

BT420 Drug Design and Discovery 3-0-0-6

Description/Preamble

The Drug Discover is one of the most crucial and vital components of contemporary Biosciences and Bioengineering. This current course is designed to introduce postgraduate students to various aspects of Drug Design and Discovery process. Further, steps required to take this drug for human use to the market, including the clinical trial and of regulatory clearances are also included. The course aims to provide good understanding of drug discovery in the pharmaceutical industry as well as insight in to how new drugs are discovered. The courses covers mostly experimental approaches with some exposure to computer aided drug discovery.

Industrial Relevance

Human health is a major global concern. The emerging and re-emerging diseases possess new challenge to this trillion dollar industry. The modern drug discovery utilizes multidisciplinary and the process demands very good knowledge about target validation to hit optimization and further clinical trials and regulatory approvals. The course provided good understanding of the entire process.

Objective

The objective of the course is to help the students understand the drug development process and use it for drug discovery research. The course focused on experimental approaches to drug discovery with some exposure to computational methods.

Pre-requisites

This course is designed as elective for M.Tech and PhD students of Department of Biosciences and Bioengineering.

Syllabus

Introduction to the drug discovery; Targets identification, Drug discovery: Drug scaffolds, Drugs derived from natural products, Existing drugs as a source for new drug discovery, Structure and ligand based drug design using computational method; Lead optimization; Stereochemistry in drug design and concept of Pharmacophore; Enzymes as targets of drug design: Enzyme kinetics, inhibition, rational design of enzyme Inhibitors; Receptors as targets of drug design; In vitro ADME and In vivo Pharmacokinetics; Animal Models and Clinical trials; Intellectual property, Role of regulatory bodies. Case studies related to drug development (Anticancer, antiparasitic and antibiotics etc).

Text/ Reference Books

1. Textbook of Drug Design and Discovery, Povl Krogsgaard-Larsen, Tommy Liljefors and, 3rd Ed., Taylor & Francis 2005.
2. Drugs: From Discovery to Approval. Rick Ng 3rd Ed., John Wiley and Sons 2015.
3. Basic Principles of Drug Discovery and Development. Benjamin E Blass , 1st Ed., Academic Press 2015.
4. Textbook of Drug Design and Discovery, Edited by Kristian Stromgaard, Povl Krogsgaard-Larsen, Ulf Madsen. 4th Ed., CRC Press 2015.

Evaluation & Grading

Evaluation will be based on assignments, quizzes, final and mid semester examination. The assignment will be done as per the existing norms of the institute.