

Gujarat Technological University

M. Pharm. Syllabus

Semester I

910103: Subject of Specialization Paper- I

Cellular and Molecular Pharmacology

Theory

(Four hours per week, 6 Credits)

Course Content:

	Hours
1. Molecular structure of biological membrane and, transport mechanism across the cell membrane	03
2. Molecular biology of receptor system: structure, receptor pharmacology, signal transduction mechanism and termination of receptor activity, regulation of receptor, their involvement in various biological processes including diseases resulting from receptor malfunction and their role in pharmaco-therapeutics. Radio ligand binding studies. Theories of drug receptor interaction. Dose response relationship, potency and efficacy and different types of antagonisms	15
3. Classification of cholinergic and adrenergic receptors, their signal transduction mechanism, agonists and antagonists	04
4. NMDA, GABA, Glycine, Serotonin, Dopamine, Histamine and Endothelin (ET) receptors, their classification, signal transduction mechanism, agonists and antagonists	10
5. Pharmacology of sodium, calcium and potassium channels and their modulators	05
6. The role of nitric oxide in various physiological functions and its importance in pharmacotherapy of disorders like hypertension, angina and erectile dysfunction.	04
7. Pharmacology of purines and peptides.	03
8. Role of Cytokines, Prostaglandins, TNF- α , Bradykinins, Leucotrienes, PAF, Interferons and Adhesion molecules in various immunological and inflammatory disorders.	06
9. Cellular and molecular pharmacology of apoptosis and necrosis, stress induced expression of genes and their role in neurochemistry of aging and anti-aging drugs. (With special emphasis on CNS)	07
10. Gene therapy	03

910103: Cellular and Molecular Pharmacology

Practical

Four hours per week, 6 Credits

1. Introduction to experimental animals, ethics in pharmacological experiments, CPCSEA Guidelines
2. Methods for euthanasia, anesthesia, dosing (i.v., oral, i.p., s.c., i.m.) and blood collection by various techniques
3. To study the effects of various agonists (pD₂) and antagonist (pA₂) using isolated preparations (rat ileum, guinea pig ileum, rat fundus strip, rat anococcygeus muscle, rat vas deference, rat uterus, guinea pig taenia coli, rat/guinea pig heart, guinea pig tracheal chain, rat aortic strip)

4. To study the effects of calcium channel blockers on responses of various agonists on rat/guinea pig ileum
5. To study the effect of various drugs on rat blood pressure by invasive/non invasive techniques

Reference Books:

1. Pharmacological Basis of Therapeutics-Goodman and Gilman
2. Pharmacology-Rang and Dale
3. Basic and Clinical Pharmacology – Bertam G. Katzung
4. Principles of Pharmacology – Paul L. Munson
5. Lewis's Pharmacology – James Crossland – Churchill Livingstone
6. Review of Medical Physiology – Ganong William F.
7. Fundamentals of Experimental Pharmacology- Ghosh M.N.
8. Basic and Clinical Immunology- Peakman, Mark
9. Handbook of Experimental Pharmacology- Goyal R.K.
10. Handbook of Experimental Pharmacology- Kulkarni S.K.
11. Pharmacology and Toxicology- Kale S.R.