of Cancer Science & Therapy	J Cancer Sci Ther	4.25	5.09
Journal of Cell Science & Therapy	J Cell Sci Ther	3.14	4.14
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Journal of Chemical Engineering & Process Technology	J Chem Eng Process Technol	-	5.04
Journal of Clinical & Experimental Cardiology	J Clin Exp Cardiolog	1.07	5.3
Journal of Clinical & Cellular Immunology	J Clin Cell Immunol	2.11	4.45
Journal of Clinical Research & Bioethics	J Clin Res Bioeth	1.14	4.1
Journal of Clinical & Experimental Dermatology	J Clin Exp Dermatol Res	1.13	5.27
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Journal of Diabetes & Metabolism	J Drug Metab Toxicol	3.21	6.07
Journal of Drug Metabolism & Toxicology	J Diabetes Metab	1.27	-
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Journal of Nanomedicine & Nanotechnology	J Nanomed Nanotechnol	5.72	4.04
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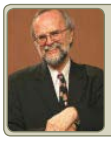
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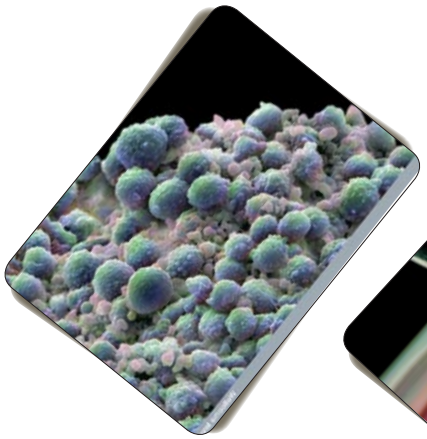
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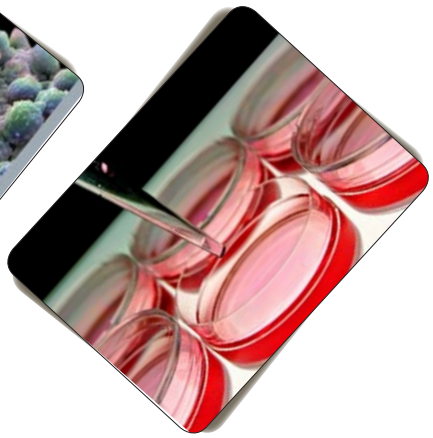


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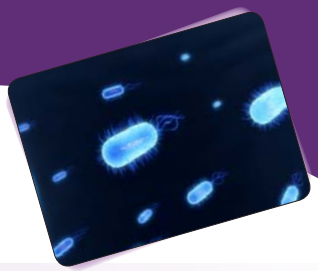
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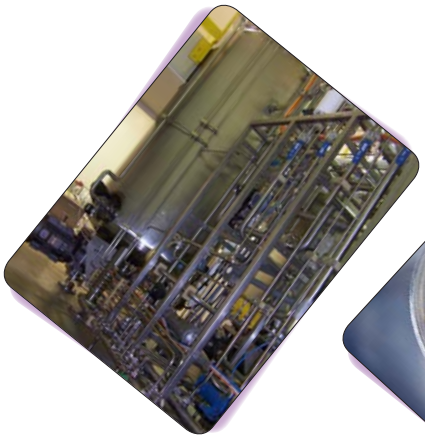
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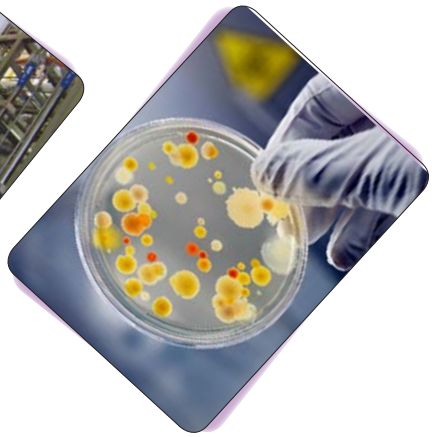


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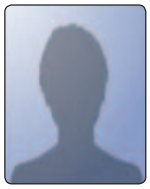




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Upcoming Special Issues

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	**Bacteria: Biochemical Physiology** **Cheorl-Ho KIM** Professor Molecular and Cellular Glycobiology Unit Department of Biological Science Sungkyunkwan University Korea	
	**Biomaterials: Biosensors & Nano Technology** **VM Thiruvanamalai** Department of Cell Biology and Anatomy School of Medicine University of South Carolina USA	
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	**Biomaterials: Down Stream Processing** **R Jayakumar** Amrita Center for Nanosciences Kansai University, Japan	
	**Molecular Diagnosis and Detection Technology** **Liu Y** Microbial Food Safety Research Unit US Department of Agriculture, USA	
	**Microbial Pathogenesis: Clinical Pathology** **Syed M Wasim Jafri** Professor Department of Medicine The Aga Khan University Hospital, Pakistan	
	**Microbial Pathogenesis: Clinical Pathology** **Asim Baig (Guest)** Associate Professor Hematology Department of Pathology and Microbiology The Aga Khan University Hospital, Pakistan Tel. +92-213-493-0051	
	**Biomaterials: Down Stream Processing** **Peter M Kilonzo** Department of Chemical & Biochemical Engineering University of Western Ontario, Canada	

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Journal of Bioprocessing & Biotechniques

Open Access

Bioprocessing is the use of biological materials like organisms, cells, organelles and enzymes to carry out a process for commercial, medical or scientific reasons.The journal provides an open access platform to publish the theoretical findings in the areas of bioprocess, bioengineering, food and bioprocess technology, immobilization biotechnology, downstream and upstream processing bioreactors.

http://www.omicsonline.org/jbpbthome.php

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56th OMICS Group Conference

3rd World Congress on

Biotechnology

September 13-15, 2012 Hyderabad International Convention Centre, Hyderabad, India

Upcoming Conferences



Upcoming OMICS Group 2012 Conferences

Accelerating Scientific Discovery



International Conference and Exhibition on
Translational Medicine
September 17-19, 2012
Holdiay Inn San Antonio, USA



3rd International Conference on
Diabetes & Metabolism
September 24-26, 2012
Marriott Convention Center, India



2nd International Conference on
Pediatrics & Gynaecology
September 24-26, 2012
Marriott Convention Center, India



International Conference on
Emerging Cell Therapies
October 1-3, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference and Exhibition on
Pharmacovigilance & Clinical Trials
October 1-3, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Tissue Science & Engineering
October 1-3, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Otolaryngology
October 15-17, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Biothreat & Biodefense
October 15-17, 2012
DoubleTree by Hilton Chicago - Northshore, USA



World Congress on
Forensic Research & Technology
October 15-17, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Material Sciences & Engineering
October 22-24, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Expo and Conference on
Analytrix and HPLC
October 22-24, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Clinical and Cellular Immunology
October 22-24, 2012
DoubleTree by Hilton Chicago - Northshore, USA



International Conference on
Pulmonary & Respiratory Medicine
October 29-31, 2012
DoubleTree by Hilton Philadelphia, USA



International Conference and Exhibition on
Computer Aided Drug Design & QSAR
October 29-31, 2012
DoubleTree by Hilton Chicago-Northshore, USA



International Conference on
Regenerative &Functional Medicine
November 12-14, 2012
Hilton San Antonio Airport, USA



2nd World Congress on
Cell Science & Stem Cell Research
November 12-14, 2012
Hilton San Antonio Airport, USA



International Conference on
Clinical Microbiology & Microbial Genomics
November 12-14, 2012
Hilton San Antonio Airport, USA



Global Biofuels & Bioproduct Summit
November 19-21, 2012
Hilton San Antonio Airport, USA



International Conference and Exhibition on
Probiotics
November 19-21, 2012
Hilton San Antonio Airport, USA



International Conference on
Genetic Syndromes & Gene Therapy
November 19-21, 2012
Hilton San Antonio Airport, USA



3rd International Conference on
Analytical & Bioanalytical Techniques
November 22-24, 2012
Hyderabad International Convention Centre, India



International Conference and Exhibition on
Food Processing and Technology
November 22-24, 2012
Hyderabad International Convention Centre, India



2nd International Conference on
Pharmaceutical Regulatory Affairs
November 23-24, 2012
Hyderabad International Convention Centre, India



International Conference and Exhibition on
Cosmetology & Cosmetics
November 23-24, 2012
Hyderabad International Convention Centre, India



International Conference on
Hair Transplantation & Trichology
November 26-28, 2012
Hilton San Antonio Airport, USA



International Conference on
Anesthesia & Perioperative Care
November 26 - 28, 2012
Hilton San Antonio Airport, USA



International
Toxicology Summit and Expo
November 26-28, 2012
Hilton San Antonio, USA



International Conference and Exhibition on
Surgery & Transplantation
November 26-28, 2012
Hilton San Antonio Airport, USA



2nd International Conference on
Nanotek and Expo
December 3-5, 2012
DoubleTree by Hilton Philadelphia Center City, USA



International Summit on
GMP&GCP: USA, Europe, Japan & Asia Pacific
December 3-5, 2012
DoubleTree by Hilton Philadelphia Center City, USA



International Conference on
QC, QA and Validation
December 3-5, 2012
DoubleTree by Hilton Philadelphia Center City, USA



International Conference on
Obesity & Weight Management
December 3-5, 2012
DoubleTree by Hilton Philadelphia, USA

Upcoming OMICS Group 2013 Conferences

Accelerating Scientific Discovery



3rd International Conference on
Pharmaceutics & Novel Drug Delivery Research
April 8-10, 2013
Hilton Suites Chicago/Magnificent Mile, USA



2nd World Congress on
Metabolomics & Systems Biology
April 8-10, 2013
Hilton Suites Chicago/Magnificent Mile, USA



3rd International Conference on
Clinical & Experimental Ophthalmology
April 15-17, 2013
Hilton Chicago/Northbrook, USA



3rd International Conference on
Clinical & Experimental Dermatology
April 15-17, 2013
Hilton Chicago/Northbrook, USA



3rd International Conference on
Clinical & Experimental Cardiology
April 15-17, 2013
Hilton Chicago/Northbrook, USA



4th World Congress on
Bioavailability & Bioequivalence
May 20-22, 2013
DoubleTree by Hilton Beijing, China



2nd International Conference and Expo on
Biometrics & Biostatistics
June 10-12, 2013
Hilton Chicago/Northbrook, USA



2nd International Conference on
Gastroenterology & Urology
June 10-12, 2013
Hilton Chicago/Northbrook, USA



2nd International Conference and Exhibition on
Biosensors & Bioelectronics
June 17-19, 2013
Hilton Chicago/Northbrook, USA



2nd International Conference and Exhibition on
Neurology & Therapeutics
June 17-19, 2013
Hilton Chicago/Northbrook, USA



3rd World Congress on
Virology
July 11-13/8-10, 2013
Embassy Suites Las Vegas, USA



3rd International Conference on
Proteomics & Bioinformatics
July 15-17, 2013
DoubleTree by Hilton Philadelphia Center City, USA



2nd International Conference and Exhibition on
Nutritional Science and Therapy
July 15-17, 2013
DoubleTree by Hilton Philadelphia Center City, USA



4th International Conference on
Biomarkers & Clinical Research
July 16-17, 2013
DoubleTree by Hilton Philadelphia Center City, USA



2nd International Conference on
Earth Science & Climate Change
July 22-24, 2013
Embassy Suites Las Vegas, USA



2nd International Conference and Exhibition on
Addiction Research & Therapy
July 22-24, 2013
Embassy Suites Las Vegas, USA



International Conference on
Animal & Dairy Sciences
July 23-24, 2013
Embassy Suites Las Vegas, USA



2nd International Conference and Exhibition on
Nephrology & Therapeutics
July 29-31, 2013
Embassy Suites Las Vegas, USA



3rd International Conference on
Vaccines & Vaccination
July 29-31, 2013
Embassy Suites Las Vegas, USA



2nd International Conference and exhibition on
Pathology
August 5-7, 2013
Embassy Suites Las Vegas, USA



International Conference on
Integrative Biology Summit
August 5-7, 2013
Embassy Suites Las Vegas, USA



International Conference and Exhibition on
Personalized Medicine & Molecular Diagnostics
August 5-7, 2013
Embassy Suites Las Vegas, USA



2nd International Conference and Exhibition on
Orthopedics & Rheumatology
August 19-21, 2013
Embassy Suites Las Vegas, USA



International Conference on
Physical Medicine & Rehabilitation
August 19-21, 2013
Embassy Suites Las Vegas, USA



International Conference on
Dental & Oral Health
August 19-21, 2013
Embassy Suites Las Vegas, USA



International Conference and Exhibition on
Solar Systems & Power Generation Technologies
August 19-21, 2013 Hyderabad, India

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Relevant Conferences






International Conference on

Tissue Science and Engineering

October 1-3, 2012 DoubleTree by Hilton Chicago-North Shore, USA

Theme: "Transforming Repairs into Regeneration"

International Conference on Tissue Science and Engineering helps the intellectuals to study the framework of the emerging technologies worldwide which include advanced R&D in Tissue Science, Regenerative Medicine & Stem Cell Research. Tissue Science-2012 is essential to start 'filling the gap' between fundamental concepts in science and engineering. It is becoming essential to utilize the knowledge base from developmental biology to guide the design of tissue engineering systems, as well as to utilize engineered tissues as controllable biological models for studies of development and remodeling.

Scientific Tracks

Track 1: Bone and Cartilage Tissue Engineering
Track 1-1 Guided bone regeneration
Track 1-2 Recombinant signalling molecules
Track 1-3 Solid free form fabrication of scaffolds
Track 1-4 Synthetic vessels
Track 1-5 Electrochemical deposition
Track 1-6 Spinal fusion
Track 1-7 Ossification
Track 1-8 Using stem cells to build new bones
Track 1-9 Bone regeneration

Track 2: Materials for Molecular Mediation
Track 2-1 Biodegradable polymer nanoparticles
Track 2-2 Biomaterials science & technology
Track 2-3 Nano structures and materials in tissue engineering and regenerative medicine
Track 2-4 Polyester urethane based biomaterial
Track 2-5 Biomimetic materials for tissue engineering
Track 2-6 Tissue implants
Track 2-7 Cryo tissue engineering and equipment design
Track 2-8 Prosthodontics
Track 2-9 Bioartificial organs

Track 3: Whole Organ Tissue Engineering
Track 3-1 Regenerative-medicine approach
Track 3-2 Tissue engineering from own stem cells
Track 3-3 Dynamics of endocytosis and exocytosis
Track 3-4 Angiogenesis & vascular tissue engineering
Track 3-5 Challenges in tissue engineering
Track 3-6 Tissue dysfunction

Track 4: Bioreactors in Tissue Engineering
Track 4-1 Bioreactor systems for cell expansion
Track 4-2 Disposable systems for cell and tissue cultivation
Track 4-3 Bioreactors for biomechanical stimulation
Track 4-4 Towards cell culture automatization
Track 4-5 2D & 3 D cultures
Track 4-6 Cell bioprocessing

Track 5: Bioengineering and Therapeutics
Track 5-1 Drug reinforcement, dependence and addiction-related behaviors
Track 5-2 Cardiovascular pharmacogenetics
Track 5-3 Regenerative therapeutics
Track 5-4 Tissue injury
Track 5-5 Craniofacial tissue engineering by stem cells

Track 6: Tissue Regeneration
Track 6-1 Xenotransplantation
Track 6-2 Biomedical chemistry
Track 6-3 Embryonic germ cell research
Track 6-4 Cell signaling
Track 6-5 Rejuvenation research
Track 6-6 Breakthroughs in cell culture technology for tissue engineering
Track 6-7 Intervertebral discs and nerve tissue repair
Track 6-8 Gene and drug delivery in tissue engineering and regenerative medicine
Track 6-9 In situ tissue regeneration
Track 6-10 Regulation of cell function

Track 7: Scaffolds
Track 7-1 Surface ligands and molecular architecture
Track 7-2 Nanoparticle-cell interactions
Track 7-3 Biodegradability
Track 7-4 3D Models for tissue engineering and cancer research
Track 7-5 The induction of apoptosis by metal compounds

Track 8: Biochips and Tissue Chips
Track 8-1 DNA and tissue microarray
Track 8-2 Nanosensors
Track 8-3 Bio DOT
Track 8-4 Chips in disease diagnosis

Track 9: Clinical Medicine
Track 9-1 Histopathology
Track 9-2 Tissue biomarkers
Track 9-3 Medical imaging
Track 9-4 Graft rejection
Track 9-5 Photodynamic therapy
Track 9-6 Biomedical engineering of stem cells

OMICS Group is organizing Tissue Science-2012 with the overwhelming support from more than 200 Editorial Board members of related journals, that includes Journal of Tissue Science & Engineering, Journal of Biochips & Tissue Chips and Journal of Cytology & Histology.

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- Organizing a small symposium at this venue?
- Organizing a small workshop at this conference?
- Deliver a speech?
- Present a poster/oral presentation?
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International Conference and Exhibition on
Probiotics

November 19-21, 2012 Hilton San Antonio Airport, USA

Theme: "Future of Probiotics - Visions and Opportunities"

The International Conference and Exhibition on Probiotics is an expert gathering of scientists, food specialists, entrepreneurs and business delegates on November 19-21, 2012 at Hilton San Antonio Airport, USA. Probiotics-2012, a three day event consists of a scientific program of comprehensive talks, special sessions, oral and poster presentations of peer-reviewed contributions and exhibit of innovative research products.

Scientific Tracks

Track 1: Molecular Nutrition
Track 1-1 Food microbial populations -identification and characterization of novel strains
Track 1-2 Nutritional physiology
Track 1-3 Lifestyle diseases
Track 1-4 Probiotics in human health and disease
Track 1-5 Bioactive components

Track 2: Types of Probiotics
Track 2-1 Recombinant probiotics
Track 2-2 Designer probiotics
Track 2-3 Prebiotics and synbiotics
Track 2-4 Non-lab probiotics
Track 2-5 Eco probiotics

Track 3: Applications of Probiotics
Track 3-1 Probiotics as complementary and alternative medicine
Track 3-2 Nutritional and medical benefits
Track 3-3 Probiotics in immune system
Track 3-4 Hormones and probiotics
Track 3-5 Obesity, type II diabetes and probiotics
Track 3-6 Probioceuticals and bacteriocins
Track 3-7 Probiotics as bio therapeutic agents
Track 3-8 Biofilms and probiotics
Track 3-9 Oral cavity and probiotics
Track 3-10 Probiotics in women's health

Track 4: Current Research and Future Perspectives on Probiotics
Track 4-1 Technological advancements in probiotic food development
Track 4-2 Production of probiotic supplements
Track 4-3 Oral vaccine developments
Track 4-4 Biomarker efficacy and clinical research on probiotics
Track 4-5 Antioxidant properties of probiotics
Track 4-6 Genomics, transcriptomics and metabolomics in probiotics development
Track 4-7 Interactions of probiotics with enzymes

Track 5: Health Benefits of Probiotics
Track 5-1 Elimination of lactose intolerance
Track 5-2 Immunoregulatory action on gut wall
Track 5-3 Antidiabetic and anticarcinogenic properties
Track 5-4 Antihypertensive and hypocholesterolemic properties
Track 5-5 Nutritional benefits of fermented Foods

Track 6: Regulatory Issues and Safety Challenges
Track 6-1 Quality assurance and stability
Track 6-2 Post-market surveillance
Track 6-3 Probiotics-GRAS (Generally Recognized as Safe) status and safety concerns
Track 6-4 Formulation of uniform standard operating procedures
Track 6-5 Food poisoning

Track 7: Probiotics in Aquaculture Practices
Track 7-1 Future perspectives of probiotics in aquaculture
Track 7-2 Probiotic bacteria as biological control agents in aquaculture
Track 7-3 Ecological aquaculture
Track 7-4 Applications of probiotics in aquaculture

Track 8: Microbial Fermentation
Track 8-1 Microbial selection and processing criteria for production of probiotics
Track 8-2 Microbial metabolism and fermentation process
Track 8-3 Industrial enzymology and microbial screening
Track 8-4 Microbial biochemistry and biotechnology
Track 8-5 Nano-biotechnology for fermentation applications
Track 8-6 Biochemical engineering

Track 9: Food Technology and Dairy Technology
Track 9-1 Food science and technology
Track 9-2 Food engineering
Track 9-3 Homogenization
Track 9-4 Pasteurization
Track 9-5 Single cell protein (SCP)

Track 10: Microbial Pathogenesis
Track 10-1 Immunology of infectious diseases
Track 10-2 Biological transformations
Track 10-3 Quorum sensing and quorum quenching
Track 10-4 Nosocomial pneumonia
Track 10-5 Antibiotic resistance

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International Conference on
Genetic Syndromes & Gene Therapy

November 19-21, 2012 Hilton San Antonio Airport, USA

Theme: "Building on Clinical Progress & Exploring Advances in Gene Therapy"

The International Conference on Genetic Syndromes & Gene Therapy is a unique platform to advance knowledge, awareness and education by amalgamating Science and Technology using the sanative applications of clinical & sdiagnostic therapeutic strategies in defending various issues related to Genetics and Genetic disorders.

Scientific Tracks

Track 1: Gene Therapy
Track 1-1 Novel technologies for gene transfer
Track 1-2 Gene transfer to induce cellular reprogramming
Track 1-3 Molecular cloning and expression of a new gene
Track 1-4 Gene expression in mononuclear cells
Track 1-5 Transfer and expression of genes in humans

Track 2: Viral Vectors for Gene Therapy
Track 2-1 Immune response to viral vectors
Track 2-2 Viral entry and nuclear translocation
Track 2-3 Host cell response to viral infection
Track 2-4 Innate & adaptive immune response to viral infection
Track 2-5 Approaches to blocking the immune response to viral infection
Track 2-6 Suppression & stimulation of the immune response by gene transfer
Track 2-7 Improvements in vector development

Track 3: Molecular Therapy
Track 3-1 Novel anticoagulant therapy
Track 3-2 Bridging therapy
Track 3-3 Biomarkers of endocrine therapy
Track 3-4 Therapeutic cancer vaccines
Track 3-5 DNA vaccination for treatment of cancer
Track 3-6 Targeted molecular therapies

Track 4: Diagnosing Genetic Syndromes
Track 4-1 Molecular techniques
Track 4-2 FISH analysis
Track 4-3 Mental retardation syndromes database
Track 4-4 Neonatal screening
Track 4-5 Early genetic amniocentesis
Track 4-6 Chorionic villus sampling
Track 4-7 Gene silencing

Track 5: Gene Therapy in the Retina
Track 5-1 RNA based therapeutics for retinal degenerative disorders
Track 5-2 Vector based strategies for retinal gene therapies
Track 5-3 Gene therapy for retinal degenerative

Track 6: Developmental Genetics
Track 6-1 Immunogenetics
Track 6-2 Neurogenetics
Track 6-3 Evolution and population genetics
Track 6-4 Medical genetics and heredity counseling
Track 6-5 Human genetic disorders
Track 6-6 Human embryology & developmental analysis of human genetics

Track 7: Genetic Disorders
Track 7-1 Single gene disorder
Track 7-2 Multifactorial and polygenic (complex) disorders
Track 7-3 Prognosis and treatment of genetic disorders
Track 7-4 Genetic syndrome associated with glucose intolerance
Track 7-5 Hereditary disorders

Track 8: Gene Therapy for Autoimmune Diseases & Epigenetics
Track 8-1 Hereditary multiple exostoses
Track 8-2 Adenomatous polyposis
Track 8-3 Genomic imprinting and related disorders
Track 8-4 Transgenerational epigenetic observations
Track 8-5 Cancer and developmental abnormalities computational epigenetics
Track 8-6 Induced pluripotent stem cells and potential therapies

Track 9: Applied Molecular Biology
Track 9-1 Genetic variation and diversity
Track 9-2 Molecular evolution
Track 9-3 Genetic diseases caused by alterations of RBP or RNA sequence
Track 9-4 RNAi mechanisms and miRNAs

Track 10: Current Strategies in Gene Therapy
Track 10-1 Recombinant DNA and gene transfer
Track 10-2 Human gene therapy and the role of the food and drug administration
Track 10-3 Genetics & Oncology
Track 10-4 Hereditary neuropathy
Track 10-5 Genome stability and DNA repair

Track 11: Clinical Genetics
Track 11-1 Pharmacogenetics
Track 11-2 Neurogenetics
Track 11-3 Community genetics
Track 11-4 Molecular cytogenetics
Track 11-5 Reproductive genetics
Track 11-6 Gene expression profiling

Track 12: Cancer Genetics
Track 12-1 Oncogenes
Track 12-2 Tumor suppressor genes
Track 12-3 Viruses & human cancer
Track 12-4 Genetics & toxicity
Track 12-5 Gene silencing & genome imprinting
Track 12-6 RNA interference

Track 13: Genetic Mapping Methods / Linkage analysis
Track 13-1 Cloning and expression systems
Track 13-2 Molecular genetic processes
Track 13-3 Mobile genetic elements
Track 13-4 Cellular and organismal genetic processes
Track 13-5 Ethical, legal and social implication of genetics

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International Conference and Exhibition on
Food Processing & Technology

November 22-24, 2012 Hyderabad International Convention Centre, Hyderabad, India

Theme: "Development of Sustainable Approaches for Food Processing"

International Conference and Exhibition on Food Processing & Technology gathers the world leaders in research and development, innovation and shape the future of the food industry. This programme highlights the most effective strategies, tools and techniques to maximize innovation, competitiveness and profitability in new market conditions.

Scientific Tracks

Track 1: Nutrition and Food Science

Track 1-1 Nutritional physiology

Track 1-2 Nutritional biochemistry

Track 1-3 Nutritional metabolomics

Track 1-4 Food and flavor chemistry

Track 1-5 Maternal nutrition, fetal development, and epigenetics

Track 1-6 Food microbiology

Track 2: Nutritional Disorders

Track 2-1 Nutritional disorders in children

Track 2-2 Nutritional disorders in women

Track 2-3 Lifestyle diseases, nutrition, and health

Track 2-4 Prevention of nutritional disorders

Track 2-5 Causes of nutritional disorders

Track 3: Food Preservation and Quality Control

Track 3-1 Food and nutritional quality management

Track 3-2 Food sanitation and hygiene

Track 3-3 Food preservation processes and technologies

Track 3-4 Food packaging and transport control

Track 3-5 Food rheology

Track 4: Food Technology Applications

Track 4-1 Functional foods and beverages

Track 4-2 Neutraceuticals

Track 4-3 Genetically modified foods

Track 4-4 Organic foods

Track 4-5 Probiotics as food supplements

Track 4-6 Bioactive compounds

Track 4-7 Fortified foods

Track 5: Nutritional Composition and Chemistry

Track 5-1 Carbohydrates

Track 5-2 Proteins

Track 5-3 Vitamins

Track 5-4 Lipids

Track 5-5 Minerals

Track 6: Food Processing Industries

Track 6-1 Fish processing

Track 6-2 Industrial rendering for edible and non-edible products

Track 6-3 Meat packing plants and slaughterhouses

Track 6-4 Sugar industry

Track 6-5 Dairy industry

Track 7: Food Processing and Engineering

Track 7-1 Food dehydration

Track 7-2 Food fermentation

Track 7-3 Operations in food preparation and manufacturing

Track 7-4 Membrane processes and applications of membranes in food processing

Track 7-5 Oil saving technologies and process optimization

Track 8: Food Security and Challenges

Track 8-1 Intellectual property rights

Track 8-2 Hybridization, genetic engineering, and loss of biodiversity

Track 8-3 Effects of climatic changes

Track 8-4 Land availability and globalization

Track 8-5 Population growth

Track 8-6 Role of biotechnology in food supply

Track 9: Food Regulatory Affairs

Track 9-1 Food and nutrient labeling FDA and EU regulations

Track 9-2 Food marketing management

Track 9-3 Food safety regulations and standards

Track 9-4 Food risk analysis and management

Track 9-5 Food contamination and health claims

Track 9-6 Food allergens guidance, compliance, and regulatory issues

Track 10: Current Research in Food Science and Technology

Track 10-1 Food traceability new developments in the technical aspects

Track 10-2 Nutrigenomics application of high throughput 'omics' technologies to food sciences

Track 10-3 Food borne illnesses and outbreaks prediction and prevention

Track 10-4 Radiation contamination of foods and associated health risks

Track 10-5 Applications of nanotechnology to food and nutritional science

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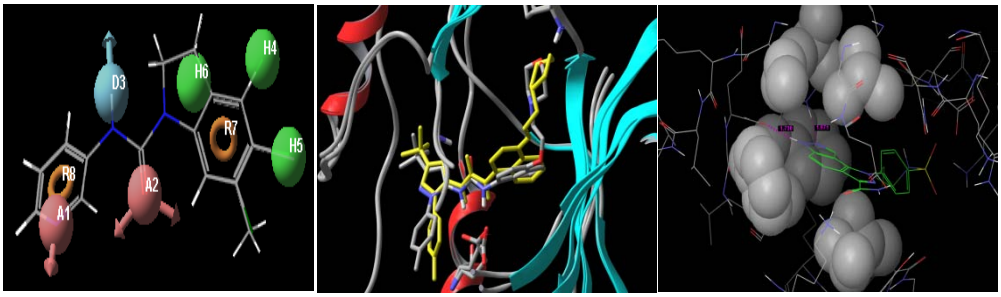



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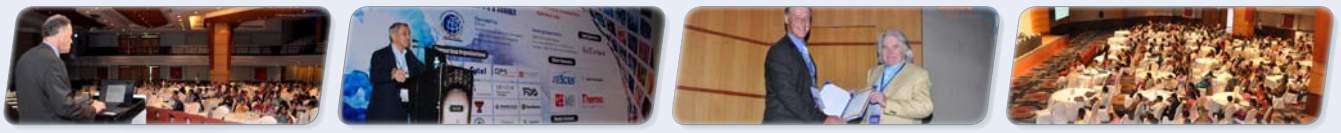
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Keynote Forum



Mukesh Verma, J Biotechnol Biomater 2012, 2:6
http://dx.doi.org/10.4172/2155-952X.S1.007

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Mukesh Verma

National Cancer Institute, USA

Epigenetic and genetic approaches in cancer epidemiology and risk assessment

The National Institutes of Health (NIH) has initiated the Epigenomics Roadmap Program (http://www.roadmapepigenomics.org/) which is comprised of five major initiatives: Reference Epigenome Mapping Centers, Epigenomic Data Analysis and Coordinating Centers, Technology Development in Epigenetics, Discovery of Novel Epigenetic Marks, Epigenomics of Human Health and Diseases. This program proposes that the origins of health and susceptibility to disease are the result of epigenetic regulation of the genetic information. Specifically, epigenetic mechanisms that control stem cell differentiation and organogenesis contribute to the biological response to environmental and other factors in the form of stimuli that contribute in disease development. Epigenetic and genetic approaches in cancer epidemiology and risk assessment will be discussed. Epidemiology is the scientific study of the causes and distribution of disease in populations. The National Cancer Institute's Epidemiology and Genetics Research Program (EGRP), in the Division of Cancer Control and Population Sciences, provides opportunities for investigators to increase understanding of cancer causes and prevention in human populations. EGRP supports research in four areas: (1) Clinical and translational epidemiology, including factors that influence development of cancer among persons with underlying diseases and conditions; the progression, recurrence, and mortality from cancer; and development of new primary cancers; (2) Host susceptibility factors that influence personal susceptibility to cancer in humans, such as genetic, epigenetic, immunological, hormonal, and biological pathways; and social, cultural, racial, and ethnic factors; (3) Methods and technologies for epidemiologic data collection, study design and analysis, and development and adaptation of laboratory and technical approaches for large studies in human populations; (4) Modifiable risk factors to reduce cancer risk in humans, such as diet and nutrition; alcohol; physical activity and energy balance; tobacco; infectious diseases; physical and chemical agents; and medical exposures, including medications and treatments. Different funding mechanisms of grants and contracts, and collaboration opportunities will be discussed.

Biography

Mukesh Verma is a Program Director and Chief in the Methods and Technologies Branch (MTB), Epidemiology and Genetics Research Program (EGRP) of the Division of Cancer Control and Population Sciences (DCCPS) at the National Cancer Institute (NCI), National Institutes of Health (NIH). Before coming to the DCCPS, he was a Program Director in the Division of Cancer Prevention (DCP), NCI, providing direction in the areas of biomarkers, early detection, risk assessment and prevention of cancer, and cancers associated with infectious agents. Dr. Mukesh Verma holds a M.Sc. from Pantnagar University and a Ph.D. from Banaras Hindu University. He did postdoctoral research at George Washington University and was a faculty member at Georgetown University. He has published 116 research articles and reviews and edited three books in cancer epigenetics and epidemiology field.

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http://dx.doi.org/10.4172/2155-952X.S1.007

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Jag H. Khalsa

National Institute of Health, USA

Drugs of abuse-HIV infection and NeuroAIDS -A Global scenario



Jeymohan Joseph

National Institute of Health, USA

NIMH NeuroAIDS Research Priorities and Global Efforts

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Scientific Tracks & Abstracts






Track 1(i)

1(i): Advances in Animal Biotechnology

Session Chair
Dipak K. Dube
SUNY Upstate Medical University, USA

Session Co-Chair
Naveen Kumar
Indian Veterinary Research Institute, India

Session Introduction

Title: **Tropomyosin expression in vertebrate hearts in relation to cardiogenesis and cardiomyopathies**
Dipak K. Dube, SUNY Upstate Medical University, USA

Title: **Delayed seroconversion to STLV-1 infection is associated with mutations in the pol and rex gene**
Syamalima Dube, SUNY Upstate Medical University, USA

Title: **Molecular analysis of candidate genes for mastitis in Murrah buffaloes (Bubalus bubalis)**
Archana Verma, National Dairy Research Institute, India

Title: **Evaluation of the effect of a DNA vaccine encoding Mycobacterium avium paratuberculosisis (Map) in mice**
Rajib Deb, Indian Veterinary Research Institute, India

Title: **Title: Bone marrow cells contribute to tubular epithelium regeneration following acute kidney injury induced by mercuric chloride**
Neelam Yadav, Dr. Ram Manohar Lohia Avadh University, India

Title: **Expressions of sperm-specific genes in normal and motility impaired semen producing crossbred frieswal (HF X Sahiwal) bulls**
Indrajit Ganguly, National Bureau of Animal Genetic Resources, India

Title: **Genetic polymorphism of milk proteins: Relationship with milk compositional traits in Indian goat breeds**
Ajoy Mandal, Central Institute for Research on Goats, India

Title: **Dose dependent effect of protein synthesis inhibitor on the developmental potency of parthenogeneticgoat embryos"**
S D Kharche, Central Institute for Research on Goats, India

Title: **Feed enzymes: A biotechnological approach in poultry feed formulation**
S. P. Muthukumar, Central Food Technological Research Institute, India

Title: **Nucleotide diversity in promoter of bone morphogenetic protein receptor type IB (BMPR1B) gene in Indian goats**
Sonika Ahlawat, National Bureau of Animal Genetic Resources, India

Title: **New genetic polymorphism of goat KiSS-1 gene**
Rekha Sharma, National Bureau of Animal Genetic Resources, India

Ajoy Mandal et al., J Biotechnol Biomater 2012, 2:6
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Genetic polymorphism of milk proteins: relationship with milk compositional traits in Indian goat breeds

Ajoy Mandal and P. K. Rout
Central Institute for Research on Goats, India

Milk samples of Jakhrana(70) and Sirohi (22) goat breeds, maintained at the Central Institute for Research on Goats, Makhdoom, Mathura, Uttar Pradesh, India, were analyzed to study the genetic polymorphisms of milk proteins and its effect on milk compositional traits. The genetic variants in milk samples were detected by sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) method. The different milk compositional traits (viz. casein, total protein, fat, total solid, and solid-not-fat content in milk) were estimated by using standard protocol. The electrophoretic pattern revealed that milk sample of both the breeds contained four major casein variants, i.e., α_{S1}- casein , α_{S2} - casein , β-Cn, and κ -Cn and two whey proteins i.e., β- lactoglobulin and α- lactalbumin. Further α_{S1}- casein locus showed 2 variants such as A and F with a frequency of 0.843 and 0.157, respectively in Jakhrana goat, whereas three variants of α_{S1}- casein viz., A, B and F, were observed in Sirohi goat, having the allelic frequencies of 0.636, 0.296 and 0.068, respectively. No polymorphic pattern was observed at α_{S2}-, β-, κ-casein locus and β-lactoglobulin whey protein locus in Jakhrana breed. However, the electrophoretic pattern of α -lactalbumin variant also showed two allelic forms i.e., A and B with frequencies of 0.97 and 0.03, respectively in Jakhrana breed. In Sirohi breed, two variants viz. A and B with gene frequencies 0.77 and 0.23 respectively were observed at α_{S2}- casein locus, but no polymorphism exists at β-casein, κ-casein, β-lactoglobulin and α -lactalbumin locus. The study also revealed that milk protein variants had no significant (P>0.05) effect on all milk compositional traits in both Jakhrana and Sirohi breeds.

Biography

Ajoy Mandal has completed his Ph.D in Animal Genetics and Breeding from National Dairy Research Institute, Karnal, Haryana, India and obtained his postdoctoral training from INRA, France in the year 2006. Presently, he is working as senior research scientist in Animal Breeding Section at ERS-NDRI, Kalyani, Nadia, West Bengal, India. He is primarily involved in the research with large ruminants, which deals with use of theory and computer analysis of data for genetic evaluation of animal. Earlier he worked on genetic evaluation of production and reproduction traits of goat and sheep at Central Institute for Research on Goats, Makhdoom, Mathura, Uttar Pradesh, India. He has also been engaged in the study of disease resistance of these species and molecular characterization of goat genetic resources.

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Bone marrow cells contribute to tubular epithelium regeneration following acute kidney injury induced by mercuric chloride

Neelam Yadav[1], Someshwara Rao, Dipankar M Bhowmik[2] and Asok Mukhopadhyay[3]
[1]Department of Biochemistry, Dr. Ram Manohar Lohia Avadh University, India
[2]Department of Nephrology, All India Institute of Medical Sciences, India
[3]Stem Cell Biology Laboratory, National Institute of Immunology, India

Acute tubular necrosis (ATN) caused by renal ischemia, renal hypo-perfusion, or nephrotoxic substances is the most common form of acute kidney injury (AKI). There are few treatment options for this life-threatening disease and the mortality rate exceeds 50%. In critical cases of AKI the only option left is renal transplantation. We report that bone marrow cells (BMCs) are involved in regeneration of kidney tubules following acute tubular necrosis in the mouse. We compared the relative contributions of enhanced green fluorescence protein (eGFP) expressing BMCs in two different approaches to kidney regeneration in the mercuric chloride ($HgCl_2$)-induced mouse model of acute kidney injury (AKI): induced engraftment and forced engraftment. The differentiation of donor cells into renal tubular epithelium was examined by flowcytometric and immunohistochemical analyses. In the forced engraftment approach, but not in the induced engraftment approach, BMCs were found to contribute to the regeneration of tubules in the renal cortex and outer medullar regions. About 70% of donor cells expressed megalin. In vitro culture revealed that lineage-depleted (Lin-) BMCs differentiated into megalin, E-cadherin and cytokeratin-19 (CK-19) expressing renal epithelial cells. These results suggest that in mice Lin- BMCs may be involved to regenerate renal tubular epithelium. Overall, this study demonstrates that transplanted BMCs can contribute to the regeneration of tubular epithelium in the $HgCl_2$-induced mouse AKI model.

Biography

Neelam Yadav has completed her Ph.D from Industrial Toxicology Research Centre, Lucknow and postdoctoral studies from Stem Cell Biology Laboratory of National Institute of Immunology (NII) New Delhi, India. She is Assistant Professor in Department of Biochemistry, at Dr. R.M.L. Avadh University, Faizabad, India. Dr. Neelam has published many papers in reputed international journals and filed one patent.

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Molecular analysis of candidate genes for mastitis in murrah buffaloes (Bubalus bubalis)

Archana Verma, I. D. Gupta, Anuj Chauhan, Indrasen Chauhan, Ramesh K. Singh, Gokul S. Sonawane and Bharat Kumar
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Mastitis is one of the most common, complex and costly diseases of dairy animals and is influenced by a number of genes, pathogens and the environment. The molecular analysis and genetic variability of the immune mechanisms underlying mastitis resistance, including genes as lactoferrin, interleukins, toll-like receptors, caspase activating recruitment domain 15 and Fore-brain embryonic zinc finger like the study has been carried out on DNA samples obtained from 150 Murrah animals. Amplicons were obtained using specific sets of primers for all the exons of these five genes. DNA sequences of complete coding regions of each gene were subjected to Clustal W alignment, variations observed and sequences submitted to NCBI gene bank. DNA polymorphism using PCR-SSCP/RFLP with Hae III, Hinf I , Hind III, PvuII, AluI, Bsp1286 I, BsiHKAI, BsaHI, SacI, Dra I, Msp I and Taq I restriction enzymes has been explored for Lf, IL-8, TLR-4, CARD-15 and FEZL gene, which revealed a varying degree of variability exhibiting monomorphic as well as polymorphic patterns. Chi-square analysis indicated significant association of genetic variation with incidence of mastitis in the animals under study. Since buffalo is less explored specie from molecular genetics point of view, this is the first attempt in this direction, which could be an aid in selection of animals for mastitis resistance. BLAST analysis was performed to sequence homology among species and Phylogenetic tree constructed to know the phylogenetic groups.

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Tropomyosin expression in vertebrate hearts in relation to cardiogenesis and cardiomyopathies

Dipak K. Dube, Sowmya Pinnamaneni and Syamalima Dube
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The assembly of a myofibril, contractile apparatus of striated muscles, involves the precise ordering of several proteins into a linear array of sarcomeres. Tropomyosin is one of the six proteins comprising the thin filament and is encoded by four different genes (TPM1, TPM2, TPM3, & TPM4) in vertebrates. The TPM1 generates atleast 10 isoforms via alternative splicing and/or by using an alternate promoter. Several missense mutations in the TPM1 gene have been implicated in familial hypertrophic cardiomyopathy (FHC) and dilated cardiomyopathy (DCM). Heretofore, it was believed that TPM1α was the key TM isoform produced in striated muscles. We have discovered a new alternately spliced isoform TPM1k of the TPM1 gene that contains exons 1a, 2a (2b in TPM1α), 3, 4, 5, 6b, 7, 8, and 9a/b. TPM1κ is expressed in the cardiomyocytes of a variety of vertebrates including humans. It is also expressed in skeletal muscles in axolotl and zebrafish. We have quantified mRNA and protein expression of TPM1α & TPM1κ in striated muscles in axolotl and humans. Although the transcript level of TPM1α and TPM1κ is comparable, the expression of TPM1κ protein is significantly lower in hearts. Although over-expression of TPM1κ in transgenic mice heart leads to DCM, transgenic animals live well and bread normally. We have evaluated the effect of cardiogenic small molecule, Shz-1 on tropomyosin isoform expression in vertebrate hearts in situ and in vivo. Small molecule mediated manipulation of isoform composition of sarcomeric protein has potential for future treatment of sarcomere diseases like FHC and DCM.

Biography

Currently, Dipak K. Dube is a Professor in the Department of Medicine and an Adjunct Professor in the Department of Cell & Developmental Biology, SUNY Upstate Medical University. He received his Ph.D. and D.Sc. degrees from University of Calcutta, India. He did his postdoctoral research at the Institute for Cancer Research, Philadelphia, USA. His major areas of research interests are Molecular Biology of Vertebrate Heart Development and Human Retrovirology. He has published about 150 full-length papers and is a member of the Editorial Board of Cardiovascular Toxicology, Journal of Cytology & Histology, and Clinical and Experimental Cardiology.

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Expressions of sperm-specific genes in normal and motility impaired semen producing crossbred Frieswal (HF X Sahiwal) bulls

Indrajit Ganguly, G K Gaur, Sushil Kumar, D K Mandal, Mahesh Kumar, Umesh Singh, Sunil Kumar and Arjava Sharma
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Mature spermatozoa harbour thousands of mRNA transcripts. These untranslated mRNA may perhaps serve as a marker for the spermatogenesis since many of them might directly or indirectly be involved in fertilization, early embryo cleavage, poor semen quality and fertility. The present research was undertaken to elucidate differential representation of few sperm specific genes in normal (% initial progressive motility: 57.61 ± 1.41) and motility impaired (% initial progressive motility: 18.45 ± 1.61) semen producing crossbred Frieswal (HF X Sahiwal) bulls. We obtained spermatozoa by subjecting the semen samples to discontinuous (40:80) Percoll gradient centrifugation. Total RNA was extracted from sperm pellets using hot Tri reagent and cDNA was synthesized. Genomic DNA contamination of the samples was tested by PCR using intron spanning primers specific to bovine deleted azoospermia-like (DAZL) and protamine 1 (PRM1) genes. Absence of epithelial cell, germ cell and leukocyte contamination of sperm RNA was tested by using primers specific to molecular markers like CDH1, KIT, and CD45 antigen, respectively. We detected the expressions of the sperm-specific genes, PRM1, PRM2, TPN1 and TPN2 by RT-PCR, and tried to associate with sperm motility. The presence of transcripts like PRM1, PRM2, DazL, TPN1, TPN2 and PPIA were demonstrated in the ejaculated spermatozoa. The normal group showed significantly higher level of PRM1 mRNAs expression as compared to the motility impaired semen producers ($P<0.05$) indicating putative role of the gene and semen quality (initial progressive motility). Although, the normal semen producing group showed comparatively higher amount of TPN2 mRNAs transcripts as compared to motility impaired group, however, transcript level was not significantly different ($P>0.05$) between the groups. Moreover, the difference of PRM2 transcript levels was not significant ($P>0.05$) among the groups and almost identical representation was observed in both the groups for TPN1transcripts.

Biography

Indrajit Ganguly has completed his Masters from National Dairy Research Institute (Deemed University), Karnal, Haryana and Ph.D from Indian Veterinary Research Institute (Deemed University), Bareilly, UP. He did postdoctoral studies at CCMB, Hyderabad. He joined Indian Council of Agricultural research as a Scientist in the year of 2008. Currently he is working as a Senior Scientist in the DNA Fingerprinting Unit, National Bureau of Animal Genetic Resources, Karnal, Haryana-132001, India. He has published many papers in reputed journals. His research area includes molecular understanding of male fertility, disease resistance and conservation & utilization of Animal Genetic Resources.

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Evaluation of the effect of a DNA vaccine encoding mycobacterium avium paratuberculosisis (Map) in mice

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Mycobacterium avium subsp. paratuberculosis (Map) is the causative agent of johne's disease whose immunopathology mainly depends on cell mediated immuneresponse. Genome sequencing revealed various PPE (Proline-Proline-Glutamic acid) protein family of Map which are immunologically importance candidate genes In present study we have developed a bicistrionic construct pIR PPE/IFN containing a 34.9 kDa PPE protein (PPE 34.9) of Map along with a cytokine gene encoding murine gamma Interferon gene (IFNγ) and a monocistrionic construct pIR PPE using a mammalian vector system pIRES 6.1. The construct were transfected in HeLa cell line and expression were studied by Western blot as well as Immunefluroscent assay using recombinant sera. Further we have compared the immunereactivity of these two constructs in murine model by means of DTH study, LTT, NO assay and ELISA. DTH response was higher in pIR PPE/IFN than pIR PPE group of mice, similar finding also observed in case of LTT and NO production assay. ELISA titer of the pIR PPE/IFN was less than that with PPE only. These preliminary finding can revealed a CMI response of this PPE protein of Map and IFNγ having synergistic effect on this PPE

Biography

Rajib Deb has completed his PG from Indian Veterinary Research Institute, Izatnagar, UP, India and was pursuing his PhD from same. Presently he is working as Agriculture Research Scientist in Project directorate on cattle, Indian council of agriculture research, Meerut, UP, India. He has published papers in reputed national and international journals.

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New genetic polymorphism of goat KiSS-1 gene

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The objective of this study was to look into molecular mechanism of puberty and generate useful information for the molecular breeding to shorten the timing of puberty of goat. KiSS-1/GPR54 system is universally considered as a key regulator and a catalyst for the puberty onset in mammals. Literature concerning KiSS-1 and goat production is rare. Thus partial sequence of KiSS-1 gene was amplified and sequenced for identification of Single nucleotide polymorphism (SNP) in a panel of 9 Indian goat breeds differing in precocity and prolificacy. A primer pair was designed according to goat sequence (GU142847.1) with expected product length of 472bp covering exon 2 along with its upstream and downstream regions. Comparison of obtained sequences resulted in identification of two SNPs (T950C, T1125C). The sites of mutation were numbered according to goat KiSS-1sequence (GU142847.1). There were no polymorphisms in the exon 2 of indigenous goat as reported sites were located in upstream (Intron1) and downstream (Intron1) of exon 2. Wild allele was predominant in indigenous goats as compared to mutant allele for both SNPs (T950C T=0.92, C=0.08 and T1125C T=0.96, C=0.04). For SNP in intron1 (T950C) all the three genotypes (TT, TC and CC) were identified in Osmanabadi breed while two genotypes (TT and TC) were detected in Beetal, Barbari and Ganjam while wild type was observed in Black Bengal, Malabari, Jakhrana, Sangamneri and Sirohi and for SNP in intron 2 (T1125C) all the breeds except Jakhrana (TT and TC) presented wild type allele. Although two novel variants do not concern the coding region, it might influence the stability of mRNA, can affect the mechanism of deadenylation and degradation and consequently, the amount of proteins produced. Further studies are necessary for association of polymorphisms with goat sexual precocity in goats.

Biography

Rekha Sharma has completed her PhD from National Dairy Research Institute (Deemed University) Karnal, India in 1998. She is Senior Scientist at NBAGR, a premier organization involved in characterization, conservation and utilization of Animal Genetic resources. She has published more than 25 papers in reputed journals on molecular characterization of AnGR with neutral and functional markers.

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Dose dependent effect of protein synthesis inhibitor on the developmental potency of parthenogeneticgoat embryos

S D Kharche, A K Goel, S K Jindal, Puja Goel , Justin Kouamo and Sonia Sarswat
Central Institute for Research on Goats, India

The objective of the present study was to compare the dose dependent effect of a protein synthesis inhibitor (6-dimethylaminopurine) following activation with calcium ionophore of in-vitro matured goatoocytes. A total of 1015 cumulus oocyte complexes (COC's) were collected from 345 ovaries. Oocytes were matured in TCM-199 medium containing FSH (5µg/ml), LH (10µg/ml), oestradiol-17β (1µg/ml), EGF (10ng/ml) supplemented with 10 % fetal bovine serum at 38.50C and 5% CO2 in an incubator under humidified air for 27h. In-vitro matured oocytes were evaluated for maturation on the basis of cumulus expansion and got 95.76% maturation rate. Morphological matured oocytes (n=972) were selected, denuded and randomly divided into five groups. Group 1(n=170) in-vitro matured oocytes activated with 5 µm Calcium ionophore for 5 min. and cultured in mCR2aa medium without DMAP treatment for 4 hours (control). Group 2 (n=189) in-vitro matured oocytes activated with 5 µm Calcium ionophore for five min. and cultured in mCR2aa medium containing 2.5 mM DMAP for 4 hours. Group 3 (n=272)in-vitro matured oocytes activated with 5 µm Calcium ionophore for five min. and cultured in mCR2aa medium containing 5 mM DMAP for 4 hours. Group 4 (n=178) in-vitro matured oocytes activated with 5 µm Calcium ionophore for five min. and cultured in mCR2aa medium containing 10 mM DMAP for 4 hours. Group 5 (n=163) in-vitro matured oocytes activated with 5 µm Calcium ionophore for five min. and cultured in mCR2aa medium containing 20mM DMAP for 4 hours. After 4 hours of DMAP treatment, the presumptive zygotes of five groups were washed and cultured in the embryo culture medium medium. Development of activated oocytes was observed at every 48hr till day 14 post actvation under inverted phase contrast microscope (200x, Nikon, Japan). The cleavage rate, blastocyst and hatched blastocyst percentage in groups 1, 2, 3, 4 and 5were 61.76, 0.00% & 0.00%, 59.79, 10.62% & 0.00%, 72.43, 10.66% & 1.52, 64.61, 7.83% & 0.00%, and 63.19, 3.88% & 0.00%, respectively. The results indicated that the cleavage rate, morula and blastocyst development were comparatively higher following activation with 5 µm calcium ionophore and 4hr culture in 5 mMDMAP of in-vitro matured goatoocytes.

Biography

S D Kharche has completed his Ph.D from Deemed University, Indian Veterinary Research Institute, Izatnagar. He is the Senior Scientist at Central Institute for Research on Goats, a premier ICAR service organization. He has published more than 50 papers in reputed journals and serving as an editorial board member of repute Open Journal of Animal Science and as referee for several national and International journals. He has received junior and senior research fellowship and several awards from the professional societies. He has visited as an expert for imparting training on A. I., goat management and finalization of action plan to promote and accelerate the progress of research and development in Zambia, South Africa.

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Feed enzymes: A biotechnological approach in poultry feed formulation

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The human diet and poultry feed share common ingredients as both belong to monogastrics. The poultry meat cost increased 250 to 300 per cent due to increased feed cost. The feed cost for poultry production constitutes about 60-70 percent of commercial poultry production. The competence for food ingredients between human and poultry makes the poultry feed costlier than ever before. So, the poultry feed need some non-conventional feed ingredients, to make the industry survive and provide the poultry meat at affordable cost. The major limitation of use of non-conventional low cost feed ingredients is because of presence of certain anti-nutritional factors (AFNs) which could not be degraded in the digestive system of poultry birds. These are responsible for problems like decreased rate of digestion, increased microbial activity in the gut, increased viscosity of fluid phase in the intestinal content, decreased feed intake, decreased body weight, low feed efficiency, increased excreta moisture etc. Some biotechnological tools like feed enzymes come in handy to address these issues. Few experiments demonstrated that exogenous enzyme addition will act upon these and alleviate these harmful effects. These novel approaches will enable us to overcome these problems and the use of appropriate enzymes in feed to breakdown the ANFs, which will ultimately yield more energy, protein, minerals etc and improve the performance of the birds.

Biography

S. P. Muthukumar completed his PhD at the age of 33 years from Indian Veterinary Research Institute and MVSc from Kerala Agricultural Univrsity in 1997. He is Principal Scientist and Incharge, Animal House, Biochemistry & Nutrition Department at CSIR – Central Food Technological Research Institute. He had published more than 30 papers in reputed journals/ conferences.

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Nucleotide diversity in promoter of bone morphogenetic protein receptor type IB (BMPR1B) gene in Indian goats

Sonika Ahlawat, Rekha Sharma and A Maitra
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In recent years, many studies on the genetics of prolificacy in small ruminants have highlighted the importance of BMPR1B gene in affecting ovulation rate and litter size through different mechanisms. Most of the research on BMPR1B gene has revolved around screening sheep and goats for the presence of FecB mutation (A746G) that is associated with hyperprolific phenotype in many breeds around the world. In the present study, in addition to screening Indian goats for the FecB (Booroola) mutation, an attempt was also made to detect polymorphism in the promoter of BMPR1B gene. Eight indigenous goat breeds (Barbari, Beetal, Black Bengal, Malabari, Jhakrana, Osmanabadi, Sirohi and Ganjam) differing in prolificacy and geographic distribution were employed for polymorphism scanning. Representative samples were collected from the breeding tract of respective breeds and DNA was isolated using Phenol-Chloroform method. Primers for detecting FecB mutation were taken from the literature whereas heterologous primers for promoter region were designed from the sequence of Bos taurus (ENSBTAT00000002690) available in Ensemble database. BMPR1B promoter was amplified in two fragments and a 1032 bp length contig was generated using SeqMan program of Lasergene software. Sequence alignments and comparisons were carried out using MegAlign program (DNASTAR Inc.) which revealed that FecB mutation was not present in all the breeds investigated. Hundred variations were observed between cattle and goat promoter sequence which include 32 transitions, 13 transversions, 50 deletions and 5 insertions. Two novel SNPs T (-242) C and G (-623) A were identified in the promoter of indigenous goat breeds. The variations and polymorphisms did not change or affect any transcription binding sites as revealed by MATCH software.

Biography

Sonika Ahlawat is working as scientist at National Bureau of Animal Genetic Resources, Karnal, India.

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Delayed seroconversion to STLV-1 infection is associated with mutations in the pol and rex gene

Syamalima Dube, Nitin Saksena, Jayne Love, Patricia Benz, Francoise Barre-Sinoussi, Dipak K. Dube and Bernard J. Poiesz
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Two Cercopithecus aethiops tantalus and 2 Erythrocebus patas monkeys from Central African Republic were transfused with intraspecies whole blood from monkeys naturally infected with simian T-cell lymphoma/leukemia virus -1 (STLV-1). Followup studies conducted over 2 years indicated that all 4 monkeys remained healthy despite being infected with STLV-1, as determined by PCR, cloning and sequencing analyses. ELISA and Western blot analyses indicated that both patas monkeys seroconverted within 2 months of transfusion, while one tantalus monkey required one year to seroconvert and the other never fully seroconverted. This latter animal failed to react to HTLV-1 p24 gag antigen. Sequence analyses indicated that, while unique, the deduced p24 gag amino acid sequence of the STLV-1 Tan 90 strain used to infect this animal was still highly homologous to the HTVL-1 p24 gag amino acids present in the ELISA and WB assays. However, a mutation in the pol sequence of STLV-1 Tan 90 encoded a putative stop codon, while a common deletion in the pol/rex regulatory gene causes significant changes in the Pol, and Rex p24 proteins. These same mutations were also observed in the viral DNA of both recipient infected tantalus monkeys and were not present in the STLV-1 Pat 74 strain. The data suggest that seroconversion to STLV-1 infection may be prolonged due to such mutations, and that compensatory molecular events vis-a-vis the pol stop condon must have occurred to allow for virus transmission.

Biography

Syamalima Dube completed her Ph.D in Biochemistry from Calcutta University. She did postdoctoral studies in University of Chicago and Fox Chase Cancer Center, Philadelphia. She was a research Assistant Professor in the Department of Medicine, University of Washington, Seattle. Currently she is a Research scientist in the Department of Medicine, Upstate Medical University, and Syracuse, NY. She has published more than 80 papers in reputed journals like PNAS, JBC, and New England Journal of Medicine.

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Track 1(ii)

1(ii): Plant Biotechnology & Crop Improvement

Session Chair
Shiv Kant Shukla
Biotech Consortium India Limited, India

Session Co-Chair
Motonobu Yoshida
Kinki University, Japan

Session Introduction

Title: **Functional analysis of novel genes expressed specifically in the early maturation of sesame seeds**
Motonobu Yoshida, Kinki University, Japan

Title: **Production of compact poinsettia (Euphorbia pulcherrima Willd. Ex Klotzsch) plants by using Agrobacterium-mediated transformation**
Md. Ashraful Islam, Bioforsk- Norwegian Institute for Agricultural & Environmental Research, Norway

Title: **Chemotaxonomy of Tinospora cordifolia male and female type plants/parts using HRMS techniques their biological activity and identification of markers for gender distinction**
Brijesh Kumar, Central Drug Research Institute, India

Title: **Root-knot nematode and Fusarium wilt control through Paecilomyces species**
Satyawati Sharma, Indian Institute of Technology, India

Title: **Impact of national certification system for tissue culture raised plants (ncs-tcp) on Indian plant tissue culture industry: A unique quality management system for commercial plant tissue culture**
Shiv Kant Shukla, Biotech Consortium India Limited, India

Title: **Studies on nutrient uptake and culture conditions for synthesis of Caffeine, (+)-Catechine, (-)-Epicatechin and (-)-Epigallocatechin gallate in anther derived haploid cell lines of tea [Camellia sinensis (L.)]**
Rakhi Chaturvedi, Indian Institute of Technology- Guwahati, India

Title: **In vitro response of Sorghum bicolor to salinity**
Kusuma Kumari Panda, AMITY University, India

Title: **Survey and biocontrol of rhizome rot disease in southern India turmeric plantations**
P. Ponmurugan, K.S.Rangasamy College of Technology, India

Title: **Agrobacterium mediated genetic transformation in Solanum surattense Burma.f (from leaf explants)**
T. Ugandhar, Karimnagar Govt Degree and P.G.College, India

Title: **In vitro regeneration of multipurpose medicinal tree Stereospermum suaveolens**
Susmita Shukla, AMITY University, India

Title: **Genetic variability analysis using mycelia compatibility grouping (MCG) and molecular markers in Indian populations of Sclerotinia sclerotiorum causing stem rot in chickpea**
Asit Kumar Mandal, Directorate of Seed Research, India

Title: **Influence of bioinoculants on soil phosphatase activity and nutrients (N, P, K, Cu, Zn, Fe and Mn) status in the rhizosphere of Stevia rebaudiana (Bert.) plants**
G.Ramakrishnaiah, Sree Vidyanikethan Engineering College, India

Title: **Microbial conversion of plant based polyunsaturated fatty acid (PUFA) to long chain PUFA and its identification by gas chromatography**
Shilpa Deshpande, Sharad Pawar College of Pharmacy, India

Title: **Modification of production medium for enhanced gum production by Xanthomonas campestris pv. campestris**
Sutanu Samanta, Lovely Professional University, India

Title: **Identification and genetic purity testing of ANGRAU cotton F1 hybrids using SSR markers**
Sambasiva Rao Palaparthi, Institute of Biotechnology-Hyderabad, India

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Genetic variability analysis using mycelia compatibility grouping (MCG) and molecular markers in Indian populations of Sclerotinia sclerotiorum causing stem rot in chickpea

Asit Kumar Mandal[1] and Sunil C. Dubey[2]
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The Sclerotinia sclerotiorum is a soil-inhabiting plant pathogen. It is considered as one of the most devastating plant pathogens infecting various crop plants including chickpea. Genetic diversity of 24 isolates of S. sclerotiorum representing 10 different states of India was determined by mycelial compatibility grouping (MCG), random amplified polymorphic DNA (RAPD), internal transcribed spacer restriction fragment length polymorphism (ITS-RFLP) and ITS sequencing. The isolates were variable in mycelial interaction and they were grouped into seven MCGs as MCG A, MCG B, MCG C, MCG D, MCG E, MCG F and MCG G. Unweighted paired group method with arithmetic average (UGMA) cluster analysis of RAPD profiles grouped the isolates into 7 categories showing high magnitude of genetic homogeneity and partial correlation with geographical origin of the isolates. The ITS I, 5.8S rDNA and ITS II regions of 10 isolates representing different RAPD groups were amplified with a set of primers ITS 1 and ITS 4 and digested with 6 restriction enzymes. Identical ITS-RFLP profiles were generated in all the isolates. Limited variability was observed in the nucleotide sequences of the ITS regions of these isolates. Phylogenic tree generated from Bootstrap neighboring joint analysis indicated that 50% of Indian populations were distinct and grouped separately. This is the first study on genetic diversity in Indian populations of S. sclerotiorum.

Biography

This work was supported by research grant from Indian Agricultural Research Institute, New Delhi as a part of Asit Kumar Mandal Ph. D program. At present, he is working on development of molecular based diagnostic kit for detection of seed borne infection as a scientist in the discipline of Plant Pathology at Directorate of Seed Research, Mau (UP), India.

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Chemotaxonomy of Tinospora cordifolia male and female type plants/parts using HRMS techniques their biological activity and identification of markers for gender distinction

Brijesh Kumar, Vikas Bajpai, Mukesh Srivaastva, Nikhil Kumar and Shailja Bhattacharya
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Tinospora cordifolia plant is known for its many medicinal properties and stem of Tinospora cordifolia plant is mainly used in ayurvedic preparations. The different class of biologically active compounds such as alkaloids, diterpenoids lactones, glycosides, steroids, phenolics, sesquiterpenoids, polysaccharides and other aliphatic compounds are reported in the Tinospora cordifolia plant. The direct analysis in real time (DART) mass spectrometric technique is very much effective in chemical profiling of natural products as solid or liquid, leaf or stem or any other samples can be directly investigated without prior sample treatment. In present work we have tried to figure out the presence of important medicinal compounds in the male and female Tinospora cordifolia plant parts stem and leaf by profiling through the new direct analysis in real time mass spectrometric technique and authentication of compounds by Q-TOF LCMS and MSMS techniques. Leaf and stem of male as well as female Tinospora cordifolia plant is subjected under investigation is described in present paper. The results show that the plant type male and female could be easily differentiated using DART MS data and chemical profiling clearly indicate the presence of characteristic compound in each part of Tinospora cordifolia plant under investigation. Some medicinally important compounds namely Jatrorrhizine, Magnoflorine, Tembetarine, Tetrahydropalmatine, Columbin, and β- Sitosterol are found in both male and female plant by their molecular formula and exact mass measurement. PCA with multivariate analysis clearly discriminate between male and female of Tinospora cordifolia. PC1 vs PC2 plot which explains 63.87% information with the help of nine marker peaks shows cent percent discrimination between male and female plants of Tinospora cordifolia. Comparative Chemotaxonomy of all the plant parts for male and female using QTOF LCMS, MS/MS (ESI and APCI) and DARTMS with their biological activity will be discussed during the seminar. This is important for quality control and efficacy of herbal drugs.

Biography

Brijesh Kumar has completed his PhD from Dr RML Avadh University Faizabad UP, India. He is the Principal Scientist in Sophisticated Analytical Instrument Facility (SAIF) division of CSIR-Central Drug Research Institute, Lucknow, India a premier drug research organization. He has published more than 40 papers in reputed journals. His current area of research is application of Mass Spectrometry tools (DARTMS/Q-TOF LCMS/4000 Q Trap LCMS) for qualitative and quantitative evaluation of known and unknown small molecules for quality control and authentication of Indian Medicinal Plant/parts. He is also involved in identification of marker compounds using statistical software.

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Influence of bioinoculants on soil phosphatase activity and nutrients (N, P, K, Cu, Zn, Fe and Mn) status in the rhizosphere of Stevia rebaudiana (Bert.) plants

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The pot culture experiment was carried out to evaluate the influence of different combinations of microbial inoculants (VAM+AZO+PSB) on soil phosphatase activity and nutrients (N, P, K, Cu, Zn, Fe, Cu & Mn) of Stevia rebaudia plant rhizosphere on 20th, 40th and 60th day. The study revealed that the combined application of microbial inoculants on soil Alkaline and Acid phosphatase activity has been found maximum at 60th day in triple inoculated plants than dual inoculated and control. The results also showed that the soil macronutrients (N, P & K) and micronutrients (Zn, Fe, Cu & Mn) have been found to be maximum at 40th day and 60th day respectively in triple inoculated plants than dual inoculated and control. The high alkaline and acid phosphatase activity in triple and dual inoculated soils attributes to the production of more enzymes by the synergetic interaction of VAM fungi, Azotobacter sp. and Phosphate solubilizing bacteria. This leads to the high yielding in the grown plants.

Keywords: microbial inoculants, macronutrients, micronutrients.

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In vitro response of Sorghum bicolor to salinity

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In the present work, three Sorghum accessions known to show different levels of salinity tolerance (viz., tolerant, moderately tolerant and sensitive) at plant level have been used to study their in vitro response to cultures under in vitro salinity stress.

The immature inflorescences of moderately tolerant (IS. 23217 Zm. 138,) ,tolerant (IS. 23190 Zm. 90) and sensitive (IS 23253 Zm.321) accessions(characterized from previous studies) collected from field grown plants were inoculated on MS medium (containing different concentrations of NaCl and $MgSO_4$) supplemented with 1.5 mg/l 2,4-D for callus induction and 0.25mg/l BA for regeneration. Data were collected on Frequency of callus induction, frequency of embryogenic calli, total callus quantity, embryogenic callus quantity and regeneration frequency under different salinity concentrations. With an increase in salinity concentration, there was decrease in all the in vitro characters. In control moderately tolerant(IS 3566) showed better response, but in salinity treatments IS 23217 Zm.138 identified as tolerant at plant level retained its tolerant nature under in vitro conditions also. Therefore it is suggested that, the in vitro screening using callus cultures can be applied for large scale screening of germplasm to identify the salinity tolerant and sensitive genotypes.

Keywords: in vitro response, Salt tolerance, Sorghum bicolor

Biography

Kusuma Kumari Panda has completed her PhD from Andhra University and postdoctoral studies at Indian Agricultural Research Institute, New Delhi. She has 10 years of teaching experience and presently working as Assistant Professor at Amity University, Noida, U.P.

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Production of compact poinsettia (Euphorbia pulcherrima Willd Ex Klotzsch) plants by using agrobacterium-mediated transformation

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[3]Faculty of Life Sciences, Copenhagen University, Denmark

Ornamental industry is one of the fast growing industries worldwide, especially in Japan and China. Global production of ornamental potted plants and cut flowers comprises about 50 billion €, corresponding to an estimated global consumer consumption between 100 to 150 billion €. Appropriate plant height is one of the most important traits in poinsettia. It is a non-food and non-feed ornamental plant, is a contemporary symbol of Christmas in most parts of the world. The dwarf characteristics in poinsettia induced by the poinsettia branch inducing phytoplasma can be obtained by using the free branching cultivars, and enhanced by spraying growth retardants such as CCC (chlormequat) or Alar (daminozide) that inhibits the biosynthesis of the plant hormone gibberellin (GA). Growth retardants are expensive, time consuming and have negative impact on human health as well as the environment and in the near future. Breeding for compact growth of poinsettia is thus of importance. Traditional plant breeding approach is time consuming and inefficient due to the heterozygous genetic background of poinsettia. Genetic engineering is thus an important approach for production of compact poinsettia plants with reduced application of growth retardants. This is considered a more straightforward and effective approach and is increasingly adopted. Here we report the production of transgenic poinsettia with compact growth and without chemical application by overexpressing the Arabidopsis short-internode (SHI) gene in poinsettia.

Biography

Md. Ashraful Islam is doing his PhD work at Bioforsk (Norwegian Institute for Agricultural and Environmental Research) and enrolled at the Norwegian University of Life Sciences (UMB), Norway. He has published some papers in the reputed journals. In his PhD, he is using different tools to get the compact poinsettia plants. Mr Islam is getting good result which will be interesting to publish in international journals. He is having about six years teaching and research experience at the Bangladesh Agricultural University (BAU), Mymensingh, Bangladesh. He has attended in some international conferences and training courses.

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Functional analysis of novel genes expressed specifically in the early maturation of sesame seeds

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Sesame seeds of Sesamum indicum contain abundant oil, in particular, large amounts of unsaturated fatty acid oleic and linoleic acids. These unsaturated fatty acids lower the cholesterol level in the body. Because of their effects and antioxidant substances, attention has been paid to sesame seeds as health food. The regulation of fatty acid synthesis in oilseed crops is quite unknown. It is necessary to clarify these points to breed novel varieties with high contents of unsaturated fatty acids. Full-length cDNA libraries prepared from sesame seed of 1 to 3 weeks DAF, were subtracted with cDNAs from plantlets of 4 weeks after seeding. Each of 1,545 cDNA clones was sequenced. The function of novel genes expressed during the early maturation of sesame seeds was studied by the transformation of Arabidopsis thaliana. Thirteen genes for a transcription factor were identified; four were involved in ethylene signaling. Nine genes including aquaporin-like protein, putative uncharacterized novel protein and ethylene response factor were analyzed by overexpression of A. thaliana. A. thaliana overexpression strain for novel protein and aquaporin-like protein genes, respectively showed the increase of unsaturated fatty acids. The localization of these products was investigated by the induction of the expression vectors for GFP fusion protein into onion cells and sesame seeds with a particle gun.

Biography

Motonobu Yoshida has received a PhD degree from Nagoya University, Japan and has worked for about two years at Max-Planck-Institut fur Biochemie, West Germany as a postdoctoral fellow. He is a professor of Faculty of Agriculture, Kinki University, Japan. He has published more than 40 papers in reputed journals.

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Survey and biocontrol of rhizome rot disease in southern India turmeric plantations

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Turmeric (Curcuma longa L.) belongs to the family Zingiberaceae is an important commercial spice crop in India. Indian turmeric is considered the best in the world in terms of total area (224.60 thousand ha), production (587.40 thousand tones), quality and disease free. Curcumin is the major pigment responsible for the yellow colour in turmeric and its production is influenced by several factors such as soil type, genotype and nutrient management. Moreover, presently there is an increasing consciousness amongst people regarding health, hygiene and environmental pollution. Among the several diseases in turmeric plants, rhizome rot caused by Pythium aphanidermatum is a serious problem in Indian turmeric plantations especially planting districts such as Coimbatore, Dharmapuri, Erode, Namakkal, and Villupuram belongs to Tamil Nadu state. It has been reported that there was a significant reduction in turmeric export since 2006 due to this disease. A survey was conducted to asses the disease intensity and severity in southern Indian turmeric plantations. The results indicated that disease intensity was found to be high in Erode and Coimbatore followed by Dharmapuri districts. Five susceptible and seven tolerant cultivars were identified. The population density of T. atroviride was enumerated in turmeric soil samples and subsequently correlated with the soil nutrient factors. An attempt was made to evaluate the potential of suppressive activity of an indigenous isolate, Trichoderma atroviride against a turmeric fungal pathogen Pythium aphanidermatum. Dual culture studies, morphological interaction and antibiosis revealed that the antagonistic properties of the fungal antagonist on P. aphanidermatum. Interaction studies on the sterilized turmeric rhizomes further confirmed this and also revealed that T. atroviride was able to suppress the growth and reproduction of P. aphanidermatum as well.

Keywords: Turmeric, Rhizome rot, Pythium, Trichoderma, Biocontrol

Biography

P. Ponmurugan is currently heading the Department of Biotechnology at K. S. Rangasamy College of Technology, Tiruchengode, Namakkal District, Tamil Nadu, India. He has five funded projects at present in his hand for which financial assistance was obtained from different funding agencies in India. He has published around 85 papers in various national and International journals and 7 patents to his credits. He is a recipient of "SERC FAST-TRACK Young Scientist Fellowship" offered by Department of Science and Technology, New Delhi.

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Identification and genetic purity testing of ANGRAU cotton F1 hybrids using SSR markers

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Microsatellite markers were used for fingerprinting of hybrids, assessing variation within parental lines and testing the genetic purity of hybrids as they offer a faster and reliable technique for assessing the genotype of a plant. The investigation pertaining to the hybrid identification of cotton using SSR markers was carried out on four F1 hybrids and their parents at Institute of Biotechnology, ANGRAU during 2011-12. Sixteen SSR markers were employed for purity analysis of 4 cotton hybrids (NDLHH 240, WGHH 2, NSPHH 5 and LAHH 4) and their parents (NA1325 x MCU 5, NA 1678 x NA 4084, NA 1325 x L604 and AB 6 x M2). On amplification of genomic DNA, 4 primers expressed polymorphism between the male parents and the female parents. The hybrids expressed clear codominance of the alleles of its respective male and female parental alleles. The microsatellite marker BNL 3449 amplified alleles specific to differentiate parents of NSPHH 5 likewise BNL 3255 primer for NDLHH 240, BNL 1317 for WGHH 2 and JESPR 148 primer for LAHH 4 hybrids and their respective parents. Based on the microsatellite banding pattern of parents, the hybrids could be clearly identified. The fingerprinting data were analyzed to create molecular IDs needed for genotype protection through IPR. The findings of this study revealed that the SSR markers are excellent genomic tools for parentage confirmation and hybridity determination (due to its repeatability, high efficiency and simplicity).

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Root-knot nematode and Fusarium wilt control through Paecilomyces species

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Prevention and control of plant disease always remain a foremost apprehension worldwide. Use of chemicals to control the diseases is one of the practical methods for the growers, which creates a great harm not only to the ecosystem and environment but also to human health. Thus, developing biological ways to control plant diseases is of high priority. Paecilomyces sp. is common soil Ascomycetes with a cosmopolitan distribution. This genus is effective against different species of plant pathogenic microbes, nematodes and insects. Metabolites from these fungi are not only control pests, diseases but can also stimulate plant growth. Present paper deals with the role of P. lilacinus as biocontrol agent against root knot nematode Meloidogyne incognita and P. variotii against Fusarium oxysporum, the causative agent of tomato wilt.

The best nematicidal activity was obtained when P.lilacinus was allowed to incubate for two weeks. Percentage mortality of M.incognita was directly proportional to exposure period to culture filtrate. Toxicity was also directly correlated with the pH of the filtrate. FT-IR of the filtrate showed that the metabolites present in filtrate were polar in nature. The efficacy of P. variotii against F. oxysporum was evaluated and compared with chemical Carbendazene. Various parameters viz. growth and plant biomass yield, biochemical parameters and disease incidence were studied. The results pertaining to the biocontrol of the diseases indicated that there was no significant difference between chemical (71.3%) and P. variotii treatment (70.5%).

Biography

Satyawati Sharma has completed her Ph.D. on Biomass production, conversion and utilization from Indian Institute of Technology, Delhi. She is the Professor at Centre for Rural Development and Technology, IIT Delhi. Her areas of research are Wasteland Recovery through Biological Methods (Silvipastoral Technology, Mycorrhizal Technology & Biological Nitrogen Fixation), Biomass Production and Rural Bioconversion Technologies (Sericulture, Mushroom Cultivation and rapid composting), Tissue culture and Plant disease management. She has guided a number of Ph.D. (13), M.Tech (10), M.Phill and M.Sc students. She has published more than 60 papers in reputed international journals besides a number of papers in national journals. She is also serving as an editorial board member of some reputed international journals.

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Microbial conversion of plant based polyunsaturated fatty acid (PUFA) to long chain PUFA and its identification by gas chromatography

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Omega-3-fatty acids are essential fatty acids necessary for various human health aspects. Humans can get alpha-linolenic acid (ALA) from plants and can convert to LCPUFAs, but to very less extent. LCPUFAs can be obtained only from fish oil which is not acceptable by vegetarian population. Hence, there is a need of an alternative process for LCPUFA production either from microorganisms or by biological engineering method using plant oil containing ALA. To avoid conversion of linoleic acid to arachidonic acid, ALA can be isolated prior to microbial conversion.

Objective: Hence the objective of the present study was to isolate ALA from plant oil and convert to LCPUFA by microbial transformation.

Experimental methods: ALA was isolated from rice bran oil by column chromatography. Fungal strain of Mortierella alpina was inoculated into GY medium containing three different concentrations of isolated ALA followed by incubation at 200 C for 8 and 15 days. The isolated ALA and microbially converted EPA were identified by TLC and GC.

Results: In 10 % ALA concentration, maximum conversion to EPA was found on 8th day. The EPA in medium was identified and confirmed by TLC and GC compared with reference standard.

Conclusion: The technique of isolation of ALA from plant oil by column chromatography and its microbial conversion to EPA was found to be simple, less time consuming and effective which can be successfully applied to any oil containing ALA to get significant yield of EPA. This can be the good alternative to fish oil for EPA production.

Biography

Shilpa Deshpande has completed her M. Pharm (Pharmacology) and doing Ph.D from Nagpur University. She is Assistant Professor at Sharad Pawar College of Pharmacy, Nagpur. She has published 13 papers in reputed national and international journals and presented many papers in conferences. She has guided three PG students and five UG students. She is a life member of various professional bodies and executive member of IPA and IPS Nagpur local branch.

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Impact of national certification system for tissue culture raised plants (ncs-tcp) on Indian plant tissue culture industry: A unique quality management system for commercial plant tissue culture

Shiv Kant Shukla, Purnima Sharma and Renu Swarup
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Quality management system (QMS) is a systemic approach of managing quality through good infrastructure, well defined organizational structure, standard procedures, resources and products. QMS aims at customer satisfaction through continuous improvements. QMS in plant tissue culture is novel approach covering the recognition of commercial tissue culture production facilities, accreditation of test laboratories and certification of tissue culture raised plants of recognized tissue culture production facilities by the Accredited Test Laboratories. The whole programme is popularly known as National Certification System for Tissue Culture Raised Plants (NCS-TCP).

Tissue culture technology through micro propagation has revolutionized the agriculture scenario worldwide by mass clonal multiplication of various economical plant species. In Indian scenario, this sector has witnessed a significant growth particularly in the last 10 years and a number of companies with production capacity ranging from a few lakhs to 30 million plants per annum are functional with cumulative production capacity of more than 300 million plants per annum. There is an enormous potential which can be realized by propagation of disease free and high quality planting material. Lack of effective quality parameters in micro-propagation may result into spread of virus infected and/or somaclonal variants which may hamper its growth resulting in lower levels of acceptance of this promising technology. Therefore, a quality management system is crucial for the healthy growth of the micro propagation industry. Accordingly, NCS-TCP has been established by the Department of Biotechnology (DBT), Government of India which is first of its kind in the world. It is a dynamic and comprehensive system intended for facilitating production of quality tissue culture plants and providing mechanisms for certification of quality tissue culture plants.

NCS-TCP has received a very enthusiastic response from the industry. In spite of the fact that the Recognition of the companies under the NCS-TCP is not mandatory, within the short duration of its implementation from 2007, more than 90% of the leading tissue culture companies have got themselves recognized under the system and many other small units are in the process of assessment. Significant impact of NCS-TCP includes strengthening the capacities of tissue culture companies, enhancing their visibility resulting into market reach, increase in the production capacity of recognized companies, introduction of new crops and increase in the number of samples referred to testing. It may be concluded that this system has provided conducive environment for the growth of plant tissue culture industry in India and has potential to be replicated worldwide.

Biography

Shiv Kant Shukla has done PhD in Biotechnology and has diversified experience in the area of commercial biotechnology. He had earlier worked as in charge of commercial plant tissue culture unit and currently working in Biotech Consortium India Limited (BCIL), New Delhi a company promoted by DBT, Govt of India. As the Manager BCIL, he is managing projects of national importance such as National Certification System for Tissue Culture Plants (NCS-TCP), consultancy services for setting up of biotech park/incubator, organization of entrepreneurship development programmes in biotechnology etc.

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In vitro regeneration of multipurpose medicinal tree Stereospermum suaveolens

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Stereospermum suaveolens (DC.) is a multipurpose tree endowed with medicinal properties and good timber wood quality. Wood is employed for construction work, planks and beam, carts, carriages and wagons, furniture, cabinet work and tool handles. It has analgesic and wound healing property. It is anti-dyspeptic, astringent and a liver stimulant. It is one of the important tree species used in the preparation of ayurvedic formulation known as Dashmula. In Dashmula tree species, the roots are used in preparation of ayurvedic formulations. The destruction of these plants is severe and planting of seedlings is almost negligible. Due to low germination and unsuccessful vegetative propagation in vitro regeneration of Stereospermum suaveolens through micropropagation was studied. In the present study, shoots were initiated from the nodal segments of Stereospermum suaveolens further shoot proliferation was achieved on MS medium supplemented with different concentrations of phytohormones and additives.100% root initiation was achieved in the MS medium fortified with IBA. Different substrates were evaluated during hardening phase. The plants of S .suaveolens grown on coco peat showed 84.6 percent survival and those on soil mixture showed 76.47 percent survival.

Biography

Susmita Shukla has completed her PhD from Pt RaviShankar Shukla University, Raipur. She has published papers in National and International Journals, presented posters in International and National conferences. She is having about seven years of teaching experience and now she is serving as Assistant Professor in Amity University, Noida (U.P).

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Modification of production medium for enhanced gum production by Xanthomonas campestris pv. campestris

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Xanthan gum is a microbial polysaccharide of great commercial significance. Xanthan is an industrially important exopolysaccharide produced by the phytopathogenic, gram-negative bacterium Xanthomonas campestris pv. campestris. The major problem associated with the culture of Xanthomonas campestris pv. campestris is that the viscosity of the medium increases as the bacterium keeps on growing and releasing Xanthan gum, which reduces the oxygen transfer to the bacterial cells and hence hinders its growth and therefore the gum yield. In order to overcome the oxygen limitation, we have attempted to modify the production medium, with salts like Sodium Acetate and Sodium chloride to examine their effects on the cell growth and gum yield and 2.67 and 3.5 folds increase in gum production were achieved on addition of 0.2% sodium acetate and 0.3% sodium chloride respectively. Addition of fresh surface sterilized cabbage, to which Xanthomonas campestris pv. campestris is pathogenic, resulted in 15 folds increase in gum production. Orange peels have been used as source of Vitamin C and it led to7.05 folds increase in gum production.

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Agrobacterium mediated genetic transformation in Solanum surattense Burma.F. from leaf explants

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Genetic transformation studies have been carried out in Solanum surattence Burma.f through Agrobacterium tumefaciens mediated transformation mature and healthy leaves were selected from the plants grown in green house for the present experiment. The explants were cultured over night on a one-day-old feeder layers. These overnight cultured leaf disc explants were co-cultivated with A.tumefaciens strain LBA 4404 harboring a binary vector containing the B-glucoronidase (GUS) and neomycin phosphotransferase (Npt-11) genes. The leaf disc explants were transferred to selective regeneration medium. The explants began to regenerates 3 weeks after transformation and Kanamycin resistant shoots have been developed. Shoot developed after transformation showed the GUS assays. Amplified DNA fragment was produced in PCR using N-11 specific primer and DNA from the transgenics. The transgenic plants were also confirmed using southern blotting technique. The efficiency of protocol and role of Agrobacterium mediated transformation in crop improvement will be discussed.

Biography

T. Ugandhar has completed his Ph.D at the age of 25 years from Kakatiya University under the guideness of Prof N. Ramaswamy Head Department of Biotechnology Kakatiya University Warangal immediately he was started his committed teaching career as a Lecturer in Botany at C.V. Raman P.G. College Mancherial in 2005 and he was appointed as Assistant Professor by APPSC at S.R.R Govt Degree and P.G. College Karimnagar. He has published 25 research articles, co-authored 2 books and guided 10 M.Phil theses. He has attended 15 national seminars and 3 international seminars and also attends 4 symposia and workshops. His major fields of teaching and research include Cytology and Cytogenetics, Genetics and Plant Breeding, Molecular Genetics, Mutation Breeding, Plant Tissue Culture and Biotechnology. He successfully applied mutation breeding to brinjals, chillies and tomatoes and developed several agronomically useful varieties. He established clonal multiplication of certain forest trees. He has a patent pending for In Vitro Propagation of Tassar Silk Plant.

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Track 1(iii)

1(iii): New Approaches to Industrial Biotechnology

Session Chair
Anushree Malik
Indian Institute of Technology Delhi, India

Session Co-Chair
Pushpa S Murthy
Central Food Technological Research Institute, India

Session Introduction

Title: **Novel antimicrobial tool for food preservation: Volatile phytochemicals and air ions**
Anushree Malik, Indian Institute of Technology Delhi, India

Title: **Design of experiment for production of citric acid using 2-level factorial method**
R. Gopinadh, GITAM University, India

Title: **Process analytical technologies: Application to biological batch processes**
Sumana Chenna, Indian Institute of Chemical Technology, India

Title: **Immobilization and effect of different metallic ions, activators and inhibitors on cells of Saccharomyces cerevisiae for improving ethanol production**
Sarabjot Kaur Sohal, Lovely Professional University, India

Title: **Essential oils and oleoresins as bio-preservatives in food**
Pushpa S Murthy, Central Food Technological Research Institute, India

Title: **Bio-processing of silk fiber for making surgical sutures**
Gurumurthy B R, Lovely Professional University, India

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Novel antimicrobial tool for food preservation: Volatile phytochemicals and air ions

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Present work deals with antimicrobial efficiency of essential oil vapours, Negative air ions (NAI) as well as their combination for food preservation applications. Antimicrobial activity of the volatile compounds (essential oils) in vapour phase could be highly effective against food borne pathogens and spoilage microorganisms at comparatively lower concentrations (MICs) than the liquid phase. The antimicrobial effect of the small charged air ions facilitating the application of air ionisation mainly in food processing and intensive care unit have the potential to control food spoilage and hospital acquired infections, respectively. The mechanisms of action as well as pilot level applications of both essential oil vapour and NAI have been investigated. A novel possibility lies in the combination of volatile compounds with charged air ions. In vitro studies show marked enhancement in antimicrobial efficiency by combination of both the agents, thereby conceiving a novel tool for food preservation. The same can be used to design a system for exposure of perishable products in order to deactivate the spoilage microorganisms as well as in the development of antimicrobial food packaging.

Keywords: Essential oil; Negative Air Ions; Antimicrobial agents; food preservation

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Pectinases purification and biotechnological applications of fermented wastes from Thermomyces lanuginosus

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A pectin degradation enzymes are widely used in the industrial processing of fruits and vegetables in order to decrease the viscosity of juices and thus to facilitate extraction, maceration, liquefaction, filtration and clarification processes. Sugar-cane bagasse (SCB) was used as the substrate for pectinases from T. lanuginosus at 55°C under solid-state fermentation (SSF) culture. Exo-PG and total PNL & PL enzymes were purified using Gel-filtration chromatography; the former exhibited only one sharp peak, while the latter showed two identical peaks each of them represents one enzyme. Biotechnological applications of fermented bagasse obtained mixed with the fungal biomass at 55°C as biofertilizer at different concentrations (w/w) were cultivated with Zea mays for 30 days to indicate the growth on sandy soil and succeeded to induce the plant growth which may give an indication of applying the present biofertilizer particularly in the reclaimed sandy soils. Only 14 and 13 amino acids were detected and obviously that Exo-PG was typical proline containing enzyme and total PNL & PL were glycine/histidine containing enzymes, respectively.

Keywords: Pectinases enzymes, Thermomyces lanuginosus, Biofertilizers, Solid-state fermentation

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Bio-processing of silk fiber for making surgical sutures

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Silk is a bio material used for many medical applications. One such application is its use as a surgical suture material. In this research the bio-process of making this surgical suture using silk filament fiber is discussed. The first process in silk braid manufacturing is degumming. Degumming is the process of removing sericin or silk gum from the silk filament. Removal of sericin would improve the sheen, color, hand and texture of the silk filament. The gum can serve as a protective layer and is typically left on the silk until it is ready to dye. The silk filaments are dried and made ready for dyeing. During degumming bio-chemicals are mainly used to remove the gum. After degumming, the silk fiber is dyed using a natural dye called as logwood black through a natural process of dyeing and oxidation. In the suture making stage this dyed silk fiber is doubled, twisted and waxed to meet the USP size standards. Also in this study physical property of silk braided suture materials is determined. Analysis of silk braid suture material is carried out after determining the fiber and yarn properties of silk braided suture materials using data generated by fiber testing instruments like vibroskop 400 and INSTRON 6021. The materials used in this study include standard silk braided sutures confirming to USP norms. Several trials were conducted on the selected samples to determine its fiber and yarn properties. Analysis and effect studies were carried using the experimentally generated data. Correlation analysis was carried out on fiber, yarn and knot pull strength properties of silk braided suture materials. However, from the result analysis it was found that fiber and yarn properties have a positive impact on the overall performance of suture material.

Biography

Gurumurthy B R is pursuing his PhD in Textiles from Visveshvaraya Technological University, Belgaum. He is presently working at Lovely Professional University, Jalandhar. He has published about 7 research papers in reputed journals and presented his research findings in various national and international conferences in India and Abroad.

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Essential oils and oleoresins as bio-preservatives in food

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Essential oils (EOs) are aromatic oily liquids obtained from plant material by steam distillation for commercial production. An estimated 3000 EOs is known, of which about 300 are commercially important and are destined chiefly for the flavours and fragrances souk. EOs or their components have been reported to exhibit biological activity such as antiviral, antimycotic, antitoxigenic, antiparasitic and insecticidal properties. The phenolic components are most active and appear to act principally as membrane permeabilizers. Food preservation is a continuous fight against microorganisms spoiling the food or making it unsafe. Several food preservation systems such as heating, refrigeration and addition of antimicrobial compounds can be used to reduce the risk of outbreaks of food poisoning; however, these techniques frequently have associated adverse changes in organoleptic characteristics and loss of nutrients. EOs could readily be incorporated in manufactured foods that are traditionally associated with herbs (savoury dishes such as meat and fish dishes, cheese, vegetable dishes, soups and sauces) or with spices (drinks and desserts containing fruit and/or dairy products). The use of EOs in consumer goods is expected to increase in the future due to the rise of 'green consumerism', which stimulates the use and development of products derived from plants. Interactions between EOs and their components and other food ingredients, stability of EOs during food processing and food additives are key concerns. Thus the potential value of these agents as natural and biological preservatives will be highlighted which is a niche in the food biotechnology.

Keywords: Essential oil, plant, food, preservation, food poisoning, biological activity

Biography

Pushpa S Murthy received her Ph.D. degree in Biotechnology at Mysore University, India. Her primary field is Microbiology and biotechnology with research emphasis on food microbiology, food technology and coffee. She is presently working as a Senior Scientist at Plantation Products, Spices and Flavor technology department. Her research work involves production of value-added products, Food and Pharmaceutical components, bioactivity evaluation of the isolated plant extracts or synthesized compounds on food borne pathogenic microbes. Dr. Pushpa S Murthy holds patents, process know –how and is the author of peer-reviewed papers, book chapters, and reviews. She is a member of Association of microbiologist of India, society of Biological sciences and also association of Food scientist and technologist of India.

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Design of experiment for production of citric acid using 2-level factorial method

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Statistical Experimental Design was employed for the improvement of citric Acid production from Madhuca indica through submerged fermentation process using Aspergillus niger MTCC 282. The results obtained from the two-level full factorial design with six factor combinations show effects free from confounding, that is, all effects are distinguishable from other effects by doing fewer runs with all possible combinations . The results obtained from two level full factorial design showed that Mg 0.05mg/ml, $(NH_4)_2$ SO_4 0.2 g/l, EDTA 0.2g/l, KH_2PO_4 2 g/l were found to be major factors for the production of citric acid. The Statistical analysis showed that maximum production of citric acid was obtained at pH 4.

Biography

R. Gopinadh has completed his under graduation in Chemical Engineering and Masters in Biotechnology from Andhra University. He is Pursuing his Ph.D in Biotechnology. He is working in GITAM University as Assistant Professor in Department of Biotechnology. He has published more than 10 papers in reputed journals and serving as a member for Various Technical Committees. His area of interest is in Bioprocess Engineering and Down Stream Processing.

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Process analytical technologies: Application to biological batch processes

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Process analytical technologies (PAT) have been gaining lot of significance in recent years from modern bioprocess industry as they provide scientific approach for process design & optimization, appropriate sensor & control technologies and chemometric monitoring resulting economic optimality, operational safety and sustainability. Modern bioprocess technology needs more sophisticated techniques and refined instrumentation to monitor its status. Any abnormal deviation in process may result in lower product yields, batch to batch quality variation, thus leading to suboptimal process operation. There can also be a risk of contamination by foreign microorganisms. Hence there is a great need for the development of on-line monitoring and control systems for bioprocess application.

Present paper gives a brief overview on various components of PAT and their importance with relevance to bioprocess application. Further, one of the major components of PAT namely chemometrics has been explored for on-line monitoring of batch bioprocesses. Chemometric analysis provides efficient means of extracting valuable information from the historical process data by using multivariate statistical techniques. An improved chemometric methodology based on local multiway PCA (LMPCA) has been proposed in this work. LMPCA considers the historical database of past successful batches and builds local off-line principal component (PC) models at each sampling instant of batch. On-line process monitoring is done by developing simple statistical process control charts, which are capable of tracking the progress of new batch runs and detecting the occurrence of observable upsets. Simulation results reveal the efficacy of the proposed chemmometric technique for on-line monitoring of a biological batch penicillin production process in resulting improved performance.

Biography

Sumana Chenna has obtained her doctorate degree in chemical engineering from IIT, Bombay. She has been working as scientist at Indian Institute of Chemical Technology, Hyderabad for the past 12 years. She has been serving process industry by providing consultancy for process design, scale-up and technology development. She has published more than 15 papers in reputed international journals and conference proceedings. Her research areas of interest include process systems engineering, mathematical modeling, optimization, monitoring and control of chemical and biochemical processes.

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Track 1(iv) & 1(v)

1(iv): Nanobiotechnology
1(v) : Aquaculture & Marine Biotechnology

Session Chair
Devaprakasam
Karunya University, India

Session Co-Chair
Awadhesh Kumar Singh
Maharaja Agrasen Institute of Technology, India

Session Introduction

Title: **Preparation of emulsified encapsulated bovine serum albumin nanoparticles of Azadirachta indica alkaline phosphatese**
Kirti Rani, AMITY University, India

Title: **Bio-sensor in engineering**
Awadhesh Kumar Singh, Maharaja Agrasen Institute of Technology, India

Title: **D-NDB- development of biomedical nano database (NDB) through microsoft access desktop web solutions**
D. Srinivasa Rao, Acharya Nagarjuna University, India

Title: **Synthesis of plant mediated gold nanoparticles using flower extracts of Carthamus Tinctorius l. (safflower) and evaluation of their biological activities**
Nagaraj B, Shridevi Institute of Engineering & Technology, India

Title: **Targeted cancer therapies: A chemical pharmaceutics approach**
B. Surendar Reddy, Central Drug Research Institute - Lucknow, India

Title: **Application of LC-MS and NMR Spectroscopy in marine biotechnology and biomedicine**
T. Narender, Central Drug Research Institute, India

Title: **Studies on enzyme activity in the tissues of Labeo rohita (Ham) exposed to distillery effluent**
J. Helan Chandra, Jeppiaar Engineering College, India

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Bio-sensor in engineering

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It is well known that animals/birds respond to earthquake much before its occurrence, especially dogs, rats and crows. They keep themselves safe by sensing it well in advance. Responsible biomolecules present in their body for this sensing system can be used as earthquake sensor. When pharmacology of dogs, rats and crows are further studied, it is found that their blood pressure/pulse-rate is also in the same range or even higher as in a human body suffering from high blood pressure, i.e. around 150-180 diastolic pressure. Pulse rate of crow=380 beats/min, rats=420 beats/min and dogs=120 beats/min [normal human body=75 beats/min]. Human body is also very sensitive to feeble vibration when suffering from hypertension/high blood pressure resulting in higher pulse rate. Means, biomolecules active during high blood pressure are responsible in sensing the feeble vibrations in human body. Sensing behavior of that biomolecules can be exploited to sense the earthquake. In human body, crows and dogs/rats, it is Norepinephrine (NE). So, behavior of NE or similar biomolecules can be used as earthquake sensor.

Biography

Awadhesh Kumar Singh has completed his B.Tech. in 1985 in Electronics and Communication thereafter M.Tech. in Instrumentation and Control. He is working on his research on behavior of organic sensor and its medical and nonmedical applications. He is Asst. Prof. in Electronics and Communication Department in Mait, Rohini, Delhi, India and have published a number of papers in various national and international technical conferences along with some patent of research products.

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Synthesis of plant mediated gold nanoparticles using flower extracts of Carthamus tinctorius L. (safflower) and evaluation of their biological activities

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The ecofriendly synthesis of nanoparticles through various biological means helps to explore various herbs for their ability to synthesis nanoparticles. Generally, nanoparticles are prepared by a variety of chemical methods which are not environmentally friendly. We report a rapid and convenient method to reductively prepare gold nanoparticles from auric chloride. In this report we use aqueous extracts of Carthamus Tinctorius L. (Safflower) flowers was used for the synthesis of gold (Au) nanoparticles. UV-visible spectroscopy studies were carried out to assess the formation Au nanoparticles. Transmission electron microscopy (TEM) was used to characterize the Au nanoparticles. TEM image divulges that nano triangle and spherical shape gold nanoparticles are formed with polydispersed size, which ranging from 40 nm to 200 nm. The antimicrobial activity of gold nanoparticles was performed on various gram negative bacteria and fungus. The gold nanoparticles showed more inhibitory activity on pathogenic gram negative bacteria than fungus.

Keywords: Gold nanoparticles, Safflower, Auric chloride, UV-visible spectrophotometer, TEM

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Targeted cancer therapies: A chemical pharmaceutics approach

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Targeted cancer therapies are which block the growth and spread of cancer by interfering with molecular targets. Among many possible Targeted therapies delivery of antineoplastic (including biotechnology derived such as siRNA) agents to cancer cells using nanomaterials as pharmaceutical delivery systems is an important strategy. Over the last two decades, nanotechnology has made its impact in every area of science and technology. Many preclinical and clinical studies with nanoparticle based diagnostic and therapeutic system for different cancers are ongoing in different parts of the world. Amongst the different arsenal of nanoparticles, Tumor specific small molecule ligand baring multifunctional nanoparticles that will selectively find and kill cancer cells play a very significant role in development of targeted therapies. Fabrication of the tumor targeted multifunctional nanoparticles with therapeutic excipients to achieve a synergistic therapeutic effect with anticancer agent is an attractive strategy. A novel therapeutic cationic molecule, siRNA and taxol based tumor specific nanoparticle system which currently is in development, targets Prostate specific membrane antigen (PSMA), over-expressed in human prostate cancer. Moreover, since PSMA is also expressed in the tumor neovasculature of other types of cancers, the resulting system may be exploited to target those cancers as well. In this talk will present the development of therapeutic lipid constituted PSMA targeted nanoparticles.

Biography

B Surendar Reddy has completed his PhD at Indian Institute of Chemical technology, Hyderabad, India and postdoctoral studies from Professor Leaf Huang's lab at University of North Carolina, Chapel Hill, U.S.A. He is working as a scientist at Central Drug Research Institute, Lucknow, India. He has published more than 15 papers in reputed journals.

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D-NDB- Development of biomedical nano database (NDB) through microsoft access desktop web solutions

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Nanotechnology recently emerged as one of the most active research field in the areas of physics, chemistry, biology and engineering. The potential impact of this novel technology applications on disease diagnosis, therapy and prevention, is foreseen to change the health care in a fundamental way. It enables to construct new materials to continue with less economy and increasing the speed of information transmission and storage. Further, the nano database can display the novel enhanced properties compared to traditional materials, which can open up the new technological applications. Developments in the nano databases is a multidisciplinary field of information technology have yielded a novel concepts of using nano materials in the replacement parts and implementation of nano parts instead normal materials. Advancements in computers, information technology, medical, agriculture and biomimetic environments have created unique opportunities to nano database generation. Today's challenge information technology needs more simple functionality, as well as skilled manpower in the biology and computer science. Now research with nano database have exhibit novel, enhanced properties of nano materials to open up new technological hurdle and test for their bioactivity and special formulation techniques can be develop to optimize the physiological and technical action of the synthesize nano database to continue success of nano data base. Nanotechnology has potential impact on technical field and disease therapy, but there is a serious lack of information concerning the human health and environmental implications of manufactured nanomaterials. Nano Desktop databases are user-friendly and inexpensive, no need of SQL Language and through desktop database management system (DBMS) offer an easy-to-navigate graphical user interface. The stupendous area nano database applications are still in their infancy and the outcome of the proposed study is expected to unravel the underlying concept of broad range use of nanotechnology in brief way with control of basic databases.

Biography

D. Srinivasa Rao has completed his Ph.D at the age of 27 years from Bharathiar University, Coimbatore and currently working as an Assistant Professor at Department of Biotechnology, Acharya Nagarjuna University, Guntur. He has published more than 20 papers in reputed journals, two books and one chapter in Google e-book. He is the acting reviewer for the Journal of Springer Book "Nano-Antimicrobials".

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Studies on enzyme activity in the tissues of Labeo rohita (Ham) exposed to distillery effluent

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[2]Department of Biotechnology, St. Joseph's College of Engineering, India

The high rate of population growth and rapid increase of industrialization have resulted in the problems of disposal of wastewater materials. Untreated industrial effluents enter either by direct disposal or via run-off of rainwater, where they adversely affect fish and other living organisms at morphological and physiological levels. The present study envisages the variations in the enzyme activities in two major tissues liver and gill of Labeo rohita exposed to sub lethal concentrations of distillery effluent. The fish were exposed to 0.049% and 0.098% sub lethal concentrations of distillery effluent for 10 and 30 days respectively. Both the sub lethal concentrations alters the activity of Aspartate Transaminase (AST), Alanine Transaminase (AST), Alkaline Phosphatase (ALP), Acid Phosphatase (ACP) and Lactate Dehydrogenase (LDH). Elevated levels of AST, ALT were observed in the liver and gill tissues of Labeo rohita. Whereas LDH, ACP and ALP levels were found to be decreased in the Liver and gill tissues. These results suggest that the evaluation of phosphatases, transaminases and LDH activity in the tissues can be used as an important biomarker for the assessment of distillery effluent toxicity and environmental pollution.

Biography

J. Helan Chandra has completed her Ph.D., from Madras University and working as an Associate Professor for the past 10 years in the Dept. of Biotechnology, Jeppiaar Engineering College, Chennai. She has also guided more than 25 B.Tech. and M.Tech. students in various field. She has attended more than 15 national and international conferences and presented various papers. She was one of the members of organizing committee for various workshops, conference, seminar and symposium both in national and international level.

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Nanomedicine based delivery to systems for the treatment of degenerative arthritis

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Osteoarthritis (OA) and Rheumatoid arthritis (RA) are the most common forms of joint diseases affecting over 250 million people worldwide. As with most auto-immune and inflammatory diseases, the severity of arthritis is aggregated by the activation of inflammatory responses mediated by biochemical agents such as cytokines, chemokines, prostaglandins, growth factors, proteases and nitric oxide (NO). Current treatments results in severe systemic side effects such as cardiovascular failure, kidney dysfunction, diabetes, gastrointestinal bleeding and osteoporosis. Here we demonstrate the activity of a naturally derived protein purified from cow's milk as an alternative treatment option for OA. Two different forms of the protein, metal saturated (P^{M+}) and unsaturated (P^{M-}) were used. Furthermore in order to increase efficient delivery and increase bioavailability, a novel non-toxic, biodegradable polymeric nanoformulation was utilised to encapsulate the bioactive proteins. Characterization techniques such as dynamic light scattering and scanning electron microscopy revealed particle size range to be between 180nm-220nm and have a spherical morphology. Differential scanning calorimetry demonstrated an enhanced thermal stability of protein loaded nanoparticles as compared to the void (unloaded) nanoparticles. Fourier transform infrared spectroscopy analysis confirmed the interactions of protein with nanoparticles through the enhanced chemical bonding and X-ray diffraction patterns revealed no change in the crystalline structure between protein loaded and void nanoparticles.

The cellular and molecular efficacy of these nanoparticles was examined on osteoarthritic chondrocytes (cartilage cells) to evaluate its anti-inflammatory and regenerative activity. Nanoparticles were observed to be non-toxic to cells and were able to internalise within 2 hours as determined by confocal microscopy. The non-toxicity was further confirmed with cytotoxic and apoptotic assays which showed no significant change in cell integrity even after treatment with increasing concentrations. The anti-inflammatory activity of nanoparticles, determined through various assays, showed significant inhibition of agents reported to initiated cartilage degradation and inflammation. Chondrocytes treated for 24 hours with P^{M+} nanoparticles significantly down-regulated the production of nitric oxide and prostaglandins as compared to P^{M-} and void particles. Gene expression analysed with real-time PCR revealed the down regulation of key inflammatory mediators such as matrix metalloproteinases (MMP)-1, MMP-2, MMP-3, MMP-9, MMP-13, MMP-14, MMP-15, nitric oxide synthase 2, cytokines interleukin-1β and tumour necrosis factor-α. Moreover, P^{M+} nanoparticles were able to increase expression of aggrecan and type II collagen. Protein expressions of MMP-3, MMP-9 and NOS2 were down regulated with P^{M+} treatments. Ex-vivo loop assay testing the absorbance of nanoparticles in different sections of the mouse intestine revealed an increased absorbance of P^{M-} and P^{M+} nanoparticles within 2 hours in the jejunum and ileum whereas void nanoparticles only showed a significant absorbance after 4 hours. Furthermore, P^{M-} showed an increased absorbance in the jejunum and P^{M+} within the ileum. These findings collectively demonstrate the regenerative and anti-inflammatory activity of natural bioactives loaded nanoparticles and its potential use as a nanotherapeutic for arthritis and other rheumatic related diseases.

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Preparation of emulsified encapsulated bovine serum albumin nanoparticles of Azadirachta indica alkaline phosphatase

Kirti Rani
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Nanoparticles are spherical particles which allow the controlled release of active ingredient. Nanoparticles have been used as carriers in the delivery of drugs, antigens, hormones, enzymes and genes. Besides, it has many advantages in the industrial application. Albumin is a major plasma protein constituent and its biodegradation leads to form natural products such as amino acids (tyrosine, tryptophan & asparagines). As well as these, albumin nanoparticles are non-toxic and non-antigenic in nature. Albumin nanoparticles are easily metabolized in the body as well as the size of particles, degree of stabilization. Hence, its colloidal forms have been considered as potential carriers of drugs for their site-specific localization. Thus, albumin, being biodegradable, biocompatible, and nontoxic, was chosen as a matrix material for the preparation of the nanoparticles. Our work involves usage of bovine serum albumin for entrapment of biologically active materials Azadirachta indica alkaline phosphatase using cross linking agent (glutaraldehyde) and emulsifier (coconut oil). Glutaraldehyde is used as cross linking agent and coconut oil is used as emulsifier which given the newly formed fluorescent complex which consists of tryptophan residues as its diene adduct. The oil bath was prepared by adding glutaraldehyde and n-butanol in coconut oil along with 50 U of Azadirachta indica alkaline phosphatase. This solution was filled in the syringe and dispersed in prepared oil bath as well as stirred for overnight at 37°C. Centrifuged at 5000rpm for 10min and supernatant was removed and pellet was collected which contain prepared nanoparticles. These prepared nanoparticles were washed with cold ether and acetone. The emulsification with coconut oil was increased the stability of encapsulated nanoparticles as well as responsible for controlled release of enzyme in the delivery system in the presence of proteases. The prepared nanoparticles were spherical in shape and exhibit fluorescent at 495nm. The specific activity of Azadirachta indica alkaline phosphatase was studied at different time intervals (1 to 7 days)as well as using different concentration of proteases such as trypsin, chymotrypsin and papin (6U, 12 U & 18U) to understand the biodegradibilty of the cross linked entrapped Azadirachta indica alkaline phosphatase. The enzyme activity of Azadirachta indica alkaline phosphatase in emulsified encapsulated bovine serum albumin nanoparticles was estimated by p-nitrophenyl-phosphate method. Among them the chymotrypsin was found to be the best proteolytic enzymes which release the maximum activity of Azadirachta indica alkaline phosphatase in solution at the fifth day, thereby confirming the proper immobilization of enzyme in prepared nanoparticles of bovine serum albumin under specified conditions. In the absence of proteolytic enzymes, Azadirachta indica alkaline phosphatase was not detected. This immobilized Azadirachta indica alkaline phosphatase in emulsified encapsulated bovine serum albumin nanoparticles can be used in detergent and leather industries along with the different proteases to wash the fabrics as well as to leach the leather. These emulsified nanoparticles of bovine serum albumin of bound Azadirachta indica alkaline phosphatase can be used in food and pharmaceutical industries too as a preservative in different kind of syrups preparation such as fructose syrups.

Biography

Kirti Rani has done her M.Sc. in 2000 and completed her Ph.D (2004) at the age of 25 years from Department of Biochemistry, Maharshi Dayanand University, Rohtak, India. She is ex-senior resident/demonstrator of department of Biochemistry, Post-graduate Institute of Medical Education & Research, PGIMER, Chandigarh, India (2004-2007). She has also worked as lecturer 7 invited as guest faculty in others private/Govt. affiliated Indian colleges/institutions (2007-2008). She is Assistant Professor in Amity Institute of Biotechnology, Amity University, Noida, India (2008-till date). She has more than 25 international & national publications including research articles/ monographs/ books/ patents/ abstracts. She is also member of Society of Biological Chemists, India and Stem Cell Voice of India. She is also reviewer of more than 8 international journals.

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Application of LC-MS and NMR Spectroscopy in marine biotechnology and biomedicine

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Natural products have been the source of most of the medicines. More than 80% of drug substances were natural products or inspired by a natural compound. New drugs from 1981 to 2007 indicate that almost half of the drugs approved since 1994 are based on natural products. Thirteen natural-product- related drugs were approved from 2005 to 2007. Over a 100 natural-product-derived compounds are currently undergoing clinical trials. Chemical compounds exist in nature as mixtures, so the combination of liquid chromatography and mass spectrometry (LC-MS) is often used to separate the individual chemicals. Databases of mass spectras for known compounds are available. Nuclear magnetic resonance spectroscopy is another important technique for determining chemical structures of natural products. Over the past 30 years, NMR spectroscopy has had tremendous impact on organic chemistry and biomolecular structure determination at all stages of drug discovery and development. With advances in NMR techniques, complex structures can be solved with much less than 1 mg of compound the structures of more than 90% of new compounds can be elucidated within 2 weeks. Application of these modern techniques (LC-MS and High Resolution NMR spectroscopy) in marine biotechnology and biomedicine will be discussed.

Biography

T. Narender was born in a remote village, Vilasagar, which is located in the Karimnagar district of Andhra Pradesh State, India. He obtained the Ph.D. degree in the area of natural products (phytochemistry) from the University of Kakatiya, Warangal, A.P., India in 1999. During his Ph.D. degree studies, he received fellowship (1994-1999) from the University Grants Commission (UGC), New Delhi, India. After obtaining his Ph.D. degree, he joined as a Scientist B the Central Marine Fisheries Research Institute (CMFRI), Cochin, India, in November 1999, and continued there until July 2002, where he worked on the bioactive substances from the marine organisms. In July 2002, he moved to the Central Drug Research Institute, Lucknow, India, on a higher position, and currently he holds a Senior Scientist position. At the CDRI, he is involved in the drug discovery program from the Indian medicinal plants, marine organisms. He has been awarded the BOYSCAST Fellowship by the Department of Science and Technology, New Delhi, India, in 2007. As a part of this program he visited University of California, San Diego (UCSD), USA, where he worked with Professor William Fenical's lab on marine microorganisms from April 2007 to March 2008. He has been awarded the CDRI Incentive Award for the best publication during 2008 and 2012. Currently, his research group is engaged in development of novel drugs/leads for various diseases such as malaria, leishmania, cancer, diabetes, and lipid lowering from the Indian medicinal plants, marine organisms. He also carries out work on chemical transformation and synthesis of natural products of biological importance.

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Track 2(i) & 2(iv)

2(i) : New Approaches to Enzyme and Microbial Technology
2(iv) : Microbial Physiology, Metabolism, and Gene Expression

Session Chair
Olubukola Oluranti Babalola
North-West University, South Africa

Session Co-Chair
Madhab K.Chattopadhyay
Centre for Cellular and Molecular Biology, India

Session Introduction

Title: **Phylogenetic screening for antibiotic producing actinomycetes from rhizospheric soils**
Olubukola Oluranti Babalola, North-West University, South Africa

Title: **Investigations on interlinked stress response in some antarctic and mesophilic bacteria**
Madhab K.Chattopadhyay, Centre for Cellular and Molecular Biology, India

Title: **High level expression of enantioselective lipase gene from Bacillus pumilus in E.coli**
Shafaq Rasool, Shri Mata Vaishno Devi University, India

Title: **Enhanced anti bacterial activity of chitosan stabilized azithromycin-gold nano conjugate against clinical isolate of E.coli and Staphylococcus aureus**
S. Karthick Raja Namasivayam, Sathyabama University, India

Title: **Study of growth kinetics for rhamnolipid production from Pseudomonas aeruginosa**
J. Satya Eswari, Indian Institute of Chemical Technology, India

Title: **Invitro adhesion and invivo colonization are desired probiotic characters of MBTU PBBM1 Bacillus subtilis isolated from milk**
T. R. Keerthi, Mahatma Gandhi University, India

Title: **Screening, characterization and bioinformatics analysis of pectinase producing actinomycetes from Vellore and Chittoor –An overview**
Suneetha Vuppu, VIT University, India

Title: **Isolation of Streptomyces sp. from soil and its medium optimization for microbial transglutaminase production by box-behnken design**
Gopal Samy B, St. Michael College of Engineering & Technology, India

Title: **Preparation of emulsified encapsulated egg albumin nanoparticles of Azadirachta indica alkaline phosphatese**
Kirti Rani, AMITY University, India

Title: **Studies on harpin- mediated cell death events in Saccharomyces cerevisiae**
Vedantam Lakshmi Vasudev, University of Hyderabad, India

Title: **Isolation and characterisation of kerosene degrading bacteria from contaminated water**
Jisha M S, Mahatma Gandhi University, India

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Cholesterol derivatives as antimicrobial agents

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Pathogen infections have threatened human's health for thousands years. During past decades, with the abuse of antimicrobial agents, more and more drug-resistant pathogens were found. Among them, methicillin-resistant Staphylococcus aureus (MRSA) is a prominent pathogen, which causes a public health concern worldwide and associates with a high mortality. Novel antimicrobial agents against MRSA have been introduced recently. However, the emergency of resistance and side effects for those agents raise the need for novel antimicrobial agents. In this work, a series of Cholesterol derivatives were checked for their antimicrobial activity, insilico metabolism, toxicity prediction, exploration of new therapeutic potential, QSAR modeling of rat acute toxicity.

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Isolation of Streptomyces sp. from soil and its medium optimization for microbial transglutaminase production by box-behnken design

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Transglutaminase (E.C. 2.3.2.13) are a family of enzymes that catalyze the formation of a covalent bond between a free amine groups. They are widely used in food industries and their demand rises daily. Though they are available in mammalian tissues, fish and plants, the complex separation and purification process led to the search of Microbial Transglutaminase (MTGase). Finding a new microbial source of transglutaminase and the study of the medium composition for MTGase production were the goals of this work. Six Different types of Actinomycetes like strains were isolated from soil sample and two of them named PG03 and PG06 were selected based on their ability to produce 23 mg/ml and 21 mg/ml MTGase enzyme respectively. Strain PG03 was chosen for further studies and it was found to be a Strpetomyces sp. In order to optimize the MTGase activity, modifications of the usual media composition described for enzyme production were tested. Strategies like screening experiment for the best carbon and nitrogen sources, Plackett-Burman method to elucidate the key ingredients in the media production and Response Surface Methodology to optimize the concentration of the key components were adopted. The experimental results were fitted to second order polynomial model at the 95 % confidence level. Under the proposed optimized conditions, the model predicted a transglutaminase yield of 21.7 mg/ml, very closely matching the experimental value of 24.1 mg/ml. The regression obtained.

Biography

Gopal Samy B has completed his M.Tech-Biotechnology at Sathyabama University, Chennai, M.Phil-Bioinformatics at PRIST University, Thanjavur and at present he is doing his Ph.D in Biotechnology at Anna University of Technology, Coimbatore, under the guidance of Dr. K. Jegatheesan. He is working as the Associate Professor in the Department of Biotechnology and an active member of the R & D Cell at St. Michael College of Engineering & Technology, Kalayarkoil. He has published more than 3 papers in reputed international and national journals and he is also the Associate member of Institute of Nanotechnology. He has also visited IBMBB, Colombo for an International Conference.

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Study of growth kinetics for rhamnolipid production from Pseudomonas aeruginosa

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Surfactants and emulsifiers are widely used in the petroleum, pharmaceutical, cosmetic and food industries. Most of these compounds are chemically synthesized and it is only in the past few decades that surface-active molecules of biological origin have been described. At present biosurfactants are readily biodegradable and can be produced from renewable and cheaper substrates, they might be able to replace their chemically synthesized counter parts. Among the heterogeneous group of biosurfactants, the rhamnose-containing glycolipids produced by Pseudomonas. Rhamnolipid has been known as biosurfactant which is produced by Pseudomonas aeruginosa in fermentation process. The different carbon, nitrogen and phosphorous sources have been used to produce rhamnolipid. This work concerns the growth kinetics aspects of rhamnolipids biosurfactants. The laboratory scale experiments are carried out for rhamnolipid biosurfactant production by Pseudomonas aerogenosa involving a medium with the following composition (g/L): Glucose (x1): 10.0, NH_4NO_3 (x_2): 1.7, KH_2PO_4 (x_3): 3.0, yeast extract (x_4): 5.0, $MgSO_4.7H_2O$ (x_5): 0.2, Na_2HPO_4 7.0, and 1ml hexadecane. The concentrations of the Glucose, NH_4NO_3; KH_2PO_4; $MgSO_4.7H_2O$; and yeast extract 5.0; were varied according to experimental design. The strain was grown at at room temperature (30±70C) with agitation speed of 200 rpm for 24 hours and was used as an inoculum at the concentration of 10%(v/v). For biosurfactant production, P. aeuriginosa was grown in 250 ml flask with 100 ml of Minimal media at the same conditions for 48 hours. The aim is to study the kinetic behaviour for rhamnolipid production from Pseudomonas aeruginosa by using different substrates such as glucose, phosphorous and nitrate. The samples continuously withdrawn for every 2 hours during 48 hours period and the kinetic behaviour of substrates concentrations (glucose, phosphorous and nitrate) and rhamnolipid concentration are observed. The rhamnolipid product concentration is found to good agreement with the reported experimental data.

Biography

J. Satya Eswari has obtained her M.Tech Biotechnology from IIT, Kharagpur. Currently she is working as Woman-Scientist at IICT, Hyderabad and pursuing Ph.D from IIT, Hyderabad. She has published few papers in reputed journals and worked in sponsored projects.

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Preparation of emulsified encapsulated egg albumin nanoparticles of Azadirachta indica alkaline phosphatase

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Nanoparticles are spherical particles which allow the controlled release of active ingredient. Nanoparticles have been used as carriers in the delivery of drugs, antigens, hormones, enzymes and genes. Besides, it has many advantages in the industrial application. Albumin is a major plasma protein constituent and its biodegradation leads to form natural products such as amino acids (tyrosine, tryptophan & asparagines). As well as these, albumin nanoparticles are non-toxic and non-antigenic in nature. Albumin nanoparticles are easily metabolized in the body as well as the size of particles, degree of stabilization. Hence, its colloidal forms have been considered as potential carriers of drugs for their site-specific localization. Thus, albumin, being biodegradable, biocompatible, and nontoxic, was chosen as a matrix material for the preparation of the nanoparticles. Our work involves usage of egg albumin for entrapment of biologically active materials Azadirachta indica alkaline phosphatase using cross linking agent (glutaraldehyde) and emulsifier (coconut oil).Glutaraldehyde is used as cross linking agent and coconut oil is used as emulsifier which given the newly formed fluorescent complex. The oil bath was prepared by adding glutaraldehyde and n-butanol in coconut oil along with 50 U of Azadirachta indica alkaline phosphatase. This solution was filled in the syringe and dispersed in prepared oil bath as well as stirred for overnight at 37°C. Centrifuged at 5000rpm for 10min and supernatant was removed and pellet was collected which contain prepared nanoparticles. These prepared nanoparticles were washed with cold ether and acetone. The emulsification with coconut oil was increased the stability of encapsulated nanoparticles as well as responsible for controlled release of enzyme in the delivery system in the presence of proteases. The prepared nanoparticles were spherical in shape and off-white to whitish brown in colour. The specific activity of Azadirachta indica alkaline phosphatase was studied at different time intervals (1 to 7 days)as well as using different concentration of proteases such as trypsin, chymotrypsin and papin (6U, 12 U & 18U) to understand the biodegradibilty of the cross linked entrapped Azadirachta indica alkaline phosphatase. The enzyme activity of Azadirachta indica alkaline phosphatase in emulsified encapsulated egg albumin nanoparticles was estimated by p-nitrophenyl-phosphate method. Among them the chymotrypsin was found to be the best proteolytic enzymes which release the maximum activity of Azadirachta indica alkaline phosphatase in solution at the fifth day, thereby confirming the proper immobilization of enzyme in prepared nanoparticles of egg albumin under specified conditions. In the absence of proteolytic enzymes, Azadirachta indica alkaline phosphatase was not detected. This immobilized Azadirachta indica alkaline phosphatase in emulsified encapsulated egg albumin nanoparticles can be used in detergent, leather, food and pharmaceutical industries for washing of fabrics as well as preservative in different kind of syrups preparation.

Biography

Kirti Rani has done her M.Sc. in 2000 and completed her Ph.D (2004) at the age of 25 years from Department of Biochemistry, Maharshi Dayanand University, Rohtak, India. She is ex-senior resident/demonstrator of department of Biochemistry, Post-graduate Institute of Medical Education & Research, PGIMER, Chandigarh, India (2004-2007). She has also worked as lecturer 7 invited as guest faculty in others private/Govt. affiliated Indian colleges/institutions (2007-2008). She is Assistant Professor in Amity Institute of Biotechnology, Amity University, Noida, India (2008-till date). She has more than 25 international & national publications including research articles/ monographs/ books/ patents/ abstracts. She is also member of Society of Biological Chemists, India and Stem Cell Voice of India. She is also reviewer of more than 8 international journals.

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Investigations on interlinked stress response in some antarctic and mesophilic bacteria

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Bacteria in natural environments are most often challenged with more than one stress factor at a time. Hence they evolve with molecules, which confer to them the ability to tolerate more than one stress condition. These multistress-protectants interlink mechanisms involved in adaptation of bacteria to different environmental stressors and are useful for various purposes. Some time back, a DBT-sponsored project was undertaken at CCMB to look for the multistress-protectants in some cold-adapted Antarctic bacteria. Association between cold stress and oxidative stress was demonstrated earlier in an isolate by measuring the specific activity of two antioxidant enzymes and the intracellular level of free radicals (using EPR-spectroscopy) in cells grown at room temperature and 4°C. Enzyme activities and production of free radicals (oxidative stress) were higher in the cold-grown cells. Studies on tolerance of 8 Antarctic and 2 mesophilic bacteria to different environmental stress factors (high and low temperature and pH, high salt, oxidative stress, ultraviolet radiation) revealed remarkable variation in stress-tolerance of organisms belonging to the same genera and isolated from the same environmental niches. Increase in the amount of unsaturated lipids was observed in a salt and cold-adapted mesophile by GC-MS analysis of the total lipids. Mutants of an Antarctic strain, sensitive to multiple stress factors, were obtained by transposon mutagenesis. Mutation in a gene encoding citrate synthase was detected in a mutant using inverse-PCR, implying the role of the enzyme in multiple stress-tolerances. Further studies are in progress.

Biography

Madhab K. Chattopadhyay (born 1956, M.Pharm, Ph.D from Jadavpur University, Kolkata) worked on control of methionine biosynthesis in Escherichia coli at the Indian Institute of Chemical Biology (CSIR), Kolkata as a graduate student; on chemical chaperones at the Institut Jacques Monod, Paris University (France) as a post-doctoral fellow (2001); on physiological characteristics, antibiotic and heavy metal tolerance of some lake bacteria at the Leibniz Institute of Freshwater Ecology and Inland Fisheries, Neuglobsow (Germany), as a visiting scientist (2006, 2009). At present, he is working on stress adaptation of bacteria at CCMB (CSIR). He is actively involved in popularization of science.

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Phylogenetic screening for antibiotic producing actinomycetes from rhizospheric soils

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In this study, we isolated Streptomyces from rhizospheric soils collected from Ngaka Modiri Molema district in South Africa. These isolates were screened for antibacterial activity against ten test microorganisms. Six isolates (NWU4, NWU91, NWU100, NWU110, NWU204 and NWU339) which exhibited antibacterial activity against at least six of the test organisms were characterized by conventional and molecular methods. All the isolates exhibited broad spectrum of antibacterial activity against both Gram positive pathogens such as Staphylococcus aureus, Streptococcus pyogenes, Bacillus subtilis, B. cereus, and Enterococcus faecalis and Gram negative pathogens such as Shigella boydii, Klebsiella pneumoniae, Pseudomonas aeruginosa, Campylobacter jejuni and Proteus miribilis. The results showed that all the isolates were active against Bacillus subtilis, S. aureus, S. pyogenes and C. jejuni with a zone of inhibition ranging between 10 to 35 mm.

A 1.5 kb fragment of the 16S rRNA gene of all the six potent isolates was sequenced. The phylogenetic analysis of partial sequence confirmed that all the potent isolates formed closed phylogenetic cluster with known members of Streptomyces species with a (97-99%) sequence identity. The results suggest that Streptomyces in rhizospheric soils may represent a vast unexplored resource for biotechnology. These isolates may be capable of producing compounds of interest importance to medicine or agriculture. However, further investigation on the isolation and characterization of the antibacterial compounds produced will be necessary to ascertain if its novel and of commercial value.

Biography

Olubukola Oluranti Babalola Principal Scientist Nat is a National Research Foundation (NRF) rated established scientist. Babalola is a Senior lecturer and the leader, Microbial Biotechnology Team, North-West University, South Africa. Her research interest is in Plant-Microbe Interactions. Babalola has > 20 professional certificates, and > 60 research outputs. There are 3 Postdocs, 5 PhD (including Adegboye MF), 8 MSc, and 4 Hons students in her research group. She enjoys international collaboration, and many awards.

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Enhanced anti bacterial activity of chitosan stabilized azithromycin- gold nano conjugate against clinical isolate of E.coli and Staphylococcus aureus

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Nanotechnology is currently employed as a tool to explore the darkest avenues of medical sciences in several ways like imaging, sensing, targeted drug delivery, gene delivery systems and artificial implants. Hence, nanosized organic and inorganic particles are catching increasing attention in medical applications due to their amenability to biological functionalization. Over the recent decade, gold nanoparticles (NPs) have attracted significant interest as a novel platform for various applications such as nanobiotechnology and biomedicine because of convenient surface bioconjugation with molecular probes and remarkable plasmon-resonant optical properties. The development of nanoparticle-based vectors that decrease the toxicity of free drugs and ensure targeted delivery directly to target cells..Conjugates of gold NPs with antibiotics and antibodies also have been used for selective photothermal killing of protozoa and bacteria.In the present study, biocom[patible polymer stabilized Azithromycin-gold nanoconjugate was synthesized, characterized by scanning electron microscopy, FTIR and the synthesized nanoconjugate was tested against clinical isolate of E.coli and Staphylococcus aureus .Increased spectrum of antibacterial activity was recorded in chitosan stabilized Azithromycin- gold nanoconjugate against both the tested strains. The highest increase in inhibitory zone for E.coli and Staph.aureus was observed.The present study suggests possible utilization of antibiotics –gold nanoconjugate as an effective anti microbial agent against the pathogenic bacteria.

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High level expression of enantio selective lipase gene from Bacillus pumilus in E.coli

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Soluble overexpression of enantioselective lipase gene from Bacillus pumilus designated as lipA in E.coli using T7 expression system and surface display expression systems were used for optimizing the overexpression of the enzyme that would allow us to produce large amounts of lipase enzyme for crystallization as well as characterization for its commercial exploitation.

Expression plasmids pET-Lip, pETB-Lip and pEst100-Lip were constructed in E.coli using pET21 (a)+, pETBlue2 and pEst100 as expression plasmids. pET-Lip, and pEst100-Lip were transformed into E. coli BL21(DE3) and pETB-Lip was transformed into E. coli BL21(DE3) pLacI.The lipase gene ljpA in all the constructs was placed directly under the control of T7 promoter.Lipase activity was found in the soluble fraction of E.coli bearing pET-Lip and pETB-Lip. However, major amount of lipase activity was only displayed on the surface of E. coli harbouring pEst100-Lip.

The increase in enzyme expression levels corresponded to 12-60 fold improvements as compared to native enzyme containing lipA under the control of its native promoter.

The recombinant enzyme BPE from the E.coli pETB-Lip at its maximum expression was purified from the CFE in a three-step procedure by ammonium sulphate precipitation, hydrophobic interaction chromatography and subsequently followed by anion-exchange chromatography.

SDS-PAGE analysis indicated that purified BPE is a monomer with a molecular mass of ~19.2 kD.

The recombinant clone as such or the cell free extract prepared from the clone exhibited original selectivity for the hydrolytic activity of various racemates.

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Screening, characterization and bioinformatics analysis of pectinase producing actinomycetes from Vellore and Chittoor –An overview

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The Microbial Enzymes with identical substrate profile produced by different microorganisms vary significantly in the optimal conditions for their reactions like temperature, pH, substrate concentration etc. This gives flexibility in their utilities. Soil is the most complicated biomaterial on the planet and it is the natural source for microorganisms and is a natural laboratory to do experiments. The soil, which arises from the weathering of parent rock materials, is by definition capable of acting as a habitat for microorganisms. Microbially most active soil is the upper 16 –cm -17.2 cm-thick plow layer .As with any material, the physical habitat is of prime importance in determining and regulating biological activity. However, until recently the opaque nature of soil has meant that any interrogation of its interior architecture has been relatively rudimentary, restricted to simple qualitative expressions of the physical heterogeneity that fail to relate to any specific function. However, new techniques and insights into the biophysical and biochemical processes of this inner space are leading to the developments of theoretical frameworks and experimental approaches that will allow us to sustainably manage Earth's most important resource. We introduce the concept that the soil-microbe system is self-organized and suggest new priorities for research based on an integrative approach that combines biochemistry and biophysics and acts as a source for soil enzymes. Microbial exploitation for the production of soil enzymes is highly attractive for applications in fruit, detergent, textile, tanning, meat and paper industries and also in waste water treatment.

Plant and animal tissues contain potentially harmful products including large amounts of enzyme inhibitors, whereas microbial enzymes are usually free from these problems. Microorganisms are highly susceptible to genetic manipulations and hence provide ample scope for strain improvement. In our study, we have screened Pectin lyase producing Actinomycetes or Actinobacteria from fruit industrial waste enriched soil samples collected from Chittoor and Vellore. Many industrially enzymes needs presence of certain inducible and non protein substrates. In the case of pectinase even though it is a cock tail enzyme but it needs same substrate i.e. Water soluble colloidal high molecular weight carbohydrate normally present in ripened fruits i.e. pectin. Its estimation in some fruits and vegetables indicates the range of 0.6-30.mg/ml and the cheapest source for pectin substrate. Microbial pectinases find application in food industry and account for ~25% of global food enzymes. Nearly 75% of estimated sale value of industrial enzymes in 1995 has been contributed by pectinases. Indeed, a quarter of today's world market in pectinase, is supplied by Biocon. India. In its latest fiscal year, it reported net profits of about $8m on sales of $52m.100m of Pectinase (Pectinex) (National Centre for Biotechnology Education-2008) costs around £14.00. The cocktail pectinases producing Actinomycetes specifically pectin lyase[4,5] were screened from fruit industrial waste soils collected from Vellore and Chittoor. Chittoor and Vellore city lies on the banks of Ponnai River at the southernmost part of Tamil Nadu and Andhra Pradesh.

The Chittoor district (Area 15,359 km², population 2,267,769-1991 census) is bounded by Ananthapur district to the northwest, Cuddapah district to the north, Nellore District to the northeast, Vellore (Katpadi) & Tiruvallur districts of Tamilnadu state to the south, and Karnataka state to the southwest. The city is strategically located at the junction of Bangalore-Chennai national highway 4 and national highway 18.Where so many Fruit Industries are working for the last 20 years and the soils are highly enriched with pectin this is a added advantage to screen potential Pectinase producing Actinomycetes which paved the pathway for development of Indigenous pectinase Technology. The screening, Characterization and Bioinformatics analysis of Microbial Pectinases will be discussed.

Biography

Suneetha Vuppu has completed her Ph.D from SPMVV and postdoctoral studies and collaborations from UK and Singapore. She is the YRC Programme officer a premier VIT organization. She has published more than 25 papers in reputed journals and serving as an editorial board member of repute and presently working as Associate Professor in VIT University.

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Invitro adhesion and invivo colonization are desired probiotic characters of MBTU PBBM1 Bacillus subtilis isolated from milk

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Present study was to investigate invitro adhesive properties and invivo colonization potentials of Bacillus subtilis MBTU PBBM1 in Balb/c mice. Spores of MBTU PBBM1 showed a higher hydrophobicity than their vegetative cells. Vegetative cells exhibit capabilities for autoaggregation and coaggregation with enteric pathogens. Invitro adhesion studies revealed that spores of MBTU PBBM1 were found to be more adhesive on intestinal mucous than their vegetative cells. So spores of MBTU PBBM1 were selected for in vivo colonization studies in Balb/c mice. Stable spore counts in the feces observed even after the 4th day of oral administration of the potential strain reveals the possibility of regermination of the spores in gastrointestinal tract. Measurable spore count of this strain detected in the ileac biopsies confirms colonization capability in small intestine. In vivo studies indicated no observable changes in the total body weight and normal health status in Balb/c mice. In nutshell invitro and in vivo studies revealed that the spores of MBTU PBBM1 have the capability for adhesion and colonization which are desirable probiotic characters.

Biography

T. R. Keerthi has completed her PhD at the age of 31years from Cochin University of Science and Technology, Cochin. She is Associate Professor at Mahatma Gandhi University, Kerala, India and the chief principal investigator of UGC funded major project "Production Purification and characterization of Antagonistic principles of potential Aquaculture Probiotics"[UGC-F.No.37-1/2009(KER)(SR)]. Her area of interest is Probiotics, Marine Microbial Products and Plant Microbe Interactions. She has more than fourteen years of experience in Biotechnological studies, attended trainings and workshops in this field. She has published more than 10 papers in reputed journals and serving as a member of board of studies in reputed Universities. She presented her research findings in reputed International conferences like Asian Congress on Biotechnology "ACB 2011" held at Shanghai, China and International Conference on Advances in Biological Sciences "ICABS 2012" Kannur, Kerala.

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Studies on harpin- mediated cell death events in Saccharomyces cerevisiae

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Background: 'Harpin' a novel protein isolated from Pseudomonas syringae pv. syringae, a phytopathogenic bacteria elicits hypersensitive response (HR) during host-pathogen interactions resulting in necrotic cell death in leaf tissues particularly in Nicotiana tobaccum cv. xanthi. Harpin is hydrophilic, heat-stable, glycine-rich, amyloid forming protein which elicits HR when infiltrated into the apoplast of certain plants and absence of homology in amino acid sequence with other known proteins makes it highly difficult to predict the three-dimensional structure and establish the structure-function relationship. The present study is oriented in understanding the physiological mechanism of action of harpin using 'Saccharomyces cerevisiae' as a model system with relevance to its biophysical features. Apart from inducing cell death in plants and yeast, harpin also induces apoptosis in 'cancer cell lines'.

Methods: In the yeast cell harpin is endogenously expressed by cloning in a yeast expression vector under a galactose (GAL1) promoter and selectively expressed by induction in galactose medium. Flow cytometric and Fluorescent microscopy techniques have been used to study the ROS release, mitochondrial potential, nuclear fragmentation and other cell death studies in the yeast system. Biochemical assays were done to evaluate various mitochondrial enzymes. CD spectroscopy, Differential scanning calorimetry, Dynamic light scattering and Atomic force microscopy were used to study the various bio-physical features of the protein.

Results: Harpin expression in Saccharomyces cerevisiae under a galactose inducible promoter resulted in yeast cell death. Flow cytometric and biochemical studies on the yeast system revealed ROS release, alteration in mitochondrial potential, changes in cell cycle events and reduction in the specific activity of mitochondrial ETC enzymes, indicating the possible role of mitochondria and metacaspases in harpin-induced yeast cell death. Harpin treatment in cancer cell lines lead to apoptotic cell death as indicated by the cellular studies. Bio-physical studies paved the way to understand the thermal stability, aggregation and structure-functional activity of harpin.

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Human sperm interaction with Staphylococcus aureus: A molecular approach

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Staphylococcus aureus is one of the predominant flora in infertile men and its presence has been correlated with altered sperm parameters, but the exact mechanism and its role in infertility is still unknown. In the present study S. aureus strain capable of causing immobilization of spermatozoa was isolated from the cervix of a woman with unexplained infertility and sperm immobilization factor (SIF) purified from the supernatant was found to be a ~20kDa protein. SIF caused 100% immobilization of human spermatozoa at 10µg/ml after 30 min at 37°C and instant loss of viability at 200µg/ ml. It also inhibited the Mg++ ATPase activity of spermatozoa and induction of acrosome reaction by ionophore at concentration of 50µg/ml and 10µg/ml, respectively. Characterization of SIF using LC-MS revealed its homology with hsp-70 protein. K_m and V_{max} value of SIF were found to be 10×106sperms/ml and 20µg/hr respectively. Binding studies of FITC labelled SIF with spermatozoa showed fluorescence over entire sperm signifying the presence of receptors. Receptor extracted by 3M NaCl was purified and then characterized by MALDI-TOF indicating receptor homology with MHC class II antigen. Further calorimetric studies showed that receptor moiety on spermatozoa bind specifically to purified ligand. Thus receptor-ligand interaction might cause immobilization of spermatozoa by SIF and the future studies of detailed molecular mechanisms of sperm immobilization by these interactions could possibly lead to useful insights for improvements in the treatment of infertility, and to create safe and effective sperm immobilizing contraceptives.

Biography

Vijay Prabha did his B.Sc. (HS), M.Sc. (HS) and Ph.D. from Department of Microbiology, Panjab University, Chandigarh. Currently he is Professor and Head, Department of Microbiology, Panjab University, Chandigarh. He has more than 30 research publications in reputed journals. He has attended a number of national and international conferences. His area of interest is isolation and purification of microbial metabolites and their role in infertility and development of these microbial metabolites as vaginal contraceptive agents. He is on the reviewer panel of journals of international repute and editorial board member of 'Fertility and Sterility' journal.

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Track 2(ii) & 2(iii)

2(ii) : Microbial Engineering for Production of Chemicals & Pharmaceuticals
2(iii) : Recent Advances in Biochemical Techniques

Session Chair
Rout N. P
Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, Mexico

Session Co-Chair
Sachin R. Tendulkar
Reliance Life Sciences Pvt. Ltd, India

Session Introduction

Title: **Comparison between two H+/Ca2+cation exchangers CAX1 and CAX2 of Arabidopsis in functional aspect of growth and calcium accumulation in Saccharomyces cerevisiae**
Nutan Prasad Rout, Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, Mexico

Title: **Expression of recombinant aprotinin in Pichia pastoris: A case study**
Sachin R. Tendulkar, Reliance Life Sciences Pvt. Ltd, India

Title: **Utilization of mixed microbial culture to mitigate carbon dioxide (CO2)**
Suresh Gupta, Birla Institute of Technology and Science, India

Title: **A novel antibacterial compound, 2-hydroxy indole propanamide produced by Lactobacillus plantarum isolated from idli batter with probiotic potential**
Jeevaratnam Kadirvelu, Pondicherry University, India

Title: **Isolation and partial characterization of Vibrio cholera isolated from environmental water sample in and around Chennai and a comparative study of microbiological and molecular biological identification technique**
Sujata Das, Lovely Professional University, India

Title: **Development of novel enzyme assay procedures to determine demethylation of kraft lignin bywood-decay fungi: Modifying lignin as substitute for phenol in formaldehyde-based polymers**
Balaji Venkatesagowda, Lakehead University, Canada

Title: **Rational engineering of mesophilic Bacillus lipase to higher thermostability: Role of proline at secondary structure**
Shelly Goomber, Panjab University, India

Title: **Composition and functions of outer membrane vesicles from Pseudomonas syringae**
Medicharla V Jagannadham, Cellular and Molecular Biology-Hyderabad, India

Title: **Transcript profiling of stress associated proteins in wheat (Triticum aestivum) under heat stress and their biochemical characterization for thermotolerance**
Ranjeet Ranjan Kumar, Indian Agricultural Research Institute-New Delhi, India

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Development of novel enzyme assay procedures to determine demethylation of kraft lignin by wood-decay Fungi: Modifying lignin as substitute for phenol in formaldehyde-based polymers

Balaji Venkatesagowda[1], Iryna Bastan-Kandybovich, Aneli Barbosa and Robert Dekker
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Lignin is a highly methylated natural aromatic biopolymer found in the cell walls of plants. Biological demethylation bywood-decay fungiremoves O-methyl groups from lignin increasing its phenolic content. The objective was to demonstrate a new enzyme associated with lignin demethylation (lignin demethylase, LDM) that cleaves O-methyl groups from benzyl rings comprising lignin making the latter more phenolic in structure toserve as phenol substitutes in formaldehyde-based polymers. Assays for LDM activity were developedthat specifically measured (i) methanol liberated as a consequence of demethylation, followed by (ii) an increase in pyrocatecholic structure content of modified lignin. Wood-decay fungi isolated from the Boreal Forest (31 isolates growing solely on Kraft lignin, KL) were screened for enzymes that modify lignin.An assay for LDM consisted of coupling an enzymatic oxidation step using alcohol oxidase to convert methanol released to formaldehyde and hydrogen peroxide, and then employing specific reagents to yield colored complexes measured spectrophotometrically. Fivebiochemical methods were developed to determine LDM using KL andlignin-like model compounds (LMC; guaiacol, veratryl, syringyl alcohols). Formaldehyde was measured using (i) pentan-2,4-dione/ammonium acetate. (ii) Hydrogen peroxide was assayed against ABTS in the presence of horseradish peroxidase. The increase in pyrocatecholic content of modified LMC's and KLas consequence of demethylation, was determined spectrophotometrically by either (iii)complexation with Ti(III)-nitrilotriacetic acid, or (iv) reaction with4-aminoantipyrine. Biologically modified KL structures were determined by FT-IR. SIFT-MS(v), a highly sensitive procedure that measuresvolatile organic compounds, was also used to measure methanol,and demonstrated unequivocally that methanol was released from LMC's and KL examined. The potential of ligninolytic enzymes to modify KL and LMCs was performed on 6 ligninolytic fungal isolates, and the results obtained are discussed.Supported by NSERC-CRD.

Biography

Balaji Venkatesagowda completed his PhD at the University of Madras (India) and joined the Biorefining Research Institute in 2010. His specialty is biodiesel production from seed oils using fungal lipases. Lately, his research focuses on biological modification of lignin for polymer applications.

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A novel antibacterial compound, 2-hydroxy indole propanamide produced by Lactobacillus plantarum isolated from idli batter with probiotic potential

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Lactic acid bacteria (LAB) generally recognized as safe (GRAS) organisms are protective bacteria due to their antagonistic activity against several pathogenic organisms. They also serve as probiotics providing a health benefit on the host. In this study Lactobacillus plantarum subsp. plantarum isolated from fermented idli batter exhibited probiotic potential. The isolate was able to tolerate up to 0.3% of bile for 4- 6 hours and pH 2.5, 3.5, 4.5, 6.5, 7.5 and 8.5. The isolates were able to resist growth against gastric and intestinal fluid. The isolate exhibited good levels of auto-aggregation, co-aggregation and hydrophobicity. The isolates showed resistance towards antibiotics like gentamycin, ciprofloxacin, nalidixic acid and norfloxacin. The isolate showed bile salt hydrolase activity indicating cholesterol lowering capacity and β- galactosidase activity. They are known to produce several low molecular weight compounds having antimicrobial activity such as lactic acid, acid, acetic acid, diacetyl, methylhydantoin, mevalonolactone, cyclic dipeptides, phenyl lactic acid and reuterin etc. The isolate was found to produce a low molecular weight antibacterial compound, which was purified by passing the supernatant of 85% cold acetone precipitation of cell free supernatant through gel permeation chromatography, Sephadex G25 followed by Sephadex G15 column. The active molecule was further purified using Sep-Pak C18 cartridge and purity was checked in HPLC. The compound is readily soluble in aqueous solutions and the structure of the compound was elucidated by LC-MS, H^1NMR, C^{13} NMR in D_2O and FTIR, while the hydroxyl functional group presence is confirmed by performing proton NMR in DMSO followed by D_2O. The molecular weight of the compound was 204 daltons and the structure of the compound was determined as 2-hydroxy indole propanamide, which showed good antibacterial activity against both gram positive and gram negative organisms. This compound may have a clinical application as they exhibit wide spectrum of activity.

Keywords: Lactobacillus plantarum, probiotic, antibacterial substance, 2-hydroxy indole propanamide, NMR, FTIR, LC-MS, idli batter

Biography

Jeevaratnam Kadirvelu has completed his PhD at Indian Institute of Science, Bangalore. He is Professor & Co-ordinator (Microbiology), Department of Biochemistry & Molecular Biology, Pondicherry University. Earlier he has served DRDO for over a period of 23 years. His research area is Pharmacology & Toxicology, Nutrition Biochemistry and Functional foods and Microbial Biochemistry & Biotechnology. He has published more than 60 papers in reputed journals. He is currently guiding 7 students for their PhD in the field of Microbial Biochemistry & Biotechnology.

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Immobilization of biomolecules from aqueous solution by carbon micro and carbon nanofiber

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Immobilization of biomolecules on carbon support has many applications, for example, in the development of biocatalyst and biosensor, and wastewater treatment. In this study, the phenolic resin precursor based carbon activated fibers (ACFs) and carbon nanofibers (CNFs) were used for the immobilization of a number of biomolecules such as glucose oxidase (GOx), bovine serum albumin (BSA), and YQEH, a laboratory synthesized protein. These biomolecules used for the adsorption study had different structures, isoelectric points (IP) and number of amino acids. CNFs were prepared by impregnating ACFs with nickel nitrate using anionic SDS surfactant to achieve the mono dispersion of Ni ions in solutions followed by calcinations, reduction and catalytic chemical vapor deposition (CVD) using benzene (C_6H_6) as a carbon-source. The metal particles on the tip of CNFs were removed by ultra-sonication in acidic medium to open up the tips and provide increased number of sites for adsorption. The prepared materials were directly used as adsorbents for biomolecules, with no further post-treatment required. The prepared ACFs and CNFs were characterized by several analytical techniques such as atomic absorption spectroscopy (AAS), scanning electron microscopy (SEM), transmission electron microscopy (TEM), Fourier transform infrared (FTIR), BET surface area and pores-size distribution (PSD) analyzers. The adsorption capacities of the prepared materials in this study were found to be 32 mg/g for GOx, 103 mg/g for BSA, and 38 mg/g for YQEH. These data reveal that the prepared ACFs and CNFs are potential adsorbents for biomolecules.

Keywords: Activated carbon fibers, carbon nanofibers, surfactant, immobilization, adsorption, protein.

Biography

Nishith Verma has PhD in chemical engineering from the University of Arizona, USA. After completing his Ph.D., he worked for three years with BOC Gases in New Jersey, USA before joining Indian Institute of Technology Kanpur in 1998. He is presently the head of the chemical engineering department and coordinator of Center for Environmental Science and Engineering at IIT Kanpur. He has published more than 60 papers in reputed international journals and holds three patents. His research interests are in adsorption, carbon nanofibers and nanoparticles, environmental remediation, and transport modeling.

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Comparison between two H^+/Ca^{2+}cation exchangers CAX1 and CAX2 of Arabidopsis in functional aspect of growth and calcium accumulation in Saccharomyces cerevisiae

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Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, Mexico

H^+/Ca^{2+}cation exchangers CAX1 and CAX2 of Arabidopsis has been well known for accumulation of cations in different tissues. We have used the yeast essays model to compare the impact of CAX1 and CAX2 on growth rate and calcium accumulation in different culture conditions. The whole length of CAX1 and CAX2 genes of Arabidopsis were cloned to a yeast shuttle vector pRS316 and were complimented in yeast mutant K667 (pmc1:TRP1 vcx1D) (Cunningham y Fink, 1996). The growth rate was monitored in YPDA and minimal medium and calcium accumulation was analyzed by confocal microscopy using floe 3. The CAX1 and CAX2 complimented mutants were found susceptible to higher calcium treatments and better growth rate were observed in rich (YPDA) as well as minimal medium in normal calcium concentration. It was also observed that, CAX1 variants were having higher growth rate in comparison to CAX2 phenotypes and accumulate high level of calcium. This result suggests that CAX1 is the better choice to use as calcium transporter compared to CAX2.

Keywords: cation exchanger, CAX1, CAX2, cation exchangers

Biography

Nutan Prasad Rout has completed his PhD at the age of 31 years from Institute of Life Sciences, Bhubaneswar, India and postdoctoral studies from Univesidad Autonoma de Mexico, Mexico. He is the reader in Biotechnology, CIATEJ, a premier Government Biotech Research Institute, in Mexico. He has published more than 10 papers in reputed journals and serving as an editorial board member of Biotech Colour Journal.

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Expression of recombinant aprotinin in Pichia pastoris: A case study

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Pichia pastoris, a methylotrophic yeast has been used for heterologous protein expression. Fast growth, high biomass, simple media for growth and availability of strong inducible as well as constitutive promoters are some of the characteristics due to which the yeast is extensively used for expression of extracellular proteins as well as for intracellular VLP based vaccines. Expression of protein in Pichia depends on a number of factors such as nucleotide sequence of the protein, signal sequence and promoters used for the purpose. Alpha mating factor signal sequence (MAT α1) of Saccharomyces cerevisiae is commonly used for secretion of protein in the culture supernatant. Since cloning downstream to Glu-Ala-Glu-Ala- (Ste 13 signal cleavage) leaves overhang of Glu-Ala-Glu-Ala on the secreted protein due to improper processivity, we prefer to clone protein sequences downstream to kex cleavage site (-Glu-Lys-Arg-). However, for aprotinin, cloning downstream to kex cleavage showed improper processivity. Hence, on the basis of N terminus data and known literature, 2 different constructs were prepared wherein aprotinin was cloned downstream to 2 different sites in pre-sequences of MAT α1. The constructs were independently transformed into P. pastoris. Secretion of protein was observed in the clone wherein aprotinin was cloned downstream to Ser- Ala- Leu-Ala- . Further characterization of purified protein is by intact mass analysis, N terminus sequencing, RP-HPLC showed good match with bovine aprotinin. Though levels of protein secretion decrease in the new strategy employed, proper processivity of the protein was obtained which is one of the important factor in development of similar biologics.

Biography

Sachin R. Tendulkar has completed his Ph.D in Microbiology from M. S. University, Baroda under the guidance of Prof. B. B. Chattoo. Further he pursued his postdoctoral studies in McGill University, Montreal, Canada. He joined Reliance Life Sciences Pvt Ltd in 2007 and working on expression of proteins of therapeutics importance since then. He has published 5 papers and a review on therapeutic protein expression and presented his work in national as well as international conferences.

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Rational engineering of mesophilic Bacillus lipase to higher thermostability: Role of proline at secondary structure

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Bacillus subtilis lipase, being extracellular in nature and smallest known lipase, is an important source for protein evaluation and for commercial use. Proline is reported as thermalpreferable residue while its role in thermostability is very much influenced by its position at the secondary structure level. Two variants were designed rationally with proline substituted at varying position at the secondary structure level i.e. helix and loop. The proline replaced by a polar residue lysine at terminal of helix observed to be destabilizing. In other variant proline placed within loop at protein surface enhanced its thermostability significantly. The molecular basis of enhanced thermostability is explained by formation of proline-aromatic residue and proline-proline interactions in the local region. Present study has firmed the role of proline in providing rigidity and hence stability to protein.

Biography

Shelly Goomber is working as Ph.D. research fellow at department of Biotechnology, Panjab University, Chandigarh. She has six year experience in teaching graduate students of biotechnology. She has two publications in journal of international repute.

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Utilization of mixed microbial culture to mitigate carbon dioxide (CO_2)

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Carbon dioxide is one of the GHG's (Green House Gases) & responsible for Global warming. As of July 2011, CO_2 in the earth's atmosphere is at a concentration of 392 ppm by volume which is 35% higher as compared to the mid-1800s. Carbon dioxide is produced during the respiration in small amount and is also emitted from combustion process, volcanic eruptions, hot springs and freed from carbonate rocks by dissolution. The anthropogenic sources for CO_2 emissions into the atmosphere is from industrial sectors which mainly comprised of industries such as automobiles, petroleum refineries, cement plants, breweries, fertilizer plants, steel plants, etc. The CO_2 concentration in earth atmosphere can be reduced by biological, chemical and technological techniques available through either mitigating or sequestering emissions. CO_2 capture and sequestration (CCS) is a technique to capturing the CO_2 from point source and storing it in such a way that it does not enter into the atmosphere. In the recent years, biological route has been identified as one of the most viable options available for the mitigation of CO_2. The biological process of photosynthesis is utilized to stabilize CO_2 in the atmosphere and thus produce valuable products. The biggest challenge is to develop a closed system to mitigate CO_2 released from industrial effluent using photoautotrophic organisms. The size, light intensity and cost is the main problem of closed system (Photobioreactor). The microbial world is full of surprises and very little attention has been paid on their ability to mitigate CO_2. There are Methanogens microbes from Archaea class are capable of utilizing CO_2 and produce Methane. The ability of different microbes to remove pollutants from air has been already established. This paper deals with capabilities of different microbial culture to mitigate CO_2. The approach is to develop a colony of microbes and fungi to biologically absorb CO_2 and convert them into other useful product like Methane. Mixed culture found to be superior candidate than photoautotrophic organisms for CO_2 mitigation. They show a promising future to develop a low cost, compact size close system for in-situ CO_2 mitigation.

Biography

Suresh Gupta has completed his PhD in the year of 2008 from Birla Institute of Technology and Science, Pilani. Currently he is working as an Assistant Professor in this institute. He has 10 years of Teaching, Research, Consultancy, and administrative experience. He has around 40 research publications to his credit in refereed journals and international conferences. He has also completed two research projects: one industry sponsored and another UGC sponsored. He has guided 6 dissertation students and currently guiding three PhD students. He is a Life Associate member of IIChE and a Fellow member of ICCE.

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Track 3(i), 3(iii) & 3(iv)

3(i) : Bioremediation of metals and radionuclides
3(iii) : Tools and techniques for bioremediation
3(iv) : Wastewater treatment

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H. K. Manonmani
Central Food Technological Research Institute-Mysore
India

Session Co-Chair
Kishore Kumar Kadimpati
Malla Reddy College of Pharmacy, India

Session Introduction

Title: **Entrapment of marine micro alga, Isochrysis galbana for biosorption of Cr (III) from aqueous solution: Isotherms and spectroscopic characterization**
Kishore Kumar Kadimpati, Malla Reddy College of Pharmacy, India

Title: **Biodegradation and biofiltration studies for removal of volatile organic compounds (VOCs)**
Smita Raghuvanshi, Birla Institute of Technology and Science, India

Title: **Optimization of process variables for biodegradation of phenol by Pseudomonas putida (NCIM 2102) using response surface methodology**
V. Sridevi, Andhra University, India

Title: **Engineering tolerance and hyper accumulation of heavy metals in recombinant E.coli cells by expressing PCS gene from Leucaena leucocephala**
Merla Sri Lakshmi Sunita, Jawaharlal Nehru Technological University Hyderabad, India

Title: **Microbial remediation of hexachlorocyclohexane**
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Title: **Simultaneous bioremediation of hexavalent chromium and pentachlorophenol from tannery waste water by immobilized Brevibacterium casei**
Tuhina Verma, Dr. R.M.L. Avadh University, India

Title: **Modeling and optimization of dye removal process using response surface methodology: Kinetic and equilibrium studies**
Narayana Saibaba K.V, GITAM University, India

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Microbial remediation of hexachlorocyclohexane

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The production, distribution, use, misuse, disposal, or accidental spills of many xenobiotic chemicals have polluted some environments to levels that threaten the health of humans, livestock, wildlife and, indeed, whole ecosystems. Hexachlorocyclohexane (HCH) is one such xenobiotic which has been used extensively to improve human health, standards of living and safety through advancements in production, application in agriculture and medicine, to strengthen national defense. Unfortunately, its unplanned applications into the environment have reversed the ecosystem by affecting its balance. Already tonnes of HCH have entered the ecosystem. Traditional methods for the cleanup of pollution have usually involved removal of the HCH polluted materials, and their subsequent disposal by land filling or incineration. These disposal/cleanup methods are often prohibitively expensive. Furthermore, available space for landfills and incinerators is declining. Perhaps one of the greatest limitations to traditional cleanup methods is the fact that in spite of their high costs, they do not always ensure that HCH residues are completely destroyed. The past two decades have seen a tremendous upsurge in the search for cost-effective and environmentally sound alternatives to traditional methods for dealing with HCH residue. Bioremediation is an option that offers the possibility to destroy contaminants such as HCH using natural biological activity. As such, it uses relatively low-cost, low-technology techniques, which generally have a high public acceptance and can often be carried out on site. In our laboratory, we have isolated many bacterial cultures which can degrade hexachlorocyclohexane (HCH) by long term enrichment technique. Bacterial isolates were found to degrade both individual isomers of HCH and Technical grade HCH in both water and soil. Trials were carried out in reactors (ex-situ) and in open fields (in-situ). The bioremediation was also tested by bioassay using germinating plants as markers. The talk addresses the bioremediation of HCH by the isolated bacteria and studies on enzymes and genes involved in their degradation.

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Isolation and characterisation of kerosene degrading bacteria from contaminated water

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The Kerosene/Jet Fuel category covers the kerosene range refinery streams, commonly referred by the generic term "kerosene". Accidental releases of petroleum products are of particular concern in the environment and this has led to a concerted effort in studying the viability of using oil-degrading microorganisms for bioremediation. The intention of this study was to isolate efficient kerosene degrading bacteria from water sample, characterize, and optimize the parameters of degradation. The 28 isolates obtained were further screened to measure their ability to grow on kerosene medium. Ten isolates thus selected were subjected to secondary screening and four of them were selected and named K1, K2, K3, and K4. These four isolates then characterized biochemically using an automated substrate utilization analyzer. Identity was further confirmed molecularly by 16s rDNA sequencing and were identified as K1 - Pseudomonas aeruginosa (JN540024), K2- Bacillus cereus (JN 600441), K3 - Sphingomnas paucimobilis (JN540025), and K4- Bacillus mycoides (JN600440). Frequent monitoring of CO_2 evolution throughout the experiment was used as a proxy for kerosene degradation. The efficiency of kerosene degradation was found to be influenced by pH of the medium, temperature, nutrient source such as nitrogen. High Performance Liquid Chromatography (HPLC) analysis was used to measure the rate of degradation. Further Gas chromatographic (GC) analysis confirmed this and metabolites were identified on mass spectrum. The study confirmed that the microbe mediated processes of mineralization remove kerosene hydrocarbons with reasonable efficiency and can be recommended for developing in situ remediation strategies.

Biography

Jisha M.S has completed her Ph.D. at the age of 28 years from Indian Agricultural Research institute, New Delhi. She is working as Associate Professor (Microbiology) in the School of Biosciences, M.G. University, Kottayam, Kerala. She has published more than 20 papers in reputed journals and more than 30 paper presentations in International and National seminars. She has produced five Ph.Ds and 17 M.Phil and M.Sc. dissertations.

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Entrapment of marine micro alga, Isochrysis galbana for biosorption of Cr (III) from aqueous solution: Isotherms and spectroscopic characterization

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Micro alga, Isochrysis galbana biomass was entrapped into alginate gel by liquid curing method in the presence of Ca (II) ions. The Biosorption of Chromium (III) by the entrapped live algal biomass has been studied in a batch system. The effect of initial cadmium concentration, pH, temperature and Liquid and Solid ratio on Cr(III) removal has been investigated. The maximum experimental biosorption capacities for entrapped live algal biomass found to be 335.27 mg Cr (III) g^{-1} of dry algal biomass. The kinetics of Chromium biosorption was slow; approximately 75% of Biosorption takes place in 2 hours. The percent adsorption increased with increase in pH, at pH 5 of the solution were found to favor adsorption very strongly. The equilibrium biosorption data was evaluated by Langmuir, Freundlich isotherm models, and was best described by Langmuir and Freundlich isotherms. The biosorbent was characterized and evaluated, the functional groups –OH, –COOH and C=O were involved in the biosorption process. Since binding capacity was relatively high for immobilized live algal biomass, those algal forms are to be considered as suitable biosorbent for the removal of chromium in wastewater treatment.

Keywords: Biosorption, Marine micro alga, Immobilization, Isotherms, Characterization

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Engineering tolerance and hyper accumulation of heavy metals in recombinant E.coli cells by expressing PCS gene from Leucaena leucocephala

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Leucaena leucocephala, a leguminous tree with high biomass, has metal tolerance and survival ability in arid, infertile and metal-contaminated areas. But so far, no reports are available on identification and functional characterization of the metal-tolerance genes in this species. In the present study, we report the isolation and characterization of phytochelatin synthase (LlPCS) gene from this tree species. The predicted 3D structure of this protein exhibited potential possible binding sites for the metals like Cd, Zn, Cu, Fe and Mn. The role of LlPCS gene in metal tolerance and accumulation was characterized in E. coli. The LlPCS gene was sub-cloned into pET32a expression vector and bacterial transformation was performed. SDS-PAGE analysis of the total protein isolated from the recombinant E. coli revealed the over expression of LlPCS protein along with His-tag. When grown in toxic metal enriched media, recombinant E. coli exhibited enhanced tolerance to broad range of metals like arsenic, cadmium, cobalt, copper, mercury, tin and zinc compared to controls. Further, these recombinant E. coli cells could also accumulate several folds increased concentrations of toxic metals like arsenite, copper and arsenate compared to controls. Thus the present study suggests that LlPCS gene confers enhanced toxic metal tolerance and accumulation in E. coli and might play crucial role in toxic metal detoxification in Leucaena leucocephala. This study can help us in better understanding the toxic metal tolerance ability of L. leucocephala for its successful usage in bioremediation technologies.

Biography

Merla Sri Lakshmi Sunita has completed her PhD in 2010 at the age of 29 years from Department of Genetics, Osmania University, Hyderabad. She was awarded Dr. D.S. Kothari Postdoctoral fellowship from University Grants Commission, New Delhi and pursuing postdoctoral studies at Centre for Biotechnology, Jawaharlal Nehru Technological University Hyderabad. She has published six papers in reputed national and international journals.

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Modeling and optimization of dye removal process using response surface methodology: Kinetic and equilibrium studies

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Color is the primary pollutant in industrial effluent whose concentration is to be reduced within the permissible limit. The application of low-cost adsorbents obtained from plant wastes as a replacement for costly conventional methods of removing color from wastewater has been investigated in this paper. Activated carbon prepared from an agricultural waste was used as adsorbent. Physical characteristics of adsorbent were studied using Fourier transform infra-red (FTIR) and scanning electron microscopy (SEM). Crystal Violet was used as the model dye pollutant in this study. The adsorption experiments were conducted to study the effect of different parameters such as, initial dye concentration, adsorbent dose, temperature, equilibrium time and pH. All the experiments were done using Response Surface Methodology (RSM). Central Composite Design was used to develop the model. The developed model to estimate the removal efficiency of dye was tested for its reliability using ANOVA and regression analysis. All the results were statistically significant. Optimization of process variables is done using the model obtained from RSM studies.

Experiments were also conducted to know the kinetic behavior. The kinetic data obtained supports pseudo-second order model and intra-particle model but shows very poor fit for pseudo-first order model. Thermodynamic studies were also done to understand the feasibility of the adsorbent. Adsorption isotherms were obtained from conducting runs at different temperatures. These adsorption data were fitted well with both Langmuir and Freundlich isotherms. In addition, The thermodynamic parameters of the adsorption process such as Gibb's free energy ΔG^0, enthalpy ΔH^0, and entropy ΔS^0 were also calculated. The negative values of Gibb's free energy reflected the spontaneous nature of the adsorption. Based on the data of present investigation, one could conclude that the adsorbent prepared being a biocompatible, eco-friendly and low cost might be a suitable alternative for elimination of dyes from colored aqueous solutions.

Adsorption studies were made for the adsorption of CV from aqueous solutions onto a new green activated carbon prepared. The following conclusions can be made on the basis of experimental results obtained:

1. This adsorbent exhibited high adsorption capacities.

2. The adsorption capacity was affected by the changes in temperature, initial pH, contact time, adsorbent dosage and initial dye concentration of the solution.

3. Adsorption kinetics followed pseudo-first order and pseudo-second order kinetics.

4. High values of correlation coefficients indicated the best fit of experimental results with that of values obtained from modeling.

5. Optimization done by Response Surface method yielded good results.

All the results showed that the green carbon obtained was an efficient low-cost adsorbent for the removal of dye from waste aqueous solutions.

Biography

Narayana Saibaba K.V has completed his B.Tech in Chemical Engineering with Biotechnology as specialization from Andhra University and Masters in Chemical Engineering with Petroleum Refining Engineering as elective from Andhra University. He also completed MBA with dual specialization in HRM and Finance. He is currently pursuing his Ph.D under the guidance of Prof. P. King. He has published more than 15 papers in international journals of repute. His papers also published in the CHEMCON (top workshop for chemical engineers). Prof. P. King published more than 100 papers in reputed journals and serving as editorial board member of repute journals.

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Biodegradation and biofiltration studies for removal of volatile organic compounds (VOCs)

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The effect of increased industrialization has adverse impact on the environment thus leading to air pollution and water pollution. The major impact of industrial systems on the environment is the emissions of gaseous, liquid and particulate materials in the atmosphere which leads to air pollution. Air pollution is aggravated now-a-days because of economic development of societies across the world. The category of air emissions include the criteria pollutants given by the Environmental Protection Agency (EPA), USA which include sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), suspended particulate matter (SPM) and lead (Pb) which are significant contributors in the deterioration of public health (USEPA, 1993). Another important category of pollutants is hazardous pollutants such as Volatile Organic Compounds (VOCs), ammonia (NH_3), hydrogen sulfide (H_2S), etc. which are responsible for major air and water pollution. Out of all listed hazardous pollutants, VOCs are the large group of organic compounds emitted into the atmosphere by a wide range of industries. In fact, VOCs are one of the major pollutants released by the industries which contaminate the atmospheric air and the fresh water resources. This technique is widely used for the removal of VOCs from and air and metal ions from water. The potential of microorganisms in consuming the VOCs as carbon source makes biodegradation and biofiltration an attractive option for the removal of pollutants from the waste air and waste water streams. The work essentially discusses the biodegradation and biofiltration studies using the mixed culture. The work also discusses the essential factors for the development of the laboratory scale biofilter column and the packing material used in the biofiltration studies. The work also details in the various parameters such as effect of time, effect of flow rate, effect of shock loads and effect of bed height to check the performance of biofiltration. The work also incorporates the various applications of biofilters.

Biography

Smita Raghuvanshi at present is working as an Assistant Professor in Department of Chemical Engineering at Birla Institute of Technology and Science (BITS), Pilani, India. She has completed Ph.D. in the year of 2010. She has several publications to her credit. She is also guiding two PhD students at present. She is Life Associate member of Indian Institute of Chemical Engineers. She is also having DST-fast track project in the field of biofiltration for removal of chlorinated VOCs. She has recently been awarded an UGC major project in the area of biofiltration for removal of metal ions.

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Bioremediation of Cr (VI) by acclimated mixed culture: Kinetic study

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Numerous industrial applications raised chromium to a very important economic element. At the same time, with the development of its uses, the adverse effects of chromium compounds in human health were being investigated. Both acute and chronic toxicity of chromium are mainly caused by hexavalent compounds. The present study deals with the removal of hexavalent chromium compound using bioremediation by an acclimated mixed culture developed from activated sludge. The acclimatization of culture was carried out for a period of 6 days by decreasing the amount of glucose from 1000 mg/l to 0 mg/l with a decrement of 200 mg/l every day and increasing Cr (VI) concentration accordingly by the same amount. At the end of the period, the biomass concentration obtained for final amount of pure Cr (VI) was 0.0187 g/50 ml of solution. The effect of one of the major operating parameters, contact time on bioremediation of Cr (VI) by acclimated mixed culture was also studied in a batch mode. This study had been conducted for an initial Cr (VI) concentration ranging from 20-80 mg/L and pH ranging from 2-10. Increase in initial Cr (VI) concentration from 20 mg/L to 80 mg/L showed increase in Cr (VI) uptake. Experimental investigation also showed that percent removal of Cr (VI) exceeding 94% at the initial concentration of 80 mg/L of Cr (VI) and pH 7.

Keywords: Hexavalent chromium; Bioremediation; Acclimated mixed culture; Activated sludge; Acclimatization, CFU; Percent removal.

Biography

Subhajit Majumder, Lecturer of Chemical Engineering at Birla Institute of Technology and Science (BITS), Pilani, India, received his B.E. degree from University of Pune, India and M.E. degree from Chemical Engineering Department of BITS, Pilani in 2007. Mr. Majumder's main professional activity has been in the area of biological based separation techniques and various novel separation methods. He has co-authored theoretical and experimental technical papers pertaining to his field of research. He is a member of the American Chemical Society and Asia-Pacific Chemical, Biological & Environmental Engineering Society.

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Simultaneous bioremediation of hexavelent chromium and pentachlorophenol from tannery waste water by immobilized Brevibacterium casei

Tuhina Verma
Department of Microbiology, Dr. R.M.L. Avadh University, India

Tanneries discharge hexavalent chromium [Cr (VI)] and pentachlorophenol (PCP) together through their effluent into cultivable lands and nearby water-bodies beyond the permissible limit due to inefficient effluent treatment technology. They are carcinogenic and cause cellular toxicity to all life forms. A bacterial strain identified as Brevibacterium casei was isolated from tannery effluent and was tolerant to a maximum of 840 µg/ml Cr(VI) and 1000 µg/ml PCP concentration simultaneously. This strain concomitantly reduced 78% Cr(VI) to less toxic Cr(III) and degraded 82% PCP within 168 h at pH 8.0, 35°C temperature and 120 rpm aeration in MSM broth and also released 900 µg/ml chloride ion. PCP degradation was confirmed through GC-MS analysis. The bacterium exhibited remarkable ability to significantly reduce Cr(VI) and degrade PCP under wide growth conditions i.e. in presence of other metal ions, between 100-120 rpm and over broad pH (6.5-10.0) and temperature (30-40°C) range. Polyvinyl alcohol (PVA) immobilized Brevibacterium casei reduced a maximum of 93% Cr(VI) and degraded 89% PCP simultaneously in MSM broth supplemented with 750 µg/ml Cr(VI) and 510 µg/ml PCP concentration in 120 h and 144 h, respectively. Further, the immobilized cells were able to significantly reduce 72% Cr(VI) and degrade 69% PCP from treated tannery effluent in bioreactor at pH 8.0 in 150 h and 120 rpm impeller speed. The results suggest the possible use of this bacterium for simultaneous removal of Cr(VI) and PCP from tanneries and other industries.

Biography

Tuhina Verma is Assistant Professor in Department of Microbiology of Dr. R. M. L. Avadh University, Faizabad, India. She has completed her Ph.D. from Indian Institute of Toxicological Research (CSIR), Lucknow and short post-doctoral course from MD Anderson Cancer Centre, Houston, Texas. She has published several research papers in journal of International repute. Dr. Verma also undertakes independent research as a Principal Investigator of funded research projects. She is the reviewer of more than five International journals and is the member of Association of Microbiologists of India and Society of Toxicology of India.

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Optimization of process variables for biodegradation of phenol by Pseudomonas putida (NCIM 2102) using response surface methodology

V. Sridevi and M.V.V. Chandana Lakshmi
Department of Chemical Engineering, Andhra University, India

Environmental pollution is considered as a side effect of modern industrial society. The presence of man-made (anthropogenic) organic compounds in the environment is a very serious public health problem. Phenol, an organic compound is toxic even at low concentrations and the toxicity of phenols for microbial cells has been investigated. Owing to the toxic nature and consequent health hazard of phenol, the need to remove it from waste waters. Harnessing the potential of microbes to degrade phenol has been an area of considerable study to develop bioremediation approaches, which is considered as "Green Option" for treatment of environmental contaminants. The optimum conditions for phenol degradation by Pseudomonas putida (NCIM 2102) were at inoculum size (6%v/v), pH (7), temperature (300C), agitation speed (140 rpm), glucose (0.8g/l), ammonium sulphate (1.5g/l), peptone (0.5g/l), and concentration of metal ion Mn2+(0.02 g/l).Central Composite Design (CCD) was employed combining with Response Surface Methodology (RSM) to optimize the physical, chemical parameters for the degradation of phenol by P. putida (NCIM 2102). Response Surface method was using three-levels of physico-chemical parameters like pH, temperature, agitation speed, carbon source (glucose), inorganic nitrogen source (ammonium sulfate) and metal ion (Mn2+) concentration which also enabled the identification of significant effects of interactions for the batch studies. The experimental values are in good agreement with predicted values and the correlation coefficient of physico-chemical parameters was found to be 0.9871, 0.9028 respectively.

Keywords: : Phenol; bioremediation; P.putida (NCIM 2102); physical-chemical parameters and Central Composite Design.

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Track 4(i), 4(ii), 4(iii) & 4(iv)

Day 2 September 14, 2012

4(i) : Biocatalysts for Biocracking/Metal Elimination
4(ii) : Importance of Bioethanol and Biodiesel from Biomass
4(iii): Environmental Biotechnology: Role in Agroecology and Zero Waste Agriculture
4(iv): Biorefining & Bioprocessing of Crude Oils

Session Chair
Katherine M. Pappas
University of Athens, Greece

Session Co-Chair
Shailendra K. Saxena
Centre for Cellular and Molecular Biology, India

Session Introduction

Title: **Genomics of a bioethanol-producing bacterium**
Katherine M. Pappas, University of Athens, Greece

Title: **Studies on crude enzyme preparation obtained from indigenously isolated fungal strain for environment friendly textile desizing**
Shalini Singh, Lovely Professional University, India

Title: **Environmental Biotechnology: Role in Agroecology and Zero Waste Agriculture**
Suresh Kumar Pattapu, Jaganmatha Bio & Organic Fertilizers, India

Title: **Application of genetic algorithm and artificial neural networks in bioremediation process**
Narayana Saibaba K.V, GITAM University, India

Title: **Production of biodiesel from non-edible Sapodilla (chiku) seed oil**
Ware Pundlik, Uka Tarsadia University, India

Title: **Study of poly (ethylene terephathalate) nanocomposites for biomedical application**
S. M. Pawde, Institute of Chemical Technology, India

Title: **Enzymatic processing of castor oil for value-added products**
Annamma A Odaneth, Institute of Chemical Technology, India

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Enzymatic processing of castor oil for value-added products

Annamma A Odaneth
Centre for Energy Biosciences, Institute of Chemical Technology, India

Lipase-mediated hydrolysis of castor oil yields a high value product free from odour, colour and undesired side products, associated with conventional hydrolytic methods. However, use of immobilized lipase is limited by diffusional constraints of conventional two phase reaction media. Smart design of reaction media allowing oil homogenization was carried out in this study for hydrolysis of castor oil using indigenously immobilized lipases. Optimization of various parameters towards complete hydrolysis was carried out in batch experiments. Maximum hydrolysis of 85% was obtained for the reusable immobilized lipase preparation under packed bed conditions. The activity of immobilized enzyme for the said reaction under optimised conditions was observed to be >85% with no loss of activity for upto 10 cycles tested. The product so formed can be further converted to sugar alcohols, estolides, conjugated linolenic acids or lactones either by enzymatic/microbial methods. The advantage of biotransformation allows production of clean materials that find wider applicability and also higher commercial value.

Biography

Annamma A Odaneth has completed her PhD at the age of 24 years from Institute of Chemical Technology in Applied Chemistry and her postdoctoral studies from the same laboratory in Enzymatic Transformations. She is associated with Enzyme Group at the DBT-ICT Centre for Energy Biosciences, which is involved in the developing technologies aimed at valorizing agricultural based products.

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Genomics of a bioethanol-producing bacterium

Katherine M. Pappas
Department of Genetics and Biotechnology, Faculty of Biology, University of Athens, Greece

Zymomonas mobilis is an ethanol-producing α-proteo bacterium that is currently considered a highly potent candidate for large scale bioethanol production. This owes to the fact that it surpasses yeasts in ethanol production rates and purity, has simpler fermentation requirements, and harbors a small, ca. 2-Mb, genome, quite permitting for genetic engineering endeavors. In order to understand the biology of Z. mobilis, six different strains from various parts of the globe, belonging to two of its major subspecies, are being sequenced at the US DOE-JGI and the University of Athens (CSP_788284). Additionally, RNA sequencing and transcriptional profiling is underway for the most robust ethanol-producing Zymomonas, industrial strain ZM4 (CSP_52). Insights gleaned from the genomics data obtained so far reveal that the different strains examined, apart from their basic metabolic repertoire that is characteristic for the species, bear a non-negligible number of unique genes in both their chromosomal and extrachromosomal (plasmid) genetic material (1-4). Consequently, unexpected signature traits have been found for each of the sequenced strains relating to secondary metabolism, inhibitor resistance or detoxification, DNA mobility via presence of conjugative or insertion elements, CRISPR-immunity, etc. By completion of this project, a fairly enriched view of the Z. mobilis pangenome will be in hand and this will aid in synthetic biology directions and the built of designer strains.

Biography

Katherine M. Pappas completed her Ph.D. at the University of Athens (UoA) and postdoctoral studies at Cornell University, NY. She is currently Assistant Professor at UoA, where she teaches at the under- and postgraduate level. She has served as an elected administrative member in UoA, consultant for Food Safety in the Greek Ministry of Health (EFET), proposal evaluator in Greece and the EU, and ad hoc or permanent reviewer for highly reputable journals. She currently holds two collaboration projects with the US DOE-JGI, and is author of many papers in high impact-factor journals and book chapters.

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Application of genetic algorithm and artificial neural networks in bioremediation process

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[2]Department of Chemical Engineering, Andhra University, India

Development of an automated effluent treatment plant is very difficult as the parameters of an industrial effluent change continuously. Hence, a computer-simulated model is required for predicting the relationship between input and output parameters. Experiments were conducted to study the efficiency of adsorbent prepared from Acacia Arabica fruits for removal of Methylene Blue (MB) dye. The adsorbed dye on green carbon was characterized by Fourier transform-infrared spectroscopy (FTIR) and Scanning electron microscopy (SEM). RSM was used to design the experimental runs. An artificial neural network model was developed and optimized for the prediction of percentage removal of dye from the effluent. The network was trained using the experimental data obtained at different process parameters such as temperature, initial pH, contact time, adsorbent dosage and initial dye concentration of the solution. Different algorithms and transfer functions for hidden layer have been tested to find the most suitable and reliable network. The prediction efficiency of this ANN model was tested and it was found that prediction was good.

The ANN model developed was optimized using genetic algorithm (GA). This experiment revealed that the adsorbent exhibited high adsorption capacities. The kinetic data obtained was analyzed using pseudo-first order, pseudo-second order and intra particle diffusion models. Thermodynamic studies were also carried out. The adsorption was efficient and both Langmuir and Freundlich isotherm models showed good fit into the experimental data. From these studies, it may be concluded that green carbon adsorbent prepared is efficient and economical for Methylene blue removal from aqueous solutions.

Keywords: Acacia Arabica, ANN, GA, RSM, Biosorption

Biography

Narayana Saibaba K.V has completed his B.Tech in Chemical Engineering with Biotechnology as specialization from Andhra University and Masters in Chemical Engineering with Petroleum Refining Engineering as elective from Andhra University. He also completed MBA with dual specialization in HRM and Finance. He is currently pursuing his Ph.D under the guidance of Prof. P. King. He has published more than 15 papers in international journals of repute. His papers also published in the CHEMCON (top workshop for chemical engineers). Prof. P. King published more than 100 papers in reputed journals and serving as editorial board member of repute journals.

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Production and characterization of biodiesel from non-edible Sapodilla (chiku) seed oil

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There are many medicinal applications found in Sapodilla fruit, bark, leaves & seeds like inhibition of ehrlich ascites carcinoma, in vitro and in vivo antioxidant activity, free radical scavenging activity & antimicrobial activity. Biodiesel is a more attractive product from Sapodilla seed oil for diesel engines, because of the seeds are chiefly available & non-edible to all human beings. Since most of the biodiesel were derived from edible oils like soybean, sunflower, rapeseed, palm etc. These oils are essentially edible in India and other developing countries, use in biodiesel leads to the food crisis. Because of the non-edible oil having high FFA content, which is not suitable for normal transesterification process, hence a two-step catalyzed method i.e. acid catalyzed method followed by alkali catalyzed, was used to prepare the biodiesel. For this study the Sapodilla seed oil was used to extract the biodiesel. Therefore, this research mainly concentrates the non-edible oils as feed stocks for biodiesel production to reduce the cost of biodiesel.

Keywords: medicinal, non-edible, Biodiesel, feed stock, Sapodilla, acid catalyzed

Biography

Pundlik Shivaji Ware is Assistant Professor in the Department of Chemistry, Uka Tarsadia University, Bardoli, Gujarat, India. He did his M. Phil. research work in the Research Department of SSR College of Pharmacy, Silvassa and submitted his M. Phil. thesis in 2010 to 'The Global Open University, Nagaland', India. He has 6 years of Postgraduate Teaching as well as research experience (2012-till date). He has five research papers to his credit in International Journals of repute along with three publications in proceedings of national/international conferences. He is pursuing his Ph.D. degree under the guidance of Prof. C. N. Murthy, M. S. University, Baroda, and Gujarat.

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Novel biofilm control measures to prevent corrosion and biofouling in cooling water systems of nuclear power plants

Rani P. George, Ruth Nithila, N. Parvathavarthini and U. Kamachi Mudali
Corrosion Science and Technology Group, Indira Gandhi Centre for Atomic Research, India

Climatic changes due to green house gas emissions and substantial increase in the energy costs, demand effective energy management. In this regard the performance of cooling water systems in various power plants to maintain highest electrical energy output per tonne of fuel consumed is particularly important. Despite efforts to provide efficient design of heat exchangers and effective maintenance that involves chlorination and sponge ball cleaning during operation, fouling and corrosion under the influence of microbes and their biofilms is posing a big threat to this objective. Materials used in cooling water systems like copper alloys, microalloyed steels, and titanium can undergo biofouling and subsequent degradation under biofilms. Titanium is chosen as condenser material for the prototype fast breeder reactor at Kalpakkam. To avoid corrosion and biofouling of titanium during service, extensive investigations were carried out by different methods including nanostructuring of surfaces for making them antibacterial. The first step was to reduce the microroughness of titanium by repeated pickling which by itself reduced microbial adhesion. In the second step, anodization of titanium surfaces followed by heat treatment was adopted to control microbial fouling. This was possible as a consequence of photocatalytic activity under visible light illumination of nanoparticles of anatase-rutile combinations produced during anodization. Electroless plating of nanocopper film on titanium surfaces demonstrated good antibacterial activity. Non-conventional techniques like applied potential and ultrasonication was also attempted to control biofilm formation on material surfaces to provide antimicrobial activity. Recently superhydrophobic surface modification is attempted on condenser materials by preparing micro-nano textured surfaces through mechanical and chemical methods, and providing low surface energy dip coatings, for antibacterial activity. The presentation highlights the above results.

Biography

Rani P. George Leader, Surface Modification Programme, in CSTG, since 1991. She is working on corrosion and biofouling of materials in aquatic systems. She has 35 papers in reputed journals and has won several awards including NIGIS Award for Excellence in Corrosion Science and Technology (2010).

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Study of poly (ethylene terephathalate) nanocomposites for biomedical application

S. M. Pawde and P. N. Nikam
Department of Physics, Institute of Chemical Technology-Mumbai, India

PET nanocomposites with the fillers and the matrix polymer blend is of interest. The advantage of both organic material and inorganic fillers composite materials used good flexibility towards weight of the material, moulding ability and enhancement in the elongation strength of the polymer material. PET is well known semicrystalline polymer used for packaging, fabrication and automotive applications. PET is used for biological materials wrapping due to its excellent chemical resistance. Its composite is flexible towards thermal stress capacity, crystallization and heat dissipation.

With the addition of fillers in the nanoparticle form such as Al2O3, BaTiO3 results in unique combination for useful applications Nanocomposites based on such nanofillers with polymer (PET) are obtained by preparation using melt extrusion process. The concentration of nanoparticles was varied in four different microscaled. In the characterization of a composite TGA, SEM and IR data is discuss. Dielectric property was improved with composites using Nonconducting antioxidant particles was studied using dielectric tester LCR Meter. The polymer material structure improvement in the poly dispersion form was observed in SEM micrograph. Due to the density variation of the particle effect on viscosity of the nanocomposite was studied using TGA data. Structural morphology is examined from IR data. The material shows improvement in the thermomechanical property. The smaller size can be innovation of encapsulation for packaging material of biomedical application.

Keywords: PET, Nanocomposite, biomedical application, Packaging

Biography

S. M. Pawde currently working as Associate Professor of Physics Department of Institute of Chemical Technology, Mumbai (India), she is working for more than 25 years in the field of Polymer Physics area. She has done her Ph.D. from Institute of Chemical Technology, Mumbai, in the area of Polymer composite base piezoelectric materials. At Present, teaching rheological science to engineering student of Institute of Chemical Technology. She has published more than 10 international reputed journal papers and presented more than 20 papers in conferences.

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Studies on crude enzyme preparation obtained from indigenously isolated fungal strain for environment friendly textile desizing

Shalini Singh and Shivani Sharma
Department of Biotechnology and Biosciences, Lovely Professional University, India

Textile desizing involves the removal of starch from the fabric on which it serves as the strengthening agent to prevent breaking of the warp thread during the weaving process. After weaving the cloth, the starch has to be removed before the dyeing process for efficient dye absorption by the cloth fibres. Chemical desizing has been long used and has been associated with increase in chemical pollutants in the textile industry effluent. Enzymes, particularly, amylases are instead being used nowadays as effective textile desizer, thereby decreasing the environment pollution attributed to textile industry effluent. The present study was undertaken to study amylases of indigenously isolated fungal strains to select the best amylase producer, which was further characterized for production of crude amylases under optimum conditions of solid state fermentation using cheap lignocellulosic substrate. Subsequently, the crude amylases produced under optimized conditions of SSF were checked for its efficacy in textile desizing. The crude amylase preparation successfully desized the textile fabric by 73% at an incubation temperature of 70°C, and incubation time of 60 mins. The crude amylase preparation was stable at high temperature and pH and retained about 25% of its maximum activity at a temperature of 80°C and about 50% of its maximum activity at a pH of 8.0, thereby adding to its successful application under harsh conditions of temperature and pH prevalent during industrial textile desizing. The use of cheap lignocellulosic substrate for enzyme production further makes the process economical.

Biography

Shalini Singh has completed her Ph.D at the age of 28 years from Indian Institute of Technology Roorkee, Roorkee. She is currently working as Assistant Professor, Department of Biotechnology, Lovely Professional University, Punjab, India. She has published 7 papers in reputed journals. She has presented 2 research papers in International conference, as an invited speaker. She is an invited reviewer for international journals of repute. She has successfully supervised 9 thesis projects including Master of Philosophy (M.Phil.) and Master of Technology (M. Tech.) and Master of Science (M. Sc.).

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Track 5, 7, 8 & 9

5: Genetic Engineering & Molecular Biology
7: Medical Biotechnology & Biomedical Engineering
8: Tissue Science & Engineering
9: Stem Cell Research & Therapy

Session Chair
Mukesh Verma
National Institutes of Health, USA

Session Co-Chair
Bhagavatula Moorthy
Baylor College of Medicine, USA

Session Introduction

Title: **Epigenetic and genetic approaches in cancer epidemiology and risk assessment**
Mukesh Verma, National Institutes of Health, USA

Title: **Methylation status of H19 and IGF2 genes in fibroblast cell lines of goat (Capra hircus) after serum starvation treatment**
Sanjeev Singh, National Bureau of Animal Genetic Resources, India

Title: **Designing and rapid screening of sirna molecules for delayed fruit ripening in tomato**
Geetha Lakshmi M, Bioseed Research India Pvt. Ltd, ICRISAT, India

Title: **Promoters promoting transgenic research**
Rajiv Ranjan, Institute of Life Sciences, India

Title: **Genetic engineering of lignin biosynthesis to improve bioethanol production from Leucaena leucocephala**
Singam Prashant, Jawaharlal Nehru Technological University Hyderabad, India

Title: **Molecular mechansisms of hyperoxic lung injury: Implications for bronchopulmonary dysplasia (BPD) and ARDS**
Bhagavatula Moorthy, Baylor College of Medicine, USA

Title: **Isolation and identification of uvrd helicase from Escherichia coli from local fever patient for PCR enzyme production**
Yamuna Sundram, Universiti Sains Malaysia, Malaysia

Title: **Malaria and matrix metalloproteinases: New perspectives for adjuvant therapy**
Mauro Prato, Università di Torino, Italy

Title: **Role of dietary Curcuma longa in combination with Emblica officinalis in the management of diabetic dyslipidemia**
Tuhin Rashmi, AMITY University, India

Title: **Approaches to lead generation - A novel molecular target in cancerdrug discovery development**
Sarita Rajender, Osmania University, India

Title: **In vitro propagation and evaluation of antimicrobial and antioxidant potential of an endangered herb - Cassia tora to explore its neutraceutical values**
Sumangala Rao, Jawaharlal Nehru Technological University-Hyderabad, India

Title: **Monitoring of drugs at molecular level using FTIR spectroscopy**
G.S. Uthayakumar, St. Joseph's College of Engineering, India

Title: **Improving biocompatibility of implantable metals by nanoscale modification of surface**
D. Bubesh Kumar, Aarupadai Veedu Institute of Technology, India

Title: **Fatigue corrosion of external illizarov ring fixators, hybrid fixators with half pins**
A. Manimaran, Aarupadai Veedu Institute of Technology, India

Title: **Biomaterials and tissue engineering approaches for soft tissue reconstruction**
Naveen Kumar, Indian Veterinary Research Institute, India

Title: **Studies of nanoscale structural, chemical and mechanical hierarchy of Sardine pilchardus fish scale in contrast with man-made nanocomposites**
D. Devaprakasam, Karunya University, India

Title: **Human dental pulp mesenchymal stem cells; efficientin bone defectshealing**
Hamed Hemati Chahardeh, Kakatiya University, India

Title: **Isolation, proliferation and transplantation of bone-marrow derived animal mesenchymal stem cells (BM-MSC) in critical sized bone defects (CSD) in animal model**
Swapan Kumar Maiti, Indian Veterinary Research Institute, India

Title: **Bone marrow cells contribute to tubular epithelium regeneration following acute kidney injury induced by mercuric chloride**
Neelam Yadav, Dr. Ram Manohar Lohia Avadh University, India

Symposium

Drugs of abuse-HIV infection and NeuroAIDS-A Global scenario

Jag H. Khalsa National Institute of Health, USA **Title:** Drugs of abuse-HIV infection and NeuroAIDS -A Global scenario	
Jeymohan Joseph National Institute of Health, USA **Title:** NIMH NeuroAIDS Research Priorities and Global Efforts	
Shailendra Saxena Center for Cellular and Molecular Biology, India **Title:** Molecular mechanism of differential neuroAIDS by HIV-1B and C clades	
Patricia E. Molina Louisiana State University Health Sciences Center, USA **Title:** Alcohol and Drugs of abuse interaction with HIV/AIDS, system approach	
Santosh Kumar University of Missouri-Kansas City, USA **Title:** Role of cytochrome P450 in tobacco and alcohol mediated effects in monocytes and astrocytes: Implications with HIV-1 pathogenesis	
Sanjay Maggirwar University of Rochester, USA **Title:** Cocaine promotes inflammation in persons with HIV-1 via formation of platelet-monocyte complexes	
Anil Kumar University of Missouri-Kansas City, USA **Title:** Synergistic cooperation between methamphetamine and HIV-1gp120 through the pi3k/akt pathway induces il-6 but not il-8 expression in astrocytes	
Anuja Ghorpade University of North Texas HealthScience Center, USA **Title:** HIV-1, methamphetamine and astrocyte glutamate regulation: Combined excitotoxic implications for neuroAIDS	
Howard S. Fox University of Nebraska Medical Center, USA **Title:** Methamphetamine and response to viral infection *in vivo*	
Shilpa Buch University of Nebraska Medical Center, USA **Title:** HIV Neuropathogenesis: A tight rope walk of innate immunity	
Khizroev Sakhrat Florida International University, USA **Title:** TBA	
Sabita Roy University of Minnesota, USA **Title:** Morphine induction of Toll like receptors on microgial cells potentiates HIV-1 TAT induced neuropathogenesis in a pneumococcal pneumonia eco-infection model	
Sulie L. Chang Seton Hall University, USA **Title:** Substance-Induced Behavioral Plasticity in the HIV-1 Transgenic Rat	
Madhavan Nair Florida International University, USA **Title:** Multi drug nano carrier totreat Opiateaddition and Neuro-AIDS	

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Molecular mechanism of differential neuroAIDS by HIV-1B and C clades

Shailendra K. Saxena
Centre for Cellular and Molecular Biology, India

Human immunodeficiency virus type 1 (HIV-1) is commonly associated with immune dysfunctions and the suppression of antigen-presenting cells. This results in immune alterations, which could lead to impaired neuronal functions, such as neuroAIDS. The neurotoxic factor kynurenine (KYN), the ratelimiting enzyme indoleamine 2,3-dioxygenase (IDO), serotonin (5-HT), and serotonin transporter (5-HTT) may play a role in tryptophan deficiency and serotogenic dysfunction in neuroAIDS. HIV-1 transactivator regulatory protein (Tat) is known to play a major role in immune dysfunction. Previous studies suggest that HIV-1 B and C clades differentially manifest neuronal dysfunctions in the infected host. In the present study we examine the effect of HIV-1 B and C clade–derived Tat on IDO and 5-HTT gene and protein expressions by dendritic cells as studied by quantitative polymerase chain reaction (qPCR) and Western blot. In addition, the intracellular IDO expression, IDO enzyme activity, and the levels of 5-HT and KYN were also measured. Results indicate that HIV-1 clade B Tat up-regulates IDO and down-regulates 5-HTT gene and protein expressions. Further, HIV-1 clade B Tat caused a reduction of 5-HT with simultaneous increase in KYN levels as compared to HIV-1 clade C Tat. These studies suggest that HIV-1 clade B and C Tat proteins may play a differential role in the neuropathogenesis of HIV-associated dementia (HAD) or HIV-associated neurocognitive disorder (HAND)

Biography

Shailendra Saxena is a Medical Microbiologist at Centre for Cellular and Molecular Biology (CCMB) in India. The main research interests of his group are to understand the epidemiology and molecular mechanisms of host-defense during human viral infections and to develop new predictive, preventive and therapeutic strategies for them using JEV and HIV as a model. His research work has been published in various high impact factor journals (Science, PNAS) with high citation. He has received many awards and honors in India and abroad including various Young Scientist Awards, BBSRC India Partnering Award and named as “Global Leader in Science” by The Scientist magazine (USA) and “International Opinion Leader / Expert” involved in the vaccination for JE by IPIC (UK).

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Fatigue corrosion of external illizarov ring fixators, hybrid fixators with half pins

A. Manimaran[1], D. Bubesh Kumar[2] and Muthurajan[2]
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[2]Mechanical Engineering Department, Aarupadai Veedu Institute of Technology, Vinayaka Mission University, India

The mechanical characteristic of an external fixator determines the biomechanical environment of a fracture, osteotomy or non-union treated by the external fixator.

Two main categories of fixators are in popular use. The more conventional type (e.g. hybrid). The second type of circular or semicircular fixator e.g., ilizarov) relies on smooth, non threaded Kirschner wires of small diameter (1.5mm to 1.8mm) under tension to provide the stability needed. Biomechanically, not only are the principles different but also, the biomechanical environment of fractures by the two system is significantly different. Using Ansys Work Bench 10 the ilizarov, hybrid1and hybrid2 were modeled and it was found that the mechanical properties ilizarov was better than the hybrid fixators. The fatigue corrosion of the k-wires for the illizarov ring fixator, hybrid fixators with half pins was analyzed.

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Molecular mechansisms of hyperoxic lung injury: Implications for ronchopulmonary dysplasia (BPD) and ARDS

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Hyperoxia is routinely used in the treatment of pulmonary insufficiency and respiratory distress in preterm and term infants and in adults with acute respiratory disease (ARDS). However, in infants, hyperoxia contributes to the development of chronic lung disease (CLD), which is termed bronchopulmonary dysplasia (BPD). The molecular mechanisms of oxygen-mediated lung injury are not understood, but reactive oxygen species (ROS) are the most likely candidates. ROSare also responsible for many other lung diseases such as acute respiratory distress syndrome (ARDS), asthma, emphysema, chronic obstructive pulmonary disease (COPD), and lung cancer. Results from our laboratory demonstrate a novel role for cytochrome P450 (CYP)1A enzymes in the detoxification of ROS-mediated lipid peroxidation products, e.g., F2-isoprostanes. Our major observations are that mice lacking the genes for CYP1A1 or 1A2 are more susceptible to hyperoxic lung injury than wild type mice, with Cyp1a2-null mice being the most sensitive. On the other hand, mice lacking the gene for CYP1B1, are less susceptible to lung injury, suggesting a pro-oxidant role for CYP1B1. Mice pre-treated with the CYP1A inducer (β-napthoflavone (BNF), followed by exposure to hyperoxia leads to protection against lung injury. We also found formation of bulky oxidative lesions (oxidative DNA adducts) in tracheal aspirates of premature infants and adults who received supplemental oxygen, and this was associated with BPD and ARDS, thereby suggesting that these adducts could serve as novel biomarkers of these diseases. Future studies could lead to the development of rational strategies for the prevention/treatment of lung diseases associated with hyperoxia.

Biography

Bhagavatula Moorthy had completed his Ph.D from the Indian Institute of Science in 1989, and underwent postdoctoral studies at the Medical College of Wisconsin and Baylor College of Medicine. He is currently Professor of Pediatrics and Director of Neonatology Research Laboratories at Baylor. He has published more than 70 papers in reputed journals and serving as an editorial board member of several journals. He also has received multiple grants from the National Institutes of Health and other agencies. He recently received the AstraZeneca Travel Lectureship award from the Society of Toxicology and will be a visiting Professor in 7 European Universities.

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Improving biocompatibility of implantable metals by nanoscale modification of surface

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The human body is an intricate biochemical –mechanical system, with an exceedingly precise hierarchical organisation in which all components work together in harmony across a wide range of dimensions. Many fundamental biological processes take place at surfaces and interfaces, and these occur on the nanoscale. The ultimate aim is to produce and enhance the natural nanoscale elements present in the human body (biometic) and to thereby develop new material with improved biological activities. Materials used for load-bearing implants must be mechanically strong and must possess high resistance to corrosion and wear and should not weaken the mechanical strength and release potentially dangerous metallic ions or debris in the human body. The most used ones are stainless steels (such as 316L) as well as titanium and its alloys (e.g., TiAI) and shape memory TiNi alloys used in orthopaedic and cardiology. The most popular and efficient ways to modify surfaces on the nanoscale involve direct chemical modifications with acids and oxidants ,because they are efficient and uniform access to all surfaces even on multifaceted devices with complex 3D shapes. Acid –etching produces micro pits on titanium surfaces with sizes ranging from .5 to 2 micrometer in diameter .Acid etching has been shown to greatly enhance osseo integration, immersion of titanium implants for several minutes in a mixture of concentrated HCL, H_2 SO_4 heated above 100°C (dual acid etching) was employed to produce a microrough surface . Implants treated by dual etching have specific topography able to attach to fibrin scaffold, higher bone to implant contact and less bone resorption with dual acid etched surfaces .These characteristics make chemical treatments an advantageous and flexible way to modify biomaterials for implants.

Keywords: Dual acid etching, biometic, implants, biocompatibility

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Studies of nanoscale structural, chemical and mechanical hierarchy of Sardine pilchardus fish scale in contrast with man-made nanocomposites

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Hierarchical design of biological structures exhibits remarkable physical, chemical mechanical and biological properties and functionalities over the wide range of length scale. Structural, chemical and mechanical properties of sardina pilchardus fish scale from nanometer to micrometer length scale has been investigated using advanced microscopy techniques. By de-collagenisation process the fish scale was demineralised, the nanoscale structural, chemical and mechanical hierarchy of constituents were analysed. It consists of particulates of calcium hydroxy apatite and fibrillar collagens which were hierarchically arranged. Calcium hydroxy apatite shows numerous level hierarchies and at each level they are commensurately interconnected. We also studied nanoscale energy dissipation and failure mechanics of nanoparticle filled polymer composite using advanced microscopy techniques. Nanocomposites and nano-structured materials are technologically important class of materials which have potential uses in many engineering and biomedical applications. Nanocomposites exhibit dramatic improvement on their mechanical properties and show high resistance to fracture and wear failures. Objective of this study is to understand, the role of nanoparticles, nano-microstructure, strength of particle-matrix interface and effects of geometrical gradient and mechanical gradient on energy dissipation process and subsequent failure mechanisms. We also present ongoing analytical and computational investigations of energy dissipation and failure mechanisms of the mechanisms of the nanocomposites. We conclude that hierarchical composites of biological systems show remarkable characteristics over man-made nanocomposites.

Biography

D. Devaprakasam is a Professor in Nanotechnology and HOD in the Department of Nanosciences and Technology & Centre for Research in Nanotechnology, School of Nanosciences and Technology, Karunya University, Coimbatore, India. He received his M.S. (Engg) and PhD (Engg) from the Department of Mechanical Engineering, Indian Institute of Science (IISc), Bangalore. His research interests have been in the area nanotechnology which includes, NEMS, MEMS, Nanomechnaics, Nanolithography Nanometrology, Nanocomposites and Advanced Microscopy-Spectroscopy. For his M.S. research thesis, he received best thesis award from the INAE-India. His PhD research was sponsored by the General Motors' Fellowship and supported by DRDO project grant. For the PhD thesis, he was honored with two best thesis awards, P.S. Narayana Medal and Prof. B.K. Subbarao Medal by IISc in the Faculty of Engineering. He also received Cheung Kong Australian Endeavour Award by Government Australia. He was selected for the Royal Society Incoming International Fellowship 2006. He carried out his Post-Doctoral research work at the IWRI, University of South Australia and NanoLab, Engineering Materials, University of Sheffield, United Kingdom from 2005 to 2010. His Post-Doctoral research was supported by the EPSRC and Technology Strategy Board, UK. He was a visiting scientist to IISc through UKIERI programme of British Council, UK.

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Monitoring of drugs at molecular level using FTIR spectroscopy

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There is an ongoing need for improvements in non-invasive techniques for the diagnostic and prognosis of gastric problem. Such technologies would allow for accuracy in results over huge number of patients. In India, there are two types of Medical Treatment systems (MTS) using drugs namely, English Medical Treatment systems (EMTS) and Ayurveda, Unani and siddha Treatment system(AUSTS).Due to modern food habits, 70% of the population suffering from gastric problem. To find the characteristics and properties of drugs given for the treatment of gastric problem by both type of physicians, the samples are taken for experiment using Fourier transform Infrared spectrometer. In this method the Infrared spectrum originates from the vibrational motion of the molecules. This property is used for characterization of biological compounds. Spectral analysis revealed differences in both the treatment systems and also several metabolic components such as lipid, proteins, glucose, and carboxylate presence in the taken samples for test. The spectral analysis indicated that the specific functional groups of the drug materials have almost the same chemical characteristics but different reactions in the human body.

Keywords: FTIR-Fourier Transform Infra red Spectroscopy, MTS-Medical Treatment System, AUSTS-Ayurveda, Unani and Siddha treatment system, KBr-Pottassium Bromide, FT-Fourier Transform, DTGS- deuterated triglycine sulphate

Biography

G. S. Uthayakumar received the B.E. degree in ECE from Madras University, Chennai in 1990, M.E.degree in Medical Electronics from College of Engineering, Anna University, Chennai and M.B.A. Degree from IGNOU. He is currently working with St. Joseph's College of Engineering in the Department of Electronics and Communication Engineering Affiliated to Anna University, Chennai, India. He has over 21 years of experience in industry and various engineering colleges. He attended many workshops in the area of Bio-medical Electronics. He has been teaching the subjects: Medical Electronics, Optical Communication and etc for number of semesters. His research interests include Bio-medical Optical Engineering, Bio-optical spectroscopy and Analytical chemistry.

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Designing and rapid screening of SiRNA molecules for delayed fruit ripening in tomato

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Tomato (Solanum lycopersicum) being the world's second most essential vegetable fruit, 20 percent of the produce is lost due to post-harvest damage. Post-harvest losses can be reduced by development and application of suitable technology for manipulation of fruit ripening at the molecular level, resulting in extended shelf life of climacteric fruits. RNA interference (RNAi) is a post-transcriptional conserved biological response where 21-23 nt short siRNA molecules mediate the suppression of gene expression in a very homology dependent sequence specific manner. Fruit ripening is modulated by expression of several genes, including ACC synthase (ACS) and ACC oxidase (ACO) responsible for ethylene production and polygalacturonase (PG) is involved in the pectic cell wall degradation. We selected several genes for detailed study of inhibition/slow down of fruit ripening process. The presented work is carried out on the design and effect of specific siRNA molecules targeting ACO gene resulting in inhibition/delayed ripening. The siRNA encoding DNA molecules were synthesized and cloned in pGSA1285 vector in sense and antisense orientation with GUS as spacer for the production of double stranded RNA with hairpin. As a convenient alternative for the stable genetic transformation, we developed an efficient longer duration transient expression methodology for the gene silencing studies. The Agrobacterium tumefaciens LBA4404 strain carrying chimeric vector containing the transgenes were used for tomato fruit pericarp injection method for the functional screening and analysis of SiRNA molecules. Inhibition of ripening around the injection site was observed from 3 days post-injection to 30-35 days of incubation at room temperature. The injection site clearly showed inhibition of natural change of color from green to red pigmentation and the effect was sustained till 40-45 days. This novel method of siRNA designing, rapid screening and longer duration transient expression through fruit injection can be used for high-throughput functional analysis of ripening related plant genes.

Biography

Geetha Lakshmi M has completed her M.Sc (Biotechnology) from Bangalore University, India and has 8 years of experience in the area of molecular biology research. Presently she is responsible for molecular biology research project in one of the premier hybrid seed companies of India and also pursuing doctorate research from Jawaharlal Nehru Technological University, Hyderabad, India.

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Human dental pulp mesenchymal stem cells: Efficient in bone defects healing

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Dental pulp is a niche housing neural-crest-derived stem cells. Dental Pulp Stem Cells or (DPSCs) are multipotent stem cells that have the potential to differentiate into osteogenic, chondrogenic, myogenic, adipogenic and neurogenic lineage according totheir embryonic origin. DPSCs are easily accessible and limited morbidity after collection. Dental pulp-derived mesenchymal stem cells (MSCs) have emerged as a promising tool for use in regenerative medicine. The limitation associated with bone marrow MSCs, such as theirdifficulty of obtainment, large trauma, high expense, and patients' low-degree reception, has led to investigation on Dental pulp tissue. Meanwhile, research indicates that DPSCs cultivated in vitro have higher clone forming ability than BMMSCs.Therefore, DPSCs are easy to amplify and have good prospects for application in bone tissue engineering.There are various studies where the importance of these cells and their regenerative capacity has been demonstrated. The quality and quantity of regenerated bone formed by DPSCs was demonstrated in in vitroand invivo experiments. The main aimwas a the comparative study on the advancements on bone defects therapy by applying DPSCs .The literatures are reviewed in order to compare new findings in the field of dental stem cell research, their potential use in the dental tissue engineering, summarization of clinical applications and asurvey on;three-dimensional (3D) scaffolds, osteogenesis-inducing factors, different methods to isolate and culture dental MSC, alsoevaluate their differentiation potential, best culture condition for enhanced proliferation, their exact identity, DPSC banking, long-term storage and source of dental pulp (tooth type).Our findings demonstrated the strong potential of stem cells bioengineered constructs for correcting bone defects in animal model and is likely a promising approach for the reconstruction of human large skeletal defects in craniofacial surgery.Collectively, the multipotency, high proliferation rates, and accessibility make the dental stem cell an attractive source of mesenchymal stem cells for tissue regeneration. It is concluded that additional studies are needed to fully evaluate the advantages and disadvantages of these candidates.

Biography

Hamed Hemati Chahardeh has completed his M.Sc. Biotechnology from Kakatiya University, India. He founded PooyaGene Biotech co, 2008 in IRAN at the age of 24 years, focusing on molecular diagnostic, stem cell and biopharmaceuticals research and manufacturing. He has established its branch in INDIA. He has achieved several awards such as national young entrepreneurship award. He is already working as CEO of PooyaGene Biotech Co.

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Characterization and sequence analysis of fibroblast growth factor 2 gene in buffalo (Bubalus bubalis)

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Growth factors play important role during gestation in livestock species. One such growth factor is Fibroblast Growth Factor 2 (FGF2) which has placentogenic and embryo-protective role during pregnancy. Studies in cattle reveal that specific mutations at intron 1 region of FGF2 gene contribute to embryonic mortality and thereby results in poor reproductive performance. The present study was conducted to characterize and find putative nucleotide changes at buffalo FGF2 gene intron 1 segment. For this study buffalo genomic DNA was isolated from blood. PCR amplification of FGF2 gene intron 1 region was carried out in 25 µl of reaction mixture containing approximately 50-100 ng of genomic DNA. Specific PCR product of 167 bp for FGF2 gene was got sequenced (SciGenom Ltd). BLAST analysis in NCBI nucleotide Database of buffalo FGF2 gene show 92% similarity with bovine FGF2 gene sequence. Sequence analysis using CLUSTALW2 software of the obtained sequence revealed eight nucleotide differences in the intron 1 region of buffalo FGF2 gene in comparison with bovine sequence (HM597774.1). These distinct differences were at position 329 (A/T), 360 (G/C), 368 (C/A), 375-6 (C/A, C/T), 381 (T/C), 385 (C/T), 401-2 (G/C, G/A) which include 4 transitions and 5 tranversions as compared to bovine sequence. Using promoter prediction software (BDGP) it was deduced that two distinct promoter regions (323-72; 338-387) with scores 0.83 and 0.92, respectively were present in the buffalo intron 1 sequence. Analysis with TFMATRIX software also revealed 12 potential transcription binding sites with a threshold ranging from 85-100% in the obtained buffalo FGF2 intron 1 nucleotide sequence. It is concluded that nucleotide sequence changes near the transcription sites in the promoter region may subsequently affect the secretion and biological function of Fibroblast Growth Factor during pregnancy in buffaloes.

Keywords: Buffalo, Pregnancy, FGF2, Embryonic mortality

Biography

Jerome A has done his Master's in Animal Reproduction discipline from Indian Veterinary Research institute. He obtained Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF) from ICAR for his Master and PhD Degree programs. At present he is working as scientist in Central Institute for Research on Buffaloes, India. His area of research is Reproductive Biotechnology. At present he is working on role of candidate genes polymorphism contributing to embryonic mortality in buffaloes.

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Malaria and matrix metalloproteinases: New perspectives for adjuvant therapy

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Besides primary therapy including quinine and artesunate, effective against Plasmodium parasite, several new adjunctive therapies to reduce clinical symptoms and mortality of severe malaria have undergone recent trials. However, results have been disappointing, with albumin being so far the only promising adjuvant therapy. Thus, research for new targets aimed at defining new affordable treatment appears urgent. Recently, convincing evidence on the involvement of human Matrix Metalloproteinases (MMP) in malaria pathogenesis emerged. In vivo, enhanced mRNA/protein levels of a large kaleidoscope of MMP, including MMP-1, -2, -7, and -9, were described in human or murine models of cerebral malaria (CM). In vitro, a tight relationship between human MMP-9 and haemozoin (HZ, malarial pigment), a Plasmodium parasite product resulting from haemoglobin digestion, was demonstrated by my group. In human monocytes and endothelium, HZ enhanced expression, release and activity of MMP-9 and several MMP-9-related molecules, including cytokines (TNFalpha, IL-1beta), chemokines (MIP-1alpha, IL-8), and enzymes/inhibitors from gelatinase granules (lysozyme, tissue inhibitors of metalloproteinases/TIMP). Enhancement of MMP-9 and related molecules appeared dependent on HZ lipid moiety, and a major role for 15-hydroxyeicosatetraenoic acid (15-HETE), a HZ lipoperoxidation derivative, was suggested. Additionally, p38MAPK and NF-kappaB signalling activation was required. Since MMP play a major role disrupting endothelial tight junctions and sub-endothelial basement membrane, along with modulating pro-inflammatory activity, they could be crucial for eliciting blood-brain barrier permeability and inflammation during CM. Therefore, further studies on MMP involvement in malaria will help to clarify mechanisms underlying severe malaria etiopathogenesis, in order to design new targeted adjuvant therapies.

Biography

Mauro Prato graduated in Medical Biotechnology in 2001 and completed his PhD in Biochemistry and Cellular Biotechnology in 2005 at the University of Torino, Italy, where he has been working as an Adjunct Professor of Biochemistry since 2008. His main research interests cover the investigation of the involvement of human matrix metalloproteinases in malaria, a new research field that he successfully pioneered. He has published 19 papers in peer-reviewed journals, 3 chapters in international books and more than 40 communications in well-established conferences. He is serving as an editorial board member of the Journal of Bacteriology and Parasitology (OMICS Group).

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Epigenetic and genetic approaches in cancer epidemiology and risk assessment

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The National Institutes of Health (NIH) has initiated the Epigenomics Roadmap Program (http://www.roadmapepigenomics.org/) which is comprised of five major initiatives: Reference Epigenome Mapping Centers, Epigenomic Data Analysis and Coordinating Centers, Technology Development in Epigenetics, Discovery of Novel Epigenetic Marks, Epigenomics of Human Health and Diseases. This program proposes that the origins of health and susceptibility to disease are the result of epigenetic regulation of the genetic information. Specifically, epigenetic mechanisms that control stem cell differentiation and organogenesis contribute to the biological response to environmental and other factors in the form of stimuli that contribute in disease development. Epigenetic and genetic approaches in cancer epidemiology and risk assessment will be discussed. Epidemiology is the scientific study of the causes and distribution of disease in populations. The National Cancer Institute's Epidemiology and Genetics Research Program (EGRP), in the Division of Cancer Control and Population Sciences, provides opportunities for investigators to increase understanding of cancer causes and prevention in human populations. EGRP supports research in four areas: (1) Clinical and translational epidemiology, including factors that influence development of cancer among persons with underlying diseases and conditions; the progression, recurrence, and mortality from cancer; and development of new primary cancers; (2) Host susceptibility factors that influence personal susceptibility to cancer in humans, such as genetic, epigenetic, immunological, hormonal, and biological pathways; and social, cultural, racial, and ethnic factors; (3) Methods and technologies for epidemiologic data collection, study design and analysis, and development and adaptation of laboratory and technical approaches for large studies in human populations; (4) Modifiable risk factors to reduce cancer risk in humans, such as diet and nutrition; alcohol; physical activity and energy balance; tobacco; infectious diseases; physical and chemical agents; and medical exposures, including medications and treatments. Different funding mechanisms of grants and contracts, and collaboration opportunities will be discussed.

Biography

Mukesh Verma is a Program Director and Chief in the Methods and Technologies Branch (MTB), Epidemiology and Genetics Research Program (EGRP) of the Division of Cancer Control and Population Sciences (DCCPS) at the National Cancer Institute (NCI), National Institutes of Health (NIH). Before coming to the DCCPS, he was a Program Director in the Division of Cancer Prevention (DCP), NCI, providing direction in the areas of biomarkers, early detection, risk assessment and prevention of cancer, and cancers associated with infectious agents. Dr. Mukesh Verma holds a M.Sc. from Pantnagar University and a Ph.D. from Banaras Hindu University. He did postdoctoral research at George Washington University and was a faculty member at Georgetown University. He has published 116 research articles and reviews and edited three books in cancer epigenetics and epidemiology field.

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Biomaterials and tissue engineering approaches for soft tissue reconstruction

Naveen Kumar
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The clinical need for strong, biocompatible materials that encourage integration while minimizing adverse reaction, such as tissue reaction and adhesion formation, is apparent. Yet, the design of optimal surgical repair materials to reinforce or replace soft tissue remains problematic. When normal tissues fail, surgeons are confronted with the challenge of manipulating available healthy anatomy in such a manner as to produce normal form and function in the affected region. Local circumstances will vary, depending on the etiologic factors involved. Congenital anomalies, acute trauma, premature tissue deterioration, and the consequences of ablative surgery all present different local circumstances with which the reconstructive surgeon must deal. At the cellular level, however, it makes no difference how the tissue fails. What does matter is a set of basic cell requirements and wound management principles common to all tissue reconstructive efforts. Most tissue engineering approaches to the restoration and repair of damaged tissues require a scaffold material upon which cells can attach, proliferate and differentiate into a functionally and structurally appropriate tissue for the body location into which it is placed. Tissue engineering is a multidisciplinary field which involves the application of the principles and methods of engineering and life sciences towards the fundamental understanding of structure-function relationships in normal and pathological mammalian tissues and the development of biological substitutes that restore, maintain or improve tissue function. The goal of tissue engineering as a treatment concept is to replace or restore the anatomic structure and function of damaged, injured or missing tissue or organs following any injury or pathological process by combining biomaterials, cells or tissue, biologically active molecules and or stimulating mechanical forces of the tissue microenvironment. One of the principle methods behind tissue engineering involves growing the relevant cell(s) in vitro into the required three-dimensional (3D) organ or tissue.

In our Biomaterials and Bioengineering Laboratory in Division of Surgery, IVRI we have optimized the protocols to prepare acellular matrix from different organs/tissues. The tissue which has been made acellular included rumen sub mucosal wall, urinary bladder, tendon, ligaments, diaphragm, pericardium, aorta, dermal matrices and intestinal sub mucosa of bovine and porcine origin. These acellular matrices were further evaluated in experimental animals as well as in clinical cases in case of reconstructive surgery. Acellular dermal graft of xenogenic origin (bovine) was found biocompatible for the repair of abdominal wall defect in a rabbit model without any crosslinking agent or after crosslinking with glutaraldehyde. These matrixes were used as without crosslinking or they were crosslinked to delay the resorption of these matrices in the body so that the reconstruction and repair of the tissue takes place. The crosslinking agents used includes glutaraldehyde, hexamethyl diisocyante, 1, 4-butanediol diglycidyl ether and 1-ethyl-3-(3-dimethyl aminopropyl carbodiimide. Besides using these biological origin biomaterials we have also tested synthetic materials like carbon fibres, carbon mesh, nylon mesh and polypropylene mesh for the reconstructive surgery in small animals as well as large animals. Carbon fibres were found very good biocompatible scaffold for the repair and reconstruction of tendon and abdominal wall defects. Other materials proved good in reconstruction of large defects of abdominal wall. We have developed some protocols for de-epithelization the skin in different species of animals, viz. rabbit, sheep, goat, buffalo and pig. In these protocols enzymes have been used for de-epithelization of the skin. We have also developed some patentable protocols for acellularity of de-epithelized skin. Acellular dermal matrix was been prepared using different combinations of enzymes, anionic and non-ionic biological detergents. These acellular dermal matrices were used for tissue engineering and for three dimensional culture configurations to promote 3-D tissue organization. The findings will be discussed at the time of presentation. There can be no doubt that the most widely recognized applications of biomaterials involve those situations where a tissue or organ has suffered from some disease or condition that has resulted in pain, malfunction or structural degeneration, and which can only be alleviated by the replacement or augmentation of the affected part.

Biography

Naveen Kumar is Principal Scientist in the Division of Surgery, Indian Veterinary Research Institute. He was educated at College of Veterinary Sciences, Bikaner Rajasthan, receiving BVSc & AH degree and MVSc degree in Veterinary Surgery with First Class. He obtained PhD degree from Deemed University, IVRI, Izatnagar, Uttarpradesh. He joined Indian Veterinary Research Institute as Scientist in year 1989 and subsequently he became Principal Scientist in 1996. He has been associated with more than 7 extramural funded projects and 10 institute projects. He is now working as principal investigator of a DBT funded project entitled "Development of 3-D biodegradable dermal matrices for reconstructive surgery".

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Approaches to lead generation - A novel molecular target in cancer drug discovery development

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Cell regulation is an essential mechanism in cell proliferation and has close relationship with carcinogenesis.The main focus in cancer research is on the formation, activation, inactivation,of Cyclin – CDK(Cyclin Dependent Kinase) complex which forms the basis of cell regulation (1).Cyclin X_1 is a new member of cyclin family which is located in nucleus, whose expression is induced by DNA damageand is transcriptionally activated by P^{53} tumour suppressor gene (2). CyclinX_1 exerts a negative feedback regulation of P^{53} by regulating dephosphorylation of Mdm2, an Oncoprotein, by complexing with PP2A during nucleolar stress. (3,4). The main objective is to inhibit the binding of PP2A- Mdm2 complex (5)and with cyclin X_1 which stabilizes P^{53} leading to cellcycle arrestor apoptosis.

In the present work, the 3D model of cyclin X1is generated using homology modeling techniques and validation protocols. Active site prediction is carried out using various server tools and Schrodinger Suite, which allow envisaging the important pockets for putative receptor binding.(6,7,8).Further studies are aimed at designing new chemical entities which may be used as potent anti cancer therapeutic leads.

Keywords: Cyclin Dependent Kinase Complex, P^{53}, Transcription and New Chemical Entities

Biography

P. Sarita Rajender, DST – Scientist at The Department of Chemistry, Nizam College, Osmania University since 2009 and has completedPh.D in Synthetic Organic Chemistry in the year 1996. She is a post-doctoral research fellow working on novel platforms for finding new leads in Cancer therapy. Patenting process is under progress for promising new lead molecules. Her field of research interest includes modeling of novel protein targets & identification of new chemical entities (NCE's) using Computational Chemistry, Chemical-Biology and Software tools. She has mentored PG students in their dissertation workduring teaching tenure. She has actively involved in organizing seminars/ workshop for students. Dr. P. SaritaRajender published several research articles in reputed international journals and has presented papers at various International and National Conferences.

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Promoters promoting transgenic research

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Plant can be used as an alternative expression system for production of recombinant proteins due to reduced production cost and lower capital investment along with appropriate posttranslational modification. One of the major limitations in moving plant-produced heterologous proteins from developmental research to commercial products is lower level of expression of transgene in plant. Expression levels of transgene/gene of interest depend upon strength of genetic regulator, the promoter. In plant molecular pharming, strong promoters may be needed to achieve maximal expression of multiple genes by successive event of transformations. However, a risk of multiple transformations by a single promoter is that, it might lead to silencing of both genes in successive generation through homologous recombination. Considering all the facts, attempts are being made worldwide to develop engineered promoter with enhanced strength and heterogeneous sequences employing different approaches including promoter DNA hybridization and shuffling. Recently, adopting these novel techniques we have developed several useful promoters viz., MSgt-FSgt, FuasFScp, MUAS35SCP. They showed 5-8 times stronger activity in transgenic tobacco and Arabidopsis as compared to CaMV35S, a widely used promoter in plant molecular biology. Functional activities of such promoters were further characterized in animal cell line using different cytokines such as IL-33 and IL-35. Our observation clearly indicated that these promoters are active not only in plant but also in animal cell line at greater level. The genetic tools developed by our group could be potential for controlling expression of various genes in both transgenic plants and animal.

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Antioxidant, anticancer and antimicrobial activities of Vitex negund , Tinospora cordifolia and Acacia nilotica

Rebecca Thombre, Rajashree Jagtap and N. M. Patil
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The aim of present study was to evaluate phytochemicals, antibacterial and antioxidant activity of different solvent extracts of leaves of Vitex negundo , Tinospora cordifolia and Acacia nilotica. Qualitative estimation was done to detect presence of alkaloids, proteins, tannins, steroids and triterpenoids, reducing sugars. Total phenolics and total flavonoids content was quantitatively estimated by Folin- Ciocalteau method and aluminum chloride colorimetric method respectively. Ethanolic extract of Acacia nilotica bark was found to contain highest amount of phenolics(307.54±2.67 mg GAE/ gm).Total antioxidant activity of different extracts was evaluated by phosphosmolybdenum method and was highest in Ethanolic extract of Acacia nilotica bark (416.60±8.28 mg AAE/ gm).Free radical activity of different extracts was determined by using DPPH (1,1-Diphenyl-2-picryl hydrazyl) method. Highest free radical scavenging activity was exhibited by Vitex negundo methanolic extract at concentration 1000ug/ml and was 71.9 ± 0.18 %. All theextracts were tested for their antibacterial activity against Bacillus cereus, Escherichia .coli, Staphylococcus aureus, and Klebsiella sp. Almost all the extracts were found to contain antibacterial activity. Methanolic extract of the plants showed inhibition against Staphylococcus aureus. Dose independent growth inhibitory activity of different solvent extracts of Aegle marmelos, Vitex negundo and Tinospora cordifolia, were tested on THP-1 leukemia cell line by using MTT assay. Methanolic extract of Vitex negundo was found to inhibit maximum anticancer activity.

Biography

Rebecca Thombre is Assistant Professor in Biotechnology at Modern College, Shivajinagar affiliated to University of Pune. She has pursued her Doctoral work on "Studies on Cyclodextrin glycosyl transferase by alkaliphilic bacteria" at Agharkar Research Institute, Pune. She was Gold medallist in M.Sc Microbiology at Mumbai University and received the Dr. Dhala Award and Eureka Forbes Scholarship for the same. She was awarded the First prize for highest marks in all faculties at the Graduate examinations conducted by University of Mumbai. Recently awarded the "BEST ORAL PAPER" award for work on Cyclodextrin glycosyl transferases in two National and International Conferences. She has a teaching experience of 9 years in reputed colleges of Mumbai and Pune University namely, Mithibai College, Juhu, Mumbai; VES College, Mumbai; Fergusson College, Pune and Modern College, Pune. Research Interest in Cyclodextrin glycosyl transferases, Nanotechnology and plant based anticancer compounds.

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Methylation status of H19 and IGF2 genes in fibroblast cell lines of goat (Capra hircus) after serum starvation treatment

Sanjeev Singh
National Bureau of Animal Genetic Resources, India

Due to the high incidences of abnormalities and the inefficiency in generating goat kids through somatic cell nuclear transfer (SCNT), the development of a model system in goat to investigate potential problems is essentially required. In nuclear transfer, where genomic imprinting has been implicated as a major cause for these problems, epigenetic regulation of developmentally important genes may give us the clue regarding the probable reasons for the low efficiency observed in SCNT. H19 and IGF2 are the genes that are involved in determining the imprinting status of donor cell in SCNT experiments. The study was conducted to investigate the methylation status of CTCF III binding region upstream of H19 gene and a fragment of IGF-2 exon 10region, before and after reprogramming of fibroblast cells by serum starvation method. Fibroblast cells were cultured up to sixth passage and genomic DNA was extracted before and after reprogramming. Genomic DNA samples were then used to amplify 295 bp fragment of H19 CTCF III binding region and 455 bp fragment ofIGF-2 exon 10region. The nucleotide sequence in H19 and IGF2 gene fragments had 19 and 27CpG motifs, respectively. Genomic DNA samples were then treated with sodium bisulphite to analyse the methylation status of identified CpG motifs. The bisulphite converted genomic DNA was amplified by bisulphite sequencing primer (BSP) set. The amplified fragments of bisulphite converted genomic DNA samples of reprogrammed and non-reprogrammed cells were then sequenced. Variation in the sequences were obtained from bisulphite converted genomic DNA of reprogrammed and non-reprogrammed cells. The nucleotide sequence analysis of bisulphite converted cultured non-reprogrammed cells revealed methylation of 6 CpG motifs in H19 gene fragment. Thus, the level of methylation observed in the study for 295 bp gene fragment was about 31.5%. However, in reprogrammed cells the CpG motifs were found to be unmethylated. Therefore, a reduction in the level of methylation was observed in reprogrammed fibroblast cells after serum starvation for this gene fragment. However, the fragment of IGF-2 exon 10 under investigation was hypermethylated in the fibroblast cells of goat in the serum- starved (0.5% Foetal Bovine Serum) and serum-fed cells (10% Foetal Bovine Serum). The DMR identified in the present study in goat can be used as an epigenetic tag for the detection of aberrant methylation. This may therefore serve as a promising approach for the early detection of putative developmental failures associated with artificial reproductive technologies incaprine species.

Keywords: H19 gene, IGF2 gene, Epigenetic, Serum starvation, Methylation, Fibroblasts; fibroblasts; Capra hircus.

Biography

Sanjeev Singh has completed his Masters and Ph.D from Indian Veterinary Research Institute (Deemed University), Izatnagar, Bareilly, UP. Thereafter, he joined Biotechnology Centre, MPPCVV (formally JNKVV) Jabalpur, as an Assistant Professor in the year of 2004. Currently he is working as a Senior Scientist in the DNA Fingerprinting Unit, National Bureau of Animal Genetic Resources, Karnal, Haryana, India. He has published several papers in journals of international and national repute. His area of research includes molecular and epigenetics studies of goat, RNA interference studies in caprine cell lines and Characterization of livestock breeds using microsatellite markers.

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Genetic engineering of lignin biosynthesis to improve bioethanol production from Leucaena leucocephala

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Lignin hinders the optimum utilization of cellulosic biomass in bioethanol production. Reduction of lignin could be achieved through down-regulation of monolignol biosynthetic pathway genes. cDNA clones of cinnamoyl CoA reductase (LlCCR) and cinnamyl alcohol dehydrogenase (LlCAD) were isolated from Leucaena leucocephala, a leguminous pulpwood tree exclusively used for paper production in India. Sense and antisense constructs of LlCCR and LlCAD under CaMV 35S constitutive promoter were introduced in tobacco to up and down-regulate CCR and CAD genes. All down-regulated lines displayed stunted growth and development with significantly reduced lignin content. Contrarily, up-regulated lines exhibited robust growth, development and significant increase in lignin content. These observations support a role for CCR and CAD down-regulation in improving wood properties of L. leucocephala for bioethanol production. Such attempts under constitutive promoters are deleterious to the plant due to pleotrophic effect. A 795 bp CCR promoter and 1882 bp CAD promoters were isolated from L. leucocephala by genome walking approach and sequence analysis revealed the presence of cis-elements like AC boxes, XYLAT, WRKY and MBS. Promoters were fused to β-glucuronidase (GUS) reporter gene in pBI101 and introduced in tobacco. Histochemical observations indicated expression of GUS in the vascular tissues of leaf, stem and root of transgenic tobacco. Down-regulating CCR and CAD genes under such vascular tissue specific-promoter could be useful for reducing the lignin content only in vascular tissues of L. leucocephala, overcoming the risks associated with reduction of lignin content across the whole plant.

Biography

Singam Prashant has completed his Ph.D in 2010 at the age of 31 years from Department of Genetics, Osmania University, Hyderabad. He was awarded Dr. D. S. Kothari Postdoctoral Fellowship from University Grants Commission, New Delhi in 2011, pursuing postdoctoral studies at Center for Biotechnology, Jawaharlal Nehru Technological University Hyderabad, Hyderabad. He has published 8 papers in reputed national (2) and International (6) journals.

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In vitro propagation and evaluation of antimicrobial and antioxidant potential of an endangered herb - Cassia tora to explore its neutraceutical values

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[2]Department of Biochemistry, National Institute of Nutrition-Hyderabad, India

C.tora, an annual herb growing in Asian countries, is edible in South East Asia by local folk fore. It is known medicinal plant as a laxative, antiperiodic, in leprosy, ringworm, bronchitis and cardiac disorders, ophthalmic, and skin disorders. There is an Ayurvedic formulation called "chakramada tailamu". C. tora constitutes an Ayurvedic preparation 'Dadhughnavati', which is one of the successful antifungal formulations.

Leaf extracts of the plant with petroleum ether, ethyl acetate and methanol were analyzed for antimicrobial and antioxidant activities. As this herb is seasonal, in vitro regeneration was done using MS medium supplemented with NAA and BAP. C tora expressed good activity against all human pathogens used for study. The results showed very high inhibitory activity against skin pathogens like Staphylococcus and Candida albicans. C. tora has very strong antioxidant activity; this is reflected by the least IC_{50} value of 60 micrograms for C. tora methanol extract. As the wild population of this plant species has become vulnerable to extinction, measures are needed to conserve it using tissue culture and other techniques. In vitro propagation provides a source of these plants in all seasons and C.tora exhibited rapid production of shoots. This study reveals a fairly good correlation between traditional therapeutic use and in vitro antimicrobial activity. C. tora which exhibited strong antibacterial and antioxidant values thus can be regularly used in diet to fight oxidative stress.

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Existence of purinoreceptors across the kingdoms

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Extracellular purines and pyrimidines are nucleotides that are gaining importance as a ubiquitous family of extracellular signaling molecules. Recently it has been shown that ATP, apart from serving as an energy molecule also acts as a co-transmitter and a modulator in neurotransmission. The role of ATP as a signaling molecule is not limited to the nervous system. ATP sensitivity and ATP mediated signaling has been identified in all kinds of tissues and cell types. ATP along with other nucleotides activates purinoreceptors which are membrane receptors for extracellular nucleotides. P2 purinoreceptors are subdivided into two families, G protein coupled P2Y (metabotropic) and ligand gated ion channels (P2X-ionotropic). In the present work, an attempt was made to identify the existence of different subclasses of P2 purino receptors across the kingdoms as varied as mammalian and single celled protozoans. The model cells selected for the study were rat pheochromocytoma cells (PC12) and the single celled protozoan Amoeba proteus. We identified the occurrence of both ionotropic and metaboropic purinoreceptors in these two different species. Specifically the ionotropic P2X2 receptor and metabotropic P2Y2 receptors were found to be expressed, in PC12 cells as well as in Amoeba proteus. The current study shows the existence of purinorecptors in diverse species and throws a light on the evolutionary significance of these receptors.

Biography

Sunitha Shroff N has completed her PhD from National Institute of Mental Health and Neurosciences, Bangalore and postdoctoral studies from Jawaharlal Nehru Centre for Advanced Scientific Research Bangalore. Currently, she is working as a lecturer at the Mount Carmel College, Bangalore. She has ten years of research experience in the areas of molecular biology, biochemistry and cell biology and has three years of teaching experience.

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Isolation, proliferation and transplantation of bone-marrow derived animal mesenchymal stem cells (BM-MSC) in critical sized bone defects (CSD) in animal model

Swapan Kumar Maiti
Indian Veterinary Research Institute, India

Mesenchymal stem cells (MSC) are self-renewing capacity with multi-differentiation potential of progenitor cell. The purpose of this study was to isolate, proliferate and orthopaedic application of MSC collected from bone marrow of different species of animals. Bone marrow aspiration was collected with the help of a bone marrow biopsy needle from the iliac crest of sheep, goat, dog and rabbit, whereas, in pig, it was collected from the sternum under general anaesthesia and aseptic condition. Isolation technique was based on the adherent properties of the MSC. The cells were repeatedly passage and expanded in optimal cultivation conditions in define culture medium until a pure culture was produced. Primary colonies were observed on day 3-5 post seeding, the majority of cells were round, oval-shaped growth; after 7-9 days, adherent cells were increased and gradually extended to the growth of the polygon, star or spindle-shaped and a colony formation unit (CFU) was observed. Cellular morphology of stem cells varied between monolayer of round, elongated spindle-shaped with shorter/longer cytoplasmic extensions and they were grown in single cell or in cluster form. Proliferation capacity of canine and porcine MSC was much higher than other species. MSCs were characterized morphologically by crystal violet stain. In vitro osteogenic differentiation of MSC was performed and evaluated by Alizarin Red S and alkaline phosphatase staining. The HA/TCP bio-ceramic tissue engineered construct seeded with animal MSCs was developed. In vivo osteogenesis of this construct at 15mm critical sized radius bone defect (CSD) in rabbit model was performed. Xenogenic (sheep & canine) BM-MSC induced osteogenesis at CSD in rabbit model was recorded. Autologous and allogenic groups showed faster and better rate of bone healing, followed by xenogenic. Canine BM-MSCs induced faster and better healing compared to sheep BM-MSCs.

Biography

Swapan Kumar Maiti was born on February 14, 1962 and graduated in Veterinary Sciences from Veterinary College, Calcutta. He completed his Post graduation and Doctorate in Veterinary Surgery from Indian Veterinary Research Institute, Izatnagar with First Class. He has joined Agriculture Research Service (ARS) at Indian Veterinary Research Institute in 1993 and is currently working as Senior Scientist in this Premier Indian Institute. He has been associated more than 15 research projects either as Principal Investigator (PI) or Co-PI and published more than 100 research papers in National and International Journals. He has been awarded prestigious fellowship from German Research Foundation (DFG) twice for conducting research on therapeutic application of stem cells in orthopedics at Germany in the year 2006 & 2010 under International Bilateral Scientist Exchange Programme of Govt. of India. He acted as "Visiting Scientist" at the University of Leipzig (2006), and University of Köln (2010), Germany. He has been invited as "Speaker" in World Small Animal Veterinary Association World Congress, held at Sydney (2007), Dublin (2008), Geneva (2010) and Jeju, South Korea (2011) and 2nd (FASAVA) Congress held at Bangkok, Thailand (2009) respectively.

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Role of dietary Curcuma longa in combination with Emblica officinalis in the management of diabetic dyslipidemia

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Diabetes is a metabolic disorder of multiple aetiology. It is also a potent risk factor for cardiovascular diseases. It is characterized by chronic hyperglycemia associated with elevated plasma free fatty acids and an enhanced generation of free radicals. Increasing evidence suggests that this hyperglycemia is responsible for a disturbance in the production and clearance of plasma lipoproteins leading to increasing cases of dyslipidemia in diabetics. A new way to combat heart diseases by diabetic control is fast emerging. This experiment aimed at studying the role of including specific plant nutrients in the diet of diabetic mice to assess the effect if any, on diabetic dyslipidemia of the experimental group. Streptozotocin (200 mg/kg/b.w) induced mice were put on herbal diet supplements for a period extending 4 weeks following which biochemical assessment of the plasma glucose, total cholesterol and triglycerides from the blood samples of the treatment subjected mice was done. The diabetic mice were separated into 4 groups of 10 each and were provided with normal food and water supply. Two groups of mice were selected for administration of aq. extract of dried rhizome powder of Curcuma longa (200mg/kg/b.w.) and aq. extract of dried fruit powder of Emblica officinalis (200 mg/kg/b.w.) separately. To the third group a combined aq. mixture of C. longa and E. officinalis extract in the ratio of 1:1 was administered. The fourth group was on food and water as water was the vehicle used for administration of the plant extracts. Diabetic mice with an average fasting sugar of 335 ± 0.343, showed marked decrease in plasma glucose, total cholesterol and triglycerides following the herbal treatment for 4 weeks. The response was, however, noticeable only towards the middle of the second week of treatment. The response was maximum in the group receiving combination treatment and was lesser in the group on pure C. longa extract. The group receiving only E. officinalis treatment showed the least amelioration. The results of this experiment show that the hypoglycemic effect and hypolipidemic capacity of dietary C. longa is definitely enhanced when supplemented with E. officinalis. These plant nutrients if necessarily incorporated into our daily diet regimen will be very beneficial in the overall management of diabetes and related vascular damage.

Biography

Tuhin Rashmi has been a gold medalist in her undergraduate programme and has completed her Ph.D in Biochemistry from Patna University. She is an Assistant Professor at Amity Institute of Biotechnology at Amity University Uttar Pradesh, which has been ranked as the top private university in the country.

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Isolation and identification of UvrD helicase from Escherichia coli from local fever patient for PCR enzyme production

Yamuna Sundram, Sasidharan Sreenivasan, Eugene Ong, Venugopal Balakrishnan and Asma Ismail
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Helicase is an enzyme that plays essential roles in nearly all DNA metabolic transactions and has been implicated in a variety of human genetic disorders. UvrD is a highly conserved helicase involved in DNA repair and it plays a critical role in maintaining genomic stability and facilitating DNA lesion repair in many prokaryotic species as it also unwinds and separates the two strands of the DNA double helix. Helicases are essential during DNA replication because they separate double-stranded DNA into single strands allowing each strand to be copied. The objective of this study is to isolate and identify Helicase of local E. coli isolate from fever patient. Nutrient broth and Nutrient agar was used for the isolation of the pathogenic microorganism from the patient samples by using the streak plate method. The morphology properties of the microorganism were investigated by using light microscope by Gram staining to confirm Gram reaction. Light micrograph and scanning electron microscopy were performed to further identify the ultrastructure of the bacteria. Chromosomal DNA from the organism was isolated and used to amplify 16S rRNA and uvrD gene fragments to detect the presence of helicase gene in the organisms. The clinical isolate was grown well on MacConkey agar. The isolates are Gram-negative and rod in shape. The fact that the E. coli sample contains the helicase gene was further supported by the presence of UvrD gene from the gel electrophoresis image. In conclusion, based on the results of this study, Helicase (UvrD gene) was successfully isolated from fever patient infected with E. coli for various biotechnological processes. This study will lead to in house production of helicase which could be applied in low setting diagnostic kit development for third world country.

Biography

Yamuna Sundram has completed Bsc in Biotechnology from Asian Institute of Medicine, Science and Technology University and currently pursuing MSc in Molecular Medicine at Institute for Research in Molecular Medicine, University Science Malaysia. This project funded by University Science Malaysia research grant RUC (1001/ PSKBP/86300110).

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Solid phase peptide synthesis and reverse phase HPLC purification of ovine kisspeptin-14 for elucidating secondary structural conformations of peptide by CD spectroscopy

Vijay Kumar Saxena
Division of Physiology and Biochemistry, Central Sheep and Wool Research Institute, India

Kisspeptin, also called as metastin, is the cognate ligand GPR-54 (G-coupled receptor), which was previously an orphan receptor. Kisspeptin consists of 54 amino acids and its biological activity can be localized to the C-terminal segment which is cleaved into C-10, C-13, and C-14 segment. Kisspeptin-GPR-54 interaction stimulates GnRH secretion and has been shown to be essential for the initiation of the pubertal LH surge. A 14 amino acid derivative of kisspeptin (Asp-58-Val59-Ser60-Ala61-Tyr62-Asn63-Trp64-Asn65-Ser66-Phe67-Gly68-Leu69-Arg70-Tyr71NH2) was synthesized by solid phase peptide synthesis using F-moc (9-fluorenyl methoxy carbonyl) strategy. Kisspeptin-14 was synthesized on Rinkamide resin after swelling it for 2h. Amino acid coupling steps were carried out by the treatment of deprotected resin with a 3 fold molar excess of F-moc protected amino acid, HBTU (O-Benzotriazole-N,N,N',N'-tetramethyl-uronium-hexafluoro-phosphate) and HOBt (N-Hydroxybenzotriazole) for 2h at room temperature under constant shaking. Deprotection was carried out using 20% piperidine for 20 min under constant shaking. Between coupling and deprotection, the resin was washed twice with di-methyl formamide followed by three washing of di-chloromethane. Peptide was cleaved out of the resin using the cleavage mixture (Trifluoro acetic acid-82.5%, Thioanisole-5%, Ethanedithiol-5%, Water-10%, Phenol-5%). Kisspeptin peptide was purified by RP-HPLC using a gradient of 65-90% using C-18 column in binary gradient module consisting of 5% acetonitrile in water and a limiting organic solvent. The peptide was recovered directly after lyophilization. Peptide was evaluated for its secondary conformation by performing CD spectroscopy which showed primarily a random coil structure in water which can be induced to adopt more ordered conformation using solvent like tri-fluoroethanol.

Biography

Vijay Kumar Saxena has completed his master's degree in Animal Biotechnology from Indian Veterinary Research Institute. He has been the All India Topper for ICAR JRF, ICAR SRF and Agricultural Research Services (Biochemistry) examinations. He has been selected twice for CSIR JRF (Life Sciences) and DBT JRF. He has also scored 98.94 percentile in prestigious Graduate Aptitude Test in Engineering (GATE). He has been selected for fellowship grant with full funding support on global competition basis at Scuola Normale Superiore, Italy in the discipline of Molecular Neuroscience and Molecular Biophysics. He is now working as principal investigator of a DBT funded project elucidating the molecular basis of seasonality in sheep. Dr Vijay Saxena is now posted as a Scientist at Central Sheep and Wool Research institute. He has more than 6 research articles in national and international journals of repute and has contributed 4 chapters in compendiums and books.

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Track 10

10: Pharmaceutical Sciences

Session Chair
Selvan Ravindran
Sai Life Sciences Limited, India

Session Co-Chair
Annapurna S.Agasthya
Lovely Professional University, India

Session Introduction

Title: **Biotransformation in drug discovery**
Selvan Ravindran, Sai Life Sciences Limited, India

Title: **Advanced drug resistance SNP analysis and monitoring of liver physiological changes during Hepatitis B virus infection**
Samira Salehnejad, Pooyagene Biotech Co., India

Title: **Screening of pure and crude extracts of some medicinal plants for antioxidant activities**
P. Vasanthakumar, Veterinary College and Research Institute, India

Title: **Design of new leads as novel therapeutics for Tuberculosis - A computational approach**
Uma Vuruputuri, Osmania University, India

Title: **Evaluation of nitric oxide and ciprofloxacin against typhoid**
S.S.Haque, Indira Gandhi Institute of Medical Sciences, India

Title: **Improved transdermal drug delivery through lipid vesicles having ethanol as integral component**
Manish K. Chourasia, Central Drug Research Institute-Lucknow, India

Title: **Preparation of BSA nanoparticles by desolvation technique using ethyl alcohol as desolvating agent**
Abbaraju Krishna Sailaja, Osmania University, India

Title: **Hydrocolloids: New suspending agents for oral formulations**
Harsha Kharkwal, AMITY University, India

Title: **Studies on anticandidal action mode by Cassia spectabilis**
Vijayarathna Soundararajan, Universiti Science Malaysia, Malaysia

Title: **Seroprevalence study of brucellosis by conventional and molecular techniques**
Annapurna S.Agasthya, Lovely Professional University, India

Title: **Study of antimicrobial activity of different indigenous wildly growing plants**
Priti Mathur, AMITY University, India

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Preparation of BSA nanoparticles by desolvation technique using ethyl alcohol as desolvating agent

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Faculty of Technology, Osmania University, India

Aim: In order to see functionality and toxicity of nanoparticles in various food and drug applications, it is important to establish procedures to prepare nanoparticles of a controlled size. Desolvation, a thermodynamically driven self-assembly process for polymeric materials. Here BSA nanoparticles were prepared by desolvation technique using Ethyl alcohol as desolvating agent.

Methodology: In our study, Ethyl alcohol was added intermittently into 1% BSA solution under stirring at 700 rpm. Amount of Ethanol added, intermittent timeline of Ethanol addition, and pH of solution were considered as process parameters to be optimized. Effect of the process parameters on size of the nanoparticles was studied.

Results: The results indicated that the size control of BSA nanoparticle was achieved by adding Ethanol intermittently. The standard deviation of average size of BSA nanoparticles at each preparation condition was minimized by adding Ethanol intermittently.

Conclusions: Particle size of BSA nanoparticles prepared by continuous addition of Ethyl alcohol as desolvating agent was in between 200-300nm.Whereas uniform particle size was obtained by adding Ethyl alcohol intermittentely. The particle size was found to be in between 180-220nm.FTIR spectra Indicates that there was no drug and polymer interaction.

Keywords: Bovine serum albumin(BSA), Ethanol, Scanning electron microscope(SEM), Fourier Transforms infrared Spectroscopy (FT-IR), Desolvation technique, Continuous and intermittent addition methods.

Biography

Abbaraju Krishna Sailaja is M-Pharm (Ph.D) with an overall experience of 8 years in various fields such as Teaching, Research and in Drugs control administration. She worked as Assistant Professor for a period of 3 years, worked as Drugs Inspector for 1 year worked as JRF for two years and working as senior research scholar since 2010 in Osmania University Hyderabad. Published 15 papers in various national and International Journals of High repute. Published one book titled as “PPARg polymorphisms and their association with type 2 diabetes”. Attended various conferences and presented papers.

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Hydrocolloids: New suspending agents for oral formulations

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Amity Center for Carbohydrate Research, AMITY University, India

Pharmaceutical suspensions are thermodynamically unstable systems consisting of two phases thus a stabilizer/suspending agent is an integral part of its dosage form. The Suspending agents used for pharmaceutical suspensions are mostly utilized from guar extracted from Cyamopsis tetragonoloba and tora gum extracted from Cassia tora. Their history for use as a pharmaceutical suspension holds long and has been utilized in the past. The present research deals provide an insight into pharmaceutical liquid suspension formulations using novel natural hydrocolloids from Cassia grandis, Cassia alata and its carboxymethyl derivative as suspending agents suitable for oral administration which remain stable and the value added novel galactomannans have a longer shelf life. There were more than 150 Set of Formulations prepared with both gums and their carboxymethylated derivatives ranging from 0.01-0.15 %, the drug taken i.e., Phyllanthus nirrui was in all cases 1 % besides adding 0.01 % of sodium benzoate as preservative and PEG as surfactant. In other sets prepared, 0.1M and 0.5M of KCl, $BaCl_2$ and $FeCl_3$ were taken to know the best electrolyte and in still other sets prepared pH 3, 7 and 9 were used to assess the optimum pH. Formulation remained stable for > 2 years. Among all the QQP's, Redispersibility number was found to be very less which indicates better suspension. This paper thus introduces a novel and alternative source of hydrocolloid for its use as a suspending agent.

Biography

Harsha Kharkwal is Assistant Professor and Coordinator at Amity Center for Carbohydrate Research. She completed her Ph.D from National Botanical Research Institute, CSIR and continued her research work at University Institute of Chemical Technology, Mumbai. She is the recipient of Lucid research Award for 2004, has published more than 25 papers in Journals of repute, she has edited 1 book and has filed more than 40 patents. In such a short span, she has even guided 2 Ph.D students.

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Improved transdermal drug delivery through lipid vesicles having ethanol as integral component

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The practical feasibility of ethosomal vesicles has been investigated in order to deliver ketoprofen though skin to systemic circulation. Basically ethosomes exhibit lipid bilayers like liposomes; however they differ with liposomes in terms of composition. Liposomes are composed of phosphatidyl choline and cholesterol whereas ethosomes contain high concentration of ethanol in place of cholesterol. In the present project, the ethosomes were prepared, optimized and characterized. Vesicular shape, size and entrapment efficiency were determined by transmission electron microscopy, dynamic light scattering and minicolumn centrifugation technique, respectively. Vesicle sizes varied from 120.3±6.1 to 410.2±21.8 nm depending on the concentrations of soya phosphatidyl choline (SPC) and ethanol. Entrapment efficiency increased with concentrations of SPC and ethanol. The formulations exhibited entrapment efficiencies of 42-78%. In vitro release through cellophane membrane showed sustained release of drug from ethosomal formulations in contrast to hydroalcoholic drug solution (HA) which released most of the drug within 2-3 hrs. In vitro drug permeation across human skin revealed improved drug permeation and higher transdermal flux with ethosomal formulations compared to hydroethanolic drug solution. Kinetics of in vitro skin permeation showed zero order drug release from formulations. Based on in vitro transdermal flux, the estimated steady state in vivo plasma concentration from ethosomes attained therapeutic drug levels whereas hydroalcoholic drug solution exhibited sub therapeutic drug concentration with a patch size of 50 cm^2. Skin permeation of ethosomal formulations assessed by confocal microscopy revealed enhanced permeation of Rhodamine 123 loaded formulation in comparison to the hydroalcoholic solution.

Biography

Manish K. Chourasia has completed his M. Pharm and PhD from Dr. H.S. Gour University, Sagar, MP, India in the year 1999 and 2005, respectively. He has completed postdoctoral studies from Department of Pharmacy, National University of Singapore, Singapore from 2007-2009. He is working as Scientist in Pharmaceutics Division of CDRI, Lucknow. He has published more than 18 papers in reputed journals. He has also received quite a few awards including university gold medal for undergraduate studies and CRS-Capsugel/Pfizer innovative aspects of oral drug delivery and absorption Graduate/Post-Doc award, USA, for his PhD work on guar microspheres for colon targeted drug delivery.

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Screening of pure and crude extracts of some medicinal plants for antioxidant activities

P. Vasanthakumar, B. Pangayarselvi, P. Sasikumar, D. Chandrasekaran and R. Kavitha
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Free radicals are implicated for more than 80 human diseases including diabetes mellitus, atherosclerosis, cataract, rheumatism etc. Antioxidant therapy has gained importance in treatment of these diseases. The aim of this research was to investigate the in vitro antioxidant activities of crude and purified commercial extracts of some herbal plants namely, Ocimum sanctum (Tulsi), Murraya Koenigii (Curry leaf), Curcuma longa (Turmeric), Withania Somnifera (Ashwagandha) and Allium Sativum (Garlic). The total phenolic content, antioxidant potential by DPPH assay, total reducing power and total antioxidant activities were determined. The total phenolic content (GAE/g) of pure extracts of turmeric, tulsi, curry leaf, ashwagandha and garlic were found to be 610.4, 185.4, 122.0, 108.6, 75.0 and the values for crude extracts of turmeric, curry leaf, ashwagandha & garlic were 7.02, 5.70, 1.84 & 0.89. Concentration of plant extracts (µg) required for 50% inhibition of DPPH radical scavenging effect (IC_{50}) were recorded as 16.42, 46.27, 186.91, 223.61, 1610, 604.44, 415.76, 8060 & 3600 for pure extracts of turmeric, tulsi, curry leaf, ashwagandha & garlic and crude extracts of turmeric, curry leaf, ashwagandha & garlic, respectively. Total antioxidant activity (%) was found to be high in pure extracts of turmeric (85.29) & tulsi (21.79) when compared to garlic (8.36), ashwagandha (7.67) & curry leaf (6.0). In crude extracts, turmeric (3.10) & garlic (3.15) were better as compared to curry leaf (2.99) & ashwagandha (0.75). In this study, screening of herbs based on in-vitro methods revealed that Curcuma longa (Turmeric) and Ocimum Sanctum (Tulsi) were having better antioxidant activities.

Biography

P. Vasanthakumar, M.V.Sc. Ph.D., Associate Professor working in Tamil Nadu Veterinary and Animal Sciences University, India has completed Ph.D. during the year 2002. He is involved in teaching, research and extension activities related to Animal Nutrition for the last 16 years. He has published more than 20 papers in reputed journals / proceedings and has guided two master degree students. He has completed four external funded research projects and currently involved in five research schemes.

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Evaluation of nitric oxide and ciprofloxacin against typhoid

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Background: Typhoid caused by Salmonella typhi remains a major health concern worldwide. The emergence of multidrug-resistant (MDR) strains of Salmonella with increased virulence leading to increased morbidity and mortality has further complicated its management. Human typhoid is similar to the infection caused by Salmonella typhimurium in mice. Most of the antibiotic are resistant and vaccines have less-than-desired efficacy and certain unacceptable side effects, making it pertinent to search for new suitable formulation. Nitric oxide (NO) is a gaseous free radical molecules; produced in biological systems. During enzymatic conversion of L-arginine to L citrulline by NO synthase (NOS) nitric oxide is produced. Ciprofloxacin one such fluoroquinolones have been shown to achieve high intracellular concentrations and least resistant antibiotic used against typhoid. Exogenous administration of L arginine results in increased NO production, indicating that endogenous substrate is insufficient for maximal NO production. By considering these facts, it was thought to see the effect of oral administration of NO donor i.e. L-arginine along with the low doses of antibiotic (ciprofloxacin).

Material and methods: NO estimation was done by the fluorometric method Misko et al., (1993) with slight modification.

Results and Discussion: Hepatic nitrite level in mice infected with 0.6xLD50 of S. typhimurium was 8.33%, higher than control animals (treated with saline) at day 8,and in group B+Arg, B+Cip & B+1/2Arg+1/2Cip were 16.66%, and 12.5% & 10.25% respectively as compared to only S. typhimurium infected mice. Formulation of L-arginine and ciprofloxacin shows better therapeutic induction against typhoid.

Conclusion: This increase of nitrite level (metabolites of nitric oxide) is may be due to enhanced cytokine expression.

Keywords: Typhoid, L-Arginine, Ciprofloxacin.

Biography

S.S. Haque Biochemist in Indira Gandhi Institute of Medical Sciences Patna-14 one of premier medical institute of India(www.igims.org) and did his Ph.D (Biochemistry) from Hamdard University New Delhi -62 and awarded 'Bharat Joyoti' in 2012 and he is working on Typhoid and nitric oxide. He has published more than 15 papers in reputed journals and serving as an editorial board member of different journal Associate editor of Journal of Infectious Diseases Letters, ISSN: 0976-8904 & E-ISSN: 0976-8912, Editor of the Continental Journal of Biological Sciences, Web med central (Open Access Biomedical Publisher Using Post Publication Peer Review) Appointed Biochemistry Faculty and Editorial board member International Research Journal of Applied Life Sciences.

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Advanced drug resistance SNP analysis and monitoring of liver physiological changes during Hepatitis B virus infection

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[2]Biotech Department, Kakatiya University, India
[3]Shrimpex Biotech Services Private Limited, India

Nucleoside analogue therapy allows the safe and long-term suppression of HBV. Lamivudine is a common drug for the treatment of chronic HBV patients. Resistant hepatitis B virus occurs as natural genome variables in YMDD motif of Lamivudine-treated and untreated chronic hepatitis B patients. Resistance detection is mainly accomplished by conventional lab methods and commercial kits. In this study we aimed to establish a Next Generation Sequencing–based method to detect Lamivudine-resistance by designing probes for a specific region of HBV genome. Meanwhile we monitored the physiological changes of liver before and during the treatment. Genomic DNA from serum samples of 92 patients with chronic hepatitis B virus infection was extracted. All patients were tested for liver enzymes, HbsAg, HbcAg, HbeAg, anti-HBs, anti-Hbe, anti-HBc, Bilirubin, Albumin and liver biopsy. NGS was accomplished using MINI-20 Sequencer by use of a mixture of reversible terminated dNTPs and Biotinylated DNA sense and antisense probes. In mix population status some mutants are not detected using conventional methods such as RFLP, nested-PCR or even common sequencing. Thus in resistant patient Lamivudine treatment is led to disease recurrence. Based on our findings Next Generation Sequencing could be more efficient, less time consuming and more sensitive for detection of mixed population of all YMDD motif mutants even rare single nucleotide mutation. It is also more accurate, faster, and more low-cost for patients.

Biography

Samira Salehnejad has completed her M.Sc. in Animal Physiology from Shahrekord University, IRAN. She co-founded PooyaGene Biotech Company, 2008 in IRAN as a research-driven and knowledge-based company, focusing on molecular diagnostic, stem cell and biopharmaceuticals research and manufacturing, with a branch in INDIA. She is already working as Senior Manager of PooyaGene Biotech Co.

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Biotransformation in drug discovery

Selvan Ravindran
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Biotransformation is a process by which organic compounds are converted from one form to another with the aid of organisms such as enzymes, bacteria and fungi. In the drug discovery programme biotransformations are used as a valuable strategy to build molecules similar to parent drug. Biotransformations can also be used to synthesize molecules which are difficult by synthetic approaches. Microbial biotransformations are widely used to generate metabolites in gram quantities. Biotransformation and synthetic approaches in tandem serves as a vital source for generating compounds around core structures which can be screened for various activity studies to advance the compounds. During pre-clinical stage, information from biotransformation experiments can be effectively utilized to synthesize more back-up compounds.

Sulfonylurea urea drugs were incubated with hepatic microsomes to produce metabolites. For example one of the sulfonylurea urea drugs in the market shows new metabolites which are characterized using liquid chromatography and mass spectrometry. Liquid chromatography is used to separate the formed metabolites. Fragmentation pattern from the mass spectrum is utilized to identify the biotransformation site in the molecule which is the metabolic soft spot. Neutral loss scan in the mass spectrometer is used to identify adducts of the drugs. Identified new metabolites are structurally similar to parent drugs implying the possibility of better therapeutic effects. Formed new metabolites are due to the activity of different type of enzymes in hepatic microsomes.

Biography

Selvan Ravindran is a Senior Research Scientist in Sai Life Sciences Limited, Pune, India. He received his Ph.D degree from Indian Institute of Technology (Chennai). He did his postdoctoral studies in University of Texas Medical Branch, USA and University of Arizona, USA. He also worked as a Biotransformation Scientist in Biocon Bristol Myers and Squibb Research Centre in Bangalore. His major areas of research interests are Biotransformation (Metabolite identification using liquid chromatography and mass spectrometry), Bioanalysis and DMPK (Drug Metabolism and Pharmacokinetics). He has published more than 10 research papers in reputed journals and presented more than 15 papers in national and international conferences.

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Design of new leads as novel therapeutics for tuberculosis - A computational approach

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Molecular Modelling Research Laboratory, Department of Chemistry, Nizam College, Osmania University, India

Tuberculosis (TB) has been a global health threat currently affecting 9million new cases every year. In spite of chemotherapy and BCG vaccine, Mycobacterium tuberculosis (MTB) is causing one death in every 10 seconds. Major challenges and lacunae in the existing therapy are: prolonged therapy coupled with poor compliance of patients to drug administration and adaptation of the pathogen to evolve into multidrug resistant (MDR) and extensively drug resistant (XDR) TB strains.

In view of the latest technological information about the genome of the MTB and the mechanism of MTB manifestation, novel targets involved in various phases of life cycle of the bacteria may be considered for design of effective TB therapeutics. In the present work, proteins involved in (a) Transcription (b) Dormant stage and (c) Multidrug resistance of MTB, are explored for design of effective leads as antagonists for the mycobacterium pathogen. Computational techniques are applied to the targets, for 3D structural evaluation, identification of active site and novel leads are designed using virtual screening against the active site with molecular databases. Specific examples are presented and discussed. The study identifies new molecular entities for tuberculosis therapy.

Biography

Uma Vuruputuri is Professor at The Department of Chemistry, Nizam College, Osmania University since 1998. Her research interests include Molecular Modelling and Drug Designing with special reference to the Identification of NME's for the treatment of Cancer and Tuberculosis using Insilco Techniques. Prof. Uma's research group includes 10 Doctoral students, 8 Master's and M. Pharmacy students working towards their Thesis dissertation. She published several research papers in international peer reviewed Journals. Prof. Vuruputuri has reviewed several Research articles of international Journals, in the field of Chemical Biology, Bio Informatics and Molecular Modelling. Currently, Prof. Uma Vuruputuri is working on projects with special focus on Tuberculosis and Cancer, sponsored by DST and UGC, New Delhi, India. She is actively involved in academic administration of Nizam College and is a Governing Body member of Nizam College She is a resource person for designing the curriculum for UG and PG programs in the field of Pharmaco Informatics and Molecular modelling.

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Studies on anticandidal action mode by Cassia spectabilis

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University Science Malaysia, Malaysia

Candida albicans has become resistant to the commercially available, toxic and expensive anti-Candida agents in the market. These factors triggered the search for new anti-fungal agents deriving from natural resources also determining the action mode involved. The possible modes of action by C. spectabilis leaf extract were determined by potassium leakage study and the effect of the extract on the cell wall, enzymes and morphology of C. albicans studied with cytotoxicity assay. The cytotoxicity result showed that the extract is non-toxic with an IC_{50} value of 59.10µg/ml. In the potassium leakage study, the cells treated with the extract caused a potassium leakage of up to 1039 ppm that was comparable to Amphotericin B-treated cells which released up to 1115 ppm. The effects of the extract on the cell wall proteins showed that there were three major types of changes in the cell wall proteins expressed by the treated cells; the presence of a new protein, the absence of a protein and a difference in the amount of protein expressed. The activities of two enzymes; proteinase and glucosidase were determined but it was observed that the extract had caused significantly higher activities of both enzymes, thereby concluding that this was not the mode of action relating to the antifungal activity of C. spectabilis. The morphology of C. albicans cells treated with the C. spectabilis showed that the treated cells had abnormal morphology whereby the cells appeared damaged and detached from each other. In conclusion, this study demonstrated that C. spectabilis leaf extract as a good source of new anti-C. albicans compound(s) with various mode of actions.

Biography

Vijayarathna Soundararajan has completed her MSc from University Science Malaysia and had published 6 papers in reputed journals. This project was funded by University Science Malaysia. Short Term Grants (304/CIPPM/639040).

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A study on protease enzyme from halophylic microorganisms

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Studies carried out on halophilic and non-halophilic microorganisms, especially during the last decade, have increased our current knowledge about different aspects, such as their physiology, ecology, taxonomy or phylogenetic relationship with other microorganisms and, to a lesser extent to their genetics. Besides ,there are several fields in which there industrial application are more promising as in the case of other extremophilic microorganisms and alkalophilic microorganisms they have an important biotechnological potential as a source of compatible, solute enzyme and other compound of industrial interest. More over moderately halophilic microorganism constitute an excellent model for the study of osmoregulatory mechanism that permits them to grow wide ranges of salt concentration. This aspect has very exciting potentialities such as, for instance, they can be used as alternative for the chemical treatment, most of these extremophiles are able to produce high concentration of enzyme at extreme condition, which can be used for the degradation of xenobiotics, their possible application in medical industry for the removal of blood stain and various surgical instruments. Also potential application in silver stripping from used film and as biocleansing agent in detergent industry.

In the present study an effort is done to isolate and characterise the microorganisms from the halophilic soil sample. The enzyme produced by the organisms Bacillus subtilis and Aspergillus flavus were subjected for the enzymatic studies. So it indicated that the enzyme is thermo stable halo tolerant and alkaline protease. The isolates had shown different enzyme activity with substrate casein and hair. The enzyme showed compatibility with detergent as biocleansing agent and removal of blood stain from surgical instrument indicated great importance in the detergent industry and medical uses for sterilization.

Keywords: Proteases, Halophiles, Cleansing activity, Silver recovery.

Biography

Annapurna S. Agasthya is working currently as Professor of Microbiology and Bioprocess engineering of Lovely Professional University and has worked at various capacities and the research interests include the Medical Microbiology, Immunology, Enzymology, Medical Mycology, Parasitology, Food and Environmental Microbiology. She has guided the students for B.Tech, M.Tech. and M.Phil Biotechnology and Post Graduate students for their dissertation. Presented the papers in various National and International conferences as well as published papers in various reputed journals.

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Study of antimicrobial activity of different indigenous wildly growing plants

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Antibiotics are an important class of Pharmacological agents used for treating infections, which are a major cause of human morbidity and mortality. Although antibiotics were first isolated from fungi and bacteria (natural Source), but over the years more and more synthetic antibiotics are flowing in market. During the last two decades, the development of drug resistance as well as the appearance of undesirable side effects of certain antibiotics has lead to the search of new antimicrobial agent. There is ample of documented evidence which show antibiotic properties in plant extracts. The present study is based on antibacterial and antifungal activity of wildly growing indigenous plants. Aqueous and ethanol extract of different part (leaves, flower, fruit, root) of Oxalis amara, Argemone maxicana, Datura inoxia, Calatropis procera , Amranthus, Pithecellobium dulce, Ziziphus mauritiana, Croton bonplandianum, Cannibus sativa, Leucaena leucophela, Andographis Peniculata were taken for study, against pathogenic bacteria Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus and fungus Candida albicans. Results were observed/ calculated by their zone of inhibition after 24 hours by agar plate gel diffusion method. These plants are showing their antibacterial and antifungal activities, differently for different microorganism. This laboratory experiments has shown that plant extracts are effective against a broad spectrum of microbes (Both Gram positive and Gram negative bacteria and fungus) & antibiotics from Plant extracts (Herbal antibiotics) are promising agents for developing newer antibiotics

Keywords: wildly growing plants, secondary metabolites, Antimicrobial Activity, pathogenic bacteria, agar plate gel diffusion method, zone of inhibition

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Track 11

11: Food Processing & Technology

Session Chair

Ara Kanekanian
Cardiff Metropolitan University, UK

Session Introduction

Title: **Biotechnology and human health: The use of Bifidobacteria spp in dairy products**
Ara Kanekanian, Cardiff Metropolitan University, UK

Title: **The identification of natural PPAR ligands using gene reporter assays**
AW Thomas, Cardiff Metropolitan University, UK

Title: **Biochemical studies on thermostable superoxide dismutase isolated from Juglans regia: A functional enzyme**
Nidhee Chaudhary, AMITY University, India

Title: **Biomimetic peptide based sensing chips for monitoring food contaminations**
Muthusamy Sivakumar, Anna University of Technology, India

Title: **Interfacial phenomena in food materials**
Carlos M. Corvalan, Purdue University, USA

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Biotechnology and human health: The use of bifidobacteria spp. in dairy products

Ara Kanekanian
School of Health Sciences, Cardiff Metropolitan University, UK

Interest in the consumption of food products containing probiotic bacteria, a health promoting intestinal microflora, has seen a large increase in Europe especially in the last two decades. Their popularity, especially the Lactobacilli and the Bifidobacteria has been apparent mostly with dairy products such as fermented milk drinks and yogurts. The use of probiotics was extended to other dairy and food products such as cheese, ice cream, fruit juices, bread etc. Extending the range of products is possible when new strains and micro- or nano-encapsulation are applied which could protect the probiotics from unfavorable surrounding environment. The growth of probiotics is usually slow and it is important to encourage their growth and survival to keep them within the recommended population number of 10^{7-10}cfu/g. Improving the growth of probiotics can be achieved by using prebiotics, which are preferentially utilized by probiotics. Research has shown that the use of prebiotics such as inulin and fructo-oligosaccharides up to 5% enhance the growth and survival of the probiotics during the shelf life of the product. It was found that a low level of milk protein hydrolysis up to 4% using trypsin could also improve their growth. Bifidobacterium animalis ssp lactis (BB12) inoculated in partially hydrolyzed UHT skim milk in the presence of prebiotics shown to have a faster growth rate and better survival ratio up to 28 days stored at 5°C when compared with the control. It is vital that the marketed probiotic products should contain the desirable number of the organisms throughout the shelf life of the product to offer the health benefits anticipated from such products.

Biography

Ara Kanekanian gained his PhD from Reading University – UK in 1983. He has been in academia for over 20 years with main interest in protein chemistry and fermentation technology and with over 10 years experience in the food industry and consultancy. He is a member of the publication committee of the International Journal of Dairy Technology and has several scientific publications. Current research activities include, milk allergy, immune modulation in colostrum and microencapsulation of nutraceuticals. He is editing a book titled "Milk & dairy products as functional foods" commissioned by the society of dairy technology –UK to be published by Wiley-Blackwell in 2012.

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The identification of natural PPAR ligands using gene reporter assays

AW Thomas, K Morris, N Davies and R Webb
Cardiff Metropolitan University, UK

Introduction: Recent evidence suggests that the risk of developing metabolic diseases such as diabetes can be substantially reduced by activation of specific gene transcription factors called the PPARs (Peroxisome Proliferator-Activated Receptors). The DREAM pharmacological intervention trial (8mg/ml daily dose of Rosiglitazone, a PPARγ agonist), showed that the risk of developing diabetes in at risk individuals could be reduced by 50% compared to placebo alone. Also evidence exist that lifestyle changes such participation in low intensity exercise programme can significantly activate PPARγ signalling and thus stimulate insulin sensitivity and reverse cholesterol transport. Therefore we aimed to determine whether (1) serum form exercised individuals and/or (2) dietary supplements might contain novel natural PPAR ligands and thus enhance PPARα, β/δ and/or γ transcriptional activity.

Method: Gene reporter assay were used to determine PPAR α, β and γ gene transcription activities. HEK293 cells were transiently transfected with either a PPAR α, β or γ expression vector, a PPRE-Luciferase reporter vector and an internal Renilla control vector using lipofectamine (Invitrogen). Transcriptional PPAR activity was determined by measuring luminescence after 24h incubation with various stimuli using a Dual-Luciferase Reporter Assay System (Promega). The following synthetic PPAR ligands, GW7647, GW0742 and Rosiglitazone were used as positive controls for PPAR α, β/δ or γ, respectively. Also the natural PPAR γ ligands, PGJ_2 and HODEs were used for comparative purposes.

Results: (1) Exercise study. Addition of plasma samples from participants undertaking an 8 week exercise programme were incubated with HEK cells containing a PPRE-Luciferase reporter vector. PPARγ activity increased following the initial standardised sub-maximal exercise bout ('Week 0 post/pre:1.23±0.10; $P<0.05$), suggesting that PPARγ ligands were generated during exercise. (2) Dietary products study. A variety of dietary products (extracts of tea, honey and Neem seeds (Azadirachta Indica)) were incubated at different concentrations with transfected HEK cells for 24 hours. White tea showed the highest PPARγ activity (2.6 fold increase cf control). Organic extracts of manuka honey and neem seeds also showed significant PPAR activities.

Conclusion: This preliminary study presents evidence that exercise generates novel PPAR γ ligands and it is interesting to postulate that these contribute to the activation of PPARγ observed during exercise. The activation of PPARs during exercise may provide the mechanism by which exercise exerts its protective health benefits. The in vitro study showed that certain dietary products may provide a rich source of PPAR ligands and these may also be capable of activating PPAR in vivo and thus be advantageous in preventing or delaying the onset of diabetes. However the exact chemical nature and bioavailability of these natural dietary ligands and those generated in the serum during exercise remains to be elucidated.

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Interfacial phenomena in food materials

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Department of Food Science, Purdue University, USA

The Transport Phenomena in Food Materials laboratory at Purdue University seeks to establish the fundamental relationships between the structure of food materials and their mechanical and functional properties as influenced by processing, composition, and environmental conditions. A current research thrust area of this laboratory: Interfacial Phenomena in Foods seeks to establish a detailed understanding of interfacial mechanisms that affect the transport of mass and heat in food matrices, particularly in terms of developing enhanced food materials and processes. Two specific examples of research within this thrust area are: a) precise control of particle size during processing (e.g. emulsification, spray drying, microencapsulation, and nanomaterials) and storage (e.g. microsintering and coalescence) via modulation of dynamic interfacial conditions; and b) identifying novel capillary and interfacial mechanisms for enhancing drying rates in porous food matrices. Advances in this area enabled by insights achieved through combinations of experimental tools (such as high-speed visualization and laser Doppler velocimetry) and recent computational modeling tools (such as first-principles approaches and direct numerical simulations) will be presented.

Biography

Carlos M. Corvalan is Associate Professor at the Purdue University Department of Food Science, and a member of the Faculty of the Purdue Biological Engineering Department. He has published over fifty research papers in a variety of fields including biopolymers, food rheology, food processing, microencapsulation, nanomaterials and transport phenomena. His recent work focuses on the the effect of surface active species on industrial and biological free-surface flows of complex fluids in multidisciplinary projects supported by U.S. National Aeronautics and Space Administration (NASA), U.S. Department of Agriculture (USDA) and U.S. Army Research Office (ARO).

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Biomimetic peptide based sensing chips for monitoring food contaminations

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Department of Nanoscience and Technology, Anna University of Technology, India

To develop a novel optical affinity biosensor technology that will enable fast, sensitive and specific detection for identification for food borne microbes (food contaminations). Our recent research on biosensors focused on the development of bionanomaterials that truly mimic the natural iridescent colour. Synthetic peptide based nanotubes that have utilized for the futuristic applications. Langmuir-Blodgett films based peptide nanotubes are deposited on silicon substrates, which have the ability to act as iridescent colour sensor. The selective architecture of peptide sequence has been chosen based on their functional groups which can detect the target's membrane components. The colour is formed by coating of uniform nanostructures through interference of light. The simple concept of these iridescent colour changes are influenced by several factors such as refractive index of the probe materials, mounting the nano ordered film thickness, number of layers and the angle of the incoming light. Visible detection based on iridescent colour (Scheme 1) is appealing and might have potential applications in the area of food contamination.

Biography

Muthusamy Sivakumar has completed his Ph.D degree from Anna University, India in the year of 1998. He has spent 9 years as postdoctoral fellow in different universities such as National University of Singapore and Nagoya Institute of Technology, Japan. He is a recipient of internationally competitive fellowship called JSPS from Japan. Later, he has joined Anna University of Technology, Tiruchirappalli as Assistant Professor in the Department of Nanoscience and Technology. Dr.M.Sivakumar has published more than 30 papers in reputed journals and has attended 50 international and national conferences. He has delivered about 25 international and national invited talks.

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Biochemical studies on thermostable superoxide dismutase isolated from Juglans regia: A functional enzyme

Nidhee Chaudhary
Amity Institute of Biotechnology, AMITY University, India

Functional enzyme like Superoxide Dismutase (SOD: 1.15.1.1), has wide applications in the industry of pharmaceuticals, cosmetics, food and/or biotechnology. SOD is a primary antioxidant enzyme catalyzing the dismutation of superoxide free radical (O^{2-}) (a disease causing agent). An important requirement for SODs intended for industrial applications is their thermal stability as thermal denaturation is a common cause of enzyme inactivation. In the present study, SOD has been isolated and characterized from Juglans regia (Walnut) kernels. The SOD enzyme obtained has been partially purified into two fractions based on 0-40% and 40-80% saturation level of ammonium sulphate; 0-40% fraction (72.46 Units/mg) having higher specific activity. The temperature optima of the partially purified SOD lied between 35°C to 40°C with thermo stability up to 70°C whereas the optimum value for pH being 5.0 with stability range of 4.0-7.0. All the tested detergents viz; Sodium Lauryl Sulphate (SLS), Cween-20 and Tween-80 and Tween-20 were found to inhibit the activity of enzyme, Cween-20 being most effective. Mg^{2+} and Ba^{2+} ions in the form of their respective salts, acted as potential inhibitors with about 50% reduction in enzyme activity. The results obtained herein indicate that J. regia (Walnut) kernel constitute an excellent source of SOD enzyme, which is an effective natural dietery antioxidant. It can be inferred from the present study that J. regia, a functional food, is a promising source of natural antioxidant (SOD) enzyme with potential application in oxidative stress-related diseases. The thermostability of the enzyme further enhances its importance making it industry friendly with high economical feasibility.

Biography

Nidhee Chaudhary is Professor at Amity Institute of Biotechnology, Amity University (AUUP), Noida, India. She has been in academia for over 15 years at various positions. She has more than 15 years of research experience with main interest in industrially and therapeutically important enzymes. She has supervised several Ph. D. (theses), M. Phil., M. Sc., M. Tech. and B. Tech. dissertations in the field of Enzymology and Bioprocess Technology. She has many international and national publications in journals of repute. She is member of various scientific groups like: Society of Biological Chemists, Society of Agricultural Biochemists, American Society of Microbiology. She has served as reviewer for several reputed Journals published by Elsevier and other well established groups.

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Track 12

12: OMICS Technologies

Session Chair

Dev Mani Pandey
Birla Institute of Technology, India

Session Introduction

Title: **Induction of apoptosis by benzamide in K562 cells was triggered by inhibition of poly (ADP-ribosyl)ation of protein(s)**
Utpal Ghosh, University of Kalyani, India

Title: **Comparative genomics and genome wide analysis of bidirectional promoters in Candida albicans**
Vijaya Kumar Nalla, Univeristy of Delhi, India

Title: **Proteomic analysis of milk is indicative of host immune response to mastitis in buffaloes**
S. K. Phulia, Central Institute for Research on Buffaloes, India

Title: **An integrated application of 'omics' to understand plant resistance mechanism against microbial invasion**
Sharmila Chattopadhyay, Indian Institute of Chemical Biology, India

Title: **Unraveling of integrated mechanisms in Omics technology for crop improvement**
Dev Mani Pandey, Birla Institute of Technology, India

Title: **An immunoinformatics approach to identify immunogenic peptide of hemagglutinin protein in H1N1 virus**
Manoj Baranwal, Thapar University, India

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Unraveling of integrated mechanisms in Omics technology for crop improvement

Dev Mani Pandey, Ashutosh Kumar, Gopal Kumar Prajapati, Archana Kumari and Aakanksha Wany
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In present-day the comprehensive analysis of biological information can be understood by applying the 'OMICS' technologies (i.e. genomics, transcriptomics, proteomics and metabolomics). The system biologists need tools not only to analyze the massive experimental data but also their accurate annotation. We aim to extract biological knowledge from publically available large-scale experimental data sets using comparative sequence as well as expression analysis, and network exploration. Identification of key enzymes and their encoding genes for the enrichment of important metabolites using computational analysis, RNAi based gene silencing, and their validation using analytical approaches are another vital aspect for metabolomic study. Identification of the less informative Transcription Factor Genes in gene expression databases, their expression analysis for constructing the gene network and in silico analysis of differentially co-expressed Transcription Factor Genes during abiotic stresses conferring the stress tolerance by regulating the downstream genes will be presented.

Biography

Dev Mani Pandey has completed his Ph. D. in 2000 from CCS Haryana Agricultural University, Hisar, India. He worked as Post-Doctoral Fellow in Plant Molecular Biology and Functional Genomics Laboratories in South Korea and has presented his research findings in various international symposia. He was invited to work as a Consultant at IRRI, Los Banos, Philippines. Currently he is an Associate Professor in the Department of Biotechnology, BIT, Mesra, Ranchi, India. His primary areas of scientific interest and expertise include rice functional genomics, stress physiology, bioinformatics, molecular biology approaches on medicinal and aromatic plants.

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An immunoinformatics approach to identify immunogenic peptide of hemagglutinin protein in H1N1 virus

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Influenza virus, which has been frequently associated with human respiratory infections, poses potential threat of widespread pandemics. The most recent outbreaks of Influenza in 2009 was the outcome of triple reassorted H1N1 called swine-origin influenza virus (S-OIV)A/H1N1. In view of the compelling need of a vaccine which is crossreactive against all the existing and eventually appearing strains of H1N1, various efforts have been made to identify conserved epitope as vaccine target. In our study, first we have predicted conserved peptide sequences of hemagglutinin (HA) obtained from all the reported strains of H1N1 using MUSCLE and AVANA tool. Three different epitope prediction tools were used for each Class I and II MHC separately. BLAST screening was employed to eliminate the peptides bearing homology with human proteome. Six out of twenty four epitopes predicted to binding class I HLA and two out of twelve epitopes predicted for Class II HLA were eliminated after BLAST analysis. Finally, ten conserved peptides containing overlapping epitopes for class I MHC and five peptides containing overlapping epitopes for class II MHC were generated. Owing to the extensive polymorphic nature of HLA alleles, population coverage analysis (tool by IEDB) was carried out for the resultant epitopes in the conserved peptides. The predicted average population coverage for class I and class II conserved peptide was 86.36% and 36% respectively. Thus, using immunoinformatics tools, we were able to select the peptide containing overlapping epitopes which may be considered as probable vaccine candidates.

Biography

Manoj Baranwal has done M.Sc from JNU, New Delhi. After that he has completed his PhD in clinical and cellular immunology from Duisburg-Essen University, Germany and continues his postdoc for one year there. He is presently working as assistant professor in Department of biotech & Env Sciences, Thapar University Patiala. He is working on Epitope Based Vaccine design in Influenza Virus (Immunoinformatics based and experimental validation) and Screening of bioactive molecules from endophytic fungi for anticancer activity; Immunomodulatory and Immunosuppressive activity. He has published four international papers in reputed journals and attended several conferences.

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Proteomic analysis of milk is indicative of host immune response to mastitis in buffaloes

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The unique ability of modern proteomics techniques offers a great opportunity for studying simultaneously all proteins in a sample. The present study was undertaken to examine proteome changes in milk in response to the severity of mastitis vis-à-vis normal milk in Murrah buffaloes. Milk was collected by hand milking and mastitis was detected by California Mastitis Test (CMT), followed by milk culture to identify micro flora. Samples collected from 4 normal and 13 CMT positive samples from organised herd at the Central Institute for Research on Buffaloes, Hisar (India) were classified as normal (4), CMT positive no abnormality detected in culture (NAD; 2), subclinical (5; Streptococci infection), subclinical mixed (2; Streptococci and Staphylocci infection) and clinical (4; Streptococci) infection. Fat removed samples were subjected to reduction of pH (~ 4.0) for casein removal, followed by sample preparation for two dimensional gel electrophoresis (2 DE). Samples (equal volume of proteins from individual samples) were pooled to make single sample for all proteomic studies. Isoelectric focussing (IEF) was accomplished using broad range (pH 3-10; 7cm) dry IPG strips at 5750 Volt- hour (Vh) followed by a 12.5% SDS-PAGE. The commisse blue stained gels so obtained were densitometrically analysed by ImageMaster 2D Platinum 7.0 software (GE Healthcare, USA) to visualize % volume changes in proteins embedded in spots of different categories. Taking normal milk as reference, a total of 17 spots – 8 from subclinical, 5 from subclinical mixed, 3 from clinical and 1 from NAD were earmarked from a total of 110 matched spots which showed a change of ≥ 5 times. These differential exhibitions in protein profile of each category suggest that the udder immune system behave differently according to stage and type of infection. Mass spectrometric analysis of the proteins in differentially expressed spots can help in identifying these proteins which can further our understanding of the host immune response to mastitis.

Keywords: Buffalo, Mastitis, Milk, 2 DE, CMT, Densitometry.

Biography

S K Phulia is currently working as senior scientist in the Buffalo Physiology and Reproduction division of Central Institute for Research on Buffaloes (ICAR), Hisar, Haryana. He has earlier worked in the CIRG, Makhdoom. He has completed his master's degree in Animal physiology from National Dairy Research Institute, Karnal and Ph.D. from CCSHAU, Hisar. He has done extensive research in lactation physiology, ultrasonography of mammary gland and reproductive systems in buffaloes. He is presently working in the area of milk and mammary gland proteomics and embryo transfer technology in buffaloes.

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An integrated appilacion of 'omics' to understand plant resistence mechanism against microbial invasion

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Plant responses to microbial invasion including various other environmental stresses are achieved through integrating shared signaling networks and mediated by the synergistic or antagonistic interactions with the phytohormones viz. salicylic acid (SA), jasmonic acid (JA), ethylene (ET), abscisic acid (ABA) and reactive oxygen species (ROS). Previous studies have shown that in response to pathogen attack, plants produce a highly specific blend of SA, JA and ET, resulting in the activation of distinct sets of defense-related genes. Regulatory functions for ROS in defense, with a focus on the response to pathogen infection occur in conjunction with other plant signaling molecules, particularly with SA and nitric oxide (NO). Recent reports added evidence to the previous studies that GSH has a distinct role in biotic stress tolerance and suggested GSH to be a member in cross-communication with other signaling molecules in mitigating biotic stress. Taken together, present investigation has been designed to obtain an in depth understanding on the plant disease resistance mechanism through an integrated "omics" approach with special reference to glutathione. For that transgenic tobacco constitutively overexpressing γ-ECS, the rate-limiting enzyme of glutathione biosynthetic pathway has been developed upto T_2 generation. ESTs analysis and disease test assay demonstrated that GSH, being a member of signaling network acts in a synergistic and/or antagonistic fashion with other established signaling molecules to combat biotrophic pathogen like Pseudomonas syringae pv. tabaci in comparison to the necrotrophic pathogen Alternaria alternata. Furthermore, proteomic analysis followed by mass spectrometric analysis identified the nature of proteins to control/prevent the disastrous microbial invasion in transgenic tobacco. Finally, an integrated analysis of genomics and proteomics datasets identified the genes and proteins regulated by glutathione level and involved in plant resistance mechanism to combat microbial invasion.

Biography

Sharmila Chattopadhyay has completed her Ph.D at the age of 26 years from Visva Bharati University and postdoctoral studies from Department of Biochemistry and Food processing, ATO-DLO, Wageningen, The Netherlands. She is presently engaged as a Senior Scientist of Drug Development/ Diagnostics & Biotechnology division, CSIR-Indian Institute of Chemical Biology, Kolkata, a premier R&D organization. She has published more than 20 papers in reputed journals and serving as reviewer of international journals. Dr. Chattopadhyay also published book chapters on Agricultural Biotechnology, Indian Medicinal Plants etc. She was invited and presented her research activities in GORDON RESEARCH CONFERENCE-Plant Metabolic Engineering, USA, 2009.

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Induction of apoptosis by benzamide in K562 cells was triggered by inhibition of poly (ADP-ribosyl)ation of protein(s)

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To investigate the mechanism(s) of apoptosis induction at physiological condition of growth by benzamide, an inhibitor of poly (ADP-ribose) polymerase, we have treated leukemic cell line K562 with various doses of benzamide for a particular time point as well as fixed dose for different time of incubation and measured several apoptotic parameters. We observed that benzamide treatment resulted significant increase of nuclear fragmentation, nucleosomal ladder formation, and activation of caspase-2, caspase-8, caspase-9/caspase-6, caspase-3 in K562 cells. Dose dependent release of cytochrome-c into cytoplasm and translocation of apoptosis inducing factor (AIF) into nucleus was also observed in K562 cells treated with benzamide for 24 h. Increase in nuclear fragmentation and caspase-3 activation were higher in PARP-1 knock down K562 cells compared to the parental K562 cells after treatment with benzamide, implicating that induction of apoptosis by benzamide is due to inhibition of PARP-1. Significant increase in NAD^+ level, i.e inhibition of PARP, by 5mM benzamide treatment was the earliest event (5 h) followed by the increase in comet tail (6 h), caspase-2 (6 h), caspase-8 (9 h), caspase-3 (24 h) activation and nuclear fragmentation (24 h). Benzamide treatment (4 h) reduced poly(ADP-ribosyl)ation of cellular proteins in a dose-dependent manner. So, induction of apoptosis by benzamide treatment was correlated with its ability to inhibit general poly (ADP-ribosyl)ation of proteins and increase in the cellular NAD^+ pool. We proposed that induced apoptosis by benzamide treatment could be initiated through inhibition of the poly(ADP-ribosyl)ation of unknown protein(s) involved in apoptosis.

Keywords: PARP, benzamide, siRNA, AIF, apoptosis, caspase-8, caspase-9/caspase-6, caspase-3, poly (ADP-ribosyl)ation.

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Comparative genomics and genome wide analysis of bidirectional promoters in Candida albicans

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Introduction: With the increasing number of genome sequencing data, it is critically needed to understand the coordination among various functional classes of genes. A genome wide analysis of gene organization and their promoter functions can give a significant insight into the working of functionally related genes as gene networks. So, with the object of identifying such organization, we have investigated the genome of Candida albicans for bidirectional promoters and compared it with the data of bidirectional promoters of human genome.

Summary of Results: Cluster of functionally related genes, which is also called "Operon", is a general feature of bacteria and other prokaryotes but such gene organizations are much less investigated in eukaryotes. The completion of Candida albicans genome sequencing project provided an unique opportunity to study the distribution of genes throughout the genome. By analysing the intergenic distances between 6,094 open reading frames, we have identified a class of divergently transcribed gene pairs, representing more than 20% of the genes in the genome, whose translational start sites are separated by less than 1000 base pairs. Upon comparative analysis it was found that, it was significant proportion than bidirectional promoters present in human genome. Although, this bidirectional arrangement has been previously described in various species, the prevalence of bidirectional gene pairs in C. albicans is striking. Our work also shows that these gene pairs have a variety of functional categories with more than fifty percent of them having a role in cellular metabolisms such DNA repair. Microarray database analysis indicated that many bidirectional pairs are co-expressed where they were tend to have positive Pearson correlation coefficient scores. Further, as a validation of computationally predicted bidirectional promoters, we constructed a dual reporter assay by which we show that promoter sequence between Nag1 and Dac1 initiate transcription in both directions.

Conclusion: These findings demonstrate that a bidirectional arrangement provides a unique mechanism of regulation and metabolic adaptation for a significant number of Candida albicans species.

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New developments in Yarrowia lipolytica yeast expression system and its application to genetic engineering of heterologous proteins

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More than 100 heterologous proteins from various phylogenetic origins have been successfully produced in Yarrowia lipolytica yeast expression system, which offers reliable performances in glycosylation, folding and secretion of complex proteins. We present here a short review of the major tools developed in this yeast, with focus on vectors for targeted monocopy integration (YLEX expression kit, Yeastern Biotech Co, Taiwan), a system particularly adapted to genetic engineering of heterologous proteins. In order to examplify the various applications of Yarrowia expression system, a number of current collaborative works on whole-cell biocatalysis, genetic engineering of secreted enzymes, and surface-display of heterologous proteins (arming yeasts) will be briefly resumed. Some applications, like high throughput screening, require improving Yarrowia transformation methods for higher efficiency, without sacrificing the high percentage of correctly targeted integrations. For that purpose, we have developed a sensor system for homologous integration, based on E. coli lacZ gene expression, which allowed us to evaluate some chemicals increasing transformation efficiency for maintenance of a high percentage of correct integration. Dithiothreitol was found to be not only more efficient than dimethyl-sulfoxide in increasing transformation efficiency, but also compatible with homologous integration, which was not the case of the latter that promoted out-of-site integration. An optimized transformation protocol using dithiothreitol has been developed, which ensures very high transformation efficiency.

Biography

Catherine Madzak has been a student at Ecole Normale Supérieure, one of the main French governmental schools of higher education. She obtained her Ph.D. in Microbiology at the Cancer Institute of Villejuif. She is now a senior research associate at INRA, the French National Institute for Agricultural Research. Her main research subject is to develop an expression system for heterologous proteins in the yeast Yarrowia lipolytica, with particular emphasis on genetic engineering of enzymes. She is author of more than 40 publications in international journals, five book chapters, and inventor of a patent on a recombinant promoter.

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Enzymatic modification of chitosan using chitin deacetylase isolated from Bacillus cereus

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The advent of molecular technologies, protein engineering and directed evolution, new avenues are being opened to make use of the enormous diversity of natural biopolymers. Polysaccharides are at the forefront of this rediscovery of natural resources, not only for the shear quantity of their production but also for the amazing quality and diversity of their physico-chemical properties and biological functionalities.

One of the classes of polysaccharide with a promising economic potential comprises those with biological activities, such as chitosan, heparin, hyaluronic acids, and other glycosaminoglycans. All of these diverse polysaccharides have been optimised over the course of evolution to fulfil their many roles in the life of bacteria, fungi, plants, animals, and humans. However, there is still considerable leeway for optimisation of these biopolymers to fulfil their many roles in biotechnology. Today, modifications and optimisations are typically done using chemical methods such as acid or alkali treatment. Alternative and/or complementing enzymatic modifications will reduce energy input and environmental impact while at the same time offering the advantage of higher specificity and, thus, potentially yielding novel polymers and/or oligomers with advanced physico-chemical properties and biological functionalities. In the following research work, one of the isolated chitin deacetylase (CDA) from Bacillus cereus was cloned in E.coli pLys strain and the activity was checked for on chitohexamers.

Biography

Ritu Raval was awarded her PhD degree from IIT Delhi under the mentorship of Prof. Prashant Mishra. She later moved to Germany for her post-doctoral experience in recombinant technology which involved both red and green biotechnology. She currently is employed with Manipal University, India wherein her main focus of interest is Expression of recombinant genes and their further scale up. She has authored four publications and one book chapter.

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Effect of micellar solubilization technology on the anticancer activity of dasatinib: A study on the in vitro survival of cell lines

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In the present research work micellar solubilization technology has been employed for the formulation development of poorly soluble Dasatinib and its effect is evaluated basing upon the cytotoxic activity. Dasatinib is an oral multi- BCR/ABL and Src family tyrosine kinase inhibitor approved for use in patients with chronic myelogenous leukemia (CML) after imatinib treatment and Philadelphia chromosome-positive acute lymphoblastic leukemia (Ph+ ALL). The formulation development for Dasatinib was done by improving its solubility by micellar solubilization technology. The resulted micellar solution was converted into spray dried powder. The MTT (3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay was carried out on Baf3/WT, E255k and K562 for the evaluation of the cytotoxic activity of placebo, pure drug, and formulation. Suitable and equivalent dilutions were made for the three samples to evaluate the effect on the inhibition of cell proliferation by MTT Assay. The IC_{50} value reveals that formulation of Dasatinib has shown a better inhibition effect on the cell proliferation than that of pure drug which may be due to more uptake of drug into the cells. Moreover, inhibition of Pgp efflux and fluidization of the cellular structure by the surfactant also accounts for the lower IC_{50} value of formulation on Baf3/WT and E255k. This concludes that micellar solubilization technology employed for the solubility enhancement of Dasatinib has also resulted better inhibitory activity of Dasatinib on cell proliferation.

Biography

P. Durga Maheswari is pursuing Ph.D. entitled "Formulations of poorly water soluble drugs using micellar solubilization technology", from Jawaharlal Nehru Technological University, Hyderabad, AP, INDIA. She had completed M. Pharm in Department of Pharmaceutical Sciences, Andhra University, Visakhapatnam, A.P, INDIA. She is working as Senior Manager, Formulation Research & Development, Natco Research Center, Sanath Nagar Hyderabad.

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Synthesis of chiral alcohols from prochiral ketones by using biocatalyst

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One of the main features of the living world is it's chirality of the biological active compounds. Stereochemistry of these compounds is one of the most important parameters governing the biological activity. The asymmetric reduction of ketones is one of the most important, fundamental and practical reactions for producing non-racemic chiral alcohols, which can be transformed into various functionality's, without racemization, to synthesize industrially important chemicals such as pharmaceuticals, agrochemicals and natural products. Asymmetric reduction of prochiral ketones by means of chemical method involves use of expensive chemical reagents and environmental hazardous heavy metals. On the contrary, use of biocatalysts, microorganisms or plant cells for reduction of prochiral ketones yielding corresponding optically active alcohols with excellent enantioselectivity, without using expensive chemicals and under eco-friendly environment. The Green Technology can be applied to almost every type of synthetic organic reactions, it is the design of safer and more efficient processes of synthetic chemistry that reduces or eliminates the use / generation of hazardous substances during the processes of chemical synthesis. In the present study highilibhts an Enzymatic approach for the synthesis of chiral tetra hydro pyranols and chiral isitinols and by enantioselective reduction of 2-substituted tetrahydropyran-4-ones and 1H-indole-2,3-diones using Daucus carota, the reaction occurred in aqueous buffer under extremely mild and environmentally benign conditions giving 83-92% yield and 85-96% Enantio meric exess (ee) in high yields.

The impending use of this ecofriendly technology has wider commercial application to the production of chiral alcohols on an industrial scale.

Biography

Ch. Sreelakshmi is pursuing her PhD in IICT Hyderabad under the supervision of Dr. A. Bhaskar Rao Sci-F, in Organic-1 Division, Registered in JNTUH Hyderabad, and Professor M.Lakshmi Narasu as a Co-Guide. She had published 6 papers in international and 1 in Indian Journals with the Supervision of her guide. She was awarded as a (Senior Research Fellow) from CSIR-SRF in 2009.

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The determinate and indeterminate nodulated legumes of jammu province and future insight in rice genome manipulation

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The term legume is derived from the Latin word legumen meaning "to gather." There are some 17,000 species of the leguminous plants, which are known for their nitrogen fixing property and the high protein content. Only 20% legumes have been explored for the root nodules to be present. Further, out of these 20% explored species, only 90% showed the presence of root nodules. There are no reports on the presence of nodulated legumes from our state i.e.; Jammu & Kashmir. The nodules contain the nitrogen fixing bacteria which have the ability to fix the atmospheric nitrogen directly, instead of utilizing it from the soil.

In the present world scenario with the population of 6.8 billion there is an expected rise to 9.1 billion people by 2050.With it comes the question of feeding these extra mouths. In past from 3 billion between 1961 and 2007,the world population has now almost duplicated ,even then agricultural output kept pace and needs to continue to do so. But the climate change due to global warming in particular, adds a large degree of uncertainty to projections of agricultural output. The Genetically modified (GM) crops will prove as an essential component of the sustainable Agriculture in future as a remedy for world hunger.

The Cereals are the most important crops for mankind and in future attempts will be made to integrate these nitrogen fixing genes into cereals, mainly Oryza sativa.

The Scientists have been using different ways for making it a reality. In early 1990s, the Nod factors were identified in legumes, leading to primary efforts to produce the root nodules on non leguminous plants itself. Second, effort was to introduce the receptors for Nod factors into the crop plants. With the scientific advancement in the field of biological nitrogen fixation, it was discovered that solely Nod factor genes, are not responsible for the nitrogen fixation but there are some alternate nitrogen fixation genes e.g; as are in Bradyrhizobium. So, now the focus has changed from root nodulation in non leguminous plants to direct transfer of the nitrogen fixing genes into cell's genome.

Keywords: Determinate nodules, indeterminate nodules, legumes, cereals.

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Appraisal of conjugated linoleic acid production by probiotic Pediococcus spp. GS4

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Purpose of Study: Probiotics with ability to produce Conjugated linoleic Acid (CLA) is considered as an additive health benefit property for its known role in colon cancer mitigation. In this study, we assessed the ability of isolated probiotic strain Pediococcus spp. strain GS4 for the biohydrogenation of Linoleic acid to conjugated linoleic acid.

Methods: Pediococcus spp. strain GS4 (Sukumar & Ghosh, 2010) were grown in MRS broth containing 0.2% linoleic acid for 48 hrs at 37°C at still condition for biohydrogenation. Formation of conjugated bond was assessed by the primary screening using UV-Vis spectrophotometry followed by HPLC, Gas chromatography and mass spectrometry (GC-MS) analysis. The study was extended to assess the ability of the strain to form conjugated linoleic acid in the medium supplied with 0.5% lipolysed sesame oil. During whole experiment the cell viability, pH change and Optical density (OD600nm) were also recorded.

Results: Pediococcus strain GS4 was found effectively able to convert linoleic acid to conjugated form with cell survivability 103.9%. UV-Vis scanning showed the major peak at 234nm and it was further confirmed by HPLC and GC-MS analysis.

Conclusion: Study suggests that strain is able to produce CLA from lipolysed oil.

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Effects of trivalent arsenic toxicity on germination, seedling growth and enzyme activity in Vigna radiata

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Arsenic (As) is a metalloid of severe environmental concern because of its extravagant toxicity and wide abundance in nature. At high concentration, arsenic interferes with plant metabolic processes and can inhibit plant growth and development through arsenic induced phytotoxicity. Seed germination rate and the early seedling growth are sensitive to arsenic toxicity. Hence toxicity of arsenic can be evaluated properly in early stages of plant development. Mung bean (Vigna radiata) is a very significant edible plant in India. The objective of this study was to investigate the in vitro effects of different arsenic concentrations on germination and change in peroxidase activities in Mung bean seeds and seedlings. The germination of Mung bean seeds was studied for 7 days in presence of arsenic tri-oxide solutions (0.5 ppm., 1 ppm., 1.5 ppm. and 2 ppm.). The sequestration of arsenic in different parts of the seedlings was estimated by using A Analyst 200 atomic absorption spectrometer (Perkin Elmer, MA, USA) fitted with a FIAS-100 flow injection system. The root and shoot lengths were measured to study the changes in growth patterns. In order to assess the oxidative stress, Guiacol peroxidase (GPX) activity was estimated in different parts of the seedlings (root, shoot and seed parts) and were expressed in enzyme activity/min./gm. fresh tissue. The germination percentage of the seeds was decreased gradually (control: 100%, 0.5 ppm. As: 95%, 1 ppm. As: 80%, 1.5 ppm. As: 25%, 2 ppm. As: 10%) after seven days of incubation with increase in the concentration of arsenic solutions. The lengths of the roots and shoots of the seedlings decreased significantly with the increase in concentrations of arsenic solutions. No root and shoot formation occurred in the seeds in presence of 2 ppm. arsenic solutions. On the other hand, peroxidase activity was highest in the roots, followed by the seed and shoot parts. One possible reason for that is the direct exposure of the root and seed part with arsenic solutions, whereas shoot part emerges out of the culture plate and thus was not under the direct exposure of arsenic. Change in peroxidase activity had shown an increasing pattern in the shoot parts, but in both the root and seed parts, the activity decreased with the increase in the concentrations of arsenic solutions upto 1 ppm., and then the activity increased further at the concentration of 1.5 ppm. The experiment, therefore, indicates that arsenic has the potential to affect the growth of Mung bean seed production in arsenic contaminated zones and can affect the agricultural economy.

Biography

Sayan Bhattacharya is a faculty in the department of Environmental Science, Asutosh College, Calcutta. For the last five years he has been engaged in his doctoral research in Department of Environmental Science in University of Calcutta. He has published 17 International Conferences proceedings and several National Conference proceedings, 6 book chapters and 4 international journal papers. He has received young researcher award from Govt. of India. He has more than 3 years of teaching experiences in 4 colleges and universities in West Bengal, India and has experiences as a reviewer in international peer reviewed journals.

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Novel approach in validation of adventitious virus removal by virus filtration

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Regulatory bodies for downstream purification processes are applied to demonstrate robust clearance of model adventitious viruses in time for execution of phase 3 clinical trials and product licensure. Model viruses selected for these studies represent a diversity of viral physicochemical properties, and the clearance methods which include orthogonal mechanisms such as clearance based on size alongside chemical inactivation. Virus filtration is a critical unit operation used in numerous purification processes of monoclonal antibodies (MAbs), recombinant proteins, and plasma-derived biopharmaceuticals. Virus filtration unit operations have been shown to be scalable, robust, and reproducible. Initial sizing of membranes involves, study on a small-scale filter followed by linear scale-up maintaining a constant ratio of process volume per square meter area. However, the ability of a virus filter to clear viruses is ultimately determined by validation studies involving virus-spike and clearance experiments. A representative feedstock is spiked with a preparation of model virus, this feedstock is passed through the filter, and viral clearance is determined after measuring recovered levels in filtrate using qualified/validated scale-down systems.

Keywords: Downstream Purification, Virus Filtration and Monoclonal antibodies.

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Hydrolytic enzyme production by marine yeasts isolated from Arabian Sea

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During the last three decades numerous bioactive compounds have been isolated from marine microorganisms and used as sources of therapeutic agents. Marine yeasts are considered to be an important category of marine microorganisms. As a unicellular organism yeast has wide range of potential application from ancient fermentation industry to modern molecular biology. Yeast enzymes were found to be useful in various industrial and biomedical fields there by indicating their importance in day to day human activities. Yeast belonging to the genera Candida, Debaryomyces, Pichia, Cryptococcus, Rhodotorula, and Trichosporon were isolated from the Arabian Sea and examined for their hydrolytic enzyme production. The result showed that majority of the isolates were lipolytic (89.91%) followed by gelatinolytic (22.94%) and amylolytic (14.68%). Generic wise analysis of the hydrolytic enzyme potential showed that Trichosporon were found to be the most potent isolate for enzyme production, 56.25% produced amylase, 32% were gelatinolytic and 9.18% exhibited lipolytic activity. Among Cryptococcus strains 18.75% produced amylase, 16% gelatinase and 9.18% produced lipase. Of Candida 12.5% produced amylase, 12% gelatinase and 39.8% lipase. Among Rhodotorula 11.22% of produced lipase and none of this isolate produced amylase or gelatinase. Among Debaryomyces strains 6.25% produced amylase, 40% gelatinase and 18.31% lipase. Among Pichia 6.25% produced amylase and 12.25% lipases and none of this isolate produced gelatinase. Among the isolated species 23.85% of strains showed urease activity. The present study highlights the importance of marine yeast as a potent source of hydrolytic enzymes.

Biography

Savitha K. Koilery is pursuing her Ph.D. in Biotechnology, under the guidance of Dr. Keerthi T.R. Associate Professor at Mahatma Gandhi University, Kerala, India. She has more than four years of experience in Biotechnological studies has attended trainings and workshops in this field. She has presented her research findings at International Conferences like Asian Congress on Biotechnology "ACB 2011" Shanghai, China, International Conference on Sensors "Asiasence 2011" Jeju, Korea and the International Conference on Advances in Biological Sciences "ICABS 2012" Kannur, Kerala. She also has paper publications in reputed journals like Res J Pharm Biol Chem Sci.

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Genetic transformation of tomato with cry2AX1 gene for resistance to fruit borer

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Tomato (Solanum lycopersicum L.,) is an important vegetable crop cultivated throughout India. The crop is extensively damaged by lepidopteran insect pest, Helicoverpa armigera Hubner (tomato fruit borer). In order to mitigate this problem, an attempt was made to generate transgenic tomato plants resistant to fruit borer. In this study, a regeneration protocol was standardized for a local high yielding genotype, PKM1. MS modified medium containing B5 vitamins along with Zeatin 1 mg/l exhibited higher regeneration efficiency (88%). PKM1 was transformed with an indigenous chimeric cry2AX1 gene encoding insecticidal crystal protein of Bacillus thuringiensis using cotyledonary explants through Agrobacterium mediated transformation. Putative transgenic plants were regenerated under kanamycin selection and screened for the presence of transgene sequences through PCR analysis. Screening of transgenic tomato events expressing Cry2AX1 showed significant insecticidal activity against H. armigera in detached leaf bioassay.

Biography

N. Balakrishnan obtained his Ph.D degree from Tamil Nadu Agricultural University in 2002 and had got training in molecular diagnosis of virus diseases in IAREC, Prosser, Washington State University, USA. He is working as Assistant Professor (Entomology) in Department of Plant Biotechnology, Centre for Plant Molecular Biology and Biotechnology, Tamil Nadu Agricultural University, Coimbatore, India. Currently he is working on cloning and characterization of indigenous Bt isolates, evaluation of transgenic plants for their resistance to insect pests and thrips- tospovirus interactions. He has published 20 research articles.

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Optimization of process parameters of hydraulic press for coconut oil yield using RSM and artificial neural networks

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Most oilseeds (eg copra, palm kernels and groundnuts) need proper processing in mills before oil extraction to increase the yield of oil. The efficient and economical utilization of feed stocks is highly essential in oil producing industries. Coconut has the highest productivity and is less susceptible to abnormal climatic condition. The production of coconut oil and its by-products, raw and fried cake, is an important source of income for women in coastal areas of India. Hence, identification of optimal pretreatment conditions of coconut nut kernel is very important for high yield of coconut oil. The optimum processing conditions can be found by incorporating reliable and efficient statistical design methodologies such as central composite design (CCD), and ANN.

Response Surface Methodology was used to conduct the experiments and experiments were designed according to CCD to study the effects of process variables such as Applied pressure, Pressing time, Roasting temperature, Roasting time and Moisture content. A simple, economical, and highly efficient model was developed to predict the yield of oil from coconut kernels in a hydraulic press. Artificial neural network (ANN) model was developed to predict the yield of oil from coconut kernels. The developed ANN was trained and tested with the experimental data obtained from CCD method. The results of ANN during training and testing were based on MSE. The results were compared with experimental data and it was found that the estimated oil yield from ANN model was able to predict the yield accurately with R value as 0.99.

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Novel acridinedione derivatives: Design, synthesis, SIRT1 enzyme and tumor cell growth inhibition studies

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A new scaffold N-(9-(ortho/meta/para -(benzyloxy)phenyl)-3,3,6,6-tetramethyl-1,8-dioxo-1,2,3,4,5,6,7,8-octahydroacridin-10(9H)-yl) isonicotinamide (H1-3) was discovered as a hSIRT1 inhibitor through virtual screening of in-house database. Based on these hits, a library of compounds were designed, synthesized and tested for in-vitro hSIRT1 activity. The most potent compound 4d in the series showed a significant inhibition of SIRT1 activity. Further antitumor studies of compound 4d, showed a dose dependent increase in acetylation of p53K382 and decrease in SIRT1 with an IC_{50} of 0.25 μM in MDA-MB231 breast cancer cell lines. Individual 3D- QSAR analysis using Schrödinger showed distribution of hydrophobic and non-polar positive co-efficient at ortho position essential for bioactivity based on 4d.

Keywords: Antiproliferative activity, Acridinedione derivatives, hSIRT1, MDA-MB231.

Biography

Alvala Mallika pursuing her Ph.D from Birla Institute of Technology and Sciences, Pilani, Hyderabad Campus and completed her Master's Degree in Pharmacy from Birla Institute of Technology and Sciences, Pilani, India. She has published 8 papers in reputed journals and serving as a reviewer for the reputed journal 'Pharmaceutical Biology'. Her research areas include designing of small molecule modulators against various targets in cancer, Obesity and TB based on molecular mechanisms using computational approach, cell based assays and in vitro screening of validated targets.

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Tea polyphenols-loaded PLGA nanoparticles: Synthesis, characterization and protective effect against induced DNA damage in vivo

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Nanoparticles have emerged as one of the most promising drug delivery systems in the field of chemotherapy for localized and metastasized cancers owing to their unique potentials like high intracellular uptake, enhanced permeability and retention while reducing undesirable side effects. A number of naturally occurring polyphenols, present in most commonly consumed beverage tea, has been shown to possess anticancer properties but has associated with limited success including inefficient systemic delivery and bioavailability under in vivo conditions. Our present work investigated the efficiency of polyphenolic constituents of black (Theaflavin-TF) and green (epigallocatechins-3-gallate-EGCG) tea encapsulated in poly (lactic-co-glycolic acid) nanoparticles (NPs) using double emulsion method. The nanoparticles formulated were and then characterized for encapsulation efficiency, surface morphology, particle size and in vitro release. TEM analysis showed the formation of spherical and monodisperse nanoparticles, with an encapsulation efficiency of ~18% and 26% for TF and EGCG, respectively. Further their preventive potential against 7, 12-dimethylbenzanthracene (DMBA) induced DNA damage in mouse skin using DNA alkaline unwinding assay (DAUA) was evaluated. Pre-treatment (topically) of mouse skin with TF or EGCG (100µg/mouse) doses exhibits protection of 45.34% and 28.32%, respectively, against DMBA induced DNA damage. Additionally, TF/EGCG loaded NPs have showed significant potential for induction of DNA repair genes (XRCC1, XRCC1 and ERCC3) and suppression of DNA damage responsive genes (p53, p21, MDM2, GADD45α and COX-2) as compared to respective bulk doses. Hence, our studies achieved successful formulation of EGCG and TF loaded PLGA nanoparticles and has high potential to control DMBA induced DNA damage at much more reduced concentrations and thus opens a new arena for clinical application in prostate cancer therapy.

Biography

Priyanka Bhatnagar has completed her M.Sc. in Chemistry (Organic) from University of Delhi, India in 2009. She is pursuing her Ph.D in Bio-organic Chemistry from Institute of Genomics & Integrative Biology (IGIB), CSIR Lab, New Delhi, India. She is working in the area of design and development of Polymeric systems for Effective Drug Delivery. She has 1 paper in reputed journal.

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Study on shelf life of liquid smoked catla (Catla catla)

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India is one among the top ten fish producing countries in the world. Man is dependent on products of plant and animal origin for food. Fish is one of the most nutritious foods. Catla (Catla catla) is an Indian major carp. It is liked for its unique taste and tender flesh. An increasing amount of evidences suggest that, fish meat and oil contains high amount of polyunsaturated fatty acid that are valuable in decreasing the serum cholesterol to prevent a number of coronary heart diseases. In the current study, the freshwater Catla catla is used, because, it is a major carp in terms of production among the freshwater fish species in India and withstands a wide range of experimental conditions Liquid smoking can be done by dipping the product or by spray injection into the smoking oven. The color produced by liquid smoke is intensified when the surface is heated and dried. Liquid smoking emerges as a potential substitution for traditional smoking method in preserving proteinaceous foods Packaging plays an important role in today's society: it surrounds, enhances and protects the goods we buy right from processing through handling and storage to the final consumer. Food is packaged to preserve its quality and freshness, and also add appeal to consumers and to facilitate storage and distribution. Vaccum packaging increases the shelf life of the fish than normal packaging. Vaccum packaging prevents moisture evaporation and also provides an attractive temper resistant package.

Biography

S. Reginold Jebitta is perusing her Doctoral Degree in the Department of Food Processing And Engineering from Karunya University and worked as an assistant professor in Kongu Engineering College, Erode. Currently she is working under the guidance of Dr. M. Ramanathan in the same university.

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Association of DAPK1 gene methylation with the prognosis in epithelial ovarian carcinoma (EOC) patients

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Background: Novel strategies for early detection of EOC, the most common and second most lethal cancer in Indian women, are urgently needed. Silencing tumor suppressor genes via DNA methylation has established hypermethylation as one of the most frequent molecular alterations that may initiate and drive many types of human neoplasia including EOC .To determine the alterations of tumor suppressor gene DAPK1 gene in EOC patients to explore the possibilities of identifying potential minimally invasive markers in blood of the patients, which could help in the clinical practice as a diagnostic and prognostic marker.

Methods: Fifty EOC patients with primary epithelial ovarian cancer were selected for the study; Genomic DNA extracted from fresh peripheral blood & serum followed by sodium bisulfate modification .The p16 methylation was detected using methylation-specific PCR (MSP). The DAPK1 gene methylation status was correlated with age, stage, menopause, Ca125.5 and clinic pathological features.

Results: The frequencies of DAPK1 gene methylation in EOC patients were found to be 68%. The significant association was seen with age at diagnosis, menopause and stage (P = 0.043). Patients with high methylation indices had poor prognosis (p<0.001, Hazards ratio=14.58) with age (P = 0.043), and tumor stage (P = 0.033). Aberrant methylation of DAPK1 gene was strongly associated with EOC patients (P = 0.037).

Conclusions: Our results that the methylated loci of TSGs (DAPK1 gene) may be employed as clinically useful biomarkers for prognosis and diagnosis of EOC noninvasively using readily available body fluid by MS-PCR and proved to be efficient and cost-effective method.

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Study of fast food eating behaviour among girls living in hostels in relation to their health

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Fast food is considered to be one of the fastest growing and popularized foods in view of the fact that it is easy to prepare within short span of time and is an economic alternative to home cooked foods. It is considered as a good source of energy and with a considerable percentage of fat along with high quantity of saturated fatty acids, cholesterol and sodium. Fast food culture has been gaining popularity especially due to altered demographic patterns with nuclear families since working parents have fewer time for meal preparation at home. Research indicates that fast food consumption is turning the females a victim of sterility and this is also now the major cause of an assortment of digestive problems. So by keeping this view in mind, the study was conducted in Lovely Professional University girl's hostels to know about their fast food eating behaviour in relation to their health. Chi- square, which is a non-parametric test, was applied for studying the sample size of 465 girl students. The survey provides converging evidence of a direct causal link between fast food consumption patterns of the hostel girls in relation to their health. The study concludes that fast food eating trend among girls residing in the hostels, is very common. Despite the fact that study did not find a momentous correlation between fast food consumption and BMI, but the fast food intake openly pointed out its ill effects on females' health.

Keywords: Fast food, hostel girls, eating behaviour, health.

Biography

Aanchal vasudev has been pursuing her M. Sc in Biotechnology in the batch of 2010- 2012 from Lovely Professional University and her research in fast food consumption in relation to girls health with the guidance of Mr. Harsh Kumar, Lecturer in the department of Biotechnology and Biosciences in Lovely Professional University.

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Treatment of organic and inorganic pollutants in wastewater by use of microorganism

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The term bioremediation has been introduced to describe the process of using biological agents to remove toxic waste from environment. Because of the adaptability of microbes and other biological systems, these can be used to degrade or remediate environmental hazards. Natural organisms, either indigenous or extraneous (introduced), are the prime agents used for bioremediation. The organisms that are utilized vary, depending on the chemical nature of the polluting agents, and are to be selected carefully as they only survive within a limited range of chemical contaminants. The first patent for a biological remediation agent was registered in 1974, being a strain of Pseudomonas putida that was able to degrade petroleum. Examples of aerobic bacteria recognized for their degradative abilities are Pseudomonas, Alcaligenes, Sphingomonas, Rhodococcus, and Mycobacterium. These microbes have often been reported to degrade pesticides and hydrocarbons, both alkanes and polyaromatic compounds. Many of these bacteria use the contaminant as the sole source of carbon and energy. Anaerobic bacteria are not as frequently used as aerobic bacteria. There is an increasing interest in anaerobic bacteria used for bioremediation of polychlorinated biphenyls (PCBs) in river sediments, dechlorination of the solvent trichloroethylene (TCE) and chloroform. Ligninolytic fungi such as the white rot fungus Phanaerochaete chrysosporium have the ability to degrade an extremely diverse range of persistent or toxic environmental pollutants. Methylotrophs, aerobic bacteria that grow utilizing methane for carbon and energy. The initial enzyme in the pathway for aerobic degradation, methane monooxygenase, has a broad substrate range and is active against a wide range of compounds, including the chlorinated aliphatic trichloroethylene and 1, 2dichloroethane.

Therefore, microorganisms represent a promising, largely untapped resource for new environmental biotechnologies. Research continues to verify the bioremediation potential of microorganisms. For instance, a recent addition to the growing list of bacteria that can reduce metals is Geobacter metallireducens, which removes uranium, a radioactive waste, from drainage waters in mining operations and from contaminated groundwater.

Biography

Abhinav K Srivastava is 26 year old Research Scholar from Amity Institute of Biotechnology, Amity University Uttar Pradesh. He has completed his M.Sc. Biotechnology from Amity University and has worked as an Environmentalist with a Canada based MNC for a year. After that he worked as Faculty of Biotechnology at an Institute situated in Noida. Presently he is doing his research in Environment Biotechnology and trying to find out a new micro-organism based technology for the efficient degradation of inorganic and organic waste.

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Developing a statistical model for fermentative hydrogen production

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The individual and interactive effects of significant process parameters were investigated for the optimization of biohydrogen production using glucose as a substrate. Response surface methodology was applied to optimize the process parameters for maximum hydrogen production using Enterobacter aerogenes. The important factors influencing hydrogen production such as glucose, initial pH, inoculum size, tryptone, yeast extract, and ferric chloride were screened using Plackett-Burman design. Based on the Plackett-Burman design, significantly influencing process variables identified were glucose, initial pH and ferric chloride. 3-dimensional (3-D) response surface and 2-dimensional (2-D) contour analysis were adopted to further investigate the mutual interaction between the parameters and to determine the optimal values for maximum hydrogen yield. The optimal values estimated using the statistical design to achieve maximum H_2 yield of 1.69mol H_2/mol glucose were glucose 16.56g/l, initial pH 6.15 and ferric chloride 213.13mg/l.

Keywords: Biohydrogen; Modified Gompertz model; Box-Behnken design; Enterobacter aerogenes; dark fermentation.

Biography

P. Karthic is pursuing his PhD at the age of 32 years from National Institute of Technology Calicut. He has published 4 papers in reputed journals and papers presented in National/International conferences. His areas of interest are bio-energy/bio-fuels and separation techniques.

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Aluminium chloride incorporated micro porous ZSM-13 isomerization catalyst: Synthesis characterization and application

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Catalysts based on Zeolites brought revolution in oil refining and petrochemical production in recent years due to their size selectivity and gained much research interest all over the world. The most well known and widely used zeolite is ZSM-5 (pores: 0.51 x 0.55 nm, 0.53 x 0.56 nm). ZSM-5 has been used successfully in aromatic isomerisation, methanol upgradation and many other reactions in organic chemistry. On the other hand anhydrous aluminium chloride has been found to have a high efficiency in isomerisation reactions due to its strong Lewis acidic nature. But application of this catalyst is limited due to its high corrosiveness. In our present work we have used ZSM-13, which has not been normally used for catalyst preparation as main matrix due to its high monobranching selectivity. And we have tried to increase its (ZSM-13) catalytic performance by modifying the micropores present in it with aluminium chloride impregnation, reducing corrosive nature of aluminium chloride. Three samples of aluminium chloride impregnated ZSM-13 containing 0.015, 0.025, 0.05 mol of anhydrous aluminium chloride have been synthesized by batch impregnation method and thoroughly characterized by XRD, FTIR, SEM, TEM, AFM and BET surface area analysis. Both XRD and FTIR analysis show that the pores present in the ZSM-13 sample is finely impregnated with aluminium chloride. The SEM images of the samples show the surface morphology. Comparison shows that pure ZSM-13 has some morphological change on the surface after impregnation with aluminium chloride. The TEM image of pure ZSM-13 shows the micro pores present in it. The specific surface area of ZSM-13 has been increased after aluminium chloride incorporation. This is very significant since the isomerisation reaction is very much sensitive to specific surface area. All the three samples synthesized show very high conversion capacity of normal alkanes like n-hexane, n-octane compared to pure ZSM-13. This is due to the increase in activity of the active sites present in pure ZSM-13 after incorporation of aluminium chloride. This enhanced performance of aluminium chloride impregnated ZSM-13 also clearly indicates that pores present in ZSM-13 have not been blocked by anhydrous aluminium chloride. Leaching test of the catalysts shows that aluminium chloride is not leached out from any catalyst surface. Thus the aluminium chloride impregnated ZSM-13 sample is found to be very promising hydroisomerization catalyst and can be very safely used for practical purpose.

Biography

Abhishek Dhar is a Junior Research Fellow in the Department of Chemical Technology, University of Calcutta. He is doing his research on the preparation of hydroisomerisation catalyst of n-alkane. He qualified CSIR-NET and GATE exams and published 2 research papers in international journals and presented papers in 4 international conferences.

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Discovery of novel anti-cancer activity against HeLa cell lines by virtual screening and MTT assay

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Elimination of superfluous or mutated somatic cells is provided by various mechanisms including apoptosis. Deregulation of apoptotic signalling pathways may contribute to oncogenesis. Aspartate specific cysteine proteases, termed caspases are the key effector molecules in apoptosis. In the present research, a novel screening approach has been utilized to screen nearly 1400 drugs available from Drug Bank database. After validating the docking protocol, molecular docking software like Molegro Virtual Docker (MVD) was utilized to test the underlying efficiency of these programs towards predicting the binding affinities of studied compounds. A consensus scoring and ranking retrieved top 3 drugs viz. Olmesartan, Telmisartan and Atorvastin which were examined for anti-proliferative effects against carcinoma of cervix, HeLa cell line using MTT assay.

Keywords: Apoptosis, Caspase, Docking, Cancer, Hela cells, MTT assay.

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Synthesis of ecofriendly silver nanoparticles from collagen of fish waste (Catla catla)

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Collagen is a protein rich tissue that is found in the bodies of animals (and of course humans). Collagen is abundant within the body, and makes up a total of 25% of protein readily available. Collagen is usually associated with cosmetic surgery, and as a burn healing agent. Collagen was prepared from the fish waste by extraction with cold 0.5M acetic acid and purification by alternative precipitation with sodium chloride and dialysis against 0.02M disodium hydrogen phosphate. The purified collagen was characterized with the help of SDS-PAGE. In this work, we describe a cost effective and environment friendly technique for the synthesis of silver nanoparticles from 1mM AgNo3 solution through the extract of collagen obtained from fish waste. Nanoparticles were characterized using UV-Vis absorption spectroscopy, FTIR. Further these biologically synthesized nanoparticles have found to be highly toxic against different multi drug resistant human pathogens. Bacteria such as Escherichia coli, Bacillus subtilis & Pseudomonas aeruginosa were used to test their antibiotic activity against the silver nanoparticle synthesized using fish collagen. Collagen has been reported as a characteristic suitable for medical application such as degrability, nontoxic, weak antigenicity and has been used in resorbable sutures, haemostatic agents. It can be processed into variety of forms and it is readily isolated and purified in large quantities. Our preliminary in vitro study report of fish collagen with silver nanoparticle is proved to be more effective against bacteria.

Biography

Ramya R has completed her M. Sc (Biotechnology) at the age of 22 years from Lady Doak College, Madurai and now she is doing her M.Phil (Biotechnology) in Lady Doak College, Madurai.

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Micro-organisms for Macro needs: Biodiesel from Microalgae

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The production of energy from renewable and waste materials is an attractive alternative to the conventional agricultural feed stocks. With increasing fuel prices, environmental concerns, and a growing transportation sector India will need to cut down on petroleum based fuels while investing and researching in various renewable energy sources. These concerns have increased the interest in developing second generation biofuels produced from non-food feedstock such as microalgae, which potentially offer greatest opportunities in the longer term. Microalgae are photosynthetic microorganisms with simple growing requirements (light, sugars, CO_2, N, P, and K) that can produce lipids, proteins and carbohydrates in large amounts over short periods of time. These products can be processed into both biofuels and valuable co-products. This paper reviews the current status of microalgae use for biodiesel production, including their cultivation, harvesting, and processing. It has been found that microalgae are the more sustainable source of biodiesel in terms of food security and environmental impact compared to palm oil. The inefficiency and unsustainability of the use of food crops as a biodiesel source have increased interest in the development of microalgae species to be used as a renewable energy source. It was found that, where there are outstanding issues related to photosynthetic efficiencies and biomass output, microalgae-derived biofuels could progressively substitute a significant proportion of the fossil fuels required to meet the growing energy demand.

Keywords: Microalgae, Bio-Diesel, Sustainable, Fossil fuels.

Biography

Abhishek Tomar is pursuing his Bachelor of Engineering (Final year) in Mechanical Engineering from Sagar Institute of Science and technology (Rajeev Gandhi Technological University, Bhopal). He has done researches in the field of energy from last many years. He has published two papers in a reputated international journal and more than 5 papers in national journal. He has also been part of many international conferences held in India as well as abroad. Other than that he is also a peer reviewer of a reputed international journal.

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A study on the possibility of identification of Phlebotomus caucasicus and Phlebotomus mongolensis, vectors of zoonotic cutaneous leishmaniasis, base on ITS2 rDNA by PCR-restriction enzyme

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P.caucasicus and P. mongolensis, subgenus of Paraphlebotomous, are secondary vectors of Zoonotic Cutaneous Leishmaniasis in Iran country. These are two closely related, morphologically similar sand fly species that we cannot find any differentiations between females of them by the standard identifiably keys. This study was carried out in order to verify identification and differentiation of P.caucasicus and P. mongolensis by PCR- restriction enzyme method. Genomic DNA was extracted from 12 specimens of P.caucasicus (male), 3 specimens of P.mongolensis (male) and 9 specimens of Cucasicus Group (female). We selected two primers from the species of sand flies and then ITS2 region of the rDNA gene was amplified by a Polymerase Chain Reaction (PCR). Primers selections were banded on alignment of ITS2 ribosomal DNA by using DNASIS software. By the PCR, 9 specimens of P.caucasicus (male), 2 specimens of P.mongolensis (male) and 6 specimens of Cucasicus Group (female) showed distinguish identical patterns with a visible fragment of about 500 bp in size. In RFLP, we had identical pattern with TasI used as restriction enzymes. For 5 specimens of three species of sand flies isolates, P.caucasicus P. mongolensis and P.papatasi, nucleotide sequencing was achieved, and comparison with other available sequences in GenBank was performed using Blast program. Two of them were the species of P.caucasicus (male), also two of another was P.mongolensis (male) and the fifth was P.papatasi. It is presumed that using PCR with specific primers could be useful for molecular analysis, diagnosis, epidemiological studies and differentiation between P.caucasicus and P. mongolensis.

Biography

Alireza Zahraei is a PhD research Scholar in Banaras Hindu University, Varanasi, India. He was graduated in two courses of Environmental Health and Medical Entomology and Vector Control in BSc and also postgraduate in Medical Entomology and Vector Control. He is a Lecturer in Department of Medical Entomology and vector control, School of Public Health, Tehran University of Medical Sciences, Iran. He has 36 published articles in different international journals and also 47 published in different congress around the world.

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Isolation, screening and optimization of production conditions for a novel hyperthermophillic lipase from a bacterial isolate STL-A59

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In the present study a hyperthermophillic lipase producing bacterial isolate has been screened by vigorous screening from the mud soil sample of a hot spring of Himachal Pradesh India. Lipase producing ability of 25 bacterial isolates was examined qualitatively, out of which 10 isolates showing maximum zone of hydrolysis on trybutyrin agar plate (0.5% v/v) has been selected for further study. The selected strain was found to be Gram-negetive, rod shaped, non-sporulating and forming round creamish white colonies with sharp edges. The physico-chemical parameters were studied to improve the production of lipase in the broth. A 12 h old seed culture (4 % v/v) was inoculated into 50 ml mineral based broth containing (g/l) $NaNO_3$ 3; K_2HPO_4 0.1; KCl 0.5; $MgSO_4.7H_2O$ 0.5; FeSO4.7H2O 0.01 and yeast extract (4%, w/v), pH 7.5. The broth/ medium autoclaved at 1.1 bar for 18 min at 121°C. The isolated strain was hyperthermophillic and a prominent growth was observed at 75°C. Initially total lipase activity of 103 U/ml was recorded for the hydrolysis of p-nitrophenylpalmitate at 65°C (7.5) after 18 h production under shaking at 150 rpm. Various reaction conditions buffer molarity, concentrations, buffer pH and were optimized at 65°C. The thermophilic lipase showed Km 0.166mM and Vmax 263.07 U/mg/min with specificity constant 231.68. The crude lipase was found to be stable at 65°C for 24 h and a 50% loss in the activity was observed after 11 h incubation at 65°C. The biochemical characterization of strain STL-A-59 showed Voges-proskeur positive, alkaline phosphatase negative, ONPG positive, urease negative and positive for sucrose and mannose utilization.

Keywords: Gram-negative hyperthermophillic, tributyrin, lipase, reaction conditions.

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Antibacterial activity of Mangifera indica kernel extracts

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Mango (Mangifera indica) is a fruit belonging to the genus Mangifera and family Anacardiaceae. Mango peels and seed kernels are the major by-products of mango juice industry, they are rich sources of natural bioactive compounds which play an important role in prevention of diseases. This study emphasized specifically on the potential of the mango Mangifera Indica seed kernel by discovering the prospective usage of mango seed kernels as a source of antibacterial compounds against Gram-positive (Staphylococcus aureus)and Gram-negative (Pseudomonas aeruginosa)bacterial strains. The significant increase in mango consumption in domestic activity leads to the accumulation of waste, especially its kernel. This study attempts to screen two varieties of mango kernels: Bannapalli and Senthura extracted using one extraction solvent i.e. distilled water to examine the potential of mango kernel as natural antibacterial against two bacterial strains: Staphylococcus aureus and Pseudomonas aeruginosa. Spread plate technique was employed to determine the antibacterial activity. Optimization of process conditions for extraction of antibacterial activity (having low number of colonies in plates) was conducted in Triplicates observation methods based on the experimental design by manipulating growth rate using kinetics and graphs. It was found that Bannapalli had the best antibacterial activity, utilizing distilled water as the extraction solvent. The maximum antibacterial activity at 37°C for 24h shows minimum number of colonies in plates. This finding would probably become an alternative source of new and natural antibacterial agents. A mango kernel extract has a bacteriostatic and antibacterial activity, and thus can be used in food products or cosmetics as a bacteriostatic and antibacterial agent. Furthermore, agents for preventing and treating acne or agents for preventing dental caries can be provided by adding said extract as an effective component.

Keywords: Mangifera indica, Staphylococcus aureus, Pseudomonas aeruginosa, Antibacterial activity, Kernel extracts.

Biography

Alok Prakash is pursuing his Bachelors in Biotechnology at the age of 20, from VIT University, Tamilnadu, India. Currently he has completed his second year of four years course. He is doing his summer internship from Britannia in Quality control department at Bangalore.

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Cloning, purification and characterization of LdFrataxin and LdIsd11 proteins involved in iron sulfur cluster (ISC) machinery of Leishmania donovani (Ld)

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Fe-S clusters are involved in electron transport, catalysis, sensing and regulation of gene expression. The Fe-S cluster assembled by three distinct machineries viz ISC, NIF & SUF system. We have chosen to investigate the Iron Sulfur cluster (ISC) biogenesis system of L.donovani, an agent of visceral leishmaniasis. Leishmania genome search using NCBI/TIGR/Sanger/Leishmania database showed the presence of Frataxin and Isd11 homologue components involved in Iron Sulfur Clusters (ISC) machinery in mitochondria. The frataxin and Isd11 genes were amplified from L. donovani promastigotes (Ag83) and cloned in pGEX-4T1 vectors containing GST-tag and respectively in pET-28a vectors which possess His-Tag. Recombinant fusion proteins were expressed in BL21 (DE3) strain and purified using affinity chromatography. Protein-Protein interaction between LdFrataxin and LdIscU (scaffold protein) which was identified by co-purification of affinity chromatography followed by western blot analysis. Further, we analyzed enzymatic activities of Fe-S clusters containing protein (eg, aconitase) and Iron content in drug resistance isolates of L.donovani promastigotes. Study suggests the presence of LdFrataxin & LdIsd11 and their interaction with central components of Fe-S cluster machinery of L.donovani. Fe-S proteins and iron content are up-regulated in drug resistant L. donovani promastigotes.

Biography

Amir Zaidi is a Predoctoral fellow at Department of Biochemistry and registered with Dr. Vahab Ali. Dr.V Ali is an eminent ICMR Scientist who first time identified NIF, Fe-S clusters machinery system in E. histolytica. Mr.Zaidi has been awarded CSIR & UGC fellowship and working on “characterization of iron sulfur clusters (ISC) machinery of protozoan parasite”, an ICMR supported project. He is a member of the Society of Biological Chemists and also in advisory committee of Renaissance Biotech Pvt. Ltd, India.

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Isolation and characterization of bacteria isolated from municipal solid waste for industrial enzymes and waste degradation

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A total of 10 samples were collected from waste dump sites of Dhapa and Barrackpore Municipality and 9 isolates of bacteria were isolated using Nutrient Agar medium. The optimal cultural conditions, microbiological characteristics, biochemical characteristics, antagonistic and synergistic activities within the strains, tolerance to 5 heavy metals (Arsenic, Zinc, Lead, Mercury, Cadmium), their sensitivity towards four different antibiotics (Gentamycin, Oxytetracycline, Penicillin, Streptomycin) and production of extracellular enzyme of the bacterial strains were documented. Among the 9 isolates 6 exhibited protease production and 1 was selected for protease production with high titer value. All of the 6 strains capable of producing protease were also applied for waste degradation efficiency test. These results have increased the scope of finding industrially important bacteria from municipal waste dump sites and these isolates could be vital source for the discovery of industrially useful enzymes / molecules.

Keywords: Waste dump sites, Bacteria, Antagonism, Extracellular enzymes.

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Natural products: A molecular target for cancer prevention and treatment

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Cancer is the second leading cause of death worldwide. With few effective therapies cancer results in the death of a significant proportion of patients. As a result, the search for new treatments of cancer has rapidly gained momentum over the recent years. In particular, non-toxic "natural products" from natural resources in combination with conventional chemotherapeutic agents are proven useful in treatment of human malignancies with lower toxicity and higher efficacy. Recent data suggest that natural products like curcumin, tea, pomegranate, neem, extra-virgin olive oil, carrot, lemon, soybean, fish oil, tomato, garlic and amla can work as modifiers of signal transduction pathways to elicit their beneficial effects. These natural compounds are responsible for regulating cellular proliferation or apoptosis mainly by acting through nuclear factor-kappa B, mitogen-activated protein kinase signalling, Akt signalling pathway and several transcription factors, proteins, enzymes. This review will discuss recent research data focusing on these natural product-induced cellular signal transduction pathways. A clear understanding of the molecular mechanisms of action is crucial in the valuation of these potent molecules as potential prophylactic and therapeutic agents.

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Biotechnological tools: A new strategies for biodegradation of leather industry waste effluent

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Leather industry effluent contributes to one of the major industrial pollution problems and the pollution causing chemicals, viz. lime, sodium sulphide, salt, solvents, etc. arise mainly from the pre-tanning processes of leather processing. The environment is under increasing pressure from solid and liquid waste effluent emanating from the leather industry. These are inevitable by-products of the leather manufacturing process and cause significant pollution unless treated in some way prior to discharge. Biological treatment is one of the prominent processes for biodegradation of leather industry effluent, which involved both aerobic and anaerobic processes. Tannery waste effluents contain sulfide, chromium, which impart high antibacterial activity .Several problems have been encountered during the biological treatment of tannery wastewater because of high toxicity. The inhibition of biodegradation due to the presence of chromium and sulfides demonstrates the antibacterial activity. So, further application of biotechnological tools like genetic transformation could developed greater strategies for the microbes (i.e. genetically modified microbes) for biodegradation of leather industry waste effluent.

Keywords: Tannery effluents, antibacterial, biotechnology, biodegradation.

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Antibacterial activities of different extracts of Holoptelea integrifolia

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The various parts of Holoptelea integrifolia, with vernacular name nemali chettu (telugu) a roadside plant, are indicated by Charaka Samhitha, Sushrutha and other traditional systems for the treatment of inflammation, acid gastritis, Antitumor, Intestinal Worms, Vomiting, Wounds, Leprosy, Antiviral, Diabetes, Adaptogenic, Anthelminitic. According to literature survey, the plant Holoptelea integrifolia Roxb. exhibits a wide range of biological activities which have been reported by many scholars. These all activities are subjected to further studies to establish the effective solvent and plant part. Methanol, Ethanol, Chloroform and Aqueous extracts of the leaf of Holoptelea Integrifolia were studied for antibacterial activity against four bacterial strains using agar well diffusion method and minimum bactericidal concentration and minimum inhibitory concentrations were determined for each strain. The antibacterial activities of different extracts of Holoptelea Integrifolea at various concentrations were evaluated where zone of inhibition was compared with the standard drug i.e ampicillin.

All extracts except aqueous extracts had a significant broad-spectrum inhibitory activity. The methanol extract of leaf had the potent antibacterial activity, with a minimum inhibitory concentration (MIC) of 50µg/ml and a minimum bactericidal concentration (MBC) of 350µg/ml against selected bacteria. The Methanolic extract of leaf showed maximum inhibitory activity compared to Ethanolic, Chloroform and Aqueous extracts. Methanol extract of leaf was found to be very effective against all the test organisms used. Ethanol extract of leaf was effective only against Staphylococus Aureus; Chloroform extract of leaf was effective against E.Coli, B.Subtilis; aqueous extract of leaf was effective against S.aureus and E.coli, when compared to standard drug ampicillin. The minimum inhibitory concentration for Methanol extract was found to be 50, 300, 25 and 100 µg/ml against S.aureus, B.Subtilis, E.coli and S.typhi; for Ethanol extract was 100µg/ml (S.typhi); for chloroform extract was 100µg/ml (E.coli) and 25µg/ml (B.subtilis) and for aqueous extract was 50µg/ml (S.aureus) and 25µg/ml (E.coli) respectively suggesting the antibacterial activity of Holoptelea Integrifolia.

Keywords: Holoptelea Integrifolia, antibacterial activity, zone of inhibition, minimum inhibition concentration, leaves.

Biography

Kavitha Alli is pursuing her Ph.D from JNTU Hyderabad under the guidance of Dr. Laxmi Narasu and she completed her masters in BioTechnology from Sri Shakthi Kailash women's college, Salem under Periyar University, Tamilnadu. Her areas of interests include use of traditional medicinal plants in modern medicine.

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Breeding of Cistan yaghouti grape using clonal selection

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Cistan Yaghouti grape is belong of seedless grapes that it is resistance to diseases and growing in situation Cistan weather which almost have hot winds and salt soil but branch of this grape is density with small berry. In order to increase of fruit quality, we investigated yard vines of Cistan areas such as Zahak, Doostmohammd and Bonjar. We collected samples of Yaghouti grape. Traits of clones of Yaghouti grape were calculated using of Descriptor method. Results shown that Yaghouti grape clones had high variation in traits such as density of branch, size of berry, weight of berry, weight of branch, hight of branch. Therefore could say clonal selection is suitable method for breeding of grape branch quality. Collected Seedlings also planted in Zahak agriculture research station for more evaluation and stability of traits in location and year.

Keywords: Cistan yaghouti grape, Clonal selection, breeding, density of branch.

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Electrochemical DNA hybridization biosensor for typhoid detection based on electrodeposited gold nano aggregates

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Gold nano-particles have been known for their excellent biological compatibility, unique physico-chemical properties. Nano-structured gold has been used in recognition of biological events, facilitating better electronic signal transduction, leading to new generation of bio-electronic devices. We have fabricated gold nano aggregates (GNAs) based electrode via direct electrodeposition method onto indium tin oxide coated glass plates for its application towards development of electrochemical DNA biosensor for early detection of Typhoid. GNP-A/ITO electrode was characterized using X-Ray diffraction that reveals the deposition of metallic gold nano particles in fcc structure. The GNAs/ITO electrode exhibited good electro-analytical activity and shows quasi-reversible behaviour. GNAs/ITO electrode was modified with self assembled monolayer of 11-Mercaptoundecanoic acid (MUA) to immobilize amine modified ssDNA probe for fabrication of ssDNA/MUA/GNAs/ITO bio-electrode. Response studies of the ssDNA/MUA/GNAs/ITO bio-electrode towards target probes were done using differential pulse voltammetry (DPV) by monitoring direct guanine oxidation and with ethylene blue (MB) as redox indicator. Direct monitoring of guanine oxidation with complementary targets on ssDNA/MUA/GNP-A/ITO bio-electrode, limit of detection was found upto 150 ottomol whereas Methylene blue redox indicator exhibited improved limit of detection upto 4 ottomol at 25°C in phosphate buffer with in 60 s hybridization time. The bioelectrode shows 37 times enhanced sensitivity and was found efficiently able to distinguish complementary, non-complementary and one base mismatch target. This biosensor electrode has implications towards detection of other pathogens like M. tuberculosis, Campylobacter, H. Pylori, E. coli etc for clinical diagnostics, food quality control and environmental monitoring.

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Interaction studies of novel antagonists for tuberculosis-An Insilico study

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Histindine Kinase (HK) and response regulator (RR) proteins play a dominant role in adaptation of Mycobacterium tuberculosis (MTB) to its host and its virulence .The two component signal transduction system involves two putative histidine kinases (HK1, HK2) and RR.The HK protein acts as signal receptor which catalyzes its auto-phosphorylation in conserved catalytic ATP binding (CA) domain. The phosphorylgroup of HK later gets transferred to RR, which is involved in DNA binding consequently regulating the gene expression. The two component systems prove to be potential drug targets as they are associated with the virulence of the pathogen MTB and are absent in the host.

In the present work the 3D model of HK1 with 168 residues is generated using comparative modeling method. Energy minimization and structure validation are carried out using various computational methods. The active site for HK1 is predicted for the receptor binding. Protein-protein docking studies are executed between HK1-RR using Z-DOCK program. The various binding interactions of docked complex are analyzed which are useful in identifying novel antagonists for tuberculosis.

Keywords: Two- component system, signal transduction, autophosphorylation, CA domain.

Biography

Anuradha Vippala has completed her M.Sc-Physical chemistry from Nizam College, Osmania University, Hyderabad in 2006.She worked as a Physical Chemistry faculty in P.G &Degree college for 3 years(2007-10).At present she is pursuing her Ph. D research work at Nizam college, Osmania University, Hyderabad. Her research interests include Computer aided Drug Designing, Design of New Molecular Entities using Insilico Bio Informatics tools and other techniques with special reference to MTB.

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Selection of aptamers against cell surface biomarkers in cancer diagnosis

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Nucleic acid aptamers can be selected from pool of randomly sequenced oligonucleotides to bind a wide range of biomedically significant proteins with high affinities and specificities that are comparable to antibodies. While efforts to identify disease-specific biomarkers using a variety of technologies has increased, effective use of disease-specific biomarkers is still scarce. Additionally, it is straight forward to conjugate aptamers to other agents without losing their affinity and they have successfully been used in vitro and in vivo to deliver drugs, siRNA, nanoparticles or contrast agents to target cells. Hence, aptamers identified against cell surface biomarkers represent a promising class of ligands to detect specific type of cancer cells. Specific Cell-SELEX method has been developed to identify aptamers for cell surface associated proteins as well as some of the methods that are used to study their binding to living cells. In contrast to conventional methods, the novelty of cell-SELEX-based biomarker discovery is rooted in its focus on finding specific cell membrane markers. Moreover, cell- SELEX does not require any prior knowledge on the molecular contents of the cell surface. Trillions of random DNA sequences in the initial DNA library, combined with the unique negative selection strategy, ensures that any disease marker molecules on cell membranes can be recognized whether they are known or unknown to us. Provided the molecules in question are expressed in a substantially different way on diseased and normal cells, they can be identified. In addition, the aptamers generated during this process can serve as high-affinity and specific probes for the identified biomarkers. This will be great advancement in future diagnostic applications for cancer therapy.

Biography

Arghya Sett completed his MTech in Biotechnology from VIT University. He is currently pursuing his PhD in Dept. of Biotechnology, IIT Guwahati. His current research interest is in development of novel molecular marker based breast cancer diagnostics.

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Culture-dependent diversity of actinomycetes in Indian solar salterns

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Solar salterns are extreme, hypersaline environments in many tropical and subtropical regions throughout the world. In India, there are several coastal solar salterns along the coastal lines but their actinomycetes diversity was largely unexplored. In the present study, soil sediments were collected from ponds of solar salterns and subjected to detailed physico-chemical analysis. Actinomycetes were selectively isolated by employing selective processing methods and agar media. Twelve representatives were selected from entire actinomycete isolates by Amplified Ribosomal DNA Restriction Analysis (ARDRA) with restriction endonuclease HaeIII. Sequencing and analysis of 16S rDNA from chosen representative isolates displayed the presence of members of bacterial genera: Streptomyces, Micromonospora, Nocardia, Nocardiapsis, Sacropolyspora and Nonomurae. The genus Streptomyces was found to be the dominant followed by Micromoonopora among the actinomycete isolates. To our knowledge, the presence of a rare actinomycete species, Nonomurae was revealed for the first time from Indian solar salterns. As actinomycetes encompass recurrently foremost sources of biotechnologically important members of the microbial communities, the actinomycetes retrieved from the Indian saltern sediments left platform to search for novel biotechnologically significant substances for bio-pharmaceutical applications.

Keywords: Actinomycetes, Diversity, Solar saltern, 16S rDNA, ARDRA.

Biography

Arul Jose Polpass has completed M.Sc., M.Phil in Biochemistry and serviced as Lecturer at N.M.S.S.V.N. College, Madurai, India. Now, he is pursuing his Ph.D with Meritorious Student Research Fellowship from UGC under the guidance of Prof. RD. Jebakumar Solomon from Madurai Kamaraj University, Madurai, India.

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Biology and biotechnological application of marine dimorphic yeasts: Yeast-metal interactions

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Heavy metal tolerance in two marine dimorphic yeasts was evaluated on YPD agar medium. Effect of heavy metal ions on growth kinetics of both yeast was observed. The morphological changes in both yeasts were also observed by scanning electron microscopy (SEM).Biosorption of lead and chromium was studied with respect to pH, temperature, contact time, biomass and initial concentration of metals. The surface sequestration of metal ions on the surface of yeast biomass was investigated by scanning electron microscope equipped with an Energy Dispersive Spectroscope (SEM-EDS) and Fourier Transform Infrared (FTIR) studies. Bioaccumulation of Cr (III), Cr (VI) and Pb (II) in yeast cells was demonstrated by Transmission Electron Microscopy (TEM). Further, Pbs, Cr and Cu nanoparticles were synthesized by using marine yeast cells as a simple, non-toxic, eco-friendly 'green material'. These nanoparticles were characterized by using SEM, TEM, XRD and Uv-Vis techniques. Cu nanoparticles were further tested for their antimicrobial activity.

Biography

Ashok Bankar is PhD student at Institute of Bioinformatics and Biotechnology, from University of Pune, Maharashtra, India. He has awarded CSIR scholarship for his Ph.D. and awarded travel grants from DST, VIBES, MICOM to attend conference at Belgium, Germany and USA. He has published 8 research papers and 1 book chapter in peer reviewed Journals.

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Production of a thermophilic and solvent-tolerant lipase-from a bacterial isolate

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The production of thermophilic and solvent resistant enzymes is a very useful task in industrial biotechnology. From the processing and economic point of view the high boiling point and low vapour pressure of water results in the expensive purification steps to separate the product (s) from an aqueous based biotransformation. Thus keeping in mind all these facts a thermophilic and solvent tolerant lipase producing bacterial isolate has been screened from the mud soil of hot spring. Among the 30 isolates grown on the tributyrin (2% v/v) agar plates the bacterial strain with maximum clear zone is selected and grown in a modified minimal medium. The isolated strain was found to be Gram-positive, rod shaped, sporulating and forming creamish white colonies with irregular edges. The physico-chemical parameters studied to improve the production of lipase in the broth were temperature, pH, inoculums size and agitation rate along with carbon and nitrogen sources. The extracellular lipase produced by isolated strain exhibited maximum activity 118 ± 3.12 IU/ml in DMSO. The lipase producing capacity has been studied against various organic solvents DMSO, hexane, heptane and hexadecane at different concentrations. It has been found that production of lipase and growth of bacteria varies with increasing the concentration of organic solvent. However the bacterial strain had shown the growth up to 25% (v/v) DMSO but lipase activity decline sharply at such higher concentration. The maximum lipase activity has been reported at 10% (v/v) DMSO. The behavior of lipase has been also varying with the nature of solvent have different pKa values. The yeast extract as a nitrogen source was found to increase the enzyme activity 120 ± 4.02 IU/ml in the broth and among the different carbon sources glucose 0.5 % w/v has also elevated the lipase activity. Among the different oils used in production medium cottonseed oil has been found to increase the production of lipase after 48 h incubation under shaking. Such solvent-tolerant lipases will probably boost many biotechnology-based industries for the synthesis of various products of commercial value.

Keywords: Solvent tolerant, lipase, tribytyrin, gram positive, spores.

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Expression and purification of biologically active alpha toxin of Clostridium perfringens

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Production of purified alpha toxin of C. perfringens is essential for development of diagnostics and vaccines against alpha toxin mediated clostridial diseases such as gas gangrene. But, purification of native toxins from culture requires a multistep procedure and the purity is often unsatisfactory. Thus development of recombinant alpha toxin is a promising technique for larger scale production at low cost with satisfactory qualitative maintenance. Thus in the current study, an attempt was made to clone and express plc gene encoding alpha toxin. For this, the particular gene (1115bp in size) was amplified from genomic DNA of C. perfringens obtained from Division of Biological Standardization, I.V.R.I, Izatnagar, using self designed primers. The forward and reverse primers contained EcoRI and XhoI site respectively. Further the amplicon was cloned into prokaryotic expression vector pPROEXHTb. The positive clones were confirmed by PCR, double restriction digestion and sequence analysis. Induction of recombinant clones with 1mM IPTG expressed rAlpha having 46.171 kDa molecular weight. This was subsequently purified from bacterial lysate using metal chelate affinity chromatography. Removal of urea from elute by stepwise dialysis yielded the biological active rAlpha as denoted by its hemolytic activity on murine RBC. The concentration of purified protein was 0.13mg/ml. Antigenicity of protein was proved by immune-blotting using whole cell anti-sera raised in rabbits. Now further studies are required to test its suitability as a vaccine and diagnostic candidate in various C. perfringens diseases.

Biography

Ajay Kumar Rai completed B.V.Sc & A.H degree in 2010 from College of Veterinary Science and Animal Husbandry, MHOW. He got 10th rank in all India entrance exam for ICAR–JRF. He is presently pursuing his post graduation in Veterinary Bacteriology and Mycology at Indian Veterinary Research Institute, Deemed University, Izatnagar.

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QSAR investigation on quinolizidinyl derivatives in Alzheimer's disease

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Alzheimer's disease (AD) is a debilitating illness with unmet medical needs. The number of people afflicted with the disease worldwide is expected to triple by the year 2050. The well known theory of quantitative structure–activity relationships (QSAR) is based on the hypothesis that the biological activity of a chemical compound is mainly determined by its molecular structure. Also, it is well known for instance that within a particular family of chemical compounds, especially of organic chemistry, that there are strong correlations between structure and observed properties. Sets of quinolizidinyl derivatives of bi- and tricyclic (hetero) aromatic systems were studied as dual or BChE-selective inhibitors. In this work, quantitative structure–activity relationship (QSAR) study has been done on quinolizidinyl derivatives as potent inhibitors of acetyl- and butyrylcholinesterase with potential in alzheimer's disease. Genetic algorithm (GA), artificial neural network (ANN), stepwise multiple linear regression (stepwise-MLR), multiple linear regression (MLR), partial least squares (PLS) and principal component regression (PCR) were used to create then on non-linear and linear QSAR models. In the gas phase the root-mean square errors of the training set and the test set for GA–ANN model using jack-knife method, were 0.1406, 0.2165 and R^2 was 0.90. Also, the R and R^2 values in the gas phase were obtained 0.88, 0.78 from GA-stepwise-MLR model and the R^2 value was obtained 0.60, 0.57 from GA-PLS and GA-PCR models. We find out GA- ANN model is the most favorable method toward the other statistical methods. Also, we find out GA-MLR model is most favorable method for predict.

Keywords: Alzheimer's disease, Quinolizidinyl derivatives, Artificial Neural Network (ANN), QSAR model.

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Diet as a strategy for primary prevention of Type 2 Diabetes mellitus

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Foods are functional if benefit one or more body functions, more than adequate nutritional effects, lead to improved health state and well-being and or reduction of risk of diseases. The biological cord between nutrition, biological responses and diseases is already established. For prevention of Type 2 Diabetes mellitus, low saturated fat products, vegetables, fruits, wholegrain foods, low glycemic index starchy foods are effective. The risk for developing type 2 diabetes is associated with overweight and obesity; abdominal obesity; physical inactivity; and maternal diabetes. Round 75% of the risk of type 2 diabetes is attributed to obesity-a nutritional burden.

In recent years, the prevalence of type 2 diabetes has increased alarmingly worldwide, giving diabetes the dimension of an epidemic. The type 2 Diabetes mellitus is a consequence of a complex interaction between genetic and environmental factors, largely due to changes in dietary pattern and lifestyle, and can be prevented via moderate diet and lifestyle modifications. The evidence available on functional foods till date in this field is incomplete: the major gap is the lack of diet-based intervention trials of sufficient duration to be relevant for the natural history of diseases like overweight and diabetes. A scientific survey was conducted on people of Jammu & Kashmir suffering from Type 2 Diabetes mellitus and a correlation of their dietary pattern and lifestyle was made. A major challenge is to practise this knowledge in field of public health.

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Invitro screening of Pseudomonas spp for their biocontrol potential against phytopathogens of vanilla

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Biocontrol involves harnessing disease suppressive microorganisms to improve plant growth. Disease suppression by biocontrol agents is the sustained manifestation of interactions among the plant, the pathogen, the biocontrol agent, the microbial community in and around the plant and the physical environment. In recent times biological control of plant pathogenic fungi has received a considerable attention, as it has several advantages such as possibility of multiple pathogen suppression, low cost and promotion of soil fertility. Fungal isolates in Vanilla pose a major problem in causing reduction in yield to considerable level. Fusarium oxysporum, Rhizoctonia solani and Sclerotium rolfsii were isolated from naturally infected vanilla plants and an attempt were made to minimize the damage caused by the pathogen using biocontrol agents Pseudomonas fluorscens , and Pseudomonas putida, isolated from soil and were found to be effective in controlling these diseases of Vanilla.

In the present study antagonistic Pseudomonas spp. isolated from the Vanilla rhizosphere were evaluated for the biocontrol of major fungal pathogens of Vanilla. The fungicide tolerance and In vitro compatibility of the identified biocontrol agents were determined and can be exploited for the effective management of phytopathogens of Vanilla. Antagonistic effect of Pseudomonas isolates against phytopathogens were tested by dual culture method outlined by Skidmore and Dickinson (1976). For this, 10 predominant isolates of Pseudomonas spp isolated from vanilla growing areas were used .The Pseudomonas isolate P7 showed maximum inhibition against Fusarium oxysporum (60.23%) Rhizoctonia solani (58.67%) and Sclerotium rolfsii (54.19%) and were selected for further studies. P3 showed least inhibition against Fusarium oxysporum (36.47 %) and P10 showed the least inhibition against Rhizoctonia solani (34.00%). All the isolates except P2 showed inhibition against Sclerotium rolfsii (22.22%) after 5 days of inoculation .In this work, the result of dual culture revealed the rapid colonisation of the medium by Pseudomonas isolates. All Pseudomonas isolates evaluated were effective in controlling colony growth of the phytopathogens. The results reported here suggested that from the isolates of Pseudomonas used in this study, P. fluorescens (P 7) and P. putida (P 4) strains were more capable of influencing the growth of all tested pathogens in dual culture.

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High performance liquid chromatographic method for determination of garenoxacin mesylate in pharmaceutical dosage form

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A simple and rapid HPLC method was developed for the determination of Garenoxacin mesylate, in pharmaceutical dosage form. An Agilent 1100 series HPLC with DAD Detection and column thermostat was used for the proposed method. Chromatographic separation was achieved on a YMC Pack Pro; C_8 (150 x 4.5 mm, 5µm) column with mobile phase containing buffer (1.36g KH_2PO_4 in 1000ml water, 1ml TEA, pH 4.5±0.05 with OPA): acetonitrile (75:25%, v/v) at a flow rate of 1.0 ml/min. The run time was 6 minutes. The column temperature was maintained at 10°C.Diode array detection and quantification of Garenoxacin was carried out at 279nm.The drug shows linearity in the concentration range of 10-160 µg/ml with a correlation co-efficient of 0.9993.The developed method was validated for specificity, linearity, accuracy, precision (system and method),solution stability and system suitability. Specificity of the method was evaluated with respect to identification, placebo interference and known impurity interference. The proposed method was used successfully for determination of Garenoxacin mesylate in tablet dosage form and can be further applied for bioavailability and pharmacokinetics studies.

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Studies on optimisation and mechanism of aerobic bacterial consortia (CN1) on textile dye, mordant black 17 and textile effluent

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The present work spotlights on the microbial degradation of textile azo dye, Mordant Black 17 (MB17) and effluent by eleven bacterial isolates. Thirty five bacterial isolates were isolated from textile dyeing industry effluents. Proficient and rapid dye degradation was identified in eleven isolates producing concomitant enzymes for efficient degradation. Microbial consortia were developed on the basis of dye degrading competence of the strains and it was inculcated on the textile effluent. Nearly 70%-90% degradation was achieved in less than about 72 h in these isolates tested on individual dyes. Promising results were obtained with consortium CN1 on both textile dye (MB17) and textile effluent. 16S rRNA gene amplification was carried out for the sequencing and the isolates were identified as Pseudomonas sps, Moraxella sps and Citrobacter sps. TLC, FTIR and GC-MS analysis confirmed the presence of aromatic amines and to aid the data supporting the course of degradation. As identified from the analyses, the final products of (MB17) were salicylic acid which was confirmed by GC-MS. Salicylic acid, a phenolic acid could be a prominent source in medicinal and cosmetic products.

Keywords: Degradation, 16S rRNA sequencing, TLC, FTIR, GC MS, Mordant Black 17, Aromatic amines.

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Biofuel production from microalgae

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The demand for fossil fuels like coal, petrol, diesel and gases are increased tremendously day by day while the available sources reduced drastically. The usage of fossil fuels the green house effects become a critical problem for the environment. In order to address these problems the world must look for alternate energy by eco friendly process. Biofuel is one of the best alternative sources for fossil fuel. In this paper, the current state of the art for biofuel production from microalgae is reviewed, analyzed and concluded that there is a future scope for the production of biofuel from microalgae using various properties.

Keywords: Biofuel, Microalgae Fossil Fuel, Harvesting and Photobioreactor.

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Mass spectrometry identification of pathogens in various sample solutions using functionalized magnetic iron oxide (Fe3O4) nanoparticles

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The textile industries show a significant increase in the use of synthetic complex dyes as colouring material. Dyes, like other chemical substances, may be capable of producing adverse health effects to living organisms. There is an increase of environmental contamination caused by the large amount of dyes involved in the textile process that are discharged in the liquid effluents. Therefore, natural dyes are now given more importance. Many researches are being undertaken for extraction of dyes from different natural colouring sources. The study was aimed at producing eco-friendly and efficient dyes from certain native flowers like Marigold, Hibiscus, Gomphrena, Dahlia and Oleander collected in and around Erode district, Tamilnadu.. The crude dye stuff was extracted by the method of boiling. The effect of different times and temperature regimes on the extraction of dye stuff and the antibacterial activity of the crude dye stuff against various Gram's positive and Gram's negative bacterial species were studied. The effect of the synthetics mordants like Potassium dichromate, Copper Sulphate, Alum and Ferrous sulphate on dyeing efficiency was compared to that of the natural mordants like lime and vinegar. The wash fastness, light fastness and abrasion fastness to infer the dying quality. The wastes after dye extraction were used as biofertilizer. The selected native flowers showed good dyeing properties. Hibiscus and marigold dye extracts gave brighter shades compared to the other flowers. Wash fastness was significant in hibiscus, gomphrena and marigold dye stuffs that were treated with potassium dichromate. Light fastness was efficient in hibiscus and the rub fastness was notable in marigold dyes. The synthetic mordants like potassium dichromate and copper sulphate and natural mordants like vinegar were effective. This method proved to be a cost effective and eco friendly alternative to the commercial synthetic dying. Future work will be focused on large scale extraction of dyestuff by standardizing optimum mordant concentration and usage of these natural colourants in food. Ultimate objective is to provide an effective alternative for the chemical textile dyes and food colourants.

Keywords: Natural dye, Antibacterial activity, Boiling, Mordant, Wash fastness, Light fastness and Abrasion fastness.

Biography

C. Monica is currently studying her undergraduate degree in Biotechnology at K.S.Rangasamy College of Technology, Tiruchengode, Namakkal District, Tamil Nadu, India. She has published around 10 papers in various national and International conferences. She is a recipient of "Summer Research Fellowship" offered by Indian Academy of Sciences, Bangalore during the academic year 2011-2012. She is serving as an Editor-in-Chief for Biozoom magazine released by Department of biotechnology, K.S.Rangasamy College of Technology.

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Biotechnological strategies for enhanced production of secondary metabolites from plants

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Plants are rich source of alkaloids, steroids, terpinoids, phenolics, sweetners, bittering agents, pigments and perfumes. These are used as source for large number of industrial products, including agricultural chemicals, pharmaceuticals and food additives. There is a continued commercial demand for these metabolites in food and pharmaceutical industries. Earlier the production of plant secondary compounds was achieved through the field cultivation of plants. It is difficult to cultivate some plants outside of their original ecosystems. The isolation of these compounds through the extraction of organs and seeds of whole plants is difficult and costly. Various methods in biotechnology, like free cell suspension culture, elicitation, immobilization and biotransformation has been developed to accumulate desired products. Currently, much interest is focused on the large-scale culture of plant cells as sources of commercially important secondary metabolites. The present review is focused on biotechnological strategies developed so far to enhance secondary metabolites production.

Keywords: Plant cell cultures; Secondary metabolites; Elicitation; Bioreactors; Biotransformation; Hairy root cultures; Immobilized cells.

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Optimization of cultivation conditions for the production of pullulan and detection of anti-oxidant and metal absorption (biosorption) properties of Aureobasidium pullulans BS1 newly isolated from the phylloplane of Brassica oleracea from chittoor and vellore

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The aim of this study was to optimize the medium and cultivation conditions and to investigate the possibility of applying Aureobasidium pullulans BS1 for the study of anti-oxidant activity and metal biosorption efficiency with the simultaneous biosynthesis of Pullulan. The A. pullulans BS1 was screened from the phylloplane of Brassica oleracea reported in our previous study by enrichment process. The various parameters (pH, Temperature, Time period of Incubation and types of Carbon and Nitrogen sources) were optimized. The optimal medium for pullulan production by this strain BS1 was 7.0% (w/v) glucose, 1.8% (w/v) soybean cake hydrolysate, 0.45% (w/v) K_2HPO_4, 0.1% (w/v) NaCl, 0.02% (w/v) $MgSO_4 \bullet 7H_2O$, 0.05% (w/v) $(NH_4)_2SO_4$, pH 6.5. The optimal cultivation conditions for pullulan production by this strain in 300-ml shake flask containing 50 ml of medium were observed at 28°C and with 180 rpm. Under these conditions, 6.5% (w/v) pullulan was produced within a time period of 3 days. No melanin like pigments in the medium was observed during the fermentation process, indicating that strain BS1 was a non-pigmented yeast strain. The metal absorption efficiency and the antioxidant properties of the isolated strain were found with simultaneous production of pullulan in the fermentation broth.

Biography

Bishwambhar Mishra has received his engineering degree in Biotechnology from VIT University, Vellore in the year 2010 and presently pursuing his research work in "production of biopolymer (pullulan) from the microbial sources" under the guidance of Dr. Suneetha Vuppu in VIT University. He has attended many national and international conferences, seminars and workshop and presented papers and posters in various scientific events. He has published total 9 papers in both national and international peer reviewed journals.

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Employment of a repeated batch system for the biotechnological production of a renewable green sweetener

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The increasing focus on sustainable industrial processes for the chemical industry has resulted recently in a number of new bio-based initiatives. Environmental pressures and a shift towards the use of agricultural-based raw materials, as well as rapid developments in the science supporting biotechnology, have stimulated this interest. A case study on xylitol production, a green sweetener, using agricultural residues and based on pentose fermenting microorganism employed in repeated batch fermentation system with immobilized cells, is presented as such a process that provides an opportunity for an improved and more competitive production route. Immobilized cell system is considered as an attractive alternative to reuse the well grown and adapted yeast cells in a new fresh fermentation media, without the need of the inoculum stage. In this work, seven repeated batches were performed in a fluidized bed bioreactor using immobilized cells in calcium alginate beads. According to obtained results it was observed that the immobilized cells of C. guilhermondii can be reused for sex successive batches maintaining an average xylitol yield (Yp/s) of 0.69 g/L and volumetric productivity (Qp) of 0.43 g/Lh at the end of 432 h of fermentation. On the other hand, in the seventh batch (504 h) it was observed a decrease of 44% in the final concentration of xylitol. This reduction can be explained by the possible diffusion and accumulation of insoluble substances found in the hemicellulosic hydrolysate in the interior of the immobilization support resulting in limitations in substrate mass transfer.

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Development of pantothenate synthetase inhibitors for mycobacterium tuberculosis infection: Design and enzyme inhibition studies

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Pantothenate synthetase (PS) encoded by panC gene from Mycobacterium tuberculosis a potential target for antituberculosis drugs. PS catalyzes the ATP-dependent condensation of pantoate and ß-alanine to form patothenate in bacteria, yeast and plants. This PS is absent in mammals and both CoA and Acyl carrier protein are essential cofactors for bacterial growth, and hence PS is an attractive chemotherapeutic agent for tuberculosis treatment. The crystal structure of PS were determined from M.tuberculosis and its complexes with AMPCPP, pantoate and pantoyl adenylate. A novel potent PS inhibitors were developed and screened against PS for inhibitory activity. The activity of PS was measured spectrophotometrically through an enzymatic cascade involving myokinase, pyruvate kinase, and lactate dehydrogenase. The rate of PS ATP utilization was quantitated by the reduction of absorbance due to the oxidation of NADH to NAD+ by lactate dehydrogenase, which allowed for an internal control to detect interference from compounds that absorb at 340 nm. This coupled enzymatic reaction was used to screen 100 compounds in a 96-well format. One hundred inhibitory molecules were computationally analyzed using Glide docking, and the inhibitors possessed better binding affinities against the PS enzyme. The in vitro validation of these inhibitors has proved its efficacy as a better target for TB.

Biography

Brindha Devi P has completed his PhD from Andhra University and pursuing research for Ph.D. in the Department of Pharmacy, Birla Institute of Technology & Science, Pilani, Hyderabad Campus.

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Studies on the production of glutamic acid by Brevibacterium immario philium under solid state fermentation of citrus pulp

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L-Glutamic acid was a widespread amino acid present in food stuffs as the free and protein bound form. Foods containing large amounts of free glutamic acid (tomatoes, mushrooms and cheese) are traditionally used to obtain savory dishes. Only the free form of glutamic in its L-configuration presents flavor enhancing properties and for this reason, it was widely used as a flavor enhancer in the food industry, particularly in the form of the monosodium salt. Even though there was no complete agreement about the safety of Monosodium Glutamate, Food and Drug Administration (FDA) includes it among the substances generally recognized as safe(GRAS).

The solid state fermentation (SSF) has number of advantages over submerged fermentation (SMF) like non aseptic conditions, use of raw materials as substrates, use of a wide variety of matrices, low capital cost, low energy expenditure, less expensive downstream processing and it also requires less solvent and lower recovery cost than SMF. SSF has been gaining more and more attention in recent years due to the possibility of cheap and abundant agro industrial waste as substrate. Economic analysis has indicated that SSF technology can considerably reduce the capital investment and total product cost and increase profitability thereby making it an ideal technology in several industrial sectors.

In the present study several agro industrial residues such as black gram husk, rice bran, green gram husk, wheat bran, corn hull, citrus peel and citrus pulp were tested for their potential in the production of L-glutamic acid by eight microorganisms which include Corynebacterium glutamicum, Micrococcus glutamicus, Rhodococcus Sp, Bacillus circulans, Brevibacterium divaricatum, Brevibacterium saccharolyticum, Brevibacterium roscum, and Brevibacterium immario philium.

All the substrates supported the growth and L-Glutamic acid formation by the above eight microorganisms. A high titre of L-Glutamic acid yield (65.1mg/gds) was obtained with citrus pulp by Brevibacterium immario philium.

The maximum L-glutamic acid 245.6µg/gds was achieved with incubation time 96h, temperature 28°C, inoculum level 30% (v/w), salt solution 2.0(v/w), substrate particle size 850µm, pH 7.5 and initial moisture content 60%(v/w).

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Development of collagen based biomaterials from ruminant gastric wall for tissue engineering

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India has the largest livestock population in the world comprising of 200 million cattle (16% of the world) and 105 million buffaloes (56% of the world). About 14.2 million of cattle (8% of cattle population) and 10.3 million of buffaloes (10% of bufffalo population are slaughtered in India each year. The gastric components (viz. rumen, reticulum, omasum and abomasum) are generally not used as edibles and they can be a good source of collagenous biomaterials. The abattoir by products can be effectively utilized as source of extracellular matrices(ECM) scaffolds after proper treatment and processing. In this present study, the protocols were standardized for decellularising the ruminant gastric wall. The rumen and reticulum of buffalo origin were procured from slaughter house. The collected organs were washed and cleaned with distilled water to remove all the debris and feed particles. The tissues were cut into small pieces of size 20x20 mm^2. The tissues were preserved at -20° Celsius in sterile 1X phosphate buffered saline containing a broad spectrum antibiotic. The preserved tissues were thawed to room temperature before it was subjected to protocol for de-epithelialisation. De-eptithelialisation was done by using hypertonic solution. The tissues were subjected to hypertonic solution for different time intervals in an orbital shaker at 37° Celsius. After subjecting the tissues to hypertonic solution, the epithelium was removed manually. The de-epithelialised tissues were then subjected to different concentrations of an ionic biological detergent for varying periods of time in an orbital shaker at 37° Celsius for decellularising the tissues. The results in detail will be discussed at the time of presentation.

Biography

Dayamon D. Mathew did his graduation in Veterinary Sciences and Animal Husbandry from Kerala Agricultural University, Thrissur, Kerala and completed post-graduation (M.V.Sc.) in Veterinary Surgery and Radiology from Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, Karnataka, with ICAR-Junior Research Fellowship. Currently he is pursuing his doctoral degree in Veterinary Surgery from Indian Veterinary Research Institute, Uttar Pradesh, India with ICAR-Senior Research Fellowship. He had published 3 research papers in journals of repute and presented more than 20 papers in various conferences and workshops.

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Potential role of diclofenac sodium in inducing biochemical changes in the testes and liver of mice

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Adverse drug reactions are a major problem for both health care providers and the pharmaceutical industry. They are common and significant cause of morbidity and mortality. Diclofenac sodium is one of the most common non-steroidal compounds of phenyl acetic acid class, binds extensively to plasma albumin, having inhibitory effects on prostaglandin biosynthesis. The prostaglandins are the lipid soluble metabolites of arachidonic acid, a component of cell membrane, which are important in the regulation of vascular responses, apoptosis and inflammation. The present investigation is an attempt to find out changes in the activity of certain transaminases (GOT, GPT), Phosphatases (Acid and alkaline) and other parameters like total proteins, lipids and lipid per oxidation in mice, when exposed to different doses of Diclofenac sodium. There was significant increase in the activity of transaminases during the different stages of the experiment in both liver and testes due to toxic effects of the drug. There was increase in lipid per oxidation owing to the oxidative stress. Significant changes were observed in the other parameters studied during the different stages of the experiment.

Keywords: Diclofenac, prostaglandins, transaminases, oxidative stress.

Biography

Deepak Mohan, working as Assistant Professor in Zoology, Govt. PG College, Mandi, H.P., presently on study leave pursuing his Ph.D. degree from Department of Biosciences, H.P.U. Shimla, H.P. He did his M.Sc. from University of Jammu in 1992 and thereafter M.Phil. from the same university in 1994. In 1999 he was appointed as lecturer in Zoology in the department of higher education. Presently, he is working on drug toxicity for his Ph.D. programme and has published one paper so far. He has been awarded Senior Research Fellowship by CSIR in 1994.

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Screening of maize germplasm for crtRB1 polymorphism and association with HPLC profiling for increased β-carotene content

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Biofortification of maize is an inexpensive and locally adaptable method to alleviate Vitamin A deficiency which is one of the major health problems in the world. Maize displays considerable natural variation for carotenoid composition, including vitamin A precursors α-carotene, β-carotene, and β -cryptoxanthin. The gene encoding β--carotene hydroxylase 1 (crtRB1) underlies a principal quantitative trait locus associated with β--carotene concentration and conversion in maize kernels. 316 maize inbred lines that were obtained from CIMMYT (International Maize and Wheat Improvement Center), Mexico and Directorate of Maize Research, New Delhi were grown and evaluated for crtRB1 polymorphism using gene specific markers. In order to detect the crtRB1 polymorphism the primer HYDB 3'TE was used. The presence of 543 bp (Allele size 1) indicates high, 296+1221+1800 bp (Allele size 3) indicates medium and 296+875bp (Allele size 2) indicates lower level of β-Carotene in maize. DMR30 and DMR38 were recorded withallele size 1. Allele size 2 was recorded inDMR35, DMR16 andDMR254. Allele size 3 was recorded in DMR99, DMR102, DMR103, DMR112, DMR113, DMR104, DMR231, DMR26 and DMR19. The identified genotypes with favorable alleles for crtRBI polymorphism were evaluated for whole kernel carotenoids using spectrophotometer analysis and β-carotene content was evaluated using high performance liquid chromatography (HPLC). The total carotenoid content rages from10.17 µg/g to29.1 µg/g. The beta carotene content ranges from 0.33 µg/g to 9.27 µg/g. Medium level of β carotene was observed in DMR 26 (4.009362 µg/g), DMR 112 (2.009941 µg/g). Higher level was observed in DMR 104 (9.278696 µg/g) and DMR 38 (7.076111 µg/g). Lower level of beta carotene content was observed in DMR 35 (0.330467 µg/g), DMR 102 (0.277442 µg/g), DMR 103 (0.361596 µg/g), DMR 113 (0.810067 µg/g). In PCR assay the 543-bp allele of crtRB1 leading to higher β carotene concentrations, was detected only in lower frequency (1.03%). This study shows that the selection of maize inbreds with enhanced seed beta carotene content is possible by selecting for crtRB1 allele.

Biography

Dhyaneswaran Palanichamy is a master's student in Biotechnology and Business Management at Tamil Nadu Agricultural University (TNAU), Coimbatore. He earned his bachelor's degree in Biotechnology in TNAU and Masters of Professional Studies in Plant Breeding degree from Cornell University, NY, USA. He is about to pursue his PhD in Plant Breeding at Cornell University starting from fall, 2012.

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Lithium chloride as an effective compound to decline acetate accumulation and enhance recombinant human α-synuclein production

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Acetate production by Escherichia coli is the most important impediment to production of recombinant proteins during exponential growth in glucose supplementation. Several strategies have been challenged for reducing acetate production. One of them is modification of the environmental conditions through medium assortment. In this study we investigated the lithium chloride effect on acetate secretion to medium and the production yield of human α-synuclein recombinant protein. We monitored what occurred when we added lithium chloride with at low concentrations (20-50 µMolar) to a TB medium which glucose was added as a replacement for glycerol. It showed that the presence of Lithium Chloride might be able to redirect carbon flux from acetate production pathways to less inhibitory byproducts because it is known as an inhibitor of bacterial acetate kinase. HPLC results showed that the acetate yield by adding lithium chloride is decreased more than fourfold compared to the control, while the biomass yield is relatively unaffected. The data propose that there is a relationship between the pH of the culture and the acetate accumulation during growth so that in the media with Lithium Chloride pH was approximately in steady state rather than control. Albeit lithium chloride might affect on the other pathway of E.coli but there was not only negative effect on the recombinant protein production but also the yield was 20% higher than control. These kinds of methods in which only by changing a bit on culture medium there is a considerable improving in the recombinant protein production could be useful in wide range of proteins production.

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Bacillus pumilus like micro-organism: A novel and promising ectoine producer isolated from the marine niche

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Ectoine, a zwitterionic, low molecular weight compatible solute found in halophiles offers numerous potential biotechnological applications. There are many reported ectoine producers, but the marine environment offers possibilities of better and other unknown producers of ectoine. During our work on screening potential ectoine producers along the Western coast of India, we isolated and identified an aerobic culture biochemically and using molecular technique as Bacilus pumilus. This culture was used for ectoine production by one-factor-at-a-time method and subsequently by Response Surface Methodology. Ectoine production increased from 15.3 mg/L in the initial medium to 99.62 mg/L in the statistically optimized medium containing 55.0 mM glucose, 0.6 % (w/v) mycological peptone, 0.1 % (w/v) ammonium chloride and 3 M sodium chloride. Supplementation of the RSM optimized medium by 4 mM aspartic acid and further optimization of the amino acid enriched medium by Evolutionary Operation (EVOP) yielded 279.68 mg/L ectoine with 70 mM glucose, 2.0 M NaCl and 4.0 mM aspartic acid. Further, the effect of a combined addition of sodium chloride and magnesium chloride and ethylene glycol/glycerol/proline/sucrose on production of ectoine was checked. A second round of EVOP optimization increased the ectoine to 552.61 mg/L with 2.25 M NaCl, 0.75 M $MgCl_2$ and 1.25 M glycerol as the final optimized medium components. Using this medium in a lab-scale bioreactor increased the ectoine production to 956.06 mg/L. Further work on identifying the gene responsible for the ectoine synthesis in this organism with an aim to enhance the productivity of the culture is under progress.

Biography

Chirag D. Desai is pursuing his Ph. D. (Science) Biotechnology degree under the guidance of Prof. Rekha S. Singhal, Professor of Food Technology, Department of Food Engineering and Technology, Institute of Chemical Technology, Matunga (E), Mumbai-400019, India. The authors are working on the topic "Studies on fermentative production and downstream processing of ectoine".

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Design and expression of N-terminal constructs of Arabidopsis thaliana PEX5

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Peroxisomes in eukaryotes are indispensable organelles that import a multitude of proteins to carry out diverse metabolic functions including detoxification. Many of these matrix-directed proteins are bound by peroxisome receptors that are found to be present in both the cytosol and within the peroxisome matrix. The PEX5 receptor plays a crucial role in the peroxisomal import cycle as it recognizes the PTS1 signal peptide present on most matrix-directed cargo proteins and aids their import into the peroxisome. Despite extensive research on this import mechanism there are several questions that need to be addressed in order to form a clear picture of the protein import machinery. The N-terminal of PEX5, lacking a well-defined three-dimensional structure, plays a pivotal role in membrane docking of the receptor and receptor recycling. In order to obtain a wider perspective of the conformational changes occurring at the N-terminal due to cargo loading, several N terminus constructs with varying lengths were designed to test the presence of an interaction between the N- and C-terminal of PEX5, in the presence and absence of cargo and also check the interactions of these N-terminal constructs with PEX14. These findings help in deriving some conclusive results about the nature of interactions at the membrane and how the cargo is imported into the peroxisomes from there on. These findings can be a starting point for the potential use of peroxisomes for biofuel production and fighting against diseases such as the Zellweger syndrome and Peroxisome Biogenesis Disorders (PBD).

Biography

Divya Ramkumar has recently completed her Masters in Biotechnology from the University of Leeds, UK. She has been awarded a distinction for her research project and also been awarded an overall distinction in her Master's degree. She has also secured a distinction in her undergraduate degree in Bioinformatics from the SRM University, India.

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A Comparative study on proteomic and biochemical alterations in the cyanobacterium Anabaena sp. PCC 7120 under short term exposure of abiotic stresses: Pesticide, salinity, heavy metal and UV- B

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Cyanobacteria are significant contributors to global photosynthetic productivity, thus making it relevant to study how the different abiotic stresses can alter their cellular activities. Here, changes in phycocyanin pigment composition, antioxidants enzyme activity, peroxidase production, NADPH, thiol content and SDS-PAGE protein profile were examined during a short-term exposure of the cyanobacterium Anabaena sp. strain PCC7120 to Salinity, Butachlor, Cadmium and UV-B. Of these stress conditions, a maximum inhibiton of phycocyanin content was observed for UV-B irradiation followed by butachlor, salt and Cd as compared to control. The total thiol content in the organism is raise slightly over the basal level, to overcome stress imposed by salt and cadmium. However, in UV-B and butachlor only showed the 0.6 and 0.95 fold significant decline in thiol level in comparison to control. Interestingly, in all cases, NADPH\NADH level is significantly decrease below the basal level. Lipid Peroxidation was found to be increase significantly in all stresses, while a SOD and catalase registered a maximum increase in cadmium and UV-B. A peroxidase production found to be highest in response to butachlor. Further, SDS-PAGE analyses of the total protein profile revealed the appearance of several differentially expressed protein bands in all the four stress. In addition, several up and down regulated proteins, newer protein bands appeared in treated cultures when compared to the control. However, biochemical and proteomic attributes suggests that, to overcome the abiotic stress, organisms generally might have defense mechanisms that prevent interaction with the stress factors and that counteract the stress-induced damages.

Keywords: Abiotic stress, Cyanobacteria, Antioxidant enzymes, SDS-PAGE.

Biography

Dhammika Leshan Wannigama is the final year student of Bsc (Hons) Industrial Microbiology at Center for Advanced studies in Botany, Banaras Hindu University, Varanasi-221005, India. He has published three international research publications, two seminar publications and including final year dissertation project related to molecular biology, under supervision of Professor L.C Rai. In year 2011 he has won the summer research training fellow ship in Tropical Microbiology, Department of Microbiology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand.

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Cationic albumin grafted onto superparamagnetic magnetite nanoparticles surface used for hyperthermia

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Our newly developed carrier, cationic albumin conjugated with citrate capped magnetite nanoparticles (MNPs) is designed with proper physicochemical characteristics for hyperthermia applications. MNPs of about 10 nm were synthesized through co-precipitation of Fe^{2+} and Fe^{3+} in an ammonia solution, then citric acid was used to stabilize the MNPs suspension. It was anchored on the surface of freshly prepared MNPs by direct addition method. Carboxylic acid terminal group provides a site for further surface modification. The surface modification of the MNPs is provided by cationic albumin, which was covalently conjugated to carboxylic function located at the distal end of MNP's surface by carbodiimide chemistry. The cell surface membrane is negatively charged, so this charged surface provides sites of interaction for cationic particles. From which we obtain nanoparticles with hydrodynamic sizes of about 100 nm. Magnetic measurement revealed that the saturation magnetization of the nanoparticles was 64 emu/g and the nanoparticles were superparamagnetic at room temperature. We also have analyzed the potential of these particles for magnetic fluid hyperthermia by determination of the specific absorption rate. This study experimentally proves the high efficiency of these new particles to absorb the energy of an alternating magnetic field and convert it into heat which shows great potential of these nanoparticles in hyperthermia.

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Rapid and direct analysis of small molecular weight extra polysaccharides of Bacteria by Hi-Speed centrifugation coupled with nanoparticle-assisted laser desorption/ionization (HC-Np-ALDI-MS) mass spectrometry

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The analysis of extracellular polymeric substances (EPS) from bacteria traditional methods requires chemical treatments and complicated separation procedures. Analysis of Low molecular weight compounds on Convention MALDI-MS is very difficult due to conventional organic matrixes like DHB or CHCA matrix background peaks are interfere with samples peaks at low molecular range .For avoiding those problems we developed a method, combining Hi-Speed centrifugation or physical extraction method with Nano-particle assisted laser desorption/ionization (HC-Np-ALDI-MS) mass spectrometry (MS) without any chemical treatment or extraction methods, separation and purification of EPS. The objective of this study is to demonstrate the use of Hi-Speed centrifugation coupled with Nanoparticle-assisted laser desorption/ionization (NALDI) mass spectrometry (MS) as a powerful technique for rapid, simple and direct analysis of low molecular weight EPS secreted by bacteria. For this we prepared manganese oxide nanoparticles and developed a nano-PALDI MS method to analyze EPS extract from different bacteria's by using Hi-Speed centrifugation. Our studies showed that nano-PALDI MS was selective for analysis of low molecular weight EPS. This study is a preliminary study reporting for the first time the feasibility of nano-PALDI MS techniques for the analysis of bacterial EPS without prior complicated purification and separation methodologies. The MnO_2 Nano-particles working as matrix during MALDI-MS analysis and help to ionize the EPS Samples. The mass spectra did not show any background interference in the low-m/z range. The results reporting the successful use of the manganese dioxide particles as matrices for analysis of bacterial EPS has been outlined.

Biography

Gangaraju Gedda has a Masters in Analytical chemistry from JNTUH, India. He is currently a Ph.D student in Marine Biotechnology at National Sun-Yat Sen University, Taiwan. He has published articles on the use of electrospray ionization (ESI) and on the use of matrix-assisted laser desorption/ionization (MALDI) for mass-spectrometry-based measurement of the molecular weights of EPS molecules within bacteria. His current research focuses on synthesizing nanomaterials, including nanowires and Nano wire based bio-chip, for use as bio-chip-based Mass Sensors. He is using these sensors to analyze pathogenic bacteria, to perform matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF-MS).

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Meta analysis of eugenol synthase-I in Ocimum basilicum

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Eugenol is one of the important chemical constituent of the essential oils of many aromatic plants, such as Eugenia caryophyllus, Dicipelium cariophyllatum, Pimenta dioica, Croton zehntneri, and Ocimum species. Recent studies suggest that Ocimum (tulsi) may be a COX-2 inhibitor, like many modern painkillers, due to its high concentration of eugenol (1-hydroxy-2-methoxy-4-allylbenzene). Ocimum is proven to be an effective treatment for diabetes by reducing blood glucose levels. Previous study showed that high glucose level in blood results in the increase transcription of Cyclooxgenase-2 (Ref:Narkunraja Shanmagum,Irene T. Gaw Ganzalo and Rama Natarajan). The basic idea behind the work is to reverse this process and for that Eugenol synthase comes in picture. Eugenol synthase suppresses COX 2 expression that has already been proved by Sun Suk Kim et al. There are around 410 experimentally proven medicinal plants having Anti-diabetic properties but the complete mechanism of action is available only for about 109. There are several medicinal plants whose extract modulate glycolysis, Krebs cycle, gluconeogenesis, HMP shunt pathway, glycogen synthesis and their degradation, cholesterol synthesis, metabolism and absorption of carbohydrates, and synthesis and release of insulin. This work provides a comprehensive overview of Meta Analysis of Eugenol Synthase-I in Ocimum basilicum.

Keywords: Eugenol synthase, COX-2, Ocimum basilicum, Meta analysis.

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Cinnamomum zeylanicum blume: A potential antifungal agent against early blight (Alternaria solani NCIM 887) infesting tomato (Lycopersicon esculentum mill)

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Tomato (Lycopersicon esculentum Mill) is susceptible to various fungal pathogens in its complete life cycle. Present study was aimed to investigate the antifungal activity of Cinnamomum zeylanicum Blume (Cinnamon), one of the common spices grown in Srilanka and India. Its bark had been extracted in hexane, methanol and water using soxhlet apparatus. Activity of all these extracts was studied against Alternaria solani (NCIM - 887), an important phytopathogen, causing early blight in tomato. Aqueous extract did not exhibit any antifungal activity. On the other hand, hexane and methanol extracts showed excellent in vitro anti-fungal activity against A. solani at 1ml and 2 ml/lit dose. Different combinations of crude extracts were tried for pot assay bioefficacy studies against the same phytopathogen. The mixture of hexane and methanol extracts showed control of early blight in tomato after 48 to 144 hrs with increase in number of flowers and fruits as compared to untreated control. These results clearly showed that this mixture, after proper formulation, has a potential, though not in total replacement but minimization in the use of chemical fungicides.

Keywords: C. zeylanicum, herbal fungicide, A. solani, early blight etc.

Biography

Gauri Yeole has completed her M.Sc. Biotechnology, qualified Ph.D. Entrance Test (PET 2010) from North Maharashtra University, Jalgaon, Maharashtra, India. She worked as a Lecturer in Undergraduate College affiliated to same university. She is pursuing her Ph.D. in Biotechnology, with research topic entitled, "Development of herbal fungicide against phytopathogenic fungi". Her research paper is in progress.

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Therapeutic role of recombinant Penaeus monodon antiviral (rPmAV) protein against WSSV in Penaeus monodon

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PmAV is the first antiviral gene identified from Penaeus monodon. Although, the antiviral mechanism of PmAV protein has been well established, no studies were conducted to evaluate its efficacy as a therapeutic molecule. Therefore, the present study was performed to evaluate the therapeutic role of rPmAV in combating WSSV in P. monodon. The therapeutic efficacy of rPmAV was tested in three different forms viz., purified rPmAV protein expressed in a fish cell line, naked plasmid DNA construct constitutively expressing rPmAV (pcDNA-His-PmAV) and rPmAV expressing plasmid DNA encapsulated with chitosan nanoparticles. Survival analysis was carried out using Kaplan Meier analysis (SPSS V.16). The challenge studies showed that pcDNA-His-PmAV, Chitosan-pcDNA-His-PmAV nanoparticles and rPmAV protein (23.5 kD) injected intramuscularly into P. monodon gave survival rates of 27.8, 83.3 and 66.7%, respectively on fifteenth day post WSSV challenge. The purified rPmAV protein gave high survival rate during the initial experimental period followed by a sudden decline owing to its shorter shelf life. On the other hand chitosan conjugated pDNA construct gave superior protection of 83.3% amongst all the treatments due to its high stability. Thus, it can be concluded that the rPmAV can be used as an effective therapeutic agent against WSSV in P. monodon provided the economically viable delivery strategies are developed.

Biography

Gireesh Babu is a Scientist at Central Institute of Fisheries Education (Deemed University), Mumbai, a premier Institute of Indian Council of Agricultural Research, Ministry of Agriculture, Government of India. He has about 4 years of research and teaching experience in the area of Molecular Biology and Genetic Engineering and has published a number of research papers.

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Process optimization for enhanced biogas production from Bagasse

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Lignocelluloses are often a major or sometimes the sole components of different waste streams from various industries, forestry, agriculture and municipalities. Hydrolysis of these materials is the first step for either digestion to biogas (methane). However, enzymatic hydrolysis of lignocelluloses with no pretreatment is usually not so effective because of high stability of the materials to enzymatic or bacterial attacks. Effective parameters in pretreatment of lignocelluloses, such as crystallinity, accessible surface area, and protection by lignin and hemicellulose are the most important ones. Although several pretreatment methods are available, their effects on improvement in biogas production are not optimised. They include milling, irradiation, microwave, steam explosion, ammonia fiber explosion (AFEX), supercritical CO(2) and its explosion, alkaline hydrolysis, liquid hot-water pretreatment, , wet oxidation, ozonolysis, dilute-and concentrated-acid hydrolysis, and biological pretreatments.

Sugar cane Bagasse is available in huge quantities, especially in tropical countries, which are at present not properly utilized.

Pretreatment of Bagasse exposes the cellulose making it accessible to cellulase enzyme. Both chemical and biological pretreatments are possible.

Exposing bagasse to 1 % alkali (sodium hydroxide) and mixing with urea enhances biogas production.

Similarly growing pleurotus florida fungi in the presence of urea, lactose and cupric chloride improves biogas production from bagasse. Urea is used to optimize the carbon: nitrogen ratio of the substrate. Lactose and cupric chloride enhances secretion of laccase enzyme, which delignifies bagasse, without sodium hydroxide.

Biography

Gopinathan C has several years of research experience in the area of fermentation technology, especially in the area of Bioenergy. He has got 15 years of teaching and research experience and filed three patents. He has also presented his inventions in several national and international conferences. Presently he is working as the head of department of Biotechnology, University of Calicut.

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Optimization of multiple shoot induction and regeneration of Indian barley cultivars

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Multiple shoot induction and direct organogenesis without callus formation reduces the time period needed for regeneration in plants especially in case of barley which is very recalcitrant to regenerate and is considered as the forth most important crop in the world. So the in vitro potential of mature embryos from six Indian originated barley cultivars provided by Leibniz Institute of Plant Genetics and Cultivated Plant Research (IPK) - Germany was investigated for direct multiple shoot induction and production of regenerated plants. Mature embryos were dissected from seeds after surface sterilization and inoculated on MS basal media containing 30mg/L maltose, 8gr/L agar supplemented with different concentrations of 2, 4-D and BAP. Adventitious shoots per explants, regenerated plants and regeneration efficiency were analyzed and multiple comparison of mean was conducted using LSD (0.5%). The result shows that there are significant differences between varieties and media composition for induction and number of adventitious shoots. The most responsive variety was HOR 4952 with average of 13.67 shoots per explants in media containing 3mg/L BAP +0.5mg/L 2,4-D, and the least responsive variety was belong to accession number HOR 8093 with 2.33 shoots per explants in 1BAP+0.3 2,4-D media.

Biography

Hassan Rostami is PhD student of biotechnology at CBT, IST, JNTUH. He is studying on barley regeneration and transformation for improving its feed quality.

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Anti-bacterial activity of total flavonoids isolated from Portulaca oleracea L

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Flavanoids are uniquitous in photosynthesizing cells and are commonly found in fruit, vegetables, nuts, seeds, stems, flowers and wine. For centuries, preparations canting these compounds as the principal physiologically active constituents have been used to treat human diseases. Portuleca olerace L is an important medicinal plant that has been used in traditional medicine. The aim the present study was to isolation of total flovanoids and investigation for anti bacterial activity of petroleum ether, chloroform, ethanol and total flavonids extracts of aerial part of Portulaca olerace L. in the present investigation we have used five standard pathogenic bacterial strains like Pseudomonas aeruginosa, Salmonella enterictyphimurium, Proteus mirabilis, Klebsiella pneumonia and enterobacter aerogenes, among all the bacterial strains Puedomonas aeruginosa and Proteus mirabilis have show maximum zone of inhibition for ethanol extract and total flovanoids respectively and remaining bacterial strains have shown mordant zone of inhibition. The present study supports that these flavonoids have antibacterial properties so helps in the developing antibacterial agents in the form of drugs for the therapy of infectious diseases caused by pathogens.

The present study was aimed to evaluate the effect of Portulaca Oleracea L on fertility of female albino rats. Albino rats were orally administered with Petroleum Ether, chloroform and Ethanol crude extracts of aerial part of Portulaca Oleracea L in both high and low dose (500mg and 250 mg / kg of body weight / day, for 7 days), and effect of crude extract on Anti implantation and Abortifecient activity was investigated. The treatment of petroleum ether crude extract has shown 20% and 30% reduction in implantation activity at low (250) and (500) high doses respectively. In case of chloroform and Ethanol crude extracts, the chloroform extract has shown 50% and 60% reduction in implantation activity at low and high doses respectively, whereas Ethanol crude extracts have shown 40% and 50% reduction in implantation sites with respect to low and high dose of extract treatment . Ethanol crude extract treatment has shown abortifieient activity but the petroleum ether and chloroform extract treatment to pregnant rats did not shown any abortifecient activity.

Keywords: Portulaca Oleracea L, Anti implantation, Abortificient.

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Biotechnology for agricultural by-products utilization

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There is huge accumulation of agro-industrial waste-materials generated by the milling, brewing and various agriculture and food based industries which in total amount to about 500 million tons per year in India. Most of these by-products contain three major structural polymers such as cellulose, hemicellulose and lignin. These are also the main source of feed for animals. A high proportion of this waste material is carbohydrate and phenolic in nature. The vast accumulation of this kind of biomass not only results in the deterioration of the environment, but also a huge amount of potentially important materials are lost. Biological degradation, now-a-days, has become an increasingly popular alternative for the treatment of agricultural, industrial, organic as well as toxic wastes. Cellulose and hemicellulose being the major constituents, these materials can be referred to as valuable resources for a number of reasons, mainly due to the fact that they can be bio-converted easily into valuable products. These wastes can be processed to yield a number of valuable added products, such as biofuels like biohydrogen, bioethanol along with a variety of chemicals. Various treatment methods such as physical, chemical, biological are employed for the production of value-added compounds. Various phenolics like ferulic acid and vanillin, world's most prized flavor compound are obtained through microbial treatment of agrowastes.

Biography

Hara Prasad Sahoo has completed his Ph.D in Botany from Berhampur University, Odisha, India. He 30 years of teaching and research experiences in various educational institutions across Odisha. Now he is the Reader and head of the department, Botany, BJB Junior College, Bhubaneswar, Odisha, India. He has guided many M.Phil and Ph.D students during his academic career. He has published more than30 papers in reputed national and international journals.

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My database: Can I manage my data in self prepared database

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Today while working with biological system we are generating huge amount of significant data in the various forms such as numerics, formulae, equations, images, graphics, literature, softwares and many more. We would always like to manage such a huge data in a systematic way in a computer system. In a requirement, for many instances we have failed to do data management because of lack of expertise in database management. Here I would like to introduce an easy protocol of Microsoft access which could be used by any student, scientist and research scholar for organizing their unorganized data. The methods utilize the Microsoft access which provides the facility for database creation in the tabular form and involving data could be linked up in various forms such as text, images (.JPG, bitmap, etc.), Zip file, hyperlink, attachment and many more. Developing database helps in easy data transfer from the database to various formats which could be used in an easy way. This protocol was built understanding the need of the data management for research scholars, scientist and students. Linked up data could be made online at the website through a database link up and also be mailed through zip format which is an advantage of such a database protocol designed. In the coming time surely developed protocol will assist the data manager for easy data storage, retrieval, editing and analysis.

Biography

Dilip G. Gore has completed his M.Sc. in Biotechnology at the age of 23 and completed his Ph.D work recently from Nagpur University. He is a director of "Sai Bioinfosys Bioinformatics Research Centre" the renowned research center in Nagpur and central India. He is also a lecturer in the GHRIIT, Nagpur in Biotechnology and Microbiology department. He has published 16 papers in the international journal and a university board member for Nagpur University, Nagpur and YCMOU, Nashik. He is a renowned trainer in the field of Bioinformatics and delivered a number of talks at national and international seminars and symposium. He has conducted a number of workshops on Bioinformatics and PCR. He is a member of several organizations and also a DBT consultant.

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Treatment of cancer by stem cell therapy

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Oncology is a Branch of medicine concerned with the study, diagnosis, treatment and prevention of cancer. Cancer is really a broad term used to describe hundreds of malignant diseases that can develop 'In the body. In which a cell or a group of cells display uncontrolled growth, invasion, metastasis. These three malignant properties of cancer differentiate them from benign tumors. Which are self limited and do not invade or metastastize. Cancer affects people at all ages, it causes about 2, 80, 000 deaths each year. Cancers are primarily environmental diseases with 90-95% of cases due to life style and environmental factors and 5-10% due to genetics. Life style and environmental facts causes abnormalities in the genetic material of cells and activate the oncogenes and inactivates the tumor suppressor genes resulting in the loss of normal functions of cells. Cancer is usually treated with a combination of surgery with chemotherapy and radiotherapy. As research develops treatments are becoming more specific for cancer one of such specific research product is Stem cell therapy. The significance of this therapy is to cure molecular abnormalities or rectification of genomic problems. This is the most advanced treatment of Cancers. Hence Stem Cell Therapy is stated as a SANJIVANI for cancer victims.

Keywords: Oncology, Malignant, Invasion, Metastasis, Chemotherapy, Radiotherapy Stem cells.

Biography

E. Venkata Naga Raju Pursuing his Ph.D (Biotechnology) from Acharya & B.M.Reddy College of pharmacy, Banglore-90. He has published more than 10 papers in reputed journals.

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Screening of staphylokinase producing Staphylococcus spp

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Staphylococcus is a spherical, gram positive bacterium that attributes to boils, food poisoning, and other infections. The Staphylococcus genus includes at least 40 species. Of these, nine have two subspecies and one has three subspecies. Most of the species are normal flora of skin and mucous membranes of humans and other mammals. They are found worldwide, and macro component of soil microbial flora. However, this particular bacterium is very often the cause of skin, stomach and blood infections causing sepsis. It is sensitive to antiseptics. Staphylokinase (SAK) is a 16.5kDa single chain protein and bacterial plasminogen activator produced by certain strains of Staphylococcus aureus, which activates plasminogen to form plasmin and digest fibrin clots. This disrupts the fibrin meshwork which can often form to keep an infection localized. Staphylokinase also cleaves IgG and complement component C3b, inhibiting phagocytosis. SAK is reported to have a serine protease domain with no proteolytic activity unlike other plasminogen activators like tissue plasminogen activator (t-PA) and urokinase. It is commercialized in the name of staphylokinase, THR-100 manufactured by Bharat Biotech with Thrombogenics (phase III clinical trial initiated).

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Modulation of cadmium tolerance of Aspergillus terreus by Ionising radiation

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We have reported that ionizing radiation has the potential to form more cadmium tolerant Aspergillus terreus. A.terreus showed 1.6 times more cadmium tolerance with respect to its non-irradiated counterparts when it was treated with different absorbed doses of gamma (20- 100 Gy). Against 90ppm Cd, 100 Gy was considered as effective dose reflecting better colony forming ability in addition higher potential of cadmium uptake from the medium. Removal potential of the said group was also much higher than the unirradiated counterparts (control). With further increase in cadmium concentration in the medium (upto 150ppm) the effective dose shifted to 80Gy.Our findings throws light towards a new step of cadmium bioremediation.

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Bacterial community profiling in the rhizosphere of field grown GM and non-GM corn

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This study examined the impact of genetically modified corn on bacterial functional community in the rhizosphere. Rhizospheric soil samples from GM and non-GM corn were collected at 60 DAS (days after sowing) and at post-harvest from Council for Scientific and Industrial Research experimental field in Gauteng, South Africa. Plate count results obtained on Pseudomonas selective agar indicated 1.5×10^3 cfu in GM and 1.7×10^3 cfu in non-GM soil samples at 60 DAS. There was a decline of 78% in both rhizospheric populations at post-harvest. To compare bacterial functional community in GM and non-GM soil, Biolog GN2 microplate, a sole carbon substrate utilization profile (SCSUP), was used and no significant difference was observed. Based on analytical profile index identification system, species of Pseudomonas putida, P. stutzeri and Achromobacter denitrificans were identified in GM and non-GM soil 60 DAS. At post-harvest no Pseudomonas spp was observed. These findings are of great significance with regards to the criteria of investigation of possible impact of GM on rhizobacterial functional community.

Keywords: Genetically modified, Rhizosphere, Biology.

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Production of recombinant fusion protein 'fliglo': fliH gene of Escherichia coli O157:H7 tagged with GFP gene

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Escherichia coli O157:H7 is a very common food borne pathogen. Without the detection at the right time, it could turn fatal. It is not only diagnosis that is important, but also the trials to make it non-virulent are also important. Detection of this in humans is also important, since appropriate therapy can be administered. Here we demonstrate a system appropriate for E. coli O157:H7 that can be extended to other bacteria and viruses such as HIV, MRSA detection. The gene fliH, in E. coli O157:H7, which is one of the major genes that produce the protein necessary for the association of the flagella, was targeted here.

A recombinant protein (for fliH) that tagged with GFP protein was produced using the plasmid. Green fluorescent protein (GFP) obtained from GFP gene is known for its fluorescence. This makes it very useful in molecular biology to detect the target gene when it is tagged to GFP. The fliH gene, which plays an important role in flagellar association in the bacteria, was used here. This when tagged with GFP is an important diagnostic tool for detecting the presence of E. coli O157:H7 in the samples. For preparing this system, E. coli O157:H7 DNA was isolated and restriction digested and by using other techniques, the fliH gene was introduced into the pGLO plasmid. This plasmid was expressed to produce the fusion protein 'fliglo'. The isolated fliglo fusion protein has different spectral signature than the original GFP. GFP shows an emission peak at 509 nm, where as the fusion protein shows it at 461 nm. This is useful in isolation of pure fusion protein. The fliglo protein will be used in detection assay to be developed by Nano Science Diagnostics, Inc. for their NanoFluro Device for the detections of E. coli O157:H7. Further the fusion protein system will be utilized for other bacteria and virus detection in blood samples and also the production of highly specific antibodies for medical uses.

Keywords: Escherichia coli O157:H7, fliH, GFP, pGLO, restriction digestion, emission, fliglo.

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Biological control of Echinochloa crus-galli (Barnyard grass): A major weed in rice (Oryza sativa L)

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Echinochloa crus-galli (Barnyard grass) is one of the most invasive paddy (Oryza sativa L.) weed in Andhra Pradesh. In this study, a survey was conducted in the paddy fields of eight southern districts of Andhra Pradesh to document the fungal pathogens of barnyard grass. Pure cultures were isolated from the naturally-infected barnyard grass leaves collected from different paddy growing areas. A total of 51 fungi were isolated and two isolates Alternariaalternata(SBT#21) and Curvularia lunata (SBT#30) exhibited more pathogenicity (>80%) under greenhouse conditions on Echinochloacrus-galli. These two strains were confirmed at species level by molecular characterization and further used for mass production by both submerged and solid state fermentation on cheaper and readily available sources. The conidia were collected and developed the powder formulations. Bioassays were conducted with formulated products onto both weed and rice seedlings under greenhouse conditions at different concentrations. 100% mortality of weed seedlings was observed at 10g/ lit concentration containing spore load of 10^7conidia/g. The phytotoxins were also isolated from both the pathogens, purified by column chromatography and subjected to HPLC analysis. The obtained fractions were tested for phytotoxic effect under laboratory conditions and found the complete wilting of weed leaves after 48 hr. This study concludes that these two fungal pathogens can be used as bioherbicides for the control of weeds in paddy.

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Polymerase chain reaction detection of Candidatus liberibacter asiatic associated with citrus huanglonbing

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Citrus is one of the most important tropical fruit crops of the world. Citriculture is the largest fruit industry in India which occupies important place in economy of the country. Diseases are known as one of the important factors in low productivity of citrus fruits in India. Among the diseases of citrus, viral diseases cause heavy economic losses in varying proportion. Around 30 viral diseases are known to infect citrus worldwide. In India, the major pathogens of economic importance in citrus are Citrus tristeza (CTV), Citrus yellow mosaic badna virus (CYMV), Indian citrus ring spot virus (ICRSV), viroids disease like citrus exocortis viroid and a fastidious prokaryote causing citrus greening disease. Detection by DNA probes though an accurate method for detection but requires handling of radioactive elements and is being discouraged now a days. Moreover, these are not practically feasible methods for handling a large sampling unit.

Polymerase chain reaction diagnosis of Candidatus liberibacter asiatic associated with citrus Huanglonbing disease is molecular technique which is used for detection of disease when pathogen present is very low concentration in disease sample. Among these three DNA isolation methods viz., commercial kit method, sodium sulphite method and membrane bard nucleic acid technique, sodium sulphite method is cost effective for commercial use. In nucleic acid membrane method for DNA extraction isolation there is no use of liquid nitrogen. Polymerase chain reaction detection of disease is based on principal of thermal cycling in which PCR instrument allow to run generally 60-65 thermal cycle, during PCR operation it allow different stages of cycle at different temperatures for different period of time i.e. initiation (94^0C), denaturation (94^0C), primer annealing (60^0C), extension/elongation step (72^0C), final elongation (72^0C) and holding temperature (4^0C). PCR based diagnosis system is developed for detection of greening bacteria. The comparative cost of detection by various combinations of reagent and sampling time was determined and cost effective technology was standardized and validated.

Keywords: Citrus, Candidatus liberibacter asiatic, Polymerase Chain Reaction.

Biography

G.P.Jagtap M.Sc. (Agri), Ph.D NET (ICAR) is Norman Borlaug Fellow 2008 (USA). He is a recipient of Norman Borlaug International Fellowship - 2008 and worked at Plant Disease Diagnostic Laboratory, Texas; A&M University, USA. He did his doctorate degree from GBPUA&T, Pantnagar with specialization in Plant Pathology and presently working as a Assistant Professor in the Department of Plant Pathology, MKV, Parbhani. He has published 20 research papers, 40 popular articles, 2 Books and 6 practical manuals. He has participated in several International and National conferences and guided 10 M.Sc. (Agri) students. He has 11 years experience in Teaching, Research and Extension work.

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Plant regeneration in Litsaea salicifolia Roxb through callus culture

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Litsaea salicifolia Roxb. (Lauraceae) commonly known as 'Dighaloti' in Assam, India, is a secondary food plant of 'muga silkworm' (Antheraea assama Westwood), is a wild bushy shrub, unisexual dioecious plant seen growing mostly in riverbanks in Assam, India. Viable seeds of 'Dighaloti' (Litsaea salicifolia) were grown aseptically in MS media containing 0.1 mg 1^{-1} BAP. Hypocotyls segments were excised from the seedlings and cultured on culture media containing various concentrations of 2, 4D and BAP. Friable callus was obtained on medium containing 2 mg1^{-1} 2, 4-D and 0.5 mg1^{-1} BAP. When transferred to MS medium supplemented with BAP (2 mg1^{-1}) and NAA (0.1 mg 1^{-1}) became nodular and developed 30-40 shoots within 30 days. Among amino acids tested, lysine (2 mg1^{-1}) was found effective in more shoot bud induction. Rooting on the shoots was achieved when cultured on MS basal medium supplemented with NAA (0.5 mg1^{-1}). Hardening of the plants was done in sugar free MS basal medium and subsequently in vermiculite. The 39 plants thus developed were successfully established in earthen pots under green house conditions with 80% survival and are under screening for somaclonal variation with beneficial characters.

Keywords: Dighaloti, Litsaea salicifolia, Regeneration, Somaclonal.

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Analysis of chill-coma recovery in Indian Drosophila species

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Chill-coma recovery is an important trait for thermal adaptation and a effective tool of cold resistance measurement in Drosophila species. Our study was aimed at evaluating chill coma recovery for D. kikkawai, D. melanogaster and D. ananassae at seven different geographical locations with varying altitudes. The flies (3-4 days old) were placed individually in 42 ml glass vials, which were immersed into ice in an insulated icebox. The vials were removed after 14 hrs and recovery time was scored. Flies were considered recovered when they stood up. These flies were initially reared at 21˚C temperature and were given a stress of 0-1˚C i.e. Chill Coma. Then the recovery time of males and females were noted separately at room temperature i.e. 25˚C. The average chill-choma recovery time in minutes for D. kikkawai female was 70.364±1.50 and D. kikkawai male was 67.542±1.43. The average chill-choma recovery time for D. melanogaster female was 34.57±0.61 and D. melanogaster male was 37.66±0.63. The average CCR time for D. ananassae female was 56.610±1.19 and D. ananassae male was 70.32±2.61. In case of D. ananassae female Chill-Comma mortality rate was 12-13%. In case of D. ananassae male Chill-Comma Mortality rate was 18-19%. In both D. kikkawai, D. melanogaster 100% chill comma recovery was observed with no Mortality. Our results indicate that D. kikkawai & D. melanogaster species are more tolerant to cold stresses and would rapidly adapt themselves in colder environment for survival than D. ananassae species.

Keywords: Chill-coma recovery, Cold-Stress Resistance, Drosophila, Adaptation.

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Evaluation of antibacterial and antifungal potential of different varieties of potatoes

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Many spices are used as medicine, religious rituals, cosmetics, perfumery, or for eating as vegetables. The term spices defined as the dried seed, fruit, root, bark, or vegetative substance used in nutritionally insignificant quantities as a food additive for flavor, color, or as a preservative that kills harmful bacteria or prevents their growth. In present study, we carried out a systematic record of the relative antioxidant activity of organic solvent extract of five spices i.e. Eugenia Caryophyllus (Clove),Vertiveria zizaniodies (Khus khus), Cinnamomum Zeylanicum (Dalchini), Terminalia chebula (Harad), Amomum krervanh (Black cardemom),using ascorbic acid as standard antioxidant.Free radical scavenging activity was evaluated by using 1,1-diphenyl-2-picrylhydrazyl(DPPH) free radical scavenging. Xylene, ethanol and chloroform were used as solvents and the effect of solvents on antioxidant activity of these spices was also compared Total flavonoid, and phenolic content of the extracts were also determined using standard phytochemical reaction protocols. In the DPPH system, the antioxidant activity of Amomum krervanh (92%) and Terminalia chebula (92%) was found to be superior followed by Eugenia Caryophyllus and Cinnamomum Zeylanicum. The present study revealed that the selected spices would exert several beneficial effects by virtue of their antioxidant potential and could be harnessed as drug formulations.

Keywords: Antioxidants, Free radicals, DPPH, Spices.

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A brief review on synthetic biology: Recreating the cells

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Synthetic biology is the chemical synthesis of biological components, or biosynthesis of chemicals, or putting engineering principles in designing novel biological systems. Hierarchy and Modular organization of biological systems allows synthetic biology to be possible. This is the newest field in bioscience and the already published papers thrust on DNA assembly, genetic regulation, chromosomal manipulation, cell signaling & coordination, cell state reporting, artificial cells and cellular structures, metabolic pathway optimization. It is very interesting; modeling synthetic libraries of intergenic sequence, synthetic protein scaffolding, markerless chromosomal deletion, modeling carboxysome- a bacterial micro-compartment. All these become possible with the new era of DNA assembly methodologies like- BioBrick, SLIC, Gibson, CPEC, MoClo, GoldenGate, GoldenBraid, USER, yeast approaches. There are broad areas open; microbial host engineering by genetic regulation without plasmid, real world therapeutics, crop engineering, bioremediation, bioprospecting.

Biography

Aparna Banerjee is receiving her M.Sc. degree in Biotechnology at the age of 22 from Vidyasagar University. Under the guidance of Dr. Bidyut Bandyopadhyay, she has worked on "Isolation and characterization of Erythromycin resistant gram negative bacteria", which is under review of Indian Journal of Biotechnology (IJBT). She has presented hypothesis in 1 international conference and published abstract in 1 national conference.

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Determination of viability of Pediococcus spp. GS4 after storage into hard gelatin capsule and its survival under in vitro simulated gastrointestinal condition

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Probiotics are regarded as panacea for modern life. Aim of the study was to formulate the capsule comprising probiotic strain, Pediococcus spp. GS4 isolated from fermented Khadi and to examine its viability with different excipients by exposing it to simulated gastric fluid (SGF) and simulated intestinal (SIF) at different time intervals. Freeze dried powder of Pediococcous spp. GS4 [FDPP] was prepared without adding excipients. The empty hard gelatin capsule was filled with FDPP aseptically adding lactose, ascorbic acid and inulin (Test). FDPP without excipients were used as Control. For stability studies both test and control capsules were stored at 4 ±1°C for 28 days. In vitro viability of probiotic cells were studied using SGF and SIF respectively. The optimal composition of effective formula was found to be composed of 6% lactose, 2.5% ascorbic acid and 2% inulin which could protect maximum viability of cells. After 28 days, the viability of Test was improved by 3.73 log (CFU/ml) as compared to Control at 4 ±1° C ($P < 0.05$). Significant difference was observed between Test and Control when incubated sequentially in SGF (pH 2.5; 45 min and 90 min) and SIF (pH 6.8; 150 min and 210 min). In vitro test showed that combination of suitable excipients have significant effect on the survival of Pediococcus spp. GS4 when exposed to gastrointestinal conditions (SGF, SIF).

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RAPD markers for genetic diversity estimation and its correlation with hybrid performance in pearl millet

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The investigation was conducted to assess the association of genetic diversity of parental lines with mean performance of hybrids, mid parent heterosis, better parent heterosis and sca effects. The material for this study consisted of five male-sterile lines, eight pollinator lines, 40 F1 crosses, which were generated through Line x Tester matings. Whole of the material was grown in a Randomized Complete Block Design with three replications. All the parental lines were screened to detect polymorphism in the form of RAPD markers. Genetic diversity among the parental lines was determined by RAPD markers and morphological characters. The genetic distances so obtained were correlated with F1 mean performance and heterosis. Positive correlation was obtained between molecular marker diversity and F1 mean performance, heterosis over better parent but the value of correlation coefficient was found to be non-significant. In contrary, negative correlation was obtained between taxonomic distance and F1 mean performance; better parent heterosis. Our results have indicated that genetic-distance measures based on RAPDs may be useful for the grouping of parents, but not for predicting heterotic combinations in pearl millet.

Keywords: Genetic diversity, RAPD, Hybrids, fodder pearl millet.

Biography

G. Nagaraju has submitted his Ph.D. to Jawaharlal Nehru University, New Delhi, and published three papers of International repute and attended several national and international conferences and also presented posters.

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Genetic dermatological disease database

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Despite the high frequency of certain skin diseases in developing countries, they have so far not been regarded as a significant health problem in the development of public health strategies. This is due to the assumption that skin diseases are not life-threatening. On the contrary, dermatologic disorders generally have a major impact on patients' daily activities, psychologic and emotional state, and social relationships. Despite this, the study of genetic basis and susceptibility of individuals to different forms of dermatological disorders is still at its nascent stage. Due to the large role played by genetic factors on the development of many dermatological diseases, it becomes important to identify the genes and variants associated with a particular disease. A database specific to these variants would help to predict individuals with high susceptibility of developing the disease. With this preview, in the present study, we have developed a database of genetic variations associated with dermatological disorders. We presume that the analysis of mutations reported in the database may help researchers understand the nature and etiology of these diseases.

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CGPSA- Comparative Genomics Methodology for Phylogenetic and Synteny Analysis of gene families in different species

Hukam C. Rawal, N.K. Singh and T.R. Sharma
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With the advancement in the scientific genomic research, there is an explosion in the number of completely sequenced genomes over the past decade, which brought us to the urgency of a well established computational strategy or methodology to analyse different genomes or different gene families in these genomes. We developed a computational strategy, to compare different gene families among various plant species. The analysis pipeline comprised of 5 main steps including identification of genes for the specific gene family, In-silico expression analysis and physical mapping of the identified genes. The phylogenetic analysis can be performed for gene families among different species and the synteny analysis can be done to identify the orthologous and non orthologous genes of a gene family among different species. A care was taken on how to represent the huge sequence data to draw meaningful conclusions. We used this strategy to perform the comparative analaysis of the seven defense response gene families such as Beta-glucanase and Chitinase in 23 plant species that not only represents two major classes- diocts and monocots but also belong to very diverse groups like legumes, fruits, vegetables, spices, flowers, medicinal and aromatic plants , grains, and trees. With this strategy a total of 6864 defense response genes were identified and analysed comparatively in the 23 plant species. The developed strategy for comparative genomics of any gene or gene family with computational methods can be used effectively across the genomes.

Biography

Hukam Chand Rawal has completed his M.Sc. in Bioinformatics from Jamia Millia Islamia, New Delhi, India and now working as Senior Research Fellow (on Bioinformatics and Comparative Genomics of crops) at National Research Centre on Plant Biotechnology under Dr. T. R. Sharma.

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Bioactivity of rhodophyta: As an ROS scavenger and anti-coagulant

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Many of the marine algae constitute a major part of diet in eastern countries which are known for the longevity of life span. Apart from providing nutrients and minerals these algae may have bioactive functional compounds. Many unusual bioactive compounds are expected by the scientists due to diverse habitat of marine algae. As their environment differs from the terrestrial, there are more possibilities for occurrence of unique and different bioactive compounds. In recent years, bioactive compounds are under phase II clinical trials, which were shown to exhibit anti cancer, anti tumor and anti oxidative properties. In our present study, we have used a common edible marine alga to find its functional properties. The aqueous and ethanol extracts of the red algae was subjected to various bioassay to find its functionality. The crude extracts and its fractions after size exclusion chromatography showed some promising results as antioxidants (DPPH and total antioxidant) and anticoagulants. Further research will be carried out in isolating and characterizing the bio-active compounds. These compounds may find its use in therapeutics or cosmetics.

Biography

Indumathi P pursuing her research in VIT University under the guidance of Dr. Alka Mehta, Professor, SBST, VIT University. Her research is on isolating and characterizing the bioactive compounds from marine algae. She worked as a research associate in the same university.

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Discovery of new small molecule inhibitors of the Hepatitis C virus RNA-dependent RNA polymerase: Pharmacophore modeling, 3D-QSAR studies dnd high-throughput screening

J. T. Patrisha, K. Sridevi, Shruthi Kakkan, D. Sriram and P. Yogeeswari
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Hepatitis C Virus (HCV), a blood-borne pathogen belonging to the Flaviviridae family of viruses, is a major cause of acute hepatitis and chronic liver disease, including cirrhosis and liver cancer. The current HCV therapy suffers from inadequate sustained viral response rate, in particular for patients infected with genotype 1 HCV, along with significant side effects, resulting in a continuing medical treatment. Our research has been focused on identifying novel small molecule inhibitors of the HCV NS5B protein, a virally encoded RNA-dependent RNA polymerase (RdRp), the activity of which is critical for the replication of the virus. In this study, a 3D pharmacophore mapping studies were undertaken for different series of synthetic derivatives. A five point pharmacophore with two hydrogen bond acceptors (A), one hydrogen bond donor (D), and two aromatic rings (R) as pharmacophoric features was developed. The pharmacophore was validated using enrichment calculation which yielded a statistically significant 3D-QSAR model with good correlation coefficient (R^2= 0.9715) for training set compounds. The model showed excellent predictive power (Q^2= 0.6063). The model was then employed as 3D search query to screen against public and In-House libraries (Asinex, BITS database) in-order to identify a new scaffold. Top ranked hits were selected, synthesized and were evaluated for their enzyme inhibitory activity against HCV Protease. Inhibitors with IC50 value >50nM were considered as potential inhibitors forHCV Protease. The backbone structural scaffold features and contour maps obtained from the 3D QSAR model could serve as template to design novel small molecule inhibitors for HCV Protease.

Biography

J. T. Patrisha has completed her M.Sc. (Chemistry) from Annamalai University, Tamilnadu. Currently, she is pursuing Ph.D. from Department of Pharmacy, Birla Institute of Technology & Science-Pilani (BITS-Pilani), Hyderabad campus, Jawahar nagar, Hyderabad under the guidance of Prof. P. Yogeeswari since March, 2010. Her research area of interest is antimicrobial drug discovery.

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Polymer controlled delivery of therapeutic nucleic acid for the treatment of cancer

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The lack of selective delivery of therapeutic molecules to tumour cells is a problem in treatment of cancer. As a result of this non-selectivity, cytotoxic agents are delivered to both healthy and diseased cells, resulting in severe side effects for the patient, eventually causing termination of therapy or ineffective therapy resulting in progression or recurrence of the disease. In this context, cationic polymers emerge as a promising option due to their unique properties that enable them to deliver therapeutic genes or molecule to the tumour site to form complexes with negative charged macromolecules such as DNA or RNA. They also form strong interaction with biological membranes and therefore with tumor cells triggering facilitated entrance of those therapeutic molecules into them for effective cytotoxic effect. Cationic polymers have been extensively reported to form nano-size complexes with therapeutic nucleic acids like DNA and small interfering RNA (siRNA). We can deliver these nucleic acids to control disease progression by induction and/or inhibition of genes. Since siRNA's high efficiency for silencing the expression of proteins at the post-transcriptional level, it shows great prospect in therapeutics for diseases. RNA interference (RNAi) is a potential method to cure diseases that mediates sequence-specific inhibition of gene expression through the activation of RNA induced silencing complex (RISC) by interaction with siRNAs. On the other hand, in DNA-based therapeutics DNA are efficiently introduced into tissues and only selected genes are switched off ensuring specificity in controlling the disease status.

Keywords: Cationic Polymers, Therapeutic Nucleic acid, RNAi, Cancer Treatment.

Biography

This presentation will be a group presentation done by Jijnasa Bordoloi, Palakshi Das, Priyanka Tiwari. They are doing M.Sc in Biotechnology from SRM University, Tamilnadu, India.

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Evaluation of antibacterial and antifungal potential of different varieties of potatoes

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The aim of the study was to investigate the phyto chemical compounds and antimicrobial activity of potato extracts including Kufri Badshah, Kufri Bahar, Kufri Pukhraj and Kufri Puskar provided by Haryana Agriculture University (HAU), Hisar, Haryana. Phytochemical screening of these plants was performed for constituents: alkaloids, flavonoids, tannins, reducing sugars, saponins and carbohydrates. The potato peel extracts were used to screen the bioactive compounds and antimicrobial activity against selected human clinical pathogens i.e. Bacillus amyloliquefaciens, Bacillus subtilis, Escherichia coli, Staphylococcus epidermidis by agar diffusion method and Disk diffusion method. The Zone of inhibition obtained by both of these methods, are then compared.

Antifungal activity of extracts was also analyzed against Aspergillus fumigates, Aspergillus niger and C. albicans. The results of both the methods were compared and extracts showing best antimicrobial activity were selected for Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC) and Minimum fungal Concentration (MFC). The present study reveals potential use of these extracts for developing new antimicrobial compounds against pathogenic micro-organisms.

Keywords: Antimicrobial, Antifungal, MIC, MBC, MFC, Extract.

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Management and treatment of wastewater: Towards clean environment and healthy society

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Every day huge quantity of waste water is generated all over our country and disposed off into the surroundings without proper treatment. This practice not only exerts heavy pollution load on surroundings but poses serious threat to human and animal life. The major obstacle in treatment of industrial effluents is their varying characteristics and casual approach of agencies responsible to curb this practice and ensure safe disposal of wastewater therefore sincere efforts are needed to find techno economic and socioeconomic solution to protect our environment by developing efficient treatment technologies and bringing awareness in public.

In this context PPP (public private partnership) model can play vital role in achieving desired goals. This paper gives an account of methods for waste water treatment with reuse and recycling possibilities.

Keywords: wastewater, management, treatment.

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Aeromycometric Investigation on the atmosphere of Vellore corporation

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This Study focus on the presence of Aeromycoflora present in the atmosphere over Vellore Corporation, TN. Microbes are omnipresent .They are most emphasized in causing respiratory and allergic diseases. Our study includes Identification of Aeromycoflora in Vellore Corporation. Over 19 Samples were taken using Anderson single stage sampler in petridish containing Potato Dextrose Agar (PDA) medium. The Samples were collected by exposing the petridish in the atmosphere using Anderson single stage simpler. The Sampler was operated at the sucking rate of 20 LPM of Air for 5 minutes. The exposed petridish were incubated at room temperature and identified. The results on Aeromycoflora will be discussed in detail.

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Molecular characterisation of Lactobacilli isolated from fermented idli batter and evaluation for probiotic potential

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Lactic acid bacteria (LAB) are non pathogenic organism widely distributed in nature. LAB has an important role in the preservation of foods and fermented products and is designated as GRAS (Generally regarded as safe). They are commercially used as starter cultures in the manufacture of dairy products, fermented vegetables, fermented dough, alcoholic beverages and meat products. In this study, molecular characterization was performed by RAPD, 16S rRNA analysis, 16S ARDRA and Multiplex PCR for species identification for the eight isolates from fermented idli batter. RAPD was carried out using the primer R2 and M13 which resulted in five different clusters. 16S rRNA analysis showed 99 to 100 % homology towards Lactobacillus plantarum. The restriction digestion pattern was similar for all the isolates with the restriction enzyme Alu I. The subspecies were identified by performing Multiplex PCR using species specific primer. The clusters were clearly identified as Lactobacillus plantarum subsp. plantarum, Lactobacillus pentosus and Lactobacillus plantarum subsp. argentoratensis. The isolates were able to tolerate up to 0.3% of bile for 4- 6 hours and pH 2.5, 3.5, 4.5, 6.5, 7.5 and 8.5. The isolates were able to resist growth against gastric and intestinal fluid. The isolates exhibited good levels of auto-aggregation, co-aggregation and hydrophobicity. The isolates showed resistance towards antibiotics like gentamycin, ciprofloxacin, nalidixic acid and norfloxacin. The isolates showed bilesalt hydrolase activity indicating cholesterol lowering capacity and β- galactosidase activity. Thus the different Lactobacillus plantarum isolates exhibited probiotic potential which would attribute beneficial effect to mankind.

Keywords: Lactobacillus plantarum, characterisation, probiotic.

Biography

Jayaprabha Agaliya P is 27 years old, pursuing PhD (Biochemistry & Molecular Biology) under the guidance of Dr. K. Jeevaratnam, Professor & Co-ordinator (Microbiology), Department of Biochemistry & Molecular Biology, Pondicherry University. She completed her B.Sc (M. L. T) from JIPMER and M.Sc (Biochemistry & Molecular Biology) from Pondicherry University. Her research is on isolation and characterisation of antimicrobial substances from lactic acid bacteria and evaluation of probiotic potential of the producer strains.

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Amniotic fluid stem cells in buffalo (Bubalus bubalis): Identification of pluripotency (Oct-4 Nanog and Sox-2) markers, characterization and chemical induced guided differentiation into neurogenic, adipogenic and osteogenic lineages

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Amniotic fluid cells are obtained from amnion for prenatal analysis and can be cultured in vitro. Heterogeneous amniotic fluid contains various cell types and it is believed that some of these cells possess the stem cell properties. Pluripotency (Oct-4, Nanog and Sox-2) markers were identify for characterization of chemical induced guided differentiation into neurogenic, adipogenic and osteogenic lineage by RT- PCR expression, staining and immunofluorescence in amniotic fluid stem (AFS) cells of buffalo (Bubalus bubalis). Expression of Oct-4, Sox-2, Nestin, FGF-5, Nanog, ALP, 18s rRNA, SCF, cyclin A, β-actin, GAPDH and GATA-4 were observed from the amniotic fluid stem cells in different passages with RT-PCR amplicon of 314, 277, 307, 210, 317, 180, 162, 216, 421, 178, 180 and 334bp respectively. In a quantitative real-time PCR analysis of AFS cells, Oct-4, Nanog, Sox-2, SCF, nestin and FGF-5 positively showed their expression. Amniotic fluid stem cells strongly expressed Oct-4, Nanog, Sox-2, SSEA-1, SSEA-4, TRA-1-60, TRA-1-81 and ALP markers by immunofluorescence staining. AFS cells were chemically induced guided characterized by into neurogenic, adipogenic and osteogenic cells. The cells were found to have a normal karyotype at different passages. We conclude that amniotic fluid cells may contribute towards establishing non-embryonic pluripotent stem cells for various therapeutic and reproductive biotechnological applications in this species and in human too.

Keywords: Amniotic fluid, buffalo, differentiation, immunofluorescence, Stem cells.

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Design and evaluation of oral controlled release mucoadhesive microspheres of didanosine

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The present work was carried out for targeted delivery of drug in a controlled manner in gastro-intestinal tract by mucoadhesion and to reduce the dosing frequency .Formulation of Mucoadhesive Microspheres was carried out by taking Drug-Didanosine (anti- viral/BCS CLASS-III), along with polymers for muco-adhesion such as HPMC K4M and Carbopol 934P(F1andF2) respectively. The prepared microspheres were evaluated by various evaluation tests such as Determination of Particle size(F1-Average particle size was reported as 502±1.20 and F2 was 510±1.36, Swelling index was reported upto 8 hours with an interval of each one hour (Swelling index reported after 8 hours for F1-0.82 and F2-0.96) , Drug content(F1 52.36 %w/v and F2 56.48 %w/v),Entrapment efficiency(F1 52.36±0.21 and F2 56.48±0.36), In-vitro drug release studies(cumulative percentage release after 8 hr was 76.264% and 80.312% for F1 and F2) and In- vitro wash off test to assess Mucoadhesive properties of Microspheres (% mucoadhesion varied from F1 –F2 after 6hr as 45%-38%).From these experimental results F2 showed maximum % yield.

Biography

K. Mani Madhuri is pursuing her M.pharm 1st year in Yalamarty college of pharmacy, Visakhapatnam and completed her B.Pharm in Roland Institute of Pharmaceutical Sciences had published a review article on Mucoadhesive Drug Delivery System in APTI Convention and also presented a research article in the National Seminar held in Bhuvaneswar.

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Structure based drug design for cytochrome-b to treat cataract

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Cytochrome-b is a protein that causes cataract in human beings. The drug to treat this defective protein has not yet been discovered. The structure of this protein was also unknown. The structure for this protein, cytochrome-b is modeled using the techniques available in molecular modeling. Further, certain drugs in the market to treat cataract are selected and their similar chemical structures available are docked with the modeled molecule to check whether the protein (receptor) and the drug molecule (ligand) binds sufficiently. We also suggest that the best docked drug chosen by screening method can be studied in the wet laboratory for practical assessment of the quality of the new drug to treat cataract.

Keywords: Cytochrome-B, Cataract, SWISS-PROT, NCBI-BLAST, PIR, FASTA and SPDBV.

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Isolation and characterization of Bacillus isolates to determine their mechanisms of antagonism against Fusarium solani *in vitro*

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Fusarium solani is a phytopathogenic fungus and is an important causal agent of various economic crop diseases, such as root and stem rot of pea, root and fruit rot of Cucurbita spp., sudden death syndrome of soybean, foot rot of bean and dry rot of potato. The fungus, F. solani also a casual agent of tomato plant, is considered one of the most important pathogens a worldwide. Recently studies have verified the antagonistic capacity of diverse bacterial isolates against F. solani. In this study, we have identified the Bacillus isolates and determine the mechanisms of antagonism against F. solani. Tests were done and consisted in determining the production of volatile metabolites, siderophores, and the effect of different culture temperatures and pH on the production of diffusible metabolites and inhibition of pathogens. The Bacillus isolates showed volatile metabolites and siderophore production as possible mechanisms of antagonism.

Biography

Faheem Ahmad has been a student at Aligarh Muslim University, one of the famous central universities of India. He completed his PhD in Botany (Plant Pathology) from Aligarh Muslim University and first postdoctoral studies from National Sun Yat-Sen University, Taiwan. He is now a Post-doctoral Fellow at North-West University, South Africa.

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Serum glucose and serum protein levels in Plasmodium falciparum infected experimental C57BL/6J mice

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Background: Malaria remains the most important parasitic disease afflicting about 2.2 billion people globally. Most malaria deaths are due to Plasmodium falciparum infection. P. f is an intra erythrocytic protozoan parasite. It exports antigens and imports extra cellular nutrients to survive. Serum albumin and its associated fatty acids are essential for intra erythrocytic development and cell cycle progression of the P. falciparum. A change in serum glucose level & protein level is a characteristic feature of much parasitic infection.

Materials and Methods: 12 week old C57BL/6J mice were divided into 6 batches each with 6 mice. These experimental groups were Control (Batch-1), Infected (Batch-2), Infected+Arteether treated (Batch-3), Infected+Artesunate treated (Batch-4), Arteether Prophylactic (Batch-5) and Artesunate Prophylactic mice (Batch-6). Serum Glucose levels were determined by Ortho-toluidine method (Mono-step). Serum proteins levels were determined by Biuret and BCG (Bromo Cresol Green) Dye Binding method. Statistical analysis such as Mean, Standard Deviation (SD), Standard Error of Mean (SEM) and Paired T-Test were performed with 'MINITAB 11. 1232 Bit'. For between group comparisons 'Two Sample T-Test' was performed. Differences were considered statistically significant at $p<0.05$ and $p<0.001$.

Results and Discussion: In the present investigation glucose levels were significantly decreased ($p<0.001$) causing hypoglycemia at high rate of parasitemia in P. f infected mice. At high rate of parasitaemia malaria parasite utilizes glucose for theirs own energy requirement. And malaria fever and infections increase the metabolic demand of the body hence more glucose is utilized. When these infected mice treated with Arteether/Artesunate the glucose levels were increased significantly ($p<0.001$) to normal level. In mice treated with Arteether/ Artesunate prophylaxis the blood glucose levels were significantly high ($P<0.001$) when compared with infected mice, but these levels were in normal as in control group. And also low serum total protein concentration was observed in this study may be due to reduced concentration of albumin i.e., hypoalbuminea. Hence the serum proteins, serum albumin levels were found to be significantly lower ($p<0.05$) compared to control group. Total globulins have increased significantly ($p<0.05$) due to P. f infection. When the P. f infected mice treated with Arteether/ Artesunate and during prophylactic treatment; total serum proteins, total albumin and total globulin levels restored to normal values. Also the finding suggested that the level of total globulins is influenced by the degree of parasitemia. It is said that the high levels of globulins are due to acute or chronic infection of P. falciparum.

Conclusion: By evaluating the above parameters in treated mice; Artesunate and Arteether have proven as still efficient drugs to human malaria, Plasmodium falciparum when compared with other existing drugs in spite of increasing drug resistance.

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Enzymatic properties of biotechnologically important industrial enzymes: Phytases

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Present study involves enzymatic characterization of industrial enzymes i.e., phytases. Groundnut field rhizospheric soil sample was aseptically collected and subjected to serial dilution by pour plate method. Screening of phytase activity was evaluated on the basis of zone of clearing. Potential and selected fungal isolate was identified and characterized as Aspergillus foetidus MTCC 10367. Phytase production was investigated both qualitatively and quantitatively by using five different natural substrates i.e., wheat bran, soybean meal, corn powder, sesame seed powder and oats keeping calcium phytate as standard synthetic substrate. Among five different substrates, wheat bran and corn powder (1% w/v) provide a maximal yield of production of phytase i.e., 5.7 and 6.3 U/ml respectively when Submerged fermentation was carried out by using media inoculated with 2% inoculum with 2 X 10^7 spores/ml of 7 days old, incubated at 30°c for 72 h at 120 rpm. The extracellular phytase was studied for the optimum pH and temperature and was found to be active at pH 7 and 50°c.

Keywords: Phytase, Aspergillus foetidus MTCC 10367, wheat bran, Calcium phytate.

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Effect of mass transfer and characterisation of aeration & agitation in xanthan gum production using oxygen vector

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Oxygen mass transfer represents the most important parameter involved in the design and operation of mixing-sparging equipment in bioreactors. It can be described and analyzed by means of the mass transfer coefficient, k_La. The k_La values are affected by many factors such as geometrical and operational characteristics of the vessels, microorganism morphology, biocatalysts properties, composition, type & concentration of media.

Oxygen mass transfer rate have been studied during xanthan gum production process in stirred tank bioreactor. The volumetric mass transfer coefficient, k_La, has been measured by dynamic technique in solution of xanthan gum for a wide interval of operational condition. This coefficient has been determined changing many variables such as air flow rate, agitation speed, and superficial velocity. The efficiency of oxygen transfer could be enhanced by adding oxygen-vectors in broths, such as hydrocarbons or fluorocarbons, without increasing the energy consumption for mixing or aeration. The work was aimed at investigating the mass transfer effects of xanthan gum production by using oxygen vectors from Xanthomonas campestris. Since the solubility of oxygen is very low in fermentation broth, it becomes a growth-limiting substrate the for xanthan gum production. The use of oxygen vectors will enhance the oxygen solubility should necessarily increase the k_La and hence oxygen transfer rate (OTR). In this work, the effect of oxygen vector n-dodecane on the xanthan gum production was compared with that of control without oxygen vector. Experimental results obtained for simulated broths indicated a considerable increase of k_La in the presence of n-dodecane, and the existence of a certain value of n-dodecane concentration that corresponds to a maximum mass transfer rate of oxygen.

Biography

K. Vasantharaj has completed his post graduation M.Tech from SASTRA University. He has published 2 papers in the reputed journal. He has participated & presented more than 9 International & National symposiums during his academic. He holds a rank in the Graduate Aptitude Test for Engineering 2012 (Biotechnology).

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Bioremediation - Comparison of degradation of petroleum hydrocarbons using Pseudomonas isolated from oil contaminated soil versus Pseudomonas incorporated into a vector

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Soil, especially from oil field has posed a great hazard for terrestrial and marine ecosystems. The traditional treatment of oil contaminated soil cannot degrade the crude oil completely. So far, biodegradation proves to be an efficient method. During biodegradation, crude oil is used as the carbon source and addition of nitrogenous compounds increases the microbial growth, resulting in the effective breakdown of crude oil components to low molecular weight components. The objective of this project work is to evaluate the biodegradation of crude oil by Pseudomonas aeruginosa. Pseudomonas aeruginosa, an oil degrading microorganism also called as hydrocarbon-utilising microorganism (or "HUM" bug) can utilise crude oil as sole carbon source. In this study, the biodegradation of crude oil is being conducted with modified mineral basal salt medium and nitrogen sources added to increase the degradation. The efficacy of the isolated strain degrading the crude oil was finally evaluated by FT-IR and GC-MS analysis in which efficient degradation of oil into was found.

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Evaluation of nanomaterials antibacterial activity by using in tissue culture media

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The field of nanotechnology is one of the most active areas of research in modern materials science. New applications of nanoparticles and nanomaterials are emerging rapidly. Nanocrystalline silver particles have found tremendous applications in the field of high sensitivity biomolecular detection and diagnostics, antimicrobials and therapeutics, Catalysis and micro-electronics. The use of nano-sized silver particles as antimicrobial agents has become more common as technological advances make their production more economical. One of the potential applications in which silver can be utilized is in management of plant diseases. TiO_2 is the most commonly used semiconductor photocatalyst. Among the different nanomaterials, it is the most studied. Activated by UV-A irradiation, its photocatalytic properties have been utilized in various environmental applications to remove contaminants from both water and air. A wealth of information on TiO_2 photocatalytic inactivation of bacteria has been acquired over the last 20 years. The concentration of TiO_2 usually required to kill bacteria varies and depending on the size of the particles and the intensity and wavelength of the light used. Plant tissue culture techniques involve the growing and multiplication of totipotent cells, tissues and organs of plants on defined solid or liquid media comprising nutrients under an aseptic and controlled environment. Plant tissue culture has an important role in the production of agricultural or ornamental plants and in the manipulation of plants for improved agronomic performance. This research was planned to evaluate the potential of nano silver and TiO_2 to remove bacterial contaminants that exist in plant tissue culture media. Potato explants were cultured on this modified MS medium and evaluated after four weeks. The results showed that nano silver and TiO_2 had a good potential for removing the bacterial contaminants in plant tissue culture procedures.

Biography

Kamran Safavi has completed his MSc. Degree in Agricultural Biotechnology from Isfahan University of Technology (IUT) at 2009. The title of his thesis was "Thaumatin-Like TLP-3 Gene Transformation into Tobacco", which led to several journal publications. In addition to his thesis related subjects he has completed research topics about Oligo software, primer and adaptor design-bioinformatics, tissue culture, gene cloning, plasmid construction, PCR, RT-PCR, bioassay, transformation by Agrobacterium tumefaciens. Finally, he has studied using nanomaterial in media of some plants tissue culture, using omega-3 in media of some plants tissue culture, DNA extraction and gene transformation. Until now he has some work experience such as director of technology incubator center and head of high-tech group at Khorasgan (Isfahan) University for two years.

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Pycnogenol ameliorates hyperlipidemia and antioxidant status in pancreas of type 1 diabetic rats

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The present study evaluated the role of pycnogenol (PYC) on hyperglycemia, hyperlipidemia, and oxidative damage in the pancreas of streptozotocin (STZ)-induced type 1 diabetic rats. Diabetes was induced in rats by an intraperitoneal injection of streptozotocin (STZ, 60mg/kg body-weight) followed by free access to 5% glucose for next 24h. Four days after STZ injection, rats were supplemented with PYC (10mg/kg body-weight) for four weeks. The PYC treatment was started after diabetes was confirmed. At the end of the experiment, blood was drawn and rats were then sacrificed and their pancreas was dissected for biochemical and histopathological assays. The level of fasting blood glucose, glycated hemoglobin, total cholesterol, triglycerides, low density lipoprotein-cholesterol and very low density lipoprotein-cholesterol significantly increased while high density lipoprotein cholesterol decreased in the STZ group. PYC treatment significantly augmented ($P < 0.05$) these effects in the STZ + PYC group. Moreover, treatment with PYC significantly ($P < 0.05$) ameliorated thiobarbituric reactive substances, malonaldehyde and protein carbonyl, and glutathione, glutathione-s-transferase and catalase in the pancreas of the STZ group. The study suggests that PYC is effective in reducing hyperglycemia, hyperlipidemia and oxidative stress related to the risk of diabetes. Thus, it may have a therapeutic value for the treatment of Type 1 diabetes.

Keywords: Pycnogenol; Type 1 diabetes; Oxidative stress; Streptozotocin.

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Bioaccumulation of Cr (VI) by using marine yeast isolates

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Two marine yeast isolates were tested for their tolerance on YPD Agar medium and adapted further in YPD liquid medium containing 1mM of Cr (VI). Effect of Cr (VI) on the growth kinetics was studied. Morphological changes were observed by using scanning electron microscopy (SEM) and light microscopy. Bioaccumulation of Cr (VI) by using both yeast cells were studied with respect to pH, temperature, agitation, cell numbers and initial metal concentrations. Accumulation of the metal by the yeast cells was demonstrated by using transmission electron microscopy. The results indicated that the yeast cells have potential for removal of Cr (VI) ions.

Biography

Ketakee Mahajan is pursuing the Integrated M.Sc. Biotechnology course at the Institute of Bioinformatics and Biotechnology, University of Pune, Maharashtra, India.

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Biochips-Nanobiotechnology: Biochips connecting to the DNA computers. A tool for biomedical application

Krithika Shankaran
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Barriers that come along with the DNA computers are the error rates of the propability 5.5 to 6.5/10 since the biochip correspond to the live neural circuits that are unpredictable. Overcoming this, it's a proposal that instead of just using the biochips in DNA computer we could possibly narrow down to the usage of both the integrated circuits and the biochips as well, on separate substrates but the same platform that are connected by transmission lines(wireless or wired or by metallization like in integrated circuits). DNA embedded on the chip, the problems that are in the height of necessity to us can be performed by the biochip, the other normal operations (programming, social networking etc) by our IC. The PIT (Programmable Interval Timer) is programmed for taking into consideration our time factor. .The C-MOS Both N-MOS and C-MOS standard circuits are made use of in parallel connections for great parallel programming, where one part is connected as the other isn't.

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Promise of pharmacogenomics

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Combinatorial pharmacogenomics seeks to characterized genetic variation that effect reaction to potentially toxic agents within the complex metabolic network of human body. Polymorphic drug metabolizing enzyme are likely to represent some of the most common inheritable risk factors associated with common disease phenotypes such as adverse drug reaction. The relatively high concordance between polymorphism in drug metabolizing enzyme and clinical phenotypes indicates that research into this class of polymorphism could benefit patient in the near future. Characterization of other genes affecting drug disposition (absorption, distribution, metabolism and elimination) will further enhance this process. As with most question concerning biological system the complexity arises out of the combinatorial magnitude of all the possible interactions and pathways .The high dimensionality of the resulting analysis problem will often overwhelm traditional analysis methods .Novel analysis techniques, such as multifactor, dimensionality reduction offer viable options for evaluating such data.

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IN- Silico studies of novel TTF protein related to Mycobacterium tuberculosis

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Mycobacterium tuberculosis (Mtb) is a successful pathogen causing tuberculosis (TB). One third ofthe world population is affected by Mtb. Tuberculosis Transcription Factor F (TTF) protein belongs to ECF – sub family, helps in the specific transcription initiation. TTF controls the expression of 14induced genes and plays a significant role in the expression of SigB and SigC Proteins which are important for virulence.

In the present study TTF homology model was generated with the help of comparative homology modeling techniques using pair wise sequence alignment. The predicted 3D model was subjected to refinement and validated. Virtual screening studies were performed with an In-house library to identify a lead molecule that can inhibit the TTF protein. The TTF protein is considered as novel target for the development of new molecular entities (NMEs) useful for tuberculosis treatment.

Biography

M. Kiran Kumar is Assistant Professor (C) at The Department of Chemistry, Nizam College, Osmania University since 2010. He is a doctoral research fellow working on identifying novel leads for Tuberculosis therapy. His field of research interest includes identification of new molecular entities (NME's) using Computational Chemistry, Chemical - Biology and Cheminformatics and Bioinformatics related Software tools. He received an award for Best Oral Presentation at the 30th Annual Conference Indian Council of Chemists - 2011. He has been mentoring M. Sc. and M. Pharmacy students in their dissertation work and actively involved in organizing Seminars and workshops for students. Mr. M. Kiran Kumar published 04 research articles in reputed international journals and has presented about 20 papers at various International and National Conferences.

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Investigation of a pantropical weed, Phyllanthus amarus schum and thonn for a medicinally important molecule- quercetin

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Phyllanthus amarus is a widely distributed pan-tropical herb under an angiosperm family Euphorbiaceae precious for quercetin. Quercetin is a naturally occurring glycosylated flavonoid, synthesized in plant tissues; it is classified under P-vitamins and resembles the non-sugar part of other complex flavonoids viz., rutin, quercetrin, isoquercetrin and hyperoside. Quercetin is found to induce antioxidant, antiallergenic, antibacterial, anti-fungal, anti-carcinogenic and pharmacological responses, and it is used for the treatment of ailments that range from allergies and pathogenic manifestations to high risk coronary diseases, like cancer and HIV. It is highly valued in the 'Ayurveda' for its therapeutic properties and cosmetology. It is also used as a potential natural dye to color fabrics; in analytical chemistry as a chelating agent to determine magnetic properties of metals, to determine oxidation state of lanthanides, and recently, to synthesize nano-particles of metals that find a great importance in drug targeting in cancerous tissues. It is a secondary metabolite found in quite small quantities in plant tissues out of the total polyphenols (polyphenols 25-30% w/w dry weight). The various applications of quercetin foresee potential industrial demand, and envisage development of biotechnological process to enhance its synthesis, extraction and production from the natural sources using a "green process".

In our laboratory, we optimized the medium composition for callus induction, Biomass enhancement and selection of high yielding cell lines for Quercetin. A thorough investigation for cell culture, extraction of the active principle and validation, are being worked out to enhance production of quercetin, and establish commercial potential of Biotech Quercetin.

Keywords: Phyllanthus amarus, Quercetin, Callus, Cell selection, Green Process.

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Estimation and biochemical characterization of diazotrophs in rice rhizosphere soil for their plant growth promoting traits

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Rice is one of the important cereal crops in the world, grown in the diverse environmental conditions. Plant root secrets different type of low and high molecular weight secondary compounds that affects rhizosphere microbial population. Rice crop absorb nitrogen in ammonical form for their growth and development in huge amount. In this study, biochemical characterization of nitrogen fixing bacteria were carried out on ten soil samples from different rice varieties rhizosphere of Directorate of Seed Research (DSR) field in 2011-2012. Diazotrophs were isolated on nitrogen free semisolid media i.e Jenson medium, Yeast Extract Mannitol Agar medium, and Ashby Sucrose Agar medium with different different carbon sources and pH values by using serial dilution method. A total number of 30 rhizobacteria of different morphotypes were selected and biochemically characterized (qualitative and quantitative) IAA production, HCN production and Siderophore production using ferric chloride perchloric reagent, glycine and CAS dye amended medium, respectively. Out of 37, 4 rhizobacterial isolates produced IAA (JA3,JB4, JD3 and JE2), 10 rhizobacterial isolates produced HCN (JA3, JE2, JF1, JH1, JH3, Y1, Y2, Y4, Y7 and Y9) and also 20 rhizobacterial isolates produced siderophore (JA1, JA2, JA3, JC2, JD1, JD3,JE1, JE2, JF1, JH1, JH2, JH3, Y1, Y4, Y6, Y7, Y9, Y10, A1, and A4) were screened in qualitative estimation. In another experiment, plant growth promoting traits as IAA, HCN and Siderophore production were estimated quantitatively. The rhizobacterial isolates that given positive results in qualitative screening were very much potential to secondary metabolites in comparisons to the others by calculating Optical Density (OD) using spectophotometer at 530nm. The results are of potential rhizobacterial isolates were showed all these three characteristics as IAA, HCN and Siderophore production i.e JA3- 1.143, 1.383, 1.592 and JE2- 1.681, 1.900 and 1.492, respectively. Therefore, isolation, identification and characterization of potential rhizobacteria are very much future concern.

Keywords: IAA, HCN, Siderophore and Rice.

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Development and characterization of efficient microbial consortium for human waste biodegradation in different climatic condition

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The water bodies in the tropical developing countries are the worst victims of the domestic wastewater/sewage, basically because of the widening gap between the increasing wastewater generation and unavailability of commensurating economical resources to address the issue through conventional technologies. Throughout the world, disposal of human waste including night-soil is becoming an ever growing problem. The situation is worse especially in the developing countries, where, particularly aquatic systems get contaminated through the disposal of untreated effluent generating a serious threat to health and hygiene of the area and beyond. Our laboratory has developed "Biotank cum Reed Bed Technology" which can be applied for the ecofriendly treatment of human wastes. The system works especially on the basis of biodegradation by the consortium of anaerobic microorganism that is being introduced within the Biotank at the time of the first use. After degradation within the Biotank, the water again is treated with natural Reed bed System. The water from this system may be reused/ recycled for various purposes like, re-flushing, gardening, lawn washing etc.

Development and characterization of the efficient microbial consortium is of great importance that will help faster degradation of the night soil, BOD, COD and pathogenic reduction in the effluent and can work in different climatic condition. Till date optimization of the anaerobic microbial consortia has been done to an extent and hence the screening and isolation and characterization of bacteria (coli form/non coli form) concern is under process.

Biography

Leeza Banu, Junior Research Fellow at Biotechnology Division in Environment Microbiology Branch working under kind guidance and supervision of Dr.Soumya Chatterjee, Scientist 'C', Defence Research Laboratory, Tezpur (ASSAM), Ministry of Defence, Defence R&D Organization (DRDO).

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Discovery of new microglial cathepsin S inhibitors for the treatment of neuropathic pain: Pharmacophore modeling, 3D-QSAR and high-throughput screening

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Neuropathic pain occurs as a result of trauma or injury to a peripheral nerve due to damage or dysfunction of the nervous system under various disease conditions. Lysosomal Cysteine protease cathepsin S (CatS) plays a crucial role for the maintenance of neuropathic pain and spinal microglia activation. Thus, effective CatS inhibitors may be of significant therapeutic importance. In this study, a 3D pharmacophore mapping studies were undertaken for different series of synthetic derivatives. A five point pharmacophore with three hydrogen bond acceptors (A) one hydrogen bond donor (D), and one hydrophobic feature (H) as pharmacophoric features were developed. The pharmacophore hypothesis was validated with enrichment calculation best pharmacophore further yielded a statistically significant 3D-QSAR model, with a correlation coefficient of $R^2 = 0.992$ for training set compounds. The model generated showed excellent predictive power, with a correlation coefficient of $Q^2 = 0.7$. The model was then employed as 3D search query to screen against public and private compound libraries (Asinex, BITS database) in-order to identify a new scaffold. Best hit compounds were selected from virtual screening for the enzyme inhibitory In-vitro activity against CatS enzyme. Inhibitors IC50 value below 50μM were considered as potential selective non-peptidic and non-covalent inhibitors for CatS. Backbone structural scaffold features and the contour maps delivered from the built 3D QSAR models could serve as building blocks in designing novel drug molecules for CatS.

Biography

Madhu Babu Battu has completed his M.S (Pharm) from National Institute of Pharmaceutical Education and Research (NIPER), Hajipur. Currently, he is pursuing PhD from Pharmacy department at Birla Institute of Technology and Sciences (BITS-Pilani), Hyderabad campus, Jawaharnagar, Hyderabad. He has awarded CSIR-Senior Research Fellow from HRDG-CSIR, New Delhi in February 2012.

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The need of hexavalent vaccine: Future perspectives

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Hexavalent vaccines including Tetanus, Diphtheria, Pertussis, Hepatitis B, Polio and Haemophilus influenza type B antigens stand for the recent advance in the development of combination vaccines. DTP-Hep, Hib, IPV based combination vaccines formulation are now widely accepted as an effective means of eliciting protection against respective diseases. To meet societies increasing demands, global disease pressure, the DTP-Hep, Hib and IPV based combination vaccine production is highly required which is currently slow and meticulous- needs to embrace innovation to become significantly more cost effective that make more vaccine coverage. For this to happen, manufacturers urgently need new technological approaches that can rapidly and safely incorporate scientific discovery into scalable, adaptive vaccine manufacturing processes.

Here we provide an overview of innovative vaccine development technologies designed to produce hexavalent combination vaccine. In addition technological trends to solve the various issues regarding antigen selection (i.e Whole cell pertussis or acellular pertussis), adjuvant compatibility issues (Hib PRP with aluminum adjuvant) and preservative selection (thimersal or 2-Phenoxy Ethanol) in vaccines are discussed. Finally, we overviewed the need of hexavalent vaccine for global polio eradication and industry perspective.

The report concludes that there are silent new opportunities for overcoming bottlenecks and constraints within the existing vaccine production system through imaginative cross-disciplinary solutions and that need to be more focused, co ordinate domestic and international effort can accelerate progress toward more rapid production of safe, effective, affordable hexavalent pediatric combination vaccines.

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GWAS: An insight in to the reproductive health of women

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Puberty, the transition from childhood to adult body size and sexual maturity, is a complex multi-staged process. Epidemiological studies with regard to reproductive health often use age at menarche, to indicate the timing of puberty and age at natural menopause, marking the end of the pubertal period. Menarche (first menstrual period) and Menopause (end of menstruation) are the hallmark maturational (physiological) events in a female's reproductive life. Throughout the last decades the interest in the mechanisms behind ovarian ageing and the timing of menarche and natural menopause has increased since both of them have great cultural, social, and epidemiological implications for women's fertility, health and health risks. Genome-wide association (GWA) studies have been successful in identifying many common susceptibility genes and variants associated with complex disease and quantitative traits and we therefore use this approach to identify genes (LIN28B, MCM8, BRSK1 etc.), involved in determining age at menarche (AAM) and age at natural menopause (ANM). Anthropological studies on AAM and ANM provide inference about growth and pattern of women under particular ecological settings, having direct developmental application in improving population growth for various populations living under challenging conditions (like infectious disease, malnutrition etc.) by effectively controlling diseases affecting women's reproductive period. Clinical epidemiologists can effectively design their randomized control trials for testing the efficacy of drugs affecting women's reproductive health based on their genetic profiles. Genetic epidemiologists can enhance the value of epidemiological research by incorporating information about genetic differences in risk into accurate statistical prediction of the time of menarche and menopause. Further, Demographers study fertility in order to foresee the future health profile of the national population. Therefore, the data on the validation of the genetic markers on Indian population will help to remodel surveys according to the genetic-make up of women populations by incorporating more parameters. Broadly, this study will help in creating more women specific public health policies, and hence women empowerment.

Biography

Mahima Gulabani is a Graduate and Post-Graduate in Anthropology with specialisation in Physical or Biological Anthropology with an excellent academic record from the University of Delhi. I am currently a Junior Research Fellow at University of Delhi, pursuing my Ph.D. in Molecular Anthropology (Molecular genetics) with regard to genomic study related to women's reproductive health among the Indian populations. I have published paper in reputed journal and some under communication.

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Use of a lipase from marine Bacillus sonorensis as an additive in detergent formulations

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The efficacy of lipase (Triacylglycerol acylhydrolases EC 3.1.1.3) as a detergent additive from a newly isolated marine halophilic bacteria Bacillus sonorensis from marine clams Paphia malabarica collected from the Kalbadevi estuary, Mumbai, has been assessed and reported. In terms of activity and stability, the lipase exhibited maximum activity in alkaline conditions and was observed to be stable over a temperature range of RT [room temperature]-60°C. The activity of the lipase increased in the presence of surfactants and detergents. Due to these properties of the lipase from marine bacteria, it was used as an additive in detergent to study its efficiency of corn oil removal from fabrics. The washing studies indicated that the efficiency of corn oil removal from the cotton fabrics increased by 20% when lipase was incorporated in the detergent as compared to the treatment with detergent alone. The lipase was also capable of removing corn oil from natural as well as synthetic fabrics dyed with respective, preferred class of dyes.

Keywords: Marine, Bacillus sonorensis, lipase, detergents, corn oil removal.

Biography

Madhura Nerurkar is pursuing PhD in Biotechnology at Institute of Chemical Technology, Matunga, Mumbai, India. She has published 5 papers in national as well as international journals and is a life member of Biotech Research Society, India [BRSI].

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Decolorization and biodegradation of sulfonated azo dye reactive violet 5 by newly isolated Pseudomonas aeruginosa GSM3

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A novel bacterial strain named GSM3 capable of degrading Reactive Violet 5 was successfully isolated from soil sample collected from Ammu Dyeing Industry, Bellary, India. The strain was identified as a member of Pseudomonas aeruginosa based on morphological features, physiological and biochemical characteristics, and phylogenetic analysis based on the sequence of 16S rDNA. The organism showed 100% decolorization of sulfonated azo dye Reactive Violet 5 100 mg L^{-1} within 24 h, while maximally it could decolorize 800 mg L^{-1} of dye within 114 h with 63% decolorization in a carbon free mineral salts medium supplemented with 0.1% (w/v) of yeast extract as a cosubstrate under static condition. The isolate has shown good decolorization activity over a wide range of pH from 5.0 to 9.0 and temperature 25°C to 40°C. However, highest decolorization was observed at pH 7.0 and temperature at 37°C under static conditions. Strain showed good dye decolorization activity in the presence of 5% NaCl. The culture exhibited significant ability to decolorize repeated additions of dye, with decrease in time up to 12 h at seventh dye aliquot addition. The organism was also capable of decolorizing five other reactive dyes. The dye decolorization and biodegradation was monitored by UV-visible spectroscopy, TLC and FT-IR spectroscopy. Thus, the isolate GSM3 has the potential to be employed for the treatment of dye contaminated textile wastewaters.

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Ameliorative action of Hemidesmus indicus root extract on doxorubicin -induced cardiotoxicity

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Chemopreventive potential of Hemidesmus indicus root extract (HiRe) was studied against doxorubicin induced cardiotoxicity. HiRe was administered 15 days before doxorubicin (30 mg/kg.b.wt) injection. Rats in all groups were sacrificed 24 hrs after doxorubicin administration. Serum marker of heart injury –LDH, CPK, SGOT and SGPT levels, which were markedly increased by doxorubicin treatment, were decreased to normal levels by drug pre-treatment. Antioxidant enzymes-SOD, catalase and gluthathione peroxidase, as well as gluthatione levels in heart tissue decreased drastically after doxorubicin injection. Hire pretreatment elevated these levels significantly. Oxidative stress markers in heart tissue, which were high in control animals, were decreased significantly by hire pre-treatment. These results indicate that HiRe, contains several carotenoids of which lutein, zeaxanthin and lycopene predominates, significantly reduced the oxidative stress and thereby toxicity induced by doxorubicin.

Biography

Mahsa Zarei has completed her master of science on biotechnology at the age of 22 years from university of Mysore and currently she is working as a research scholar at the department of biotechnology, University of Mysore under the guidance of Dr. T. Shivanadappa. Field of her research work is toxicology, cancer biology and pharmaceutical biotechnology.

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A preliminary in-vitro study of the carbon mesh as a scaffold for growth of fibroblasts

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Tissue engineering is the process of creating functional 3-D tissue combining cells with scaffolds that facilitate cell growth, organization and differentiation. The most important aspect of tissue engineering is the adhesion and proliferation of cells on scaffold material. The cells are grown on the scaffold that functions to provide mechanical support for cells and synchronize the functions of cells in a manner analogous to extracellular matrix. Carbon as an inert element has advantages over other materials because it is a basic constituent of tissues. The high proportion of the tissues of living organisms is composed of carbon compounds so it should be tolerated by the tissues. The fibroblasts are common cells present in the connective tissue that synthesizes and continuously secretes precursors of extra cellular matrix. Fibroblasts provide a structural framework for many tissues and play a critical role in wound healing. To develop a novel biomaterial for wound healing in-vitro biocompatibility of carbon mesh is tested. In the present study, carbon mesh is cut in desired size and after sterilization placed in six well cell culture plates. The mesh was co-cultured with mouse embryonic fibroblast (MEF) cells. At different time intervals the viability and proliferation of the MEF cells was evaluated using Phase contrast inverted microscopy, Light microscopy and Scanning electron microscopy. The results will be discussed in detail at the time of presentation.

Biography

Mamta Negi completed her Master in Biotechnology with specialization in Animal Biotechnology from Allahabad Agricultural Institute Deemed University, Allahabad, Uttar Pradesh and is pursuing PhD from the same Institute. She has published papers in reputed journals and some are under communication. Presently, she is working as JRF in the DBT sponsored project entitled "Development of the 3-D biodegradable matrices for reconstructive surgery" investigated by Dr Naveen Kumar in the Division of Surgery, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh.

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Regenerative nanomedicine 'dendrimer' in blood-brain barrier drug delivery and targeted therapy of cerebral palsy

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Nanotechnology is the design and assembly of submicroscopic devices called nanoparticles. With a high burden of disease coming from neurological disorders, nanoneurotechnology, an application of nanoparticles in drug delivery, has provided promising answers to some pressing issues in recent years. Conventional therapeutics, although effective, remain critically below levels of optimum therapeutic efficacy due to presence of the tightly regulated blood–brain barrier and its unique ability to protect the brain from xenobiotics. Nanotechnology has fashioned colloidal drug delivery systems that penetrate the blood–brain barrier, which are similar to the lipophilic and less than 500 Da size molecules for which it generally allows passage. Here, we highlight the recent advances in the understanding of Cerebral palsy and particularly the applications of nanoparticles, nanotechnology-based methods and therapeutic modalities, to diagnose and treat it. Advances in nanoplatform, nano-imaging, and nano-drug delivery will drive the future development of nanomedicine, personalized medicine, and targeted therapy. In neurological diseases, advances in nanotechnology will require accelerated translation to the fields of brain mapping, CNS imaging, and nanoneurosurgery.

Cerebral Palsy is a term which encompasses the neurological disorders caused by some form of damage or injury to the brain, often occurring during development or the birthing process. CP can cause physical disability in human development. Delivery of therapeutic compounds by nanomedicine, called dendrimers, is one of the advanced discoveries in cerebral palsy treatment.

Biography

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Pectinase from marine Bacillus subtilis: An efficient bioscouring agent

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Bioscouring refers to the enzymatic removal of pectins and waxes from the surface of a cotton fiber, which endows it withimproved bleachability and dyeability. This process preserves the fiber's structure and strength, and avoids the high energy consumption and severe pollution problems that are associated with conventional alkaline treatments. In the present study Pectinase enzyme was extracted from marine Bacillus subtilis isolated from marine sediment sample collected from Chinchani beach, India and was optimized under different cultural conditions. The partially purified enzyme was used in the scouring of the cotton fabric. It was observed that water absorbing capacity of the enzymatically scoured fabric was comparable with the alkaline scoured fabric. In addition when both the enzymatically scoured cotton as well as alkaline scoured cotton was dyed, colour strength values determined were more or less similar indicating efficient removal of pectin from graige cotton.

Keywords: Bioscouring, Marine, Bacillus subtilis, Pectinase.

Biography

Manasi Joshi is pursuing Ph.D. in Biotechnology at Department of Fibres and Textile Processing Technology, Institute of Chemical Technology (ICT), Mumbai. She has published one paper titled as 'Dyeing of Fabrics with a Natural Orange Pigment Extracted from Bacteria Isolated from Garden Soil' in Journal of Textile Association, Nov- Dec 2011, pp 235-237.

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In vitro evaluation of modified polyethylenimine polymers as efficient carriers for nucleic acids

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In arena of gene therapy, cationic polymers as non viral gene delivery systems are the most promising candidate, due to their facile synthesis, robustness. Among all cationic polymers, branched PEI is the most widely studied polymer because of its efficient capability to condense DNA and the resulting PEI/DNA complex can act as proton sponge, thus enabling DNA delivery into cytoplasm by rupturing endosomes. High charge density on bPEI is responsible for high transfection efficiency; however, it simultaneously contributes to increased cytotoxicity. To improve the biocompatibility of PEI for in vitro and in vivo applications, the modifications have been incorporated. Here, in the present study, we have examined the potential of hydrophobically modified PEI polymers for their cytotoxicity and ability to deliver gene to cells in vitro. For this purpose, primary amines of bPEI were substituted by hydrophobic and positively charged N,N,N',N'-tetramethylguanidium moiety (Tmg) by treating PEI with 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU). A small series of Tmg-P polymers was synthesized by varying the amount of HBTU. These modified polymers were characterized by spectroscopic techniques and their percent substitutions were determined. Subsequently, these polymers were evaluated for their buffering capacity and in vitro studies (transfection and cytotoxicity) on various mammalian cells and the results compared with the standard transfection reagents. In vitro studies revealed that one of the formulations with ~5.2% substitution of Tmg groups on PEI showed enhanced transfection efficiency and cell viability out competing the standard transfection reagents in the absence and presence of serum. The study suggests that projected modified PEI polymers may act as efficient vectors for in vivo gene delivery.

Biography

Manohar Mahato has completed his M.Sc. in Chemistry (Organic) from University of Delhi, India in 2009. He is pursuing his Ph.D. in Bio-organic Chemistry from Institute of Genomics and Integrative Biology (IGIB), CSIR lab, New Delhi, India. He is working in the area of design and synthesis of self assembled peptides and modified polymers for delivery of biomolecules. He has two papers in reputed journals.

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Identification and characterization of bio-remediating bacterial isolates from soil and water

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Bioplastics are natural biopolymers have certain advantages over petroleum-derived plastic that do not cause toxic effects in the host. These are synthesized and catabolized by various microorganisms as a by-product. The world is currently using approx 140 million tons of plastics per annum consuming approximately 150 million tons of fossil fuels for processing of these plastics. Substitution of such a big demand is difficult for coming eras therefore bi-plastic provide a base for this industry as eco-friendly plastic. These biopolymers accumulate as storage materials in microbial cells under stress conditions. The most widely produced microbial bioplastics are polyhydroxyalkanoates (PHAs) and their derivatives. Ralstonia eutropha H16 is a gram-negative, rod-shaped, and facultatively chemolithoautotrophic hydrogen-oxidizing bacterium that serves as a model organism for polyhydroxyalkanoate (PHA) metabolism. Mainly found in soil and water and this bacterium has great ability to use in bioremediation, as it is able to degrade a great number of chlorinated aromatic (chloroaromatic) compounds and chemically related pollutants. Therefore, in the study the different isolates of bacteria strains were isolated from different soil and water sources. To identify these bacterial strains a 16S rDNA gene based approach was applied. Genomic DNA isolated using Gen Elute Bacterial Genomic Kit (Sigma). PCR conditions optimised to amplify 16S rDNA by using universal known primers set of rDNA at different annealing temperature in a gradient PCR. The PCR amplicon sequenced commercially and phylogentic analysis done by sequence homology search with the known sequences from the gene bank and taxonomic position of the new isolates was established.

Biography

Manorama Singh has completed his M.Tech in Biotechnology from School of Biotechnology, Rajiv Gandhi Prodaugiki Viswavidhayalaya, Bhopal, Madhya Pradesh. Presently she is working as Junior Research Fellow in the Division of Veterinary Biotechnology, Indian Veterinary Research Institute, Izatnagar.

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Training technology users is waif

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Introduction: In recent decades, health care systems has greatly influenced by the technology development And the technology help to enhance quality of care, reduce costs and improve patient care. These technologies can be helpful only when they are applied to the correct way. So appropriate training for technology application and impact of education on how the application appears to be essential.

Objectives: This qualitative study conducted to explain how using technology in nursing education has been made.

Methods: In this study, qualitative method used for analyzing content of 24 interviews in nurses who were occupied in hospitals affiliated to Isfahan University of Medical Sciences. They Selected by using purposive sampling and were nurse, head nurse, supervisor and chief nurse managers were interviewed. Interviews conducted in deep semi-structured interviews (2 focus group and 13 individual interviews) and after interviews transcription, qualitative content analysis used for coding and classification of data.

Finding: 160 initial concepts revolved after content analyzing and seven major themes inferred from 23 common sense.

Conclusion: Content analysis is suitable method for answer to questions which have been answered rarely about technology. The results of this study showed that although the training and information about using technology conducted but formal training quality is no "sufficient and qualify". In addition, there is no documented information about how is training workforce for implicating and maintaining technology.

Keywords: Heath care technology, nursing research, qualitative research, training.

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Isolation and characterization of rhizospheric Streptomyces with plant growth promoting potential

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Plant growth promoting agents can promote growth and increase productivity of plants by exerting beneficial effects through various mechanisms. Streptomyces have been poorly explored specifically for their potential as plant growth promoting rhizobacteria. In this study, a total of 62 Streptomyces isolates were obtained from rhizospheric soils and identified based on their morphology, biochemical tests and 16S rRNA gene sequence analysis. The highest number of Streptomyces was isolated from Zea mays rhizosphere soil. Plant growth promoting characteristics were elucidated, 14 strains exhibited all the plant growth promoting attributes of phosphate solubilization, ammonia production, 1-aminocyclopropane-1-carboxylate (ACC) deaminase activity, indole-3- acetic (IAA) production and siderophore production. 12 isolates were able to produce siderophores, ACC deaminase and ammonia. Only 7 isolates were able to produce siderophores and solubilize phosphates at the same time. The result indicated that Streptomyces have potential in agricultural application as biofertilizer and this will be of tremendous value as chemical fertilizers are becoming expensive with adverse effect on the environment.

Biography

Mobolaji Felicia Adegboye has completed her MSc at Obafemi Awolowo University, Ile-ife Nigeria. She is a PhD student at North-West University, South Africa. Her research entails the Phylogenetics of Actinomycetes under the mentorship of Dr Babalola OO. Mobolaji has published couples of articles in peer review journals.

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Genotoxicity of hierarchical web of carbon micro-nano fibers

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Despite great interest in carbon based nanomaterials for environmental remediation and biological applications, there is a concern regarding their potential toxicity. The hierarchical web of carbon micro-nanofibers are relatively newer materials. They are prepared by growing carbon nanofibers (CNFs) on the substrate activated carbon microfibers (ACFs) by chemical vapor deposition (CVD) using benzene (C_6H_6) or acetylene (C_2H_2) as a carbon-source, and metals such as Ni, Cu, Fe, and Ag as the metal-catalyst. The metal nanoparticles on the tip of grown CNFs are removed by ultra-sonication in acidic medium. The prepared hierarchical structure (ACF/CNF) has been successfully applied in several environmental remediation applications, including removal of SO_2, NO_X and volatile organic compounds (VOCs) from air, and arsenic, fluoride from wastewater. Such materials have also been used for removing bacteria from water. In this study the in-vitro evaluation of the genotoxicity (cellular as well as molecular toxicity) of ACFs/CNFs on human lymphocytes was carried out. The cellular toxicity was ascertained by MTT assay, whereas the molecular toxicity test was carried out using the DNA profiling technique. The latter technique was used for ascertaining DNA damaging potential of the prepared materials. The cellular toxicity of a few common commercial adsorbents such as carbon nanotubes (CNTs), activated carbon (AC) and non-carbonaceous materials such as silica, alumina, zeolite was also tested for the comparison purpose. From the results, ACFs/CNFs were found to be less toxic than the other carbon based adsorbents. The present study reveals that CNFs are preferable to other commercial carbon-based nanomaterials and may be safely used for the aforesaid various environmental and biological applications.

Keywords: Activated carbon fibers, carbon nanofibers, cytotoxicty, lymphocytes.

Biography

Mohammad Ashfaq is working as a Project Scientist under the supervision of Prof. Nishith Verma at Center for Environmental Science and Engineering, Indian Institute of Technology Kanpur. He has published 3 papers in reputed international journals.

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Prunus armeniaca L: A novel source of β-Glucosidase

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β-Glucosidase occurs in a variety of organisms and catalyzes the hydrolysis of aryl and alkyl β-D-Glycosides as well as glycosides with only carbohydrate moiety such as cellobiose and also cyanogenic glycosides. Here β-Glucosidase of the Prunus armeniaca (wild apricot) was purified to 8 fold and 5.3% yield with specific activity of 281 units/mg protein. Assay conditions were optimized at 37°C as specific activity was found to be maximum. The enzyme showed maximum activity in 0.15 M sodium citrate buffer of pH 6 with p-nitrophenyl β-D-Glucopyranoside (PNPG) as substrate. Kinetic properties of enzyme have K_m of 0.143 mM and V_{max} of 143 μmole/mg/min using cellobiose as substrate. Stability profile of the enzyme was studied and half life of the enzyme was found to be 8 hr and 15 min during the reaction. After immobilization, the activity of the enzyme was decreased by 53%. Immobilized beads were used twice to carry out the reaction which proved the utility of immobilization.

Biography

Mohammad Asif has completed his post graduate in biotechnology and pursuing his Ph.D. from Dept. Of Biotechnology, H P University, Shimla. He is presently working on the studies on Hydroxynitrile lyase and their application for synthesis of various cyanohydrins. He has qualified CSIR-JRF, UGC-JRF, and GATE etc. He also worked at Bhabha Atomic Research Centre (BARC), Mumbai as research scholar. He attended several seminars, workshops and published abstract at International conference.

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Development and validation of poly protein vaccine candidate against leishmania in human

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Leishmaniasis is caused by parasitic protozoa transmitted by the bite of female sand fly,They are obligate intracellular protozoan parasites with over 20 species and subspecies that infect humans and other mammals causing different range of clinical signs and symptoms collectively known as leishmaniasis. Leishmaniases are endemic in 88 countries with a majority of the cases occurring in develop and undevelope countries mostly in the tropics and subtropics. Currently about350 million at risk of infection and 12 million people are believed to be afflicted with the disease worldwide (1,2,5).

The life cycle of this kinetoplastid parasite involve alternating life form in the mammalian host, and the vector. The vector takes up the amastigote from the host during a blood meal,where it transforms to the motile promastigote, which mulitiplies in the sand fly digestive tract, to be regurgitated with the following blood meal. The injected promastigotes enter macrophages in the mammalian host, where they transform into amastigote, evade macrophage killing mechanisms and multiply to great number.

The manifestations of leishmaniasis range from a self-healing cutaneous lesion (cutaneous leishmaniasis, CL) to a lethal visceral form of the disease (visceral leishmaniasis, VL; also known as kala azar) and mococutaneous leishmania(MCL). VL is a major public health problem in the Indian subcontinent and East Africa. However, VL also occurs in the Mediterranean region and Latin America, where the primary reservoir of infection are dogs. Parasites are transmitted to humans from human or infected dogs or by the bite of sand flies. . More than 90% of cutaneous leishmaniasis, which first appears as papules on the exposed skin followed by ulceration and scab formation, occur mostly in seven countries, namely Algeria, Brazil, Iran, Peru, Afghanistan, Saudi Arabia and Syria. (3)

Although antibiotic treatments for leishmaniasis are available, because of re-infection, drug resistance and economic reasons, it is unlikely that we will be able to control the global spread of leishmaniasis without an effective vaccine. To date, however, no commercial vaccine has been available. A peptide vaccine for leishmaniasis, developed by identifying a potential antigen, like mention the antigen list of protein 3) could be an effective alternative as it arrests the promastigote invasion.

Biography

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Role of nanoparticles in the drug delivery system

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Nano technology, a newly evolved discipline aims the creation, manipulation and application of structures in the nanometer size range. Nanotechnology has tremendous applications in various field of science; its importance has been also realized in drug delivery via nanoparticle.

Drug delivery is a very efficient process, but it is facing different challenges. For the effective drug delivery it requires stabilization, extended circulation and the proper targeting of the drug. In this regard use of nanoparticle has evolved a best alternative. A variety of nanoparticles like metal based, lipid based, polymer based etc. are extensively studied for their role in drug delivery. Nanoparticle can easily enter most cells and circulate through the body, are suitable for targeted delivery vehicles to carry large doses of chemotherapeutic agents or therapeutic genes into the target site. Among the newly developed nanomedicine and nanodevices such as quantum dots, nanowires, nanotubes, nanocantilevers, nanopores, nanoshells, the nanoparticles are the most promising applications. The present article reveals the medicinal aspects of nanotechnology especially nanoparticle and highlighting its importance in drug delivery systems.

Keywords: Nanotechnology, drugs delivery, nanomedicine.

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Molecular markers a tracking contrivance for mycorrhizal fungi

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Arbuscular mycorrhizal (AM) fungi are diversified groups of symbiotic soil fungi of phylum Glomeromycota. AM fungi not only increase the acquisition of P and mineral nutrition and also had an adverse effect of the soil borne pathogenic microorganisms. AM fungi having the genetic inequality at the species level and its colonization amongst the species level also differ from plant to plant. The tacking of AM fungi in the various ecological and geographical conditions needs a reliable tracking approach which given a real story of this below ground symbiosis. The microsatellites are the short tendom sequences repeat of nucleotides present is almost all the groups of eukaryotic fungi and play a significant role in the identification of mycorrhizal biodiversity. This tracking scheme of microsatellite markers is very reliable in the biodiversity studies of these symbiotic fungi because its gives the real portrait of the different strains of AM fungi at the species level differing only in one or two base pair sequences.

Keywords: AM fungi, Biodiversity, Genetic inequality, Microsatellite, Soil Symbionts.

Biography

Mohd. Sayeed Akhtar did his Ph.D. from Aligarh Muslim University, Aligarh, India and post-doctoral studies from University of Basel, Switzerland and Chonbuk National University Republic of Korea. Presently working as Assistant Professor in Department of Biology, College of Natural Sciences, Jimma University, Jimma, Ethiopia. He is the leading scientist in field of Microbial biotechnology and Nano-biotechnology. He has published several published several research articles in Journals of International repute and books from internationally recognized publishers. His research interest includes plant-microbe interactions, microbial and mycorrhizal biotechnology, bioremediation, soil biological health indicators, microbial molecular biology and nano-biotechnology.

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Characterization of buffalo Esx-1 gene: An X-linked homeobox protein

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The present study we have undertaken is to clone and express the partial length cDNA of extra embryonic tissue-spermatogenesis homeobox gene 1 (ESX-1). ESX-1 is an X-linked gene which encodes for a homeobox protein. The ESX-1 expressed specifically in extraembryonic tissues during development and in the adult testis as well. In particular, in situ hybridization experiments delimited ESX-1 transcription to preleptotene spermatocytes and round spermatids, suggesting a role in spermatogenesis. Available Bos taurus ESX-1 gene sequence was used to design the gene specific primers and used for amplification of Bubalis bubalus ESX-1 gene from the cDNA. Amino acid sequence has shown his hest identity with Bos taurus (91.6%). The homeobox region has shown the identity of 98.4%, 70.5%, 70.5%, 69.4% and 69.4% with Bos taurus, Homo sapiens, Pan troglodytes, Macaca mulatta and Mus musculus respectively. The ESX-1 cDNA was cloned and expressed in Escherichia coli and was purified in a single chromatographic step using Cobalt-Agarose gel affinity column. The purity and the molecular weight of the fusion protein were checked in SDS-PAGE which showed a purified product of molecular weight 27KDa. The purified product was confirmed by Western blot analysis using Ni- HRPase conjugate. As the ESX-1 protein is X-chromosome specific and expressed in only X-bearing spermatozoa the antibodies raised against the protein can be used for assessing the enrichment of buffalo spermatozoa in sex sorted semen.

Biography

N Vijay has completed his BVSc & AH degree from Veterinary College, Bangalore in the year 2008. He got selected in Indian Veterinary research Institute, Izatnagar to pursue Masters Degree in the discipline Animal Biochemistry in the year 2009 and completed the same with MVSc degree in 2011. Presently he is pursuing PhD from Deemed University, Indian Veterinary Research Institute, Izatnagar.

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Identification of nematode toxic Bacillus thuringiensis isolates using Caenorhabditis elegans as a model nematode

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Cry5, Cry6, Cry13, Cry14, Cry21 and Cry55 are crystal toxins produced by Bacillus thuringiensis and specifically toxic to nematodes. In the current study, seven (T32, T44, T73, T146, T161, T210 and T321 indigenous isolates of Bacillus thuringiensis) obtained from Bt collection of CPMB&B, TNAU were screened for their toxicity to nematodes using Caenorhabditis elegans as a model nematode. L4 worms of C. elegans were allowed to feed on the bacterial lawn individually grown on NGM (Nematode growth medium) agar plates and observed for growth retardation and mortality of nematodes. Nematode toxic Bt strain YBT1518 (obtained from BGSC, Ohio State University, USA) and E.coli strain OP50 expressing cry5 gene (obtained from UCSD, California, USA) were used as standard checks for comparison. Based on the lawn bioassay results, mortality of L4 worms was observed in T73 and T161 and retarded growth of nematodes was observed in T44, T146 and T210. Further PCR analysis using screening primers based on already known gene sequences indicated the presence of nematode toxic genes cry5 and cry55 in T44 and cry55 in T210. Though there was no amplification for any of the known genes screened (cry5, cry6, cry13, cry14, cry21 and cry55), there was retarded growth and mortality observed in nematodes fed on T73, T146 and T161 isolates indicating possibilities of getting novel genes from these isolates.

Biography

V. Balasubramani has completed his PhD from Tamil Nadu Agricultural University (TNAU), Coimbatore at the age of 27 years and Post doctorial studies from University of Sussex, UK and University of California, San Diego, USA. He is currently working as Associate Professor (Entomology), at the Department of Plant Biotechnology, Centre for Plant Molecular Biology and Biotechnology, TNAU, Coimbatore, India. He has published 20 research papers in reputed journals.

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Study on conversion of digestable starch to resistant starch in rice (Ir8) and finding its resistant starch value

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Rice, being a primary source of carbohydrate, its a major food grain in India and whose varieties are used as a staple food. But the GI (glycemic index) of rice was found to be higher than any other starch containing food. [Glycemic Index - 77 ± 2 (high) Glycemic Load - 40.04 (high). (Serving size: 250 grams)]. The rice variety IR8 is chosen as the amylose content was found to be 28.8. The amylose content of IR8 variety is high when compared to other rice variety. The Glycemic index is inversely proportion to amylose content. Resistant starch (RS) is defined as the sum of starch and products of starch degradation not absorbed in the small intestine of healthy individuals. Resistant starches cannot be broken down by digestive enzymes; they pass through the small intestine intact. In the large intestine (colon), they are partly fermented by gut bacteria in a way similar to soluble fibers. In rice the resistant starch (type 3) is formed during heat treatment by roasting at particular temperature (145^0 C) and on sudden cooling, by which the glycemic index of rice gets reduced. After heat treated the rice is grinded into powder and mixed with water and black gram power in correct proportion, and idly batter is made and allowed to ferment. The idly produced from this batter reduces the glycemic index and helps to maintain the blood glucose level for diabetic patient.

Biography

N. Renu Priya is pursuing her M.Tech (Food Processing Engineering) in Karunya University. She did her B.Tech (Food Technology) in Kongu Engineering College. Through this project, she has learnt about resistant starch formed during roasting of rice which reduces the glycemic index.

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Biological activity of Ascidians Polyclinum madrasensis (Sebestian, 1952) and Phallusia nigra (Savigny, 1816) from tuticorin coast of India

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Ascidians are fouling animals with a great ability to synthesis bioactive substances. This study examined the biological potential of ascidians Polyclinum madrasensis and Phallusia nigra. Ascidians were collected and extracted by MeOH (3×0.5 L) and DCM/MeOH (1:1) (3 x 0.5 L). These extracts were tested for biological activities such as bioassay, analgesic activities, CNS depressant activity and anti-inflammatory assay. In mice bioassay, MeOH extracts 150 mg/kg and 200 mg/kg of P. madrasensis showed lethality at 2.45 ± 0.05 and 1.52 ± 0.02 (Mean ± S.D) min & sec, DCM/MeOH extracts of P. madrasensis showed lethality at 2.38 ± 0.05and 2.22 ± 0.04 (Mean ± S.D) min & sec. MeOH and DCM/MeOH extracts of P. nigra were showed lethality at the dose of 200 mg/kg, at 1.10 ± 0.03 and 2.13 ± 0.04 (Mean ± S.D) min & sec. In tail flick method maximum pain reaction time 7.14 ± 0.11** sec was observed in MeOH extract ofP. nigra. In hot plate method maximum pain reaction time (paw licking) 9.12 ± 0.02* sec and pain reaction time (jump response) 8.16 ± 0.01** sec were recorded in MeOH extract of P. nigra after 15 min. The maximum CNS depressant activity recorded 74.43 ± 0.11% in MeOH extract of P. nigra. In anti-inflammatory responsesDCM/MeOH extracts of P. nigra showed promising effects.The result strongly proved that the ascidians extracts has remarkable analgesic and anti-inflammatory activities. Further studies will fulfill for purification and structural elucidation of analgesic and anti-inflammatory drugs.

Keywords: Mice bioassays, analgesic ratio, tail flick, paw licking, jump response and anti-inflammatory.

Biography

N. Sri Kumaran is a Ph. D Research Scholar in Centre of advanced study in Marine Biology, Faculty of Marine Sciences, Annamalai University. He is working on Bio medical and Pharmacological studies in biofouling ascidians. He has 3 years research experience and well knowledge in research filed. He also served as JRF in DBT project. He has published 15 papers in reputed national and international journals with good impact factors.

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Applications of dental pulp stem cells (dpsc) in treatment of myocardial infraction

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Stem cell research is a new field that is advancing at an incredible pace with new discoveries being reported from all over the world. Stem cells are powerful and unique cells that can multiply several times and, depending on the surrounding environment can form specific desired tissue or organ. This has the potential to provide solutions for several incurable diseases or injuries. There are 3 types of stem cells: human embryonic stem cells, adult stem cells and induced pleuripotent stem cells. Dental pulp cells are adult stem cells fond in both baby teeth and wisdom teeth. Dental pulp stem cells are new era of tissue engineering. Human dental pulp contains precursor cells termed dental pulp stem cells (DPSC) that show self-renewal and multilineage differentiation and also secrete multiple proangiogenic and antiapoptotic factors. Dental pulp was rich in different stem cell types such as: Chondrocytes: which are stem cells that have the ability to regenerate cartilage and these cells play an important role in the treatment of arthritis and joint diseases. Adipocytes: stem cells that have the ability to repair damaged cardiac tissues following a heart attack. Mesenchymal Stem Cells: They have the ability to differentiate into various types of reparative cells. Dental cells can differentiate into cardiac cells that have the potential to repair damage caused by myocardial infarction. The infracted heart heals by scar formation, and large myocardial infarctions typically result in heart failure. Although adult stem cells with the capacity to transform into various cardiac cell types and to secrete cardio protective cytokines have been identified, endogenous repair mechanisms in the adult heart are not sufficient for meaningful tissue regeneration. These observations, however, suggest that it may be feasible to develop interventions aimed at enhancing these processes, and to promote functional, and eventually, structural recovery of the infarcted heart (MSCs) are promising cell types in the treatment of cardiac dysfunction. They may trigger production of reparative growth factors, replace damaged cells and create an environment that favors endogenous cardiac repair. To achieve the maximal clinical benefits, ex-vivo manipulation can further enhance MSC therapeutic potential. To examine whether these cells could have therapeutic potential in the repair of myocardial infarction (MI), DPSC can be infected with a retrovirus encoding the green fluorescent protein (GFP) and expanded ex vivo. Human dental pulp stem cells improve left ventricular function, induce angiogenesis, and reduce infarct size in rats with acute myocardial infarction. Conclusions—The recognition that the differentiation of hCSCs (human cardiac stem cells) into mechanically integrated cardiomyocytes has important clinical implications for the treatment of human heart failure. DPSC could provide a novel alternative cell population for cardiac repair, at least in the setting of acute MI.

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Green synthesis of gold nanoparticles by using Acinetobacter sp and their antibiofilm activity

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Acinetobacter sp. was isolated from spoiled apple fruit and used for synthesis of gold nanoparticles. Biosynthesis of gold nanoparticles was optimized with respect to pH, temperature, time of incubation and gold salt concentrations. These nanoparticles were characterized by using UV/Vis spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Energy Dispersive spectroscopy (EDS) and X-ray diffraction analysis (XRD).TEM studies revealed that spherical nanoparticles were formed on the cell surfaces and in supernatant with a size in the range of 5-20 nm. These gold nanoparticles showed antibacterial, antifungal and anti-biofilm activities against some pathogenic organisms.

Biography

Narendrasingh Rajput is M.Sc. student at Department of Microbiology, University of Pune, Maharashtra, India.

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Comparative study of antibacterial activity of garlic and cinnamon at different temperature and its application on preservation of fish

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The antibacterial effect of aqueous garlic and cinnamon extract at five different temperatures (40O C, 60O C, 80O C, 100O C, 120O C) against five multidrug resistant bacterial isolates (2 gram negative and 3 gram positive), including Bacillus cereus, Staphylococcus aureus, Enterococcus faecalis, E. Coli and Proteus mirabilis were studied by well diffusion method. The maximum antibacterial effect of aqueous garlic and cinnamon extract of different temperature obtained in Enterococcus faecalis and E. Coli at 60O C (1.041) and in Enterococcus faecalis at 60O C (0.87) respectively. This antibacterial property was applied on preservation of fish. A time dependent antibacterial study was done using the gum acacia coating with garlic and cinnamon paste. It is observed that the microbial load present on the fish was totally reduced on second day. In short, the aqueous garlic and cinnamon extract and pastes show a wide range of antibacterial activity at 40O C to 60O C and satisfy all the criteria for antibacterial agent as compared to antibiotic Gentamicin. These results suggests that garlic and cinnamon can be used as food preservative and thus the use of other chemical preservatives can be minimized, which would be beneficial for environment and consumer health; or a plastic for food preservation can be invented using the antibacterial activity of garlic and cinnamon, the inner wall of the plastic coated with garlic and cinnamon paste.

Keywords: Aqueous garlic extract, Aqueous cinnamon extract, Gentamicin, activity index, fish and coating.

Biography

Nandita Dasgupta is in B.Tech Biotechnology 3rd year at the age of 21 years from VIT University, Vellore. She was the Student coordinator of VIT Biosummit'12, a meet between industrialists and academia. She has published 3 papers in reputed journals. She was also student coordinator in many college tech and cultural fests. She has good subject command in depth and technical skills with excellent management skills.

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DFT studies of ferulic acid derivative, FA15 using computational approach

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Application of computational biology involves the data based development of analytical and theoretical techniques that employs mathematical modeling and simulation methodology to perform the in-silico study of biological systems. Molecule FA15 (2-methyl-1-butyl ferulate) is a high potential chemo-preventive agent, both structurally and functionally. In respect to activity shown by FA15, it suppresses iNOS/COX-2 expression and also the release of TNF-α. It also has in-vivo suppressive nature towards oxidative stress, papiloma development and inflammation. Moreover it shows suppressive effect on LPS/IFN-γ induced degradation of IκB-α, which is a suppressive nuclear factor. In our work, the objective is to resolve the molecular structure of FA15. For this purpose Gaussian 09 (computational chemistry software) was used. Software Gaussian 09 is the latest version of Gaussian series programs. This computational tool presents unique capabilities for electronic molecular based modeling. Several versions of Gaussian software are available for specific scientific and computational oriented tasks. The stereo-molecular chemistry of FA15 molecule was fully optimized at discrete basis sets. We also computed the chemical shifts associated to Proton (1H) and Carbon (13C) presents in the FA15 molecules. A multistage approach had been devised to calculate bond length, dipole moment, total energy etc in respect to the molecular structure of FA15.

Biography

Naresh Kumar is pursuing his Ph.D from Department of Biotechnology, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India. He is working on computational biology of biological molecules. He has completed his post graduation in Biotechnology and had worked in Indian Institute of Science, Bangalore during his post graduation. He has qualified CSIR-JRF in 2009. He frequently reviewed the research papers in African Journal of Microbiology (an international journal). He has one publication in journal and many publications in the national and international conferences.

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Osteogenic differentiation of cord blood stromal cells on composite polymer scaffolds

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Composite polymers (PLGA) scaffolds were fabricated by solvent casting and simultaneous particulate leaching, and their ability to enhance the osteoblastic behavior of umbilical cord blood stromal cells (MSCs) in osteogenic media was investigated. MSCs were isolated from human umbilical cord blood and cultured on polymer scaffolds to assess short-term cyto- compatibility and long-term physiological behavior. Smooth polypropylene flasks were used as control surfaces. The short-term cyto-compatibility results indicated that hybrid polymer scaffolds supported comparatively good cell adhesion and viability compared with control surfaces. In osteogenic conditions, MSCs grown on this polymer scaffolds also shown increased levels of alkaline phosphatase activity after 3 weeks of culture. Calcium phosphate mineralization was substantially accelerated over the scaffolds compared to control surfaces as indicated through von Kossa and calcium staining. These results demonstrate the enhanced tissue regeneration property of hybrid composite scaffolds, which may be of potential use for engineering osteogenic scaffolds for orthopedic applications.

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Bacteria in cancer therapy: A new approach

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Anti-cancer therapy faces major challenges, particularly in terms of specificity of treatment. The ideal therapy would eradicate tumor cells selectively with minimum side effects on normal tissue.

Gene or cell therapies have emerged as realistic prospects for the treatment of cancer and involve the delivery of genetic information to a tumor, to facilitate the production of therapeutic proteins. An emerging family of vectors which involves bacteria of various genera had been found useful to target the proteins involved in the replication process of cancer. It has been concealed that bacteria are naturally capable of homing to tumors when systemically administered resulting in high levels of replication locally and furthermore invasive species can deliver heterologous genes intra-cellularly for tumor cell expression.

A typical therapy regime called Bacterially Directed Enzyme Prodrug Therapy (BDEPT) involves intravenous administration of the vectors in two steps. In the first step, the bacterial vectors are administered (at safe levels) which target the tumour where they proliferate and express the therapeutic enzyme. In the second step, once the expression of the enzyme is optimal, a non-toxic prodrug is administered which is converted to the cytotoxic drug at the tumour by the expressed enzyme. This results in tumour cytotoxicity rather than systemic toxicity, leading to tumour cell death and sparing normal tissue because the vector that is delivering the enzyme gene is a bacterium.

In this review we discuss the use of bacteria as vehicles for gene therapy of cancer, detailing the mechanisms of action and successes at preclinical and clinical levels.

Keywords: BDEPT, Vectors, Gene therapy, Tumor cytotoxicity.

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Characterization of a novel eukaryotic initiation factor 5A (eIF5A) in Leishmania donovani

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Leishmania donovani is a protozoan parasite which leads to visceral leishmaniasis. Though Leishmaniasis is a dreadful disease the treatment options of it are limited and far from satisfactory. Eukaryotic initiation factor 5A (eIF5A) is a small, essential eukaryotic protein that contains a modified lysine residue, hypusine. The role of eIF5A in cell proliferation was documented in yeast. In HIV it was reported that it is involved in transport of viral mRNA from nucleus to cytoplasm in association with Rev HIV-1 protein. In humans, it induces apoptosis by acting as regulator of p53 and also is involved in translation elongation. In Leishmania, the function of eIF5A protein is not yet documented. This study was carried out to find out the function and localization of eIF5A in Leishmania donovani. To examine the subcellular localization of eIF5A protein, we cloned the gene in GFP vector and transfected in Leishmania donovani. Confirmation of the transfectants was done by fluorescent microscopy. Western-blot analysis using anti-GFP antibody showed expression of the fused eIF5A-GFP protein in total cell lysate and cytosolic fraction. However, this protein was absent in the nuclear fraction. This indicates that eIF5A has functions confined to the cytoplasm. To elucidate the function of eIF5A in parasite proliferation, the gene was cloned in an overexpression vector and transfected in promastigotes of Leishmania donovani. Interestingly, we found that there was decrease in growth of overexpressors when compared with the wild type and vector alone parasites. eIF5A overexpression may be leads to apoptosis as reported in other system.

Biography

S. Rashmi is PhD Scholar in the Department of Biotechnology, National Institute of Pharmaceutical Education and Research (NIPER), S.A.S Nagar, Mohali, India.

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Bandages from microbial cellulose

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The ever advancing field of medical biotechnology has led us to a new path of exploiting the production of cellulose by a species of Acetobacter. These microbial cellulosic fibres produced by this bacterium may substitute cellulosic cotton fibres as it does not have lignin and hemi-cellulose unlike plant cellulose fibres. Cellulosic fibres synthesised by Acetobacter has shown a vast potential in wound healing. This wound healing capacity possessed by them is due to their unique nano morphology. These fibres prove to be further advantageous as they possess great elasticity, high wet strength and comfortability. These all attributes led it to prove it beneficial in formation of bandages. Also these microbial fibres have nonporous behaviour which will allow potential transfer of antibiotics to the wound as well as prevent any further infection by acting as a barrier. Moreover they can be moulded in any form or shape and hence can be applied at any place. This bandage will prove to be non-toxic, non-pyrogenic. Treatment with bases at high temperature will remove unwanted cells also and hence making it biocompatible also. Further treatment with citric acid will increase its antimicrobial properties. Microbial cellulose required for this process can be produced efficiently in fermenters giving less shear-stress to cell for eg: an air lift fermenter having hollow fibres. Hence production of bandage by microbial cellulose will surely prove advantageous over bandages synthesised from plant cellulosic fibres.

Keywords: Microbial cellulose, Bandage, Agar, Citric acid, Biocompatible.

Biography

Niharika Srivastava is pursuing B.Tech Biotechnology degree from VIT University, Vellore. She has done projects antimicrobial properties of major medicinal plants, preparation of cancer drugs using Silver Nanoparticles, comparative study of antimicrobial property of Cinnamomum zyelanicum and C. cassia on major food spoilage bacteria, protein profiling (at Indian Agricultural Research Institute, New Delhi).

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In silico molecular modelling and docking studies on leukocidin LUKD in Staphylococcus aureus

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Methicillin Resisistant Staphylococcus aureus (MRSA) infection is one of the most prevalent infection among the bacterial infections in animals as well as humans and are resistant to most of the potential antibiotics. The existing drugs are not sufficient to control and cure the infection. Panton Valentine Leukocidin (PVL), a β-pore forming cytotoxin, of prophage origin that helps MRSA to obtain the nutrient from host cell by oozing out the cell contents, increases its virulence. It targets phagocytes, especially polymorphonuclear neutrophils (PMNs), and also causes necrotising pneumonia. In silico docking provide a platform to study the interaction between the antimicrobial compounds and PVL. But no 3D molecular structure is available for PVL so far. Considering the above, the present study is focused to model a template for the protein and to find out the potential inhibitor for the PVL by interacting the available antibacterial compounds with the predicted active sites. We obtained γ-hemolysin as the template for PVL with 90% querry coverage and 77% identity through BLAST. The active sites are predicted by Q-Site Finder and are docked with existing antibacterial compounds using ArgusLab. Based on docking energy and hydrogen bond interaction, diathymosulfone, myrophine, andrimid, beclobrate and probucol are identified as best antibacterial compounds to be used as drugs against PVL containing MRSA.

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Development of ISSR and RAPD markers for authentication of Centella asiatica and Baccopa monnieri

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Herbal medicine has been enjoying renaissance among the customers throughout the world. Due to the complex nature and inherent variability of the chemical constituents of plant-based drugs, it is difficult to establish quality control parameters. The commercial Bacopa monnieri drugs are frequently adulterated with Centella asiatica as both are sold in the market by the name of 'Brahmi'. This work using two Centella asiatica and one Bacopa monieri accession for development of species specific markers for both species. Baccopa monnieri a member of the Scrophulariaceae family is a traditional Ayurvedic herb used as a brain tonic to improve memory and learning, the entire plant is used medicinally Centella asiatica belongs to family apiaceae enjoys considerable reputation in Indian system of medicines. Morphological as well as biochemical markers used in the authentication of herbal drugs have many limitations due to the impact of environmental conditions. The molecular approach for the identification of plant varieties/genotypes seems to be more effective than traditional morphological markers because it allows direct access to the hereditary material and makes it possible to understand the relationships between individuals. In this study, the ISSR (Inter simple sequence repeat) and RAPD (Random amplified polymorphic DNA) techniques were employed for authentication of Centella asiatica and Bacopa monieri. Thirty primers in the ISSR and thirty eight in RAPD analysis were screened for identification of genuine samples using the DNA isolated from the leaf samples. Out of 30 only sixteen ISSR primers were found amplifiable and in RAPD analysis twenty two were amplified with both species. Among 16 ISSR primers only two were amplified specific alleles for both species and in 22 RAPDs only four gave species-specific reproducible unique amplicons, which could clearly distinguish genuine as well as adulterant samples having similar commercial name 'Brahmi'. ISSR and RAPD could thus, help to serve as complementary tools for quality control of genuine samples sold in the local markets.

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Classification of nitrilases using support vector machine

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Classification of enzymes based on their stability and specificity is one of the most important tasks for their application. Various classifiers such as HMM (Hidden Markov Model) and Neural Network Classifiers previously used are found to be less sensitive and accurate as compared to Support Vector Machines (SVM's). Continuous increase in genomic/proteomic data new nitrilases are being discovered whose annotation and functional assignment of classes to these through various wet lab techniques involve lots of time consuming and laborious experiments. Machine learning techniques such as SVM's can be effectively used to complement them saving time, money and also applicable to various other proteins. In view of this the present investigations aims to describe a novel approach for predicting the two sub classes of the nitrilase on basis of their amino acid composition, a powerful method developed from statistical learning with wide applicability in the field of proteomics. The application of SVM tool have clearly differentiated two of nitrilases with accuracy of 88.46%, specificity 80.77%, accuracy 84.62% and MCC (Mathews Correlation Coefficient) of about 0.69 for the amino acid composition, whereas dipeptide and split amino acid composition showed accuracy of 88.46 % & 84.62% and MCC of 0.73 & 0.69 respectively for aliphatic and aromatic nitrilases.

Biography

Nikhil Sharma is presently working as a research scholar in the Department of Biotechnology and is working in the area of microbial enzyme technology both in vitro and in silico. He has contributed research article & chapter to renowned journals with other many in pipeline.

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Introgression of the low phytate (lpa2) traits into elite maize inbred through marker assisted backcross breeding

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Maize is one of the major food crops used for food and feed industries in World wide. In order to enhance the nutritional quality of maize grains the present study is formulated to develop maize lines with low level of phytic acid. The lpa2 mutant blocks the function of the inositol phosphate kinase gene in the biosynthetic pathway of phytic acid (Victor Robay 2009) and hence resulted in the low phytate maize grains (50 % reduction in phytate Phosphorus). The recurrent inbred lines selected for the crossing programme were environmentally stable with high phytic acid content and agronomically more advanced and adapted to Tamil Nadu agro-climatic condition. The donar lpa2 mutant line is associated with, nearly 50 % reduction in the Inositol (6) phosphate level and was used for introgression programme. Marker assisted back cross breeding method was attempted for the introgression of the alien low phytate (lpa2) mutant locus from the mutant line EC659418 (lpa2) obtained from Victor Raboy, USDA in to the popular inbred lines with high agronomic traits. The hybridization was done between the inbred lines viz., UMI285, UMI395, UMI936 and UMI1008 and the lpa2 line (EC 659418) in Rabi 2009. There was a considerable variation in the level of phytic acid content among the four F_1 s' evaluated during Rabi 2010. Among the four different crosses, the UMI395 x EC659418 (lpa2) was found to have low level of the phytic acid (1.96 mg/100g) with desirable agronomics traits. Genotyping of the F1s' was attempted for the identification of the true hybrid. Forty SSR markers of the lpa2 region (1.05 bin) were obtained from the maize gdb database (www.maizegdb.org). Those markers are distributed in the 1.05 bin location in the short arm of the maize chromosome. Out of forty SSR markers screened in the lpa2 region four markers were found to be polymorphic for UMI395 and EC659418. Hence, the marker umc2230 which closely linked (0.4cM) to the lpa2 locus was used as a foreground marker for screening the F_1s. The selected F_1 hybrid was backcrossed further to develop BC_1F_1 generation. The resultant single cross hybrids were again backcrossed to the recurrent parent UMI395 during Kharief 2011.The genotyping of the segregating BC_1F_1 backcross progenies was done with foreground SSR marker umc2230. Among the 75 BC_1F_1 progenies the number of heterozygous progenies was found to be 30. Resultant introgressed lines are advanced to further generations for the development of low phytic single cross maize hybrid.

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Isolation and identification of Lactobacillus sp from milk and yoghurt, PCR amplification for the amplification of lactase encoding gene

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Lactase is an intracellular enzyme in Lactobacillus sp which has tremendous potential in research and applications on various fields like food, bioremediation, etc. This study was carried out to detect the lactase encoding gene in Lactobacillus sp by polymerase chain reaction, for this three Lactobacillus sp (LB1, LB2 and LB3) were isolated and identified from raw milk and yoghurt. The identities of the isolate were based on the morphological, biochemical characteristics of Lactobacillus as given in Bergy's manual of determinative bacteriology. Carbohydrate utilization of the bacteria was studied by UV/VIS spectrophotometer with an initial concentration of 4.8mg/ml and after 28hrs the sugar was reduced to 3.8mg/ml. Antibiotic sensitivity test was conducted and observed that all the three isolates were resistant to Ampicillin(A^{10}), Pencillin(P^{2}), Methicillin(M^{5}) and sensitive resistant to Ciproflaxin(CF^{5}), Tetracyclin(T^{30})and Streptomycin(S^{10}). Lactobacillus casei was used as the control sample for all the tests. The Lactase encoding gene was amplified by Polymerase Chain Reaction and bands were observed at 0.5Kbp on Agarose gel electrophoresis using 500bp as the marker DNA indicating that the gene was encoded in the chromosome.

Keywords: Lactobacillus sp, Lactase encoding gene, Antibiotic sensitivity test, Polymerase Chain reaction.

Biography

Niti Sarat completed her Post graduation in M.tech Biotechnology from SRM University in the year 2010. She is currently working as Analyst in Biotechnology in Quality Assurance Laboratories, Quilon, Kerala. She is leading the team of Biotechnologist in the department. She has supervised the dissertation thesis of more than 20 graduates and post graduates in the field of Life Science till now. She has sequence publication in NCBI GENBANK databases to her credit.

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Actinomycetes an emerging organism for exploring potent bioactive compounds

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Actinomycetes are group of bacteria which are extremely interesting as active producers of many primary and secondary metabolites. With the advent of molecular biology they have become important to biotechnologists in the search for new antibiotics, vitamins, enzyme inhibitors and often use in the biodegradation of agriculture and industrial wastes. From the biologically active compounds that have been obtained so far from microbes, 45 percent are produced by actinomycetes, 38 percent by fungi and 17 percent by unicellular bacteria. Soil sample comprise a major source for isolation of novel actinomycetes. Accomplishment of various screening assays help for demonstration of actinomycetes effective activity which like resistance against pathogenic organism, antioxidant property, anticancerous and hemolytic activity. Certain useful pigments has also been reported that can be use in various industrial areas. Further bioactive compound can be isolate, extract and purified for conducting a study at molecular level to determine industrial and commercial application. Currently throughout the world there are a series of institutes and a number of companies devoted to the commercialization of bioactive compounds from actinomycetes. Indeed, this requires a more visionary, long-term, internationally coordinated approach that includes the sequencing of multiple actinomycetes genomes to further our knowledge of the extent and variety of secondary metabolite pathways present in actinomycetes, and to provide additional genes to exploit in combinatorial biosynthesis.

Biography

Nitin Jain is receiving his B.Tech degree in Biotechnology from VIT University and is presently in his final year. Under the guidance of Mrs. C. Subathra Devi he is working on the Actinomycetes as a source of potential bioactive organism. He has also worked previously on the two projects – "Antagonistic activity of trichoderma on plant pathogens and its mass multiplication" and "Anti-microbial activity of TiO2 micro-particles in suspension on E.coli strains under UV irradiation.

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Mass spectrometry identification of pathogens in various sample solutions using functionalized magnetic iron oxide (Fe3O4) nanoparticles

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Nanotechnology has triggered a revolution in many important areas in molecular biology, biotechnology and medicine, especially in the detection and manipulation of biological species at the molecular and cellular levels. With the advent of nanotechnology in biology and medicine, the need for conjugation of nanoparticles (NPs) to biomolecules has grown. In this study, magnetic and functionalized magnetic iron oxide nanoparticles were synthesized and used as affinity probes to capture Gram-positive/negative bacteria. The morphology and properties of these magnetic NPs were examined by transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FT-IR) and zeta potential measurements. We have investigated the interaction between functionalized magnetic nanoparticles and bacteria. A variety of electrostatic and covalent linking chemistries have been reported. Furthermore, the magnetic nanoparticles with various functionalities including Fe_3O_4, poly acrylic acid (PAA), TiO_2 and SiO_2 were employed to concentrate target bacteria from sample solutions. The trapped bacteria were then analyzed by using matrix-assisted laser desorption/ionization mass spectrometry (MALDI-TOF MS).

Biography

P. Muralidhar Reddy received B.Sc., M.Sc., and Ph.D. (chemistry) degree from Kakatiya University, Warangal, India. Currently, he is working as a postdoctoral fellow with Prof. Yen-Peng Ho at National Dong Hwa University (NDHU), Taiwan. He has published more than 50 papers in reputed journals and presented research articles in various conferences. Dr. Reddy received two gold medals, one at the BS level and the other at the MS level. He also received best paper presentation award (Ranked First) in ICNN-2011 and the most popular student award in 1999. He is a member of Indian Council of Chemists (ICC) and Taiwan Society for Mass spectrometry (TSMS).

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Production, purification and characterization of pectin lyase from Byssochlamys fulva MTCC-505

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Byssochlamys fulva produced an extracellular enzyme, pectin lyase, which was enhanced when various production parameters were optimized. Maximum pectin lyase (PL) activity was obtained in 48 h at 30°C and pH 4.0 with pectin methyl ester (1% w/v) as carbon source and a combination of casein hydrolysate (0.1% w/v) and yeast extract (0.1% w/v) as nitrogen source. The enzyme was purified to homogenicity (20-fold) by DEAE-Cellulose ion exchange and Sephacry1 S-100 gel-filtration chromatography. The molecular mass was estimated to be 29 kDa on SDS-PAGE. The enzyme was found to have K_m and V_{max} values of 0.25 mg/ml and 83.33 µmole of galacturonic acid/ml/min at 0.1% to 0.5% (w/v) concentration of the substrate. The addition of phenolic acids (0.05 mM), metal ions such as Mn^{2+}, Fe^{3+}, Zn^{2+} and thiols had inhibitory effect on the enzyme. Pectin lyase was inhibited strongly by protein inhibitors such as potassium permanganate and potassium ferrocyanide. The enzyme showed maximum activity in the presence of polygalacturonic acid (0.1 % w/v) at pH 4.5 and 25°C.

Biography

Pankaj Kumari has done her post graduation and M.Phil. in Biotechnology. Presently she is pursuing her Ph. D. degree from Dept. of Biotechnology, Himachal Pradesh University, Shimla. She is RGNF fellow and presently working on application of pectin methyl esterase from microbial sources.

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Putative t-RNA dihydrouridine synthase from Saccharomyces cerevisae (MTCC-181) as a biomarker for malignant cells

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Using comparative genomics and computational methods, we have identified the structural & functional aspect of a putative t-RNA dihydrouridine synthase encoding gene of Saccharomyces cerevisae (MTCC-181) by homology modeling approach. Dihydrouridine synthases (DUSs, EC 1.3.1.91) are flavin-dependent enzymes that catalyze site-specific reduction of uracils in tRNAs. A putative protein of 668 amino acids was analyzed. It contains 12-FMN-binding conserve domain on the active site, characteristics of DUS_like_FMN super-family (cd02801, E-value=3.21e-63) which catalyzes the reduction of the 5, 6-double bond of a uridine residue on tRNA. Four catalytic residues 386 (Cys), 428 (Arg), 457 (His) and 459 (Arg) were found on the DUS-like conserved domain (294-557), among which an active site cysteine is important for catalysis, likely through the protonation of uracil during tRNA reduction. The protein have multi-domains with high similarity to COG0042 (CDD, 284-597); a tRNA-dihydrouridine synthase (E-value=1.07e-62) and TIM barrel superfamily (cl09108, 296-550, E-value=3.83-20) which share a structurally conserved phosphate binding motif and in general have an eight β/α closed barrel structure. The structure of an FMN-binding α/β-barrel also has significant similarity to dihydroorotate dehydrogenases and dihydropyrimidine dehydrogenases. Three dimensional (3D) structure was constructed by modeller 9v7 modeling software by using the 1VHN (4.4e-15 & similarity =76%) as a template. Binding of substrate (uracil-t-RNA) and acceptor molecules (NADPH and FMN) were confirmed by Autodock 4.2.

Dihydrouridine modification of tRNA is widely observed in prokaryotes and eukaryotes. Most dihydrouridines occurs in specific positions in the D-loop of t-RNAs. The role of dihydrouridine synthase in oxidation of uracil bound t-RNA to tRNA-dihydrouridine by simultaneous reduction of acceptor molecule like NADPH and FMN were confirmed by enzymatic assay. Increase in tRNA dihydrouridine synthase activity was detected in human lung carcinoma cells (ATCC Number-TCP-1016) as compare to normal tissue. It is likely that different family members have different substrate specificities, which may overlap. Abundance of dihydrouridine is linked to pulmonary carcinoma. It was observed that hypermodified t-RNA-dihydrouridine has a specific functional role for growth of cancer cells, through the complex of tRNA-DUS protein combined with aminoacyl tRNA synthetase. This complex is a strong therapeutic target for new anticancer drugs.

Biography

Parul Aggarwal Pruthi has done her Ph.D in 1998 from IMTECH Chandigarh and was Post-Doc fellow in Indiana University Purdue University, Indiana Polis (IUPUI). Presently she is working as Scientist (DBT Biocare Program), Department of Biotechnology, IIT Roorkee. Dr. Parul has several publications in reputed journal and many international and national conferences.

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Isolation and characterization of arsenic resistance bacteria and their bioremediation implication

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Arsenic is naturally occurring element that is widely distributed in the earth's crust. Living organisms, both on land and in water, react in a variety of ways to Arsenic exposure. The effect depends on the chemical form of Arsenic, the nature of the surrounding environment and their own particular biological sensitivity. West Bengal and Bangladesh are highly Arsenic contaminated areas which can cause rapid poisoning, developing pigment spot in the skin and damage to red blood cells, bone marrow, livers, nerves and brains. Hence, it should be clean up by the process of bioremediation. There are number of strains of bacteria which can help in this process. Some bacteria isolated from soil such as Escherchia coli, Pseudomonas spp., Bacillus spp., Staphlococcus spp., Acidithiobacillus spp., Shewanella spp have ability to accumulate Arsenic metal. Out of which, P. vittata which is isolated from rhizosphere, can tolerate the high availability of Arsenic.

Keywords: Arsenic, bioremediation, Escherchia coli, Pseudomonas spp.

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Use of statistical and computational intelligence based optimization technique to increase streptokinase production

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Streptokinase is obtained from strain of beta-haemolytic streptococci. It is a well known fibrinolytic activator used particularly in treatment of acute myocardial infarction. In our work recombinant cells of E.coli-BL21 strain containing vector pRSET-B with amp marker is utilized. Various classical mathematical models have already been developed that often depicts the dynamics of the bioreactor operational procedure. One of the computational intelligence based tool, neural network has been devised to supervise the bioprocess of the production dynamics. Matlab-7.2 toolbox is utilized in our work for computational purpose to efficiently carry out neural approach with multilayer perceptron. Parameters including cell biomass, plasmid copy number are taken as input and product streptokinase as output. Comparing the observed and predicted data a relevant statistical inference can be drawn in terms of r^2 value which shows the significant correlation. Statistical optimization methodology for media and culture conditions is devised to maximize the production of recombinant enzyme. In Plackett Burman method, seven media components were taken; using Design Expert-8.0 software. The response was taken in terms of streptokinase production. Finally employing chi-square test and criteria of p-value four media components (glucose, yeast extract, phosphates $MgSO_4$) were screened out. Furthermore the interaction of factors associated to culture condition has been resolved with their significance in bioreactor dynamics using central composite design (CCD). The result depicts that using the optimized culture conditions (pH, agitation, temperature and inoculum concentration) the production of streptokinase is about 20% higher in magnitude in comparison to the case applying usual basal conditions.

Biography

Pavan Kumar did MSc (spl. Bioinformatics) from University of Allahabad and subsequently obtained MTech (IT) degree from Indian Institute of Information Technology Allahabad (U.P.) INDIA, in 2007. Presently he is pursuing his PhD from Indian Institute of Technology Roorkee (Uttarakhand) INDIA, in the field of computational bioprocess engineering. He has presented several papers in National and International conferences, recently got Young Scientist Award in National Conference on Biotechnology and Biodiversity 2012, Rewa (M.P.). His prime research interest is associated to modeling and simulation of streptokinase production and analysis of various parameters related to bioreactor system.

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Targeting the transcription factor Osmyb4 for disease resistance in rice

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Evolution of the disease resistance variety has been one of the most extensively explored areas in agriculture. Tools in biotechnology have provided techniques to overcome this problem. Tailoring of the foreign gene and introduction in rice plant to develop disease resistance variety is next to what used to be with conventional and molecular breeding methods. But the recent genome level data indicate that we have only caught hold of the tail of the tiger, namely multiple and sustainable disease resistance. The expression of the foreign gene suffers not only from regulatory issues of genetically modified rice but also lack of sustainability under field trials. Transcription factors have been reported to be the regulatory genes which have the control over hundreds of genes and hence prove themselves as novel candidate for the study. An attempt has been made to isolate the transcription factor Osmyb4 from popularly cultivated rice varieties. The level of constitutive expression of the gene has been studied. Literature reports the involvement of PR protein and its products which are found to be expressed in the course of pathogenecity. Over expression of the Osmyb4 in rice varieties would result in the transgenics which will be evaluated in the major cultivated varieties and correlation of their native level of resistance/susceptibility to various diseases.

Biography

Pooja Singh has completed M.Phil in Biotechnology in the year 2010 from Bharathiar University, Coimbatore and presently pursuing her PhD in Biotechnology with specialization in Plant Biotechnology from School of Bio Sciences and Technology, VIT University, Vellore, Tamil Nadu State, India. She is working as Research Associate in VIT University from past one year and has published two papers in peer reviewed journals.

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Prevalence of multi drug resistant E.coli from fast food and environmental samples

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E. coli causing diarrhea is an emerging food-borne pathogen which is gram negative, rod shaped, mostly motile and some of its sero groups has public health impact on humans by causing haemorrhagic colitis (HC) to haemolytic uremic syndrome (HUS). It is known that these food-borne pathogens are associated with animal reservoirs ie., ruminants and foods of animal origin, especially under cooked meat, unclean vegetables are often involved in outbreaks. In this study, a total of 200 samples, 100 from fast foods like hotdogs, burgers, chicken tikka rolls, sausages and 100 from meat shop samples like swabs from slaughter platform, knife, water, butcher's hands etc, were collected and processed. From the screened samples 30 isolates were identified as E. coli, by conventional biochemical methods and carbohydrate utilization tests. Out of these 30 isolates, 4 were found to be non-motile and showed mucoid and stringy colony morphology. When subjected to salt aggregation test with different concentrations of ammonium sulphate solution, most of the isolates were observed to be positive, which shows the presence of cell-surface appendages and their hydrophobicity. All the isolates showed resistance to more than one antimicrobial agent. Hemagglutination assay with human blood of different groups was carried out for all the isolates as the agglutination of erythrocyte is an indirect evidence of the presence of fimbriae and it provides a simple indirect method of testing the virulence of the organism. Pili or fimbriae are non-flagellar filamentous bacterial surface appendages composed of hydrophobic proteins which may be responsible for the aggregation. Occurrence of E. coli in food and environment is an important health concern because of the risk of food-borne outbreaks.These isolated E. coli strains could impose threat on public health.

Keywords: E. coli, fast food, drug resistance.

Biography

Pavithra M who is 27 years old is a product of VIT University, with her B.Sc (Microbiology), M.Sc (Microbiology) and persuing Ph.D (Medical Biotechnology) with the guidance of Dr. Asit Ranjan Ghosh, (Former Scientist of ICMR), Professor and Asst, Director, Centre for Infectious Diseases and Control, SBST, VIT University. Her research is on the prevalence of E. coli causing diarrhoegenic diseases in the environment. She've served as a Teaching cum Research Associate (TRA) in the same University and handled Microbiology, Princilples of Genetics, Immunotechnology, Genetic Engineering and Biochemistry for B.Tech, M.Tech and M.Sc Biotechnology students. She've been a co-author for few papers in peer reviewed journals. She has done a project on Anti-retiro Viral Therapy and the Effect of Nutrition on HIV positive Individuals, which was highly recognized and recommended by Ramana Maharishi Rangammal Hospital, Thiruvannamalai, Tamilnadu.

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Analysis of the HIV-1 Tat Exon 2 gene motifs as a potent candidate for therapeutics against hiv infection

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HIV-1 tat gene is a regulatory gene responsible for initiation and elongation of viral transcription through the LTR transactivation, composed of two coding exons yielding a protein of 101 amino acids. Exon 1 (1–72aa) is important for viral transcription and Exon 2 (73–101 aa) is believed to have major role in cell adhesion and cellular uptake of the exogenous Tat and facilitates apoptosis. The aim of our study was to analyse HIV-1 tat exon 2 and to assess its potential for therapeutics against HIV infection. Comparative analysis of nucleotide sequences of HIV-1 patients with Indian reference isolate (HIV-1C-IN) showed that samples had ~75% similarity with HIV-1C-IN and phylogenetic analysis showed them falling in close cluster of HIV-1 clade C. The tat exon 2 sequences displayed the presence of conserved RGD motif and ESKKKVE motif. Presence of RNA binding domains was reported, which if undergoes any mutation may alter the binding of the Tat with TAR element, essential for the Tat-mediated trans-activation. Hence making the domain a potential drug target. Further sequence analysis of the samples suggest that in CCMB121 lysine residue was not seen to be conserved at position number 90 which may be hypothesized in downregulating the HIV-1 replication. Even though Tat plays an important role in viral transcription, till date there is no Tat based drugs designed, for this the novel CTL epitope (DPSGSEESK) observed by us can be analysed for posing as drug target.

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DNA barcoding: A new perspective in taxonomy

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Taxonomy, the science of naming and classifying organisms, is the foundation of biology. Identification and documentation of all forms of life on earth and proper nomenclature of species provide the framework for organizing biological information (Kumar and Jain, 2011). Existing morphology-based diagnostic approaches used by traditional taxonomists are often cumbersome and based on ontogeny. Barcoding organizations note that taxonomists have identified only 15 per cent of all living species over the past 250 years (Ebach and Holdrege, 2005).

DNA barcoding is a novel system designed to provide rapid, accurate and automatable species-identification by using short, standardized gene regions as an internal species tag (Hebert and Gregory, 2005). Small region of the mitochondrial COI gene is used in animals for such identification (Hebert et al., 2003). However, COI sequence is not appropriate in plants because of a much slower rate of Cytochrome c oxidase I gene evolution (Kress et al., 2005). Consortium for the Barcode of Life (CBOL)-Plant working Group has recommended a combination of chloroplast genes rbcL and matK as the standard two-locus barcode for plants (Ratnasingham and Hebert, 2007).

Just like Universal Product Code (UPC) which uses a unique series of lines for identification and tracking of a given product, DNA barcodes also uses a unique series of lines to identify a given species. These natural barcodes usually consist of 600 to 650 bp DNA sequence in which each nitrogen base is represented by established colours (Adenine=Green, Thymine=Red, Cytosine=Blue and Guanine=Black) (Hollingsworth, 2008).

DNA barcoding is advancing through the Consortium for the Barcode of Life (CBOL), Barcode of Life Database (BOLD), International Barcode of Life Project (iBOL) and Canadian Center for DNA Barcoding (CCDB). Their major barcoding projects are All Birds Barcoding Initiative, Fish Barcode of Life, Mosquitoes Barcoding of Life and Tephritid Barcoding Initiative of CBOL and Mammalian Barcode of Life.

DNA barcoding has emerged and established itself as an important tool for species-identification and phylogenetic studies in taxonomy. Apart from this, it has proved useful in protecting endangered animals, identifying agricultural pests and disease vectors, tracking adulteration in products and thereby sustaining environment.

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Biosynthesis of silver nanoparticles using Allium cepa extract and evaluation of their antibacterial activity

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Development of novel and environment friendly methods is an expanding area of research in the field of nanotechnology. Generally nanoparticles have been prepared by chemical and physical methods which are toxic, hazardous, costly and most importantly not environmental friendly. We have reported rapid, cost effective and eco-friendly method for the synthesis of silver nanoparticles using onion (Allium cepa) extract. The synthesized nanoparticles were characterised by using UV-Vis spectrophotometer, Dynamic Light Scattering (DLS) and Transmission electron microscope-energy dispersive spectra (TEM-EDS). The surface Plasmon resonance of silver nanoparticles was occurred at 413 nm in UV-Vis spectrophotometer. The size distribution of the particles was determined using DLS. Further nanoparticles were characterised by TEM to analyse the particles size and their morphology. EDS confirmed the elemental signal of silver and its homogenous distribution. The antibacterial activity of the nanoparticles was studied against E.coli dh5α by means of the growth curve and inhibition zone analysis.

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Utilization of renewable agricultural residues for solute and enzyme from newly isolated halophilic bacteria

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Halophilic bacteria form a versatile group adapted to life at varying concentrations of salt. They have the potential to yield valuable new products for biotechnology. Most saline environments have an influx and presence of plant matter and hence, the resident microbes can be expected to harbor the machinery for biomass exploitation. Agricultural residues (lignocellulosic biomass) are mainly composed of (on dry weight basis) - cellulose (40-60%), hemicellulose (xylan - 20-40%) and lignin (10-25%). These lignocelluloses are generally pretreated to remove lignin and increase the porosity of the materials. Alkaline and enzymatic pretreatment of wheat bran was carried out. Cost of the growth medium in industrial fermentations is estimated to account for about 40% of the production costs. In biotechnological production processes, where even small improvements can be decisive for commercial success, optimization of production parameters plays a very significant role.

Several strains of biopolymer degrading bacteria isolated from sea coasts and solar salterns of coastal Karnataka were screened for the production of compatible solute (ectoine) and extracellular enzymes (xylanase and cellulase). Ectoine production by strain PS6 was detected by HPLC analysis. In the alkaline range, strain PS3 yielded higher amount of xylanase in agro-residue media. Strain PS47 was found to produce higher yields of cellulase at a neutral pH. These bacteria were able to utilize a number of agro-wastes for higher yields of products. Statistical optimization techniques like Placket-Burman design and response surface methodologies were further adopted to increase the product yield.

Biography

Pooja S is currently pursuing her doctoral studies in the Department of Chemical Engineering, National Institute of Technology Karnataka, Surathkal, Mangalore, under the guidance of Dr. Gopal Mugeraya. She has done M.S. (By Research) along with teaching-cum-research assistantship from VIT University, Tamil Nadu and Bachelor of Engineering (Biotechnology) from BVBCET Hubli, Karnataka. She has received DAAD scholarship for short-term Ph.D. studies in the Institute for Microbiology and Biotechnology, Bonn, Germany in 2011. She has four research publications to her credit. She has received the Best technical paper award in the 39th ISTE annual convention (2009) held at NITK Surathkal.

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Modeling of PINK1 protein and detection of protein-protein interaction with other mitochondrial proteins

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Aberrantly expressed PTEN-induced putative kinase 1 (PINK1) is a mitochondrial serine/ threonine-protein kinase encoded by the PINK1 gene. It has been found that absence of a protein PINK1 causes heart cells to produce less energy and due to lack of energy, some heart cells dies in turn forcing the remaining cells to work harder to keep the heart going. Due to this stress, the heart muscle cells become dense and this kind of changes occur in the heart that leads to a functional degradation and heart failure. In this work, we have addressed homology modeling of PINK1 protein and minimization of the modeled structure using CHARMm force field. Further we found the novel interactions that could be useful to study PINK1 as a disease target. We have used the following proteins for protein-protein interaction study, BAG5 and mitochondrial proteins GRP75, HSP60, LRPPRC and TUFM with PINK1. We have found several interactions, many of these are known to cause disease, and we also identified several novel interactions which could be further useful for in vivo study and also to study PINK1 as an efficient drug target.

Keywords: PINK1, Homology Modeling, Minimization, Protein-Protein Interaction.

Biography

Priyanka Purkayastha is currently pursuing her Ph.D in Biological Sciences Department at BITS Pilani, Hyderabad Campus. She has completed M.Tech Bioinformatics from SASTRA University, Tamil Nadu.

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Antimycolytic effect of quercetin dihydrate loaded electrospun nanofibrous membrane on Candida albicans

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Candida is an opportunistic fungus, known to cause systemic and life threatening infections in immunosuppressed patients. In our attempt to dealt with this ominous fungal pathogen we have successfully fabricated ultrafine poly (D,L-lactide-co-glycolide), PLGA, nanofibrous membrane loaded with different concentrations of quercetin dihydrate, natural flavones with antioxidant and antimycolytic activity, using acetone-dichloromethane as solvent system. The bulk fabrication of these nanofibrous membrane was performed via electrospinning technique. The morphology of resulting nanofibrous membrane with or without quercetin dihydrate was examined using field emission scanning electron microscopy (FE-SEM). The nanofibrous membrane was also subjected to detailed analysis by Fourier transform infrared spectrometry (FTIR). The antimycolytic effect of these quercetin dihydrate loaded nanofibrous membrane on to the viability of C. albicans cells was established using modified XTT (2,3-bis(2-methoxy-4-nitro-5-sulfophenyl)-2H-tetrazolium-5-carboxanilide) reduction assay in 6 well polystyrene microtiter plates. Scanning electron Microscopic (SEM) visualization of this C. albicans treated quercetin dihydrate loaded nanofibrous membrane showed drastic reduction in the intense network of yeast, hyphae and pseudohyphae forms. These highly loaded nanofibrous membrane can be efficiently used as an antimycolytic agent as well as can be exploited as cost effective wound dressings and protective bandages.

Keywords: Electrospinning, Nanofiber, Quercetin, Antimycolytic.

Biography

Priya Vashisth is currently pursuing her PhD in Department of Biotechnology from Indian Institute of Technology Roorkee, India under the joint supervision of Dr. Vikas Pruthi and Dr. R. P. Singh. She is working in the field of Nanobiotechnology (fabrication, characterization of polymeric nanofibers and their applications). She is awarded with the CSIR-JRF Fellowship, funded by Council of Scientific and Industrial Research (CSIR).

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Importance of bioethanol and biodiesel from biomass

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To combat the energy crisis and environmental degradation, due to heavy use of fossil energy sources, biodiesel and bioethanol are attractive alternatives to diesel fuels or petroleum. The paper aims at presenting the comparisons of bioethanol and biodiesel and the energy obtained from fossil fuels and increased interest of using biofuels over conventional fuels.

Biomass represents an abundant C-neutral renewable resource for the production of bioenergy and biomaterials. Bioethanol is derived from alcoholic fermentation of sucrose or simple sugars and used as a petrol additive or substitute. Biodiesel is eco-friendly alternative fuel that can be used in diesel engine with both the environmental and economic benefits.

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Effect of nano-ZnO particle suspension on growth of gram (Cicer arietinum) seedlings

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The present study demonstrates an effect of nano-ZnO particles on the growth of plant seedlings of Gram (Cicer arietinum). Various concentrations of nano-ZnO particles in suspension form were introduced to the agar media, and their effect on the root and shoot growth of the seedlings was examined. It was found that at certain optimum concentration, the seedlings displayed good growth over control, and beyond that, retardation in growth was observed.

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Screening up of anti-inflammatory property from Ipomea staphylina

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Inflammation is part of the non-specific immune response that occurs in reaction to any type of bodily injury. Although there has been some progress in the usage of improved anti-inflammatory drugs, they make up about half of analgesics, remedying pain by reducing inflammation as opposed to opioids, which affect the central nervous system. Thus researches in screening up of anti-inflammatory components from the plants have been shown very good progress. Such similar property was been screened using Ipomea staphylina, a local weed belonging to Convulvulaceae family. Study included the mechanism by which the Convulvulaceae species I. staphylina inhibited inflammatory pathway key enzymes. Plant extract was randomly divided into 3 groups namely water extract, ethanol extract and methanol extract. We screened by randomized trials to estimate levels of all the three key enzymes activity involved in inflammation i.e., PLA_2, COX (cyclooxygenase) & LOX (lipoxygenase) using the plant sample. Results show that the water extract of the Plant sample inhibited secretory PLA_2 significantly than the other groups. $PLA_2$was significantly inhibited as the concentration of the sample increased and this showed reproducible results. COX and LOX had inhibitory effects but not to a greater extent. These data suggest that the crude plant water extract had molecules that inhibited PLA_2 which is the first enzyme in the inflammatory pathway.

Biography

Priyadarshini K has received her Master's degree in Bio-Technology from the University of Mysore in June 2011. She has planned to continue her career with a PhD on her Masters Dissertation work. She worked exclusively on snake venom for the enzymatic study of secretary PLA_2 action and its inhibition using various plant samples under the world famous Venom specialist Dr. T. Veerabasappa Gowda. Other than that her oratory skills are very good. She has fantasy for Paintings and Drawings.

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Comparative homology modeling and docking of lamin A molecule and its incidence in progeria

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Progeria is a rare and fatal autosomal recessive disorder affecting children, usually newborn babies causing accelerated ageing. It is caused due to mutation in a gene called LMNA which leads to instability of nucleus thereby causing rapid ageing. This means that an individual carrying a mutation in a single gene does not show any sort of symptoms as its recessive in nature. Moreover 90% of the children have mutation on the gene that encodes protein Lamin A. The gene involved is LMNA which codes this protein and due to one point mutation (mostly) defective fibrous protein is formed leading to unstable nucleus thereby causing premature ageing. Researches are being done as no cure is available till date but some drugs are used in order to subsidies the effects caused. This work deals with establishing a drug or to manipulate analogues of approved drug and to check its effectiveness and binding activity over the receptor protein through docking. For this purpose number of ligands and their analogues were prepared and docked on the receptor lamin A whose structure was obtained through a request from EBI-Swiss model with PDB id as q369. Out of all the drug molecules docked one specific analogue Indinavir showed great results with energy of -94.2 Kcal/mol and good binding capacity, So this drug was manipulated and modified and again docked where better results were obtained with a binding energy of -105.5 Kcal/mol. Using this modified analogue might further aid in the treatment of this disease and can be subjected to clinical validations.

Biography

Priyanka Narad has completed her masters in Bioinformatics from Birla Institute of Technology. Presently, she is working as Assistant Professor I (Bioinformatics) at Amity Institute of Biotechnology. She has two research papers published in international and national journals respectively. She has presented six posters at international conferences. Her main area of interest is protein modeling and systems biology.

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Study on the biosorption of synthetic dyes using immobilized fungal biomass and aquatic weeds

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The large amount of lignin and lignin-derived compounds are primarily responsible for effluent color, due to the inherent high degree of conjugation in these molecules. There is thus the requirement on industries to minimize environmental release of color considered as toxicologically rather innocuous. Biological treatment is the often the most economical alternatives when compared with other physical and chemical processes.

Biosorption potential of fungal species (Aspergillus niger) and Aquatic weed (Eichhornia crassipes) for synthetic dye such as Acid- Lanasyn yellow and Direct- Indosol royal blue studied with respect to temperature, time, pH, adsorbent dosage, agitation time and initial dye concentration to determine the kinetic model. The mechanism of dye sorption by Aspergillus niger and Eichhornia crassipes earned good fits for Freundlich and Langmuir models. Further desorption techniques were studies to recover the loaded pollutants. This study has shown the efficiency of A.niger and E.crassipes immobilized into Ca- alginate beads for the decolourization of synthetic dyes. Batch studies clearly suggest that the high adsorption capacity for the removal of Acid- Lanasyn yellow and Direct- Indosol royal blue dye were obtained at pH- 6. Up to 86% color removal could be achieved in 31/2 days contact with initial dye concentration (2 to 10 mg/ml), respectively. In addition, it is found to be the reusability of the immobilised A.niger and E.crassipes after storage could be a potential advantage in wastewater treatment.

Keywords: Biosorption, Decolourization, A.niger, E.crassipes, Synthetic dye, Acid- Lanasyn yellow and Direct- Indosol royal blue, Immobilization.

Biography

R. Sivashankar is pursuing his Ph.D at National Institute of Technology. He has published a paper in reputed journal. He holds 2 papers in International Conferences proceedings. He has participated & presented about 13 papers in the International and National conferences. His research areas are Environmental science and technology and Biotechnology.

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Effect of compost derived from decomposed fruit wastes by effective microorganism (EM) technology on plant growth parameters of Vigna mungo

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In the present study, the plant growth promoting effect of compost derived from decomposed fruit wastes by commercial formulation of effective microorganisms (EM) on plant growth parameters of Vigna mungo discussed. Effective microorganisms (EM), a culture of co-existing beneficial micro organisms predominantly consisting of lactic acid bacteria, photosynthetic bacteria, yeast, fermenting fungi and actinomycetes that are claimed to enhance the decomposition of organic matter which in turn improves the soil fertility. In the present study ,the fruit wastes were effectively decomposed by applied Effective microorganisms with complete reduction of volume of wastes, development of pleasant odour and formation of finely dispersed nutritious compost with 672.0, 708.0, 2927.0, 13.02 mg/kg and 35.1% of total nitrogen, phosphorous, potassium , humic acid and organic carbon. The plant growth parameters such as shoot length, leaf surface area, and total chlorophyll, height of the plant, total leaves and branches emerged in the plant, total foliage density / plant was increased in compost treated plants and distinct reduction in pest infestation and disease spots were recorded. As in plant growth parameters, compost treated plot reveals maximum phyllosphere, soil heterotrophic microbial population and soil nutrients via total nitrogen, phosphorous, potassium, organic carbon and humic acid. Total yield and cost benefit ratio was also increased in compost treated plots.

Keywords: Effective microorganism, compost, fruit wastes, Vigna mungo, plant growth parameters.

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Liver as target organ of carcinogenesis by xenobiotics

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The liver is a metabolically versatile organ responsible for the regulation of man's internal chemical environment. The main function of liver is to synthesize an array of body proteins and to act as the detoxifying centre for the multiple toxic metabolic byproducts endogenous to the body and the toxins ingested daily by the organism. The liver's main function is to synthesize an array of body proteins and to act as the detoxifying centre for the multiple toxic metabolic byproducts endogenous to the body and the toxins ingested daily by the organism. Unique metabolism and relationship of the liver to the gastrointestinal tract make it an important target of the toxicity of the drugs and xenobiotics. Therefore examination of blood and liver become significant to help in the diagnosis and treatment of the diseases. The liver undergoes dramatic changes in structure and function during development. The developmental changes that occur in the liver determine the rate and metabolic pathways used in the disposition of drugs and other xenobiotic. In toxicology liver plays an important role because all substances absorbed by the gastrointestinal tract pass through it before entering into the general circulation .Blood is highly specialized liquid connective tissue. Some toxicants cause direct injury to liver and others convert the chemicals into toxic substance through metabolic conversion. The classification may focus on the source and the chemical class of the toxicant, on the circumstances of exposure on the type of hepatic lesion produced, on the cell structure damaged or on the molecular or cellular mechanisms involved. Idiosyncratic reaction is attributable to pharmacogenetic differences between individuals (genetic polymorphism in the metabolism of compounds). In the case of severe toxicity the patient may develop liver failure. Cytotoxic injury resembles acute hepatitic and is characterized by damage to the hepatocytes with prominent elevation of amino transferse. Severe case may result in fulminant liver failure. Due to the presence of different types of cells blood has varied functions and analysis of its components helps in evaluating the abnormal conditions which create pathological conditions in a person. Therefore examination of blood and liver become significant to help in the diagnosis and treatment of the many diseases including cancer.

Biography

Rajesh K. Bhaskar worked as Guest Faculty in the Department of Molecular Biology, Kannur University ,Kerala .,India and doing his Ph.D. in the School of Biosciences ,Mahatma Gandhi University, Kottayam, Kerala. India. He has paper publications in reputed journals like Indian Journal of Fisheries (ICAR).

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Increasing the efficacy of giant knotweed for improving crop yield

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Regalia is the leaf extract of Polygonum Sachalinensis used as plant protectant. It boosts the plant immunity by increasing the activity of chalcone synthase and chalcone isomerase in the phenyl propanoid pathway and induces the production and accumulation of phytoalexins. Activities of pathogen related proteins such as chitinase, glucanase and peroxidase are increased. Then it also increases the papillae formation at pathogen penetration site as well as lignification of plant cell wall. But this Regalia inhibits the plant growth due to the pigment Emodin. Now we insert a second gene of Emodin in antisense direction into the Knotweed genome. When the antisense gene is expressed it interferes the production of Emodin. Now we can use the leaf extract of this Giant Knotweed as a foliar spray in controlling a wide range of fungal and bacterial diseases, such as powdery mildew of cucurbits, downy mildew of lettuce (Bremia lactucae), Botrytis of grapes and strawberries, bacterial spot of tomatoes and peppers (Xanthomonas campestris pv. vesicatoria), Cercospora on soybeans (Cercospora kikuchii) and bacterial canker on citrus (Xanthomonas axonopodis pv. citri).

Biography

Pushkar Tatiya is pursuing his B. tech in Biotechnology at the age of 19 years from SRM University .He is in his 3rd year of engineering. He is working on a project of crop improvement.

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Multilevel network protection based on iris biometric

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Network protection and safety of data have been of great anxiety and a subject of research over the years. There are many different forms of cryptographic mechanisms like Triple DES, AES, MD5 proposed to guarantee data security. In an arrangement, the success of the algorithm depends on the time taken of the key that user uses. It is observed that due to expediency of remembering the key, users use short keys. This increases the weakness of the data. In this work we propose a exceptional confirmation and encryption technique using IRIS biometric pattern of a person. At the time of registration to the network, a person's IRIS is scanned and create templates of the image are generated using Vision Assistant 2009. Server stores this key iris template as users Identity or password. To transfer data to another user, first IRIS pattern is generated, it is sent to the server, server authenticates the user by comparing the incoming IRIS code with the one saved in database by using Vision script file is create. A long time ago valid, user is allowed to swap information over the network. Every information is now be encrypted using the receivers IRIS template. The success of the technique depends upon the pattern matching score is maximum generated. There is always an error margin of 5% to 10% when IRIS template is generated which may result in an unsuccessful authentication. This paper presents a fast and efficient iris image enhancement algorithm. A database of fingerprint images has been collected from 80 different individuals. This method was tested on all these images in the database using the NI Vision Assistant 2009 and NI LabVIEW (Laboratory Virtual Instrument Engineering Workbench) toolbox version 2009.

Keywords: Biometrics, iris pattern, image pre-processing, NI Vision Assistant 2009, NI LabVIEW.

Biography

Rajni Bala has been pursuing her M. tech at the age of 23 years in batch 2010-2012 from SLIET Longowal College (Deemed University) and her research in biometric field on Iris and Palm using LABVIEW 2009. She is the lecturer in poly technical college. She has published more than 7 papers in reputed conferences.

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Stigma sterol: An important therapeutic product and its synthesis

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Sterols are called as a major lipid component of the plasma membrane with essential functions in eukaryotes. The amount of sterols is generally constant among plant species: a value of 2-3 mg of total sterols per gram of dry weight is frequently found. Among all sterols, stigmasterol is of high therapeutic properties. It is acting as a precursor for progesterone, and vit. D_3 and having antioxidant, hypoglycemic and thyroid inhibiting properties. Synthesis of phytosterols start from cycloartenol and its transformation to delta-5-sterols in higher plants is a multistep process. Stigmasterol biosynthesis in plants is through a side branching from methylfecosterol to episterol. Therefore the available precursor methylfecosterol formed in the steroid biosynthetic pathway is either equally or unequally exploited for the synthesis of campesterol and stigmasterol depending upon the plant species. Sterol 24-C-methyl transferase-2 is the first enzyme for the biosynthesis of end sterol i.e stigmasterol from methylfecosterol. Following to Sterol 24-C- methyl transferase -2 there is the initiation for the activity of other enzymes like SMO2, STE1, DWF5, DWF1 and CYP710A1. CYP710A1 encodes the enzyme sterol C-22 desaturase which is the last enzyme, which acts with substrate β-sitosterol and produces stigmasterol. An attempt has made for the isolation of sterol C-22 desaturase gene from rice and successfully isolated the two copies of gene. Thus the future prospects aim for the overexpression of sterol methyl transferase and sterol desaturase gene which are the first and the last enzyme involved in the biosynthesis of stigmasterol and thus pharmaceutically important stigmasterol can be produced in large quantities in real time after the scale-up mass culturing of the transformed plant cells.

Biography

Raksha Ramkrishna Bawankar has completed Master of Philosophy from Bharathiar University, Coimbatore (2010) and persuing Ph.D from VIT University, School of Biosciences and Technology, Vellore-632014 Tamilnadu, India. She is working as Research Associate and has published two papers.

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Antimicrobial activity of silver nanoparticles synthesized from the bark extract of Syzygium cumini

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The unique property of the silver nanoparticles having the antimicrobial activity plays an important role in present nanotechnology. The environmentally non-toxic and eco-friendly silver nanoparticles production from the plant extracts creates the major research interest in the field of nanobiotechnology. The present research study was the biogenic synthesis of the silver nanoparticles with a precise stability from the bark extract of Syzygium cumini, which is a medicinal plant available in the tropical forests, and it has best anti-diabetic property.

In this study we had done the characterization through the UV-Visible spectroscopy, Atomic force microscopy, Dynamic light scattering, and Scanning electron microscopy. From all above characterization techniques the synthesized nanoparticles shows average size from 40 nm to 80 nm and these nanoparticles are polydispersive and uniform in distribution.

The synthesized nanoparticle shows antibacterial property and has a better zone of inhibition with the different pathogenic bacteria species such as Escherichia coli, staphylococcus aureus, Pseudomonas aeruginosa, and Bacillus licheniformis 9555. The zone of inhibition was characterized by the well plate method at different concentrations of 2, 5, 10, 15, 25, 50, 75 and 100 µL.

Nanoparticles had a wide variety of application in medicine, electronics, chemistry and other related sciences. These nanoparticles are used in electronics, household hospitals appliances, cleaning agents, odor textiles, water drainage systems, food packaging materials and supplements, etc.

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Meta analysis of eugenol synthase-I in Ocimum basilicum

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Eugenol is one of the important chemical constituent of the essential oils of many aromatic plants, such as Eugenia caryophyllus, Dicipelium cariophyllatum, Pimenta dioica, Croton zehntneri, and Ocimum species. Recent studies suggest that Ocimum (tulsi) may be a COX-2 inhibitor, like many modern painkillers, due to its high concentration of eugenol (1-hydroxy-2-methoxy-4-allylbenzene). Ocimum is proven to be an effective treatment for diabetes by reducing blood glucose levels. Previous study showed that high glucose level in blood results in the increase transcription of Cyclooxgenase-2 (Ref:Narkunraja Shanmagum,Irene T. Gaw Ganzalo and Rama Natarajan). The basic idea behind the work is to reverse this process and for that Eugenol synthase comes in picture. Eugenol synthase suppresses COX 2 expression that has already been proved by Sun Suk Kim et al. There are around 410 experimentally proven medicinal plants having Anti-diabetic properties but the complete mechanism of action is available only for about 109. There are several medicinal plants whose extract modulate glycolysis, Krebs cycle, gluconeogenesis, HMP shunt pathway, glycogen synthesis and their degradation, cholesterol synthesis, metabolism and absorption of carbohydrates, and synthesis and release of insulin. This work provides a comprehensive overview of Meta Analysis of Eugenol Synthase-I in Ocimum basilicum.

Keywords: Eugenol synthase , COX-2, Ocimum basilicum,Meta analysis.

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A novel role for miRNA let-7b target FZD4 in the regulation of developmental megakaryocytopoiesis

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Background: Neonatal thrombocytopenia is common among sick infants and it is known that developmental differences between neonatal and adult megakaryocytes (MKs) contribute to the higher vulnerability of neonates to develop prolonged and severe thrombocytopenia. The regulatory mechanisms underlying these developmental differences are unclear. Recent reports indicate a critical role of small non-coding microRNAs (miRNAs) in the regulation of megakaryocytopoiesis. miRNAs regulate the target gene expression on a post-transcriptional level by binding to the target mRNAs which, in turn, leads to translational arrest. Our studies found that out of 88 miRNAs involved in the stem cell development, let7b was the only miRNA downregulated in human cord blood (CB-) MKs compared to peripheral blood (PB-). Let7b has not been previously described in MKs, however reduced expression of let-7b was found in several human cancers, suggesting that it functions as a tumor suppressor.

Objective: To investigate the differential expression of miRNAs in neonatal and adult megakaryocytes, and its contribution to the phenotype.

Design/Methods: We cultured human CB- and PB- derived $CD34^+$ cells in the presence of thrombopoietin for 14 days. At day 14, >90% of cells were megakaryocytes ($CD41^+$) as measured by flow cytometry. miRNA was prepared using the miRNeasy mini kit (Qiagen) and expression analysis of 88 miRNAs was performed using a quantitative PCR-based array kit (SA Biosciences). Web-based computational approaches (TargetScan, PicTar and MiRanda) were used for putative target prediction.

Results: All CB- and PB-megakaryocyte samples expressed detectable amounts of all 88 screened miRNAs. Nevertheless, the specific miRNA expression levels differed significantly between CB- and PB-derived megakaryocytes. Ten miRNAs were expressed at significantly higher levels in CB MKs (2 to 22 fold), while only one, let-7b, was down-regulated (10% of PB). All of these differences reached statistical significance ($p<0.05$). Specific targets of let-7b were predicted by web-based computational approaches (TargetScan, PicTar and MiRanda) and identified FZD4, a Wnt family protein as a potential target. The complex Wnt family molecules are generally thought to be important to sustain large-scale production of blood cells, delivering critical signals to stem cells and progenitors as they reside in specialized niches. Wnt proteins are also known to be involved in malignancies and are causatively involved in the development of several types of leukemias.

Conclusions: Our results indicate that neonatal and adult megakaryocytes show a differential expression pattern of miRNAs that are likely to regulate some or all of the molecular mechanisms underlying their phenotypic differences. Our findings could unveil a novel role for let-7b target FZD4 in the regulation of megakaryopoiesis, and implicate developmental differences in this axis as one of the molecular mechanisms responsible for the high proliferative rate of neonatal MKs. This might explain the susceptibility of neonates to develop myeloproliferative disorder in the presence of trisomy 21 and GATA-1s mutations.

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A study on proneural genes in the development of olfactory local interneurons in Drosophila

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Certain morphological, physiological and molecular characteristics are shared by all neurons, however, despite these similarities; neurons constitute the most diverse cell population. Genetic studies in Drosophila have provided that small number of proneural genes which encode the transcription factors of the basic helix – loop helix (bHLH) class, are necessary in the context of ectoderm to initiate the development of neuronal lineages. We studied the role of atonal, acheate, amos and scabrous genes in the development of olfactory local interneurons of Drosophila using UAS- Gal4enhancer trap lines, RNAi , splinkerette PCR, MARCM ,Immunohistochemisty and Confocal analysis.

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Green synthesis of gold nanoparticles by using plant leaf extract and their application in lipase immobilisation

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Synthesis of gold nanoparticles by biological means leads to, eco-friendly, non-toxic, quicker synthesis and is commonly called as green method. In this study, plant leaf extract was prepared for gold nanoparticle synthesis. Physicochemical factors were optimized with respect to pH, temperature, time of incubation and gold salt concentrations for synthesis of gold nanoparticles. The optimum gold salt was 0.5 mM, pH 7.0, time 50 minutes and temperature 50^0C for synthesis of gold nanoparticles. Gold nanoparticles were characterized by using UV/Vis spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Energy Dispersive spectroscopy (EDS) and X-ray diffraction analysis (XRD). TEM studies revealed that spherical nanoparticles were formed with a size in the range of 10-20 nm. Using these Au nanoparticles, lipase enzyme was successfully immobilized on sodium alumino silicate. Immobilized enzyme was stable and showed more activity as compared to free enzyme.

Biography

Rasika Kulkarni is M.Sc. student at Department of Microbiology, University of Pune, Maharshtra, India.

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Purification and characterization of alkaline phosphatase from dolichous lab-lab and its *in vitro* dephosphorylation activity on nucleic acids

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Phosphatase serves several functions in a plant's metabolism including growth governance, phosphorous level control, starch breakdown etc. Alkaline Phosphatases, acting at an alkaline pH 8, are a significant class of enzymes that catalyze phosphate esters especially. This enzyme finds its role in various plant growth and metabolism and is of high interest in clinical research. This enzyme study is so far limited only to animal source and partly to microbial sources, in terms of clinical research. Although it has been identified that plant as a source of this enzyme may be exploited, there always has been a challenge on the isolation and characterization of this enzyme and how pure it can be. This paper partly addresses the above problem, where the enzyme has been from the seeds Dolichous lab-lab plant, characterized and its purity was checked by HPLC. The purity obtained was 98% and the enzyme has been further analyzed for its activity on nucleic acids, which gave promising and positive results.

Keywords: Dolichous lab-lab, Alkaline Phosphatase, BCIP/NBT, Bradford Assay, Smoothie.

Biography

Ramya Velampati is doing her b.tech 4th year in the field of biotechnology in Koneru Lakshmaiah University, Vaddeswaram, Guntur.

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Coinoculations of Rhizobium and Pseudomonas strains isolated from Trigonella foenum graecum (Methi) and check their PGPR potential

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The rhizosphere is populated by a diverse range of microorganisms, and the bacteria colonizing this habitat are called rhizobacteria. Plant root colonizing bacteria can function as harmful, deleterious rhizobacteria (DRB) or beneficial, PGPR inhabit plant growth promotion directly and indirectly There are several ways of promoting plant growth like by fixation of atmosphere nitrogen, solubilization of minerals such as phosphorus, production of siderophore that enhance plant growth at various stages of development. Auxins are produced by several rhizobacterial genera e.g. Azospirillum, Agrobacterium, Erwinia and Pseudomonas. Cytokinins promote root formation. Siderophore are low molecular weight, extracellular compounds with a high affinity for ferric iron, that are secreted by microorganisms to take up iron from the environment and their mode of action in suppression of disease were thought to be solely based on competition for iron with the pathogen .The cyanide ion is exhaled as HCN and metabolized to a lesser degree in to other compounds. Indole Acetic Acid (IAA) is phytohormone which is known to be involved in root initiation, cell division and cell enlargement. Phosphorus (P) is major essential macronutrient for biological growth and development. Pseudomonaceae is a large family of Gram negative bacteria, they are very good PGPR. The most effective strains of Pseudomonas used as PGPR belong to the category of fluorescent pseudomonads. These act as systemic bio-control agent against various fungal and bacterial diseases such as Fusarium, Pythium, Phytophthora, Rhizoctonia, Sclerotium, Sclerotinia and Ustilogo. Rhizobia are well known bacteria works as the microbial symbiotic partners of legumes, forming N2-fixing nodules. Rhizobia can produce phytohormones, siderophore, HCN; they can solubilise sparingly soluble organic and inorganic phosphates. Inoculation of Rhizobium causes a greater increase in growth and yield and the number of nodules per root system. Seed bacterization with both fluorescent Pseudomonas strains and Rhizobium and their combinations (co-inoculations) brought distinct crop enhancement in most cases. Fenugreek (Trigonella foenum-graecum or Methi) is an annual forage legume crop. Fenugreek is regarded as the oldest known medicinal plant in recorded history. Its seed and leaves have medicinal value, and have been used to reduce blood sugar and lower blood cholesterol in cancer, sexual health, digestion, coughs, fever and flu symptoms. Fenugreek has traditionally been used to ease coughing and reduce fever. The two most common fungal diseases infecting Fenugreek are Cercospora leaf spot and Powdery mildew. In this study investigation was carried out to assess the effect of fungal pathogen levels on Fenugreek seedlings grown in sand. Fungal inoculums affected the mortality of crop seedlings. It is showed from the present study that co-inoculation of Pseudomonas and Rhizobium strains shown better PGPR activity by suppressing the growth of fungus and enhancing the growth of Fenugreek plant.

Keywords: PGPR, Rhizobium, Pseudomonas, Coinoculation, Fenugreek.

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Biogenic synthesis of gold nanoparticles using Trichoderma harzianum and their characterisation

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Nanotechnology is the new evolution of science and technology. Currently nanoparticles have drawn much attention because of its various valuable properties. Biogenic synthesis of nanoparticles is considered to be good approach because it is cost effective, easy, eco-friendly, reliable and rapid methods. Nanoparticles have been already synthesised by chemical and physical route. In this study, we have synthesized gold nanoparticles using fungus (Trichoderma harzianum). These gold nanoparticles were characterized by UV-Vis spectrophotometer; Dynamic Light Scattering (DLS), Transmission electron microscope (TEM), X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR).In UV Vis spectra, the surface Plasmon resonance of gold nanoparticles was occurred at 532 nm. The particles size distribution profile of the nanoparticles was determined by using Dynamic Light Scattering (DLS). TEM micrograph showed formation of well dispersed spherical gold nanoparticles in the range of 20-40 nm. XRD pattern of nanoparticles exhibits the formation of metallic gold. The involvement of Trichoderma harzianum in the stabilization of nanoparticles was confirmed by FTIR.

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Carotenoids: The most potent phytochemicals in nature having health promoting activities

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Carotenoids are fat-soluble pigments widely distributed in nature. They comprise two main groups; carotenes and oxycarotenoids. Their distinctive pattern of alternating single and double bonds in the polyene backbone might be responsible to quench reactive oxygen species (ROS), while the nature of specific end groups on carotenoids may influence their polarity. Antioxidants help to control free radicals by quenching them by donating electrons to molecules before they damage other biomolecules of the cell or by reducing their energy or stopping their formation by interrupting oxidizing chain reaction. Scavenging of free radicals may be by gaining its "missing" electron by removing an electron from another molecule or to add itself to another molecule in its attempt to pair single electron, forming an adduct. In either case, the electron-rich character of carotenoids makes them attractive to radicals, thus sparing other cell components (DNA, RNA, carbohydrates, proteins, andlipids) from damage. Carotenes along with xanthophylls, astaxanthin, lycopene and lutein seem to offer protection against breast, lung,colorectal,uterine and prostate cancers. They help to prevent heart diseases, supplementation along with vitamin C and E reduce the risk of developing diabetes and to fight against Alzheimer's disease. They are generally regarded as safe (GRAS) but increased consumption of carotenoids may cause the skin to turn orange or yellow, known as "carotenodermia." This occurrence is completely benign and is unrelated to jaundice that can result from liver disease or other causes. Although it is tempting to formulate a cocktail of carotenoids with a desire to provide a full spectrum of health benefits but it is advised to take into consideration the health benefit to be targeted specifically.

Keywords: Carotenoids, Carotenes, Oxycarotenoids, Xanthophylls, Antioxidants, Free Radicals, Phytochemicals.

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Optimization of culture condition for production of acyltransferase activity of Pseudomonas sp. BR1 through response surface methodology approach

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Response surface methodology was applied to optimize the medium constituents and culture conditions for acyltransferase activity of amidase from Pseudomonas sp. BR1. Placket–Burmen design of the experiment revealed that glycerol, KH_2PO_4 and inducer have positive effect out of eleven independent variable on acyl transfer activity. A quadratic model was analysed as suitable model for amidase mediated acyltransferaseactivity analysis. Central composite design (CCD) was used to determine the quantitative effect of various variables having positive effect on acyltransferase activity. ANOVA analysis of the CCD model revealed that the medium containing (%, w/v) glycerol, KH_2PO_4 and inducer was most suitable production of acyltransferase by Pseudomonas sp. BR1. Validation of experiment was carried out under the optimized conditions and acyl transfer activity of 94.46 U/mg dcm was close to the predicted activity 93.82 U.ng dcm. After optimization with CCD, there was an increase of 17%in acyltransferase activity, from 77.2 U/mg dcm to 94.4U/mg dcm as compared to un-optimized conditions and the bioconversion of hydroxamic acid was significantly improved.

Biography

Ravi Kant Bhatia working as a Ph.D Research Scholar in Department of Biotechnology, Himachal Pradesh University, Shimla under the supervision of Prof. TC Bhalla. He is MSc and M Phil in Biotechnology having UGC-RGNF-SRF. He is working on acyltransferase activity of amidase from Pseudomonas sp. BR1. He has attended various workshops and published abstracts in various national and international conferences.

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A novel role of JDP2/miR-9 Axis in developmental megakaryocytopoiesis

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Background: Thrombocytopenia, defined as a platelet count <150 x 10^9/L is common among sick infants (20-35% of infants admitted to the Neonatal Intensive Care Unit). Neonates are affected by disorders of megakaryocytopoiesis that predominantly or exclusively present during this developmental stage, including a syndrome of megakaryocytic hyperproliferation known as transient myeloproliferative disorder (TMD) and the thrombocytopenia associated with the thrombocytopenia-absent radius (TAR) syndrome. It has been hypothesized that developmental differences between neonatal and adult megakaryocytes (MKs) contribute to the vulnerability of neonates to develop severe thrombocytopenia. The regulatory mechanisms underlying these developmental differences are unclear, but we hypothesize that epigenetics may play a critical role in the regulation of developmental megakaryocytopoiesis. Epigenetics is defined as heritable changes in gene expression, i.e. the presentation of a certain phenotype, without alterations to the genetic code. Recent advancements in the rapidly evolving field of epigenetics have shown extensive reprogramming of every component of the epigenetic machinery including DNA methylation, histone modifications, nucleosome positioning and non-coding RNAs, specifically microRNA expression.

Objective: We hypothesized that miRNAs are differentially expressed in neonatal and adult megakaryocytes and, therefore, might contribute to their phenotypic differences.

Design/Methods: We cultured human cord blood (CB-) and peripheral blood (PB-) derived $CD34^+$ cells for 14 days in the presence of thrombopoietin. At day 14, >90% of cells were megakaryocytes ($CD41^+$) as measured by flow cytometry. miRNA was prepared using the miRNeasy mini kit (Qiagen) and expression analysis of 88 miRNAs was performed using a quantitative PCR-based array kit (SA Biosciences). Web-based computational approaches (TargetScan, PicTar and MiRanda) are used for putative target prediction.

Results: All samples (n=3 per group) expressed detectable amounts of all 88 screened miRNAs involved in stem cell development. Our studies revealed that miR-9 exhibited the largest developmental difference, being expressed at levels 22-fold higher in neonatal compared to adult MKs. To explain the potential roles of miR-9 in megakaryocyte development, we predicted the targets of miR-9 via the algorithms: TargetScan, PicTar, and miRanda and Jun dimerization protein 2 (JDP2) was found to be a predicted target by bioinformatic analysis. JDP2, a member of the AP-1 family of the basic leucine zipper transcription factors, is involved in cellular senescence, chromatin remodulation and proliferation. JDP2 is also involved in senescence, cell cycle arrest and cell differentiation processes, such as differentiation of skeletal muscle cells, osteoclasts and in stress response to ultraviolet irradiation. Various studies suggest that JDP2 has a dual role in malignant transformation. JDP2 is one of the candidate oncoproteins that collaborate in the oncogenesis associated with the loss of p27 as the result of insertional mutation. Serial analysis of gene expression identified increased levels of JDP2 in a number of cancers including prostate, kidney, liver and skeletal muscle. Our studies need further elucidation to prove the role of JDP2 in developmental megakaryocytopoiesis.

Conclusions: Our results indicate that neonatal and adult MKs has different miRNA expression profiles, which likely modulate critical regulators of MK development. JDP2 was found to be a predicted target by bioinformatics of miR-9 being upregulated-22 fold in neonates. This study suggests that JDP2 expression may play a critical role in megakaryocyte development by potentiating the compensatory proliferative response. The biological role of JDP2 in megakaryocytes, however, is unknown. We anticipate that JDP2 play major role in megakaryocyte development and differentiation. Characterizing miR-9/JDP2 will help in defining main pathways involved in developmental megakaryocytopoiesis and give a better understanding of neonatal MK disorders and enhance our understanding of MK biology as a whole. In addition, this may provide new mechanistic insights and therapeutic targets for adult hematopoietic disorders potentially associated with re-activation of fetal pathways (i.e. myeloproliferative disorders). This in turn will be useful in developing biomarker to use as a diagnostic tool.

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Production and partial characterization of a thermostable amylase from Bacillus firmus strain isolated from bhairon ghati of trikuta hills

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An extracellular amylase producing strain designated as SMVDU-1 was isolated from Bhairon Ghati of Trikuta Hills located in the state of J&K.The strain was identified as Bacillus firmus by 16S rDNA sequencing.The enzyme production was optimized using various Carbon sources and it was found that soluble starch and wheat bran increased the enzyme production up to 151% and 220% respectively as compared to Luria Bertani broth.The growth profile of the strain was studied at 35°Cfor 72 hours and it was found that the enzyme production was best after 24 hours of growth. The amylase enzyme from the supernatant of SMVDU-1 was partially purified and characterized.

The enzyme showed optimum activity at a temperature of 65°C and pH 7.0. The temperature stability of the enzyme was found to be in the range of range of 45°C -80°C and the pH stability is in the range of 6.0 – 8.0.

Effect of metal ions like Ca^{2+}, Mn^{2+}, Mg^{2+}, Cu^{2+}, and Ag^{2+} on enzyme activity was studied and it was found that Mn^{2+} and Ca^{2+} ions at a concentration of 2mM increased the enzyme activity considerably.

Effect of inhibitors on enzyme activity was also studied and it was found that 50% of the enzyme activity was retained when SDS was used at a concentration of 2%. EDTA at a concentration of 1mM and 5mM was found to decrease the enzyme activity.

From the above studies it may be concluded that the enzyme under investigation could be exploited for biotechnological applications because of its temperature optima and temperature stability and thermostable amylases have a great role to play in starch industry.

Keywords: Thermostable amylase, Trikuta Hills, Bacillus firmus.

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Tissue engineered fish swim bladder scaffolds for repair of full thickness skin defects

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Extensive or irreversible damages to skin necessitate immediate coverage using skin substitutes to aid repair and regeneration. Tissue engineering skin, based on the concept of a cell–matrix construct, has been a significant advancement in the field of wound healing. In the present study decellularization of fish swim bladder (FSB) was done with 0.5% ionic biological detergent. Light microscopic and scanning electron microscopic examination revealed complete loss of cellularity and loosening of collagen fibers. Bone marrow derived mesenchymal stem like cells of rat (R-BMSc) and goat (G-BMSc) were seeded over decellularized fish swim bladder. These tissue engineered grafts have been implanted for wound repair on the 7th day of cell seeding. The efficacies of these tissue engineered grafts were tested in the repair of full thickness skin defects in rat model. The study was conducted on thirty two clinically healthy adult rats of either sex. The animals were randomly divided into 4 groups of eight animals each. One 2×2 cm^2 size full thickness skin wound was created on the dorsum of each animal for assessing the healing potential of tissue engineered scaffolds. The defects of groups II, III and IV were repaired immediately with acellular FSB scaffold, G-BMSc seeded scaffolds and R-BMSc seeded scaffolds. Group I animals were treated as control where wounds were left open. The wound healing was studied for a period of 28 days. It was found that acellular fish swim bladder seeded with bone marrow derived mesenchymal stem like cells of goat and rat were found to be a novel biomaterials which have amphipathic character in full thickness skin repair and enhances wound healing. The detail results will be discussed at the time of presentation.

Biography

Remya V has completd her B.V.Sc. & A.H degree in 2009 from College of Veterinary and Animal Sciences, Mannuthy, Kerala. She received Junior Research Fellowship from Indian Council of Agricultural Research to pursue post graduation in Veterinary Surgery at Deemed University, Indian Veterinary Research Institute, Izatnagar. She is the Member of Kerala Veterinary Council and presently pursuing her post graduation from Deemed University, Indian Veterinary Research Institute, Izatnagar.

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Meta Analysis of eugenol Synthase-I in Ocimum basilicum

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Eugenol is one of the important chemical constituent of the essential oils of many aromatic plants, such as Eugenia caryophyllus, Dicipelium cariophyllatum, Pimenta dioica, Croton zehntneri, and Ocimum species. Recent studies suggest that Ocimum (tulsi) may be a COX-2 inhibitor, like many modern painkillers, due to its high concentration of eugenol (1-hydroxy-2-methoxy-4-allylbenzene). Ocimum is proven to be an effective treatment for diabetes by reducing blood glucose levels. Previous study showed that high glucose level in blood results in the increase transcription of Cyclooxgenase-2 (Ref:Narkunraja Shanmagum,Irene T. Gaw Ganzalo and Rama Natarajan). The basic idea behind the work is to reverse this process and for that Eugenol synthase comes in picture. Eugenol synthase suppresses COX 2 expression that has already been proved by Sun Suk Kim et al. There are around 410 experimentally proven medicinal plants having Anti-diabetic properties but the complete mechanism of action is available only for about 109. There are several medicinal plants whose extract modulate glycolysis, Krebs cycle, gluconeogenesis, HMP shunt pathway, glycogen synthesis and their degradation, cholesterol synthesis, metabolism and absorption of carbohydrates, and synthesis and release of insulin. This work provides a comprehensive overview of Meta Analysis of Eugenol Synthase-I in Ocimum basilicum.

Keywords: Eugenol synthase, COX-2, Ocimum basilicum, Meta analysis.

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Design and assay of inhibitors for pathogenic bacterial DNA gyrases

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Type II topoisomerases are the only enzymes capable of introducing negative supercoiling, hence these have a crucial cellular processes both in the treatments of anti-cancer and anti bacterial chemotherapy. Ecoli DNA Gyrase is a heterodimer with A2B2 complex, while the A domain had the function of cleavage and re-ligating the DNA strands and the B domain was involved in the ATPase catalytic activity which was important for the holoenzyme activity. Through the years, the A domain has been studied extensively and reports of fluoroquinolones inhibiting their activity was exploited for treating the bacterial infections, but their side effects, toxicity and emergence of bacterial fluoroquinolone resistance revived a growing interest in alternative compounds such as inhibitors of the ATPase catalytic domain (B domain). Though few coumarin inhibitors for DNA Gyrase are known like Novobiocin, Cyclothialidines and few synthetic derivatives like triazine, yet these have shown either high toxicity or low solubility and permeability during invivo tests. Hence search for an alternative lead compounds are still in the process. Through high throughput screening from commercial databases employing Glide, Gold and Autodock modules, few promising molecules were identified. Molecules showing good docking scores and high fitness values compare to crystal ligand are further screened in invitro and finalized. Hence these compounds would be potential leads for treating pathogenic bacterial diseases.

Biography

Renuka J has completed her MSc from Osmania University. Currently she is doing PhD in Bits Pilani, Hyderabad campus. Her area of interest is to design and screen small molecules against DNA gyrase.

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Identification of novel inhibitors of chorismate mutase enzyme involved in shikimate pathway of Mycobacterium tuberculosis: Design and in-vitro screening

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Tuberculosis is a frightful disease which affects one third of world population, and kills 1-2 million people a year, is a top health priority. The emergence of multiple and extensively drug resistant forms (MDR and XDR) of the disease that are difficult to treat with the existing drug regimen. Despite this need, no new drug classes have been specifically marketed for TB in the last forty years, in part owing to lengthy and costly process that makes almost two decades for drug approval. One strategy that will allow for a rapid path to new anti-TB agents to discover new classes of compounds against already validated targets. One of the target is Chorismate mutase (E.C 5.4.99.5), which catalysis conversion of Chorismate to prephenate by claisen rearrangement. This enzymatically catalysed conversion of Chorismate proceed through a endo-oxa bicyclic (chair- like) transition state. Chorismate plays a key role in shikimate pathway for biosynthesis of aromatic amino acids like phenyl alanine, tyrosine and tryptophan. Thus, it has a main role in maintaining the balance between these aromatic amino acids in the cell is vital. In this study, we performed invitro screening of inhouse database molecules. More than 15 molecules showed IC50 below 1micro molar concentration. These were further supported by docking studies using Glide module (schrodinger.Inc). Hence, the thiazine derivative which showed highest percentage of inhibition at 1micromolar conccentration can be a potential lead for treating tuberculosis.

Biography

Reshma Chowdary Alokam completed her M.sc Microbiology from Avanthi PG College affiliated to Osmania University. Currently she is pursuing her Ph.D from BITS-Pilani Hyderabad Campus, Jawahar Nagar, Hyderabad.

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Ethanol production using neurospora crassa under solid state fermentation of Recinus communis leaves

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Fuel ethanol is one of the most important clean fuels and renewable energy resources, which would play an important role in effectively solving the problem of the oil shortage. Lignocellulosic materials are renewable, abundant and economical carbon sources to potentially substitute for large amounts of petroleum for fuels and chemicals production. Ethanol is generally expected to be the first major commercial product of this emerging cellulosic biofuel technology. Bioconversion of fermentable sugars to ethanol is of central importance to this technology. The utilization of bioethanol as fuel can significantly reduce the accumulation of green house gases.

The solid state fermentation can be a simpler and less energy intensive and low grade lignocellulosic substrates can be used. The risk of contamination is lower than in submerged fermentation because the hyphal growth mode of filamentous fungi employed gives them an advantage over potential contaminating bacteria which cannot easily access the cellulose inside the substrate in the absence of water.

The present work deals with the production of ethanol using Neurospora crassa under solid state fermentation of Recinus communis leaves Experiments were carried out for optimization of the process parameters by step by step method via direct microbial conversion conditions. The substrate was pretreated with 5M cold alkali, ethanolic alkali and steam with 1M alkali. After optimization of the process parameters, the maximum amount of ethanol 0.5524g/g was recorded with fermentation time of 48h, temperature 37°C, pH 6.0 with citrate buffer, inoculum level 70%(v/w) and at moisture content 30%(v/w). Addition of 0.3% (w/w) ATCP as carbon source had little impact on ethanol production.

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Diversity of phosphate solubilizing bacteria from proposed uranium mining site

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Radiological survey and exploration by Atomic Mineral Division (AMD), Hyderabad, has indicated the presence of rich uranium deposits in the Bhima river belt of Karnataka (Gogi, Shahapur Taluk, Yadagiri district). The radionuclides/metal enriched reserves are under-explored ecosystems in terms of microbial diversity. It is envisaged that, these ecosystems might harbor microbes possessing special characteristics namely, metal-resistance, phosphate solubilization, and radiation resistance, which may be of use in remediating metal contaminated sites. With this background information, the present study was aimed at isolating and characterizing culturable and phosphate solubilizing bacteria from Gogi region (16° 43' N, 76° 44' E). Soil and tube well water samples were collected aseptically from these sites. These samples were analyzed in laboratory for pH, temperature, salinity, radionuclide activities namely K-40, Th-232 and Ra-226 and presence of phosphate solubilizing bacteria (PSB). For the isolation of PSBs, the samples were inoculated on Pikovskaya's agar and incubated for 10 days. Among 32 isolates obtained on this media, 15 isolates showed clear zone around the colonies with the Solubilization Index > 1. These isolates were further assessed for their solubilization efficiency in Pikovskaya's broth containing 5 g/L tri-calcium phosphate for 3 days. The phosphate released by the isolates ranged from 200 mg/L to 800 mg/L with proportional decrease in pH of the media which was significantly higher compared to the uninoculated control. The decrease in pH can be attributed to the release of organic acids which play a role in solubilization of insoluble phosphate. Taxonomic identification by 16S rRNA sequencing and phylogenetic analysis revealed that the isolates belonged to eight genera namely Acinetobacter, Curtobacterium, Enterobacter, Leclercia, Pseudomonas, Pantoea, Staphyloccus and Serratia. This study opens scope for in-depth investigation of these natural isolates possessing important characteristics for environmental application.

Biography

Sowmya S has completed Masters degree in Biotechnology and is presently pursuing Ph.D. on the topic of bioremediation of uranium under the guidance of Dr. Arun A.B. in Yenepoya University, Mangalore, Karnataka.

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Synthesis, characterization and evaluation of non target eco toxic effect of nanocomposite

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Nanobiotechnology is a branch of biotechnology which deals with the study and application of biological and biochemical activities from elements of nature to fabricate new devices like biosensors. Increasing numbers of commercial products, from cosmetics to medicine incorporate manufactured nano materials (MNMs) that can be accidentally or incidentally released to the environment Concern over the potentially harmful effects of such nanoparticles has stimulated the advent of nanotoxicology as a unique and significant research discipline. However, the majority of the published nanotoxicology articles have focused on mammalian cytotoxicity or impacts to animals and bacteria, and only a few studies have considered the toxicity of MNMs to plants. Developmental phytotoxicity of NMS is a critical knowledge gap because nanoparticles entering wastewater streams may predominantly be incorporated into sewage sludge and applied to agricultural fields. In the present study, silver chitosan and copper chitosan nanocomposite was synthesized adopting solution casting method and characterized by scanning electron microscopy, energy dispersive X ray spectroscopy and FTIR. Ecotoxic effect of thus synthesized Nanocomposite evaluated was studied against plant growth parameters of Vigna radiata (green gram) and Arachis hypogea (ground nut), soil microbial population, soil enzyme activity. The respective nanocomposites didn't cause any significant effect on seedling emergence and plant growth parameters of the both the tested plants, soil enzyme activity.

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Development of cost – effective technology for mass multiplication and delivery of Beauveria bassiana and Metarhizium anisopliae biocontrol agents

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Plant protection against H. armigera has been progressively reoriented from a therapeutic approach to a rational use of pesticide chemicals in which consumer health and environmental preservation prevail over any other productive or economic considerations. Beauveria bassiana and Metarhizium anisopliae are the most widely used biocontrol agents and their application on plants is foliage spray. Unlike chemicals these biocontrol agents need support even after their application to get established in targeted niche. To ensure the sustained availability of biocontrol agent's requires several steps addressed to its isolation in pure culture and screening by means of efficacy bioassays performed in vitro and in vivo trials under real conditions of application and standardization of abiotic factors. For the commercial delivery of B.bassiana and M.anisopliae, these were produced on Agricultural wastes like wheat bran flakes supported excellent growth of both B.bassiana and M.anisopliae. Population of B.bassiana and M.anisopliae in colonized wheat bran are as $>10^8$cfu/gm of the fermented substrate. The developed fungi are formulated by means of biocompatible additives to increase survival and to improve the application and stability of the final product. This study led to test the efficacy of developed final product under laboratory and field trials for control of H. armigera. Cost –effective Technologies of colonization of biocontrol agents on agricultural wastes are becoming popular and to improve plant health and yield, irrespective of crop.

Keywords: Delivery system, Mass multiplication, B.bassiana and M.anisopliae.

Structure-function based study in ns-synonymous SNPs of MMP3 and MMP13 genes responsible for cardiovascular disease - A computational approach

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Human genome project paved the way to understand and predict molecular basis of disease. Single-nucleotide-polymorphisms (SNPs) are the predominant mutation, may be as a result of biochemical abnormalities. The Matrix-metalloproteinase MMP 3 and MMP 13 genes inspected in the study accounts for various forms of Cardiovascular Diseases (CVD). The deleterious effect of non-synonymous (ns-SNPs) were analyzed using computational tools such as SIFT and PolyPhen 2. iMutant, PANTHER and PROVEAN tools were also used to analyze the phenotypic and evolutionary prospects. Further, Root Mean Square Deviation (RMSD) was calculated using SWISS-PDB viewer for the 50% of SNPs that were predicted to be deleterious by SIFT and PolyPhen 2.0 together. Accordingly, the point mutations P187S, P276S, R316C, and W333R in MMP 3 and Y42H, F74S, M91T, D100N, D198V, W207G, P281L, T323M, and G446R in MMP 13 had RMSD ≥ 1.0 Å. The deviation between native and mutant type structures will be more if the RMSD value are more and this deviation may reflect on their function. Thus we conclude that the study helps us in better understanding of the variation in the perspective of in-silico structure and function and also showed that the above mutation as major targets which may lead to CVD.

Keywords: MMP3, MMP113, computational tools, RMSD, Cardiovascular Disease.

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Microbial synthesis of the silver nanoparticles using aromatic compounds as substrate and its antimicrobial activity

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Microbial synthesis of nanoparticles is a green chemistry approach that interconnects nanotechnology and microbial biotechnology. In this present study, synthesis of silver nanoparticles (AgNPs) has been demonstrated using a metabolically versatile actinobacteria Rhodococcus sp. by reducing aqueous silver nitrate. The synthesis of AgNPs was done using aromatic compounds such as phenol, p-nitro phenol, xylene, benzene and toluene as carbon source for the growth of the Rhodococcus sp. The AgNPs were characterized by Ultraviolet–Visible (UV–vis) Spectrometer, Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Analysis (EDAX), Dynamic Light Scattering (DLS), zeta potential, Selected Area Diffraction Pattern (SAED) and Transmission Electron Microscopy (TEM). The TEM showed spherical particles with an average size of 10 nm. The SAED pattern showed the characteristic Bragg peaks of (111), (200), (220) and (311) facets of the face centered cubic (fcc) silver nanoparticles and confirmed that these nanoparticles are crystalline in nature. The AgNPs showed antimicrobial activity for more than 30 µg/ml against Gram positive and Gram negative pathogenic microorganisms, E.coli, Enterococcus fecalis, Staphylococcus aureus, Klebsialla pneumoniae, Pseudomonas arugenosa and Proteus vulgaris. The synthesis of AgNPs is a biosynthesis process where cell enzyme systems of Rhodococcus sp. may take part in synthesis process as the cell free extract did not showed any reduction of the aqueous silver nitrate. Thus synthesis of the AgNPs can be done using waste containing these aromatic compounds.

Keywords: Biosynthesis, Silver nanoparticles, Rhodococcus sp., Biomaterials, Bioremediation.

Biography

Sachin V. Otari is pursuing his Ph. D. in field of nanotechnology from D. Y. Patil University, Kolhapur, Maharashtra under the guidance of Prof. (Dr.) S. H. Pawar. He has completed his post graduation and graduation in Microbiology from Shivaji University, Kolhapur, Maharashtra. He has two publications in international journals on his name.

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Bioremediation of paper and pulp mill effluents

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Effluents from pulp and paper mills are highly toxic and are major sources of aquatic pollution. More than 250 chemicals have been identified in effluents which are produced at different stages of paper making. Effluent contains heavy load of organic matter which are responsible for high BOD, COD of effluent. These are tannins, Resin acids, lignin and its derivatives and unsaturated fatty acids such as oleic acid, linoleic acid and linolenic acid which are carcinogenic and mutagenic. Several methods have been attempted by various researchers throughout the world for the removal of these chemicals from pulp and paper mill effluents. The biological process uses various classes of microorganism to remediate the wastewaters from pulp paper mill- bacteria, algae and fungi--to degrade the polymeric lignin derived chromophoric material. Enterobacteria sp. can be used to degrade tannin acid and two Basidomycetous fungi and one deuteromycetous fungi can minimize the level of BOD, COD and lignin of the effluent due to the production of hemicellulase, lignin peroxidase, manganese peroxidase and laccase. Paenibacillus sp., Aneurinibacillus aneurinilyticus and Bacillus sp. are lignin-degrading bacteria which can degrade lignin of effluent. Phanerochaete chrysosporium can lower the phenol content in pulp paper mill effluent.

Keywords: effluent, tannin, rasin acid, Enterobacteria sp.

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SETS -Solar energy trapping system

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Energy efficient systems in the modern world play a vital role, as we are in energy crisis. Due to the man made causes energy is being wasted, in addition to this, polluting the surroundings indeed the mother earth. Here we come with an idea of producing steam by trapping solar energy where this type of system doesn't release any waste gases or pollutants and thus steam obtained can be used for many purposes like Cooking food, Generation of Electricity etc,

Our idea is to trap solar energy by parabolic arrangement which can Efficiently Convert the Solar Energy into Electrical or Mechanical according to the Purpose, so that it can be made available for a Lane man.

Biography

Sampath Ram P is in Final Year of B.Tech in the stream of Electronics and Communication Engineering (ECE), at the age of 21 years from SK University, Anantapur. He was the Student Organizer of EVINCE 2012, a National Level Technical Symposium Conducted by Dept of ECE. He has presented Many Papers, Posters and Projects at Various Technical Fests. He was also student coordinator in college tech and cultural fests. He has good presentation skills with leadership and team management skills. He was the Founder of Music Club in the University.

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Green synthesis of Au-Ag nanocomposites and their anti-biofilm activity

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In the present work, Au-Ag nanocomposites were synthesized by a green route using Banana Peel Extract (BPE) powder. The characterization of nanoparticles was carried out by different techniques such as UV-Visible Spectroscopy, SEM-EDS, TEM and XRD. The antibacterial and anti-biofilm activities of these nanoparticles were checked against pathogenic strain of P. aeruginosa. Agar diffusion method was used for antibacterial activity and 96 well cell culture plates were used for Anti-biofilm activity. Biofilms were quantified by crystal violet assay method. Biofilm formation on the glass surfaces were stained with acridine orange (0.01%) and observed by fluorescent microscopy. Results showed that Au-Ag nanocomposites were 50-100nm in size. The Au-Ag nanocomposites showed antibacterial and anti-biofilm activities against P. aeruginosa as compared to individual Au and Ag nanoparticles. Thus, this study has revealed potential synergistic effect of Au-Ag nanocomposites against P. aeruginosa.

Biography

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Antimicrobial potential of actinomycetes isolated from soil samples of Punjab, India

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The present study was conducted to determine the antibacterial and antifungal potential of actinomycetes isolated from soil samples collected from two different locations of Punjab, India. The actinomycetes isolates showed various types of color pigments like pink, yellow, orange, red and brown which may have potential use in industries. Out of the various actinomycetes isolates, three of them showed significant inhibition of the bacteria E. coli, Staphylococcus aureus, Kleibsiella pneumonia, Salmonella enterica typhimurium and the fungi Alternaria alternata and Trichoderma viride. The crude antimicrobial compound from the best isolate A5 was obtained by ethyl-acetate extraction and the MIC against two different bacteria Klebsiella pneumoniaand Salmonellaenterica typhimuriumwas 12 mg/ml. The crude antimicrobial compound from the isolate A5 was further screened to determine the nature of the antimicrobial compound by TLC analysis. Result obtained indicated that the compound may be alcohol, phenol or steroid in nature. Further the stability of the antimicrobial compound obtained from isolate A5 was checked and it was found that the compound was stable even above 60°C and in the presence of proteinase K enzyme (5 mg/ml).The results showed that isolate A5 which produced dark orange colour pigment has excellent antimicrobial characteristics with very low MIC value and stability at high temperatures and high concentration of proteinase K.

Biography

Sandeep Rana is receiving his M.Sc. degree in Microbiology from Punjabi University, Patiala, India and is presently in his final year. His project work, under the guidance of Dr. S. Menaka Devi (Assistant Professor, Dolphin Postgraduate College of Life Sciences, Chandigarh), is on the study of actinomycetes with novel antimicrobial activity. An endeavouring young person, his area of interests is Industrial Microbiology, Medical Microbiology and Pharmacology.

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Enhanced anticancer effect of tea polyphenols loaded PLGA nanoparticles in Ehrlich's ascites tumor model

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Nanomedicine concerns the use of precision-engineered nanoparticles to develop novel therapeutic and diagnostic modalities for human use. The current study demonstrates the development of black tea (theaflavin: TF) and green tea (epigallocatechins-3-gallate: EGCG) polyphenols loaded-PLGA nanoparticles (NPs) and their characterization for entrapment efficiency, percent yield, drug load, surface morphology, particle size and in vitro drug release. Furthermore the antitumor efficacy of EGCG/TF loaded PLGA-NPs was evaluated in vivo by measuring the changes in tumor burden, increased life span, and cumulative survival rates of Swiss albino mice with grafted Ehrlich ascites carcinoma (EAC) cells. TF and EGCG were encapsulated in poly (lactide-co-glycolide acid) (PLGA). The results indicated that EGCG/TF loaded PLGA-NPs prolonged the mean survival-time of EAC bearing mice and exhibited higher therapeutic efficacy compared with TF/EGCG. Additionally, these NPs are able to induce apoptosis and generation of reactive oxygen species (ROS) with simultaneous decrease in mitochondrial membrane potential (MMP). Thus, TF/EGCG loaded PLGANPs may be used as a promising delivery system for cancer treatment.

Biography

Sanjay Mishra has completed his M.Sc. in Zoology (Cytogenetics) from University of Calcutta, India in 2009. He is pursuing his Ph.D. in Cancer Biology from Indian Institute of Toxicology Research (IITR), CSIR lab, Lucknow, India. His core area of research is to develop a panel of miRNAs as potential biomarkers of having high clinical utility for early detection of breast cancer as well as to study the regulatory role of miRNAs in breast cancer development and progression. He has one paper in reputed journal. He is also working on the anti-carcinogenic potential of nanotized anti-carcinogenic compounds in in vivo tumor models.

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Synthesis and activation of immobilized beads by natural dye extracts

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Immobilization technique is used for preservation of enzymes. Here we are using different colors of natural dye in this technique. Our major emphasis would be to create beads of different colors which will act as different carriers for essential enzymes. The need for using colourful dye is because when we need to preserve more than one enzyme then it is helpful in identification of that which enzyme is to be preserved and in which color. Here we used natural dye because most of the chemical dyes are carcinogenic in nature and may alter the nature of preserved enzyme. For this different plant products like mint leaf, rose petal, beat root and Carrot are used for the extraction of dye. In this research studies, we have identified, extracted, characterized, optimized and standardized the natural dyes from plant and microbial sources and we did a comparative study between natural dyes and artificial dyes with respect to different solvent systems like petroleum ether, diethyl ether, acetone, chloroform, ethanol and water systems. The extraction methodologies, characterization, MIC (minimum inhibitory concentration), and solubility studies will be discussed. These immobilization studies will help us to use this application in a variety of fields like in wine stabilization, in modifying the shelf life of food and other natural products which degrade quickly and are difficult to preserve under natural conditions. Here sodium Alginate beads are being used so that there is good number of beads formation and that will help for the proper entrapment of the essential enzymes required for an important reaction in Bio-systems.

Keywords: characterization, MIC, immobilization, Dye, extraction, Sodium Alginate, beads.

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Production of biodiesel from unconventional feedstocks

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Due to the depleting reserves of fossil fuel and uncertainty in their availability as well as the environmental problems associated with them, considerable attention has been given to biodiesel production as an alternative to petro-diesel. However, as the biodiesel is produced from vegetable oils there is a concern that biodiesel feedstock may compete with food supply in the long-term. Hence, the recent focus is to find tree borne oil seeds (TBOS) that produce non-edible oils as the feedstock for biodiesel production. Production of biodiesel from non-edible oils like Jatropha, Karanja etc. has been well documented. In order to meet biodiesel demand, biodiesel production from newer sources of non-edible oils is need of the hour. In coastal area of Karnataka, large numbers of trees are available yielding non-edible oil having no/less application. Of these some TBOS have been evaluated and it has been found that Scleropyrum pentandrum (Naikkuli), Calophyllum inophyllum (Sura Honne), Hevea brasiliensis (Rubber), which bear seeds rich in oil. Oil was extracted using Soxhlet apparatus with hexane as solvent. Batch experiments were conducted to produce biodiesel from extracted oil. Methanol with NaOH as catalyst was used for reaction at 60-650C under magnetic stirring for 60 min. Major properties of the biodiesel such as density, viscosity, flash point, acid value, copper corrosion test were measured. Experimental analysis showed that these oils have great potential to be used as feedstock for biodiesel production. During investigation three tree species namely Terminalia bellirica (Shanti Kayi), Vateria indica (Dhoopa) and Mimusops elengi (Renjevu) are found to contain less than 20% oil and concluded that they are not feasible for biodiesel production.

Keywords: Biodiesel, Tree borne oil seeds (TBOS), FFA, Soxhlet extractor.

Biography

Santhosh Poojary is presently studying in 8th Sem B.E. Biotechnology in Nitte Mahalinga Adyanthaya Memorial Institute Of Technology along with doing research work funded by Karnataka State Biofuel Development Board. He is an active member of The Institute of Engineers India (IEI).

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One Step Purification of Intracellular L-asparaginase from E. carotovora MTCC 1428 and its Application

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L-asparaginase is a chemotherapeutic enzyme that catalyzes the conversion of L-asparagine to L-aspartate and ammonia. The important application of the L-asparaginase enzyme is in the treatment of acute lymphoblastic leukemia, Hodgkin disease, acute myelocytic leukemia, chronic lymphocytic leukemia, lymphosarcoma treatment, reticulosarcoma and melanosarcoma. L-asparaginase is widely distributed among prokaryotes and eukaryotes and since the large amount of this enzyme drug has been needed for pharmacological and clinical tests, microbial sources are found to be best for the bulk production of L-asparaginase. In the present study, the L-asparaginase from Erwinia carotovora MTCC 1428 was purified and used for the killing of Hep-2C cell line. Sonication of the resting cells was carried out to release the intracellular L-asparaginase and cell free extract was subjected to acid precipitation. Sulphopropyl Sephadex was used for further purification of enzyme. The 24% yield of the L-asparaginase was obtained after single step purification. The specific activity of the purified enzyme was found to be 0.37 IU/mg and the electrophoresis results suggest that the L-asparaginase of E. carotovora MTCC 1428 exists in the form of dimmer of dimmers. Moreover, the purified L-asparaginase from E. carotovora MTCC 1428 devoid of glutaminase activity. The L-asparaginase purified from E. carotovora MTCC 1428 showed better in vitro toxicity on Hep-2C cell lines (84% survival) in comparison to commercial L-asparaginase preparation (90% survival) obtained from E. coli.

Biography

Sarita Devi has completed her PhD in the year 2012 at the age of 29 years from Himachal Pradesh University. She has published many papers in the journals on international repute.

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Evaluation of RIL's population using UMI 79 x UMI 936(w) for tagging downy mildew resistance in maize

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Maize is the world's third most important crop after rice and wheat. Downey mildew is one of the most destructive diseases of maize in tropical and subtropical regions in Asia. Sorghum downy mildew (SDM) caused by Peronosclerospora sorghi (Butler, 1907) is a disease of sorghum and maize (Zea mays) (Williams et al., 1982) and it can cause severe epidemics, resulting in heavy yield loss. Exploitation of the genetic variation in maize germplasm to identify putative genomic regions conferring SDM resistance and marker assisted selection (MAS) can help us in introgression of the resistance into susceptible genotypes. The recombinant inbred lines developed from UMI 79 x UMI 936 (w) using progeny row method. The F4 RIL's populations evaluated during Rabi 2011. The RIL's mapping population is developed between downy mildew susceptible (downy mildew score 9) and resistance (score 0) inbred in order to tag downy mildew resistance QTL regions. The 125 F4 populations evaluated for various phenotypic traits viz., plant height (in cm), tasselling and silking (in days), length and girth of the cob (in cm), number of columns and rows on the cob,100 seed weight in (gm.) etc. to study variability in the population. The various phenotypic traits showed considerable variation among the F4 progenies. The mean 'tasselling' period varied from 51 days to 62 days and 'silking' ranges from 56 days to 59 days. The mean 'height' shows variation between 88 cm to 188.70 cm. Phenotypic coefficient of variation and genotypic coefficient of variation was estimated for tasselling , silking and plant height .The populations is presently used for SSR genotyping in order to fine map the QTL for downy mildew resistance.

Biography

Saykhedkar Gajanan R has completed B.Sc. in Agri. Biotechnology in the year 2009 from Marathwada Agricultural University, Maharashtra and presently pursuing his M.Sc. in Biotechnology with specialization in Plant Biotechnology from Tamil Nadu Agriculture University, Tamil Nadu India.

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Microbiological and biochemical characterization of seera: A starch based bioenriched fermented food of Himachal Pradesh

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Fermented foods and beverages have been in the Indian food menu since ages. In Himachal Pradesh people have developed traditional food processing technology for preparing conventional fermented foods from locally available substrates largely governed by the ethnic preference, agro-climatic conditions, socio-cultural ethos and religion. Seera is a traditional fermented food prepared in Bilaspur, Kangra, Hamirpur, Mandi, Shimla and Kullu districts of Himachal Pradesh. It is a starch based food made by soaking, crushing and fermenting wheat grains used to prepare sweet dish/snack generally served people during religious fast. Samples during seera fermentation were analyzed for various microbiological and biochemical parameters. The microflora isolated from seera mainly comprised Saccharomyces cerevisiae, Cryptococcus laurentii and Torulosporadelbrueckii among yeasts and Lactobacillus amylovorus and Leuconostocsp. among bacteria. The biochemical analysis of seera revealed that it is an acidic food having a pH of 3.4 and titrable acidity of 0.44%. It has 10.4±0.20 % (w/w) protein, 89.0±0.43 mg/g of dry matter total proteins, 87.4±1.51 mg/g dry matter starch and 11.9±0.53 mg/g dry matter reducing sugars. The activities of amylase and protease were 3.6±0.36 U/g and 1.02±0.05 U/g respectively. A significant increase in thiamine, riboflavin, nicotinic acid and cyanocobalamin was observed during fermentation of seera. The level of essential amino acids especially methionine, phenylalanine, threonine, lysine and leucine also increased during seera fermentation. As seera is biologically enriched with vitamins and amino acids during fermentation so it forms a good source of nutrition to the people who consume it.

Biography

Savitri has completed her Ph.D. (Biotechnology) in 2007 at the age of 28 years from Himachal Pradesh University, Shimla and then worked as Assistant Professor in Abhilashi Institute of Life Sciences, Nerchowk, Mandi, Himachal Pradesh for 3 years. At present she is pursuing her postdoctoral studies from Himachal Pradesh University, Shimla. She has published 5 research papers and reviews in reputed journals and 1 chapter in book. She is Life Member of Association of Microbiologist of India and Founder Member of SASNET (Swedish South Asian Network of Fermented Foods, Sweden).

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Micropropagation of Jatropha curcas for effective bio-diesel production

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There is a worldwide trend towards use of biodiesel as a substitute for diesel to reduce air pollution. Biodiesel is a form of diesel fuel manufactured from vegetable oils, animal fats. The action of our study is energy from crops can be an alternative renewable source of energy for solving fuel crisis. The non-edible vegetable oil of Jatropha curcas has the requisite potential of providing a promise and commercially viable alternative diesel fuel, since it has desirable physiochemical and performance characteristics comparable to diesel fuel. Seed kernel contains about 33-60%curcas oil. Micro propagation is the growing of plants from meristematic tissue or somatic cells of superior plants on nutrient suitable media under controlled aseptic physical conditions. In our study the healthy Jatropha curcas plants were developed by micro propagation technique using MS medium. Shoot bud proliferation from axillaries was assessed on an initial basal Murashige and Skoog (MS) salt medium supplemented with different concentrations of benzyladenine (BA), and IAA along with adenine sulfate, glutamine. In vitro produced shoots were induced to root on half-strength MS medium supplemented with IBA.

The highest frequency of shoot induction was recorded in the medium supplied with 3.0 mg BA/L and 1mg IBA/L. Highest roots induction in 3mg IBA/L. Regenerated plantlets were successfully transferred in the field(coir pith) after initial acclimatization.

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Biosurfactant mediated crude oil bioremediation through well characterized marine bacterium Staphylococcus spp

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Bioremediation of crude oil was achieved by glycolipid biosurfactant produced by marine bacterium Staphylococcus spp isolated from the petroleum hydrocarbon contaminated site cuddalore district, Tamil Nadu, India, through the standard screening and extracting procedure. The optimized physico-chemical conditions for the maximum production of biosurfactant was 30h incubation, pH 7.0, 35°C temperature, 20ppt salinity, 3% glucose and 1.5% yeast extract as carbon and nitrogen sources respectively and ionic supplements of 0.3% K_2HPO_4, 0.1% $FeSO_4$, 0.3% $CaCO_3$, 0.2% $MgSO_4$, 0.2% $ZnSO_4$. Extracted partially purified biosurfactant showed broader stability over a wide range of pH 2-10, temperature up to 70°C, salinity up to 50ppt shows the ability to withstand almost of the environmental condition and nil antimicrobial activity against bacterial and fungal strains pre-isolated from coral reef sediment and water samples shows the indigenous microorganism may not harmed therefore the fertility of the environment. Biosurfactant mediated bioremediation was carried out in conical flask using petroleum hydrocarbon pollutant and reef sediment consortium, biosurfactants solubilize the pollutants was used as sole source of carbon and energy by consortia confirmed by turbidometric, CFU and protein content in the media and was compared with the controls. From our study, isolated biosurfactant has unique property on its emulsification activity, broader stability and must provide promising environmental friendly treatment technologies for the remediation of hydrocarbons in future.

Biography

Senthil Balan S is a Research Scholar doing PhD in Marine Microbiology, Annamalai University, Tamil Nadu, India. Also holding a category as SRF in ongoing DBT project previously worked in DRDO project for a period of 2 years and totally has a research experience of 5 years. He finished his UG, PG, M.Phil and doing PhD in Microbiology in well and reputed institutes. Published 3 paper and now 3 papers in review with good impact factors. His keen interest is on bioluminescence and biosurfactant.

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Exploring endophytic diazotrophic bacteria as potential plant growth promoters and biocontrol agents of rice sheath blight disease

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The interior of plants provides habitat for a wide range of bacteria and fungi that benefit the plant host by increasing nutrient acquisition, stress tolerance, pathogen resistance, and aiding in phytoremediation of environmental pollutants and are termed "endophytes" that spend a significant part of their life cycle within plants without causing any harm. Although endophytes can increase plant growth through a variety of mechanisms, an especially intriguing method of growth promotion is through providing fixed nitrogen. The present study isolated 17 diazotrophic endophytic bacteria from surface sterilized rice (Oryza sativa) plants and screened for their ability to antagonize Rhizoctonia solani, the rice sheath blight pathogen. Molecular characterization of two promising strains was done by 16 S rDNA analysis and was identified as Lysinibacillus sphaericus and Bacillus cereus. They were subjected to qualitative analysis in order to find out the possible mechanisms of biocontrol potential such as production of siderophore, HCN, salicylic acid, volatile and non volatile compounds, biosurfactant and lytic enzymes. The plant growth promoting properties like IAA production, ammonia production, phosphate solubilization and the vigor index were also studied to check seed germination efficacy. Lysinibacillus sphaericus showed HCN and IAA production while Bacillus cereus showed lytic enzyme activities. Both were excellent seed germination promoters. Endophytic nature and colonization ability of the isolates were proved by plant inoculation methods with antibiotic sensitivity profile as marker. 'nif' gene analysis was also done to confirm the diazotrophy of the isolates.

Biography

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Serum based prospective biomarkers for early detection of hepatocellular carcinoma (HCC): A proteomic approach

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The completion of human genome project resulted in opening of new vistas for understanding the gene expression. A number of specialized fields of studies, the 'omics' have been initiated. The proteomics is one of these branches that deals with the analysis of protein profile of a cell or tissue under different physiological condition. All the metabolic activities of cell are regulated directly or indirectly by proteins. The analysis of proteins, therefore, gives better insight into the metabolic status of cell than studying its genomics. This approach is now being used for discovering novel biomarker(s) that can be used to diagnose, predict the susceptibility and monitor progression of diseases. Direct analysis of serum or other biological fluids is one of the most convenient strategies for the search of protein biomarkers. Hepatocellular carcinoma (HCC) is an international problem. It is the third most prevalent cancer and the fifth leading cause of cancer deaths worldwide (WHO-2008). The current standard diagnosis of HCC is based on the detection of serum α-fetoprotein (AFP) level. However, AFP has relatively low sensitivity (64.8% - 78%) and low specificity (50% - 93%). More reliable and accurate biomarkers are urgently needed to overcome the shortcoming of the current tools for HCC diagnosis. We report the development of an animal model for study of HCC by modifying the Solt –Farber protocol. The protein profiles of serum have been analysed by 1D SDS PAGE and 2D electrophoresis. Few specific changes in proteins profiles have been detected that bear correlation with disease progression. Marker enzymes have also been monitored to decipher the disease condition. Histopathology of liver tissue was performed to confirm liver damage. Differentially expressed proteins and the novel proteins that are expressed during tumor progression have been characterized by MALDI-TOF and LC-MS/MS techniques. The expressions of genes for the proteins of interest are in progress in our laboratory. Further, patient sera from clinically confirmed cases have been used to validate these markers. Our results suggest that some of these proteins have showing potential for the development of biomarker(s) for early detection of HCC.

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Identification of Lactobacillus Bacteria involved in municipal solid waste leachate biodegradation

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Bio-digestion comprises a series of processes in which microorganisms break down biodegradable materials. The digestion process begins with hydrolysis in which bacteria transform complex polymers into monomers. In the second stage, acidogenic bacteria transform the products of hydrolysis into volatile fatty acids. Many authors have suggested that during anaerobic digestion, long chain fatty acids are converted to propionic acids, butyric acids and acetic acids. Then propionic and butyric acid are converted to acetic acid. We observed that lactic is also produced in good quantity during anaerobic digestion. For identification of Lactobacillus Bacteria (LAB), we first enriched the leachate in MRS media, which is specific for LAB. Two reactors were set up, one containing acidified and filtered leachate (to remove humic acid portion) with MRS and second one with crude leachate with MRS. Then the reactors were first run aerobically. Genomic DNA was extracted from the reactor samples and subjected for PCR using lactobacillus specific primer. No PCR product was obtained. Then the reactor was subjected to anaerobic conditions. After running the reactor for more than 21 days, in anaeorobic condition genomic DNA was extracted and subjected to PCR using lactobacillus specific primers. PCR products were cloned and sent for sequencing. Result shows that both homo lactic acid and hetero lactic acid producing bacteria may be present in the MSW leachate.

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Detection of Cyclospora, Microsporidia and Cryptosporidium by direct microscopy and PCR in stools specimens in northwest Iran

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This study directs to Cyclospora, Microsporidia and Cryptosporidium three parasitic protozoa may be spread in food or water, even if are not considered as huge a risk to food production, owing to the fact that in cold and humid conditions, they may stay alive for months, control of them is important and following of consumption of contaminated drinking water or foods that have not received heat treatment, some outbreaks may appear. In this study we assessed the frequency of the two parasites in fecal samples submitted to the Central Parasitology laboratory of Tabriz, Iran. From 2009 to 2010, 1825 fecal samples submitted to the Central Parasitology laboratory of Tabriz were assessed by conventional methods of Light microscopy, Formalin-ether concentration technique, staining technique and PCR method. The frequency of Cryptosporidium was 0. 0%, 15%, 3% and 2% and Microsporidia were 0.0%, 3%, 1% and 0% by methods of microscopy, formalin-ether concentration, staining and PCR, respectively. Cyclospora was not found in all the stool samples examined. The frequencies of these three protozoa in our study were less than our expectations. Lack of infection with Cyclospora can be good news for local health care providers. More investigations especially in at risk populations is needed for health policy making.

Keywords: Cryptosporidium; Cyclospora; Microsporidia, Iran.

Biography

Shahrokh Izadi is a Lecturer in Department of Medical Parasitology and Mycology, School of Public Health, Tehran University of Medical Sciences, Iran. He was graduated in Public Health Health in BSc and also postgraduate in Medical Parasitology. He has 12 published articles in different international journals and also 8 published in different congress around the world.

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Possible cure of Type-1 Diabetes through stem cell induced islet cell transplantation

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Diabetes is a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects of insulin secretion, insulin action or both. Present drug regime for diabetes only deal with controlling, managing, screening and monitoring the concentration of glucose in urine/blood and to check the further complications like macro-vascular, micro-vascular diseases, Neuropathy Infections and Anxiety disorders.

Recently a new islet cell transplant technique has shown promise in people with Type-1 Diabetes. The transplants have resulted in several patients becoming insulin free for up to 14 months after treatment. Clinical trials are now underway at various premier diabetes centers to investigate if the insulin reversal can be successful with more patients. The investigators have found that it improves glucose control, elimination of comas, hypoglycemic reactions & metabolic labiality. It also normalize HbA1C (Glycated hemoglobin, marker for average blood glucose level) which is impossible with intensive insulin therapy.

But this transplant technique have draw backs like, insufficient availability of donors, long post-operative stay in the hospital, continuous supply of anti-rejection medication , nasty side-effects of the medicine, including nausea, vomiting, fatigue, acne, diarrhea and some that are more serious, like forms of cancer besides low success rate of transplant.

Almost all above problems can be avoided if β cells of Langerhans raised invitro from adult stem cells of same patient may be used for transplant.

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Bienzymatic bioprocess for the conversion of 2-hydroxyisobutyronitrile into 2-hydroxyisobutyric acid

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Alcaligenes sp. MTCC 10674 was isolated as 2-hydroxyisobutyronitrile hydrolyzing bacterium from soil of orchid gardens of Himachal Pradesh. Acetone cyanohydrin hydrolyzing activity of this organism comprised of nitrile hydratase and amidase activities. The media components and culture parameter for production of acetone cyanohydrin hydrolyzing enzyme activity by this bacterial isolate were optimized using response surface methodology and inducer mediation approach was also used to enhance the acetone cyanohydrin hydrolyzing activity. Isobutyronitrile (40 mM) acted as a carbon source as well as inducer for growth of Alcaligenes sp. MTCC 10674 and expression of acetone cyanohydrin hydrolyzing activity. Optimization of culture condition using response surface methodology increased acetone cyanohydrin hydrolyzing activity by 1.3 fold, while inducer mediation approach increased the activity by 1.2 fold. The half life of this enzyme was 25 h at 15°C. V_{max} and K_m value for acetone cyanohydrin hydrolyzing enzyme was 0.71 µmole $mg^{-1}min^{-1}$ and 14.3 mM, when acetone cyanohydrin was used as substrate. Acetone cyanohydrin hydrolyzing enzyme encountered product inhibition and IC50 and K_i value were calculated to be 28 mM and 10.2 mM respectively, when product α-hydroxyisobutyric acid was added in the reaction. Under optimized reaction condition 0.33 M acetone cyanohydrin was fully converted by 3 $mgdcwml^{-}$ resting cell in 6 h 40 min at 40 ml fed batch scale with 25.6 $mgml^{-}$ α-hydroxyisobutyric acid accumulation. The characterization of acetone cyanohydrins hydrolyzing activity revealed that it comprises of bienzymatic nitrile hydrolyzing system i.e. nitrile hydratase and amidase for the production of α-hydroxyisobutyric acid from acetone cyanohydrin and maximum 70% yield is being reported for the first time.

Biography

Shashi Kant Bhatia has completed his M.Sc in Biotechnology in 2007 and persuing Ph.D in Biotechnology from Dept. of Biotechnology, Himachal Pradesh University. He is working on nitrile hydrolyzing enzymes of Alcaligenes sp. for the synthesis of hydroxy acid from their corresponding hydroxynitriles.

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Preparation of curd (dahi) in the presence of different prebiotic sources and study of their effect on physiochemical and microbiological properties of the curd

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Probiotics and Prebiotics have been demonstrated to positively modulate the intestinal microflora and could promote host health. Prebiotics, alone or in combination, along with probiotics can lead to an increase in the activity as well as number of the Lactobacillus sps in the curd, thus improving it quality. The aim of this study was to determine the effect of different easily available prebiotic sources on the physiochemical, sensory and microbiological properties of curd. Four different kinds of Prebiotic sources were used. The chemical properties were indicated in terms of pH and acidity and the microbiological properties were indicated by the growth of Lactobacillus spp. in the MRS media. All the prebiotic materials were shown to enhance the growth of Lactobacillus spp. The organoleptic and chemical property of the curd containing prebiotics was also compared to the normal curd.

Biography

Shreya Mehrotra is pursuing her career in biotechnology; aim with respect to research is to make significant contribution towards improving quality and productivity, through qualitative research in Bioengineering, in food and food processing technology.

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Expression, purification & interaction of mitochondrial tryparedoxin and tryparedoxin peroxidase from Leishmania donovani

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The peroxide metabolism of trypanosomatids is an appealing source of drug candidates, since it depends exclusively on Trypanothione [$T(SH)_2$,N^1,N^8-bis(glutathione) spermidine], a low molecular mass dithiol absent in mammals. In the parasites, many vital functions are either directly fulfilled by trypanothione or catalysed by trypanothione dependent enzymes. An important mediator for the trypanothione fuelled redox reaction is the mitochondrial tryparedoxin peroxidase (mTXNPx) plays major role in biological function to regulate oxidative stress. We have cloned mTXNPx & mTXN genes of Ag83 strain of Leishmania donovani in pET28a and pGEX-4T-1 expression vectors for expression of recombinant fusion proteins. The protein expression was standardized by titration of temperature and IPTG to achieve higher expression in soluble form. We have found that about 50-70% proteins were expressed in the soluble form at lower IPTG concentration & temperature. The recombinant fusion proteins were purified by Ni-NTA and GSH-Agrose affinity column chromatography upto homogeneity. The purified proteins were about 25 kDa and 17 kDa. The expression is good so we got about 10mg/Litre purified proteins. We checked protein-protein interaction between mTXNPx and mTXN through in vitro approach using different tag. Our result demonstrated that mTXNPx & mTXN interact to each other and make stable complex during electron transfer confirmed by co purification and followed western blot analysis. Thus, the reduced tryparedoxin (TXN) interacts with TXNPx and passes on a reducing equivalent to tryparedoxin peroxidase, allowing it to catalyze the reduction of hydrogen peroxide and organic hydro peroxides to water or alcohol, respectively. We have immunized the rabbit and generated polyclonal antibodies. The future work for cellular localization and in vivo interaction is in progress.

Biography

Shashi Shekhar Suman is a CSIR-JRF at Department of Biochemistry and registered with Dr. Vahab Ali under Calcutta University. Mr.Suman has been awarded CSIR-NET fellowship and working on "Thiol metabolism in leishmaniasis", an ICMR supported project.

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Synthesis and phytotoxicity evaluation of biologically and chemically synthesized silver nanoparticles

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Silver nanoparticles (AgNPs) were biologically synthesized using Rhizophora apiculata leaves and chemically synthesized by modified Creighton's method. The absorption maxima of silver nanoparticles were characterized by UV–Visible spectrophotometer. The X-ray diffraction (XRD) analysis confirmed the characteristic facets (111, 200, 220, 222 and 311 planes) of silver nanoparticles. The hydrodynamic sizes of biologically and chemically synthesized nanoparticles measured by the particle size analyzer were found to be 67.10±0.63 nm and 64.23±0.83 nm. The phytotoxicity assessments of biologically and chemically synthesized nanoparticles (NPs) were carried out in two seed systems of higher plants - Radish (Raphanus sativus) and Tomato (Solanum lycopersicum). Seed germination tests were conducted at different silver nanoparticle concentrations - 5 mg/L, 10 mg/L, 15 mg/L and 20 mg/L. The results showed that the biologically synthesized nanoparticles exhibited meager effect on root elongation and seed germination compared to the chemically produced NPs. The plausible reason for lower toxicity could be due to the coating of the phytochemicals on the surface of the nanoparticles, as confirmed by FTIR, which would have resulted in the modulating toxic effects. The study throws light on the ecofriendly process for synthesis of nanoparticles from the biological source. Thus, biological processes have more benefits over chemical processes, having lower impact on the ecosystem.

Keywords: Silver nanoparticles, Rhizophoro apiculata, chemical synthesis, germination test, FTIR.

Biography

Sindhu Priya Dhas has completed her M.Sc from VIT University. Currently she is pursuing her PhD in Nanobiotechnology in VIT University. Her studies are focused on the synthesis of functionalized nanoparticles and green nanoscience.

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Biosorption of heavy metal by immobilized and dead fungal cells: A comparative assessment

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Heavy metal concentrations in soil treated with industrial wastewater of Gwalior (M.P), India were determined. The analysis of test samples revealed high levels of Cu. An A.lentulus and four bacterial spp. were isolated from sample and were characterized on the basis of morphological, cultural and biochemical characteristics. MICs of Cu (II) for each isolate were determined. All the strains isolated from sample harbored resistance to copper. Heavy metal resistant fungi were isolated from an electroplating industrial effluent samples that uses copper for plating. These isolates were tested to evaluate their applicability for heavy metal removal from industrial wastewaters. Initially the physico- chemical parameters of the sample were analyzed. The optimum condition of pH, biomass concentration and heavy metal concentration were determine for microbial growth on biosorbents and correlated with heavy metal removal. The observed condition was applied for the biosorption process in immobilized and dead fungal cells. The biosorption of immobilized cells of A. lentulus was 89% of Cu whereas the dead cells of A. lentulus were 74%. Experimental results reveal that all the immobilized isolates have potential application for the removal of Cu2+ from industrial wastewater than the dead fungal cells. On to the surfaces of immobilized biomass were performed static and dynamic adsorption studies of Cu2+ ions at fixed pH and ionic strength of the aqueous metal ion solutions. The adsorption data were applied to Langmuir and Freundlich isotherm equations and various static parameters were calculated. The dynamic nature of adsorption was quantified in terms of several kinetic constants such as rate constants for adsorption.

Keywords: Heavy metal, fungal sorption, optimization, dead fungal cells, immobilization.

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Immobilization of biomolecules from aqueous solution by carbon micro and carbon nanofiber

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Immobilization of biomolecules on carbon support has many applications, for example, in the development of biocatalyst and biosensor, and wastewater treatment. In this study, the phenolic resin precursor based carbon activated fibers (ACFs) and carbon nanofibers (CNFs) were used for the immobilization of a number of biomolecules such as glucose oxidase (GOx), bovine serum albumin (BSA), and YQEH, a laboratory synthesized protein. These biomolecules used for the adsorption study had different structures, isoelectric points (IP) and number of amino acids. CNFs were prepared by impregnating ACFs with nickel nitrate using anionic SDS surfactant to achieve the mono dispersion of Ni ions in solutions followed by calcinations, reduction and catalytic chemical vapor deposition (CVD) using benzene (C_6H_6) as a carbon-source. The metal particles on the tip of CNFs were removed by ultra-sonication in acidic medium to open up the tips and provide increased number of sites for adsorption. The prepared materials were directly used as adsorbents for biomolecules, with no further post-treatment required. The prepared ACFs and CNFs were characterized by several analytical techniques such as atomic absorption spectroscopy (AAS), scanning electron microscopy (SEM), transmission electron microscopy (TEM), Fourier transform infrared (FTIR), BET surface area and pores-size distribution (PSD) analyzers. The adsorption capacities of the prepared materials in this study were found to be 32 mg/g for GOx, 103 mg/g for BSA, and 38 mg/g for YQEH. These data reveal that the prepared ACFs and CNFs are potential adsorbents for biomolecules.

Keywords: Activated carbon fibers, carbon nanofibers, surfactant, immobilization, adsorption, protein.

Biography

Shiv Singh is pursuing his Ph.D. from Indian Institute of Technology Kanpur in Chemical Engineering. He has published 3 international papers and 3 national papers in reputed journals. He has written one international book related with Environmental science and engineering.

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Identification of therapeutic targets in Leishmania donovani and Leishmania infantum

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The availability of genomic data of human parasites in public databases has made it possible to find drug targets in the pathogen. One such approach is genome subtraction where we try to find genes which are essential to the pathogen but not present in the host. Such gene products can be proved as potential targets in the parasites, with absolutely no host toxicity issues. The leishmaniases are a group of diseases caused by protozoan parasites of the genus Leishmania. The parasite is transmitted by bites from sand-flies infected with the parasite. Leishmaniasis presents in three main clinical forms: cutaneous, mucocutaneous and visceral, which are associated with a broad range of signs, symptoms and degrees of severity. The present study aims at identifying Potential Candidate Drug Targets In Leishmania Donovani and Leishmania Infantum through genome subtraction approach using Pairwise comparison.

Protein sequences belonging to the parasite was derieved from NCBI genome and compared with human proteins. Non-homologous proteins were compared to essential genes present in Database of essential genes. Proteins which passed the screening parameters were considered essential to the parasite. These essential proteins were compared to Protein Data Bank, to obtain significant hits belonging to Leishmania Donovani and Leishmania Infantum. These hits were studied to obtain promising Targets in the parasite. Six potential targets were identified overall, namely topoisomerase, petridine reductase(PTR1) phosphoribosyl transferase, Trypanothione Reductase, OMP decarboxylase and Glyoxalase II.

Biography

Shivanjali Saxena and suhail ahmad khan are pursuing Btech-Bioinformatics from Amity university, lucknow. the project work entitled “Identification of therapeutic targets in Leishmania donovani & Leishmania infantum” is a bonafide work carried out by Shivanjali saxena and suhail ahmad khan, at Institute of Computational Biology, Bangalore, in partial fulfillment for the award of degree of ‘Bachelor of Technology in Bioinformatics’ of AMITY University, Lucknow, during May 2012-June 2012. This work was done under Ms. Tanima shree, the research associate of Institute of computational biology (IOCB).

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Time dependent and spectrophotometric analysis of blood clotting property of marigold leaf extract and comparative study of its antibacterial activity

Shivendu Ranjan, Nandita Dasgupta and Proud Saha
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A time dependent blood clotting analysis was done after separating blood cells from the plasma. It was observed that on increasing the concentration of marigold leaf extract the time taken in formation of blood clot was decreased. Time dependent and spectrophotometric analysis suggests us that for 0.6ml of leaf extract in 1ml of blood gave the best result. The antibacterial effect of marigold leaf extract at room temperature against 3 multidrug bacterial isolates (2 gram negative and 1 gram positive) including Klebsiella pneumoniae, Pseudomonas aerugenosa and Staphylococcus aureus were studied by well diffusion method. The maximum and minimum antibacterial effect of marigold leaf extract among those micro-organisms was obtained on Klebsiella pneumoniae and on Staphylococcus aureus respectively. These results suggest that marigold leaf extract can be used as natural antiseptic blood clotting agent and thus the use of other chemical clotting agents can be minimized which would be beneficial for environment and consumer health; or a better ointment can be prepared for wound healing purpose after testing it on animals for its efficiency.

Biography

Shivendu Ranjan is in B.Tech Biotechnology 3rd year at the age of 21 years from VIT University, Vellore. He was the Student Organizer of VIT Biosummit’12, a meet between industrialists and academia. He has published 3 papers in reputed journals. He was also student coordinator in many college tech and cultural fests. He has good presentation skills with leadership and team management skills.

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Immobilization of pectinase enzyme on ionic pullulan gel

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Immobilization of enzymes has attracted a great deal of attention because of its ability to make high-cost enzymes reusable and stable. The biomaterial Pullulan is a natural water-soluble exo-polysaccharide and a slow digesting macromolecule. It is declared as a low calorie food additive providing bulk and texture, produced from starch by fermentation. It is basically used as a glazing agent, a film-forming agent, a thickener or as a carrier in the production of capsules for dietary supplements as a substitute for gelatin, coatings for coated tablets containing dietary supplements, for production of edible flavoured films used as breath fresheners and in the production of jams, jellies, confectionery and some meat and fruit products. In our study we screened Aureobasidium pullulans, a Pullulan producing microorganism from leaves of mango (Mangifera indica), Asoka (saraca indica),Ficus sp.,Hibiscus, Nerium sp.,Tamarindus indica leaves from a village named Iruvaram in chittoor district . The produced pullulan was reacted to a bifunctional compound capable of forming ether linkages to give a three-dimensional reticulated hydrophilic gel for the entrapment of the Pectinase enzyme which is highly needed for applications in fruit, textile and paper industries and also in waste water treatment. This enzyme (Pectinase) was immobilized on diethyl amino ethylated pullulan gel by the ionic adsorption method. The amount of enzyme immobilized was estimated by the measurement of the ultraviolet absorption intensity at 280 nm.

Biography

Shrestha Sinha Ray is receiving her B.Tech degree in Biotechnology from VIT University and is presently in her final year. Under the guidance of Dr Suneetha Vuppu, she has worked on the "Screening and Identification of Degradable products by Pectin-Lyse producing Actinomycetes from Katpadi and Chittoor Fruit Industrial waste enriched Soil Samples" which is in press in the Asian Journal of Biotechnology, Microbiology and Environmental Sciences (AJBMES).

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Extractive spectrophotmetric methods for the determination of tamsulosin

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Sophisticated analytical methods viz. spectrophotometric methods (A and B) which being employed for analysis, are relatively expensive and hence need for simple analytical methods arises. In the proposed research work, such methods have been developed and applied for routine determination of Tamsulosin in pharmaceutical formulations and bulk dosage forms. These methods were based on the formation of colored species on binding of Thymol blue with Tamsulosin in the presence of Chloroform for method A and formation of a colored chromogen on binding of Erichrome black-T with Tamsulosin in the presence of Chloroform for method B, and the colored chromogen obtained in each method was finally treated with the Drug Tamsulosin hydrochloride to produce yellow colored for method A and purple colored chromogen for method B with λmax at 400nm and 520nm respectively. Statistical analysis of these methods exhibited Sandall's Sensitivity of 0.028 and 0.032(Method A and B) respectively, and the relative standard deviation (RSD) of these methods were found equal to 1.82 and 1.95 respectively, indicating that these methods are highly reproducible, based on the principle of absorption visible spectrophotometry for the determination of Tamsulosin hydrochloride in formulations and bulk dosage forms.

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Analysis of promoter sequences from next generation transcriptome sequencing data of wheat near isogenic lines challenged with leafrust pathogen

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Promoters are non-coding regions in genomic that contain information crucial to the activation or repression of downstream genes. They are located upstream of the transcription start site (TSS) of a gene. The promoter region consists of certain short conserved DNA sequences known as cis-elements or motifs. The promoters are recognized by RNA polymerase, which then initiates transcription of the relevant gene under its control. Promoters control the expression of genes in response to one or more transcription factors. Prediction of promoters is of utmost importance in order to understand the regulation and expression patterns of genes, where confidence and accurate estimation is of fundamental requirement. With increasing numbers of plant genome sequences becoming available, it has become important to develop robust computational methods for detecting plant promoters. In the present study, four transcriptomes were sequenced using the Next Generation Sequencing technique SOLiD (Sequencing by Oligonucleotide Ligation and Detection). The CLC Genomics Workbench was used to assemble and analyze the transcriptomes. Preliminary examination of the sequences using softwares available at the website of SoftBerry revealed several promoters/ regulatory sequences. Softwares like TSSP-TCM, PlantProm DB, plant promoter database (ppdb) and GLAM2 were used to confirm promoters/ regulatory sequences/ motifs. The studies were focused on analysis of the promoters and check the expression levels of different promoters under different conditions of pathogenesis. We could obtain approximately 600 promoters and analysis of the expression profile revealed expression to be as high as 9133 times in infected conditions as compared to mock inoculated plants.

Biography

Sneha has completed her MSc in Bioinformatics in 2012 and Dharmendra Singh has submitted his Thesis for PhD in 2011 in the Department of Biotechnology, BIT Mesra, Ranchi. Dr Kunal Mukhopadhyay is a professor in the Department of Biotechnology, BIT Mesra, Ranchi since 2003 and specializes in plant molecular biology. The major focus of the research group is molecular biological studies of biotic stresses, particularly leafrust disease in wheat.

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Isolation of thermophile producing helicase for nucleic acid- based detection for fast diagnosis

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Helicase-producing thermophilic microorganisms were successfully isolated from hot springs in the from Ulu Legong Hot spring, Kedah, Malaysia and were identified up to genus level. The light and scanning microscopy technique were used to identify the morphology of the isolate. Chromosomal DNA from the organism was isolated and used to amplify 16S rRNA and UvrD gene fragments. The gene was amplified by a set of universal primers (F_UNI16S and R_UNI16S). The phylogenetic tree, homological analysis, and detailed comparison of the sequences showed that 16SrRNA gene sequence of the isolate had closest similarities with Anoxybacillus sp. Isolates gave PCR fragments of 2149bp which represent the UvrD gene and 1500bp which represent the 16S rRNA respectively of Anoxybacillus. Thermophile producing helicase (UvrD) was successfully isolated for Nucleic Acid- Based Detection for Fast Diagnosis.

Biography

Sreenivasan Sasidharan has completed PhD in Biotechnology from University Science, Malaysia. He is the lecturer in USM. He has published more than 100 papers in reputed journals .This project funded by Universiti Sains Malaysia research grant RUC (1001/ PSKBP/86300110).

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Removal of Cr (VI) ions from aqueous solutions by cauliflower stalks and maize leaves powder

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In this study, simple, nontoxic, eco-friendly and inexpensive adsorbents were investigated, namely cauliflower stalks and maize leaves powder for removal of Cr (VI) from aqueous solutions. Adsorption of Cr (VI) was studied with respect to pH, temperature, biomass, agitation speed, contact time and initial concentration of chromium (VI) ions. Maximum biosorption was observed at pH 2.0 and at a temperature of 37^0C. Increase in biomass was resulted in a decreased metal uptake. With an agitation speed of 130 rpm, equilibrium was attained within 2 h. Under optimum conditions, biosorption was enhanced with increasing concentrations of Cr (VI) ions. Maize leaves and cauliflower stalk powder displayed a specific uptake of Cr (VI) ions of 48.12 ± 1.2 mgg^{-1} and 43.05 ± 0.22 mgg^{-1} at 955 ppm, respectively at a concentration of 1000 ppm respectively. The adsorption data obtained also fitted well to the Freundlich isotherm. Kinetics data was also studied by using both adsorbents and data was followed by Pseudo-second order.

Biography

Soumitra Marathe is pursuing the Integrated M.Sc. Biotechnology course at the Institute of Bioinformatics and Biotechnology, University of Pune, Maharashtra, India.

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Isolation of oral bacterial flora from a Colubrid snake Lycodon aulicus (Colubridae) and their susceptibility to antibiotics

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In recent time we have witnessed the hazardous effect of snakebites on human body. Studies have observed that it is not only venom that is affecting a human body but also many other deadly microorganisms like bacteria have dangerous effect on human body which is present in the buccal cavity of snakes.

In this light the present study aims to isolate and identify the bacteria present in the oral cavity of snakes and to test their susceptibility towards antibiotics.

Two male species of Lycodon aulicus was collected from Bhubaneswar, Orissa, India. Nine strains were isolated by using swabs in six different growth media i.e. Centrimide, EMB, TCBS, XLD, Urea agar and Nutrient Agar. After 48 hrs of incubation in 37^0 C, each type of micro organisms were isolated and subjected to different biochemical tests. Mainly two strains were identified and others are still under experiments. Then these strains are named as per the snake's numbers i.e. 54 and 55.

These two strains showed better growth on TCBS medium, so named as 54T1 and 55T1. As they gave better result on TCBS , they are identified as Vibrio. Then these are subjected to further tests i.e. Morphological study and Biochemical test. On the basis of these tests the two strains 54T1 and 55T1 are identified as V.cholorae and V. parahaemolyticus respectively.

In our study, the antibiogram showed that both the isolates were sensitive to commonly tested antibiotics such as Gentamicin, Gatifloxacin, and ciprofloxacin. However strain 54T1 was resistant to most commonly used antibiotics vis. Ciprofloxacin, Vancomycin, Cephalexin, Cloxacillin and Tetracycline.

Keywords: Lycodon aulicus, antibiotics susceptibility.

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Determination of heavy metal stress on bacterial diversity

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In the present study total thirty heavy metal resistant bacteria were isolated from sewage of industrial effluents, garages and petrol pumps of Cachar district of Assam, India, against copper, zinc, and lead. Samples were streaked on selective media's and incubated at 37^{0}C for 24 hrs for recovery of potent isolates. The isolated and distinct colonies were sub-cultured and obtain in the form of pure culture and identified on the basis of their morphology and biochemical characters. There were decreases in total count and microbial population diversity with increasing metal concentrations and the predominant isolates obtained were Pseudomonas sp., Klebsellia sp. and Bacillus sp. Some isolates exhibited high resistance to heavy metals with minimum inhibitory concentration (MIC) for heavy metals as 50µg/ml (for copper), 180 µg/ml (for lead) and 1500µg/ml (for zinc). They also showed multiple heavy metal tolerance and were multi antibiotic resistant.

Biography

Soumitra Nath is a Research Scholar from Bioinformatics Centre, Gurucharan College Silchar under DBT funded project and registered for his Ph.D in Department of Microbiology, Assam University, Silchar (AUS). He has completed his Master degree from Department of Biotechnology, AUS and PG Diploma in Bioinformatics from Department of Life Science, AUS. He has also been appointed as Lecturer in Department of Biotechnology and Bioinformatics Centre of Gurucharan College, Silchar. His research aim is to find an efficient soil-bacteria for better crop production in heavy metal contaminated crop field.

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Formulation and quality evaluation of hot beverage nutritive soya fee as a substitute of coffee

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The soya bean (Glycine max L. Merrill) has been called the "miracle crop" because of its vast array of uses. They are rich in protein and contain beneficial phytochemicals such as iso- flavones, which may help fight chronic diseases. Coffee contains caffeine which can, in due course of the time, increase risk of heart diseases, insomnia or disrupted sleep, infertility problems, high blood pressure, miscarriage, panic, anxiety and overall stress and a horde of other diseases. Hence, hot beverage nutritive soya fee was prepared. Soaked, split and dried soya beans were roasted at two temperatures 170^{0}C (T_1) and 160^{0}C (T_2) for 8 minutes up to dark brown and medium brown colours which were then coarsely ground and used to make a beverage that tastes quite similar to coffee with the addition of cardamom and ginger powder in the milk. Samples were evaluated at the intervals of 15, 30, 45 and 60 days for sensory and chemical analysis. It was found that moisture content was slightly increased; fat and protein content were slightly decreased during storage whereas no significant difference in ash content of samples T_1 and T_2 was noticed during the storage. On the basis of overall sensory attributes, colour of sample T_1 has better appearance as compared to T_2. Flavour, Aroma, Taste, After Taste and Overall Acceptability of sample T_1 has got higher score than sample T_2 because of the dark brown colour of the powder. Its score slightly decreased during storage. After chemical analysis, it was found that sample T_2 had high percentage of protein and other nutrients. The shelf life of product was stable up to 60 days during storage period.

Keywords: Soya bean, Hot Beverage Nutritive Soya fee, Coffee, Protein, Roasting, Powder.

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Pharmacophore based virtual screening and building of 3D-QSAR in the discovery of new cathepsin K inhibitors

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For the therapeutic optimization of various cancers such as breast cancer, prostate cancer, thyroid carcinoma, lung adenocarcinoma targeting the predominant papain-like cysteine protease Cathepsin K is found to be dominant strategy. In current study, designing of Cathepsin K inhibitors through pharmacophore and virtual screening methodology displayed promising number of scaffolds. A five point pharmacophore with two hydrogen bond acceptors (A), one hydrogen bond donor (D), one hydrophobic feature (H) and one ring feature (R) as pharmacophoric features were developed to understand active scaffolds with specific functional groups. Validation of the pharmacophore hypothesis was carried out with enrichment statistical calculation. The best pharmacophore model has shown best fitness against 100 active molecules with PIC_{50} values greater than 8 among 254 active molecules. Further, it yielded a statistically significant 3D-QSAR model with a correlation coefficient of R^2 = 0.901 for training set compounds and with test set correlation coefficient of Q^2 = 0.823, the generated model showed excellent contour map predictions. The model was then employed as 3D search query to screen against private and public compound libraries (BITS, Asinex database) followed by virtual screening which resulted in 322 molecule hits. Inhibitors having above 50 percent oral bioavailability predicted through Qikprop were chosen for biological activity assays. Molecules which have shown enzyme inhibition at nano-molar concentration were considered as potential selective non-covalent inhibitors for Cathepsin K.

Biography

Sridevi Kondepudi is pursuing her B.Pharmacy (Hons.) from BITS-Pilani, Hyderabad campus. Currently she is working on a lab oriented project in Computer-aided drug discovery lab at BITS Hyderabad. She has been placed as Trainee in Mylan laboratories Ltd.

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Immobilization of Glycine max amylase onto activated woven Bomybx mori silk fabric

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Silk fibers in the form of woven fabric were used as a novel and inexpensive carrier for the immobilization. Fibrous silk has a large surface area, high mechanical strength and good compatibility which are advantageous to the use as a support for the enzyme immobilization. Silk biomaterials are biocompatible and can be chemically modified through amino acid side chains to alter surface properties for immobilizing the cellular growth factors. Woven Bombyx mori silk fabric have excellent properties in diffusivity of substrates, mechanical strength, and handling. The amino group enrichment of Bombyx mori silk fabric was made by the treatment of chlorinated silk fabric with 2-aminoethanethiol (AET) and poly(ethylenimine) (PEI). Although the method of immobilization of alkaline phospatase onto Bombyx mori silk fibroin are available such as immobilized was by covalent bond formation by diazo and cyanogen bromide onto partially hydrolyzed silk fabrics by using diazo, adsorption, glutaraledyde and azide methods. As well as the other enzymes such as glucose oxidase (GOD) was immobilized on the nonwoven fabrics with Bombyx mori silk fibroin gel, viscose rayon, poly-ethyleneterephthalate, 6-nylon, and polypropylene with activated surface by fluoline treatment. However, all these methods were expensive methods as it required tedious techniques for activation of silk fabric and required costly equipments as well as commercial enzyme. But, in this work, we describe the immobilization of amylase which is extracted from Glycine Max (soybeans) onto aminated-chlorinated woven Bombyx mori silk fabric through covalent coupling with glutraraldehyde method which was given by Avrameas, 1969. As well as kinetic properties of immobilized enzymes were studied. In the present report, we described the covalent coupling of glycine max amylase onto aminated/ chlorinated woven Bombyx Mori silk fabric and this coupling suppresses the thermal denaturation of bound enzyme as well as bound enzyme becomes more resistant to fungal and bacterial attack. The enzyme immobilized onto activated woven Bombyx mori silk fabric was showed fairly good storage stability of 2 months. The kinetic properties are compared with that of free enzymes.

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Complete screening of the Moringa oleifera leaf for different therapeutic applications

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Moringa oleifera, commonly known as Drum stick tree, is a pan-tropical species widely cultivated all over India - also known by different regional names as Sajna, Saijhan, Horse radish tree, Marango, Mlonge, and Mulangay. Many reports have been published previously about the nutritional and medicinal properties of Moringa. Evenits utility as a non-food product has been extensively described (e.g. lumber, charcoal, fencing, water clarification, lubricating oil).The objective of the present study is the screening of different therapeutic properties of the Moringa leaves. As part of this exercise, the whole extract was tested for the effect on high creatinine level in the blood serum of human body. The high creatinine level in the blood is generally harmful for the kidney. A colorimetric detection process was used for the determination of creatinine level in serum, and it was discovered that the leaf extract does have an effect on reducing high creatinine levels. Further the whole extract is being purified for specifying which component protein would be the key player for the other reported therapeutic uses of Moringa leaf, viz., anticancer and anticoagulant activities, apart from the creatinine control.

Keywords: Creatinine, Anticancer, Leaf extract.

Biography

Subhasish has completed his B.Pharm at the age of 22 years from Biju Patnaik University of Technology, Odisha and now he is doing his M.E (Biotechnology) in BITS Pilani K K Birla Goa Campus. He has published 4 papers in International journals.He has participated in several National and State level conferences.

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Identified target in Leishmania infantum

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The availability of genomic data of human parasites in public databases has made it possible to find drug targets in the pathogen. One such approach is genome subtraction where we try to find genes which are essential to the pathogen but not present in the host. Such gene products can be proved as potential targets in the parasites, with absolutely no host toxicity issues. The Leishmaniases are a group of diseases caused by protozoan parasites of the genus Leishmania. The parasite is transmitted by bites from sand-flies infected with the parasite. Leishmaniasis presents in three main clinical forms: cutaneous, mucocutaneous and visceral, which are associated with a broad range of signs, symptoms and degrees of severity. The present study aims at identifying Potential Candidate Drug Targets in Leishmania Infantum through genome subtraction approach using Pairwise comparison.

Protein sequences belonging to the parasite was derived from NCBI genome and compared with human proteins. Non-homologous proteins were compared to essential genes present in Database of essential genes. Proteins which passed the screening parameters were considered essential to the parasite. These essential proteins were compared to Protein Data Bank, to obtain significant hits belonging to Leishmania Infantum. These hits were studied to obtain promising Targets in the parasite. Three potential targets were identified, namely Trypanothione Reductase, OMP decarboxylase and Glyoxalase II.

Biography

Suhail Ahmad Khan is pursuing Btech-Bioinformatics from Amity university, lucknow. The project work entitled “Identification of therapeutic targets in Leishmania infantum” is a bonafide work carried out by Suhail Ahmad Khan, at Institute of Computational Biology (IOCB), Bangalore, in partial fulfillment for the award of degree of ‘Bachelor of Technology in Bioinformatics’ of AMITY University, Lucknow, during May 2012-June 2012. This work was done under Ms. Tanima shree, the research associate of Institute of computational biology (IOCB).

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Activated sludge process for the treatment of sugar industry effluent

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The effluent, which is coming out from the sugar industry, is not fit for irrigation purposes or other usages. Untreated effluent cause severe pollution problems on land, plants, rivers and aqua creatures. The effects are extended to human beings through his feed containing the polluted food plants and animals. There are various origins of the sugar effluent like Mill house waste, Boiler house waste, Waste along with floor washings and Filter cloth wastes. This wastewater having severe pollution loads should be treated properly until they are free from pollutants. There are various methods available for the treatment of sugar effluent. Among them activated sludge process has a high pollutant removal efficiency and is suitable for normal atmospheric conditions. In this work an attempt was made to find out reason for frequent disturbance of microorganisms, which is present in the aerator tank and the various characteristics of wastewater like P^H, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Mixed Liquid Suspended Solids (MLSS), Sludge Volume Index (SVI), F/M ratio were determined before and after the treatment and reported. The various microbes present in the sludge were also identified and it was found that nearly 84.39 kg/day of urea and 60.38 kg/day of Diammonium Phosphate (DAP) were required to treat 800 m3 of effluent from the sugar industry using the activated sludge process.

Biography

Sujitha has completed his B.Tech-Biotechnology at St. Michael College of Engineering & Technology, Kalayarkoil and doing her M.Tech-Biotechnology in the same Institution. Prior to her M.Tech as well as now, she is working as Assistant Professor in the department of Biotechnology. She is also an active researcher doing many research works under the guidance of Dr. K. Jegatheesan. She has published a paper in a reputed national journal. She has also organized and attended various National level Symposiums, Seminars and workshops.

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Antimycotic activity of polyphenols against Candida albicans biofilm

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The increase in Candida albicans biofilm infections in last decades has paralleled with the increased use of a broad range of medically implanted devices in patients with impaired host defences. These biofilm- implant associated infections are inherently difficult to resolve and may require both long-term antifungal therapy and the physical removal of the implant to control the infection. The aim of this investigation was to identify active compounds which could negate the necessity of the biofilm formation on these implanted devices. In recent years, the interest in polyphenols from plant extracts has been rejuvenated for their anti-inflammatory, anti-oxidant and antimicrobial property has come into renown. The minimum inhibitory concentration (MIC) assayed by the CLSI M27-A3 broth micro-dilution method showed antifungal activity at a concentration of 1.2 mg mL^{-1} for quercetin and curcumin, 8.0 mg mL^{-1} for gallic acid on C. albicans MTCC 227 with ketaconazole as positive control. The effect of polyphenols on metabolic activity of preformed C. albicans biofilm cells was established using 2,3-bis(2-methoxy-4-nitro-5-sulfophenyl)-2H-tetrazolium-5-carboxanilide (XTT)/Menadione in 96-well polystyrene micro plate. Curcumin (10 mg mL^{-1}) and gallic acid (10 mg mL^{-1}) inhibition was recorded to be >75%, whereas quercetin (2.5 mg mL^{-1}) resulted in >90% inhibition against C. albicans biofilm. Further microscopic visualization of polyphenolic treated C. albicans biofilm under scanning electron microscopy (SEM) showed radical reduction in the dense network of yeast, hyphae and pseudohyphae forms. These broad-based initiatives would be helpful to combat the C. albicans biofilm formation and supplement the current therapies related to biofilm infections.

Biography

Suma C. Pemmaraju is currently pursuing her PhD in Department of Biotechnology from Indian Institute of Technology Roorkee, India under the joint supervision of Dr. Vikas Pruthi and Dr. R Prasad. She is working in the field of Molecular Microbiology (Fungal Biofilms). She is a University top rank holder and awarded with the INSPIRE Fellowship, funded by Department of Science and Technology. She has two publications in referred journals and three international conferences.

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Production and purification of phytase by solid state fermentation from Rhizopus oligosporus MTCC 556 using agricultural wastes

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Phytic acid (myo-inositol 1,6 hexakisphosphate) is the major storage form of phosphorus in plants. It cannot be metabolized in monogastric animals since phytic acid acts as an anti-nutritional agent by chelating several metal ions and insoluble form of protein complex. This consequence resulted in mineral deficiencies and phosphorus pollution. One of the finest ways to utilize the phosphorus from phytate is the use of phytase enzyme. In this study, Rhizopus oligosporus MTCC 556 was used to produce phytase by solid state fermentation (SSF) using six different agricultural residues as substrates. A maximal enzyme production of 15.8 U/gds was observed with wheat bran as substrate. Three-step purification was employed with ammonium sulfate precipitation, ion exchange and gel filtration chromatography which resulted in 14.6-fold purified phytase. The molecular weight was estimated to be 88Kda by sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE). The optimum pH and temperature for phytase activity was found to be 5.5 and 55°C respectively. The effect of different metal ions was examined which showed that Mg^{2+} and Zn^{2+} ions enhanced the phytase production significantly. This study would be useful for reducing the phosphorus pollution and increasing interest towards efficient utilization of agro industrial wastes for enzyme production.

Biography

Suresh S is pursuing his PhD in the department of chemical engineering, Anna University, Chennai. He has completed M.Sc (Biochemistry) during 2007-09 at SRM Arts and Science College, Chennai and also having a teaching experience for one year at Dr. MGR.Chockalingam Arts College, Arni, Thiruvanamalai District, Tamilnadu.

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Production and characterization of monoclonal antibodies against nucleoprotein of avian influenza

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The present study was carried out with the overall objective of developing anti-NP mAbs which can be used in immunochromatographic test based assay and competitive ELISA (C-ELISA) for the rapid detection of avian influenza virus (AIV) antigen and antibodies, (Abs) respectively. The recombinant NP antigen (rNP Ag) was expressed in E. coli BL 21 strain as approx 57^{+} kDa protein mainly as soluble fraction. Immunoblotting with anti-His HRPO conjugate revealed strong reactivity with the recombinant protein confirming the expression of 6X his-tagged protein in E. coli BL21 strain. The recombinant NP was used to immunize Balb/c mice to produce hybridomas secreting anti-NP mAbs. Seven anti-NP hybridoma clones could be recovered with OD in ELISA ranging from 0.223 to 1.378. After subcloning, total of 9 mAbs were recovered and were further characterized. Out of 9 mAbs, 8D2-H5, 8D2-H9 and 6D11-A7 were of IgM isotype, 5D10-C9 and 5D10-F11 were of IgG2b type while 3F3-D2, 7D2-G7, 7D2-G8 and 7D2-C9 were of IgG1 isotype. The mAbs 3F3 and 7D2 showed high intensity positive reaction with rNP and a low intensity reaction with H5N1 virus in western blot analysis. The anti-NP mAbs produced in the present work may be valuable in developing a Competitive ELISA or Immunochromatographic strip test based assays for the rapid diagnosis of avian influenza.

Biography

Sushant Bhat completed his M.V.Sc in Veterinary Immunology at the age of 25 years from Indian Veterinary Research Institute (deemed university). He completed his research work in High Security Animal Disease Laboratory (OIE reference laboratory for Avian Influenza), Anand Nagar, Bhopal. Presently he is pursuing his PhD in Veterinary Immunology from Indian Veterinary Research Institute, Izatnagar, Bareilly, UP, India.

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Development of a secretory DNA vaccine construct encoding surface layer protein EA1 of Bacillus anthracis

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The quick onset, rapid lethal progression and potential to be used as biological weapon necessitate the development of a highly efficacious well tolerated vaccine against anthrax. But, currently available anthrax vaccines are so far from ideal. DNA vaccines may be attractive approaches since they are safe, stable and can induce both cellular and humoral immunity. Immune response against DNA vaccines can be increased by using secretory antigens. EA1, the major surface layer protein of Bacillus anthracis is abundant in vegetative cell surface and spore preparations. Immunity to EA1 contributes to protection at the early phase of anthrax infection making it a novel vaccine candidate. Keeping these facts, an attempt was made to develop a secretory DNA vaccine encoding EA1 of B. anthracis. For this, eag gene (2502bp) was amplified from genomic DNA of B. anthracis strain 34F2 obtained from Division of Biological Standardization, IVRI, Izatnagar using self designed forward and reverse primers having NheI and BamHI sites respectively. The purified amplicon was cloned into Signal pIg vector to create CD33 signal sequence prior to eag. The positive clones were confirmed by PCR and double RE digestion and sequence analysis. Further, cd33- eag was amplified from recombinant Signal pIg using specific primers having XbaI and NotI restriction site and was subcloned into eukaryotic expression vector, pIRES. The positive clones were confirmed by PCR and double restriction digestion. Further studies are now required to test the immunogenic potential of this DNA vaccine.

Biography

Sumithra T. G. completed her B.V.Sc & A.H in 2008 from College of Veterinary and Animal Sciences, Kerala. She received Junior Research Fellowship from Indian Council of Agricultural Research to pursue post graduation in Veterinary Bacteriology and Mycology at Indian Veterinary Research Institute, Deemed University, Izatnagar. She is presently pursuing her PhD in the same discipline as ICMR-SRF from Indian Veterinary Research Institute, Deemed University, Izatnagar.

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Split application of gypsum on herb and essential oil yields of Ocimum tenuiflorum variety Cim-Ayu, Cymbopogon flexuosus variety Krishna and Cymbopogon martini variety Trisha

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Gypsum is used in the reclamation of sodic soils. Gypsum provides calcium which is needed to flocculate clays in soil. Such flocculation is needed to give favorable soil structure for root growth and air and water movement. A pilot scale experiment was conducted for a period of one month to study the influence of split application of gypsum on the soil, plant and oil characteristics in Ocimum tenuiflorum variety Cim-Ayu, Cymbopogon flexuosus variety Krishna and Cymbopogon martini variety Trisha. In the experiment same quantity of gypsum was applied at four different times to study its influence in reducing soil salinity, influence morphological characteristics, volatile oil quantity and quality. Agronomical and biochemical analysis of Ocimum tenuiflorum variety Cim-Ayu has revealed that the split application of gypsum decreased the soil pH but EC was not influenced compared to application of gypsum at one time. The bicarbonates, chlorides, calcium & magnesium and sulphate contents decreased due to split application of gypsum. The treatments did not influence morphological characteristics. The oil content did not show any significant variations due to split application of gypsum. A slight improvement in the Eugenol content of the oil was noticed due to split application of gypsum. Agronomical and biochemical analysis of Cymbopogon flexuosus variety Krishna have revealed that the split application of gypsum did not influence the soil pH but EC was increased. The bicarbonates content was increased with split application of gypsum where as chlorides, calcium & magnesium and sulphate contents decreased due to split application of gypsum. There is increase in the oil content due to split application of gypsum. A slight improvement in the Citral content of the oil was noticed due to split application of gypsum. Agronomical and biochemical analysis of Cymbopogon martini variety Trisha have revealed that the split application of gypsum has no effect on pH & EC. Bicarbonates, sulphates increased with time, chlorides, calcium & magnesium decreased with split application of gypsum. There is an increase in Gerenoil content in oil.

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Lactic acid bacteria isolated from malaysian domestic non-broiler chicken producing antimicrobial proteins against methicilin-resistance Staphylococcus aureus (MRSA)

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This work reports on the isolation of Lactic acid bacteria (LAB) from non-broiler chicken, other than commonly useed broiler chicken. Lactic acid bacteria (LAB) were isolated from the ceca, intestine, gizzard and bile of Malaysian non-broiler chicken 'ayam kampung'. Following the incubation on MRS agar plates, 56 LAB isolates were collected. Based on agar disk diffusion method, 5 out of 56 isolates; L3, L4, L5, L7 and L7 show inhibition against the indicator bacteria Methylene-resistant Staphylococcus aureus MRSA. All of the five isolates show typical characteristics of Enterococcus family which are Gram positive coccus morphology, non-spore forming, catalase negative, producing acid from glucose and able to grow on 4, 6 and 10% NaCl. Ability to produce inhibitory proteins using agar disk diffusion method were tested using three phase partitioning (TPP) purified fraction employing t-butanol and ammonium sulphate. The purified fraction produced zones of inhibition (approx. 16-18 mm in diameter) on indicator organism Staphylococcus aureus MRSA. The purified fraction contained putative low molecular weight proteins of about 8-10 kDa in size, as determined by SDS-PAGE. These putative proteins are stable upon heat treatments and inactivated by trypsin. The partial rDNA sequences from the 5 isolates showed to be at least 98% similarity with Enterococcus family. Isolates L3, L4, and L5 belonged to the E. faecum. Meanwhile, L7 and L10 belonged to E. faecalis and E. mundtii. These strains were exclusively isolated from non-broiler chicken; and they produce putative inhibitory proteins or bacteriocins against Staphylococcus aureus MRSA are useful as probiotic for chicken.

Biography

Tengku Haziyamin Tengku Abdul Hamid has completed his PhD in 2009 at University Putra Malaysia in the area of enzyme technology. He is currently the Deputy Dean Academic at Faculty of Science, International Islamic University Malaysia Kuantan campus.

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Possible mechanisms of different drugs of abuse with HIV in pathophysiology of NeuroAIDS and its therapeutic approaches

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CNS infection by HIV-1 can result in NeuroAIDS which is a chronic disease with subsequent neurodegeneration that leads to several domains of neurocognitive impairment. NeuroAIDS is becoming a major health problem among AIDS patients and long-term HIV survivors. As per the recent estimates, approximately more than 5 million people have been infected with HIV in India out of which ≥ 50% show signs and symptoms of neuropsychiatric disorders. Exacerbation of these impairments is seen in HIV-1 patients associated drug abuse. Drug abusers with HIV-1 infection have higher viral loads, increased immunosuppression, more severe cognitive impairment, and neuropathological changes. Opioids, cocaine, cannabinoids, methamphetamine, alcohol and other substances of abuse have been implicated as risk factors for HIV infection as they all have potential to compromise host immunity and facilitate viral replication. CNS is protected by blood-brain barrier (BBB) and most of the brain cells are negative for receptors and co-receptors for HIV infections. Neurons have been found to be completely nonpermissive for HIV infection. Practically HIV should not produce any neurotoxicity. But vast prevalence of NeuroAIDS in HIV positive drug abusers has stimulated the minds of researchers to think about the role of psycho-stimulats in combined neurotoxicity and neuropsychiatric complications. In this review, we will discuss the mechanism of various drugs of abuse which are responsible for neuroAIDS. These drugs may synergize with the neurotoxic substances released during HIV infection. Hence future directions can be made for the therapeutic approaches of NeuroAIDS by targetting specific signaling and molecular processes.

Biography

T. J. Patil has completed his M. Pharm (Quality assurance) from Sharad Pawar College of Pharmacy, Nagpur. He is a Lecturer at Ideal College of Pharmacy, Kalyan.

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RAPD polymorphism in Puccinia sorghi Schw. causing common rust of maize

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Maize (Zea mays L.) is one of the most important cereal crops that expand its adaptation from very high north and south latitudes in temperate areas, through subtropical and tropical environments in north and south of the equator. As many as 18 foliar diseases are reported to occur in India, but common rust of maize caused by Puccinia sorghi Schw. is considered to be a major disease. Due to the high virulence of Puccinia sorghi Schw. in maize field populations, genetic variability of this fungus has been accounted as one of the chief causes of disruption in cultivar resistance. Virulence diversity of Puccinia sorghi Schw. in maize has been mainly attributed to parasexual recombination and mutation processes. Morphologically, it is difficult to distinguish between various isolates of Puccinia sorghi Schw. Research work with respect to the molecular variation of this pathogen in India is limited and needs further investigation.

An experiment was conducted at University of Agricultural Sciences, Dharwad, Karnataka to detect molecular variation in Puccinia sorghi Schw. through molecular tool viz., RAPD. In this study, molecular variation in the pathogen shall serve as a guideline for breeding suitable maize varieties against common rust disease which seriously affects maize productivity. Losses in total yield in late-planted sweet corn were 18 per cent, 26 per cent and 49 per cent for cv. Sugarloaf (most resistant), cv. Jubilee (intermediate) and cv. Style Pak (most susceptible), respectively. Out of 10 primers used, 3 primers viz., OPA-19 (11.11 %), OPB-17 (20 %) and OPF-2 (14 %) showed polymorphism. The similarity coefficient values revealed that, the least similarity (81 %) was between Tamil Nadu-Andhra Pradesh, Haryana-Tamil Nadu and Madhya Pradesh-Haveri isolates. The maximum similarity (100 %) was found between Andhra Pradesh-Haryana and Belgaum-Jammu & Kashmir isolates. Bihar isolate formed entirely separate cluster within group A; whereas Tamil Nadu-Maharashtra and Bijapur-Haveri isolates formed separate clusters within group A. In group B, Sikkim, Uttar Pradesh, West Bengal and Bengaluru isolates formed entirely separate clusters respectively.

Keywords: Genetic variability, Maize, Zea mays, Common rust, Puccinia sorghi Schw, RAPD.

Biography

Utpal Dey has received B.Sc. (Agri.) degree from Central Agricultural University, Imphal, Manipur and M.Sc. (Agri.) specialization in Plant Pathology degree from University of Agricultural Sciences, Dharwad, Karnataka. Now he is doing Ph.D. degree from Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra. He has received additional degree in Journalism and Mass Communication (PGDMCJ). He has published four research papers in reputed National and International Journals, 11 popular articles. He has participated in several National and State level conferences.

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Chitosan and its derivatives as promising materials for controlled drug delivery

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Chitosan, a natural based-polymer obtained by alkaline deacetylation of chitin, is nontoxic, biocompatible, and biodegradable. These properties make chitosan a good candidate for the development of conventional and novel drug delivery systems.. Chitosan and its derivative nanoparticles are good drug carriers because of their good biocompatibility and biodegradability, and can be readily modified. As a new drug delivery system, they have attracted increasing attention for their wide applications in, for example, loading protein drugs, gene drugs, and anticancer chemical drugs, and via various routes of administration including oral, nasal, intravenous, and ocular. For a breakthrough in utilization, especially in the field of controlled drug delivery, graft copolymerization onto chitosan will be a key point, which will introduce desired properties and enlarge the field of the potential applications of chitosan by choosing various types of side chains. Chemical modification of chitosan is useful for the association of bioactive molecules to polymer and controlling the drug release profile. This paper reviews on chitosan and its derivative nanoparticles, including its preparation methods, characteristics, modification, in vivo metabolic processes, and applications. From the studies reviewed it is concluded that chitosan and its derivatives are promising materials for controlled drug delivery.

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Stem cell therapy in treating osteoarthritis

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Osteoarthritis (OA) is a common joint disorder caused due to ageing, wear and tear of joints. Classified under degenerative joint disorders, it occurs in the cartilage which provides cushion effect in the joints causing pain, swelling and stiffness. General characteristics of OA: hereditary, expresses in middle age (around 55 years), more common in women than men. Hemophilia, avascular necrosis and rheumatoid arthritis also known to cause OA. Though the general medical methods seem to have little effect in the curing process, stem cell therapy in caprine model of osteoarthritis proves to be an effective method for reducing the pain and easing movement. Mesenchymal stem cells (MSC) play a major role in tissue repair mechanism and regeneration of the injured joint by an autologous preparation of stem cells to caprine knee joints. MSC(s) have capacity to differentiate into a variety of connective tissue cells: bone, cartilage, tendon, muscle and adipose tissue. Adult stem cells are isolated from the bone marrow, expanded in culture and transduced to express green fluorescent protein. OA is unilaterally induced into the knee joint of the specimen using medical meniscus and resection of anterior cruciate ligament. After 6 weeks, a single dose of 10 million autologous cells suspended in a dilute solution of sodium hyaluronen (SHA) was delivered to the injured knee by direct intra-articular injection. The control specimens receive only SHA and not OA so as to make a comparative study. Results showed evidence of regeneration of medical meniscus, implanted cells detected in newly formed tissues. This infection-free mode of therapy prevents progressive destruction seen in normal OA and effect observed 1-2 hours within implementation, hence proving to be an effective therapy with fairly successful results.

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Computational study of novel target protein RA1 for Rheumatoid arthritis - Design of new lead

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Rheumatoid arthritis (RA) is an autoimmune disease, a systemic inflammatory disorder which affects tissues and organs, mainly by attacking synovial joints. Chemokine proteins of intercrine beta (chemokine CC) family play a major role in RA. These proteins are secreted by the dendritic cells and macrophages present in synovium. The chemokines play an important role in trafficking of T-cells and B-cells to lymphoid organs, lead to excess production of synovial fluid in inflamed joints causing RA.

In the present study the chemokine protein, RA1, is targeted for designing a new lead compound against RA. RA1 protein sequence of 98 AA length, was used to generate 3D model by comparative modeling using Modeller 9v10. The generated 3D-structure of the protein RA1 was evaluated and active site was identified using Castp and SiteMap. The active site was considered for structure based virtual screening of small molecules using an in-house library. Insilico screening of the molecules against RA1 was carried out using of Schrodinger suite. The new leads are identified as potent RA1 antagonist for RA therapy.

Keywords: Rheumatoid arthritis, Chemokine, Synovial joints, Lymphoid organs, Virtual screening.

Biography

V. Santhiprada is working for her Doctoral Degree at The Department of Chemistry, Nizam College, and Osmania University. She had completed her M.Sc (Organic chemistry) from P.G.College of Science, Saifabad, Osmania University, Hyderabad and worked for Narayana Jr. College as a faculty in Chemistry. Later worked as Group leader in R & D Department and Sr. Executive in IPM Department for Symed Research Centre (Hetero Groups). Her research interests include Computational Chemistry and its applications to Drug Designing with particular reference to Rhematoid arthritis.

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Screening for novel clot busters from food and environmental samples

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Clot busting is the breakdown or lysis of blood clots by pharmacological means and is colloquially referred to as thrombolysis. Thrombolysis suggests the use of thrombolytic agents, which can be derived from certain microorganisms. Here we are using Staphylococcus spp. to produce Staphylokinase (SAK), which is used to activate plasminogen. It functions by stimulating fibrinolysis by activating plasminogen to form plasmin through the infusion of analogs of tissue plasminogen activator (tpa) and can break up clots which may block the blood flow to the heart muscle. Staphylokinase (SAK) is a bacterial kinase produced by certain strains of Staphylococcus spp. It is a 15.5 kDa, consisting of 136 amino acid single chain protein, which activates plasminogen to form plasmin and digest fibrin clots. The present research work was carried out to screen the staphylokinase producing Staphylococcus spp. from different environmental and food samples collected (milk, water and sewage) in and around Vellore district, Tamil Nadu, India. Out of 12 isolates, 4 organisms were producing staphylokinase effectively.

Keywords: Staphylokinase, Staphylococcus spp., thrombosis, fibrinolytic.

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Optimization of process parameter for bioconversion of p-hydroxybenzonitrile to *p*-hydroxybenzoic acid using nitrilase activity of Gordonia terrae

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P-Hydroxybenzoic acid finds its applications incosmetics, food, pharmaceutical and polymer industries.In the present study optimization of process parameters for bench scale synthesis of *p*-hydroxybenzoic acid from *p*-hydroxybenzonitrile using resting cells of Gordonia terrae having nitrilase activity has been done. The production of *p*-hydroxybenzoic acid was carried out at 35°C in a fed batch reaction at a 500ml scale using BIOFLO C-32 Fermenter (New Brunswick Scientific, USA). The reaction contained 0.1 M of potassium phosphate buffer (pH 8.0) and 3g dcmof resting cells of G. terrae. Six feeding of *p*-hydroxybenzonitrile at an interval of 1h were made. First feeding comprised of 40 mM substrate, second 37.5mM and subsequent feedings were lessened by 2.5 mM from earlier. The reaction mixture was centrifuged at 5,000 g for 10 min to separate the cells and the supernatant was dried at 80°C. Buffer component were separated by solubilizing the dried product in ethanol. *p*-Hydroxybenzoic acid recovered was weighed and analyzed by HPLC. A total 14.4 g of *p*-hydroxybenzoic acid with 98.7%purity was obtained in 6 h with a productivity of0.78 g $h^{-1}g^{-1}$ dcm of G. terrae.

Biography

Vijay Kumar is working as a Ph. D Research Scholar in Department of Biotechnology, Himachal Pradesh University, Shimla under the supervision of Prof. TC Bhalla. He has done M.Sc in Biotechnology and UGC (NET) JRF. He is working on biotransformation with nitrilase enzyme. He has attended various workshops and published abstracts in national and international conferences.

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Designing of small molecule inhibitors for NMPRTaseas Anticancer leads using insilico approach

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Nicotinamide Phospho ribosyltransferase (NMPRTase) is an enzyme catalyses the biosynthesis of NAD^+. It is generally expressed more in cancerous cell lines. The inhibitors targeted to NMPRTase reduce the cellular NAD^+ concentration which results in apoptosis and cell death, hence can be used to treat cancer. These inhibitors could also target the NAD^+ dependent enzymes like sirtuins indirectly, which were implicated in many diseases like diabetes, neurodegeneration and inflammation. Thus designing inhibitors to NMPRTase would be a good strategy to treat various disorders. In the present work, crystal structure of NMPRTase (2GVJ) with 2.1 A^o resolution, was employed for the energy based pharmacophore model generation for the crystal ligand (FK866) and virtual screening was carried out using Glide docking (Schrodinger). Commercial databases were used for virtual screening.Top30 potential hits were shortlisted by comparing pharmaophore fitness, docking score and hydrogen bonds with crystal ligand. These top hits are the potential lead compounds for treating cancer and other disorders.

Biography

Venkat Koushik Pulla has completed his MSc from Sheffield Hallam University, UK. Currently he is doing PhD in Bits Pilani, Hyderabad campus. His area of interest is to design and screen the lead compounds targeted to cancer.

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To study the mechanism of the formation of controlled Ag nanoparticles using E.coli

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Our work, demonstrates the microbial synthesis of controlled silver nanoparticles along with the growth mechanism of formation of desired silver nanoparticles. However, the partially known mechanism says that the formation of nanoparticles is due to the reduction of ions into silver metal. The bacterial machinery consists of ions and enzymes that help in reduction of silver ions into the silver metal. In natural environment also this technique is followed where microbes involve their systems to convert the reactive metal ions called radicals into the stable metal. Hence, this helps in decreasing the toxicity from the environment. The experiment on lab scale consists of the study of controlled nanoparticles with respect to the change in their environment. This involved the change in their temperature, duration, pH, concentration of the enzyme as well as the substrate. The proper combination of these parameters can help a lot in optimizing the growth of the nanoparticles in the desired range. The analysis has been done with the help of UV-Visible Spectrophotometer and SEM, where the existence of Ag nanoparticles is confirmed within the desired range. We are also trying to keep the size dispersion as low as possible. The interaction, formation and the results will be discussed accordingly.

Biography

Vibha Saklani has completed her M.Tech in Biotechnology from Faridabad. Her six months internship was on “Bioequivalence and Bioavailability studies”. She also undertook various trainings in the field of Clinical research, Agribiotechnology (Plant Quarantine Division), Water purification through Nanobiotechnology, Diagnostic oncology, Instrumentation and Wet lab analysis. Currently, she is working as a Research Scholar at Amity Institute of Advanced Research and Studies at Amity University, Noida. She is also an author of a book chapter to be published on: “Piriformospora indica- A multifunctional symbiotic fungus” written for a new book entitled: “Symbiotic Endophytes” finalized under Soil biology series. She has also been awarded as best speaker in a lecture competition at International year of physics, 2005 organized by B.H.E.L Gurgaon and MNRE.

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Synthesis of silver nanoparticles from leaf extract of Mangifera indica

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Nanotechnology is a multidisciplinary research area and the synthesis of nanoparticles is gaining significance worldwide. Nanoparticles have a very large surface area which results in greater chemical reactivity, biological activity and catalytic behavior as compared to larger particles of the same chemical composition. Nanoparticles are used in application such as catalysts in chemical reactions, electrical batteries and in selective coatings for absorption of solar energy, as optical elements, pharmaceutical components and in chemical sensing and biosensing. The synthesis of nanoparticles has been reported using chemical and physical methods. The present study explains a cost effective and ecofriendly approach for the synthesis of silver nanoparticles (AgNPs) from leaf extract of Mangifera indica. In this study aqueous extracts of the leaves of Mangifera indica used as reducing and stabilizing agents. Phytochemicals are assumed to be responsible for the formation of AgNPs. The rapid reduction of silver (Ag+) ions was monitored using UV-visible spectrophotometer. UV-visible spectrum of the aqueous medium containing silver ions demonstrated a peak value at 440nm. The further characterization of the nanoparticles was done by technique such as X-RAY diffraction (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscope (TEM), Atomic Force Microscopy (AFM) and Fourier Transform Infrared Spectroscopy (FTIR).

Keywords: Nanoparticle, Nanotechnology, NAD, XRD, FTIR, TEM, SEM and AFM.

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Enhanced antibody response in laboratory animals immunized with a combination of rabies virus specific T-helper and B-cell epitopic peptides

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Rabies the 10th most common lethal infectious disease is a major zoonotic disease, still a serious public health problem mainly in developing countries. It is a unique viral disease of warm-blooded animals, kills virtually every individual it infects. The World Health Organization (WHO) estimates that rabies is related to the death of approximately 55,000 people per year. The present study was undertaken with an aim to develop synthetic peptides antigen in different format to see the immunogenicity of these synthetic antigens. The peptides were synthesized in B cell and T cell epitopic peptides in alone and in chimeric format. The B cell epitopes were identified from the Glycoprotein (G) and T cell epitopes were selected from the Nucleoprotein (N), and Phosphoprotein (P) regions of rabies virus. Peptides were synthesised by solid phase peptide synthesis, using Fmoc chemistry. The desalting of peptides was done with ODS silica column and purity of peptides was checked by RP-HPLC and insured about 90% purity. The circular dichorism (CD) spectroscopy performed to determine the solution confirmation of these peptides. The CD data were recorded in water with random coil structure ranging in between 20-35%. The B cell Peptide were immunised with and without T helper peptide and with chimeric peptides. The reactivity of the peptides was checked in peptide ELISA with corresponding peptides. Known positive and known negative sera were taken as positive and negative controls respectively. A more than three folds ELISA signals of the negative sera was recorded for all the B cell peptides and it goes up to 30 times more when same corresponding peptide was immunised with the T helper peptide or in chimeric formats. Overall, the B cell peptides immunised or synthesised in chimeric format with T helper peptides has a potential to produce the rabies specific antibodies, which can be used as safe antigens.

Biography

Vinod Chandra Pandey has completed his PhD from Gobind Ballabh Pant University of agricultural technology and Post Doctoral studies from Indian Agricultural Research Institute, New Delhi. He is working as a Research Associate in the Division of Veterinary Biotechnology, Indian Veterinary Research Institute, Izatnagar, Bareilly, U.P. The present research work was conducted in GBPUAT, Pantnagar during his PhD.

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Biocatalysts towards ever greener for production of biodiesel from non-edible oil and comparison of fuel characteristics

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The biodiesel production is the transesterification reaction which could be catalyzed either chemically or enzymatically. Enzymatic transesterification has certain advantages over the chemical catalysis of transesterification, as it is less energy intensive, allows easy recovery of glycerol and the transesterification of glycerides with high free fatty acid contents. Lipases (triacyl glycerol acylhydrolase EC 3.1.1.3) are hydrolytic enzymes that catalyze the hydrolysis and synthesis of variety of acylgcerols at interface of lipid and water. In the present study, transesterification reaction of karanjia oil was carried out by using Pseudomonas aeruginosa lipase. In this study, the effect of various parameters were optimized. Enhanced conversion 85.9 % of fatty acid to fatty acid methyl ester within 48 h at 45 °C was achieved by using lipase at a concentration of 5 % (w/v of oil), molar ratio of 1:4 (oil: methanol), methanol acyl donor, n-hexane solvent and temperature 45 °C. The biodiesel obtained was qualitatively determined by thin layer chromatography and gas chromatography. This approach might pave the way for industrial production of biodiesel equivalents from renewable resources by employing micro – organism, enabling a broader use of biodiesel – like fuel in the future.

Biography

Vinod Kumar has been a student at University of Delhi South Campus. He is pursing Ph.D. in Microbiology, under the guidance of Prof. R. K. Saxena at Department of Microbiology. His main research subject is to develop an Eco friendly system for Synthesis of bioactive molecules by enzymatic method which important in industrial sector. He has published 5 papers in reputed journals and papers presented in National/International conferences.

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Design of immobilized packed bed cell bioreactor for effective degradation of simulated cyanide containing water

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Cyanide compounds are present in abiotic and biotic components of most of the ecosystems. Cyanide is produced in plants, bacteria, yeasts and molds naturally to cope with various stresses mainly for defense purposes. However man made cyanide compounds are contributing significantly to raise the levels of cyanide in environment. Biological agents can be used as effective alternatives for cyanide degradation. In present study, an attempt has been made for complete degradation of cyanide with alginate entrapped cells of bacterial isolate CM2 in a packed bed bioreactor. Cells grown in minimal salt medium supplied with 1% glucose and 0.1% tryptone as carbon and nitrogen source respectively were harvested at 20 h and entrapped with 2% alginate beads using citrate buffer (pH 6.0). Alginate beads containing cells were packed in a column reactor maintained at 35°C. Simulated cyanide (12mM) containing water was loaded and fractions were collected after definite time intervals. Percent degradation of cyanide was then calculated for different flow rates of the simulated cyanide containing effluent. When flow rate was set to 1.5 ml per h, complete degradation of 12 mM cyanide in 10 h was observed i.e 100% removal of cyanide. The study resulted in successful design of a packed bed reactor for complete removal of cyanide from simulated waste water.

Biography

Virender kumar is B.Sc, M.Sc (Biotech), M.Phil (Biotech). He is a research scholar (UGC-JRF) at Department of Biotechnology, HP University shimla, India working on title "Development of bioresource for effective degradation and detection of cyanide". He has worked mainly on environmental bioremediation. He has published abstract in international conference.

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Bacteriophage as a therapeutic agent and a novel route for the synthesis of gold nanoparticles

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A strain of Klebsiella sp. was isolated from the Pavana River, Pune city, Maharashtra, India. Based on biochemical characterization and molecular analysis, the bacterial strain was identified as Klebsiella sp. Similarly, a bacteriophage was isolated from the river that was capable of forming plaques on the plates containing Klebsiella sp. Morphology of Salmonella-phage was observed by using transmission electron microscopy (TEM). Potential of this phage was checked for disruption and inhibition of Klebsiella biofilms in 96 well plates. Biofilm disruption and inhibition was also observed on glass surfaces by using scanning electron microscopy (SEM). Further, the phage lysates were used for synthesis of gold nanoparticles. Gold nanoparticles were characterized by UV-visible spectrophotometer, SEM-EDS and XRD. Gold nanoparticles were also showed antimicrobial activity against some pathogenic microorganisms. Thus, phages were found effective against pathogens and green source for nanoparticle synthesis was investigated.

Biography

Vishal Mahale is pursuing the Integrated M.Sc. Biotechnology course at the Institute of Bioinformatics and Biotechnology, University of Pune, Maharashtra, India.

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RAPD markers for identification of cytoplasmic genic male sterile and restorer lines of pigeonpea

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GMS system was exploited for potential heterosis breeding but proved failure because of labour intensiveness in seed production and seed purity concerns. This resulted in the development of cytoplasmic genetic male sterility system using cytoplasm of wild species like C.sericeus and C. scarabaeoides. In development of CMS based hybrids, male sterile (A), maintainer (B) and restorer (R) lines are required. Unambiguous characterization of the parental lines not only reduces the cost, labour, and time but also leads the hybrid development in the proper perspective.

DNA based markers are the best option to characterize the parental lines involved in the development of hybrids as they are numerous, independent of environmental effects and can detect the plants of interest at an early growth stage. In present study, RAPD analysis was used to study the genomic DNA variation among the Sterile (A) lines and Restorer (R) lines of pigeonpea. The cytoplasmic-genetic male sterility (CMS) system is considered to be feasible approach to develop hybrids in pigeonpea. Identification of CMS lines and their putative restorers using molecular markers in the early stage of growth is important and economical in long duration pigeonpea. Random amplified polymorphic DNA (RAPD) markers were used to identify the sterile (A) lines and fertility restoration (R) lines of pigeonpea. Of the 80 RAPD primers screened, 72 were found to be polymorphic. Two RAPD primers were identified that could distinguish the sterile (A) lines and restorer (R) lines. The use of these primers in heterosis breeding is discussed.

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The Biological Approach to Enhance Durability in Concrete Structures

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Concrete durability is the function of its internal pore structure, porosity and the permeation properties. Improved pore structure, reduced porosity and enhanced permeation properties lead to the durability of structures. The objective of the present paper is to discuss the biological approach to enhance durability in concrete structures. Research has shown that specific species of alkaliphilic bacteria can be used to repair cracks in already existing concrete structures. A novel eco friendly self healing technique called 'Biocalcification' is one such approach on which studies were carried out to investigate the crack healing mechanism to study the enhancement of durability in concrete. Microbiologically induced calcite precipitation (MICP), a highly impermeable calcite layer formed over the surface of an already existing concrete layer, due to microbial activities of the bacteria Bacillus subtilis JC3 (cultured at JNTU) seals the cracks in the concrete structure and also has excellent resistance to corrosion therefore increases the durability of concrete structures. MICP is a complex mechanism and is a function of cell concentration, ionic strength, nutrient and pH of the medium. This paper aims to reports the investigations on the enhancement of durability by microbiologically induced calcite mineral precipitation (MICP) in ordinary (M20) and standard (M40) grades of concrete. Quantification and Characterization was done using Scanning Electron Micrograph (SEM) analysis, only to be noted that cracks were sealed up by crystalline material grown over the surface due to microbial activity of the bacteria.

Biography

V Srinivasa Reddy is a Research Scholar at Jawaharlal Nehru Technological University College of Engineering, Hyderabad, India.

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Antibiotic susceptibility and determination of Minimum Inhibitory Concentration (MIC) of potent antibiotics used against Staphylococcus spp. isolated from raw milk

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The uncontrolled use of antibiotics has led to the development of multiple antibiotic resistance, there by rendering the treatment ineffective. In the present study, raw milk samples were collected from different areas of Patna. Out of the 12 isolates obtained, nine were identified as Staphylococcus species. The isolates were examined for their susceptibilities by Bauer Kirby Disc Diffusion test against ten antibiotics. Results showed that incidence of resistance to the antibiotics was quite high, as the maximum susceptibility obtained was only about 13.19%, Rifampicin and Tetracycline being the most ineffective in vitro. Amoxicillin and Cloxacillin were the most effective in phase I exhibiting 12.13% and 11.24% efficacy, respectively, whileAmpicillin + Cloxacillin was the most effective combination exhibiting 14.31% efficacy in phase II. The MIC values of two antibiotics in pure form and three in combinations were determined by agar dilution and broth dilution methods. The MIC values ranged between 0.5 – 1.0 μg/L showing comparable results throughout the dilution range. However, slightly higher values were obtained for Amoxicillin + Erythromycin and Amoxicillin + Clavulanate i.e. > 1.0 μg/L.

Biography

Ankita Shrestha has completed her graduation at the age of 23 from Patna Women's College, Patna and qualified the All India Combined Biotechnology Entrance held by JNU, New Delhi. She is currently pursuing her Masters Degree in Biotechnology from Utkal University, Bhubaneswar. She has underwent several summer internships under renown scientists and also done a Research Project under University Grants Commission of India. She is a young budding scientific mind who wants to build up a career in the Biotechnology Industry.

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Studies on immune response against a new bicistronic DNA vaccine for anthrax using the protective antigen gene (pag) and catalytically inactivated lethal factor gene (mlef)

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Anthrax is primarily a disease of herbivorous animals including cattle, buffalo, sheep, and goat. Anthrax causes per acute death in the animals, hence treatment is neither possible nor pragmatic approach to control the disease. So vaccination is considered as a key strategy for prevention and control of anthrax in ruminants. In the present study, bicistronic DNA vaccine construct for anthrax using protective antigen (pag) and catalytically inactivated mutated lethal factor (mlef) along with monocistronic construct encoding pag and mlef were developed. The lethal factor was catalytically inactivated by mutating the GAA codon to TGC codon (E687C) by primer based site directed mutagenesis. Simultaneously both pag and mlef were cloned and expressed in prokaryotic expression system and recombinant protein was used for booster immunization. Prepared DNA vaccine constructs were tested for their functional expression by transfection of MDBK cell line followed by indirect immune-fluorescence analysis. The immune response study was done in mice with these DNA vaccines boosted with DNA vaccine or recombinant protein or anthrax spore vaccine on 14th and 28th DPV and monitoring of immune response was done by ELISA. Antibodies were detectable from 7th day onwards and peaked on 42nd day. Cell mediated immune response was assessed by quantitating level of IFN$^{\gamma}$, IL-2 and IL-4. The level of these three cytokines were high in the (pMlef-Pag+ rPag+ rMlef) and (pPag +rPag) groups. The immunized mice were challenged with 1000 LD_{50} of Bacillus anthracis IVRI strain on 42nd day. Among the various vaccine groups, pMlef-Pag+rPag+rMlef and pPag+rPag groups were found to provide maximum protection (66.66%) while, pMlef-Pag + pMlef-Pag, pPag+pPag and AVA induced only 50%, 33.33%, and 50% protection respectively. Considering the protective efficacy, immune responses and stimulation of cytokines pMlef- pPag+rPag+rMlef vaccine seems to be better than other vaccines. Among the DNA vaccine group pMlef-Pag had shown better immune response and protective efficacy than pPag indicating synergestic effect of pMlef on immune response and protective efficacy.

Biography

Bincy Joseph has completed graduation in veterinary sciences (BVSc & AH) from Kerala Agricultural University with KAU merit scholarship. She has completed post graduation in Veterinary Bacteriology from Indian Veterinary Research Institute with ICAR Junior Research Fellowship and completed doctorate in veterinary bacteriology from Indian veterinary research institute with Senior Research Fellowship. She has published 8 research articles in various reputed journals and participated in more than 10 national and international conferences and presented research papers.

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Influence of enzymes on the physicochemical characteristics of papaya pulp

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Papaya (Carica papaya L.) is low acidic fruit which is deliciously sweet with musky undertones and a soft, butter-like consistency consumed worldwide. The post-harvest losses of papaya are mainly attributed to its perishable nature and inadequate post-harvest storage facilities and handling. In the present scenario of underutilized fruits, there is an ever increasing demand for the diversified processed products from papaya. Use of enzymes as processing aids has been practiced in the fruit and vegetable processing industry to obtain low viscosity pulp and high yields of juices. This study aims to optimize the enzyme concentration, incubation time and incubation temperature required for the enzymatic liquefaction of papaya pulp using response surface methodology (RSM) to achieve higher juice yield and further to observe the physicochemical changes during the process. The results showed that 0.3% amyloglucosidase: pectinase: cellulase (AMGPC) enzyme concentration for a period of 180 minutes at room temperature was sufficient to achieve a maximum juice yield of 87%. Similarly at 45°C, 0.7% of amyloglucosidase: pectinase (AMGP) enzyme concentration for a period of 180 minutes yielded the maximum juice yield of 74.5%. Parameters such as pH, acidity, TSS, reducing sugars, total sugars, ascorbic acid and color values were found to have changed marginally. Significant changes were observed in viscosity, clarity and total carotenoids during enzymatic liquefaction as compared to the untreated papaya pulp. Finally, it can be summarized that there is a vast scope and demand for the production of enzyme liquefied papaya juices in the international arena.

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To compare the therapeutic efficacy and safety of fexofenadine with chlorpheniramine maleate in the treatment of allergic rhinitis and bethmethasone, short course therapy given orally in allergic rhinitis

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INTRODUCTION: Allergies are among the most common diseases affecting millions of people throughout the world. A significant percentage of Indian population affects from one or the other allergic disorders. Allergic rhinitis is one of the commonest allergic disorders. It is sensitization of the nasal mucosa by the allergens leads to the allergic response in the nasal cavity resulting in the typical symptoms of sneezing, watery nasal discharge, itching and blocking of nose. These symptoms cause considerable disturbance to the normal daily activities and even be a forerunner for more severe forms of allergy like Bronchial Asthma.

The present treatment options for Allergic Rhinitis include: Oral Antihistamines, Topical Corticosteroids, Oral Corticosteroids (Short Course), Topical Anticholinergics and Immunotherapy (Desensitization) of all these Anti Histamines are the most commonly used.

OBJECTIVE: 1] Comparing the therapeutic efficacy and safety of second generation anti histamine eg:fexofenadine with first generation eg:chlorpheniramine maleate. 2] Comparing the therapeutic efficacy and safety of Anti histamines with other group of drug used in allergic rhinitis (i.e)Bethamethasone orally short course.

INCLUSION CRITERIA: patients between age 15-45. Number of cases 75.

METHODS: ENT examination.complete Blood Picture,Absolute eosinophil count, X Ray of paranasal sinuses,skin test for Allergy, IgE levels in the serum.

CONCLUSION: The three drugs fexofenadine, chlorpheniramine maleate and Bethamethasone were and found to have similar levels of efficacy in controlling the symptoms of allergic rhinitis. The physical signs improved better with chlorpheniramine than other two drugs. Fexofenadine was found to be most effective in suppression of the skin reaction to the allergens. It was closely followed by Betamethasone and then chlorpheniramine. The anti-histamines Fexofenadine and Chlorpheniramine had no significant effect on the absolute eosinophil count and serum –IgE levels. Whereas Betamethasone had significant effects. Adverse effects were reported more by patients on chlorpheniramine maleate than with Fexofenadine or Bethamethasone.

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Production of biodiesel fuels from non-editable oils using two-step catalyzed transesterification

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In recent years biodiesel fuel from plant and animal fats become more attractive due to its renewability, biodegradability and its environmental concerns. Presence of more oxygen content in biodiesel fuel is the main difference between the petroleum diesel and biodiesel. But the major problem associated with the use of biodiesel fuel is its high cost. Because most of the biodiesel fuel were prepared from edible oils likes soy bean, sunflower, rape seed, palm etc. However there is edible oil crisis in India and other developing countries limits the use of edible biodiesel production from edible oils. This will encourages the development of another potential alternate source from non-edible oils and used cooking oils for biodiesel making process. Hence in India the following non-edible oils such as Jatropha, Pongamia and Madhuca are considered for biodiesel making process. Because these oils are easily cultivable in low fertile lands/waste lands which is abundantly available in India and the usage is very little. Hence in this study the following non-edible plants such as Jatropha curcus, Pongamia pinnata, Azadirachta indica and Madhuca indica are used for biodiesel production using a two step catalyzed method (acid method followed by alkali method). The important physical properties (Viscosity, Calorific value, Flash point, Cloud point etc) of different biodiesels from different non-edible oils were analyzed and the values compared with petroleum diesel fuel.

Keywords: Non-edible oils; Two-step catalyzed method; Biodiesel; Diesel engine.

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Evaluation of in vitro angiotensin-converting enzyme inhibitory activity of Psidium guajava Linn. leaf extract and a study on enzyme kinetics

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Psidium guajava Linn leaf is used traditionally in Indian medicine to control hypertension in human. The aim of this work was to study the hypotensive effect of Psidium guajava Linn. leaf extract in human. Hypertension is due to the activity of the Angiotensin-Converting Enzyme that catalyzes the conversion of the inactive Angiotensin I to the active Angiotensin II. Angiotensin II functions as a potent vasoconstrictor causing hypertension. Hence, ACE inhibitors are considered to be the first choice treatment of hypertension. The ACE inhibitory activity of Psidium guajava Linn. leaf extract in human was studied by its in vitro inhibitory effect on human serum-ACE using the substrate FA-PGG (N-(3-(2-Furyl) acryloyl)-L-phenylalanyl-glycyl-glycine). The enzyme kinetics of ACE inhibition was investigated by Michaelis–Menten kinetics and Lineweaver–Burk graph and Vmax and Km values were calculated. The results show that there is a decrease in both Vmax and Km values in the presence of Psidum guajava leaf extract. The decreased Vmax and Km seen with Psidium guajava indicates that Psidium guajava binds to other alternative sites rather than the active site of the ACE and hence the inhibition is uncompetitive. The decreased Vmax/Km value indicates decreased catalytic ability/affinity of enzyme-substrate due to the presence of the inhibitor Psidium guajava leaf extract. From these we could conclude that P. guajava Linn leaf extract inhibit human serum-ACE uncompetitively and it has hypotensive effects in human.

Biography

Jomon Sebastian has completed his B.Tech in Biotechnology from Sathyabama University, Chennai and he is currently doing his M.Tech in Biotechnology and Biochemical Engineering at Sree Buddha College of Engineering, Alappuzha which is affiliated to Kerala University.

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In silico studies on flavonoids against prostatic acid phosphatase receptor

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Ridge gourd is a common vegetable in India and many other South Asian countries. It has a high water and nutrient content, thus having a low percentage of fats and cholesterols. It also a high nutritive value, and is often called a nutrition powerhouse because of its rich and varied nutrient content. Review of literature reveals that two flavonoids are isolated from above mentioned vegetable. Prostatic acid phosphatase (PAP) is a valuable marker and the key enzyme involved in prostate cancer. Though its secretory level increases, its cellular form decreases in prostate cancer patients. Cellular prostatic acid phosphatase (cPAP) functions as a tyrosine phosphatase of oncoproteins associated with prostate carcinogenesis. Thus, cPAP whose expression diminishes with the progression of prostate cancer is selected as the drug target. Ligands that can enhance the activity of cPAP may have potential applications for prostate cancer therapy. This work involves an Insilco study on the enhancing effect of anti-cancer flavonoids of Ridge gourd on the activity of cPAP. In our research work we have taken the Prostatic acid phosphatase (PAP) receptor of PDB ID [1CVI] and the Flavonoids (Myricetin and Quercitin) from PubChem database against Prostate cancer. The Binding site was predicted using Q-sitefinder. The receptor was docked to the above said Flavonoids and the energy value obtained as follows: myricetin(-7.74kcal/ mol), quercitin(-8.39kcal/ mol) using the ArgusLab docking software. The interaction between the ligand and the protein were then viewed in pyMol viewer. Hence these compounds hold a good prospective of being used as medicine, which targets the PAP receptors.

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Differentiation of sheep and goat strains of Mycobacterium avium subsp paratuberculosis by Multiplex PCR on Large sequence polymorphisms

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Mycobacterium avium subsp paratuberculosis (MAP) is the causative agent of chronic wastin disease in cattle and sheep, but caused by different strains. Genomic reduction by loss of large sequence polymorphisms (LSPs) is the major contributor of genomic diversity in M avium subspecies and can also be used for differentiating cattle and sheep strains of MAP. A part of LSP^A4 is present only in sheep strains not in cattle strains. Faecal samples were collected from cattle, sheep and goat from Bareilly and Thrissur districts. DNA was extracted from those faecal samples by using the Qiagen QIAamp DNA kit and was subjected to IS 900 PCR. 20% cattle, 25% sheep and 44.44% goat were positive for MAP. All the DNA samples were subjected to LSP4 multiplex PCR for specific detection of cattle and sheep strains of MAP. All positive cattle samples had given amplification of 490 bp and all positive sheep samples had given amplification of 540 bp. One except all goat samples gave 540bp product indicating infection with sheep strain. One goat sample gave both 540bp and 490 bp products indicating mixed infection of sheep and goat strains as they are susceptible to both strains. None of the negative samples produced any amplification with LSP 4 multiplex PCR. The ability to detect and differentiate between strains of MAP is of obvious importance for both accurate diagnosis and to guide control programs. LSP's are very specific for MAP diagnosis and strain differentiation of MAP.

Keywords: Mycobacterium avium subsp paratuberculosis, multiplex PCR, LSP, Faecal PCR, Johne's disease.

Biography

Radhika Syam is the native of Kerala, India. She has completed her MVSc degree from Indian Veterinary research institute and is pursuing PhD from the same institute on Veterinary Bacteriology. She is the holder of JRF from ICAR for PG, ICMR and CSIR for PhD and SRF from ICAR for PhD. She is also honoured by Prime minister of India for her achievement in BVSc exams.

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Nano bio robotics application in DES treatment

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Clinically talking eye specialists come across increasing complaints of dry eyes problem in large number of people. Most patients with dry eye have only discomfort, and no vision loss. With severe cases, the clear window on the front of the eye (cornea) may become damaged or infected. Ulcers or infections of the cornea are serious complications. There is no way to prevent dry eye syndrome. You can prevent complications by using wetting and lubricating drops and ointments. The only solution to this is artificial tear drops or if the problem has increased over time the lens get cracked leading to surgery to replace lens. Thus, I have reached to a thought why not rectify the problem using nano bio robotics that can eventually detect and overcome this problem. Nanotechnology, the engineering and art of manipulating matter at the nanoscale (1-100 nm), the art of future, offers the potential of novel nanomaterials for the treatment of various deadly diseases. At the present time many nanomaterials are under active research and development. The development of environmentally-responsive functional 'nanodevices', capable of performing complex tasks at nanoscale, will require the assembly of individual nanoscale components. Hence, a robot (functionally attach to middle layer of eye, detector of dryness, and therefore programmed to overcome dryness) of nano size biologically active could be developed and used for the patient and they could be freed from this problem for life time.

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Construction of broad host range vector for expression of heterologus protein in Brucella abortus strain 19

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Brucellosis, a major zoonotic disease causing abortion and infertility in cattle, is controlled mainly by vaccination with strain Brucella abortus strain 19. It is a smooth, attenuated and live vaccine candidate which can induce a strong humoral and cellular immune response and therefore, it is an attractive vector platform for the delivery of heterologus antigens. The objective of this study was to construct a broad host range vector for expression of heterologus protein in B abortus strain 19. For this, promoter sequence of Brucella groE gene was cloned into broad host range vector pBBR 122. For one step purification and easy detection of the expressed protein, six histidine tag was added in to the reverse primer of groE promoter. To check promoter activity and expression status of the construct, a promoterless GFP gene was cloned into the vector. The construct pBBR GroE_ GFP was then electroporated in to strain 19. The expression of GFP was induced by heat shock at 42°C and treatment with H_2O_2. Then the recombinant protein was purified by using urea lysis method and followed by Ni-NTA affinity chromatography. Further, the purified protein was dialysed and the specific reactivity of the recombinant protein was checked by western blotting using anti histidine antibody. A single specific band could be detected at 28kDa confirming the expressed recombinant protein. Based on the present study, it is concluded that B abortus strain 19 can be used as vector for expression of foreign protein and further experimentation is required study its vaccinal potential.

Keywords: Brucella abortus strain 19, broad host range vector, expression vector, recombinant DN.

Biography

Justin Davis K is the native of Kerala, India. He has completed his MVSc degree from Indian Veterinary research institute in veterinary epidemiology and has procured PhD from the same institute on Veterinary Bacteriology. He had received IVRI fellowship for both MVSc and PhD. He had also received PTF grant for young scientists for presenting a paper at Estonia conference.

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Transfer and expression of tobacco osmotin (Tbosm) conferred fungal disease resistance in Indian soybean

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Soybean is an important vegetable protein and oil crop throughout the world. India ranks fifth in soybean production with an annual production of 10.12 million metric tons. Soybean productivity is negatively influenced by several diseases and pests. Among the several diseases, fungal diseases causes significant lose in soybean production. To overcome the negative impact of fungal diseases in soybean, we transformed soybean cv. Pusa 16 with biotic and abiotically induced and apoplastically secreted pathogenesis related tobacco osmotin (Tbosm) gene using Agrobacterium-mediated genetic transformation. Integration and expression of Tbosm in transformed soybean was confirmed by polymerase chain reaction (PCR), southern hybridization and western blotting. Totally 5 transformed soybean plants were obtained and all the transformed soybean plants showed significant resistance against four fungal pathogens Microsphaera diffusa, Septoria glycines, Phakopsora pachyrhizi, and Rhizoctonia solani. The transformed soybean plants accumulated significant levels of proline, glycinebetaine, chlorophyll, APX, CAT, SOD, DHAR, and MDHAR than non-transformed plants during fungal disease analysis. The present investigation clearly shows that expression of Tbosm protects the soybean plants against fungal diseases.

Biography

K. Subramanyam is pursuing Doctoral degree in Biotechnology under the guidance of Dr. A. Ganapathi. Bharathidasan University, Tamil Nadu. He standardized Agrobacterium mediated genetic transformation for chilli, banana, and soybean. At present he is concentrating on genetic improvement of soybean against salinity stress and fungal disease resistance. His findings were published in well reputed journals like Planta, Plant Cell Reports, Plant Cell Tissue and Organ Culture, and Acta Physiologiae Plantarum.

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Adventitious root culture in Podophyllum hexandrum Royle (syn. P. emodi Wall. ex Hook.f. & Thomas) - An important medicinal plant

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Podophyllum hexandrum Royle belongs to the family Berberidaceae is an important Indian medicinal plant, which grows at 2700–4200 M in the Himalayan region. The rhizomes of this plant species are the source of podophyllotoxin, which is used for the synthesis of anticancer drugs and for several medicinal applications. The Indian Podophyllum hexandrum is superior to its American counterpart, namely, Podophyllum peltatum in terms of higher podophyllotoxin content (4% in the dried roots in comparison to only 0.25% for Podophyllum peltatum). The seed looses viability and posses problem in regeneration in natural habitat. In addition, the plants become endangered due to intensive collection and also owe its own biological characteristics. Zygotic embryos were used as explant for in vitro germination. MS medium supplemented with GA_3 (5.0 mg l^{-1}) responded for in vitro germination of embryos into plantlets. Establishment of adventitious root cultures was achieved using root explants derived from in vitro seedlings. MS medium supplemented with IAA (3.0 mg l^{-1}) in combination with NAA (3.0 mg l^{-1}) was found to be the optimal concentration for the induction of callus from the root explants. Maximum number of adventitious roots (14.1) was obtained on MS Solid medium supplemented with IBA (1.5 mg l^{-1}). The Morphological differences of the root induced in MS medium supplemented with IAA, IBA, IAA in combination with NAA has been observed and recorded. The fresh weight and length of the roots increased in the IBA treatment when compared to the other hormones tested. The plant cell and tissue culture technique discussed in this study is an alternative and a powerful protocol for the production of secondary metabolites. Considering these fact, adventitious root culture in large scale regarded as an attractive alternative for production of secondary metabolites of pharmaceutical and nutraceutical interest.

Biography

M. Rajesh is pursuing Doctoral degree in Biotechnology under the guidance of Dr. A. Ganapathi, Professor, Department of Biotechnology and Genetic engineering, School of Biotechnology, Bharathidasan University, Tamil Nadu. He has experience in plant tissue culture and Agrobacterium mediated genetic transformation in medicinal plants. At present he is concentrating in adventitious root culture for secondary metabolite production.

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A Critical study of Somatic embryogenesis in Cucumis sativus.L from seed cultures

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A protocol for the production of healthy in vitro plantlets directly from seed explants and somatic embryos from the seed derived calli of cucumber (Cucumis sativus. L) Was described. The seeds were excised from fresh fruit and cultured on Murashige and skoog (MS) medium supplemented with varied concentrations of BA (Benzyl adenine) and IBA (Indole butyric acid) for effective organogenesis which gave rise to healthy plantlets within short time duration on MS medium with BA 1.0 mg/l and IBA 0.3 mg/l.

The explants inoculated on 2, 4- Dichloro phenoxy acetic acid (2, 4-D 0.5 mg/l) for callus induction gave rise to luxuriantly growing calli after two weeks. These calli were sub cultured on MS medium supplemented with various concentrations of 2,4-D(1.0-2.0 mg/l) alone or along with Benzyl adenine(BA 0.25-1.0 mg/l) for shoot initiation. The efficient somatic embryogenesis was observed on full strength MS medium supplemented with 2, 4-D (1.0 mg/l) along with BA (0.25mg/l) within 45 days of time.

Keywords: Cucumis sativus, seeds, direct regeneration, callus, somatic embryogenesis.

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Isolation and characterization of ovine embryonic stem cells

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Embryonic stem (ES) cells have become very important resources in basic medical researches. ES cells are derived from explanted culture of the inner cell mass (ICM) of blastocyst stage embryos and has definite explicative potential and differentiate into derivatives of all three germ layers. Initially invitro fertilized embryos were cultured using TCM 199 +20% Fetal bovine serum + L–Glutamin 2mMol and Penicillin/Streptomycin 100mg/100IU/ml for 3 days. These cell lines were generated by removing ICM from preimplantation embryos using 0.75% pronase. Es cells are grown on a layer of mitotically inactivated primary mouse embryonic fibroblast (MEF) feeder layer to promote growth and prevent differentiation using mitomycin – c, primary embryonic fibroblast were isolated from 13 to 14 days old fetuses. The cells were disaggregated and trypsinized every 3 days until the appearance of the colonies of ES cells. The colony positive cells were fixed and stained for alkaline phosphatase. The ES cells were cultured in suspension state for 5 days; at the same time Leukaemia Inhibitory Factor (LIF) was removed from media to form embryoid bodies (EBs). Undifferentiated cells were seen as intensely small cells attached together compactly with high nucleus/cytoplasm (N/C) ratio. The cells of colonies tend to differentiate by separation from each other and became larger and diffused on substrate by attaching to dish. The positive alkaline phosphatase cells were seen in typical morphology of ES colonies. The EBs cells were seen in culture after 5 days in suspension and began to spontaneously differentiate into various types of cells such as nerve and hematopoitic lineages.

Keywords: Embryonic stem cells, Embryoid bodies, Differentiation, ovine.

Biography

P. Iyya Shankar completed her Post graduation in M.Sc Biotechnology from University of Madras in the year 2007. He is currently working as Senior Executive – cell culture department in Life cell International Private ltd, Chennai, Tamil Nadu, previously working as Senior Research Fellow in Department of Animal Biotechnology, MVC, Tanuvas, Chennai – 600053, Tamil Nadu, India.

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Molecular evidence for association of a begomovirus and betasatellite with a recently emerged leaf deformity disease of Sunn-hemp in eastern India

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Sunn-hemp (Crotalaria juncea L.) is cultivated as a multipurpose legume especially for its bast fiber in many parts of the world including India. It produces high organic matter yields, potential to fix biological nitrogen, and could reduce the build-up of root-knot nematode populations. A leaf deformity disease of the crop not hitherto known was observed recently at different farmers field of West Bengal and experimental farm of Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore, Kolkata, West Bengal. Diseased plants showed various symptoms like up- and down-ward leaf curling, puckering and leaf crumpling along with severe height reduction. These plants were collected and used as initial source for viral inoculum in transmission experiment. Minimum 10 whiteflies were found to transmit the virus with only 20% transmission efficiency. Increase in the number of whiteflies increased the transmission efficiency. After whitefly transmission, typical symptoms appeared after at least 16–20 days under glasshouse conditions. Total genomic DNA was extracted from the plants obtained from field (symptomatic and asymptomatic) and glasshouse (whitefly inoculated and healthy) by CTAB method. The presence of begomovirus genome (DNA-A and DNA-B) and the associated betasatellite was detected by PCR using primers PALIc1960/PARIv722, PBL1v2040/PCRc1 and β01/β02 respectively. PCR with DNA-A and betasatellite primers yielded 1.2 kb and 1.3 kb amplicon where as PCR with DNA-B primers failed repetitively indicating the presence of a monopartite begomovirus and a betasatellite with the disease.

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Screening of commonly consumed fruit seeds for antioxidant activity for improvising human health

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The world is fully enriched with flora varietals which has most of the therapeutic and medicinal values. People in the world consume most of the flora in the form of fruits and vegetables. Commonly consumed fruits were taken and investigated for their antioxidant activity. Antioxidants have been suggested to have a well-defined role as preservatives and preserve from getting deteriorated, rancidity or discolouration caused by oxidation. Lipid peroxidation is an important deteriorative reaction of foods which cause adverse effects such as carcinogenesis, cell DNA mutagenesis and aging. Preliminary phytochemical analysis of plant extracts showed the presence of phenols flavonoids, terpenoids and saponins. Commonly used plant species for the activity are Cucurbita maxima, Benincasa hispida, Cucumis melo, Carica papaya, Citrullus lanatus, Citrus sinensis. Quantitative estimation of flavonoids and total phenolics showed Citrus sinensis has highest phenolics content and Carica papaya has highest flavonoids content in the above samples. Antioxidant activity was evaluated by 4 types of non-enzymatic methods like Total antioxidant capacity, DPPH method, FRAP method and Modified FRAP assay. Among the plant species the ethanol extracts of Citrus sinensis has highest total antioxidant capacity. In DPPH free radical scavenging assay Citrus sinensis has highest free scavenging activity in concentration range of (50-250) µg/ml. ABTS cation scavenging assay showed Citrullus lanatus has highest ABTS cation radical scavenging activity in the concentration range of (50-250) µg/ml. In FRAP assay Citrullus lanatus has highest antioxidant activity at A_{700} in the concentration range of 100 µg/ml. Modified FRAP assay showed Citrus sinensis has highest antioxidant activity at A_{750} in the concentration range of 100 µg/ml.

Biography

A. Manojkumar currently doing his final year in M.Tech Biotechnology completed his B.Tech Biotechnology in Mepco Schlenk Engineering College, Sivakasi. He has been doing his post-graduation project under the supervision of Dr. N. Saraswathy.

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Phytoremediation of dye effluent using different aquatic plants in kadodara (dist. surat) region by rhizofiltration technique

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Environmental pollution is one of the human's unsolvable problems from the start of the industrial revolution and colonization. Bioremediation of dye effluent & wastewater after twenty days under the influence of Eichhornia & Pistia species shows significant changes in the concentration of impurities. The change was observed by Physico-chemical, Nutrients, Microbial Factors & Solid analysis of dye effluents with different interval of days. The percentage of nutrients absorbed by Eichhornia was better than Pistia. The level of impurities was reduced in a certain amount of activated charcoal & alum. Different percentages of NPK are found in Eicchornia & Pastia species.

Keywords: Bioremediation, dye, nutrient analysis, charcoal.

Biography

Avadhesh Kushvah has been pursuing his M. Sc. (Organic Chemistry) in the Department of Chemistry of Uka Tarsadia University, Bardoli. He is working as a Research Student in the project titled, "Production & Characterization Of Biodiesel From Nonedible Seed Oil" under the guidance of Mr. Pundlik Ware (Asst. Prof) at Department of chemistry, Uka Tarsadia University.

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Molecular characterization of IS407A-fliP genomic region of Burkholderia mallei

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Glanders is an infectious and highly contagious disease of solipeds with high zoonotic potential, caused by Burkholderia mallei, a Gram-negative, nonmotile, aerobic rod-shaped bacterium. Although this disease is not endemic but sporadic outbreak of this dreaded disease has been reported from various part of India. Rapid and accurate diagnosis is crucial for prevention and control of glanders. Present study aimed for molecular characterization of insertion sequence for developing molecular diagnostic test for rapid detection of B.mallei in natural glanders disease outbreaks.

Present study identified and characterized 3' end of insertion sequence in genome that is unique to B.mallei organism only and it can differentiate with other related organism. Briefly, Genomic DNA from B.mallei NCTC 3709 strain cultures was extracted using phenol: chloroform extraction method and Extracted DNA was quantified and checked for purity with spectrophotometer. The oligonucleotides primers were designed based on differences of flagellar P gene (fliP) from B.mallei ATCC 23344 (accession numbers NC_006348 and NC_006349) and B. pseudomallei K96243 (accession number NC_006350 and NC_006351). PCR reaction was optimized for amplification of IS407A-flip genomic region which produced ~396bp amplicon. PCR product was purified and confirmed by restriction enzyme digestion with AluI enzyme. For nucleotide sequence determination, purified PCR product (396 bp) was ligated into pGEM-T Easy vector by T/A cloning strategy and transformed into E. coli DH5α competent cells using x-gal screening methods. Positives clones were confirmed by colony PCR and EcoRI restriction enzyme digestion of Plasmid DNA from positive clones released ~396bp amplicon. Released product was eluted from the agarose gel and once again checked by restriction enzyme digestion with AluI enzyme. Nucleotide sequence of positive clones were determined and submitted in NCBI (accession no. JQ335996). Insertion sequence IS407A showed complete agreement with other B.mallei strain while fliP gene showed variability among different B.mallei strain and other micro-organism. This study clearly underlines importance of this insertion sequence in developing molecular diagnostic test for diagnosis of glanders. Consensus presence of insertion sequence IS407A in all B.mallei strains without presence of even single nucleotide polymorphism offers a wide scope to develop insertion sequence based molecular diagnostic test for detection of glanders. These diagnostic tests may helpful in precise diagnosis in natural glanders outbreak.

Biography

Chandan Prakash has completed his graduation with chancellor gold medal in veterinary sciences (BVSc & AH) from CSA University of agriculture and technology, Kanpur, Uttar Pradesh, and acquired post graduation in Veterinary Bacteriology from Indian Veterinary Research Institute with ICAR Junior Research Fellowship. Presently, he is working as scientist in centre for animal disease research and diagnosis (CADRAD), IVRI, Izatnagar, Uttar Pradesh. He has published papers in reputed journals of national and international level.

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Natural products: A molecular target for cancer prevention and treatment

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Cancer is the second leading cause of death worldwide. With few effective therapies cancer results in the death of a significant proportion of patients. As a result, the search for new treatments of cancer has rapidly gained momentum over the recent years. In particular, non-toxic "natural products" from natural resources in combination with conventional chemotherapeutic agents are proven useful in treatment of human malignancies with lower toxicity and higher efficacy. Recent data suggest that natural products like curcumin, tea, pomegranate, neem, extra-virgin olive oil, carrot, lemon, soybean, fish oil, tomato, garlic and amla can work as modifiers of signal transduction pathways to elicit their beneficial effects. These natural compounds are responsible for regulating cellular proliferation or apoptosis mainly by acting through nuclear factor-kappa B, mitogen-activated protein kinase signalling, Akt signalling pathway and several transcription factors, proteins, enzymes. This review will discuss recent research data focusing on these natural product-induced cellular signal transduction pathways. A clear understanding of the molecular mechanisms of action is crucial in the valuation of these potent molecules as potential prophylactic and therapeutic agents.

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Studies on detection and characterization of shigatoxigenic Escherichia coli (STEC) and enteropathogenic Escherichia coli (EPEC) associated with diarrhoea in infants in mizoram

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Diarrhoeagenic Escherichia coli (STEC and EPEC) are responsible for an estimated 300,000-500,000 death annually in children under the age of 5 years. STEC and EPEC are commonly recovered from the faeces of food producing animals and pose threats to health of humans and livestock. A total of 264 faecal samples were collected from infants with the history of diarrhoea from different hospitals of Mizoram. Samples were processed in laboratory for isolation of E. coli. All the E. coli isolates were screened for STEC and EPEC encoding virulence genes by PCR assay. All the virulence gene carrying E. coli isolates were subjected to serotyping (O & H), subtyping for stx_2 subtypes by PCR, detection of bfpA gene by PCR, vero cell cytotoxicity of STEC isolates and antimicrobial sensitivity assay.

A total of 540 E. coli isolates were isolated from infants. All together 17 (3.15 %) E. coli isolates were found to be positive for at least one virulence gene of which 8(1.5%) and 9 (1.67%) were recorded as STEC and EPEC, respectively. Of the total 8 (1.5%) stx_2 positive isolates, 5 (62.5%) were positive for stx_2c and 3(37.5%) were positive for stx_2e subtypes, respectively. Of the 17 (3.15%) eaeA positive isolates 3(17.65%) were positive for bfpA gene. 2 different somatic types and 4 different flagellar types were recorded. All the isolates were exhibited varying degree of CPE on vero cell lines. Enrofloxacin exhibited 100% sensitivity, whereas amoxicillin, polymyxin B and kanamycin exhibited 100% resistance in infant isolates during antimicrobial sensitivity assay. Serogroup O60 E. coli may be the emerging pathogens of infants in Mizoram.

Keywords: STEC, EPEC, Infant Diarrhoea, Antimicrobial sensitivity.

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Development and evaluation of DNA construct expressing nucleoprotein gene of H5N1 avian influenza virus for production of antiserum

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In this study, an attempt was made to develop and evaluate a DNA construct encoding its nucleoprotein (NP) gene of influenza A viruses (IAVs). The NP gene of a H5N1 avian IAV was amplified using a forward primer containing Bam HI restriction site and reverse primer with Eco RI site. The gene was cloned into pGEM-T Easy® cloning vector and then subcloned into pVAC-1 mcs vector®. The concentration of zeocin® antibiotic required for selection of recombinant clone containing pVAC-1 mcs-H5N1 NP DNA construct was found to be 50□g/ml. Sequencing of the recombinant plasmid confirmed that the open reading frame of the NP gene was in-frame with the IL2 signal sequence and transmembrane anchoring domain of the placental alkaline phosphatase of the vector at the 5' and 3' ends respectively. Six 4 week old specific pathogen free chickens each were inoculated intramuscularly with 50□g and 100□g dose of DNA construct and three birds from each group were given booster on 14th day. The pVAC 1-mcs-H5N1NP DNA construct induced sero-conversion by 5th week by ELISA kit in one of the chickens inoculated and boosted with 50μg of vector but it was less efficient than inactivated antigen. None of the other chickens showed any sero-conversion. The positive reaction with three subtypes of AIV viz. H5N1, H9N2 and H4N6 and none with NDV in western blot analysis indicated that the antiserum from sero-converted chicken was specific and could be used for group specific diagnosis of IAVs.

Biography

Lekshmi S Rajan has completed her B.V.Sc. & A.H degree in 2009 from College of Veterinary and Animal Sciences, Thrissur, Kerala and did her post graduation (M.V.Sc.) in Animal Biotechnology from Deemed University, Indian Veterinary Research Institute, Izatnagar.

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Removal of soil polymerase chain reaction inhibitors by addition of powdered activated charcoal

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Polymerase chain reaction (PCR) represents fast and reliable DNA amplification method applied in many scientific fields. However, its sensitivity to presence of various PCR inhibitory substances can lead to false negative results. Humic substances (HS), as major component of soil organic matter, are commonly found in DNA prepared from biological material exposed to environment. Due to their highly complex chemical composition, soluble HS readily co-purify with DNA and are difficult to remove without additional, often laborious treatments to obtain DNA suitable for PCR. The objective of the present study was to investigate removal of soil PCR inhibitors using powdered activated charcoal (PAC). The data show that soluble HS could be reduced up to 12-folds, based solely on change in temperature and time of adsorption. Complete PCR inhibition occured in 90% of unpurified samples, while 45% of PAC-purified samples were successfully amplified. In addition, optimized PAC-purification resulted in minimal loss of DNA and DNA quantity and quality obtained using this simple method and commercially available ultrafiltration column were compared.

Biography

Lucija Barbaric graduated in Biotechnology from Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia. Currently she works at Forensic Science Centre "Ivan Vucetic" and pursuing her PhD degree in Molecular Biology from Faculty of Science, University of Zagreb.

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Biotechnology of the honey bees: Morphometric analysis, floral rewards and floral calendar of the Asiatic honey bee Apis cerana in andhra pradesh, India

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The honeybees are one of the important and the oldest social insect forms which have the ecological capacity to sustain plant reproduction and rich source of honey production. Honeybee pollination sustains native plants and indirectly contributes to the control of soil erosion, the maintenance of plant biodiversity, which in turn beautify the human environment. Moreover honeybees pollinate native plants, which provide food for wildlife, and as inherent members of the local ecosystems. They play an important role in sustaining natural plants and animal communities that depend on them and hence are good indicators of the quality of the environment. The present study deals with the morpho-clusters of the Asiatic honey bee, Apis cerana F. (Order: Hymenoptera; Family: Apidae) in all seven agro-climatic zones of Andhra Pradesh State of India through sampling and morphometric analysis. Ten representative localities were selected in each agro-climatic zone based on the distance, topography and vegetation. Twenty one morphological characters were measured for twenty samples of worker bees of A. cerana collected from forage sources of each locality. As a result, the twenty one morphometric characters have been reduced to sixteen morphometric characters and then they were subjected to multivariate morphometric analysis. The inference is that there are two distinct populations of A. cerana in Andhra Pradesh. The study forms the baseline for improvement in A. cerana populations for good honey production and foraging efficiency in pollination and subsequent fruit/seed yield.

Biography

N. Govinda Rao has obtained his Ph.D. in Environmental Sciences from Andhra University Visakhapatnam. He has published 6 papers in reputed journals and presented his research findings in National/International conferences. His areas of interest are Bee Biology, Honey processing and development, Bioremediation, Bioengineering, Enzymology and Protein Chemistry.

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Lignocellulosic waste conversion into biofuel

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Due to finite petroleum reserves and the ever increasing energy consumption by the developed as well as developing countries has created an international unease. This international concern has led to the need for the search of other alternatives such as solar, water and wind energy conversion. A thing what matters is: Are we only going to consume what is available to us or being the most developed species can we make out something from the consumed or which is considered as waste? Lignocellulosic biomass present on our earth, consisting of cellulose, hemicellulose and lignin is considered to be as "Waste". This waste biomass can easily be converted into biofuel with the help of different chemical as well as biochemical conversion. Current strategies to delignify lignocellulosic materials, includes mild acid and alkali treatment, which often lead to the production of a number of fermentative inhibitors including that of Yeast. These inhibitors include 5-hydroxymethylfurfural and furfural, which are produced by the dehydration of hexose and pentose sugars, respectively. The significant improvements can be made if a process is developed to reduce toxic compound during lignocellulosic pretreatment and increase conversion of plant cell wall polysaccharides to monosaccharides. Lignocellulosic material can efficiently be converted into fermentable sugars through enzymatic hydrolysis using cellulases and hemicellulases without the conversion of inhibitors of yeast fermentation. Xylan, major polysaccharide of hemicellulose, requires the action of several hydrolytic enzymes due to its heterogeneity and the complex chemical structure. Xylanase can potentially be use in pretreatment of lignocellulosic material, mainly hemicellulose for conversion of fermentable monosaccharides.

Biography

Lalit Kumar is pursuing his PhD from Department of Paper Technology, IIT Roorkee, Uttarakhand, India. His research work is mainly on xylanase, an industrially important enzyme. He is a Post graduate in Botany with Gold Medal and has qualified CSIR-JRF-2007, UGC-CSIR-2010 and GATE -2008 in life science. His research interest includes molecular characterization, structure-function relationship of enzymes that is useful for industrial purpose. The structure determination of this protein will be helpful to improve the stability of the enzymes by mutational studies and thus modulate the function of these important enzymes.

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Solid state fermentation of Antigonum leptopus leaves for cellulase production from Trichoderma reesei

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Cellulase production: the most important step in the production of ethanol, single cell protein and other chemicals from renewable cellulosic materials. To date, the production of Cellulase has been widely studied in submerged culture process. Major impediments to exploiting the commercial potentials of cellulases are the yield, stability, specificity and the cost of the production. In the past decades only very little has been given to solid state fermentation. The applicability of the product, the high product concentration and reduce the cause of dewatering make SSF a promising technology for Cellulase production.

In the present study, cellulase enzyme was produced from Trichoderma reesei using Antigonum leptopus leaves as a substrate in solid state fermentation. Three different microorganisms were procured, which include Aspergillus fumigatus, Trichoderma reesei and Trichoderma veridae were studied for their ability to produce Cellulase enzyme on different substrates namely Antigonum leptopus leaves, maize corn husk, grape pomace and saw dust. It was observed that Trichoderma reesei and Antigonum leptopus leaves show higher yields compared to the other microbes and substrates evaluated. 24hrs seed culture of Trichoderma reesei gave higher Cellulase activity when compared to spore suspension and seed cultures of other fungi. Process parameter were optimized such as incubation time 72hrs,incubation temperature 30°c, particle size 180 µm, substrate weight 6 gms, pH-7.0 were found to be optimum conditions for maximum Cellulase product.

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Discovery of novel leads as dual acting inhibitors of acetylcholinesterase using pharmacophore modeling, docking consensus and 3D-QSAR studies for Alzheimer's disease

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Alzheimer's disease (AD) is the most debilitating and chronic irreversible neurological condition, characterized by dementia and cognitive impairment due to the depletion of acetylcholine in the nervous system. The existing experimental data obtained from animal studies and other neurological studies are all indicative that, the main cause of dementia is the decrease of the integrity of the cholinergic inputs, which is believed to be due to its rapid hydrolysis of acetylcholine in the synaptic clefts by acetylcholinesterase (AChE).The limited number of drugs available for the treatment of AD, and many recent studies which have provided ample evidences of the molecular mechanisms of the progression of the disease has been our driving force for designing novel agents for treatment of AD. The structural insights provided by many studies of our target enzyme, AChE, in recent times have boosted our confidence of designing more potent and safer agents to tackle the disease more efficiently.

The objective was to identify hit candidates with probable AChE inhibitors by a process of virtual screening the public databases based on pharmacophore hypothesis (positive ionizable group, two hydrogen bond acceptors, and two aromatic rings). The relevant hypothesis was built using the known inhibitors of AChE as templates to investigate the pharmacophoric elements that represent the critical receptor-ligand interactions. The identified hits were predicted for activity by the 3D-QSAR models i.e. CoRIA {Comparative Residue Interaction Analysis} and later short listed for in vitro testing. The most potent predicted compounds were procured from Enamine and tested by the Ellman's colorimetric method. The inhibitory concentration for the most active candidates was 1.7, 21.14, and 35.4 μM.

Biography

Elvis A. F. Martis is currently pursuing his Master of Pharmaceutical Sciences with specialization in Pharmaceutical Chemistry from University of Mumbai. He is currently working on various in silico methods to develop potent therapeutic agents for Alzheimer's disease. He has authored 11 papers which include four Research articles, six Review articles and one book chapter.

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Evaluation of antioxidant and anticancer potential and identification of polyphenols by RP-HPLC in Michelia champaca flowers

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There is a growing interest in the food industry and in preventive health care for the Development and evaluation of natural antioxidants from medicinal plant materials. In the present work, flowers of M. champaca plants used in ayurveda and traditional purposes in India were screened for their enzymatic, non-enzymatic antioxidants with antioxidant potentials in aqueous, ethanol and methanol extracts and cytotoxic activity. The Folin-Ciocalteu procedure was used to assess the total phenolic concentrations of the extracts as Gallic acid equivalents. A modified reverse phase high pressure liquid chromatography (RP-HPLC) was used to obtain chromatographic profiles of the phenolic compounds in the medicinal plants. The predominant phenolic compounds detected in different extracts of the flowers were catechin, quercetin, caffeic acid and p-coumaric acid. Results indicated that high levels of phytochemicals such as phenols, flavonoids, tannins as well as antioxidant potential and cytotoxicity were found to be more in the methanol extracts of M. champaca dry flowers. It is very interesting that the levels of enzymatic antioxidants were found to be high in the aqueous extracts of M. champaca fresh flowers.

Keywords: Medicinal plants, Antioxidant activity, Total phenolics, RP-HPLC, Enzymatic and nonenzymatic antioxidants and cytotoxic activity.

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Chemotherapy in the treatment of experimental visceral leishmaniasis caused by Leishmania donovani using chromenochalcones

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Visceral leishmaniasis (VL) is a chronic infection, caused by the protozoan parasite Leishmania donovani and L. infantum, transmitted through the bite of female phlebotomine sand flies. VL is endemic in more than 60 countries, around 59,000 deaths, with 200 million people at risk, 90% of the 500,000 cases per year happen in six countries: India, Bangladesh, Nepal, Sudan, Brazil and Ethiopia. All recommended treatments have several limitations including high toxicity, resistance issues, prohibitive prices, long treatment length or inadequate mode of administration. Moreover, there are no effective vaccines to prevent leishmaniasis. Therefore, the development of new antileishmanial agent with improved pharmacological properties is imperative.

Licochalcone A isolated from Chinese licorice roots efficiently inhibits proliferation of L. donovani and L. major promastigotes and amastigotes in vitro by inhibiting fumarate reductase, a selective target present in the parasite mitochondria. In continuation of our antileishmanial drug discovery program and based on our earlier findings, we synthesized the large number of chromenochalcones analogues using pyridine-catalyzed Claisen-Schmidt condensation reaction. All the 44 synthesized compounds were tested in vitro against intramacrophagic amastigotes of L. donovani. Amongst all, twenty two compounds displayed promising antiamastigote activity with IC_{50} ranging from 0.75 to7.66 µg/ml. Most of the compounds displayed better in vitro activity compared to the existing antileishmanials, sodium antimony gluconate (SAG) and miltefosine in respect to IC_{50} and selectivity indices (SI). Compound 7 identified as a most active analogue exhibited significant in vivo inhibition of 84.74% in L.donovani/ hamster model, and provided a new structural scaffold for novel antileishmanials.

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Assessment of antibacterial activity of some economically seaweeds from rameshwaram coastal areas of south India

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The different types of economically active seaweeds extract were used for antibacterial activity using four types of Bacterial strains. Out of four types of algal extracts, the methanolic extracts shown its maximum zone of inhibition against Pseudomonas aeruginosa measuring 14.7mm in Gracilaria corticata and minimum zone of inhibition 1.7mm in Sargassum wightii against Bacillus cereus, due to activity of bioactive compound. The order of activity decreases against some bacterial strains may due to resistant activity of bioactive compounds present in the extracts of seaweeds.

Keywords: Seaweeds, Antibacterial activity, Solvent extracts, Bacterial Strains.

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Potentials of sewage water treatment plant, surat by using rhizofiltration technique

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Sewage water is one of the sources that are responsible for many epidemic diseases. Bioremediation is green technique that reduces contaminates & nutrient from sewage water. The sewage under the influence of Eichhornia & Pistia species for twenty days shows significant changes in the concentration of impurities. The change was observed by Physico-chemical, Nutrients, Microbial Factors & Solid analysis with different interval of days. The percentage of nutrients and other parameters absorbed by Eichhornia was better than Pistia. The level of impurities was reduced in remarkable amounts by activated charcoal & alum treatment.

Keywords: Sewage, Bioremediation, Eichhornia, chemical analysis, charcoal.

Biography

Vikaskumar Shukla has been pursuing his M. Sc. (Organic Chemistry) in the Department of Chemistry of Uka Tarsadia University, Bardoli. He is working as a Research Student in the project titled, "Synthesis & application of carbon black obtained from pyrolysis of scrap rubber" under the guidance of Mr. Pundlik Ware (Asst. Prof) at Department of chemistry, Uka Tarsadia University. He has attended the state level seminar on 'Recent Trends and challenges in Dyestuff Industries' in Gujarat.

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Isolation, identification, characterization and antibiogram of Pasteurella multocida isolated from pigs in mizoram with special reference to progressive atrophic rhinitis

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Progressive atrophic rhinitis caused by toxin producing Pasteurella multocida in swine causes considerable economic losses to the pig rearing industry throughout the world. Four hundred nasal swabs were collected from 6 different districts of Mizoram. All the samples were processed detection and isolataion P. multocida by PCR and traditional bacteriological assays. Isolated organisms were subjected for multiplex PCR for capsular typing, screened for toxA gene and characterized by RAPD-PCR. Isolates were also tested for their antimicrobial sensitivity profile by disc-diffusion method. A total of 21 nasal swabs were found to be positive by P. multocida species specific PCR (PM-PCR) with an amplicon of 460 bp, of which 15 (3.75%) P. multocida could be isolated. All the isolates were grouped under capsular type A (n=9) and D (n=6) by multiplex PCR. In detection of toxA gene, all the isolates were found to be negative by specific PCR, indicating the isolates as non-toxigenic. All the isolates under similar capsular type provided a unique banding pattern by RAPD-PCR, whereas no discrimination was observed between serotypes. Antibiotic sensitivity assay indicated that majority of the isolates were 100% sensitive against the antimicrobials used. P. multocida is prevalent in the nasal swabs of pigs in Mizoram. PM-PCR could be a suitable technique for rapid and specific detection of P. multocida in compare to traditional bacteriological methods. Isolation of P. multocida by mice inoculation may improve the result. Capsular typing using multiplex-PCR further reduced the time for type specific identification of P. multocida.

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The state of art in mesenchymal stem cells in tissue engineering

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Stem cells have continuously attracted attention due to their unique property of self-renewal following which they differentiate into diverse specialized cell types. In adult organisms, stem cells act as a repair system for the body and replenishing adult tissues. The advancements in Tissue Engineering can be attributed to the ability to grow particular cells when required. Stem cells are thus the best option of progenitor cells that are capable of differentiation, while also giving rise to daughter cells. Multipotent Mesenchymal Stem Cells possess the ability to differentiate into a multitude of cells ranging from osteoblasts to chondrocytes and adipocytes. These cells can easily be obtained from the patient and are able to produce a large number of progeny that can be induced to form connective tissue. Thus, Mesenchymal Stem Cell (MSC)-based therapies have been suggested as a promising strategy in tissue regeneration. A thorough understanding of the origin and development of MSC heterogeneity will help to improve MSC culture conditions and thus facilitate their clinical use. The controlling, differentiation into tissue cells of liver, nervous system, bones or heart, preventing the uncontrolled proliferation after insertion are the challenging tasks ahead.

Keywords: Tissue engineering, stem cells, mesenchyma, and progenitor.

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Glucose oxidase deactivation in gluconic acid production

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The use of glucoseoxidase for the oxidation glucose has wide applications in analytical methods. However, application of the same to large scales has major issues. In the present work, selective oxidation of D-glucose to D-gluconic acid was performed at atmospheric pressure, controlled pH value and temperature. The glucose oxidation to gluconic acid was systemically studied using soluble and co-immobilized glucose oxidase and catalase in a bubble column membrane bioreactor for enzyme deactivation. The effects of residence time, aeration rate, membrane reactor and substrate-to-enzyme ratio for glucose conversion were investigated. A conversion of about 97% was attained with optimization of residence time. The results also show that the higher aeration rate had a negative effect on enzyme activity. Enzyme activity remained unaltered in membrane reactor up to 40 hours. Irrespective of substrate-to-enzyme ratios, both soluble and co-immobilized enzyme start deactivating after 28 and 200 hours, respectively; under optimized conditions.

Keywords: Glucose oxidase, catalase, co-immobilization, bubble column membrane bioreactor, gluconic acid, activity, deactivation.

Biography

Abhijit Rathi is pursuing his PhD as senior research fellow from DBT-ICT Center for energy biosciences at Institute of Chemical Technology. He is currently working on design and scale up of enzymatic biotransformation and has filed one provisional patent.

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Isolation of transposon mutant of Escherichia coli with altered biofilm formation

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The investigation of biofilm formation is critical to reducing infection rates as more than 60% of the clinically infectious diseases are associated with biofilm formation. Here, we used a plasmid pRL27, having an R6Kγ origin of replication, to generate transposon mutants altered in biofilm development in Escherichia coli 2443 (K-12 strain). The R6Kγ origin of replication requires the pir gene encoding the π protein, which binds at a 22-bp recognition sequence to initiate DNA replication. As the Escherichia coli 2443 is a pir negative strain, the plasmid pRL27 cannot replicate in it and this makes the plasmid an effective suicide vector for genome wide transposon mutagenesis. The plasmid was maintained in MFDpir strain, which is a diaminopimelate (DAP) auxotrophic mutant (dap–) of Escherichia coli and produces the π protein. The plasmid pRL27 was conjugatively transferred from MFDpir to Escherichia coli 2443 on minimal medium plates. Transconjugants were selected by plating the mating mixtures onto LB plates supplemented with dap (300 µg/ml) and kanamycin (50 µg/ml). The transposon insertion mutants obtained were screened for altered biofilm formation using crystal violet staining. The biofilm formation was normalized to planktonic growth, thus obtaining the biofilm formation index (BFI). Based on the results two mutants RM 56 and RM 69, showing significantly lower and higher BFI respectively, were selected. These mutants will be characterized further to identify the site of the transposon insertions and the underlying mechanism altering biofilm formation. This may be of benefit to develop a better understanding of biofilm formation.

Biography

Akash Kumar is pursuing PhD in Department of Biotechnology, Indian Institute of Technology Kharagpur. He has published one research paper in Research in Microbiology.

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Transformation of cholesterol by two novel isolates of Streptomyces sp

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Cholesterol oxidase (COD) is a bacterial FAD-containing flavooxidase that catalyzes the oxidation of cholesterol (cholest-5-en-3β-ol) using oxygen as an electron acceptor to form 4-cholesten-3-one (CEO) and hydrogen peroxide. Microbial cod is an enzyme of great commercial value, widely employed by laboratories routinely for the determination of cholesterol concentrations in serum and other clinical samples as a diagnostic enzyme. In addition, the enzyme has potential applications as a key enzyme in the biosynthesis of the polyene macrolide pimaricin antifungal antibiotic, used in biocatalysis for the production of number of steroids such as 4-androstene-3,17-dione and 1,4-androstadiene-3,17-dione, in the production of precursors for chemical synthesis of steroid hormones, as an insecticidal protein against boll weevil (Anthonomus grandis grandis Boheman) larvae. We are reporing production of extracellular COD by two novel Streptomyces sp. and transformation of cholesterol into CEO.

Extracellular COD production by the two Streptomyces sp. isolates was compared with the known COD producing culture of Streptomyces violascens NRRL-B2700. Maximum extracellular enzyme production was 10.5 U/ml at 48 hr and 8.3 U/ml at 64 hr respectively at 30°C and 180 rpm. Cholesterol was used as inducer at various concentrations from 0.1%-0.5%. Approximately 80% of cholesterol at 1g/l concentration was converted within 96 hr to CEO. The detection of cholesterol degradation products was ascertained by thin layer chromatography and quantified by HPLC. The maximal UV absorbance of cholesterol degradation product was at 240nm. Its mass spectra revealed an ion peak at m/z ratio 385.3 and the product was chemically characterized as CEO.

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Comparison of milk ring test with milk-ELISA for diagnosis of brucellosis

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Brucella contaminated milk is a potential threat to the new born calves and human beings. Udder and supramammary lymph nodes are the primary sites of Brucella multiplication in lactating bovine animals and hence become potential source of contaminants in milk. In response of bacterial multiplication, antibodies are produced by animal and get excreted in the milk. MRT and Milk-ELISA are reliable tests to detect these secreted antibodies. Organized dairy farm of Pantnagar was the target populations for present study. A total 246 milk samples of cattle were screened for Brucella antibodies by MRT and Milk-ELISA. Results showed that, 23.98% and 28.05% cattle population were positive for Brucella antibodies, respectively by Milk-ELISA and MRT. Detection of antibody in cattle respectively by MRT and ELISA in milk showed that, maximum percentage of crossbred animals (28.48% and 33.54%) had antibody against Brucella in comparison to indigenous group of animals (15.91% and 18.18%). Among age groups, 6 to <9 years age groups (33.71% and 38.20%) had maximum reactivity against Brucella followed by ≥9 years age groups (20.24% and 22.62%) and 3 to <6 years (16.44% and 21.92), respectively by MRT and Milk-ELISA. Results of this study revealed, brucellosis were significantly prevalent in target population. Statutory mass vaccination programme in susceptible animals are only method of control and eradication of disease since slaughter of cattle are banned in our country.

Biography

Anand Mohan completed his B.V.Sc & A.H. form GADVASU, Ludhiana (Punjab) and M.V.Sc. from GBPUA&T, Pantnagar (Uttarkhand) in Department of Veterinary Epidemiology and Preventive Medicine under ICAR-JRF with distinction. Now he is pursuing Ph.D in Veterinary Bacteriology from IVRI, Izatnagar (U.P.) under UGC-JRF. His two papers have been accepted for publication in Indian journals. He published fifteen abstracts in different National/International Conferences/Symposium. He had been awarded NCC-B certificate in 2006.

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Effect of chitosan based coppernano composite gel on the expression of various cytokines and growth factors involved in the healing of excisional wound in wistar rats

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Wound healing occurs through complex interplay between several cellular and molecular mechanisms, involving the activity of an intricate network of cytokines and growth factors. Copper nanoparticles regulate their modulation due to its high reactivity and small size. Chitosan based copper nanocomposite (CCNC) gel was used topically in the present study to evaluate its time dependent wound healing potential on a 2×2 cm2 open excision wound in adult Wistar rats. Experimental design consists of three groups in which acetic acid, chitosan and CCNC were applied topically on these wounds for 14 days and the collection of healing tissue was done on days 3, 7, 11 and 14. The cytokine and growth factor profile analyzed using real time PCR revealed that VEGF mRNA expression was up-regulated significantly by 26 fold on day 3 and TGF-β¬1 mRNA expression was significantly up-regulated approximately by 5.9 and 7.4 fold on days 3 and 7 in the CCNC-treated group, establishing its role in facilitating angiogenesis, fibroblast proliferation, and collagen deposition leading to normal architecture of skin. The inflammatory cytokine (TNF-α) and anti- inflammatory cytokine(IL-10) was also studied and results showed that TNF-α mRNA expression was decreased and the IL-10 mRNA expression was increased significantly in the CCNC treated group. Photographic evaluation and wound area measurement also supported the same result. So it can be concluded that incorporation of nanocopper in the chitosan develop an appropriate combination which efficiently enhances the different phases of wound healing by modulating different cytokines and growth factors on different days.

Biography

Anu Gopal completed her B.V.Sc. & A.H degree in 2009 from College of Veterinary and Animal Sciences, Kerala.She received Institute Fellowship from IVRI to pursue post graduation in Veterinary Pharmacology at Deemed University, Indian Veterinary Research Institute, Izatnagar. She is the Member of Kerala Veterinary Council and presently pursuing her post graduation from Deemed University, Indian Veterinary Research Institute, Izatnagar.

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New defence mechanism against viruses and cancer

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Introduction: Many drugs and therapies have been developed for treating viral infections, HIV/AIDS, cancer but with little success or adverse and toxic effects on the organisms. Scientists have found a mechanism which might help us fight with these, dreadful disease.

Interluekin 33: IL-33 is a cytokine belonging to the IL-1 superfamily. IL-33 induces helper T cells, mast cells, eosinophils and basophils to produce type 2 cytokines. This cytokine was previously named NF-HEV 'nuclear factor (NF) in high endothelial venules' (HEVs) since it was originally identified in these specialized cells. IL-33 mediates its biological effects by interacting with the receptors ST2 (aka IL1RL1) and IL-1 Receptor Accessory Protein (IL1RAP), activating intracellular molecules in the NF-κB and MAP kinase signaling pathways that drive production of type 2 cytokines (e.g. IL-5 and IL-13) from polarized Th2 cells. The induction of type 2 cytokines by IL-33 in vivo is believed to induce the severe pathological changes observed in mucosal organs following administration of IL-33.

Experiment: Scientist have exploited the mechanism of vaccination and found that when a foreign or viral particle enters our body which are regarded as PAMP's, these cells alert the dendritic cells and there by alert T-cells but the new mechanism found, relates the activity of dendritic cells with the injured cells which give out alarmins(factor) responsible for stimulating T-cells i.e., Interluekin 33(IL-33).It forms scaffold for T-cells and improves their activity and thus T-cells destroy the foreign or cancerous cells. It was found when a mouse was knocked out of the gene responsible for IL33 it could not sustain the viral attacks Conversely, IL-33 could be used to artificially increase the T killer cell army, which was generated in response to vaccination.

Result: The "foreign look" of viruses (PAMPs) activates the "dendritic cell" policemen to engage T killer cells. T killer cells, however, remain lousy fighters unless alerted by a cell death in their neighborhood. These new findings could provide a key to effective vaccination against infectious diseases and cancer.

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A dual purpose biological model for oxidation of sulphide waste and generation of electricity

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Two chamber microbial fuel cell has been studied since long time for waste water treatment. Among the different compound found in waste sulfide waste removal has gained significant importance as a consequence of its toxic effects and obnoxious properties. Conventional method of sulfide waste removal involves chemical oxidation of the sulfides to sulphates. Our present research is concerned with biooxidation of sulfide by Chromatium sp. using a mediatorless two chamber microbial fuel cell (MFC). The electrons released from sulphides during biooxidation will be captured and donated by the bacteria to the graphite electrode. The electrons flow to the cathode through an external circuit where potassium hexaferrocyanide acts as a catholyte. The balance of ions between the two chambers was maintained by a salt bridge. The proposed MFC model generated electricity with a highest power density of 0.0086mW/L of anode solution accompanied with 89% reduction of sulphide from the initial concentration. Thus this MFC model reduces sulfide level in the wastewater as well as provides a source of energy in the form of bioelectricity. SEM analysis was also done to detect presence of any biofilm formation. In this present mediatorless system, the transport of electrons was limited due to some medium components as could be demonstrated by cyclic voltammetry. Further study is being done on designing an appropriate medium and innoculum size to improve the power generation.

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Comparative Assessment of microbial load of the dose depended irradiated crab meat under cold preservation

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Irradiation has, of late, been recognized as a potential tool to improve the shelf life and safety of meat and meat products by restraining the pathogenic and spoilage microbes. The present study attempts to make comparative assessment of the microbial load of the various tissues of the edible crab, Scylla serrata after a dose - dependent irradiation and subsequent storage at freezing temperature (-20^{0}C). The tissues such as hepatopancreas, muscle and gills were irradiated at 0.5, 1.0 and 2.0 kGy using 10meV gamma rays at a dose rate of 3.8 kGy/h. The irradiated sample tissues were examined for the presence of microbes soon after irradiation (0 days) and after preservation at -20^{0}C at various time intervals of 7, 14, 21 and 28 days. The data on the microbial population were compared with those of non-irradiated controls maintained simultaneously. The microbial load showed statistically significant ($P < 0.001$) decrease in all the irradiated samples irrespective of their irradiation dosage and the types of tissues compared to those of the controls; and the decrease in the microbial load of the tissues irradiated with a dosage of 1.0 kGy is statistically comparable to those of the tissues that received 2.0kGy throughout the duration of the experiment (28 days), signifying that the radiation dosage of 1.0 kGy could be considered as the optimum dosage of preservation of the crab meat for at least four weeks. Our comparative analysis further showed that microbial load (due to irradiation) of each type of tissue has a specific pattern of microbial load irrespective of irradiation doses ((0.5, 1kG and 2kG) and time intervals (0, 7, 14, 21 and 28 days); maximum microbial load was noticed in gills, intermediate level in hepatopancreas and minimum level in muscles. The present paper also discusses the possibility to optimize of the irradiation dose to preserve the crab meat under 0 level microbial loads.

Biography

Arshad Keethadath has been doing research on the topic "The effect of irradiation on crustaceans with special reference to edible crabs" under the UGC-MANF Fellowship program. He has been worked as Project fellow under the DAE project, Govt. of India during the period from 2009-2012. He has 13 publications in the proceedings/abstract volume of National/international conferences. He has also presented a paper on DNA Fragmentation in irradiated tissues in an International conference held at Bharathiyar University, Coimbatore in 2011.

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Effect of caffeine on cognitive functions and behavioral symptoms of rats

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Cognition refers to things like memory, learning, speech and reading comprehension. Factors like aging, anxiety, depression and disease like Alzimer, Huntington, may affect cognitive function. Caffeine, worldwide consumed Methylxanthine stimulant drug is well characterized as a neuro modulator with known effect on motor behavior information processing and cognitive performance. It shows the effect according to age, sex, time of day, type of administration and dose. It affects all type of memory. We studied some of the characteristics of this psychoactive drug using an animal model. 12 adult male rats were used for study which divided into 3 groups of which one was control. Second was administered low dose of caffeine (10mg/kg) and the third was administered high dose (30mg/kg), according to their weight. The result of the study show that low dose of caffeine increases the memory and learning (positive effect), high dose decreases memory and learning (negative effect), But in case of anxiety there was a reverse effect.

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Role of immunostimulants and gut probiotics in the shrimp, Penaeus monodon aquaculture at amplam in srikakulam district of Andhra Pradesh

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Extensive use of antibiotics and chemicals in aquaculture for infectious bacterial and viral diseases leads to development of resistant lethal strains of microbes and the accumulation of antibiotics and chemicals in the shrimp, thereby hampering production and export. Use of beneficial bacteria like gut probiotics and immunostimulants showed promising positive results. The present study was carried out on the application of gut probiotics in the feeds of the shrimp, Penaeus monodon, with and without the addition of immunostimulants (1, 3 – ß glucan). The experiments were carried out in one control and two experimental ponds at Amplam in Srikakulam district of Andhra Pradesh during summer and winter months for two years. The immunological indices in the present study were graphically represented with line diagrams to evaluate the statistical significance. Total haemocytic and phagocytic counts were measured by collecting random samples from the shrimp haemolymph to evaluate the phagocytic activity with and without immunostimulants administered along with gut probiotics in the feeds. A significant growth, survival, increased haemocytic count and a phagocytic activity with resistance to diseases were observed. Immunostimulants administered along with gut probiotics are beneficial, economical, ecofriendly, produce no adverse effects and are more effective than administering chemicals and antibiotics for healthy and organic shrimp farming.

Keywords: Penaeus monodon, Immunostimulants, gut probiotics, haemocytes, phagocytes & antibiotics.

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Isolation and evaluation of phyto-compounds against cancer and expression analysis of related genes in cell lines

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Cancer is one of the world's most dreaded diseases causing the death of lakhs of people at the global level every year. It is estimated that there are 2 to 2.5 million cancer patients at any given point of time in India alone with about 0.7 million new cases coming every year and almost half of them die every year. Nearly two-third of the new cancer cases are diagnosed in their advanced and incurable stage. More than 60% of these affected patients are in the prime of their life between the ages of 35 and 65 years. Many methods have been adopted to treat the disease including the methods involving combination of drug therapies, but a complete cure has not been found beyond a certain stage. This challenging task has intrigued many researchers to work for a complete cure of the disease. Presently, Chemotherapy and Radiation therapy are used in the treatment of cancer. These therapies while curing the disease also damage normal cells adjacent to the cancerous cells apart from causing various other side effects such as nausea, vomiting, loss of hair, allergic reactions, liver disorders, heart arrhythmias, etc. Phyto-anti-oxidants having anti-cancer properties with minimal side effects are a good hope for treatment of the disease in future. The present study aims at identifying plant species having compounds with potential anticancer properties, their extraction, identification, quantification and evaluation against cancerous cell lines, besides identifying the levels of expression of the anti-cancerous genes.

Biography

C. Shivakanth is working for his Ph.D. degree under the guidance of Prof. D. Manohar Rao in Osmania University. He worked as Junior Analyst in Thomson Reuters (Scientific) for a brief period of two years after completing his Masters of Science (M.Sc.) degree from Osmania University in 2007.

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FTIR analysis for investigating transitions in the biochemical compositions of indigenous algae

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Development of high throughput method for tracking the transitions in the biochemical constituents in algal cells has become an important task from a bio-chemical engineering and biotechnology perspective. In the present study an ATR-FTIR (Attenuated Total Reflectance-Fourier Transform Infrared) spectrographic technique was developed for quantifying changes in various biochemical components of an algal cell as polysaccharides, protein, lipid and phosphates of cultured algal cells to rate its lipid accumulation abilities. Based on a statistical approach and efficient peak fitting, the measured ATR-FTIR spectra from algal cells were analysed using the spectra of the known quantities of the substances to determine their relative contribution to the overall cellular spectrum. From this specific absorption, absolute macromolecular cell composition was calculated using calibration curves, which have been validated by independent biochemical methods by elemental analysis. This technique can be used for research for investigations in time-resolved changes in quantifying the cellular composition of algae in algal biochemistry i.e. lipid production, nutrient and toxicant accumulation, stress response etc. and can provide solutions to several environmental problem. The non-destructive spectrometric technique improves the efficiency of algal screening processes during bioreactor working and analysis, and can act as a potential tool in metabolic engineering of algal cells.

Keywords: FTIR spectroscopy, algal lipid, biochemical composition, lipid accumulation, stress response.

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Influence of fungal strain Curvularia lunata on polyethylene waste films

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Polyethylene is one of the most widely used polymers which cause serious environment pollution and is certainly a cancer in nature. It is regarded to be a biological hazard since it is almost non- degradable.

Polyethylene films, 20-micron thick carrier bags were used to study the degradation pattern using the fungal strain Curvularia lunata. Polyethylene films were inoculated with fungal culture. The fungal culture was allowed to degrade the films. After regular time intervals the degraded films were harvested. The degraded film was characterized by FT-IR, SEM, contact angle measurement, weight change and the thermal properties were studied by TGA and DSC. The weight change results show 12-14% degradation in 90 days of culture exposure. The SEM analyses showed microbial adhesion of fungal mycelia and several pits were observed on the surface of the film which suggested that the fungi penetrated into the polyethylene matrix during degradation making the strips physically weak. The fungal strain increased the surface hydrophilicity through enzymatic oxidation and offered improved electron exchange between microbes and polyethylene, followed by biofilm formation. It is well known that oxidized forms of polyethylene surfaces are more susceptible for microbial attack and degradation than the hydrophobic non ionic polyethylene surfaces. This can be easily supported by the FT-IR spectra of the control and fungus treated polyethylene films. The result showed that the fungal strain Curvularia lunata despite the availability of other organic carbon of materials could utilize the plastics as their carbon source and hence degrade the polyethylene films.

Biography

Manisha Sharma has completed her masters in Biotechnology from Berhampur University and presently working as a research scholar in Indian institute of Technology (IIT), Kharagpur.

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Evaluation of Eucalyptus bark waste and corn cobs as a renewable carbon source for production of single cell oil as a biodiesel feedstock by Aspergillus terreus IBB M1

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Recently oleaginous fungi have emerged as an alternative feedstock for biodiesel production in the form of microbial lipids (single-cell-oils, SCOs). Filamentous fungi are known to degrade and utilize a wide range of lignocellulosic waste materials. Therefore, it is economically promising to develop a biodiesel production process using oleaginous fungi grown on such renewable carbon sources. The main intent of the present work was to evaluate the growth and lipid accumulation by a newly isolated Aspergillus terreus IBB M1 on Eucalyptus bark waste (EBW) and corn cobs, this fungal strain was earlier shown to produce SCO (54 % w/w) on glucose, in our laboratory (Khot et al., 2012). EBW constitutes the major lignocellulosic waste generated during debarking of the Eucalyptus wood in pulp mills.It was initially used as a sole carbon and energy source under solid state fermentation conditions without any chemical pretreatment while corn cob (CC) was taken as a conventional solid substrate for comparative study. The dried and milled substrates were moistened with mineral solution in wide mouth Erlenmeyer flasks (1:5 w/v) and kept for incubation in humidity chamber at 30°C for 7 days. The fermented mass containing mycelia and unutilized substrate was harvested, dried till constant weight and used to extract total cellular lipids as SCOs in presence of chloroform : methanol (2:1) by cryopulverization in a mortar and pestle using liquid nitrogen. The extracted fungal SCOs were analyzed for fatty acid composition by GC-FID and found to be rich in saturated fatty acids for both the substrates with 33% and 24% relative contents for EBW and CC, respectively. In particular, the SCO from EBW was rich in lignoceric acid (C24:0) indicating the direct transformation of lignin fractions of the waste into the fatty acids while oleic acid (C18:1) was the major dominant monounsaturated fatty acid. The PUFAs with ≥ 4 double bonds were not detected for SCOs obtained on both the substrates. A few biodiesel fuel properties (density, kinematic viscosity, iodine value and cetane number) were determined by prediction models for fungal SCO obtained on EBW and CC found to be in accordance with the national and international biodiesel standard specifications. The submerged fungal cultures were grown in shake flasks using EBW (1% w/v) and the SCO yield was determined to be approx. 1g/L after 120 h incubation. The results obtained suggest the suitability of bark waste obtained from Eucalyptus wood mills for the production of SCO with potential for biodiesel production.

Keywords: Single cell oil (SCO), Eucalyptus bark waste, mangrove wetlands, oleaginous fungi, Aspergillus terreus IBB M1

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Isolation & characterization of a strong antibacterial compound from Datura inoxia

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The present study was carried out to isolate the antibacterial and antifungal compound of Datura inoxia Mill against certain gram positive (Staphylococcus aureus), gram negative (Escherichia coli, Pseudomonas aeruginosa) bacterial strains and fungal strain (Candida) using agar gel diffusion method. Powdered leaf, stem, fruit, root and flower were extracted with different solvent viz., methanol, ethanol, chloroform, hexane, butanol & ethyl acetate. The dry residue after the evaporation of all solvent extract were dissolved in respective solvents (1:10 w/v) and tested for antibacterial and antifungal activities. The best suitable extract was further optimized from the results of antibacterial studies. The phytochemical screening of the leaves extracts was performed. Datura inoxia(leaves) was found effective against E.coli & Staphylococcus aureus. Datura(flower) was found effective against E.coli & Pseudomonas aeruginosa, Datura inoxia (fruit, root) was found effective against Pseudomonas aeruginosa. The antibacterial activities of ethanol extract and aqueous extract of Datura inoxia(leaves, root, flower & fruit) are checked by gel diffusion method. The leaves extracts exhibited significant inhibition. Comparative study of the results obtained from the above methods indicates that the ethanol extract (minimum inhibitory concentration of 50µgm/ml) shows better antibacterial activity against these strains. All the extracts showed concentration dependent activity comparable with the reference drug Streptomycin, Gentamycin and Tetracycline. Phytochemical analysis of leaf, stem, fruit, root and flower extract revealed that the anti-microbial activity of the plant material is because of the presence of different chemical compounds.

Keywords: Antibacterial activity, antifungal activity, solvents, phytochemical analysis.

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Insilico study of mechanism of azodye degradation in cyanobacterium Nostoc sp PCC7120

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Azodyes poses a great threat on public health due to their toxicity and carcinogenicity. Azoreductase enzyme plays a pivotal role in the degradation of azodye released by industrial effluents and other sources. However data available on the degradation pathways in organisms expressing this enzyme is very scarce. Our study attempts to analyze the interaction between the azoreductase enzyme and other accessory interacting proteins alr2106, alr1063, alr2326 in cyanobacterium Nostoc sp PCC7120. Insilico methodologies like structure modeling by I-Tasser server, Protein-Protein docking by ClusPRO were instrumental to attain the objectives. Our investigation shreds light on the possibility that the accessory interacting proteins in cyanobacterium Nostoc sp could enhance azoreductase activity and thus facilitating better dye degradation. Our future aim is to explore similar prospects in algae for enhanced azo dye degradation ability.

Biography

Nitanjay Singh completed his B.Tech in Biotechnology from SRM University, Chennai and is currently pursuing M.Tech in Chemical Engineering from National Institute of Technology, Tiruchirappalli. He participated in many national Conferences/seminars. His research interests include waste water treatment and algal Bioinformatics.

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Effect of heavy metals on morphology of actinomycetes

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Actinomycetes, a group of filamentous bacteria are reported to grow in presence of some heavy metals. It is also reported that bacteria change their morphology under different stress conditions. In the present research, effect of heavy metals on the morphology of actinomycetes is demonstrated. Nearly 50 strains were tested for their ability to grown in presence of different heavy metals like mercury, cadmium, iron, lead and nickel. These strains were exposed to gradually increasing concentration of heavy metals to choose the strain best representing directed evolution and better tolerance. A strain named as A-27 which could grow at 5mM of all heavy metals, was chosen for further studies. Morphological characteristics were studied by slide culture technique. The strain was grown on half strength medium in presence and absence of heavy metals at 1 mM concentration. In presence of lead, only aerial mycelium was seen there was no sporulation. Similarly, in case of nickel, sporulation was lesser than the control. These observations clearly indicate that heavy metals have an effect on the growth and morphology of the cells.

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Construction of infrared and green light based optical biosensor

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Optical biosensors exploit the theoretical and instrumental approaches of spectroscopy and the unique properties of biological molecules. We present here the design and construction of a simple inexpensive optical biosensor. The sensor is based on an LED colorimeter and polymer entrapped myoglobin. Myoglobin's absorbance maximum is sensitive to ligand binding. Moreover, the overlap of its absorbance spectrum with the emission of a green LED increases with cyanide binding. The sensors response was linear at least in the range of 50 to 200 mM cyanide. The experiment is appropriate for introductory chemistry, environmental chemistry, instrumental analysis, and biochemistry students. It was initially developed for a summer program with advanced high school students.

Biography

Rahul Singh is a student of B.Tech in Biotechnology in the Department of Biotechnology, Lovely Professional University, Punjab.

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The influence of Butea monosperma on doxorubicin-induced nephrotic syndrome in rats

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The objective of study was to evaluate the effect of n-butanol fraction (NBF) and ethyl acetate fraction (EAF) of flowers of Butea monosperma (BM) against doxorubicin (DOX) induced nephrotic syndrome (NS). A single injection of DOX (7 mg/kg, i.v) induced severe nephrotic syndrome after 4 weeks of its administration and was associated with hypoalbuminemia, hypoproteinemia, elevated serum urea (BUN), creatinine, hyperlipidemia, and a high urinary excretion of protein. Female Sprague-Dawley rats were divided into 7 groups (n = 6). Group I was treated with vehicle. Group II to VII were injected with a single dose of DOX (7 mg/kg, i.v.) to induce nephrotic syndrome. After administration of DOX, group I and II were treated with (vehicle, p.o), Group III was treated with prednisolone (3 mg/kg, p.o.), while the test groups IV, V were administered NBF (100 and 200 mg/kg, p.o.) and test groups VI and VII were administered EAF (100 and 200 mg/kg, p.o.) respectively, daily for 28 days. NBF (200 mg/kg, p.o.) reduced increase in urine protein excretion, plasma total cholesterol and triglycerides, BUN, creatinine. NBF was found to be more potent than EAF. The results confirmed the involvement of free radicals in the pathogenesis of nephropathy induced by DOX. The data suggest the potential of extract of Butea monosperma as a protective agent for nephrotic syndrome as alternative or as an adjunct to conventional therapy. The antinephritic potential of Butea monosperma could be attributed to its flavonoid and steroid content.

Biography

Nitish Chaudhari is currently persuing masters in pharmacy (Pharmacology) at Bombay College of Pharmacy, University of Mumbai, under the guidance of Dr. M. N. Saraf, Principal and Professor of Pharmacology.

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Development of single and multi-metal adapted arsenate [As5+] grown acidithiobacillus ferrooxidans – HGM 38 towards biooxidation of arsenopyrite ore- A method for gold extraction

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Acidithiobacillus ferrooxidans by their chemolithotrophic behaviour is widely implicated in bioleaching of metals from sulfidic ores. This process of metal extraction, an eco-friendly process and widely practiced in western countries, are more economically beneficial to lean ores, [metal conc in ppm-mgs] with normal metallurgical process not feasible. Arsenopyrite, an arsenic ore, is a lean ore of gold, with gold encapsulated within arsenic matrix. The current works aims in bioleaching of arsenopyritic ore with arsenic [As^{3+}/As^{5+}] multi-metal resistant thiobacilli strain. Multi-metal resistant strains effectively combat toxicity of solubilized metals beyond certain concentration, with enhanced bioleaching efficiency.

MC [Wild culture] and HGM-38 effectively grew on Fe^{2+} ions, in 72 hrs [% of Fe [II] oxidized = 97.0%] at 2.5 pH, 37°C, 180 rpm. On initial exposure to arsenate [20, 40 & 80mM] HGM 38 showed better growth in 72, 72 & 144 h respectively, while MC failed to grow even on prolonged incubation. By definite transfer pattern, 40mM adapted HGM 38 strain was developed [t= 48 h], while in 80 mM, iron utilization time remained constant [t=144 h], with better adaptation expected on further transfers. 40mM grown HGM-38 as inoculum, in nickel supplemented medium [20, 60, 80 & 250 mM Ni^{2+}] showed growth pattern in 48 – 96 hrs, while MC failed to grow at 250 mM. Thus arsenate adaptation increased the level of tolerance to Nickel. Further studies with other metals in single/combination, are in progress and discussed there on.

Biography

P. G. Greeshma is pursuing her Master's, currently working under the guidance of Dr. C. D. Venkatakrishnan for her M.Sc dissertation. Her undergraduation was from PSG College of Arts & Science., Coimbatore, and currently in SASTRA University., Thanjavur for her Master's program. Her mentor obtained his doctoral degree from Indian Institute of Technology, Madras, with post-doctoral experience in United States of America.

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Antiulcer and antioxidant potential of aqueous extracts of Annona squamosa and Achyranthes aspera in aspirin plus pyloric ligation model in rat

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Peptic ulcer disease (PUD) encompassing gastric and duodenal ulcer is the most prevalent gastrointestinal disorder. For decades it was believed that gastrointestinal ulcerations were caused by the excessive secretion of gastric acid, but many patients presenting such ulcerations had normal acid secretion rates. Then, researchers reported that peptic ulcers were been caused by an imbalance between the aggressive factors and a number of known defense mechanisms. An estimated 15,000 deaths occur each year as a consequence of PUD. In India PUD is common. In Indian pharmaceutical industry, antacids, and antiulcer drugs share 6.2 billion rupees and occupy 4.3% of the market share.

Today there are two main approaches for treating ulcer. The first deals with reducing the production of gastric acid and the second with re-enforcing gastric mucosal protection.

The anti secretory and anti ulcer activity of aqueous leaf extracts of Annona squamosa and Achyranthes aspera are compared standard antiulcer drug Ranitidine and evaluated. The antioxidant activity (Lipid peroxidation inhibiting activity and Nitrous oxide scavenging activity) of the respective extracts are compared for the effects with Ascorbic acid as standard. Present study establishes antiulcer and antioxidant potential in aqueous extracts of Annona squamosa and Achyranthes aspera in Aspirin plus pyloric ligation model in Rat.

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Comparison of indirect based ELISA by employing purified LLO and its synthetic peptides and cultural method for diagnosis of ovine listeriosis

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Listeriolysin O (LLO) known as a dominant antigen target of anti-listerial immunity; the present study was undertaken to develop an indirect ELISA employing immunodominant noncross-reactive synthetic peptides of LLO (LLO-1 and LLO-2) and its comparison with that of purified LLO based indirect ELISA using serum samples collected from 59 ewes which either had abortion or had a history of abortion. Initially isolation of Listeria was attempted from the samples collected from the ewes. A high seropositivity (54.2%) was observed against purified LLO; however, after adsorption of positive sera with Streptolysin O (SLO), the seropositivity was 23.7%. Overall seropositivity with LLO-1 and LLO-2 peptides revealed comparatively less cross-reactivity in comparison to that of purified LLO. Three of the four animals culturally positive for L. monocytogenes were also positive serologically for ALLO by both the ELISAs even after adsorption of test sera with SLO. Antibodies against purified LLO and synthetic LLO-1 peptide based ELISAs detected antibodies even in samples from which non-pathogenic Listeria spp. were isolated; however, LLO-2 peptide did not reveal any ALLO antibodies from those samples which were culturally positive for non-pathogenic Listeria. Thus, based on the current findings, it can be concluded that LLO-2 peptide can be used as virulent marker for serodiagnosis because of its non-cross reactive nature and highly specific for detection of L. monocytogenes.

Biography

Shabu Shoukat has recently completed her M.V.Sc. degree from Division of Veterinary Public Health, Indian Veterinary Research Institute, Izatnagar. During her Masters programme she was a recipient of ICAR Junior Research Fellowship. Besides, she is a member of professional societies such as Indian Association of Veterinary Public Health Specialists and Jammu and Kashmir State Veterinary Council.

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Thalassemia: Possible cure through gene therapy using lentiviral vector

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Thalassemia is a genetic disease caused by frameshift mutation of gene on chromosome number 11 (β-thalassemia) or 16 (α-thlalassemia) resulting in reduce or abolish formation of the β- globin and α-globin chain respectively that form hemoglobin. This promotes formation of abnormal hemoglobin molecules causing anemia. Treatments of thalassemia involve: blood transfusion, iron chelation therapy and bone-marrow transplantation. These methods have many complications like high risk of infection, negative response of immune system against the transplant and transfused blood, weak immune system due to immune suppressive drugs and these are temporary, time taking and expensive.

In this context, we can use our understanding of gene therapy through Lentiviral vector (LV). LV carry genes that promote host cell division, it reproduce inside host cell indefinitely without killing it and carry strong promoters for viral gene expression which can be subverted to control the expression of transgenes. Transferring functional gene to hematopoietic stem cells in bone marrow through LV can permanently produce normal hemoglobin. LV has shown promise in curing the thalassemia in mouse model, although it causes insertional mutagenesis. If we design a regulator which control expression or activation of oncogenes then it would be a possible, promising and permanent cure of thalessemia.

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Study of poly (ethylene terephathalate) nanocomposites for biomedical application

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PET nanocomposites with the fillers and the matrix polymer blend is of interest. The advantage of both organic material and inorganic fillers composite materials used good flexibility towards weight of the material, moulding ability and enhancement in the elongation strength of the polymer material. PET is well known semicrystalline polymer used for packaging, fabrication and automotive applications. PET is used for biological materials wrapping due to its excellent chemical resistance. Its composite is flexible towards thermal stress capacity, crystallization and heat dissipation

With the addition of fillers in the nanoparticle form such as Al2O3, BaTiO3 results in unique combination for useful applications. Nanocomposites based on such nanofillers with polymer (PET) are obtained by preparation using melt extrusion process. The concentration of nanoparticles was varied in four different microscaled. In the characterization of a composite TGA, SEM and IR data is discuss. Dielectric property was improved with composites using Nonconducting antioxidant particles were studied using dielectric tester LCR Meter. The polymer material structure improvement in the poly dispersion form was observed in SEM micrograph. Due to the density variation of the particle effect on viscosity of the nanocomposite was studied using TGA data. Structural morphology is examined from IR data. The material shows improvement in the thermomechanical property. The smaller size can be innovation of encapsulation for packaging material of biomedical application.

Keywords: PET, Nanocomposite, biomedical application, Packaging.

Biography

Pravin N. Nikam is a research scholar, pursuing Ph.D. degree from Institute of Chemical Technology, Mumbai, which is one of the most reputed institutes of India. He is doing his research work under the valuable guidance of Dr. (Mrs.) S.M. Pawde. He is going to publish his research work in good reputed journal in short period.

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Salt induced changes of photosynthetic apparatus in Chlamydomonas reinhardtii

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Photosynthesis, the process through which plants convert solar energy to chemical energy by harvesting sunlight and transfer the excited energy from photosystems (PS) PSII and PSI, which are membrane protein complexes that helps in primary photochemical reactions. In general abiotic stress affects the plant photosynthesis particularly salinity stress. There are number of studies on salt effects on photosynthesis of prokaryotic and eukaryotic species which were short term treatment of different concentrations of salt. Here we have grown the green algae C.reinhardtii cells directly in the medium containing NaCl with different concentrations (50 mM, 100mM, and 150mM) which is more close to the natural condition. The impact of high salt concentrations on the structural organization of photosynthetic apparatus in C.reinhardtii was studied. Confocal microscopy data have revealed the morphology of the cells indicating that salt stress had delayed the cell division. Electron transport processes were investigated using OJIP curves which reveals that both donor and acceptor side of PSII were impaired at moderate concentrations of NaCl (100,150 mM).The chlorophyll a emission peak in low temperature fluorescence measurements (77K) was reduced in increasing salt stress grown cells indicating that structural changes at the level of PSII and PSI had occurred. Further, circular dichroism (CD) spectrum in the visible region associated with the strongly coupled chlorophyll dimers showed reduction in intensity, indicating that pigment–pigment interactions were altered. Thylakoid protein complexes have been characterized using BN PAGE where many of the protein complexes were down regulated in high salt conditions indicating that protein-protein and pigment-protein interactions have changed. Further, western blot analysis of thylakoids with PSII core and light harvesting complex antibodies have shown that antenna proteins CP47, 43 along with Lhc components Lhcb1, Lhcb4 were reduced which indicates that both core and Lhc antenna are equally sensitive to the above optimum salt concentrations. This damage may be due to reactive oxygen species generated in chloroplast.

Biography

Satyabala Neelam completed her M.Tech in Biotechnology in the year 2009 from University of Hyderabad, Hyderabad, Andhra Pradesh. She is pursuing her Ph.D in Department of Biochemistry, under Dr. S. Rajagopal, Reader, Department of Plant sciences, University of Hyderabad, Hyderabad India.

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Impact of nanotoxicity on cell culture and DNA

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Nanosized (Size<100nm) particles are uniquely suited to interact with biological machinery through inhalation and skin damage and parental route of administration. Nanoparticles like carbon, alumina, zinc oxide, titanium dioxide are spread through anthropogenic sources. These are transported to organs like brain, lungs, heart, liver, spleen, pancreas, kidney, bone marrow and nervous system through blood stream. The production of free radicals increased and production of antioxidants decreased. This can leads toxicity to tissues and cell culture. Resultant as DNA mutation, mitochondria damage finally cell death occurs. These are all sequences depend on the nanoparticle size, dose, physical and chemical characteristics, mandatory to protect human being from nano toxicity.

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RabDis: An expert system for rabbit disease diagnosis

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Rabbit husbandry has vast potential to improve the socio-economic status of the rural poor and to provide food security in terms of low cost animal protein. The total rabbit population of the country is about a million. Rabbit is highly prolific. Meat production in India is reported to be about 20 thousand tonnes/ year. Angora wool production is around 30 tonnes annually. Apart from providing wool and meat, Rabbits provide income from sale of kits, pelt and manure. Introduction of high yielding strains and varieties of rabbits, led to high susceptibility to many diseases among rabbit population. The rabbit farms are usually located in suburban or rural areas, where the immediate expert veterinary care is rarely available. The major loss due to mortality of rabbits is caused by delayed diagnosis and treatment. Further the access to knowledge on diseases, symptoms, diagnosis and treatment options, for the farming fraternity is limited. Raising awareness of these activities, an attempt has been made to develop a web based disease diagnosis database for rabbit farmers, field veterinarians, students, rabbit users, pharmacists and those involved in rabbit farming. Detailed description for symptoms, diagnosis, treatment, prevention etc. for each disease were collected and digitalized in suitable retrieval platform. With bioinformatics programming language PERL, PHP graphical user interface a web-based tool and dynamic web service was built for rabbit disease diagnosis. The "RabDis" is an expert web based model system where we can access the information through identified symptoms, lesions, disease etc for rapid diagnosis of rabbit diseases.

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Development of a novel CNT based coconut palm mesocarp extract composite for enhanced wound healing

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Carbon nanotubes are increasingly being considered for biomedical applications despite concerns over the toxicity of these materials. The use of CNTs in last few years for its therapeutic and medicinal values with the world scenario of diseases has intrigued us to move forward in research in this subject. Our focus mainly laid on development of a novel CNT based material with augmented healing abilities. Bio-active coconut palm mesocarp solvent extract were produced and specific therapeutic compounds were isolated using Thin Layer Chromatography (TLC) and qualitative analysis was performed by High Performance Liquid Chromatography (HPLC) to identify the bioactive components. Multiwalled Carbon nanotubes of 20nm in diameter synthesized in-house by chemical vapor deposition (CVD) method have been used for preparing the antiseptic composite. The synthesis protocols are established to obtain active composite with 2% of silk fibroin extract with enhanced stability characteristics. The composite solution of CNT/Coconut palm solvent extract is deposited as a thin film on a PTFE membrane by vacuum filtration. The tests based on Disc Diffusion Assay for antimicrobial activity has shown encouraging results. We propose to use this composite material as a CNT based herbal antiseptic displaying antimicrobial properties owing to the bioactive components of the solvent extract while the CNTs embedded in the composite film would promote electron signal transmission between neurons thereby stimulating nerve reconnection suggesting potential use of this nanotextured composite material for enhanced wound healing in cases of severe burns.

Biography

Sumit Kumar Singh completed his B.Tech in Biotechnology from National Institute of Technology, Raipur and is currently pursuing M.Tech in chemical Engineering from National Institute of Technology, Tiruchirappalli. He has published one paper each in national and international journal respectively. He has also presented poster in 51st International conference of Association of Microbiologist of India (AMI- 2010).

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Production of protease from rice mill wastes by Aspergillus niger using solid state fermentation

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The production of enzymes by bioprocesses is a good value added to agro industry residues. A comparative study was carried out on the production of protease using different varieties of Rice brokens (BPT-5204,CR-1009,RNR-10754,NLR-145) from Rice mill wastes as substrates in solid-state fermentation (SSF) by Aspergillus niger. Among the all tested varieties of rice broken NLR-145 produced the highest activity as 0.379µg/ml while RNR-10754 produced lowest protease as 0.159µg/ml under solid state fermentation conditions. The optimized conditions for producing maximum yield of protease were incubation at 30°C, 72 h and pH 6.The protease production from waste treatment could be commercially used in detergents and leather industry.

Biography

T. Mohammad Munawar completed his M.Tech from Osmania University. He is working as lecturer in JNTUA College of Engineering, Pulivendula, India. He has published 3 International papers in reputed journals.

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Production of functional fermented soybean using Bacillus strain FB315

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Cardiovascular diseases (CVDs) are one of the major medical problem in the modern world specially India and Southeast Asian countries along with Mediterranean region. WHO estimates that 23.6 million deaths by 2030 will be from CVDs alone? The largest increase in number of death will occur in Southeast Asia. By 2020 CVDs will be the largest cause of death and disability and the loss due to CVDs, stroke, and diabetes was 9 billion US$ in 2005 which is likely to increase to 237 billion by 2015 (WHO Global report 2005). The phenomenon of increase in CVDs may be due to various reasons like inadequate diet, aging, sedentary life style, stress etc. In India and Southeast Asian countries changing life style due to globalization, like shifting to western ways of fast food and other process foods which lead to skipping habituated, time tested healthy traditional food may also contribute to gradual rise of CVDs in these regions (Goenka et al., 2010, Bhoopat et al., 2010). Fermented foods have been traditionally produced and consumed for centuries provide an ample scope for study as it has hoards of fermenting microbes which belong to GRAS category. Nattokinase is a fibrinolytic enzyme produced by Bacillus subtilis natto isolated from natto, a traditional fermented soybean food of Japan (Fujita et al., 1993). This enzyme has been extensively studied on its role in fibrinolysis. Oral (Sumi et al., 1990, Yamashita et al., 2003) as well as intravenous introduction (Kamiya et al., 2010) of nattokinase enhance plasma fibrinolytic activity in rat model without any allergic reaction. Natto is nowadays sold commercially as a functional food not only in South East Asia but also in western countries including US. Similiar to natto a traditional fermented soybean food Hawaijar is consumed from ancient times in Manipur, India. This study primarily aims at exploring the possibilities of functional fermented soybean using fibrinolytic culture derived from Hawaijar.

40 Hawaijar samples were collected from different villages. Bacillus spp were isolated and screened for fibrinolytic activity. Four cultures were selected based on its activity and F/C ratio. The selected strains were identified using both Molecular techniques like ARDRA and sequencing of the 16S rRNA gene. Further the data was compared with by API CH50 kit data for confirmation. The selected four Bacillus subtilis strains were used to produce fermented soybean. On basis of rate of fermentation and sensory evaluation strain FB 315 was selected for production of Functional fermented soybean. The fermentation was completed within 24 hrs as compared to 4-6 days for traditional production of Hawaijar. The fibrinolytic activity of the novel fermented soybean was evaluated by Fibrin plate method as well as spectrophotometric method from the acetone extracted crude enzyme using plasmin as standard. The fibrinolytic activity and F/C ratio of the novel fermented soybean was found to be 15800plasmin Unit per gram of sample and 3.8. This new product may be a cheap edible therapy for myocardial infarction and other CVDs.

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Caspase-3 activity as a prognostic factor in colorectal carcinoma

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Several techniques to determine apoptotic frequencies in tumors have been described. In this study, we report that biochemical detection of enzymatic caspase-3 activity is a simple and quantitative technique to measure apoptosis in colorectal tumor cells. The relevance of the level of apoptosis in colorectal cancer for the clinical course remains unclear. Therefore, we studied the correlation between caspase-3 activity and prognosis of the disease in relation to different factors known to be involved in apoptosis induction. High caspase-3 activity significantly correlated with a higher risk of recurrence and was preferentially found in tumors of the right side of the colon. No correlation was detected between high caspase-3 activity and altered protein expression of p53, beta- catenin, or proteins of mismatched repair genes. This indicates that high caspase-3 activity has no evident correlation with the genetic Wnt-signaling or the mismatch repair mutational pathways. The caspase-3 activity significantly correlated with CD57(+) tumor infiltrating cells. Therefore, high caspase-3 activity in right-sided tumors might be induced by a specific lymphocytic reaction.

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Nanotechnology applications in stem cells and cancer

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Nanobiotechnology is the application of nanotechnology for the study of biological and biomedical systems. One of the major areas is the utility of nanoscale systems and nanofabricated devices to guide stem cell development and develop tools for cancer research. Since stem cells are able to self-renew and differentiate into specialized cell types, so called pluripotency , they have great potential to better understand diseases, aid in drug discovery and treat diseases. The breakthrough findings that adult cells can be reprogrammed to Induced Pluripotent Stem Cells (iPSCs) provide an important cell source for regenerative medicine and drug discovery. These iPSCs hold great promise for the study and treatment of human disease. Nanofabrication-based gene delivery of reprogramming factors into cells will facilitate generating iPSCs in a safe, efficient and effective manner. Cell-cell junctions play a critical role in stem cell proliferation and differentiation. It is essential to understand how stem cells interact with their microenvironment before realizing the full potential of iPSCs and other stem cells. The nanoscale interactions between stem cells and their microenvironment can be revealed by metrology tools Micro-/Nanofabrication technologies make it possible to construct micro-tissue models for understanding stem cell differentiation and tissue morphogenesis. The drugs that regulate stem cell behaviors can be good therapeutics. In this way, the 3-D micro-tissue model provides a platform for screening therapeutics and testing drug efficacy such as scanning electron microscopy, transmission electron microscopy, atomic force microscopy and fluorescence microscopy combined with cell biology techniques. The advance in nanotechnology will provide better metrology tools as well as molecular probes to visualize cell-microenvironment interactions. It is necessary to establish 3-D tissue models for stem cell studies. A rare subtype of cancer cells shares similarities with normal stem cells which possess unlimited self-renewal potential and differentiation capacity. These cells are referred to cancer stem cells. Comparing behaviors of embryonic stem cells, iPSCs generated from patients with cancer, and cancer stem cells in 3-D cultivation system will facilitate the discovery of therapeutic target.

Conclusion: The surrounding microenvironment of cancer cells plays a critical role in tumor genesis and metastasis. Micro-/nanotechnology can be used to construct 3-D microenvironments and deliver diagnostic and therapeutic agents. The established 3-D tumor model is very useful for animal experiments for cancer research, anti-cancer drug screening, and novel diagnostic and therapeutic testing. The marriage of nanotechnology and stem cell biology will provide a new avenue to address challenges in cancer research. This exciting frontier is expected to lead to transformative change in the way we diagnose and treat cancer.

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Computational approach for optimizing inhibitors of HMG-CoA reductase

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Coronary artery disease isone of the most investigated diseases in medicinal chemistry. HMG-CoA reductase (or 3-hydroxy-3-methyl-glutaryl-CoA reductase or HMGCR) is the rate-controlling enzyme of the mevalonate pathway, the metabolic pathway that produces cholesterol and other isoprenoids. Normally in mammalian cells this enzyme is suppressed by cholesterol derived from the internalization and degradation of low density lipoprotein (LDL) via the LDL receptor as well as oxidized species of cholesterol. This enzyme is thus the target of the widely available cholesterol-lowering drugs known collectively as the statins.

In present study crystal structure of HMG-coA 1HWK was prepared. Active site was identified. Virtual screening was performed against ligand data set prepared from different literature search and ZINC data base to identify a lead molecule. This lead molecule was optimized using molecular dynamics. These lead molecules show good docking score than statins.

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Isolation of Staphylococcus sps. from mobile phones and in-vitro study of Mollugo cerviana leaf extract on Staphylococcus sps.

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Micro – organisms are omnipresent. Thus, the pages on which we pen down our imagination are also the habitat for these microbes, with this in mind, we isolated micro – organisms from The mobile phones of students, staffs, workers and cleaners of our College, By using The cotton swabs. By gram – staining and observation under the microscope, Cocci were observed. On performing various biochemical tests such as catalase , oxidase, starch hydrolysis, gelatin, we identified the organisms to be a species staphylococcus sps . Antibacterial test were performed in – vitro using Mollugo cerviana leaf extracts to study its role on the inhibition of this pathogen. A standard borewell method was employed.

Keywords: Mollugo cerviana, Staphyloccocus, Catalase test, Oxidase test, Mobile phones.

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Biochemical analysis of epicardial and subcutaneous adipose tissue – A clinical correlation with cardiovascular risk factors

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Epicardial adipose tissue is the visceral fat around the heart which has special properties that distinguish it from the other adipose tissue. The role of epicardial adipose tissue related with the heart diseases found to be unclear. Hence, this study is to analyse the oxidant, antioxidant and lipid profiles of Epicardial adipose tissue and subcutaneous adipose tissue and clinical correlation with the cardiovascular risk factors. The oxidant, antioxidant and lipid profiles were done using standard methods. The proteins was extracted and run in SDS PAGE electrophoresis. Lipoproteins were separated using agarose gel electrophoresis from the both adipose tissue. Lipid profile and oxidant found to be more in the subcutaneous adipose tissue, while the antioxidant, HDL and phospholipids were more in the Epicardial adipose tissue. Vitamin C, HDL, phospholipids, triglyceride, ceruloplamin and total cholesterol ($p< 0.04$) were found to be more significantly associated with the comparison studies. The antioxidant found to be high in the diabetic patients affected with acute myocardial infarction. Lipoproteins were separated in both tissues and found to be high in subcutaneous adipose tissue. In conclusion, the Epicardial adipose tissue possesses protective mechanism and seems to be benefiticial to the cardiovascular system.

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Isolation of Staphylococcus sps. from mobile phones and in-vitro study of Mollugo cerviana leaf extract on Staphylococcus sps.

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Human serum albumin (HSA) is an important plasma protein responsible for the binding and transport of many endogenous and exogenous substances including hormones, fatty acids and foreign molecules such as drugs. Most of the drugs can bind to HSA and be transported to target locations of the body. For this study, Trimethoxy flavone (TMF) is used which is a naturally occurring flavone isolated from Andrographisviscosula and used in the treatment of dyspepsia, influenza, malaria, respiratory functions and as a astringent and antidote for poisonous stings of some insects. In order to see the binding, conformation and binding sites of the HSA-TMF complexation we used fluorescence emission, mass spectrometry, circular dichroism and molecular docking parameters. The fluorescence emission was quenched and the binding constant of TMF with HSA was found to be K_{TMF}=1.0 + 0.01 x 103 M^{-1}, which corresponds to -5.4 kcal M^{-1} of free energy. Micro-TOF Q results showed a mass increase of from 65,117 Da (free HSA) to 66,689 Da (HSA +Drug), indicating the strong binding of TMF with HSA resulting in decrease of fluorescence. The HSA conformation was altered upon binding of TMF to HSA with decrease α-helix and an increase in β-sheets and random coils suggesting partial unfolding of protein secondary structure. Molecular docking experiments found that TMF binds strongly with HSA at IIIA domain of hydrophobic pocket with hydrogen bond and hydrophobic interactions. Among which two hydrogen bonds are formed between O (19) of TMF to Arg 410, Tyr 411 and another one from O (7) of TMF to Asn 391, with bond distance of 2.1Å, 3.6Å and 2.6Å, respectively. In view of the evidence presented, it is imperative to assign a greater role of HSA's as a carrier molecule for many drugs to understand the interactions of HSA with TMF will be pivotal in the design of new TMF-inspired drugs.

Biography

G. Mahesh completed his M.Sc in Biochemistry in the year 2005 from University of Hyderabad, Hyderabad, Andhra Pradesh, after pursuing his master's degree, he joined as a JRF under Dr. S. Rajagopal, Reader, Department of Plant sciences. Now he is pursuing his Ph.D under the same supervisor in the field of Biochemistry. In the past four years he has published 5 papers in reputed international journals (Plos one, Journal of photobiology and photochemistry B, The Journal of physical Chemistry B, Journal of Molecular modeling).

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Anti-ulcer activity of andrographolide: Possible involvement of H+ K+ ATPase activity

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Introduction: Evidences have suggested that andrographolide attenuates gastric mucosal injury; however its mechanism has not yet been established.

Objective: The aim of the present study was to evaluate the gastroprotective mechanism of andrographolide isolated from Andrographis paniculata.

Methods: Andrographolide was evaluated against cold restraint (CRU), aspirin (AS), alcohol (AL) and pyloric ligation (PL) induced gastric ulcer models in rats. Potential anti-ulcer activity of andrographolide was observed against CRU (62.5%), AS (57.81%), AL (72.41%) and PL (60.00%) induced ulcer models. The standard drug omeprazole (10mg/kg, p.o.) showed 77.40% protection against CRU, 57.08% against AS and 69.42% against PL model. Sucralfate, another standard drug (500 mg/kg, p.o.) showed 62.72% protection in AL induced ulcer model. andrographolide significantly reduced free acidity (50.42%), total acidity (24.43%) and upregulated mucin secretion by 34.24% respectively.

Results: Andrographolide significantly inhibited H^+ K^+-ATPase activity in vitro with IC_{50} of 71.435 µg/ml respectively as compared to the IC_{50} value of omeprazole (30.24 µg/ml) confirming their anti-secretory activity.

Conclusion: The anti-secretory mechanism of andrographolide mediated apparently through inhibition of H+ K+-ATPase with corresponding decrease in plasma gastrin level, is novel to our finding. andrographolide was found to possess anti-ulcerogenic activity which might be due to its anti-secretory activity and subsequent strengthening of the defensive mechanism.

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Identification of toxicity mechanisms through the relationship between chemical exposure and changes in genome - Wide gene expression pattern by using bioinformatics tools and databases

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Toxicogenomics is a form of analysis by which the activity of a particular toxin or chemical substance on living tissue can be identified based upon a profiling of its known effects on genetic material. Once viable, the technique should serve for toxicology and toxin-determination, a role analogous to DNA-testing in forensic identification of individuals. Toxicogenomics may also be of use as a preventative measure to predict adverse "side", i.e. toxic effects, of pharmaceutical drugs on susceptible individuals. This involves using genomic techniques such as gene-expression level profiling and single nucleotide polymorphism analysis of genetic variation of individuals. Studies of those types are then correlated to adverse toxicological effects in clinical trials so that suitable diagnostic markers (measurable signs) for these adverse effects can be developed. Using such methods, it would then be possible theoretically to test an individual patient for his or her susceptibility to these adverse effects before administering a drug. Patients who would show the marker for an adverse effect would be switched to a different drug. While this approach is currently theoretical, it has great potential. There are many well publicized cases in which popular drugs such as Vioxx and Fen-Phen were pulled from the market because of toxic effects experienced by a small percentage of patients, with a cost of many billions of dollars to the companies responsible, and the loss of a helpful drug to individuals not at risk for the side effects. If an accurate test using Toxicogenomic methods could be developed, that successfully identified patients who are susceptible to these adverse effects. These drugs could be returned to market with very little risk. Such would have the triple benefit of re-allowing the therapeutic use of a previously banned drug, preventing potentially life-threatening side effects, and restoring the majority of the lost market share of these drugs to the company that developed them. Predicting its immense scope of application, we hence put forth this theory as a small donation to the sea named biotechnology.

Biography

G. Rajeshwari is pursuing her undergraduate in Bachelor of Biotechnology (IVth year) at Rajalakshmi Engineering College affliated to Anna University, Chennai, India. She performed many Paper and Poster Presentations in several National Conferences. She have underwent training in Bioinformatics tools, learnt several techniques related to molecular biology field, Chromatography Techniques (Protein Purification Techniques) and Animal Handling. She had a chance of understanding the techniques & methodologies followed in Pharmaceutical industries. She did piece of work on toxicogenomics & Stem Cells of her guide, M. Subash Chandra Bose.

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Biological forms, ubiquos organisms in sewage treatment – bioremediation

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The concentric problem faced by the society is sewage disposal. Many remedies were developed to overcome this serious threat but none of them were proved to be economically feasible and economically applicable. A novel way through which economically substantiated methods to replenish the useful products from sewage is directed. Application of biological agents like microbes, unicellular organisms in oxidation of sewage components is the novel idea developed. Use of halophilic, thermophilic, mesophilic , psychrophilic , sulphur oxidising bacteria to degrade complex molecules into simple molecular forms and various such methods were included in the presentation in detail.

New measures to develop economic oriented and eco friendly methods of Bioremediation are the topics discussed vividly in poster.fair conclusions are even included. Purification of eutrophic lakes is more stressed. Oxidation reactions, biochemical degradation of organic compounds by bioforms like microbes is called bioremediation.

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Biomineralization by biofilm producing bacteria (bio concrete)

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Bacterial surfaces such as cell walls or polymeric materials (exopolymers) exuded by bacteria includes slimes, sheaths, or biofilms, or even dormant spores can act as important sites for the adsorption of ions. Bacterially induced mineralization has recently emerged as a method for protecting decayed construction materials. In nature, building and remediation structures with local materials occurs without any requirement of extreme energy usage. This occurs through the application of microorganisms which deposit carbonates (as part of their basic metabolic activities), one of the most well known minerals. These deposits (commonly called as calcium carbonate crystals/ calcite crystals/ microbial concrete) act as binders between loose substrate particles and reduce the pores inside the substrate particles.

The use of bacteria for remediating building materials is a new idea, In nature many carbonate rocks have been cemented by calcium carbonate precipitation from microbes, This can be used for solving various durability issues of construction materials. Microorganisms are abundant in nature, which paves the way for massive production of bacterial calcium carbonate crystals. As the microorganisms can penetrate and reproduce themselves in soil or any such environments, there is no need to disturb the ground or environment unlike that of cement. This technology also offers the benefit of being novel and eco- friendly.

This new technology can provide ways for low cost and durable roads, high strength buildings with more bearing capacity, long lasting river banks, erosion prevention of loose sands and low cost durable housing.

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Designing and construction of binary vectors containing phytase gene suited for cereals transformation

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Cereals are the most important crops in the world. Phosphorous is stored in their grains as phytic acid which is an antinutrient agent due to its ability to bind with valuable minerals like calcium, iron and zinc. Monogasteric animals including human are incapable of utilizing the phosphorus bound in phytate due to low levels of phytase activity in the digestive tract. Plant biotechnology offers new tools to break down the phytat by introducing phytase gene in crops to increase nutrient content and their feed quality. For this, we designed a set of binary vectors containing phytase gene with different features, phytase genes from A. niger and E.col driven by three different promoters; maize Ubi, rice Act and CaMv35S, different selection markers for plants, kanamycine (nptII), hygromycine (hptII) and herbicide resistance (bar gene), Kozak sequence at start codon site and KDEL retention signal peptide at 3` end before stop codon. The murine signal peptide of mAb24 light chain also has been inserted in 3` of the gene. The main backbone of vectors obtained from Pcambia series. All the constructs confirmed with digestion followed by electrophoresis.

Keywords: Phytic acid, phytase, binary vector, regulatory elements.

Biography

Hassan Rostami is PhD student of biotechnology at CBT, IST, JNTUH. He is studding on barley regeneration and transformation for improving its feed quality.

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Analysis of plant growth promoting and prominent phenolic compounds producing rhizobacteria in rice

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In this study, survey and collected rhizospheric soil samples was done from different regions of Indogangetic plains in U.P. (Gorakhpur, Lucknow, Kanpur, Varanasi, Meerut and Mau). Physiochemical properties of rhizospheric soil were determined for their pH (ranges 7.0-8.4), EC-value (ranges 1.3-1.9ds/m) and organic carbon in soil (ranges 0.500-0.750 to 0.750-1.00% by permagnate method). Isolation of rhizobacterial populations were made by the different inoculation techniques (soil plate and serial dilution) on various general and specific culture media (Nutient agar, Jenson agar, Pikovshaya agar, Burk,s medium, NFB medium, Malate Medium and YEMA medium). A total of 143 rhizobacterial isolates of from rhizospheric soil samples that were visually characterized for their different morphotypes. As the different morphotypes were tested for the HCN production, Siderophore production and Phosphate solubilization, in which some of the isolates showed significant results. Prominent plant growth promoting rhizobacteria showing qualitative characteristics, further their samples were prepared in methanol and ethyl acetate for the phenolic compounds analysis (Sinapic acid, Ferulic acid, Veratric acid, p-coumaric acid, Vanillic acid, Syringic acid, p-hydroxybenzoic acid, Cinnamic acid, Benzoic acid, o-coumaric acid, m-coumaric acid, Caffeic acid, Salicylic acid, Protocatechuic acid and Gentisic acid). Secondary metabolite profiling for the phenylpropanoids i.e phenolic compounds was done to characterize rhizobacteria for the biomolecules production using HPLC standards. Some isolates were identified as prominent phenolic compounds producers. Identification and quantification of these phenolic compounds in culture filtrates, cell pellets and or in soil by these bacteria through LC-MS conditions is underway. During plant microbe's interaction using phenolic compounds i.e. biomolecules as plant growth promotion by the defence system activation, plant pathogens suppression by production of inhibitory compounds and or symbiosis by the production of quorum sensing compounds in the ecosystem. Therefore, identification and quantification of phenolic compounds producing rhizobacteria may helpful to develop consortia for some metabolic interaction in rhizosphere that may influence plant growth and productivity.

Keywords: PGPR, Phenolic compounds, and Rice

Biography

Lalan Sharma has completed his Ph.D. from G.B. Pant University of Agriculture and Technology, Pantnagar in 2010 and worked on "Variability in Sarocladium oryzae and Management of sheath rot rice". Obtained Jawahar Lal Nehru Memorial Award for his Doctoral Studies and also qualified All India Level Competitions like ICAR-JRF, ICAR-SRF, and ICAR-NET. Qualified ARS and Joined as Scientist (Plant Pathology) at NBAIM in 2010. He has published 4 research papers, 7 popular articles, and 5 proceedings chapters. He has participated in National conferences and also guided 4 M.Sc students. Presently, he is focusing on developing strategies to manipulate root-associated bacteria by estimation of PGPR and their secondary metabolites i.e., phenolic compounds to improve soil health and crop productivity with eco-friendly safe.

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Nanotechnology in medicine and antibacterial effect of silver based compounds

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Nanotechnology is expected to open some new aspects to fight and prevent diseases using atomic scale tailoring of materials. Most of the natural processes also occur at the nanometer scale regime. Therefore, a combination of nanotechnology and biology can solve several biomedical problems, and can revolutionize the field of health and medicine. Nanotechnology is powerful tool which could provide support to the medical science in several aspects such as targeted drug delivery, gene delivery systems and artificial implant. Nanomaterials aid in the development of devices for the diagnosis purposes certain analytical tools and also play a vital role in the development of drug delivery system. Metallic nanomaterials having antibacterial properties are considered as best .The crystallographic surface structure and the large surface as compared to the volume ratio enhances the chemical activity of the nanomaterials. Priority for study is given to bactericidal nanomaterials because of the several new bacterial strains which are potent to the most of the antibiotics. Scientists are involved in the research of silver nanoparticles and silver based compounds because of they have found healthy chemical activity against gram negative bacteria than the gram positive bacteria.

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Effect of immune pressure on antigenic and genetic characteristics of (H5N1) Avain influenza

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In India, outbreak of H5N1 HPAI virus in poultry was confirmed in Maharashtra on 18th February 2006. The virus was characterized as genetic clade 2.2 of H5N1 viruses, since then outbreaks have been reported in poultry almost every year till 2010. Recently, a new clade 2.3.2.1 of H5N1 virus has been isolated from chickens and ducks from Tripura in 2011. Antigenic analysis revealed significant antigenic differences between the two viral clades hence the present study was taken up with a goal to mimic the in vivo immune selection process of clade 2.3.2.1 virus in the presence of clade 2.2 viral antibodies. The H5N1 virus isolate A/chicken/India/03Cl488/2011 (clade 2.3.2.1) was given serial passages (50 passages) in embryonated SPF chicken eggs in the presence of chicken anti-serum against a clade 2.2 virus (A/chicken/West Bengal/239020/2008). Antigenic and Genetic analysis was carried out and different variants were generated, as expected, nucleotide substitutions were observed in the highly variable HA gene of the H5N1 virus.The mutations in the nucleotide sequence led to amino acid substitutions. For example, there were three amino acid substitutions in the antigenically significant HA1 (P74T, R189G and T315I).Analysis of HA amino acids sequence with NetNGlyc 1.0 server revealed of one additional glycosylation site at position 72 due to amino acid alterations P74T. In addition avian-receptor specificity (α2,3-linkage sialic acids) polybasic amino acid motif in the HA cleavage region, and susceptible to anti-influenza drugs were analysed. The present study highlights the importance to understand the antigenic drift that could evolve in case of vaccination, response that aim at maintaining a high level of avian emergency preparedness and capacity to rapidily repond to disease outbreaks.

Biography

M. Qureshi has completed masters in Veterinary Virology from Indian Veterinary Research Institute. She carried out her research in HSADL, Bhopal (O.I.E reference laboratory), presently doing PHD in All India Institute of Medical Sciences, New Delhi.

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Effect of Paecilomyces lilacinus on the growth of tomato, population of root-knot nematode (Meloidogyne incognita) and their histological interactions

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A pot experiment was conducted to evaluate the effect of Paecilomyces lilcinus on the growth of tomato and on the population of root-knot nematode (Meloidogyne incognita) in glasshouse conditions. The histological interactions studies were also carried out to check the parasitisms of nematode eggs by P. lilacinus. Application of P. lilacinus one week before nematode inoculation caused an increase in growth and yield of tomato, and also reduced the nematode population as compared to other treatments. It is evident from histological interactions results that the P. lilacinus parasitized on the M. incognita eggs through the germination of formation of fungal hypae and conidiophores, which causes severe damage to the eggshells, egg masses and juveniles of M. incognita inside the eggs.

Keywords: Histology, Paecilomyce lilacinus; Parasitism; Meloidogyne incognita; tomato

Biography

Mohd. Sayeed Akhtar did his Ph.D. from Aligarh Muslim University, Aligarh, India and post-doctoral studies from University of Basel, Switzerland and Chonbuk National University Republic of Korea. Presently working as Assistant Professor in Department of Biology, College of Natural Sciences, Jimma University, Jimma, Ethiopia. He is the leading scientist in field of Microbial biotechnology and Nano-biotechnology. He has published several published several research articles in Journals of International repute and books from internationally recognized publishers. His research interest includes plant-microbe interactions, microbial and mycorrhizal biotechnology, bioremediation, soil biological health indicators, microbial molecular biology and nano-biotechnology.

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Role of HSPs in ameliorating deleterious effect of thermal stress in animals

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Stress is a complex phenomenon which alters normal physiological equilibrium or homeostasis of animals. It is revealed by inability of animal to cope with its environment, a phenomenon that is often reflected in the failure to achieve genetic potential for production traits. Cells increase the expression of several classes of proteins in response to environmental stresses such as heat shock. Heat shock proteins (HSP) are a class of functionally related proteins involved in the folding and unfolding of other proteins. Heat shock proteins are present in cells under normal conditions but their expression is increased when cells are exposed to elevated temperatures or other stress. Heat shock proteins family consists of many proteins which are classified as HSP110, HSP100, HSP90, HSP70, HSP60, HSP40, HSP10 and small HSP families. The principal heat-shock proteins that have chaperone activity belong to five conserved classes: HSP33, HSP60, HSP70, HSP90, HSP100 and the small heat-shock proteins. Some members of the HSP family are expressed at low to moderate levels in all organisms because of their essential role in protein maintenance. These account for 1-2% of total protein in unstressed cells which increased to 4-6% of cellular proteins when cells are exposed to heat stress. HSPs help in maintaining cellular homeostasis by three principal biochemical activities.- 1) Chaperonin activity 2) Regulation of cellular redox state 3) Regulation of protein turnover and they participate in numerous functions including folding of newly synthesized proteins, transport of protein into cell compartment, disaggregation of protein complexes and other functions.

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Mi-64: a high molecular weight glycoprotein from Mastobrancusindicus (marine polychaete) demonstrated antitumor effects in in vitro and in vivo models

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Marine polychaetes have been indicated for the treatment of several diseases including cancer by medicinal men in eastern part of India. The aim of this study was to explore the antitumor effects of Mi-64. Mi-64, a glycoprotein isolated and purified from Mastobrancusindicus (marine polychaete) whole body extract through DEAE-cellulose ion exchange chromatography and high performance liquid chromatography. The molecular weight of the Mi-64 was found to be 130kDa (Alam et al., 2012). MTT assay was performed to determine the antitumor effects of Mi-64 on U937 and K562 cell lines. IC_{50}value were 1.42±0.16 and 2.01±0.35 $\mu g.ml^{-1}$ respectively. Morphometry and bax/bcl-2 ratio studies indicated apoptosis induction in Mi-64 treated leukemic cells. Male Swiss albino mice were treated with Mi-64 (0.25 and 0.5 $mg.kg^{-1}.day^{-1}$) 24h later the Ehrlich ascites/solid tumor implantation.Mi-64 significantly decreased the number of viable Ehrlich ascites carcinoma (EAC), thereby increased the lifespan of EAC bearing mice. Microscopic (Fluorescence and confocal) study on Mi-64 treated EAC cells reveals certain features of apoptosis. DNA fragmentation was clearly observed in alkaline comet assay and agarose gel electrophoresis. Apoptosis induced by Mi-64 was further confirmed through flow-cytometric analysis of annexin-V/PI binding study.Sub-$G_0/_1$arrests in the cell cycle are found to be mediated through caspase 3 dependent pathways. Mi-64 treatment reduced the weight and volume of Ehrlich solid tumor, antagonized the pro-oxidant effect and balanced the pro- and anti-inflammatory cytokines. Histopathological studies also support the ameliorating effect of Mi-64.In conclusion, Mi-64demonstrated caspase dependent apoptosis in Ehrlich ascites/solid carcinoma.

Biography

Mohammed Aftab Alam has completed his Ph.D (2011) from the Department of Marine Science, University of Calcutta and published more than 15 papers in journals of repute. Currently, he is working as a Postdoctoral Fellow in the Department of Microbiology (CU) on platelet activation mechanisms and cancer biology. He is also serving as a Project Consultant in the Department of Marine Science (CU). He has worked on different in vivo and in vitro models of cancer, inflammation, osteoporosis, arthritis, atherosclerosis, toxicity, etc. Research interests are in marine toxins, drugs from sea, cancer and apoptosis, arthritis and autoimmune diseases, cardiovascular diseases and platelet research.

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Vanshanudhan: A rice gene database for geneticists and breeders

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Rice (Oryza sativa L.) is the staple food for almost 50% of the world's population. Rice genome is fully sequenced but sharing of genomic information with the world scientific community is one of the important hallenges. Many databases are maintaining rice genomic information but Vanshanudhan is very different because of its queries based searches. Vanshanudhan database (http://125.18.242.23:8080/genome/Login.jsp) facilitates search based on complete genome data including gene, cDNA and protein sequence. Present Vanshanudhan data is based on rice pseudomolecule version 3.0 released from Michigan State University with a unique gene nomenclature e.g. 01-0001, which defines chromosome number as well as gene number. We have upgraded the complete genomic information from pseudomolecule version 3.0 to version 7.0 and integrated it with the recently developed NRCPB rice marker information system which provides specific SSR and SNP marker information for each rice chromosome. We simultaneously incorporated NRCPB trait information system with it which is broadly classified into six different categories such as yield, quality, biotic stress, abiotic stress, plant architecture, biomass and further these are again classified into sub category . These marker and trait information systems are fully integrated with each other and are able to provide relevant query based information. The database platform is developed using MySQL in relational database management system and JSP is used as a middle ware. The entire database is implemented on high performance computing server with UNIX Sun solaris version 5.9 and easily accessed through links. This database aims to provide useful information for the researcher community engaged in rice crop improvement programme.

Biography

Pawan Kumar Jayaswal is at present working as a research associate at the National Research Centre on Plant Biotechnology, New Delhi, India. He has Master of Technology degree in Bioinformatics from SASTRA University, Tamilnadu, India in 2009. His research interest include next generation sequence data analysis, database development and in silico drug designing.

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PCR amplification for the identification of Fusarium sp from OMW and plant, and amplification of catalase/esterase encoding gene

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Lipase is an extracellular enzyme in Fusarium sp which has tremendous potential and application in pharmaceutical, food and in Detergents etc. This study was carried out to detect the lipase encoding gene in Fusarium sp by polymerase chain reaction, for this three Fusarium sp (FS1, FS2 and FS3) were isolated and identified from OMW and plant. The identities of the isolate were based on the morphological, biochemical characteristics of Fusarium as given in Fusarium manual of for identification of fungi. Carbohydrate utilization of the fungi and growth conditions were studied. Fungal sensitivity test was conducted and observed that all the three isolates were resistant to Ampicillin (A10), Pencillin (P2), and Methicillin (M5) and sensitive resistant to Ciproflaxin (CF5), etracyclin (T30) and Streptomycin (S10). Fusarim sp, pnp us was used as the control sample for all the tests. The Lipase encoding gene was amplified by Polymerase Chain Reaction and bands were observed at 0.5Kbp on Agarose gel electrophoresis using 500bp as the marker DNA indicating that the gene was encoded in the chromosome.

Keywords: Fusarium sp, Lipase encoding gene, fungal sensitivity test, Polymerase Chain reaction.

Biography

Ramesh Mantri completed his Doctoral studies and graduation in M.tech Biotechnology from Centre for Biotechnology, Andhra University in the year 2012 and 2002. He is currently working as Lecturer in Biotechnology and Pursuing for his Post Doctoral Studies in Abroad. He has sequence publication in NCBI GENBANK databases to his credit.

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Study of mesenchymal stem cells from umbilical cord tissue- A promising approach to human future

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Research on stem cells is advancing knowledge about how an organism develops from a single cell and how healthy cells develop in adult organisms. This promising area of science is also leading scientist to investigate the possibility of cell based therapies to treat disease, which is often to a regenerative medicine. Stem cells are one of the most fascinating areas of biology today. But like many expanding field of scientific inquiry, research on stem cells raises scientific questions as rapidly as it generates new discoveries. The major sources of stem cells are embryonic and adult stem cells. Embryonic stem cells, as their name suggests, are derived from embryos and the sources of adult stem cells are umbilical cord, menstrual blood, muscle, tendons, adipose tissue, bone marrow etc. Mesenchymal stem cells (MSC) or mesenchymal progenitor cells can be ex vivo expanded and induced, either in vitro or in vivo, terminally differentiate into osteoblasts, chondrocytes, adipocytes, tenocytes, myotubes, neural cells and hematopoietic – supporting stroma. The multi-potential of these cells, their easy isolation and culture, as well as their high ex vivo expansive potential makes these cells an attractive therapeutic tool. As they are multipotent, they are applied as a promising tool in regenerative medicine and new clinical concepts in supporting cellular theraphy. This leads to the purpose to find an alternative source of Mesenchymal Stem Cells as collection of MSC from bone marrow involves an invasive, painful procedure and low amount of functional, viable MSCs are isolated from the Human Umbilical Cord Blood and thus we are isolating the Adult Mesenchymal Stem Cells from Umblical Cord ant the isolated stem cells are cultured in vitro in culture medium. The isolated stem cells are cryopreserved in liquid Nitrogen vapour which can be retrieved for future studies. The isolated Mesenchymal Stem Cells can be characterized morphologically and also by Flow Cytometry using surface markers like CD90, CD105, CD31, CD34 and the viability is also checked using Tryphan blue. Control assay is performed to detect the presence of Mycoplasma and inorder to avoid the non specific binding of antigen to the antibody, the isotype controls were used in the form of immunoglobulin flourochrome moieties (IgG_1 –FITC and IgG1-PE). In this study, the isolated cells showed the typical characteristics of mesenchymal stem cells derived from umbilical cord. They were spindle shaped in nature and formed colonies in the primary culture and they resulted positive for CD90 and CD105 markers and negative for markers CD34 and CD31. Thus the isolated Mesenchymal Stem Cells are used for further studies such as differentiation, population doubling, karyotyping, animal studies for clinical trials and make it all the way viable for its use in transplantation procedures for curing the dreadful diseases.

Biography

R. Sangeetha is pursuing her undergraduate in Bachelor of Biotechnology (IVth year) at Rajalakshmi Engineering College affliated to Anna University, Chennai, India. She performed many Paper and Poster Presentations in several National Conferences. She have underwent training in Bioinformatics tools, learnt several techniques related to molecular biology field, Chromatography Techniques (Protein Purification Techniques) and Animal Handling. She had a chance of understanding the techniques & methodologies followed in Pharmaceutical industries. She did piece of work on toxicogenomics & Stem Cells of her guide, M. Subash Chandra Bose.

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Biofuels

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Biofuels are the energy of the future and a substitute for fossil fuels. Biofuel cells are made up cations and anions that continously convert chemical energy to electrical as long as catalysts such as microorganisms or enzymes are suplied to it. Different types of bio fuel cells are enzymatic and microbial fuel cells. Biodiesel from algae shall be discussed. Biodiesel is an eco-friendly alternative diesel fuel prepared from domestic renewable resources like vegetable oils and animal fats,which in turn are made of tryglycreides. Jathropa curcas has been identified in India as the most suitable tree borne oilseed it can be grown on any wasteland. Methods for preparing bio diesel are direct transformation of organic substances, catalytic depolymerisation and distillation process. Bio diesel can be blended in any ratio with petro-diesel. Biofuels are renewable and they can be used to suppliment hydrocarbon fuel assist in their conservation. Comparison of bio-diesel vs. diesel table, Performance of biodiesel and behavior on diesel engine parts shall be discussed. They help in increasing employment, enhance energy security owing to reduced independence on oil imports.

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Application of response surface methodology for optimization of removal of lead (II) from simulated waste water using alginate immobilized papain

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Lead (II) ranks second among the top twenty hazardous substances as listed by ATSDR. It is discharged through waste water coming from different industries viz. leather, paint, battery, ceramic, pottery etc. Due to its non-biodegradable and re-circulating nature, lead (II) accumulates in the environment causing a serious threat to human health and ecological systems. Thus, it is mandatory to reduce the concentration of lead (II) in waste water below permissible limit. Papain (E.C. 3.4.22.2), a cysteine protease, has the characteristics of metal binding due to presence of four sulfhydryl groups at its active site. Though several works have been done to analyze the performance of papain in different fields like medicinal, food etc., no work has been made to explore its metal binding property for abatement of lead (II) from waste water. In the present work, the efficacy of immobilized papain in removing lead (II) from simulated solution has been investigated. Papain is immobilized in calcium alginate bead by ionotropic gelation method and termed as Alginate Immobilized Papain (AIP). Lead acetate was used to prepare simulated solution of lead (II). The removal of lead (II) using AIP has been optimized by Response Surface Methodology (RSM) using Design Expert Software 8.0.5 considering initial concentration of lead (II), weight of AIP and pH as input factors and percentage removal of lead (II) as response. The optimum condition for removal as designated by software is as follows: initial concentration of lead (II): 31 mg/L; volume of solution: 30 ml; weight of AIP: 6 g, pH: 7; temperature: 30^0C. Theoretical prediction (99.37%) matches very well with experimental value (99.29%). Maximum 99.37% removal has been obtained at optimum condition. Lead (II) is recovered by stirring AIP-Pb complex in distilled water at different pH condition. Almost 35% metal recovery is achieved at pH 4 from 3 g of AIP-Pb complex at room temperature. SEM and EDS study confirm the binding of lead (II) with AIP.

Keywords: Immobilization, Adsorption, Papain, Lead removal, Lead recovery, Response Surface Methodology

Biography

Soumasree Chatterjee, Senior Research Fellow sponsored by CSIR (Council of Scientific & Industrial Research), Govt. of India, is pursuing her Ph.D at National Institute of Technology, Durgapur India. She has published 2 papers in reputed international journals and 7 proceedings in different national and international conferences. She is also the first author of a book chapter. Her research areas are Biochemical Reaction Engineering and Environmental Engineering.

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Biochemical analysis of epicardial and subcutaneous adipose tissue- A clinical correlation with cardiovascular risk factors

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Epicardial adipose tissue is the visceral fat around the heart which has special properties that distinguish it from the other adipose tissue. The role of epicardial adipose tissue related with the heart diseases found to be unclear. Hence, this study is to analyse the oxidant, antioxidant and lipid profiles of Epicardial adipose tissue and subcutaneous adipose tissue and clinical correlation with the cardiovascular risk factors. The oxidant, antioxidant and lipid profiles were done using standard methods. The proteins was extracted and run in SDS PAGE electrophoresis. Lipoproteins were separated using agarose gel electrophoresis from the both adipose tissue. Lipid profile and oxidant found to be more in the subcutaneous adipose tissue, while the antioxidant, HDL and phospholipids were more in the Epicardial adipose tissue. Vitamin C, HDL, phospholipids, triglyceride, ceruloplamin and total cholesterol ($p< 0.04$) were found to be more significantly associated with the comparison studies. The antioxidant found to be high in the diabetic patients affected with acute myocardial infarction. Lipoproteins were separated in both tissues and found to be high in subcutaneous adipose tissue. In conclusion, the Epicardial adipose tissue possesses protective mechanism and seems to be benefiticial to the cardiovascular system.

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Identification of virulent lactose positive Vibrio species from Nemipterus japonicus off visakhapatnam coast

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In the marine environment, unfortunately there is an increased incidence of bacterial infections caused by environmental and toxicological risks. As fish is a highly perishable food item due to bacterial contamination from the environment, the present study is aimed to isolate the associated bacteria in order to assess the quality and hygiene of edible marine fish, pink perch, Nemipterus japonicus. Samples were collected from mucus and internal organs of the fish and cultured under sterile conditions on various types of enriched and selective media for 48 hours at 37°C. The bacterial isolates were identified by employing various standard morphological and biochemical techniques. The pathogens were recognised as halophilic, lactose-positive, Gram negative, motile, curved bacterium Vibrio vulnificus. The lactose positive Vibrio is a recently recognised marine organism that has pathogenic potential for humans, which may cause blistering dermatitis, gastroenteritis, septicaemia and also affecting the small intestine through secretion of enterotoxins. Thus, the present study puts emphasis on sustainable quality and safety of the fish to the consumer.

Keywords: Pathogen, Lactose-positive, Vibrio, Nemipterus japonicus

Biography

T. C. Diana obtained her Ph.D. in Zoology at Andhra University, Visakhapatnam, India. She is now Principal investigator for DST Women Scientist Project, New Delhi, India. She is author of seven publications in national/ international journals and presented her research findings in national/ International conferences. Her areas of interest are fish biology, microbiology, pathology, immunology and environmental studies.

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Substance P: A new therapeutic intervention in the healing of diabetic wounds

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Diabetes mellitus is the leading cause of nontraumatic lower extremity amputations globally. Development of chronic non-healing foot ulcerations is one of the most serious and debilitating complications of diabetes. Cutaneous diabetic wounds in addition to causing pain and discomfort and predisposing the patient to superficial and chronic infection, involve significant cost associated with the long term treatment. The most common complications involved in a diabetic for delayed wound healing are: reduction in chemotactic and phagocytic activities of neutrophils, decreased angiogenesis, decreased eNOS activity, depletion of substance P (SP), increased oxidative stress and reduced number of growth factors like PDGF, VEGF etc. SP is a neuropeptide released by cutaneous neurons and is associated with inflammatory processes involving various cytokines and growth factors released from inflammatory cells, as well as epithelial and endothelial cells. It modulates responses in the skin by activating a number of target cells via neurokinin receptors and is able to cause vasodilation because of direct actions on vascular smooth muscle and enhanced production of nitric oxide by the endothelium. Depletion of SP in the central and peripheral nervous system and decrease in number of SP-positive fibers in the dermis of diabetic patients with diabetic neuropathy is one of the reasons of delayed wound healing. So, application of SP could be helpful in wound healing in diabetic patients.

Keywords: Diabetes mellitus, eNOS, Substance P, TGF-β1, VEGF and wound.

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Nanotechnology and its vistas in dentistry

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Nanotechnology, a conglomeration of the multidisciplines, includes biology, physics, engineering and chemistry. This field opened up to create new vistas for advancements in medical science and is providing novel approaches for disease diagnosis and prevention and promoting human health care. The ideology behind nanotechnology is to employ individual atoms and molecules to construct functional structures. These structures are highly specific to target the cellular and sub cellular (molecular) mechanisms of the body designed to achieve maximal therapeutic efficacy with minimal side effects. Various nanosystems can be successfully used as new drug carriers (drug delivery systems), and these nano-scale objects can deliver the repaired genes or replace the incorrect genes (gene delivery).

Nanotechnology plays a vital role in the maintenance of comprehensive oral health by employing nanomaterials, including tissue engineering, and ultimately, dental nanorobots thus generating a part of predicted future.

Biography

Aparajita Sunkavalli, a dental practitioner and a Periodontist, has completed her postgraduation in Dentistry in 2011, from GITAM University,Visakhapatnam. She has published a handbook on "The role of cytokines in Periodontal Diagnosis (2012)", an article, i.e., letter to the editor in Oral Oncology (2012), an article under revision in Oral Diseases.

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Primary infertility and human papilloma virus genotyping

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Human Papilloma Virus (HPV) infection is one of the commonest among the sexually active individuals and in some cases this infection could coincide with pregnancy in women and many times it causes infertility. In the present study, the examination of 315 women was carried out. Out of which, 98 cases were found to be of primary infertility. Among primary infertile cases, 80% of women, when tested with the aid of Papanicolaou stain smear test, were found to be negative while 20% positive cases were recorded. Further, the studies were carried out for detection and genotyping of HPV following standard Polymerase Chain Reaction (PCR) Protocol. The said investigation revealed that, out of 77 case studies carried out for HPV genotyping, high risk HPV genotype 16 is highly prevalent with primary infertility from Central Indian population as compared to other HPV genotype under study.

Biography

Prajakta Patil is a Research Student at the Rashtrasant Tukadoji Maharaj Nagpur University under the supervision of Arti Shanware.

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Effects of pentavalent arsenic toxicity on germination, seedling growth and peroxidase activity in black eyed bean

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Arsenic is one of the most toxic environmental pollutants because of its chronic and epidemic effects on human health through widespread water and crop contamination. There are concerns that arsenic can be absorbed by plants and can bioaccumulate in the food chain. Large numbers of studies indicated that low concentrations of arsenic can stimulate the growth of plants; but excessive arsenic can be detrimental for plant growth and survival. The objective of the study was to investigate the effect of pentavalent arsenic on the germination of Black eyed bean (Vigna unguiculata, variety: KH 11, PUSA), an important crop of northern India. The germination of the seeds were studied in presence of sodium arsenate solutions (As V) (0.5 ppm., 1 ppm., 1.5 ppm. and 2 ppm.). The sequestration of arsenic in different parts of the seedlings was estimated by using AAnalyst 200 atomic absorption spectrometer (Perkin Elmer, MA, USA) fitted with a FIAS-100 flow injection system. The root and shoot lengths were measured to study the changes in growth patterns. In order to assess the oxidative stress, Guiacol peroxidase (GPX) activity was estimated in different parts of the seedlings (root, shoot and seed parts) and were expressed in enzyme activity/min./gm. fresh tissue. The lengths of the roots and shoots of the seedlings increased significantly with the increase in concentrations of arsenic solutions after seven days of incubation. Peroxidase activity was found to be highest in the root parts, followed by seed and shoot parts. One possible reason for that is the direct exposure of the root and seed part with arsenic solutions, whereas shoot part emerges out of the culture plate and thus was not under the direct exposure of arsenic. Interestingly, peroxidase activity gradually decreased in the seed parts with increase in the concentrations of arsenic solutions, whereas in the root parts, peroxidase expressions decreased upto 1.5 ppm. arsenic solution and then the activity further increased in presence of 2 ppm. arsenic solution. However, no specific pattern of peroxidase expressions was found in the shoot parts. The study reveals that arsenic may have some interference with the growth factors and enzyme systems in Black eyed bean, which deserves further attention in future researches.

Biography

Sayan Bhattacharya is a faculty in the department of Environmental Science, Asutosh College, Calcutta. For the last five years he has been engaged in his doctoral research in Department of Environmental Science in University of Calcutta. He has published 17 International Conferences proceedings and several National Conference proceedings, 6 book chapters and 5 international journal papers. He has received young researcher awards from Govt. of India and IUPAC. He has more than 3 years of teaching experiences in 4 colleges and universities in West Bengal, India and has experiences as a reviewer in international peer reviewed journals.

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Molecular docking studies of potent adsorbed receptors of amino acids: A new target for biodegradation of indigo dye particles

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The present work investigated the biodecolorization and degradation of indigo dye particles using mixed adapted bacterial strains. The results of the identification of indigo degrading bacterium were analyzed by 16sRNA sequence. The nucleotides were distantly related to Staphylococcus aureus and Pseudomonas mendocina of these species showing 98% and 99% sequence similarity respectively with several uncultured bacteria in the BLASTn search. Staphylococcus aureus and Pseudomonas mendocina produced 7- methyl transferase and Thrh enzyme products respectively, when carbon and nitrogen (0.1%) were used as food supplements under aerobic condition. These enzymes were isolated by ammonium sulfate fractionation and purified to homogeneity using size exclusion and ion exchange column chromatography (DEAE- Sepharose A-50). The molecular masses of 7 methyl transferase and thrh gene product were ~ 28 kDa and ~ 23 kDa respectively serve differentially as saturates that have significant roles on indigo degradation. The optimum temperature for the enzyme activity was 80˚C at pH 6.5. Also we studied decolorization of indigo dye particles interaction between these amino acids together with theoretical analysis (model as a Glide flexible Docking program in Schrodinger) of three dimensional structures of enzyme molecules and proved that certain combination of enzymes had hydrophobic domins on their surface. The results of H-NMR spectrum and FTIR stretching of the treated dye output of the bioreactor indicated the non aromatic region at different time intervals (8, 16, 24, 32, 40, 48, 56 upto 72 hours). This work will be an initiative for the degradation of environmental hazards using amino acids.

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A symbiotic gas exchange between fermenters and photobioreactors enhances microalgal biomass and lipid productivities: taking advantage of complementary nutritional modes. Concept, applications and future directions

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The association of two bioreactors, photoautotrophic and heterotrophic, connected by the gas phase, allowing an exchange of O_2/CO_2 gases between them, benefiting from a symbiotic effect, is described. The O_2-rich outlet gas flow from the autotrophic bioreactor was used as the inlet gas flow for the heterotrophic bioreactor. In parallel, the CO_2-rich outlet gas flow from another heterotrophic bioreactor was used as the inlet gas flow for the autotrophic bioreactor.

One mixotrophic bioreactor was also used as a model, for its claimed advantage of CO_2 and organic carbon being simultaneously assimilated. Chlorella protothecoides was chosen as a model due to its ability to grow under auto, hetero, and mixotrophic nutritional modes, yielding high biomass productivity and lipid content, suitable for biodiesel production. Heterotrophic growth achieved the highest biomass productivity and lipid content (>22%), as well as the most suitable fatty acid profile in order to produce high quality biodiesel. Both associations showed higher biomass productivity (10–20%), compared to the sum of the two separately operated bioreactors (controls). A more remarkable result would have been obtained if the two bioreactors had been inter-connected in a closed loop. The biomass and lipid productivity gain would have been 30% and 100%, respectively, by comparing the productivities of the symbiotic assemblage with the sum of the two non-connected control bioreactors. These results show an advantage of the symbiotic bioreactors association towards a cost-effective microalgal biodiesel production. The concept can be extended to any single-cell-oil rich heterotroph, such as the yeast Rodotorula glutinis.

Biography

Alberto Reis, chemical engineer, Ph.D. degree (biochemical engineering) from the Technical University of Lisbon in 2001. In 2001, he was appointed as a Researcher at the National Institute of Engineering, Technology, and Innovation (INETI) in Lisbon, now the National Laboratory for Energy and Geology (LNEG). He was awarded as a postdoc at the Birmingham University (UK) for one year. He currently conducts research at the Bioenergy Unit of LNEG being a Coordinator of the Bioengineering Program at the same institute. He authored over 40 international peer-review scientific publications. He is the Editorial board member of Journal of Biomedicine and Biotechnology.

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Microbial desalination cell for simultaneous water desalination and current production

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A microbial desalination cell (MDC) is a new approach for desalinating water. Electrical current in this cell is generated by exoelectrogenic bacteria. This is accomplished by using a source of organic matter as the fuel to desalinate water. This study aims to achieve desalination using a laboratory scale H type three chamber reactor. Graphite electrodes were used as cathode and anode. The microbial desalination cell (MDC) was demonstrated using water at different initial salt concentrations (5 to 20 g/L) with sodium acetate used as the substrate for the bacteria. The maximum voltage produced during MDC operation with an initial concentration of 20 g/L (10Ω external resistor) was 190 mV, with a maximum current of 19 mA. The water in the middle chamber was desalinated. The 30 % chloride removal was obtained for initial NaCl concentration of 20 g/L.

Biography

A Carmalin Sophia is a Scientist in National Environmental Engineering Research Institute (NEERI). She is a recent Fulbright – Nehru Environmental Leadership Scholar (2011-2012). She is a Young Scientist Awardee of the Indian Science Congress 2004. She has innumerous International and National research articles published to her credit. She has travelled extensively to many countries around the globe like US, Brazil and Dubai.

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Efficient hydrogen production by novel microbial consortia (co-culture of Rhodobacter sphaeroides NMBL-02 and Bacillus firmus NMBL-03) from cane molasses

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Hydrogen is a clean and an efficient carrier of fuel. It is widely being accepted as a potential substitute for fossil fuels. Therefore, if hydrogen is to replace fossil fuels in the future, it has to be produced renewably and in large scale, through environmentally benign process. Rhodobacter sphaeroides NMBL-02, photosynthetic purple non sulfur (PNS) bacteria and Bacillus firmus NMBL-03 were isolated from water sample collected from 15-20 inches beneath the surface of ponds from Northern region of India. The PNS and heterotrophic bacteria associated with the culture was purified by clonal selection method and characterized by 16S rDNA sequencing The PNS isolate was identified as Rhodobacter sphaeroides NMBL-02 (ID: 1467407, Accession BANKIT: JN256030) and associated heterotroph as Bacillus firmus NMBL-03 (Gene Bank Accession no.: JN 256029).

The effect of initial medium pH on optimization of hydrogen production was investigated in temperature controlled CSTR (constant stirred tank reactor) using cane molasses as carbon source. The effect of initial medium pH on optimization of hydrogen production was investigated in batch process. The maximum hydrogen potential and hydrogen production rate was 3310 ± 55 ml/l and 18.50 ml/$l_{culture}$ h respectively using glutamate (1.7 mM) as nitrogen source at initial medium pH 5.0 using 1L batch reactor under optimized trace metal concentration using light intensity of 4.5 kLux at 38 ± 2°C. This co-culture has the ability to produce significant amount of hydrogen in pH range of 5.0 to 10.0 with 80% to 35% COD conversion.

Keywords: Hydrogen production, COD, Rhodobacter sphaeroides NMBL-01, Bacillus firmus NMBL-03.

Biography

Anjana Pandey had received PhD degree at the age of 26 years from Banaras Hindu University, India in the area of Biochemistry. She has published more than 35 papers in refereed journals. She is working in the area of Biological hydrogen production, plant biotechnology and Nanobiotechnology.

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Functional analysis of latex specific promoters (hevein) for the production of recombinants in transgenic Hevea brasiliensis

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Any protein, either naturally occurring or designed synthetically, could be produced safely, inexpensively and in large quantities by harnessing the laticiferous system of Heveabrasiliensis (Rubber tree) for the production of recombinant proteins on a plantation scale. Using the constitutive 35S CaMV promoter, recombinant Human Serum Albumin, ScFV antibody and β-glucuronidase have been successfully synthesised in the latex of transgenic Hevea plants. For the functional analysis of a latex-specific promoter, transgenic Heveawith hevein promoter fragments (0.2 kb designated as P1; 0.4 kb designated as P2; 0.7 kb designated as P3 and 0.9 kb designated as P4) fused to uidAc DNA gave signals for single and multiple copies for uidAgene and this was similarly reflected in the positive controls, using the constitutive 35SCaMV promoter (B6 plants) by Southern analysis. The expression of β-glucuronidase(GUS) in latex of transformants was identified qualitatively by the blue coloration of the latex using x-gluc (5-Bromo-4-chloro-3-indoyl-β-D-glucuronic acid) and their level of expression was classified using three categories (strong, moderate and weak) based on the intensity of the blue colour. The profile of the recombinant protein expression in Hevealatex-serum for controls (untransformed - C), negative control (transgenics containing promoterless vector - KAN), positive controls (transgenics containing 35S CaMV promoter - B6) and transformants (containing all four hevein promoter fragments - P1, P2, P3 and P4) is reported. The recombinant protein level for GUS in the latex of Hevea transformants and controls was quantified using ELISA technique. The level of GUS in latex serum from transgenic plants (B6) ranged from 0.079 to 0.063 µg/ml of latex serum. The levels of GUS protein (µg/ml of latex serum) in Hevea transformants P1 ranged from 0.0052 to 1.55; P2 ranged from 0.005 to 0.0012; P3 ranged from 0.0017 to 0.0027 and P4 ranged from 0.0002 to 0.0012. Untransformed and negative controls gave background levels. The highest expressing transgenic plants was derived from B6 using the 35S CaMV promoter for uidA gene (positive control) and P1 containing the smallest fragment of the hevein promoter foruidAgene.

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Pharmacokinetic and antigenic properties of Aspergillus flavipes (JF831014) L-methioninase *in vivo*

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Methionine starvation can powerfully modulate DNA methylation, cell cycle transition, polyamines and antioxidant synthesis of tumor cells, in contrary to normal cells. Aspergillus flavipes L-methioninase (Af-METase) displayed affordable biochemical properties comparing to Pseudomonas putida enzyme (ONCASE) as described by our previous studies. The catalytic properties of Af-METase in New Zealand rabbits were evaluated, in vivo. Af-METase (40.8 U/ml) have T1/2 19.8 hr, elimination constant 0.088 U/hr and apparent volume of distribution 85 U/ml. In vivo, Af-METase has two maxima one at A_{280}nm (apo-enzyme) and at A_{420}nm (internal Schiff base with PLP), unlike control plasma (without enzyme), as baseline. The two peaks of absorption spectra were detected maximally at 15 min then the absorbance at 420nm was subsequently decreased with circulation time, due to dissociation of the co-enzyme. The $A_{280/420}$ ratio was increased from 1.69 to 5.81 with circulation time from 15 to 30 hr. Plasma methionine of rabbits was depleted from 18.7 µM (control) to 8.8 µM after 1hr of enzyme injection. After 2 hr till 19 hr, L-methionine was not detected by HPLC column, assuming the sustainability of negligible levels of methionine (< 2µM) in plasma of rabbits, for about 17 hr. Upon infusion of PLP, the $T_{1/2}$ of Af-METase was significantly prolonged by 3.2 fold, assuming the fully reconstitution of the enzyme. The holo-enzyme form still retained its co-enzyme, completely, till 33hr of PLP infusion. From spectral studies, the internal aldimine linkage by apo-Af-METase was formed upon infusion of PLP, with fully catalytic structure after less than 4 hr of PLP infusion, the ratio of $A_{280/420}$ being not relatively changed till 45 hr. Immunologically, the titer of IgG was appeared after 25 days of last enzyme dose, by about 1.66 fold higher comparing to control (without enzyme). However, IgM was not detected along the tested challenge points. Plasma anti-Af-METase neutralizing antibodies (NAb) were assessed. No significant reduction on activity of Af-METase, only about 15 % of its initial activity was lost upon 40.8 U/ml, in vitro. All the hematological parameters were in normal range, except the titer of RBCs and level of platelet were shown to be slightly increased, after 25 days of Af-METase injection, comparing to control. There is no obvious negative effect on chemistry of liver, kidney, glucose, lipids, and other electrolytes.

Biography

Ashraf El-Sayed has completed his Ph. D in 2008 from Faculty of Science, Zagazig University, Egypt. I have postdoctoral studies in Applied Biology Department, Kyoto Institute of Technology, Japan (2008- 2009), focusing on production of gamma glutamyl dimmers as thermostable analogues to the corresponding amino acids that are valuable in food industries. Currently I am associate professor of biotechnology, faculty of science, Zagazig University. My current research concerned with biochemical, molecular characterization, immobilization and posttranslational modifications of some therapeutic enzymes as L-methioninase, cystathionine gamma lyase, homocysteine gamma lyase, arginase, arginine deiminase and L-amino acid oxidase. I have published more than 12 in reputed journals. I am reviewer for more than 30 published paper various reputed journals.

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Jatropha and algal biomass: Study on the better source for biodiesel

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Biodiesel is replacing the normal petrol and has become an irreplaceable necessity of the present World. Many researchers in India and abroad are working on the sources of biodiesel, in India mainly being Jatropha and Microalgae Which owing to their rich Biomass and cost effectives encourages commercialization of the same. The preset paper is a comparative study to find out the better source of Bioethanol and biofuel production. Results suggest microalgae to be better source due to following reason: more oil per acre than the current crops now utilized for the production of biofuels. They can produce up to 94,000 liters of oil per acre, shrinking land requirements and are easily grown under conditions which are unsuitable for conventional crop production i.e., marine water, wastewater, open ponds.

Biography

Harsha Kharkwal is Assistant Professor and Coordinator at Amity Center for Carbohydrate Research. She completed her Ph.D from National Botanical Research Institute, CSIR and continued her research work at University Institute of Chemical Technology, Mumbai. She is the recipient of Lucid research Award for 2004, has published more than 25 papers in Journals of repute, she has edited 1 book and has filed more than 40 patents. In such a short span, she has even guided 2 Ph.D students.

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Molecular characterization and structure analysis of a putative tumor suppressor QM homologue from the cabbage butterfly Pieris rapae

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The highly-conserved tumor suppressor, QM-like gene homologues have been cloned and characterized from various organisms including vertebrates such as mammals and fish, invertebrates such as insects (D. melanogaster) and shrimp (P. japonicus), plants, yeast and protozoan parasites. The gene encodes a ribosomal protein L10 and has been implicated to function during cell growth, cell differentiation, apoptosis and immunological defence mechanisms. The study describes the molecular characterization and structure analysis of a putative tumor suppressor, QM-like gene (designated as PrQM) found in a normalized whole tissue cDNA library of the cabbage butterfly, Pieris rapae, considered to be a serious agricultural pest in the world. The sequence comprised of 660-bp open reading frame and encoded a protein of 219 amino acids corresponding to 26 kDa protein with predicted ribosomal protein L10a/L10e domain. PrQM amino acid sequence showed high levels of conservation at their N-terminal regions with putative QM homologues from other insects. The apparent difference in functional modules in insects can therefore be attributed to the less conserved C-terminus. The cDNA corresponding to PrQM was thereafter cloned into pET28 (+) vector and expressed in E.coli BL21 cells, and the recombinant protein purified by His-tag affinity chromatography. The recombinant PrQM was detected as a single band of expected molecular weight of 29 kDa in SDS-PAGE. Polyclonal PrQM antibody was generated in Swiss-albino rats and western blotting studies recognized a polypeptide with a molecular weight of 26 kDa, relating to the endogenous PrQM protein, consistent with the theoretical molecular size. The anti-PrQM antibody was ultimately used to understand sub-cellular localization of the PrQM in infection models of Pieris rapae larvae.

Biography

Bharat Bhusan Patnaik has completed his doctorate from University of Madras in the year 2005 and is the recipient of International Scholar Exchange Fellowship by Korea Foundation for Advanced Studies for the year 2011-12. He has also served as UGC-NRCBS Visiting Fellow to Madurai Kamaraj University, Madurai and received the Indian Academies of Science Fellowship for Teachers to Visva-Bharathi University, Santiniketan. He has published quality papers in International and National journals and is a reviewer to Elsevier and academic journals.

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Biotechnology for industrial sustainability

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Industrial scale application of biotechnology has a tremendous potential as they are often associated with reduced energy consumption, greenhouse gas emissions, and waste generation, and also may enable a paradigm shift from fossil fuel-based to bio-based production of value-added chemicals.

The pivotal factor that contributes to the development and implementation of industrial biotechnology is the market economy, as biotechnology offers a highly efficient process at lower operating and capital expenditures. McKinsey & Company reported that in 2010 the industrial biotechnology contributed to 10 percent of sales within the chemical industry, accounting for $125 billion in value.

Some of the promising avenues of for a sustainable biotechnology are protein engineering, metabolic engineering, system biology, bioprocess engineering, and combinatorial biocatalysis.

The above technologies have significantly contributed to sustainability at the industrial scale. Sustainable industry has been coined to identify and classify those industries that produce goods and services in such a manner as to meet the needs and aspirations of the present without compromising the ability of future generation. Essentially, these industries strive to have a economically viable, environmentally compatible and associate "green social responsibilities" to their business objectives. Role of above technologies in promoting industrial sustainability will be discussed.

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Microalgae as potential source of anticancer drugs

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Microalgae are valuable source of many unique biologically active compounds including anticancer compounds. Micro algae include marine blue green algae (Cyanobacteria). Stigonema sp. is a type of cyanobacterium from which a compound "Scytonemin" is isolated. This compound can provide an important agent having anti-proliferative and anti-inflammatory activities. Cell extracts of Calothrix isolates are found helpful in inhibiting the growth of human HeLa cancer cells in a dose dependent manner. Calothrixin A (I) and B (II), pentacyclic metabolites are obtained from micro algae, which have growth inhibitory effects. Curacin-A obtained from the organic extracts of Curacao collections of Lyngbya majuscule is found to be unusually potent anti-proliferative agent. It shows inhibitory effect against colon, breast and renal cancer cells. Largazole is another compound having anti-proliferative activity was obtained from Symploca sp. And Apratoxins, obtained from cyanobacteria, have the ability of inhibiting a variety of cancer cells. An example of apratoxin is apratoxin-A which is obtained from Lyngbya boulloni and is found to have cytotoxic effect on adeno-carcinoma. A compound, coidamide-A obtained from Leptolyngbya is found to be cytotoxic in mouse models. Other discoveries are compounds cryptophycin 1 and 8, borophycin and cyanovirin. Borophycin is obtained from marine cyanobacterial strains of Nostoc spongiaeforme and Nostoc linckia var. tenue. It is a boron containing metabolite and is found to have effective cytotoxicity against human epidermoid carcinoma (LoVo) and human colorectal adeno-carcinoma cells. Cryptophycin-I obtained from Nostoc sp. GSV 224 have potent cytotoxic activity against human tumor cells especially solid tumors.

Microalgae notably Dunaliella and Spirulina are also rich source of natural beta carotene (precursor of vitamin A) and have been extensively tested for anticancer effects that are well documented. Besides beta carotene, a blue green algal pigment, cryptophycin demonstrates a powerful anticancer property that is especially useful in the chemotherapy of drug-resistant tumors.

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Plastid biotechnology for food security and bioeconomy

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The world population is expected to reach 9.2 billion by 2050. Therefore, food production globally has to increase by 70% in order to feed the world, while total arable land, which has reached its maximal utilization, may even decrease. Moreover, climate change adds yet another challenge to global food security. In order to feed the world in 2050, biotechnological advances in modern agriculture are essential. Plant genetic engineering, which has created a new wave of global crop production after the first green revolution, will continue to play an important role in modern agriculture to meet these challenges. Plastid genetic engineering, with several unique advantages including transgene containment, has made significant progress in the last two decades in various biotechnology applications including development of crops with high levels of resistance to insects, bacterial, fungal and viral diseases, different types of herbicides, drought, salt and cold tolerance, cytoplasmic male sterility, metabolic engineering, phytoremediation of toxic metals and production of many vaccine antigens, biopharmaceuticals and biofuels. This talk will give an overview over the current state of the art of plastid engineering in relation to agricultural production, innovation and bioeconomy.

Biography

Jihong Liu Clarke received her PhD in 2003 and has extensive experience in tissue culture and genetic engineering of various plants including Brassica napus, barley, tobacco and poinsettia. Recently, her research group is focusing on genetic engineering of ornamental crops and molecular farming for plant produced human and fish vaccines. She is supervisor/co-supervisor to 6 PhD and 4 master students and has been project manager for 10 projects since 2005. She is serving as an editorial board member for 3 peer-reviewed journals and has published considerably in addition to her role as a coordinator for China relations at her institute.

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Hypocholesterolemic activity of bovine casein hydrolysates fractions

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Increasing amounts of research show the bioactive role of peptides beyond their nutritional value. These food proteins derived bioactive peptides show huge potential to incorporate in functional foods, foods for specific health purposes and as nutraceuticals. These peptides have been found in various food sources in plant and animal protein origin. Peptides are released during fermentation or digestion of food proteins by proteolytic enzymes. Some of these released peptides exert biological activities such as antihypertensive, hypocholesterolemic, antioxidative, mineral-binding, opiate-like, antimicrobial, immuno- and cytomodulating activity. Now-a-days, the application of proteolytic enzymes in combination with new technologies such as membrane separation techniques allow the large scale production of bioactive peptides from various food proteins. This enables the enrichment of selected foods with bioactive peptides or the development of new functional foods. The present study focused on the bioactivities of casein hydrolysates for hypocholesterolemic (HC) properties.

Bovine casein was used as the source for the production of bioactive peptides by enzymatic hydrolysis using trypsin alone and with a combination of trypsin and pepsin at different time intervals. Crude casein hydrolysate was further fractionated by membrane separation technique using two different molecular weight cut-off membranes at 10 kDa and 1 kDa. The crude hydrolysate was then compared with the collected permeates. Hypocholesterolemic effect of the hydrolysates and the permeates, using trypsin showed a reduction of cholesterol level by 39.5, 50.7 and 69.6%, respectively. Furthermore, a pronounced hypocholesterolemic effect of 44.9, 52.2 and 87.0% was observed by the combined action of pepsin and trypsin. The combined effect of trypsin and pesin and fractionation by ultrafiltration proved to be effective in cholesterol reduction.

Biography

Imran Irshad completed his PhD in 2011 from University of Wales Institute, Cardiff, UK. He is currently working as assistant professor of food science at PMAS - AAUR, Pakistan. Formerly, served as a Technical Manager at Barons Patisserie, United Kingdom, for over 9 years, has an extensive knowledge in food safety and food quality well.

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Rational design and characterization of D-Phe-Pro-D-Arg-derived direct thrombin inhibitors

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[4]Mount Sinai School of Medicine, USA

Novel peptide-based thrombin inhibitors were discovered by use of computer-based docking procedures followed by experimental confirmation. These compounds contained both L- and D-amino acids, with the general sequence D-Phe(P3)-Pro(P2)-D-Arg(P1)-P1'-CONH2. One of the best compounds to come out of this study, D-Phe-Pro-D-Arg-D-Thr-CONH2, competitively inhibits α-thrombin with a Ki of 0.92 μM.

X-ray crystallography was used to determine the three-dimensional structure of three peptides of this family while complexed with human α-thrombin. All three inhibitors bind in a substrate-like orientation to the active site of the enzyme.

Two of the inhibitors were shown to disrupt the active site His57-Ser195 hydrogen bond. The combination of a P1 D-Arg and a bulky P1' residue induce an unfavorable geometry for the nucleophilic attack of the scissile bond by the catalytic serine.

The experimental models explain the observed relative potency of the inhibitors, as well as their stability to proteolysis. The newly identified direct thrombin inhibitors provide a new platform for developing antithrombotic agents.

Biography

Manfred Philipp received his Ph.D. at the age of 26 years from Northwestern University and did postdoctoral studies at the University of Freiburg and Johns Hopkins University. He is the President of the CUNY Academy for the Humanities and Sciences, Secretary for the Fulbright Association in the US, and Vice President of the German Academic Exchange Service Alumni Association in the US. He has published more than 30 papers in peer-reviewed journals.

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Crossing domains of nanotechnology, microbiology and analytical chemistry

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This is the era of nanotechnology, whose very success relates to the fact that it closely envelops the main stream research areas such as chemistry, physics and engineering blending human welfare related streams such as biology and medicine. Here, I would touch upon areas which I have been closely associated with, for the past two decades- nanotechnology, microbiology and analytical chemistry. Currently, my lab works on microbiological analysis from environmental and clinical samples using nanoparticle-assisted MALDI-MS technique. Here we combine nanotechnology, microbiology and an analytical technique such as MALDI-MS. My first contribution in this area was the rapid analysis of Gram-positive bacteria in water via membrane filtration coupled with MALDI-MS. We have also traced the Invivo growth kinetics of Staphylococcus aureus, pathogenic bacteria in animal model using mice. We have synthesized ZnO, Ag and TiO_2 nanoparticles inhouse and used them as affinity probes in bacterial studies for enhanced MALDI-MS detection. We have for the first time reported the degradation of bacterial extrapolysaccharides (EPS) using Quantum dots. We have also reported the use of mass spectrometry as a bacterial biosensor using TiO_2 NPs assisted MALDI-MS. I have coupled my experience in NPs and microextraction technique into microbiology in a project where we use Pt nanoparticles combined with Ionic Liquid to extract bacteria from Plasma via single drop microextraction. Another key area, where I have been working on is the introduction of nanoparticles and quantum dots for the detection of proteins, peptides, biomolecules and drugs. Recently, we have reported the use of functionalized quantum dots modified with dopamine as matrix for the quantification of efavirenz in human plasma and their rapid identification using MALDI-TOF-MS. At present we are working on the introduction of nanoparticles for detection of cancer cells using MALDI-MS. All these studies show the successful implementation of nanotechnology into analytical chemistry for microbiological analysis. Since all research and development is oriented towards human health and welfare, contributions such as these lay foundations to future implementation in clinical and medical studies.

Biography

Hui-Fen Wu received her Ph.D. degree from the University of Texas at Austin, USA in 1994. Followed by postdoctoral appointments at University of California at Berkeley, she went back to Taiwan as an Associate Professor (1996-2001) and Professor (2001-2006) in the Department of Chemistry, Tamkang University. She moved to the Department of Chemistry, National Sun Yat-Sen University in 2006 as a Professor and since 2006 her research work has focused on Nano-Biomedicine using Nano-based Mass Spectrometric techniques. Basically, an analytical chemist, she has diversified her research interests to the application of nano-based biological mass spectrometry in bacteriology, mycology, biotechnology, oncology and molecular biology. Her research diverges into areas such as proteomics, lipidomics, glycomics and metabolomics. To date, she has more than 100 publications. In National Sun Yat-Sen University, she is also associated with the Doctoral Degree Program in Marine Biotechnology (2009~), Center for Nanoscience and Nanotechnology (2008~), Institute of Technology and Medical science (2011~) and Center for Cross Research (2011~). She also serves as the editorial board member in Journal of Analytical Methods in Chemistry, American Journal of Analytical Chemistry, Journal of Biotechnology & Biomaterials, Journal of Biochips & Tissue Chips and Chemistry (the Chinese Chemical Society, Taipei) and also as an associate editor in Journal of Integrated OMICS. She is currently the director of Taiwan Society for Mass Spectrometry and delegated as review committee member of the Expensive Instrument Project, National Science Council.

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Bacterial cell surface display: Its medical and environmental applications

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Cell-surface display is the expression of peptides and proteins on the surface of living cells by fusing them to functional components of cells which are exposed to the environment of cells. This strategy can be carried out using different surface proteins of cells as anchoring motifs and different proteins from different sources as a passenger protein. It is a promising strategy for developing novel whole cell factories. Surface engineered cells have many potential uses in Biotechnology. Utilization of the surface of living cells is attractive in different microbiology and molecular biology applications. This technology allows displaying of different size of protein molecules, from small to large and from single-subunit proteins to hetero-oligomeric multi-subunits. In this presentation, we focus on the principles and some applications of surface display technology in Biotechnology fields.

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Role of urease and carbonic anhydrase in the calcium carbonate biomineralization

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The application of bacteria for ecological engineering purposes is becoming increasingly popular. Microbial carbonate precipitation has gained interest in the last 20 years in civil engineering, because of the selective cementation due to formation of deposits commonly called calcite crystals. These $CaCO_3$ crystals have advantages in special structures and excellent material properties through biomimetic synthesis. Microbial calcite precipitation comprises of a series of complex biochemical reactions. Certain bacterial species produce urease enzyme which is responsible for raising the pH of the system and production of carbonate crystals. However, studies related to carbonic anhydrase on calcite precipitation by these bacteria have not been studied in detail. In the present study we have studied the role of urease (UA) and carbonic anhydrase (CA) in the calcium carbonate biomineralization by Bacillus megaterium (SS3) isolated from calcareous soils of Anantapur district of Andhra Pradesh, India. Two types of experimental systems with and without B. megaterium which could produce extracellular UA and CA were studied to determine the effect of bacteria and bacterial produced UA and CA in calcite precipitation. The results showed that precipitation of Ca^{2+} was significantly faster in the experimental system with bacteria than that without bacteria. The effect of UA inhibitor acetahydroxamic acid and CA inhibitor acetazolamide was also studied to find the role of these enzymes in calcite precipitation. The results showed that calcite precipitation significantly reduced when both inhibitors are present in the system compared to the individual inhibitors. SEM and XRD analyses also confirmed the precipitation of calcite crystals by this bacterium. These results suggest that bacteria themselves could serve as nucleation sites for calcite precipitation and both UA and CA are involved in precipitation of Ca^{2+}.

Biography

M. Sudhakara Reddy has completed his PhD from University of Madras and postdoctoral studies from University of Lyon, France. He is the Professor and Head, Department of Biotechnology, Thapar University, Patiala. He has supervised 12 Ph.D. theses and published more than 70 papers in reputed journals. He also handled many research projects as Principal Investigator sponsored by different funding agencies such as DBT, DST, CSIR, UGC, AERB, and CEFIPRA. He is also honoured as Fellow of Mycological society of India and Fellow of Association of Biotechnology and Pharmacy.

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Optimization of medium for pullulan production using a novel strain of Exiguo bacterium sp. SH3

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The aim of this work was to study the effects of cultural parameters on Pullulanase production of Exiguobacterium sp. SH3. This bacterium produces an interesting cold-adapted Pullulanase with high catalytic activity at temperatures approaching freezing condition. To this aim, the combinatorial effects of seven cultural parameters including: time (h), temperature(c), pH, shaking speed (rpm), yeast extract (g/l), tryptone (g/l), starch (%) were analyzed at two levels using Plackett–Burman and Central composed design. The results indicated that the effects of 3 factors including temperature (25 and 40oC), yeast extract (1 and 3 g/l), and shaking speed (100 and 180 rpm) were statistically significant resulting in improved amylase productions. Temperature at lower level while yeast extract and shaking speed at higher levels were more suitable for Pullulanase production and secretion by this bacterium. The results revealed that cold condition is more suitable for Pullulanase production by this psychrotrophic bacterium. Yeast as a general growth-improving factor and shaking as an important factor for aerobic organisms at higher levels were effective. The newly psychrophilic PullulanaseSH3 seems to be suitable biocatalyst for practical use in liquefaction of starch at low temperature, detergent and textile industries.

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Direct multiple shoot induction and plantlet regeneration in soapnut(Sapindus emarginatus vahl)

M. Venkateshwarlu and D. Srinivas
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Multiple shoot induction in Sapindus emarginatus vahl has been achieved by two methods: (1) Direct germination of Sapindus emarginatus. vahl seeds in 6-benzylaminopurine (3.0mg/ L) supplemented MS liquid medium and supported on a filter-paper bridge and (2) in planta treatment with 6-benzylaminopurine (100 µg on alternate days) of the axillary bud regions of plants germinated and maintained under sterile conditions. While the former method resulted in as many as 7.5±8.6 shoot buds from the cotyledonary node within four weeks, the latter yielded on average approximately 8 shoot buds from each treated node in eight weeks. The cytokinin treatment in planta consisted of placing sterile filter paper moistened with sterile distilled water over the node and adding different concentrations of 6-benzylaminopurine. The shoots elongated and rooted directly in vermiculite after a pulse treatment with IBA (2.5 mg mL-1) for 15 min. Fungus growth, a serious problem in Sapindus emarginatus. vahl tissue culture, was controlled using a fungicide, Bavistin, along with elimination of organic nutrients from the growth medium.

Biography

M. Venkateshwarlu has completed his Ph.D at the age of 25 years from Kakatiya University under the guideness of Prof B.Mallaiah, Head, Department of Botany, Kakatiya University, Warangal, immediately he was started his committed teaching career as a Lecturer in Botany at Univesity College Kakatiya University Warangal in 2000 and he was appointed as Assistant Professor by University committee. He has published 26 research articles, co-authored 2 books and guided 6 M.Phil theses. He has attended 15 national seminars and 3 international seminars and also attends 4 symposia and workshops. His major fields of teaching and research include Cytology and Cytogenetics, Genetics and Plant Breeding, Molecular Genetics, Mutation Breeding, Plant Tissue Culture and Biotechnology. He successfully applied mutation breeding to Cucumis and tomatoes and developed several agronomically useful varieties. He established clonal multiplication of certain forest trees. He has a patent pending for In Vitro Propagation of Tassar Silk Plant.

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In vitro protocol for rapid micro propagation of Sapindus emarginatus vahl using nodal segments

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An efficient regeneration protocol under in vitro conditions has been developed for Sapindus emarginatus vahl. an important medicinal plant using nodal segments. Nodal explants of this species were cultured on Murashige and Skoog medium supplemented with various concentrations of auxins and cytokinins individually and in various combinations. BAP was found to be more effective than Kinetin for shoot multiplication. The highest number of shoots (8.0 ± 0.23) was achieved on MS medium augmented with 3.0 mg/l BAP. The medium supplemented with 3.0 mg/l BAP + 1.0 mg/l NAA responded better than all other media combinations.MS half strength medium supplemented with 3.0 mg/l IBA proved better with forty percent rooting after 22 days of implantation. Most of the roots were long and healthy. The micropropagated plantlets were hardened and acclimatized. They were successfully transferred in pots containing sterilized soil and sand mixture (1:1) with 60% survival rate under field conditions.

Biography

M. Venkateshwarlu has completed his Ph.D at the age of 25 years from Kakatiya University under the guideness of Prof B.Mallaiah, Head, Department of Botany, Kakatiya University, Warangal, immediately he was started his committed teaching career as a Lecturer in Botany at Univesity College Kakatiya University Warangal in 2000 and he was appointed as Assistant Professor by University committee. He has published 26 research articles, co-authored 2 books and guided 6 M.Phil theses. He has attended 15 national seminars and 3 international seminars and also attends 4 symposia and workshops. His major fields of teaching and research include Cytology and Cytogenetics, Genetics and Plant Breeding, Molecular Genetics, Mutation Breeding, Plant Tissue Culture and Biotechnology. He successfully applied mutation breeding to Cucumis and tomatoes and developed several agronomically useful varieties. He established clonal multiplication of certain forest trees. He has a patent pending for In Vitro Propagation of Tassar Silk Plant.

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DNA technology and human genome: Will it change our life in the future

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Around 3200 years ago, the legendary Solomon, the king of Hebrews was petitioned by two women, both of them claimed to be the mother of the same child. He decided to cut the child into two pieces and give half, half to each woman. Listening to this judgment, one woman cried, No! No! Don't cut the child into but give it to the other woman. She was thus the real mother. Now DNA fingerprinting technique could have solved this problem very easily.

Each cell nucleus contains chromosomes which are composed of DNA. Enclosed in the DNA are about 30,000 genes which regulate each and every function in our body. We have information about only 5% of the total DNA, remaining 95% of DNA is called 'junk' or 'extra' DNA. This extra DNA contains numerous repeated units which show higher level of variation between individuals and thus is exactly what it can offer in distinguishing one individual from other through profile. Initially DNA fingerprinting technique was used in the area of forensic sciences to solve the murder and rape cases, but now this technique has majority of uses starting from preservation of endangered species to mapping of the human genome. American President Bill Clinton and British PM Tony Blair announced on June 26, 2000 that HUMAN GENOME, and international government funded project and Celera Genomics, a private US company have both produced a working draft of the 3.1 billion chemical letters that contain the entire biological secrets of the human life. 20 Years from now, life and death will be very much different from what we experience today. Once the project cracks the final sequence every physiological function, structural details and behavioral traits will have been explained in terms of genetic makeup. It will explain that how diseases like cancer etc. occur. It will also be possible to know that if a newborn is vulnerable to certain diseases and prepare for the preventive actions.

Author is the first person in the world to start SCIENTOONICS, a new branch of science communication, which deals with effective science communication using a novel class of science cartoons called scientoons. SCIENTOONS are a new class of science cartoons, based on science. They not only make you smile and laugh but also provide information about new researches, subjects and concepts in a simple, understandable and interesting way.

This paper is an attempt to discuss in detail using SCIENTOONS a novel concept in science communication about the DNA Technology, Human Genome project including DNA fingerprinting technique, methodology involved and its future prospects not only in the crime detection but in several other dimensions and areas.

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Nanotechnology: Current status and future trends in applied medicine

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Many distinctive and potentially useful phenomena and properties emerge as size approaches the nanoscale level. These include transport properties (momentum, energy and mass) that extend from a continuum description to a molecular description. Similarly, the optical, electrical, magnetic and chemical properties tend from a classical to a quantum description. By manipulating the matter on a nanometer scale and taking advantage of changes in the physical properties, it is possible to develop nanoscale devices and materials that provide new capabilities, tools and technologies. Recent advances in nanotechnology with respect to material sciences, micro fabrication technologies and integrated device platforms have enlarged the application from integrated circuits to biological and medical areas. Current active research and development areas include Nanocapsules, Nanocrystals, miniaturized diagnostic devices with multiplexing capabilities, micro fluidic valves, miniaturized chemical reactors, encapsulated/ nanoparticle modified drugs, drug delivery systems that incorporate nanostructures for transdermal, pulmonary and oral delivery of complex pharmaceutical and therapeutic molecules. The review will cover a) current status of nanotechnology, b) materials used in the synthesis of nanostructures, c) tools used in nano-synthesis d) application of nanotechnologies in medical diagnosis, drug delivery, e) nanotechnology based security/ anti-counterfeiting and nano-optics. Advances in the areas of in vitro diagnostic applications will be detailed with special emphasis on Point-of-Care.

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Studies on antibacterial and antifungal activity of silver nanoparticle embedded textile

Rebecca Thombre, Amruta Mandhare and Neelam Kadam
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Nanotechnology has now started leaving the confines of laboratories and conquering new applications to change our lives. Nanoparticles possess increased structural integrity as well as unique chemical, optical, mechanical, electronic and magnetic properties compared to large particles of bulk materials. These unique properties are derived due to variations in specific characteristics such as size, distribution and structure of particles. Metallic and non metallic nanoparticles of Pb, Au, Zn, Fe, and Ag have applications in various fields. Silver has been used since ancient times in medicine. Nanoparticles of silver were produced using different chemical, biological and physical methods. Nanoparticles thus produced showed good antibacterial and antifungal properties.The formation of silver nanoparticles is characterized using UV- visible absorption spectroscopy (surface Plasmon resonance at 418-420) and also by using Energy Dispersive Spectroscopy (EDX), Scanning electron microscopy (SEM), X-Ray diffraction (XRD) and FTIR (Fourier transform infrafed spectroscopy. The silver nanoparticles were used to prepare silver Nanoparticle embedded textile by different methods. Antibacterial and antifungal activity of this cloth was assessed. The results obtained were good showing great future for application of Nanoparticle embedded textiles in various fields.

Keywords: Silver nanoparticles, UV-visible spectroscopy, Energy dispersive microscopy (EDX), scanning electron microscopy (SEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Nanoparticle embedded cloth, Percentage reduction assay.

Biography

Rebecca Thombre is Assistant Professor in Biotechnology at Modern College, Shivajinagar affiliated to University of Pune. She has pursued her Doctoral work on "Studies on Cyclodextrin glycosyl transferase by alkaliphilic bacteria" at Agharkar Research Institute, Pune. She was Gold medallist in M.Sc Microbiology at Mumbai University and received the Dr. Dhala Award and Eureka Forbes Scholarship for the same. She was awarded the First prize for highest marks in all faculties at the Graduate examinations conducted by University of Mumbai. Recently awarded the "BEST ORAL PAPER" award for work on Cyclodextrin glycosyl transferases in two National and International Conferences. She has a teaching experience of 9 years in reputed colleges of Mumbai and Pune University namely, Mithibai College, Juhu, Mumbai; VES College, Mumbai; Fergusson College, Pune and Modern College, Pune. Research Interest in Cyclodextrin glycosyl transferases, Nanotechnology and plant based anticancer compounds.

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Immobilization and effect of different metallic ions, activators and inhibitors on cells of Saccharomyces cerevisiae for improving ethanol production

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The present investigation was carried out keeping in view the potentials of cell immobilized techniques. The cells of Saccharomyces carevisiae were immobilized in different matrices viz. polyacrylamide, agar, Ca-alginate and K-caragenan. Out of these Ca-alginate proved to be the matrice for ethanol production. The ethanol production by immobilized cells of Saccharomyces cerevisiae in Ca-alginate beads was maximum. The ethanol production with immobilized cells was maximum at 30^0C and at pH 5.0. Among glucose, fructose, mannose and sucrose, glucose resulted in highest ethanol production and sucrose proved the next better substrate. The ethanol production was maximum with 1% glucose concentration. With glucose as carbon source fermented at 30^0C in media having pH 5.0 Mn^{2+}, Sr^{2+} and Ba^{2+} at levels of 0.5 to 2.5 UM adversely affected the ethanol production while Zn^{2+} and Co2+ had stimulatory effect and among these two, Zn^{2+} proved to be more effective. B-mercaptoethanolamine and hydroxylamine were having inhibitory effect while indole acetic and glutathione were having the stimulatory effect on ethanol production within concentration range of 5 mM to 15 mM.

Biography

Sarabjot Kaur Sohal completed her PhD from Punjab Agricultural University, Punjab in 2000. She has teaching experience of more than 5 years. She has published 1book chapter and 2 abstracts in international conference proceedings. She has supervised 2 M. Phil, 1M.Sc and 4 M.Tech dissertation projects.

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Application of biotechnology on malaria transmission blocking vaccines in Iran

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A malaria transmission Blocking Vaccine (TBV), Altruistic Vaccines, would work in combination with drugs and insecticides by blocking the transmission of the Plasmodium parasite from human to human. These vaccines are targeting the parasite's sexual stages in the mosquito body. A large reduction in the burden of malaria has recently been achieved in Iran following the scaling up of effective treatment and vector control programmes. These achievements need for a partially effective malaria vaccine targeted at disease elimination. The problem is that most of Plasmodium parasites are not continues cultivable in laboratory especially to study sexual stages. Therefore biotechnology helps researchers to obtain sexual stages proteins for evaluation their role in transmission. Different type of epitopes from several parts of the life cycle of Iranian malaria parasites and their Anopheles vectors are already characterized and also have been challenged or in challenging process which contain immunogens from the disease life cycle. This presentation will discuss different malaria vaccine candidate genes studies from Iran with the focus on PvWARP, Plasmodium vivax Transmission Blocking Vaccine candidate gene. The details will be discussed in presentation time.

Keywords: Biotechnology, Malaria, Transmission Blocking Vaccine, Iran.

Biography

Saber Gholizadeh, Medical Entomologist (Biotechnology), graduated from Medical Entomology Department, Tehran University of Medical Sciences in 2010. He worked on Transmission Blocking Vaccine in Malaria. He was research staff and Co-PhD student in Pasteur Institute of Iran (PII), Biotechnology Research Center (BRC), Malaria and Vector Research Group (MVRG) since 2000. He is Assistant Prof. in Urmia University of Medical Sciences now. He has published more than 10 papers in reputed journals and serving as an editorial board member of Journal of Bacteriology and Parasitology.

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Rapid antibody production in CHO cells using human glutamine synthetase gene as selection marker

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The production of foreign proteins especially therapeutic antibodies in mammalian cells is pivotal to the biotechnology industry. Advances in the field have resulted in enhanced cellular growth and production characteristics. With increasing flux of therapeutic candidates in the industry's product pipelines, platform approach that could potentially be applied for the wide array of products is highly desirable. In this study we describe a cell line development platform referred here as CHO-GS^{HT} to produce high levels of antibody in CHO cells using a human Glutamine Synthetase gene as a selection marker. PEImax was used to make stable transfections. Integration of an automated colony picker allowed high throughput detection and rapid isolation of the high secreting clones. CHO-GS^{HT} platform does not use serum or animal-derived components at any step. It was successfully used to generate high expressing chimeric heavy-chain antibody (cHCAB) and immunoglobins (IgG1) clones with 14 days batch titers of > 200mg/L achieved for the top clone. Starting with transfection step, high producing clones were generated in a time span of 7-8 weeks. Generic fed-batch strategies including temperature shift were able to enhance the productivities by ~ 4-fold achieving antibody titers of ~ 824 mg/L. To this end, increase in cellular GS expression level and the improvements in the antibody productivities were studied by selection at higher MSX concentration.

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Composition and functions of outer membrane vesicles from Pseudomonas syringae

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Qualitative analysis with colistin and streptomycin on the growth curves of the P. syringae Lz4W shows that the growth was resumed to exponential stage after delayed lag phase at a lethal antibiotic concentration, when supplied externally with prepared OMVs from the same organism. This result shows that the OMV's may play an important in antibiotic resistance. In order to understand the functions of the OMVs, a detailed study was undertaken to analyze different components present in the OMVs. We have characterized different components of OMVs from an Antarctic bacterium Pseudomonas syringae Lz4W. The OMVs were prepared from P. syringae Lz4W and their size was determined by Transmission Electron Microscopy (TEM) and dynamic light scattering. The phospholipids from these MVs were characterized by a combination of MALDI-MS and fatty-acid methyl ester (FAME) analysis on GC-MS. The OMVs were also found to contain LPS. The proteins of OMVs were separated by 1D-gel and then analyzed by nano LC-MALDI-TOF/TOF and LC-ESI-MS/MS (Orbitrap). Mass spectrometric data was analyzed by Mascot and Sequest softwares respectively. Since the genome sequence of this organism is not known, a database was prepared from different Pseudomonas species and used to identify the proteins. The subcellular localizations of these proteins were predicted by using Psortb V3 software. Along with inner membrane, periplasmic and outer membrane proteins, we identified many cytoplsmic proteins/enzymes segregating in to the OMVs. These proteins are implicated in their functions. Attempts were also made to understand the mechanism of protection to bacteria by the OMVs using fluorescent probe NPN.

Biography

Medicharla V. Jagannadham completed his PhD in the year 1998 and working as a Scientist for the past 22 years at Centre for Cellular and Molecular Biology, Hyderabad, India. He has published more than 35 research papers in internationally reputed Journals. He published a monograph on the "Membrane proteins of an Antarctic bacterium Pseudomonas syringae" He is a member of several learned scientific societies such as Society of Biological Chemists (India), The American Society for Biochemistry and Molecular Biology. His research interests are developing proteomics technologies and studies on the functions of the outer membrane vesicles of bacteria.

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Embedded system for the measurement of physiological parameters of human body

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There is a huge market of noninvasive devices to measure the parameters. But they have limitations like either they are continuously health monitoring system or they can measure only one parameter and keep records. The health monitoring systems which are used in multispecialty hospitals are very bulky and costly. This paper proposes a design and implementation of a reliable, cheap, low powered non-intrusive and accurate system that can measure many parameters of human body and keep the records of each patient. It gives an idea to make a database of each patient so that whenever the patient comes to the doctor he doesn't have to keep his record with him manually. Such a device can be handled by non technical personnel also and can be used both in small clinics and big hospitals. This paper is presented with a motto of saving time of both the doctor and patients. As the device can measure the vital signs in a very less time it can save time of doctor and no. of patients can be observed. This paper specifically deals with the signal conditioning and data acquisition of three vital signs: heart rate, body temperature, and weight. The vital signs that have been taken are temperature, heart rate and body mass index. The heart rate is measured by Heart beat sensor which works on the principle of light modulation by blood flow through finger at each pulse. The temperature is measured by using LM34 which measures the temperature directly in Fahrenheit and does not need external calibrations. And the weight is measured by load cell. Here a simple circuit is designed by using AT89S52 microcontroller as heart of the circuit. The three sensors are connected with microcontroller via signal conditioning equipments. The data is also easily accessible by both the doctor and patient as complete record of output can be generated by using VB as programming language.

Biography

Neelam Dewangan is an Associate Professor in Chattrapati Shivaji Institute of Technology. She has published more than six international journals and attended more than eleven national/International conferences. She has also published more than four National/International books.

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A novel approach for biogenic synthesis of silver chloride nanoparticles using leaf extracts of Cissus quadrangularis and their antibacterial efficacy

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Plant materials are emerging as an exciting resource for the development of non-toxic noble nanoparticles. In this study, we demonstrated a single step method for synthesis of silver chloride nanoparticles (AgCl-NPs) using leaf extract of Cissus quadrangularis under ambient condition. It was found that aqueous $AgNO_3$ when treated with leaf extract of C. quadrangularis was reduced leading to the formation of AgCl-NPs which was continuously monitored by measuring the change in absorbance at different time intervals using UV–visible spectral studies. The synthesized particles were characterized by FTIR, XRD and FE-SEM to understand the nature, size and shape. The average size of the AgCl-NPs was found to be 13 nm. The antibacterial activity of AgCl-NPs was evaluated against Gram positive and Gram negative bacterial pathogens by minimum inhibitory concentration (MIC) test. Results showed that AgCl-NPs could inhibit the growth of tested bacteria and their MIC values were less than 7 µg/mL. Thus, the leaf extract of C. quadrangularis could be used as a bio-reactant for the biogenic synthesis of AgCl-NPs and it can be used as potent antibacterial agent.

Keywords: Biosynthesis, AgCl-NPs, Cissus quadrangularis, FE-SEM, antibacterial activity.

Biography

P. Velusamy has completed his Ph.D from Centre for Advanced studies in Botany, University of Madras. At present he is serving as faculty member in the Department of Biotechnology, SRM University, India. He has served as postdoctoral fellow in the Department of Biomedical Sciences at Academia Sinica, Taiwan and Department of Biotechnology at Chonnam National University, South Korea during 2004-2009. He is actively involved in, to explore the mechanism of antimicrobial activity with using biogenic nanoparticles. He has published 20 research papers, in reputed journals and serving as an editorial board member of repute.

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Development and applications of enzymatically reticulated hydrocolloidal films

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Interest in using biodegradable materials is strongly increasing because of the consumer's awareness of environmental damage caused by plastics of petrochemical origin, more than 250 million tons of which are still produced each year throughout the world. Therefore, the development of the so-called "bioplastics" is happening as a consequence of the need to derive more carbon for chemical processes from renewable molecules instead of oil reserves. Some new biodegradable materials are produced utilizing renewable biomass sources through the recycling of agricultural by-products, with the concurrent goal to manage lower waste amounts and reduce environmental pollution. However, since petrochemical-based materials are known to exhibit good mechanical performance, heat sealability, effective barrier to gases, and are available at low cost, further efforts for preparing market compatible bioplastics are needed. Although transglutaminase (TG) was mostly studied for its ability to postranslationally remodel different proteins in vivo, its reaction has also attracted the attention as an effective way to manipulate the structure of proteins outside the living cells. One promising exploitation of TG as crosslinker is related to the production of new protein-based bioplastics with desired mechanical and gas barrier properties. In this respect, we obtained hydrocolloidal films of either pectin or chitosan in the presence of different plant and milk proteins able to act as substrates of the enzyme. The features of the composite films produced suggest the possibility to obtain enzymatically "tailored" molecular networks conferring desired characteristics to specific bioplastics with potential applications not only in food industrial sector but also for pharmaceutical and agricultural applications.

Biography

Raffaele Porta is full professor of Biochemistry at the Faculty of Agricultural Sciences of the University of Naples "Federico II" and member of the Editorial Board of "Open Biotechnology Journal" (Bentham Sci.Publ.), "Enzyme Research" (Hindawi Publ.Co.), and "Journal of Biotechnology and Biomaterials" (OMICS Publ.Group). He carries out research activity at the Dept. of Food Science of the University of Naples "Federico II" and the use of the enzyme transglutaminase to produce hydrocolloidal films was his current most important field of investigation. His activity is documented by more than 100 articles published on journals endowed with high impact factors and by 25 chapters in worldwide distributed books.

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Caenorhabditis elegans: A tiny worm model for ageing research

Rakesh Pandey
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Aging and age-related diseases have an ever-increasing potential economic impact on the prosperity of nations. It is associated with an accumulation of damaged/discarded proteins in cells which correlates with a decline in normal physiological function of organism. The free radical theory of aging suggests reaction of reactive oxygen species (ROS) as the proximal cause of ageing. ROS is normally generated during metabolism and results in a declined cellular homeostasis. ROS contributed ageing can be slowed or modulated either through reduced ROS production, endogenous antioxidant genes or by increased repair mechanism. Indeed, genetic mutations and manipulations that confer resistance to oxidative stress also cause extended life-span; however, dietary restriction and dietary antioxidant supplements have been shown to have effects on ageing. Caenorhabditis elegans is one of the promising and experimentally proven models for ageing research worldwide. The adult C. elegans worm is self-fertilizing hermaphrodite with a 3-day life cycle, and a mean life span of approximately 18–20 days when cultured at 20°C. Importantly, more than 70% C. elegans genes have human homologues and the loss of function of the equivalent genes has also been shown to extend the lifespan of mammals. This suggests that mechanisms found to influence ageing in C. elegans are likely to have a conserved role in regulating longevity in humans. Besides its short lifespan, the ease of genetic and dietary manipulations has also led C. elegans to become established at the forefront of ageing studies. Large numbers of phytomolecules have proven their antiaging activity in C. elegans will be highlighted in the present lecture.

Biography

Rakesh Pandey has completed his Ph.D at the age of 28 years from Kanpur University, Kanpur, India and postdoctoral studies from Institute of Plant Disease, University of Bonn, Germany. He is the Senior Scientist, in CSIR - Central Institute of Medicinal and Aromatic Plants, Lucknow unique organization in field of medicinal and aromatic plants research. Dr. Pandey has published 80 research papers in reputed journals and serving as an editorial board member of important international journals of repute.

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Growth rate optimization of BHK-21/C13 cell line in coconut modified media

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The objective of current research was to study growth behavior of BHK Cell line in coconut water owing to its various similar useful components as FBS used in DMEM media. On comparing the growth rate, coconut water 10% (v/v) found to have comparable growth rate (0.205×10^6 cells/ml.hrs) as FBS 10% (v/v) (0.219×10^6 cells/ml.hrs) and there was overall (6.8%) improvement in the growth rate on mixing the two at equal ratio. Further improvements in growth rate were observed after application of Taguchi methodology where eight factors essential for growth were optimized by design of experiments at three levels viz. Temperature, FBS, Cell number, Coconut water, pH, Folic acid, Speed and $NaHCO_3$. Thus, after eighteen experiments final optimized conditions were obtained which after validation shows overall 27.4% improvement in growth rate of BHK-21/c13 cell line. Thus, It can be helpful for growth of viral culture and vaccine preparation since are these are one of the few cell lines that can be grown both in suspension as well as anchorage dependent.

Keywords: Coconut Water, DMEM, FBS, BHK-21/C13 cell line, Cell growth rate, Cell viability, Taguchi methodology optimization.

Biography

S. M. Bhatt did his Ph.D from Banaras Hindu University, Varanasi, India in 2008. During this period he was awarded with senior research fellow from Department of science and technology, New Delhi. Before Joining to PhD Programme, he also worked as scientist at Transgen Biotech (P) Limited for short period and prepared techniques for vaccine against Japanese Encephalitis. He has 8 years of teaching and research Experience in Biotechnology and published more than 10 papers in reputed international journals along with 2 Patents and 2 Books and serving as an editorial board member in journal of repute. He joined Lovely professional University in 2010 and still working there. During this period he worked on Enzyme Production (cellulase), Bio-separation of Arsenic from water and Kinetics study of HK cell lines. His current focus is on Biofuel production by degradation of various cellulosic components.

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Extraction & optimization of natural herbal colourant from different natural origin for using in textile industry

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Due to the harmful effects of most of the synthetic dyes, there is move to find renewable sources to supplement the need for safe dye industry and the research has led to revive the production of natural dyes on commercial scale. Today, nearly, 40,000 dyes and pigments are listed which consist of over 7000 different chemical structures. Overall at present more than 100,000 dyes and pigments are used industrially with a rough estimated production of 7×10^5 — 1×10^6 tons per year. The big consumers of synthetic dyes are textile, leather tanning, paper, printing, food, coke, wood preserving chemicals, pesticide, cosmetics, paint, pigments, plastics, pharmaceutical as well as iron-steel industries. In addition, petroleum-based products such as waxes, lubricating oils, polishes, and gasoline are colored with dyes. Dyes are also used to stain biological samples, fur, and hair. Hence the effluents of these industries as well as those from plants manufacturing dyes tend to contain dyes in sufficient quantities. As a result, considerable amount of colored wastewater is generated. Approximately 12% of synthetic dyes are lost during manufacturing and processing operations and 20% of these lost dyes enter the industrial wastewaters. Textile industries consume two thirds of the dyes manufactured. ith the rising awareness of the occurrences and accumulation of synthetic dyes in aquatic environment which has intensified numerous deteriorations on several ecosystems and seriously threatens the human health and environment, the enforcement of stringent rules and regulations concerning the emission of contaminants from industrial waste streams by various regulatory agencies has been promulgated. Simultaneously, a developing research by the invention of alternative dye sources with varying levels of successes has accelerated a dramatic progress in the scientific community. As such, the interest of natural dyestuffs has revived in Europe, Japan and United States. Revival of the application of natural dye on cotton, silk, wool, jute etc has gained momentum all over the world possibly due to the ban on some of the synthetic azo dyes by the government of several countries. Natural dyes derived from flora and fauna are believed to be safe, but all the natural colorants on textiles may not be safe; sometimes the method of application of the colorants using some metallic mordants may make them non-friendly to our environment. However, natural dyes have a potential; for high value-added fabrics, particularly for export market. Unfortunately, very little work has been done on dye extraction from flowers and leaves. When the plant organs like roots, stem etc are used for dye extraction, the whole plant is destroyed whereas if soft organs like flowers and leaves are used for the extraction, the plant is not at all destroyed. It is more eco-friendly and does not cause any damage to the plant.

Keywords: Natural dye, natural colorant, Response surface methodology, Optimization.

Biography

Papita Das Saha has completed her PhD from Jadavpur University and at present she is Assistant Professor at Department of Biotechnology, National Institute of Technology - Durgapur. She has published 44 International journal papers and 7 national Journal papers and 10 International books and one book chapter. She is also service as an editorial board member of six reputed International journals like Journal of Environmental Research and Management; Research Journal of Environmental Sciences; Journal of Environmental Science and Technology; Research Journal of Environmental Toxicology; International Journal of Chemical Technology; Current Research in Chemistry.

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The process of germination in seeds leads to human insulin like proteins

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Diabetes is a global health problem and this research may provide safe and cost effective Insulin like proteins and functional foods from edible legume and cereal seeds. This research reports a cost effective alternative source for Insulin. A few reports are there on the presence of insulin-like proteins in plants since 1923, after the discovery of insulin in animals. The oldest report on the existence of insulin-like hormone in various plant materials was given by J.B.Collip in 1923. He reported its hypoglycemic activity and suggested the name 'glucokinin' for it. Growing diabetic population and the complications associated with diabetes stimulates the search for new drug targets and more efficient drugs with less adverse effect. The standard drugs which are widely used for diabetes all over the world were derived from plants. This is in the case of metformin, which is developed from biguanides present in the leaves of the legume plant Galega officinalis (Bailey1989), salacinol, an á-glucosidase inhibitor extracted from the roots of Salacia reticulata (Yoshikawa 1997), and cryptolepine, an indoloquinolene alkaloid isolated from the leaves of Cryptolepis sanguinolenta (Luo J 1998). No research was done after this pioneering work of the 1920s. And the silence was broken when Khanna and collaborators reported on the presence of insulin in plants and patented a process for its production from the fruits of Momordica charantia (bitter gourd) (Khanna 1976). Insulin like proteins is detected in various plants and microbes after that showing similar functions as that of vertebrate insulin. Isolated Insulin like proteins (glucokinin) detected and quantified by ELISA shows its structural/sequence similarity with insulin of animal origin. I observed that sprouts of Glycine max are amazing blood sugar regulators (Manju Pathak, 2005). Further it was observed that Insulin like proteins is the outcome of the process of germination in seeds; (Manju Pathak and Danik M, 2011); Potential users of the new product are all the diabetic patients. Problems in the availability and compatibility of animal insulin in treating diabetes in humans resulted in the development of human insulin of recombinant DNA origin in bacterial and yeast expression systems. But high production cost, low yield and the need of the robust techniques in the downstream processing and to minimize contaminations involved in the production of the recombinant human insulin makes it expensive for the users. The new product will be cost effective because the plants can be cultivated extensively in a cheaper way according to the demand. Oral hypoglycemic drugs are shown to have many side effects. Preliminary results in animal models prove the hypoglycemic activity of the plant insulin. New product developed under this project by designing and testing various formulations and combinations will be as efficient as insulin in market. The search for improved insulin formulations that reproduce as closely as possible the physiological profile resulting from endogenous insulin secretion is the expected outcome. Substantial efforts will be taken for the development of non-invasive methods of insulin administration. The efforts in this research is to develop a new product which will be non invasive and will be as efficient as insulin in market.

Biography

Manju Pathak has completed her Ph.D at the age of 27 years from University of Delhi. She carried her postdoctoral research from National Centre for Cell Science, Pune. Presently she is Professor, Biotechnology at Amity University, Noida. She has three granted patents and has published more than 30 papers in reputed journals. Her technology was selected in top sixty technologies by Department of Science and Technology, Govt. of India (DST) and IC2, University of Texas, USA in 2010. She licensed her patent to Futureceuticals, USA, in 2006 for some time.

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Quantum mechanical investigations of magnetically controlled photosynthetic centers of artificial minimal cells

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Department of Chemistry and Central Microscopy Research Facility, University of Iowa, USA

Quantum mechanical density functional theory methods with nonlocal gradient electron correlation interactions are used to investigate various self-assembled photosynthetic centers of active fatty acid micelles [1-3]. The micelle systems studied in this paper are based on a photoelectron donor neutral radical molecules (5-(4-(1-hydroxyethyl)phenyl)pentanoic acid (1) or 5-(2,8-dimethyl-1,3-dioxo-2,3-dihydro-1H-phenalen-5-yl) pentanoic acid (2)), a precursor of fatty acid (pFA, 2-oxo-2-phenylethyl ester) molecule and water molecules. The systems include an explicitly simulated aqueous environment consisting of some 306 or 366 atoms and are up to about 2.3 or 2.6 nm in diameter. The quantum mechanical based electron correlation interactions are the source of the weak hydrogen and Van der Waals chemical bonds that are critical to the behavior of these systems. These were accounted for by including Grimme dispersion correction during the geometry optimization process. Polar solvent molecules such as water increase the strength of these bonds and thus play a central role in the self assembly and functioning of the systems studied. The distances between the separated neutral radical, precursor of the fatty acid, and water molecules are comparable to Van der Waals and hydrogen bonding radii. As a result, these nonlinear quantum interactions compress the overall molecular system resulting in a smaller gap between the HOMO and LUMO electron energy levels that in turn allows enhanced tunneling of photoexcited electrons from the sensitizer molecules (1) or (2) to the pFA. The quantum mechanical processes of self-assembly of neutral radicals molecules (1) or (2) with pFA in real water molecules environment were performed in the moving format with indication of hydrogen bonds formation. The quantum mechanical process of selfassembly of neutral radicals molecules (1) or (2) with pFA in an environment with individual water molecules was performed in a movie format. Therein, the formation of hydrogen bonds is signalled using specific sounds.

Spin density transfer rates in the intense absorption states were calculated and visualized in neutral radicals supramolecules (1) or (2). The metabolism involves magnetically controlled photoexcitation of an electron in these neutral radical supramolecules which possess stable α or β oriented spin. The main quantum mechanical research result of this paper is that the nonconventional systems which were proposed include the use of molecular spintronics logic gates to control growth and division of artificial living cells. The excited electron is used to cleave a waste organic molecule resulting in the formation of the desired product. In the future, this process might be applied for the destruction of the tumor cancer cells or to yield building blocks in artificial cells.

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Studies on nutrient uptake and culture conditions for synthesis of caffeine, (+)-catechine, (-)-epicatechin and (-)-epigallocatechin gallate in anther derived haploid cell lines of tea [Camellia sinensis (L)]

Rakhi Chaturvedi and Mishra Vijay K
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Tea is a perennial, evergreen tree of the family Theaceae. It is most consumable non-alcoholic caffeine containing beverage in the world due to its pleasant taste, attractive aroma and its medicinal property. Tea contains large amount of Catechins (a group of very active flavonoids) which have anticancer, antidiabetic, antiviral, antimalarial, hepatoprotective, neuroprotective and cardio protective effects. Present study aims to study batch kinetics of androgenic haploid cell lines established from pollen grains in anther cultures of TV21 cultivar of tea. The haploid status of these cell lines were confirmed by flow cytometry. Cell suspension cultures were raised from fresh friable and high proliferating calli established on semi-solid medium. Dynamic changes of parameters, such as pH, fresh and dry cell concentrations, consumption of major nutrients, carbon source and agitation speeds, were studied to understand the culture characteristics. Maximum viable cultures were obtained at a rotation speed of 120 rpm. Identification and quantification of Caffeine, (+)-Catechine, (-)-Epicatechin and (-)-Epigallocatechin gallate were performed by HPLC which were further confirmed through Mass spectrometric data analysis. Maximum yield of 2.7% Caffeine, 0.26 % (+)-Catechin, 0.92% (-)-Epicatechin, and 10.36% (-)-Epigallocatechin gallate per gram dry weight was obtained from cells in suspension culture at 24th day. Compare to this, leaves from parent plant produced 3.14% Caffeine, 0.48 % (+)-Catechin, 1.3% (-)-Epicatechin, and 11.3% (-)-Epigallocatechin gallate per gram dry weight which was marginally higher. The optimized conditions and parameters of the present study would be useful for further scale-up process by using suitable elicitors/precursors.

Biography

Rakhi Chaturvedi is Associate Professor at Department of Biotechnology, IIT Guwahati. She has been awarded 'Prof Y.S. Murty Medal 2011' by Indian Botanical Society and Overseas Travel award from DST and INSA New Delhi, India. She is member of National Academy of Sciences, India and the Associate Editor of Springer journal "In Vitro Cellular and Developmental Biology- Plant". Besides, she is member of many prestigious academic societies such as, Society for In vitro Biology (SIVB), USA, Society of Biological Chemists, India (SBCI), The Biotech Research Society (BRSI), India, Indian Botanical Society (IBS). She has published 7 book chapters, >36 conference proceedings and over 30 publications international journals of high impact factors like, Biotechnology Advances with impact factor of 7.6, Bioprocess Biosys Eng, Industrial Crops Products, In Vitro-Plant, Biotechnology Bioprocess Eng, Biol Plantarum, Plant Cell Rep, J Plant Physiology, Plant Cell Tissue Organ Cult, Plant Sci etc. She has guided more than 16 B.Tech., M.Tech, and Ph.D. students and received research funding worth over 1.5 Crore from and DST, India.

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Transcript profiling of stress associated proteins in wheat (Triticum aestivum) under heat stress and their biochemical characterization for thermotolerance

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Plant small heat shock proteins (sHSPs) and antioxidant enzymes are known to be important for environmental stress tolerance and involved in various developmental processes. In this study, two full length cDNAs encoding sHSP and superoxide dismutase, designated TasHSP and SODI were identified and characterized from wheat. An alpha crystalline domain was observed in TasHSP and manganese iron binding domain in case of SOD. Quantitative real time PCR showed very high transcript level of TasHSP in C-306 compare to PBW343 at different stages of growth and against differential HS. Quantitative transcript profiling of superoxide dismutase showed 1.3, 1.8, 1.9 fold increase (C-306) and 1.1, 1.3, 1.5 fold increase (PBW343) at pollination, milky dough and seed hardening stages. Expressions of many new heat stable proteins were observed in C-306 compare to PBW343 against heat stress. Western blot analysis revealed the accumulation of one cross-reacting protein band corresponding to the calculated size of 18KDa and the result was well consistent with the mRNA expression pattern of TasHSP in case of C-306 and PBW343 at different stages of growth. Isoenzymes analysis of superoxide dismutase showed expression of three (C-306) and two (PBW343) prominent isoenzymes against heat stress with highest activity at pollination and seed hardening stages. Thermotolerance capacity was analyzed using cell membrane stability and C-306 showed highest CMS (74%) compare to PBW343. TasHSP and superoxide dismutase plays very important role in enhancing thermotolerance capacity of the plants and need to be further characterized and used for developing tolerant cultivar.

Keywords: small heat shock protein, Heat stress, protein profiling, Isoenzymes, western blotting, superoxide dismutase.

Biography

Ranjeet Ranjan Kumar has completed his PhD degree from Indian Agricultural Research Institute, Pusa New Delhi. He got 1st rank in All India Competitive ARS examination during the year 2008 and joined IARI as a scientist in Division of Biochemistry, IARI. He has published many research articles, technical bulletins, manuals, book chapters and scientific reviews in national as well as International journals. He received two young scientist awards by Indian Society of plant physiology and in National symposia by SVPUAT.

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Production of poly (3-hydroxybutyrate-co-3-hydroxyvalerate) by a new Bacillus OU40T from inexpensive carbon source

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Utilization of wastes from agro industry is becoming increasingly important due to concerns of environmental impact. The goal of this work was to characterize and evaluate the ability of a novel Bacillus OU40^T strain to produce Polyhydroxyalkanoates by using agricultural wastes, which was isolated from polluted water. The growth of isolate OU40^T was assessed in mineral media containing glucose, starch, bagasse, whey and rice bran. Highest cellular copolymer content yielded 71.98% using rice bran, followed by starch(64.85%),whey(60.09%) ,bagasse(59.29%) and glucose(45.00%). The biomass production was fastest between 30-38h and obtained in the range of 3.0to3.5 g\L. The characterization of the polymer was carried out with FTIR, H^1 NMR, ^{14}C NMR, DSC, GPC, XRD and GC-MS. Biopolymers produced by strain OU40^T had an average molecular weight 1,304 kDa to 2,332 kDa with melting point 155-160 T_m(°C) and percentage of crystallinity 40- 50%. This strain is producing PHBV copolymer with feed stocks without precursors. The cells were characterized by the presence of iso-C15: 0, iso-$C_{16:0}$, iso-C17: 0 and $C_{13:0}$ as the predominant fatty acids and MK-7 as the isoprenoid quinone. The DNA G+C content was 52.5%. Based on phenotypical, biochemical and genotypic investigations, the strain OU40^T was assigned to the genus Bacillus.The 16S rRNA gene sequence is deposited in EMBL/Genbank under accession number FN 663629.The type strain is OU40^T (=JCM 17287^T=CCM 7835^T =DSM 24141^T). The strain utilized rice bran completely and CDW was noticed up to 3.012%. PHBV content was reported as 71.97% CDW with 84.40% HB units and 15.60%HV units. Till now production of PHBV copolymer with 15.60% HV units by utilizing rice bran as carbon source by Bacillus strain has not been reported.

Keywords: Poly (3-hydroxybutyrate-co-3-hydroxyvalerate), PHBV; Bacillus cereus, Cell dry weight, Agro industrial wastes, Polyhydroxyalkanoates.

Biography

Shaik Mahmood got his M.Sc degree in the year 1984 and PhD in 1988 from Osmania University. His PhD thesis is Rhizosphere Microbiology He joined the University in 1989 as an Assistant Professor and later promoted as Associate Professor. He was awarded Young Scientist, Under Young Scientist Scheme Department of science and Technology (DST), New Delhi and Scientist of the year 2005 by National Environment Science Academy, New Delhi. Earlier he has been recipient of the awards of Junior Research Fellow (CSIR) Senior Research Fellow (CSIR) and Research Associate (UGC). He held various administrative positions like: Mess and General Warden, NRSH hostel, O.U- Course Co-coordinator, Dept of Bio Informatics, O.U- and Coordinator, PGRR Center for Distance Education, Osmania University. Dr. SK. Manhood's areas of specialization are: Bioinformatics and Environmental Microbiology. He has 23 years of research experience. He has written Two Books and published 100 research papers to his credit in various reputed international journals with Impact Factor. He has guided 1 M.Phil and 6 PhD scholars and presently 6 scholars are working under him. He was Principal Investigator to four Research projects from National funding agencies- i.e., Department of Science and Technology and University Grants Commission, New Delhi. He has attended 38 national and 5 international conferences. He is a life member of Indian Institute of Public administration (New Delhi), Indian Science Congress Association (Calcutta,) National Environmental Science Academy (New Delhi) apart from the Editorial Board member Indian Biological sciences. At present he is Co-coordinator, Dept of Bio Informatics, Osmania University.

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Synthesis, molecular modeling and in vitro antibacterial activity of new steroid [6, 7 - b] annulated pyrrole derivatives

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Pyrroles are found to be as the fundamental structural motifs in various classes of natural and biologically important molecules such as porphyrins, bile pigments, coenzymes, and alkaloids.This moiety is also present in several synthetic pharmaceuticals as well as electrically conducting polymers. They have shown to possess extensive biological activities and pharmacological properties such as antimicrobial, analgesics, ionotropic, anti-tumor, anti-inflammatory and antiallergic. These have also been employed as P38kinase, prolyl-4-hydroxylase, poly (ADP-ribose) polymerase inhibitors, estrogen receptor β- selective ligands, AT1-selective angiotensin II receptor antagonists and minor groove recognition elements. Several macromolecular antibiotics having pyrrole structure have been isolated from biological sources and their biological activities are thus defined.

Intrigued by the above applications of pyrrole derivatives and in continuation of our work for the development of new antimicrobial agents, we wish to report herein an efficient and novel procedure for the synthesis of 3'-acetoxy, 5α-cholestano[6,7-b]-2H-pyrroles from steroidal ketoximes using vinyl acetate in the presence of catalytic amount of p-toluene sulphonic acid under reflux conditions.

The newly synthesized compounds were characterized by IR, NMR, MS and analytical data. These compounds were also screened for their in vitro antibacterial activity against different Gram positive and Gram negative strains of bacteria. Molecular modeling studies have been performed to evaluate their binding sites.

Biography

Shamsuzzaman has been a student at Aligarh Muslim University, one of the famous institutions of higher education in India. He obtained his Ph.D. in synthetic organic chemistry in 1983. In 1985 he was awarded Liverhulme Commonwealth/USA Visiting Fellowship to work at Queen's University, Belfast. He is now Associate Professor at the department of chemistry, AMU, Aligarh. His main research subject is to develop new antimicrobial as well as anticancer agents, with particular emphasis on steroid derivatives. He is author of more than fifty publications in international journals. He is a member of various scientific societies.

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Agrobacterium tumefaciens-mediated genetic transformation of black night shade (Solanum nigrum L.) using root explants

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An efficient variety-independent method for producing transgenic Black night shade (Solanum nigrum L.) via Agrobacterium tumefaciens-mediated genetic transformation was developed. Root explants were transformed by co-cultivation with Agrobacterium tumefaciens strain LBA4404 harbouring a binary vector pBAL2 carrying the reporter gene β-glucuronidase intron (GUS-INT) and the marker gene neomycin phosphotransferase (NPTII). Transgenic calli were induced in media containing 0.1 mg l–1 thidiazuron (TDZ), 3.0 mg l–1 N6-benzylaminopurine, 100 mg l–1 kanamycin and 500 mg l–1 cefotaxime. The putative transgenic shoot buds elongated on basal selection medium and rooted efficiently on Soilrite irrigated with water containing 100 mg l–1 kanamycin sulphate. Transgenic plants were raised in pots and seeds subsequently collected from mature fruits. Histochemical GUS assay and polymerase chain reaction analysis of field-established transgenic plants and their off springs confirmed the presence of the GUS and NPTII genes, respectively. Integration of T-DNA into the genome of putative transgenics was further confirmed by Southern blot analysis. Progeny analysis of these plants showed a pattern of classical Mendelian inheritance for both the NPTII and GUS genes.

Biography

T. Ugandhar has completed his Ph.D at the age of 25 years from Kakatiya University under the guideness of Prof N. Ramaswamy Head Department of Biotechnology Kakatiya University Warangal immediately he was started his committed teaching career as a Lecturer in Botany at C.V. Raman P.G. College Mancherial in 2005 and he was appointed as Assistant Professor by APPSC at S.R.R Govt Degree and P.G. College Karimnagar. He has published 25 research articles, co-authored 2 books and guided 10 M.Phil theses. He has attended 15 national seminars and 3 international seminars and also attends 4 symposia and workshops. His major fields of teaching and research include Cytology and Cytogenetics, Genetics and Plant Breeding, Molecular Genetics, Mutation Breeding, Plant Tissue Culture and Biotechnology. He successfully applied mutation breeding to brinjals, chillies and tomatoes and developed several agronomically useful varieties. He established clonal multiplication of certain forest trees. He has a patent pending for In Vitro Propagation of Tassar Silk Plant.

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Biochemical, rheological and sensory changes in probiotic yoghurt made with natural microflora of dahi during refrigerated storage

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Dahi is one of famous fermented milk products in SAARC countries that also possess anti-bacterial properties and provides relief in gastro intestinal problems. It was believed that dahi is rich source of probioitc bacteria that were well adapted to local environments. In this study probiotic yoghurt was prepared in three different combinations by selected probiotic strains i.e. L. acidophilus La06FT, L. bulgaricus TLb06FT and S. thermophilus S02FT which were previously characterized as probiotic and have non-antagonistic behavior. Biochemical, rheological and sensory changes in these combinations were recorded for 28 days of storage at the temperature of 4°C. Among the studied variables; change in titratable acidity and pH differ significantly ($P < 0.05$) among various preparations during storage. At 0 day the highest acidity and lowest pH value was obtained with Y1 and consistent inverse relationship was maintained up till 28 days of storage. Similarly, syneresis, viscosity, viable counts and antibacterial activities changed significantly ($P < 0.05$) during storage. Organoleptic evaluation of all yoghurt preparations revealed that Y1 has maximum overall acceptability followed by Y2, Y3 and Y0. It was ascertained that a yoghurt preparation Y1 made with 1:1:1 ratio of these probiotic strains have high keeping and sensory values.

Y0: Non probiotic starter culture bacteria i.e L. bulgaricus (TLb07FT) and S. thermophilus (ST01FT) in ratio of 2:1 used as control

Y1: Preparation of yoghurt with three probiotic strains L. bulgaricus TLb06FT, S. thermophilus ST02FT and Lb. acidophilus (LA06FT) in the ratio of 1:1:1.

Y2: Preparation of yoghurt with two probiotic strains L. bulgaricus TLb06FT and S. thermophilus S02FT in the ratio of 1:2.

Y3: Preparation of yoghurt with two probiotic strains L. bulgaricus (TLb06FT) and S. thermophilus (S02FT) in the ratio of 1:1.

Biography

Tariq Masud is a Professor/Chairman of the Department of Food Technology, PMAS, AAUR, Pakistan. He has a rich experience (> 29 years) in research and academics having 93 research publications in journals of international repute. He has 6 patents and 2 books in his credit and supervised > 63 M. Sc. (Hons.) and 6 PhD students. Being a food biotechnologist, he characterized probiotic cultures for fermented milk products and their phages. He also identified Withiania coagulans as a useful replacement for rennet. Moreover he has also generated new knowledge for the storage life of tomatoes, mangoes, potato, apricot and bread.

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At-line monitoring flow cytometric approach for lipid and carotenoid detection in yeasts

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Microbial oils can be used as feedstock for biodiesel production. Compared to other vegetable oils and animal fats, the production of microbial oil has many advantages: short life cycle, less labor required and easier to scale-up. However, at present, the major obstacle for commercialization of biodiesel obtained from microbial lipids is the high production cost involved. Therefore it is crucial to explore approaches to reduce the price of microbial biodiesel process as the coproduction of microbial lipids and high value added-products.

Biodiesel production from yeasts may have particular interest as these microorganisms may contain a high lipid content which can be extracted and converted into biofuel.

In addition, some yeasts (Rhodotorula sp.) contain carotenoids of high commercial interest (beta-carotene, others) which are used as natural food colorants and feed additives in aquaculture. The co-extraction of lipids and carotenoids from the yeast biomass, in a biorefinary concept, will allow the economical sustainable biofuel production since the high-value added products (carotenoids) will support the fuel production.

Therefore it is crucial to monitor the lipid and carotenoid production when producing these compounds from yeast. If at-line information is available, it is possible to change the process control strategy during the process progress, in order to achieve the maximum productivities by changing the operational conditions (agitation, aeration, medium composition, etc.). Such approach is not possible when using conventional microbiology techniques such as optical density, dry cell weight or colony forming units, currently used for process monitoring.

In the present work we used flow Cytometry to at-line monitor the lipid and carotenoid content in some Rhodotorula species. Such approach allows the quick process optimization from bench to pilot scale.

Biography

Teresa Lopes da Silva is a Chemical Engineer, done her Ph.D. degree (Biochemical Engineering) from the University of Évora in 2005. She is a Researcher at the National Laboratory for Energy and Geology (LNEG). She is the head of the Flow Cytometry Group at the Bioenergy Unit/LNEG and leads the Biotechnology Process Group of the Iberian Cytometry Society. She was awarded as a postdoc at the Birmingham University (UK) in 2006. She authored over 30 international peer-review scientific publications.

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Insilico evaluation and validation of Ketol-acid-reductoisomerase (KARI) as putative antimicrobial target for Aspergillus

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The genus Aspergillus consorting with a prevalent air born filamentous fungal pathogen causing morbidity and mortality in immune compromised patients. Approximately 33.3 million people are HIV-positive and such persons are highly prone to various infections. To identify and prioritize antifungal drug targets, against fungal pathogens is required to develop new pharmaceuticals. Here, I would like to talk on comparative metabolic pathway analysis to identify the putative target and their characterization and virtual screening. We analyzed various enzymes from different biochemical pathways of Aspergillus. We identified eight enzymes including Keto-acid-reductoisomerase/1.1.1.86 (KARI) as the potential target. The enzyme KARI was found to be unique by comparing to host proteome through BLASTp analysis. The structure of KARI was modeled based on predicted structural homology to characterize the enzymes. The generated model had been validated by PROCHECK and WHAT IF programs. The Zinc library was generated within the limitation if Lipinski rule of five, for docking study. Based on the dock-score six molecules, ZINC00720614, ZINC01068126, ZINC09291743, ZINC02090678, ZINC00663057 and ZINC02284065, have been further studied for ADME/TOX analysis. These molecules were found to be pharmacologically active agonist and antagonist of KARI. This systematic evaluation of metabolic enzymes of pathogens reliable and conventional bioinformatics methods and can be extended to other pathogens of clinical interest. The target and their inhibitor which is reported in this paper could be an alternative for synthesis of the new kind of drug against Aspergilli..

Biography

V. K. Morya has graduated from the department of biotechnology, DDU Gorakhpur University. At present he is serving as faculty member in the Department of Biological Engineering, Inha University, Republic of Korea. He has served as Assistant professor in the Dept. Molecular and Cellular Engineering, Sam Higginbottom Institute of Agriculture, Technology and Science, India (2007-2010). He is actively involved in, to explore the molecular basis of skin pigmentation and aging; and target identification for antimicrobials. He has published 20 research papers, in reputed journals and serving as an editorial board member of repute.

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Transcripts of interleukins in mastitis affected and oxytocin administered buffaloes: Clinical significance and prognostic value

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With modern intensive farming, buffaloes are subjected to various stressors and compromising their health and production potential. Mastitis is one of the most costly dairy-based diseases worldwide, impairing the milk yield, processing quality and causing heavy economic losses to farmers and the dairy industry as well. Synthetic oxytocin is commonly used to facilitate milk ejection, expulsion of retained placenta and also as an adjunct to antibiotic therapy for the treatment of mastitis. Interleukins are known best for their involvement in the immune response to inflammatory conditions like mastitis. Therefore, to understand the molecular determinants of mastitis and to see effect of exogenous oxytocin, the expression patterns of interleukins were investigated by real-time PCR of total RNA derived from total somatic cells of mastitis affected; oxytocin administered and control milk samples. All the lactating buffaloes of CIRB animal farm, Hisar were screened for incidence of mastitis with the aid of California Mastitis Test (CMT) using Masti- Check Kit. All the positive samples were reconfirmed by subsequent microbial culture and somatic cell count. For observing effect of oxytocin administration, four lactating buffaloes were administered Oxytocin @ 5.0 IU by IM route aseptically twice daily for 7 days. Milk samples were collected immediately before first administration (as control) and immediately after it. Subsequently, samplings were done 1, 7, and 15 day post- seven day oxytocin treatment. Total RNA was extracted by TRIZOL method from the pelleted and resuspended total somatic cells. A higher expression was found in the clinical form of mastitis for IL-1β, IL-6 and IL-10 genes. For IL-12A gene, no significant difference was observed in different samples. In sub-clinical cases of mastitis, IL-1β and IL-6 expression was higher compared to control samples. However, higher expression of IL-1β and IL-6 was evident in clinical samples compared to sub-clinical samples. A positive relationship was found between higher somatic cell count in milk and IL-1β, IL-6, IL-10 expression. In response to oxytocin administration, high IL-1β mRNA expression values in control samples decreased significantly on immediate administration of OT ($P < 0.05$) and increased thereafter on day 1 post- seven day OT administration. On day 7, post OT administration, IL-1β mRNA expression increased and it was still lower than the control. Transcript levels of IL-6 gene also decreased significantly immediately after OT administration. However, on chronic administration of OT, an increased expression of IL-6 was observed compared to control. There was a decrease in expression of IL-6 on day 7 and 15 post OT administration. A significant and immediate downregulation of proinflammatory cytokines' transcripts upon administration of oxytocin was observed. Interleukin transcripts could possibly be biomarkers for development of diagnostic tests or assays.

Keywords: mastitis, oxytocin, interleukins, transcript, real time PCR.

Biography

Varij Nayan is currently working as scientist in the Buffalo Physiology and Reproduction division of Central Institute for Research on Buffaloes (ICAR), Hisar, Haryana. He has earlier worked as Assistant Professor for three years in the C.V.Sc. & A.H. (Central Agricultural University), Aizawl, Mizoram. He has completed his master's degree in Animal biochemistry from National Dairy Research Institute, Karnal and has been selected two times for CSIR-JRF and for ICMR-JRF. His research interests include identification of bio-markers of early pregnancy, prognosis and therapeutic outcome in relation to mastitis; recombinant protein production and fertility augmentation in buffaloes.

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Selecting natural drought and heat tolerance in different wheat genotypes on the bases of their root characters

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Abiotic stresses have a major impact on growth and yield of crops. Wheat (Triticum aestivum L.) is one of the most important cereal crop and sensitive to heat stress. Drought and high temperature cause reduction in yield by reduced photosynthesis, production of Reactive Oxygen Species leading to oxidative damage to lipids, proteins, and nucleic acids finally disrupts cellular functions. Different genotypes perform differentially against these stresses to minimise the stress. A well developed deep root system thought to minimise the effect of drought and heat by taking the deep water therefore to explore the genetic potency we have screened thirty-five different wheat genotypes studied for their root trait for drought and heat susceptibility/ tolerance. Experiment was conducted in pot for root mass, in field for total root length and used pin board method for root architecture in control, 70% and 30% stressed conditions. Besides this Membrane thermostability (MTS), chlorophyll content, canopy temperature (CT), relative water content (RWC) and stomatal conductance were taken for their physiological responses. The varieties with relatively higher MTS value measured between 70 to 80% and chlorophyll content 51-58 (SPAD value), and stomatal conductance ranges 300-400 mMol $m^{-2}s^{-1}$ and reaches up to 50 mMol $m^{-2}s^{-1}$in drought and heat stressed conditions in susceptible varieties. A remarkable canopy temperature variation among the varieties was recorded. Varieties with well developed root system, higher root volume and higher total root length have a relatively higher MTS values, stomatal conductance and a low canopy temperature have selected for breeding program in order to achieve better performance under drought and high temperatures. Varieties with known drought and thermotolerance have also the similar performance.

Biography

Vinod Chandra Pandey has completed his PhD from GB Pant University of agricultural technology and postdoctoral studies from Indian Agricultural Research Institute, New Delhi. He is a life member of Indian Peptide Society and Indian Biophysical Society.

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Orchid micropropagation: Regeneration competence of anther culture

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Androgenesis in flowering plants is a unique biological phenomenon. The principle of androgenesis is to arrest the development of the pollen grains and to force them towards a somatic pathway. Antherculture is the main technique for haploid induction in crop improvement.

Since Guha and Maheshwari [1964, 1966] reported the induction of haploid plants from Datura innoxia, this technique became important for plant breeding and crop improvement [Clapham, 1973]. Anther culture has become a powerful tool for the rapid production of haploid and inbred lines used for obtaining hybrid cultivars and it has reduced the time required for breeding new cultivars by at least 3 to 5 years [Tai, 2003]. Hence, this system provides an unparalleled opportunity to shorten the breeding cycle and fix agronomic traits in the homozygous state and provides excellent material for research, plant breeding and plant transforma [Datta, 2005]. Production of haploids plants has been useful in providing access to recessive genes and for biotechnological manipulations, while using as a tool for cultivar development [Tai, 2003]. Therefore, in vitro techniques are considered to be alternative tools of conventional method of plants improvement[Sayem,2010].It is particularly useful in out breeders like orchids which generate a great deal of heterozygosity in the progenies.

Till now there is one report on anther culture in Orchids[Suryowinoto, and Somaryo,1985] , but attempts to assess a similar competence of anther culture in monocots including Orchidaceae, have remained almost negligible because of the following reasons(a)Little success in inducing callus and maintaining proper growth,(b)difficult to obtain suitable size of homogenous tissue from monocotyledonous plants.

R. retusa Bl. (Orchidaceae), a genus of fox tail orchid, is an important stem herb. The stem extract of R.retusa commonly known as 'Rasna'is used as expectorant for curing rheumatic diseases [Lawler, 1984]. Besides being victim of its own beauty & utility R. retusa is progressively losing its natural habitat and heading towards extinction particularly, in Sri Lanka [Wicramasingh, 1992] and conforming to these, in this paper, we report the possibility of using anthers for initiating in vitro cultures of R. retusa.

The study was designed to study the effects of physiological status,stage of microspore development and pre-cold treatment on androgenic response in Orchids. The anthers from open flowers (2 days of anthesis) in tetrad stage failed to respond despite variations in the chemical regime; whereas those from unopened buds (1.25-1.35cm long) with an intact operculum & pre-cold treatment with microspores in early & late-uninucleate decussate regenerated provided their nutritional complexities were satisfied through an exogeneous supply of Peptone (2mg/l) in the BAP (10mg/l) and NAA enriched Vij and Sharma, 2011 medium. The best response was obtained when a 24hrs cold treatment was employed at 4°c in darkness. The callus induction was promoted under darkness, but was inhibited by light. The complete plantlet (2-3 leaves &1-2 roots) was formed in 24wks.The plantlet was accilimatized & the survival rate is 70%.

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Detection of Lou Gehrig's disease and parkinson's disease in rat models through locomotion analysis

Wenlong Tang and Uri Tasch
The University of Maryland, USA

A non-invasive locomotion analysis approach is described to detect locomotion deficiencies due to amyotrophic lateral sclerosis (ALS) (also called Lou Gehrig's disease) and Parkinson's disease (PD) in laboratory rats. SOD1-G93A and 6-OHDA lesioned rats were used in the experiments to model ALS and PD, respectively. The locomotion data was collected by an in house locomotion analysis system introduced in our previous publications. The locomotion deficiencies are recognized by performing three different comparisons: (i) comparing the locomotion of an ALS model, G93A mutation of SOD1 with control rats, (ii) comparing the locomotion of a PD model, 6-OHDA lesioned with control rats, and (iii) comparing the locomotion of G93A/SOD1 and 6-OHDA lesioned rats. Each comparison resulted in different set of locomotion parameters (LPs) for ALS and PD that characterized the locomotion deficiencies and resulted in the best logistic regression model that classifies the rats into diseased/healthy groups with minimum error. All the LPs that best capture the locomotion differences in the first two comparisons and two out of three best LPs in the third comparison are derived from Ground Reaction Forces (GRFs), indicating the importance of measuring GRFs components in locomotion characterizing. The sensitivity and the specificity of the classification for comparisons (i), (ii), and (iii) were all above 90%. The proposed approach may potentially assist the diagnosis of neurological disorders in the clinical practice.

Biography

Wenlong Tang is a postdoctoral fellow at The University of Alabama. His research interests include locomotion analysis, signal processing and pattern recognition. He developed a noninvasive early detection methodology based on locomotion analysis for neurological and neuromuscular disorders. He has published more than 20 papers in journals and conference proceedings. Moreover, he is the co-inventor of a pending US patent and two Chinese patents. He received his Ph.D. in Mechanical Engineering from University of Maryland Baltimore County in 2010. He is serving as an editorial board member of Journal of Medical Advancements in Genetic Engineering.

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3rd World Congress on
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September 13-15, 2012 Hyderabad International Convention Centre, Hyderabad, India

Chitin and chitosan degrading fungi: A novel Chrysosporium sp

Zahoorullah S MD
Department of Biotechnology, Joginpally B R Engineering College, India

A novel chitinolytic and chitosanolytic fungi, Chrysosporium sp. has been isolated that has degrading activity on chitin and chitosan. It secretes both chitinase and chitosanase into surrounding medium in response to chitin or chitosan induction. Chitin is one of the most abundant biopolymers widely distributed in the marine and terrestrial environments. The role of the chitinolytic enzymes in nature is to degrade the huge quantities of chitin for recycling. Renewed commercial interest in the production and utilization of chitin and chitinolytic enzymes has demonstrated the need for inexpensive reliable sources of stable chitinase and chitosanase .In the present study chitin was prepared from shrimp and then, the obtained chitin was hydrolyzed by hydrochloric acid solutions and the yield is 25%.Similarly chitosan is prepared from chitin by heating at 90-95^{o}C for about one and a half hour with 40% caustic soda with the yield of about 60%.Glucosamine hydrochloride is also produced from chitin by hydrolysing the chitin in hydrochloric acid and heating to about 95°C to give yield 30%.

The growth curve of the Chrysosporium sp. on both chitin and chitosan medium is plotted. It is capable of producing extracellular enzymes chitinase & chitosanase where the specific enzyme activities are calculated to be 1.1625µg per minute per mg of protein and 4.3µg per minute per mg of protein respectively. The optimum hydrolysis conditions for chitosanase are pH 6.0 and temperature at 50^{0}C. These results show that Chrysosporium sp. may have potential for industrial application particularly in recycling of prawn wastes from the environment.

Biography

Zahoorullah S MD is presently working as Assistant Professor of Biotechnology in Department of Biotechnology, Joginpally B R Engineering College (JNTU), Hyderabad. He has done BTech in Biotechnology, MTech in Biotechnology from JNTU and presently pursuing PhD in Biotechnology in JNTU, Hyd. He is the Course Coordinator for MTech Biotechnology Course. He was selected as Assistant Professor at the age of 23 in JBREC and ratified by JNTU. He is a certified teacher by DALE CARNIEGIE TRAINING USA on High Impact Teaching Skills and honoured as the best faculty. One of his lecture video is being shared by Waterloo University bioinformatics database, USA.

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September 5-7, 2012
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August 27-29, 2012
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August 21-22, 2012 Hilton Chicago/ Northbrook, USA



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August 20-22, 2012
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Bioavailability & Bioequivalence:
Pharmaceutical R & D Summit
March 26-28, 2012 Hyderabad Marriott Hotel, India



World Congress on
Gastroenterology & Urology
March 12-14, 2012
Omaha Marriott, Omaha, USA



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March 5-7, 2012 Omaha Marriott, Omaha, USA



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March 5-7, 2012 Omaha Marriott, Omaha, USA



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March 5-7, 2012 Omaha Marriott, Omaha, USA



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February 20-22, 2012
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Nov29-Dec1, 2011 Philadelphia, USA



2nd World Congress on
Biotechnology
Nov29-Dec1, 2011 Philadelphia, USA



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Vaccines & Vaccination
November 22-24, 2011 Philadelphia, USA



International Conference-cum-exhibition on
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November 20-22, 2011 Hyderabad, India



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September 12-14, 2011 Baltimore, USA



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June 6-8, 2011 HICC, Hyderabad, India



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Integrating Glycomics with other Omics in Cancer Detection and Diagnosis Cancer Detection and Diagnosis
January 19-20, 2010
Stanford University School of Medicine



3rd World Congress of
Gene-2009
December 1-7, 2009



7th Annual World Congress of
International Drug Discovery Science & Technology
October 22-25



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July 18-20, 2009



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