

MOLECULAR PHARMACOLOGY (HCB-918)

Credit hours 3 (3-0)

Educational Objectives:

1. Pharmacology is an emerging area of the biological and biosciences which gives useful knowledge covering multiple aspects of the drugs, from drug development to the mechanism and ultimately to the metabolism. This course will be a step towards achievement of global objective of the personalized medicines, because this will also cover molecular aspects of the principles of drugs actions.

Course Outcomes:

2. The student will be able to use his knowledge to access pertinent information about drugs and natural products, focusing on the identification of appropriate reliable sources of information. Communicate appropriately with other health professionals regarding drug therapy, focusing on using appropriate technical language related to pharmacology and will find a place in the industry and diagnostics.

3. Course Contents:

- a. Introduction to pharmacology
- b. Protein targets for drug binding
 - (1) Drug receptors
 - (2) Classification
 - (3) Interaction
- c. Drug specificity
- d. Competitive antagonism
- e. Partial agonists and the concept of efficacy
- f. Drug antagonism and synergism
- g. Desensitisation and tachyphylaxis
- h. Targets for drug action
 - (1) Receptors
 - (2) Ion channels
 - (3) Enzymes
 - (4) Transport proteins
- i. Regulation of intracellular calcium

- j. Excitation
- k. Pharmacogenetics, pharmacogenomics and personalized medicines
 - (4) Single-gene pharmacokinetic disorders
 - (5) Therapeutic drugs and clinically available pharmacogenomic tests
 - (a) General principles of peptide pharmacology
 - (b) Amino acid transmitters

Recommended Books:

1. **Rang & Dale's Pharmacology** by Rang, H. P., Elsevier.
2. **Basic and clinical pharmacology** ^{11th} Edition by Bertram G. Katzung, Susan B. Masters, Anthony J. Trevor.
3. **Goodman and Gilman's the pharmacological basis of therapeutics** (2007) by Louis Sanford Goodman, Joel G. Hardman, Lee E. Limbird, Alfred Goodman Gilman