

Advanced Pharmacological and Toxicological Screening Methods (MP102T)

| Course Code | Name of the Course | No. of Hours | Tutorials | Credit Points |
|-------------|--|--------------|-----------|---------------|
| MP102T | Advanced Pharmacological and Toxicological Screening Methods | 4 | - | 4 |

Schemes for internal assessments and end semester examinations semester wise

| Course Code | Name of the Course | Internal Assessment | | | | End Semester Exam | | Total Marks |
|-------------|--|---------------------|----------------|----------|-------|-------------------|----------|-------------|
| | | Continuous Mode | Sessional Exam | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| MP102T | Advanced Pharmacological and Toxicological Screening Methods | 10 | 15 | 1 Hr | 25 | 75 | 3 Hrs | 100 |

MP102T Advanced Pharmacological and Toxicological Screening Methods

Scope

The scope of this course is to inculcate the importance of pre clinical drug screening methods using suitable *in-vitro* and *in-vivo* experimentation of laboratory rodents. The concepts drug screening methods enable researchers to design and evaluate appropriate preclinical studies in their respective area of research cluster.

Objectives

After completion of course student is able to:

Know various common laboratory animals and their experimental usage in drug screening.

Acquire the concept and use the mammalian cell culture techniques and its application on drug screening.

Discuss the preclinical and translation rodent model of common diseases and disorder.

Know the standard guidelines and protocols used in various preclinical toxicity studies and clinical trials.

45 Hours

- 1. Common laboratory animals including Transgenic animals:** (9 Hrs)
Description, handling, drug administration and blood collection techniques, anaesthesia and euthanasia of experimental animals. Maintenance and breeding of laboratory animals. CPCSEA guidelines relevant animal ethics and conduct experiments on animals. Alternative animal models in experimental Pharmacology.
- 2. Animal cell culture Methods:** (9 Hrs)
Cell culture equipment: safety, sterile and aseptic techniques. Cell culture techniques: freezing, thawing and harvesting of cells. Primary culture and subculturing of cells. Microscopic analyses of cells and sub cellular characterization including immunohistochemistry, physical and chemical stress of cells. Isolation of proteins and their quantitative expression study. Cell death characterization and cell based bioassays.
- 3. Preclinical and Translation animal models:** (9 Hrs)
Diabetes, Metabolic Syndrome (Mets), Pain and Inflammation, Inflammatory bowel disease, Cancer animal models, Cardiovascular, Neuropsychiatric and neurodegenerative animal models. Data Acquisition software used in experimental pharmacology.
- 4. Basic and Experimental Toxicology:** (9 Hrs)
Regulatory guidelines for conducting toxicity studies including OECD guide lines. Acute, sub-acute and chronic- oral, dermal and inhalation studies as per OECD guidelines. Acute eye

irritation, skin sensitization, dermal irritation & dermal toxicity studies. Test item characterization- importance and methods in regulatory toxicology studies. Concept and its importance in drug development. Alternative animal species for Toxicity studies.

5. Regulatory Perspectives of Clinical Trials:

(9 Hrs)

Origin and Principles of International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidelines Ethical Committee: Institutional Review Board, Ethical Guidelines for Biomedical Research and Human Participant. New drugs and clinical trials rules, 2019-CDSCO:

References:

1. Vogel, H. G. (Ed.). (2002). Drug discovery and evaluation: pharmacological assays. Springer Science & Business Media.
2. Vogel, H. G., Hock, F. J., Maas, J., & Mayer, D. (Eds.). (2006). *Drug discovery and evaluation: safety and pharmacokinetic assays; with 125 tables*. Springer Science & Business Media.
3. National and International Journals on Pharmacology / Drug Discovery.
4. Kenakin, T. (2016), *Pharmacology in drug discovery and development: Understanding drug response*. Academic Press.
5. Huang X, Aslanian RG, editors. Case studies in modern drug discovery and development. John Wiley & Sons; 2012.
6. McArthur RA, Borsini F, editors. Animal and translational models for CNS drug discovery. Academic Press; 2008.
7. Faqi AS, editor. A comprehensive guide to toxicology in preclinical drug development. Academic Press; 2012.
8. Seethala R, Zhang L, editors. Handbook of drug screening. CRC Press; 2016.
9. Pollard JW, Walker JM, editors. Basic cell culture protocols. Springer Science & Business Media; 1997.