

RESEARCH AREA

➤ **PHARMACEUTICAL ANALYSIS**

- Analytical method development and validation
- Method development for Bioavailability/ Bioequivalence studies

➤ **PHYTOCHEMISTRY**

- Bioactivity guided fractionation of herbal extracts, isolation of active constituents and its structural elucidation
- Standardization of herbal extracts
- Lead discovery and optimization

➤ **SYNTHETIC CHEMISTRY**

- Process development of bulk drugs and drug intermediates
- Synthesis of impurities and metabolites of drugs
- Lead optimization studies
- Microwave assisted synthesis of compounds

➤ **DRUG METABOLISM AND PHARMACOKINETIC STUDIES**

- Phenotype study
- *In vitro* pharmacokinetic study

➤ **DESIGN, SYNTHESIS AND PHARMACOLOGICAL EVALUATION OF BIOLOGICALLY ACTIVE MOLECULES**

➤ **FORMULATION AND DEVELOPMENT**

- Preformulation studies
- Design and evaluation of formulations
 - Tablets-Effervescent, Immediate release, Sugar coated, Bilayer, Enteric coated, Film coated
 - Capsules
 - Liquid orals
 - Ointments
 - Gels
 - Powders
 - Injectables

- Controlled release drug delivery systems by hydrophilic single matrix tablet
- Sustained release formulations using matrix and coating technology
- Orally disintegrating tablets and its taste masking
- Design and formulation of highly insoluble drugs by changing its polymorphic form
- Development of Geomatrix technology for tableting
- Taste masking of drug
- Scale up & Technology transfer to production shop floor of the formulated products
- In-vitro and in-vivo evaluation of the formulations

➤ **NOVEL DRUG DELIVERY SYSTEMS**

- Design and Development of novel drug delivery systems such as
 - Ophthalmic drug delivery system,
 - Bioadhesive drug delivery system
 - Osmotic drug delivery system
 - Liposomal drug delivery system
 - Ethosomes drug delivery system
 - Transdermal drug delivery
 - Iontophoretic drug delivery
 - Hydrogel based oral drug delivery systems
 - Parenteral drug delivery Approaches- Microparticles and Implants using Biodegradable polymers
 - Delivery Systems for Therapeutic Proteins and Peptides: Vaccines, insulin, hepatitis surface antigen

➤ **PRECLINICAL EVALUATION FOR PAIN AND NOCICEPTION**

- Anti inflammatory activity by carageenan induced rat paw oedema
- Analgesic activity by hot plate method (Eddy's hot plate)
- Analgesic activity by writhing method

➤ **CNS PHARMACOLOGY**

- CNS stimulants and depressants
- Anti-epileptic drugs using MES method

➤ **METABOLIC DISORDERS**

- Anti-diabetic agents

- Anti-hyperlipidemic agents
- Anti-obesity agents
- Anti-ulcer agents

➤ **MICROBIOLOGICAL STUDY**

- Antimicrobial screening of plant / synthetic products
- Microbiological testing of water, food and pharmaceuticals
- Identification of clinical isolates from patients and various environmental sources like water, soil and so on

➤ **ANTIFERTILITY AGENTS IN RATS**

➤ **HISTAMINERGIC RECEPTORS**

- Effect of H₁ and H₂ receptors on Guinea pig ileum and rat uterus

➤ **TOXICITY STUDIES**

- Acute and repeated dose toxicity in rodents

➤ **DETERMINATION OF VARIOUS BIOCHEMICAL PARAMETERS**

- Liver disorder e.g. Estimation of Bilirubin, Alkaline phosphatase, SGPT and SGOT
- Kidney disorder e.g. BUN estimation
- Lipid profile e.g. LDL, HDL, Total cholesterol and Triglycerides
- Glucose estimation

➤ **CLINICAL EVALUATION**

- Cardiovascular parameters: ECG, Blood Pressure, heart rate and pulse
- Pulmonary parameters: Respiratory volume, Lung capacity

