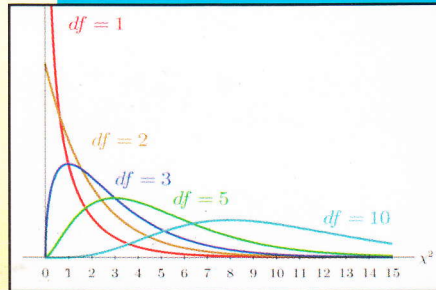
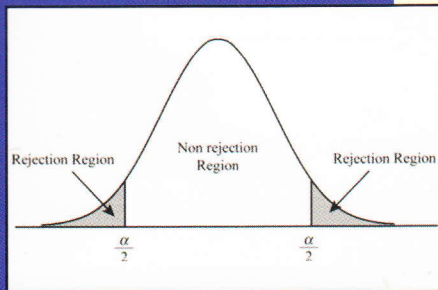
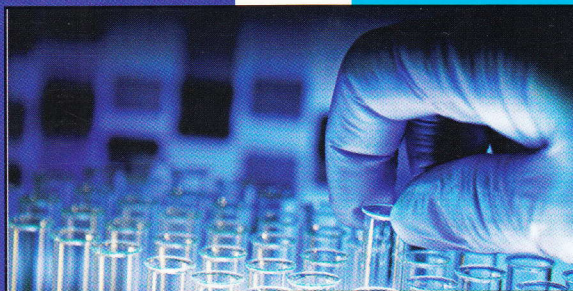


AS PER PCI REGULATIONS
THIRD YEAR B. PHARM.
SEMESTER-VI

EXPERIMENTAL PHARMACOLOGY-III

Dr. GHANSHYAM PANIGRAHI

Dr. ARJUN PATRA



 **NIRALI**
PRAKASHAN
ADVANCEMENT OF KNOWLEDGE

ABOUT THE AUTHORS



Dr. Ghanshyam Panigrahi is working as Associate Professor and Head, Department of Pharmacology, Royal College of Pharmacy and Health Sciences, Berhampur, Odisha. He has deep insight into experimental pharmacology and preclinical testing of drugs. He has experience of 13 years in teaching experimental pharmacology to undergraduate and postgraduate students. His fields of research interest are natural product research, diabetes mellitus and associated disorders. His research work has been published in more than 35 research articles. He has guided numbers of M. Pharm. and Ph.D. scholars to carry out their research work. Dr. Panigrahi is a life member of Indian Pharmacological Society (IPS) and The Association of Pharmaceutical Teachers of India (APTI).



Dr. Arjun Patra obtained postgraduate and doctorate degree from Birla Institute of Technology, Mesra, Ranchi. Recently he has completed Postdoctoral Research in USA under Raman Fellowship funded by University Grants Commission. He has around 16 years of teaching experience in various pharmacy colleges at Berhampur, Moradabad and Jaipur, and currently working as Assistant Professor at Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, Chhattisgarh. Dr. Patra has supervised M. Pharm. and Ph.D. students and published and presented research papers in national/international journals/conferences. Dr. Patra specializes in Pharmacognosy and has studied a wide range of plants for their phytochemical and pharmacological potential. Dr. Patra's major fields of research interest are natural product exploration, nano-delivery of natural products for treatment of cancers and screening of medicinal plants for different pharmacological activities.



Email : niralipune@pragationline.com

Website : www.pragationline.com

Also find us on  www.facebook.com/niralibooks

 [@nirali.prakashan](https://www.instagram.com/nirali.prakashan)



Contents

Experiment No.	Experiment Title	Page
	Guide to use this book	
1.	Dose calculation in pharmacological experiments. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	1
2.	Antiallergic activity by mast cell stabilization assay. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	8
3.	Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	12
4.	Study of effect of drugs on gastrointestinal motility. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	19
5.	Effect of agonist and antagonists on guinea pig ileum. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	23
6.	Estimation of serum biochemical parameters by using semi-autoanalyser. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Swaha Satpathy)	27
7.	Effect of saline purgative on frog intestine. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	30
8.	Insulin hypoglycemic effect in rabbit. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Swaha Satpathy)	40
9.	Test for pyrogens (rabbit method). (Contributed by Dr. Swaha Satpathy and Dr. Arjun Patra)	45
10.	Determination of acute oral toxicity (LD50) of a drug from a given data. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Swaha Satpathy)	49
11.	Determination of acute skin irritation / corrosion of a test substance. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	61
12.	Determination of acute eye irritation / corrosion of a test substance. (Contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)	67
13.	Calculation of pharmacokinetic parameters from a given data. (Contributed by Dr. Gourishyam Pasa and Dr. Ghanshyam Panigrahi)	74
14.	Biostatistics methods in Experimental Pharmacology (central tendency) (Contributed by Dr. Gourishyam Pasa)	89
15.	Biostatistics methods in Experimental Pharmacology (student's t test, ANOVA). (Contributed by Dr. Gourishyam Pasa)	98
16.	Biostatistics methods in Experimental Pharmacology (Chi-square test, Wilcoxon Signed Rank test). (Contributed by Dr. Gourishyam Pasa)	110
	Appendices	115
	Bibliography	121

Experiment No. 4

STUDY OF EFFECT OF DRUGS ON GASTROINTESTINAL MOTILITY

(Chapter contributed by Dr. Ghanshyam Panigrahi and Dr. Arjun Patra)

Purpose:

At the end of practical class, the students shall be able to:

1. Know about the mechanism of gastrointestinal motility.
2. Know the effect of different drugs on gastrointestinal motility.
3. Know the different animal models used for screening of drugs acting on the gastrointestinal motility.

Terminology:

Gastrointestinal Motility: Gastrointestinal (GI) motility is an essential function of digestive and absorptive processes of the gut, required for propelling intestinal contents, mixing them with digestive juices, and preparing unabsorbed particles for excretion.

Description:

With the exception of the upper one third of the esophagus and the external anal sphincter, the muscular layers of the bowel wall are made up of smooth muscle cells. Like striated muscles, smooth muscle contractions of mammalian small intestine are preceded by changes in membrane potential differences. Depolarization of the membrane tends to cause the muscle cell to contract, whereas hyperpolarization has the opposite effect.

Gut motility is controlled by myogenic (GI smooth muscle has its own intrinsic rhythmicity), hormonal (gastrin, serotonin, cholecystokinin, enkephalin, etc.) and neuronal (The gut receives extrinsic sympathetic, parasympathetic and NANC [non-adrenergic non cholinergic] innervation, but it also has its own intrinsic enteric nervous system capable of independent function in many instances) parameters/functions.

Myenteric nerve plexus lies between circular and longitudinal muscularis externa and controls peristalsis and segmentation. Peristalsis is a reflex response that is initiated when the gut wall is stretched by the contents of the lumen, and it occurs in all parts of the gastrointestinal tract from the esophagus to the rectum. The stretch initiates a circular contraction behind the stimulus and an area of relaxation in front of it. The wave of contraction then moves in an oral-to-caudal direction, propelling the contents of the lumen forward at rates that vary from 2 to 25 cm/sec. Peristaltic activity can be increased or