Polymer Based Electrospun Nanofiber scaffolds in Biomedical and Tissue Engineering

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Abstract

During the talk, I will discuss the development of various polymer based biomaterials for biomedical and tissue engineering applications. The development of PCL based electrospun nanofiber scaffolds for delivery of antibacterial drugs required during the wound healing, where we have examined the in-vitro chloramphenicol release and effect of the scaffold architecture and drug on cellular behaviour with human epithelial cells. We have also modified the properties by blending with other polymers like PEG and PLCG etc. and showed the effect on the cellular behaviour in terms of cell morphology, attachment, biocompatibility and cell proliferation. We have demonstrated the regeneration potential of these scaffolds by using human gingival Mesenchymal Stem Cells (gMSCs) and can be further used for soft tissue engineering. I will also discuss plant products with anticancer and bone regenerative activity. These active compounds were embedded with nanofiber scaffolds and studied its effect on cellular growth, proliferation and bone regeneration potential.

Recent Publications (minimum 5)

1. **Gajanan Kashinathrao Arbade**, Vikram Kumar, Vidisha Tripathi, Aishwarya Menon, Suryasarathi Bose and T. Umasankar Patro (2019) Emblica officinalis loaded poly(ε-caprolactone) electrospun nanofiber scaffold as potential antibacterial and anticancer deployable patch. ***New J. Chem.**, 43, 7427—7440.*
2. Shivaji Kashte, **Gajanan Arbade**, R.K. Sharma, and Sachin Kadam (2019) Herbally painted biofunctional scaffolds with improved osteoinductivity for bone tissue Engineering. ***Journal of Biomimetics, Biomaterials and Biomedical Engineering** Vol. 41, pp. 49-68, 2019.*
3. **Gajanan Kashinathrao Arbade**, Juhi Srivastava, Vidisha Tripathi and T. Umasankar Patro (2019) Enhancement of hydrophilicity, cellular biocompatibility and proliferation of poly(ε-caprolactone) nanofiber scaffolds through blending with poly (ethylene glycol) and poly(L-lactide-co-ε-caprolactone-co-glycolide) *(In revision- The Journal Biomaterial Sciences)*
4. **Gajanan Kashinathrao Arbade**, Sonali Jathar, Vidisha Tripathi, T Umasankar Patro (2018) Antibacterial, sustained drug release and biocompatibility studies of electrospun poly (ε-caprolactone)/chloramphenicol blend nanofiber scaffolds. ***Biomedical Physics & Engineering Express** 4 (4), 045011.*
5. **Gajanan Kashinathrao Arbade** and T. Umasankar Patro (2019) Biocompatible Polymer Based Nanofibers for Tissue Engineering. Materials Horizons: From Nature to Nanomaterials Adv. Sustain. Polym. 2019. p. 43–66.-springer publications.



Biography:

I am presently working as research fellow at National Centre for Cell Science, Pune, India. Recently, I have completed my PhD from Defence Institute of Advanced Technology, Pune, India. I have received graduate and post graduate degree in Biotechnology from Swami Ramanand Teerth Marathwada University, Maharashtra, India in 2008 and 2010 respectively. I always actively involved in conferences/ workshops etc. I have also served as Lecturer in Biotechnology at Marathwada Agricultural University, Parbhani, Maharashtra, India. I have published my research articles, communications and book chapter(s) nationally as well as internationally in/with the reputed journals and publishers. I have also delivered talks in various conferences, seminars and student development programs. I am also involved in reviewing research articles from various national and international journals. Apart from the scientific work for science popularization at school and graduate and post graduate college level.

Research Interest: Nanotechnology, Biomaterials, Nanomaterials for biomedical and Tissue engineering applications

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