CALIFORNIA NORTHSTATE UNIVERSITY

2015



Exploring the Research Challenges and Advancements in Pharmaceutical Sciences

COLLEGE of HEALTH SCIENCES

COLLEGE of PHARMACY

COLLEGE of MEDICINE

About OMICS Group

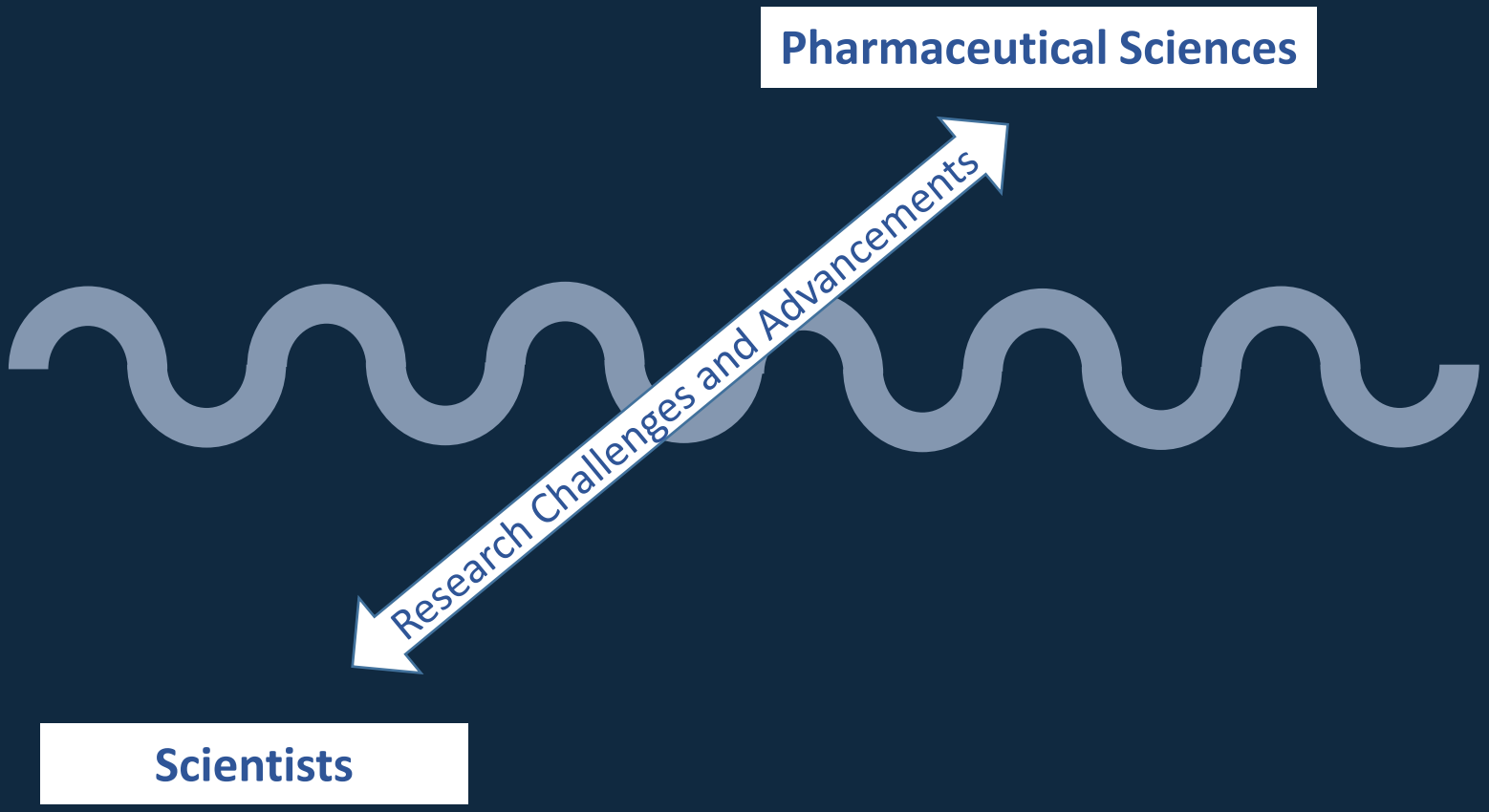
- OMICS Group is an amalgamation of Open Access Publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 500 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 500 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

OMICS International Conferences

OMICS International is a pioneer and leading science event organizer, which publishes around 500 open access journals and conducts over 500 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

BELOW THE WATER LINE



THE ROOT

The Challenge of Cultivating the Next Generations of Pharmaceutical Researchers

THE QUESTIONS

CHALLENGES



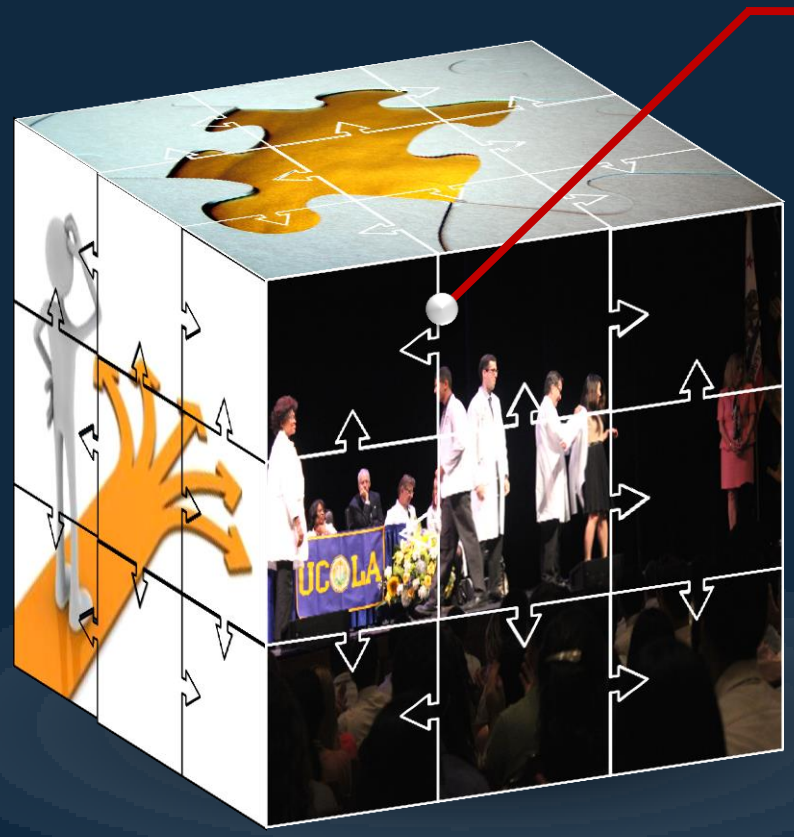
1. Career options
2. Pathway to Scientists
3. The “big new innovations[1]”
4. The Reward
5. Time & cost to gainful readiness
6. Competing choices

CHALLENGES



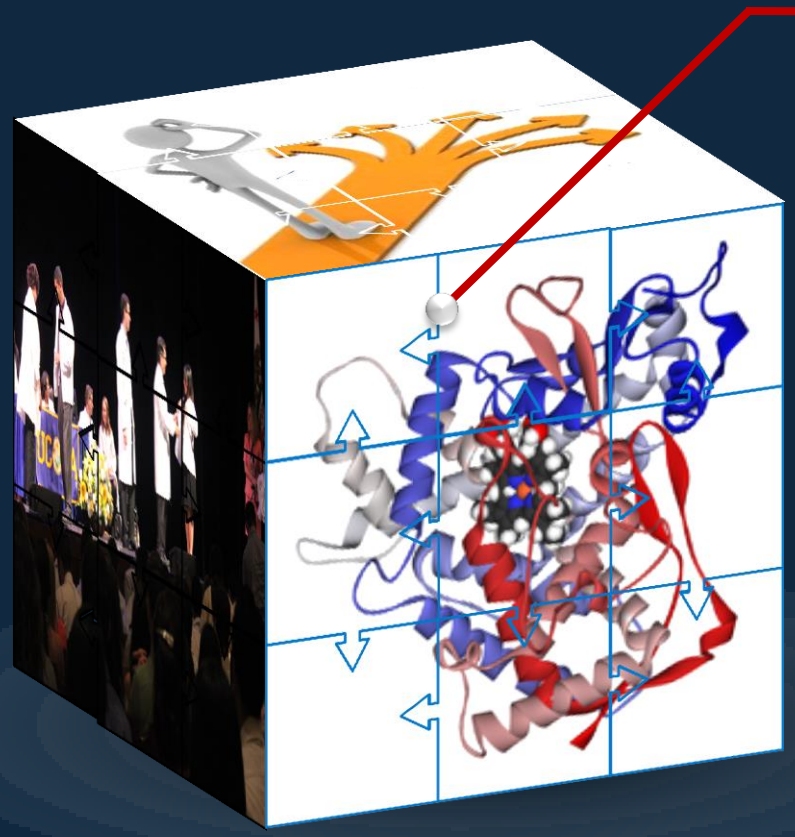
1. Career options
    a) Discovery
    b) Developing
    c) Manufacturing

CHALLENGES



2. Pathways
   a) Academic
   b) Pharma
   c) CRO
   d) Government
   e) Non-profit foundations
   f) Self-employ

CHALLENGES



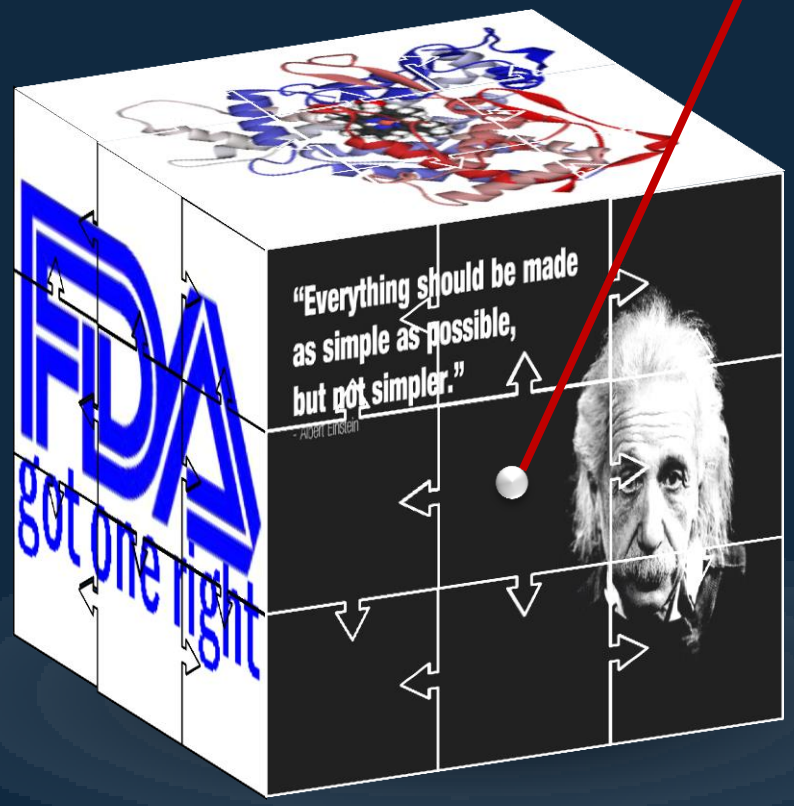
3. The Big New Innovations
   a) PCR vs “Shot Gun Sequencing”
   b) Hepatitis C Anti-viral drugs
   c) 3-D drug printing

CHALLENGES



4. The Reward
    a) PI
    b) Chief Scientist
    c) Bonuses
    d) Next project
    e) Fortune 5
    f) Nobel prize

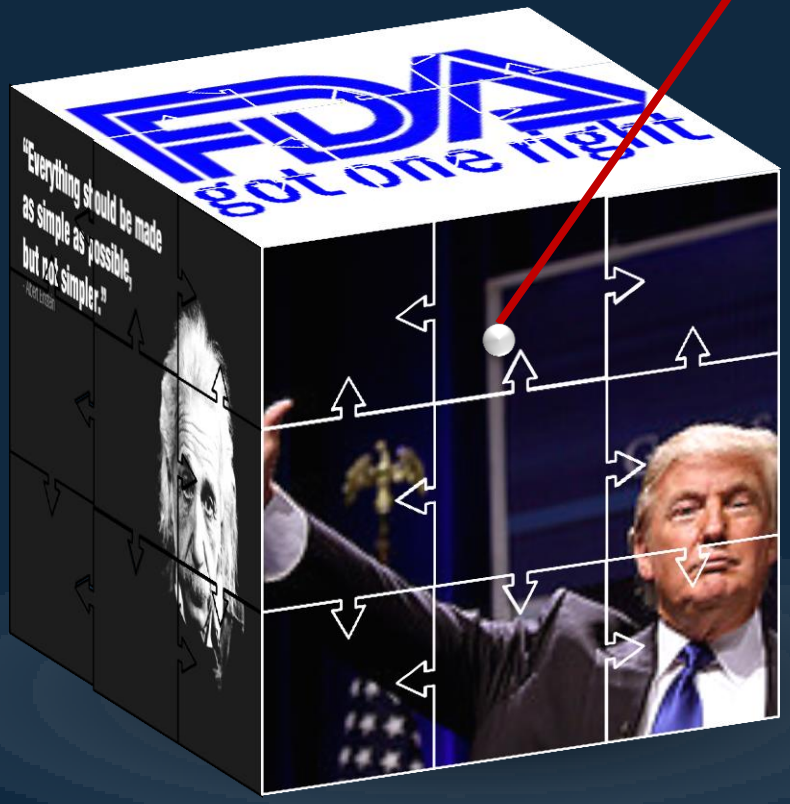
CHALLENGES



5. Time & Cost To Gainful Readiness

a) 5 - 6 years to PhD
b) 2 - 3 years more of post-doc .
c) Elite labs are highly competitive
d) Low pay and indebtedness
e) A long uncertain road for a bright mind

CHALLENGES



6. Competing Choices

REMEDIES

1. Career options
2. Pathway to Scientists
3. The “big new innovations[1]”
4. The Reward
5. Time & cost to gainful readiness
6. Competing choices

EVEN MORE SELECTIVE

1. Personality
   a) Patient
   b) Persistency
   c) Delayed gratification
2. Research Universities: ↑ selectivity of PhD candidates

REMEDIES


EDUCATION AND TRAINING
CAREER
Undergraduate Education
Predoctoral Training/Clinical Doctorate
Postdoctoral Training/Clinical Residency
Early Research Development
Mid-Career Research Development and Mentoring
Senior Career Research Development and Mentoring

REMEDIES

EDUCATION AND TRAINING	CAREER

Undergraduate Education

1. **Strong K-12 STEM**
2. **Undergrad Research Opportunity Programs (UROP) at**
   - **Universities**
   - **Industries (Pharma)**
   - **Gov. (NIH) – T02**
   - **Non-profits**

REMEDIES

EDUCATION AND TRAINING	CAREER

Undergraduate Education → **Predoctoral Training/Clinical Doctorate**

1. **Better paid work-studies** (e.g. Gates Millennium Scholars program)
2. **Graduates Research at:**
   - **Universities**
   - **Industries (Pharma)**
   - **Gov. (NIH)- T01, T90**
   - **Non-profits**
3. **Research is integral graduate study: inquiry based- learning**

REMEDIES

EDUCATION AND TRAINING	CAREER

Undergraduate Education → **Predoctoral Training/Clinical Doctorate** → **Postdoctoral Training/Clinical Residency**

1. **Combined Degree-Programs: B.S./MD, PhD/MD, PharmD/PhD**
2. **Better paid Research/Study Programs at**
   - **Universities**
   - **Industries (Pharma)**
   - **Gov. (NIH)**
   - **Non-profits**

REMEDIES

EDUCATION AND TRAINING	CAREER



1. Solving indebtedness: Income based repayment (10% of income)
2. B.S./MD, PhD/MD, PharmD/PhD: Increase Availability
3. Better paid Research/Study Programs at
   - Universities
   - Industries (Pharma)
   - Gov. (NIH)
   - Non-profits
4. Early selection / determination

REMEDIES



1. Solving indebtedness or compensation issues
2. Advanced Employment Opportunity
   - Universities
   - Industries (Pharma)
   - Gov. (NIH)
   - Non-profits
3. Grant opportunity
4. Tenure is not a solution
5. Getting prepared & counseling
   a) Quality of life (long hours)
   b) High risk and unstable earning, pay is not guaranteed

REMEDIES



1. **Mentoring:**
   a) Adjust the mindset
   b) Big picture initiative
   c) Be content with being a small part of a big machine
   d) Lay-off potential
   e) Risk of R&D stages
   f) Be willing to move along from firm to firm
2. **Collaboration**
3. **Greater technology transfer opportunity**

A FEW EXAMPLES – AMGEN'S

Amgen's UROP

1. One of the Best:
   a) >5,000 applied – 354 accepted (75)
   b) 213 participants in the US, 101 participants in Europe, and 40 in Japan
   c) Most common areas: Biology, biochemistry, and biomedical engineering
2. So much effort, yet still not enough…

	# accepted	# of Universities	# of States/ Countries
US	**213**	**128**	**39**
Europe	**101**	**63**	**20**
Japan	**40**	**33**	**10**

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NIH

	Individual Awards																	
	Individual Fellowships					Career Development Awards												DS*
	F05	F30	F31	F32	F33	K01	K02	K05	K07	K08	K12	K18	K22	K23	K24	K25	K26	K99/R00	R36
NCI		✓	✓	✓	✓	✓			✓	✓			✓	✓	✓	✓		✓	
NEI		✓	✓	✓						✓	✓			✓				✓	
NHLBI		✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓		✓	
NHGRI		✓	✓	✓	✓	✓				✓								✓	
NIA		✓	✓	✓	✓	✓	✓		✓	✓				✓	✓	✓		✓	✓
NIAAA		✓	✓	✓	✓	✓	✓			✓				✓	✓	✓		✓	
NIAID		✓	✓	✓		✓				✓			✓	✓	✓	✓		✓	
NIAMS		✓	✓	✓	✓	✓				✓				✓	✓	✓		✓	
NIBIB		✓	✓	✓		✓				✓				✓		✓		✓	
NICHD		✓	✓	✓		✓	✓			✓				✓	✓	✓		✓	
NIDCD		✓	✓	✓		✓	✓			✓		✓	✓	✓	✓	✓		✓	
NIDCR		✓	✓	✓	✓		✓			✓		✓	✓	✓		✓		✓	
NIDDK		✓	✓	✓		✓				✓	✓			✓	✓	✓		✓	
NIDA		✓	✓	✓		✓	✓			✓	✓			✓	✓	✓		✓	✓
NIEHS		✓	✓	✓	✓		✓			✓			✓	✓	✓	✓		✓	

NCI National Cancer Institute
NEI National Eye Institute
NHGRI National Human Genome Research Institute
NHLBI National Heart, Lung, and Blood Institute
NIA National Institute on Aging
NIAAA National Institute on Alcohol Abuse and Alcoholism
NIAID National Institute of Allergy and Infectious Diseases
NIAMS National Institute of Arthritis and Musculoskeletal and Skin Diseases
NIBIB National Institute of Biomedical Imaging and Bioengineering
NICHD *Eunice Kennedy Shriver* National Institute of Child Health and Human Development
NIDA National Institute on Drug Abuse
NIDCD National Institute on Deafness and Other Communication Disorders
NIDCR National Institute of Dental and Craniofacial Research
NIDDK National Institute of Diabetes and Digestive and Kidney Diseases
NIEHS National Institute of Environmental Health Sciences

http://grants.nih.gov/grants/acronym_list.htm

Student Financial Aid

Reconciliation Act of 2010 H.R. 4872 was signed into law on March 30, 2010.

http://explorehealthcareers.org/en/issues/news/Article/233/Reconciliation_Act_of_2010_Includes_Significant_Student_Aid_Provisions

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Qustions?

Let us meet again..

We welcome you all to our future conferences of OMICS International

7th Annual Global Pharma Summit

On

June 20-22, 2016 at New Orleans**, USA**

http://american.pharmaceuticalconferences.com/