**MOLECULAR PHARMACOLOGY CREDIT HOURS 2+1**

**LEARNING OUTCOMES:**

**The students will be able to:**

1. About general principles, methodology, application and techniques of pharmacology
2. The molecular pharmacology of receptors.

**COURSE CONTENTS:**

Introduction, history and its classification of pharmacology, drugs and their sources, routes of drugs administration, advantages and disadvantages of enteral routes, parentral routes, topical routes, pharmacokinetics, drug solubility and passage of drugs across the body membranes, plasma concentration of drugs and various factors affecting its absorption and factors influencing the rate of absorption, GIT and other routes of drugs, distribution and factors influencing the rate of distribution of drugs, biotransformation and factors influencing the rate of biotransformation of drugs, excretion, channels of excretion and factors influencing the rate of excretion of drugs, definition of bioavailability and bioequivalence, therapeutic index, plasma half-life (t½), dose-response curve, volume of distribution, pharmaco dynamics, drug receptors and theories, mechanisms of drug action, specificity of drug action and factors modifying the action and dosage of drugs. Genetic variability in drug action, protein structure-activity relationships, receptor-ligand interactions, signal transduction, biochemical and molecular aspects of G-protein coupled receptors and their signaling mechanisms.

**PRACTICALS:**

1. To study the effect of nostigmine, adrenaline, acetylcholine on skeletal muscle contraction.
2. To perform the screening test for paracetamol and phenothiazine in body's fluids
3. To demonstrate the duke bleeding time method in rabbit
4. To observe the effect of warfarin and heparin on bleeding time in rabbit
5. To study the effects of drugs on rabbit eye pupil diameter
6. To study the effect of acetylcholine, atropine, adrenaline on cardiac muscles.
7. To observe the effect of central nervous system depressants and stimulants in animal models.
8. To study the effect of hypoglycemic drugs in rabbit
9. In silico tool to predict drug pharmacokinetics (PK) and effects on ADME (absorption, distribution, metabolism and excretion) processes

**RECOMMENDED BOOKS:**

1. [Rho](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Jay+P%2E+Rho),J.P., and [Louie](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Stan+G%2E+Louie), S.G., 2003. Handbook of Pharmaceutical Biotechnology. Haworth Press, Incorporated
2. Bryant, B. J. 2015. Pharmacology for health professionals. Chatswood, New South Wales : Mosby
3. Clementi, F., & Fumagalli, G. 2015. General and molecular pharmacology: Principles of drug action. John Wiley & Sons, Inc
4. [Dean J. A. Crommelin](http:///h), D.J.A., [Daan J. A. Crommelin](http://www.allbookstores.com/browse/Author/Crommelin%2C%20Daan%20J.%20A.),D.J.A., and [Robert D. Sindelar](http://www.allbookstores.com/browse/Author/Sindelar%2C%20Robert%20D.), R.D., 2002. [Pharmaceutical Biotechnology : An Introduction for Pharmacists and Pharmaceutical Scientists](http://www.allbookstores.com/book/0415285011), 2nd  Edition. CRC Prentice, Licence
5. Dickenson, J., Freeman, F., Mills, C.L., Thode, C. and Sivasubramaniam, S., 2012. Molecular Pharmacology: From DNA to Drug Design. ISBN: 978-0-470-68443-6. Wiley-Blackwell
6. [Kayser](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Oliver+Kayser), O., [Muller](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Rainer+H%2E+Muller), R.H., and (Editor), [Müller](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Rainer+H%2E+M%FCller), R.H., 2005. Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications. Wiley, John & Sons, Incorporated.
7. Klefenz, H., 2002. Industrial Pharmaceutical Biotechnology, Wiley-VCH Verlag GmbH.
8. [MichaelA.Santoro](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Michael+A%2E+Santoro), [Thomas M. Gorrie](http://search.barnesandnoble.com/booksearch/results.asp?z=y&ath=Thomas+M%2E+Gorrie), 2005. Ethics and the Pharmaceutical Industry, Cambridge University Press

Rang, H. P., Ritter, J., Flower, R. J., & Henderson, G. 2016. Rang & Dale's pharmacology. Elsevier/Churchill Livingstone