

ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ



# University of Mysore

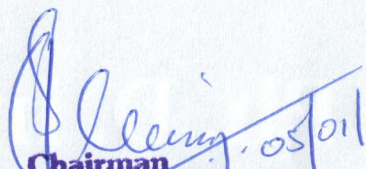
(Estd.1916)

## Ph. D. in BIOCHEMISTRY



UNIVERSITY OF MYSORE  
Department of Studies in Biochemistry  
Manasagangotri, Mysuru-570 006

Regulations and Syllabus  
Ph. D. in BIOCHEMISTRY

  
Chairman  
Dept. of Studies in Biochemistry  
University of Mysore  
Manasagangotri, MYSORE-570 006  
INDIA  
10/05/2021

**UNIVERSITY OF MYSORE**  
**GUIDELINES AND REGULATIONS**  
**LEADING TO**  
**PH. D. IN BIOCHEMISTRY**

**Programme Details**

Name of the Department	:	Department of Studies Biochemistry
Subject	:	Biochemistry
Faculty	:	Science and Technology
Name of the Programme	:	Ph. D.

**PH. D. PROGRAM IN BIOCHEMISTRY**

The Ph.D., programme in Biochemistry is comparable to that of reputed National Institutions and is highly sought among life sciences in the University.

**PROGRAMME OUTCOME**

On successful completion of this programme each Ph.D. scholar will:

- Have through knowledge of current literature in the specified area.
- Know how design experiments to address the chosen research problem.
- Have confidence to write publications in the peer reviewed Journals.
- Have knowledge to take up any research problem independently.
- Have required knowledge to teach post-graduate students.

**PROGRAMME OBJECTIVES**

The main objective of this Ph.D. programme is to provide strong foundation to

- To understand the basic problems in current research scenario and find meaningful solutions.
- To develop as an independent researcher both in academic institutions and in R & D programmes of industries.
- To take up research problems at higher level to work as a postdoctoral fellow worldwide.
- To take up teaching profession in academic institutions

**PROGRAMME PEDAGOGY**

- Conducting literature survey under the direction of the supervisor is a primary module in the research methodology.
- Participatory learning on surveys and conducting experiments under the supervision of teachers are adopted.
- Practical orientation on Sample survey data organisation and interpretation through statistical techniques is yet another major method of approach in the pedagogy.

**COURSE – I: RESEARCH METHODOLOGY**  
**Objectives**

- To learn types of research.
- To learn about various research models with the use of advanced techniques
- To learn about good laboratory practices and ethical issues.
- To learn the applications of suitable statistical analysis.

#### Course outcome

- Understand the use of appropriate biological samples or animal model to address the selected research problem
- Understand the applications of advanced techniques.
- Understand the signaling pathways at cellular levels.

#### COURSE CONTENT

**Types of Research-** Academic, Industrial, clinical, Basic research, applied research. Research objectives. Review of literature-identifying gaps; formulating hypothesis, selecting research topics.

**Collection of Research Material:** Information, types and sources. Pubmed as a resource. Collection, classification and retrieval of information.

**Research Design:** Types of studies-cohort, double blind, placebo control, cross over. Overview of Framingham study.

**Statistical methods:** Error and its significance, choosing sample size, collection of data-questionnaire; methods of scaling, collection analysis and presentation of data. Parametric and non-parametric tests and when to use them.

**Ethical issues:** Handling of animals.  
Animal ethics; human volunteers-ICMR guidelines of ethical issues. Intellectual property rights. Conflict of interest, Issues on plagiarism. Intellectual property. Authorship issues-multiple authors, corresponding author. Safe handling and disposal of biological samples.

Writing reports- lab records, program reports, grant applications.

**Modern Biochemical Techniques:** Advanced techniques in Biochemical analysis- LC-MS, confocal microscopy, AFM, DNA microarray. Real time PCR.

**New models of Biochemical studies:** Drosophila, Zebra fish, Trypanosoma and *C. elegans*. Knock out, over expression phenotype.

Integration of metabolic pathways of carbohydrate and lipid metabolism.

**Mechanism of drug action:** Receptors (PPAR, LXR, RXR, AhR) downstream effectors, genes, agonists, antagonists, mechanisms and toxicity, COX-1, COX-2, Drug metabolizing enzymes-Cyp.

**Cell signaling:** Signaling in animal and plant cells.

Regulation of eukaryotic gene expression.

#### COURSE-II: RESEARCH METHODOLOGY

##### Objectives

- To work with research guide in scientific spirit.
- To know the current literature of the selected research problem.
- To learn about good laboratory practices and ethical issues.

#### **Course outcome**

- Understand how to work in a research group.
- Understand the use of scientific literature to support his research.
- Understand the importance of plagiarism and authorship issues.

#### **COURSE CONTENT**

**Responsibility of the guide:** The Guide shall ensure that the research student understands the following aspects. The Guide shall conduct tests/evaluation from time to time and have the IA marks ready.

#### **Current status of the lab:**

- 1) Ongoing projects/ past projects/ publications resulting from the Guide's Research group. Any novel technique developed. The review of the literature pertinent to candidates work-relevant publications. Identification of Research problem, identifying gaps in the knowledge, formulating objectives and work plan.
- 2) **Review of the allied fields-** Literature of the allied area to candidate's field, outstanding publications.
- 3) **Authorship issues-** the primary author, corresponding author, contributing author, etc., Guide's responsibility to assign the appropriate authorships.
- 4) **Plagiarism-** adopting a figure v/s cut and paste and its implications in plagiarism.
- 5) **Sharing reagents/ chemicals/ methods in lab-** team work is essential.

**How to publish/ present in seminars/ symposia/ meeting proceedings/ etc.,**



