

Novel and Nanostructured Drug Delivery for Diverse Biomedical Applications

Overview

The domain of drug delivery has been revolutionized with the advent of nanotechnology in the 21st century. Several nanostructured drug delivery products have lately hit the market, providing better quality of life to patients, especially for diseases like lung, breast and pancreatic cancer, psoriasis, eczema, etc. Nanoparticle technology has been utilized not only for the treatment but also for imaging of cancer. Furthermore, the application of drug nanocarriers is being investigated for topical, inhalation, nasal, rectal and oral delivery routes for a host of applications and diseases. The current course is endeavoured to be targeted towards biomedical applications of drug delivery systems with distinct translational promise to improve quality of life, enabled using modern QbD paradigms. This course will discuss the basic principles of drug delivery and polymer or lipid-based nanoparticle/liposomes technology, as it applies to various diseased states. It will also cover a gamut of nanotechnologies already on the market and a few prospective newer technologies which are currently undergoing investigations in various research laboratories and pharmaceutical companies. One portion of the course will specifically entail imaging techniques to track nanoparticles. Apart from classroom discussions, emphasis would be on live demonstrations using laboratory tutorials, particularly using devices like inhalers, cascade impactors, nanoparticulate and liposomal constructs. The ultimate goal of this course is not merely to disseminate the scientific information, but also to generate rational and critical thinking among the participants.

Objectives:

The primary objectives of the course are as follows:

1. Understand the evolution of drug delivery concept and recognize the challenges faced by drug delivery scientists.
2. Understand how various types of barriers present in the human body will help understand the limitations encountered when developing a drug or its drug delivery system.
3. Recognize, compare and contrast various physical methods of gene transfer as alternatives to viral and chemical methods for biomedical applications in cancer, inflammation, psoriasis, etc.
4. Acquire sound knowledge of various approaches to predict drug permeability and bioavailability *in vitro* and understand the complexity and simplicity of various cell culture models.
5. Understand principles and intricacies of transdermal and topical drug delivery for various applications in skin diseases like, psoriasis, irritant and contact dermatitis and learn the techniques for drug targeting as applied to cancer therapy, and for preparing antibody-drug conjugates.

Modules	Module A: Liposomes and antibody drug conjugates Module B: Quality by Design and Commercialization aspects of Nanosystems Module C: Overview on topical/transdermal delivery Module D: Lung Physiology and Delivery Module E: Barriers in cancer delivery and role of nanoparticles Number of participants for the course will be limited to fifty.
You Should Attend If..	<ul style="list-style-type: none">• Students at all levels with an interest in drug development, drug delivery, Biopharmaceutics, Nanotechnology, Cancer targeting.• Faculty from academic institutions with such interests• Researchers from industry with such interests.
Fees	The participation fees for taking the course is as follows: <ul style="list-style-type: none">• Participants from abroad : US \$300• Industry/ Research Organizations: 5000• Academic Institutions: 2500 The above fee includes all instructional materials and assignments, laboratory equipment usage charges, 24 h free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty



Prof. Mandip Singh Sachdeva is the Section Leader of Pharmaceutics at Florida A&M and has won several honors and awards such as Novapharm Award for the year 1989-1990 for Excellence in Biopharmaceutics, AAPS Fellow Award 2007, Davis Productivity Award from the State of Florida, 2009, 2011, 2014, Who's Who in America 2008 and 2009, Research Excellence Award from FAMU, 2011. He has published more than 130 articles and papers in the area of Drug Delivery and Nanotechnology in high impact journals and has been issued five US patents. He has over 200 presentations and his work has been highlighted at the AAPS national meeting several times. His research work is very broad encompassing publications in the area of triple negative breast, lung, skin and pancreatic cancer, nanotechnology and targeted drug delivery. He has been the Editor-in-Chief for CRC Critical Reviews in Therapeutic Drug Carrier Systems (Current Impact Factor: 4.259) for nearly a decade. Further, he is the Chair of the Dermatopharmaceutics Focus group at AAPS for the year 2014-2016, and has conducted various webinars and symposiums for the AAPS in the last several years. His work has resulted in more than 120 peer reviewed publications, 6 book chapters and more than 250 presentations in national and international meetings.



Prof. Bhupinder Singh Bhoop is globally acclaimed for his Quality by Design (QbD)-enabled research work on novel and nanostructured drug delivery. He has to his credit over 315 publications in peer-reviewed journals and book chapters, along with 11 books. A widely travelled scientist, he has delivered more than 260 keynote, plenary and invited talks in India and overseas. Over a thousand of industrial scientists have been duly trained by him on various vistas of QbD and commercialization of nanomedicines and IVIVC. He has spearheaded over a dozen of industrial consultancy assignments and projects, 5 patents and tech. transfers of two nano-based drug delivery products. His work has fetched Prof. Bhoop with numerous awards and accolades including, QbD & Product Performance Award (AAPS, USA), Innovative Scientist Award, APTI Best Pharma Teacher Award, Minitab Scientist Par-Excellence Award (UK), and Name in Science Award (Germany).



Prof. O. P. Katare is recognized globally as an accomplished dignitary in the sphere of Phospholipid-Structured Systems. With more than 80 research publications, 04 Book Chapters along with 03 International patents and more than 40 invitational talks; Prof. Katare has contributed substantially towards the pharmacy education and research. In a pioneering work, Prof. Katare has successfully accomplished tech-transfers to Pharmaceutical Industry from his Liposomal Research Laboratory for three novel liposomal nano-tech products for the sufferers of dreaded skin disease, Psoriasis. This fetched him an unprecedented recognition in the field of pharmacy by then President of India, Dr. A. P. J. Abdul Kalam in 2007 by being conferred DBT Technology National Award.

Course Coordinators

Prof. B.S. Bhoop

Phone: 0172-2534103

E-mail: bsbhoop@pu.ac.in

Prof. O.P. Katare

Phone: 0172- 2534112

E-mail: drkatare@yahoo.com

.....
<http://www.gian.iitkgp.ac.in/GREGN>