DEPARTMENT OF BIOCHEMISTRY, BIOTECHNOLOGY AND BIOINFORMATICS

Biochemistry is a prime branch of biological sciences that has played a very important role in unravelling many of the life processes. Biotechnology has put this understanding into technological use, resulting in the development of successful industrial processes. Bioinformatics is the application of information technology to the management of the biological data, thus giving an altogether new dimension to the understanding of Biochemistry and Biotechnology. Knowing the importance of these subjects, the department has been built up with very strong roots and has grown into a full-fledged banyan, bringing Biochemistry, Biotechnology, Bioinformatics and all other allied fields under its banner. The department is very well equipped with several laboratories and instrument rooms, all of which house many state-of-the-art scientific equipment. The department also has specialized research laboratories for Animal Tissue Culture, Plant Tissue Culture, Enzymology & Immunology and a Centralized Advanced Research Laboratory.

Vision
Produce world-class academicians, scientists, industrialists and entrepreneurs in the field of Biochemistry, Biotechnology and Bioinformatics.

Mission
Inculcate strong theoretical, practical, research and analytical skills in the subject domain and thereby prepare the students for both employability and entrepreneurship.

Objectives

- To impart a thorough holistic knowledge by integrating the concepts of Biochemistry, Biotechnology and Bioinformatics and emphasizing on the recent developments.

- To strengthen the practical knowledge of students through internships and visits to reputed research institutions, universities, industries, pharmaceutical companies and hospitals.

- To develop leadership qualities in students by motivating them to participate in workshops, seminars, symposia, conferences and competitions.

- To encourage students to carry out high quality research catering to societal needs and publish in reputed journals.

- To collaborate with world class prime Institutes and broaden research activities in the department.

- To equip students to take up important positions in leading universities, research institutes and industries globally.

- To build confidence in students to take up entrepreneurial ventures.

Department of Biochemistry, Biotechnology and Bioinformatics

Our Team

Thrust Areas of Research

1. Medicinal Plant Research and Clinical Studies
2. Enzyme Technology and Environmental Studies
3. Data Science and Computational Biology

Medicinal Plant Research and Clinical Studies

This thrust area is actively involved in fundamental research, clinical studies and molecular level studies to elucidate and validate the mechanism of action of both whole plants and individual active compounds. Well established and equipped laboratories and facilities like Animal tissue culture laboratory and Plant tissue culture laboratory are available for both basic and advanced research. Work is being done on medicinal plants with broad spectrum of activities like anticancer, antidiabetic, antilithiatic, anti-thrombogenic activities and addressing and counteracting conditions like cardiovascular, PCOS and PCOD and obesity and other lifestyle disorders. These disorders are addressed using animal and clinical subjects. Molecular pathway interactions, genomic and proteomic studies are done. The plants are also clinically validated using animal and cell line studies. Metabolic engineering of valuable secondary metabolites from medicinal plants is being done in our plant tissue culture laboratory. Identification of lead compounds and its molecular interaction is done by *in silico* approach to integrate the results of wet lab and dry lab studies. The department is striving to establish a Centre of Excellence in Translational Research and Preventive Medicine. Efforts are being taken to produce and patent valuable medicinal plant-based products/food products based on traditional system of medicines for general well- being and to address specific disease conditions.

MEDICINAL PLANT RESEARCH AND CLINICAL STUDIES

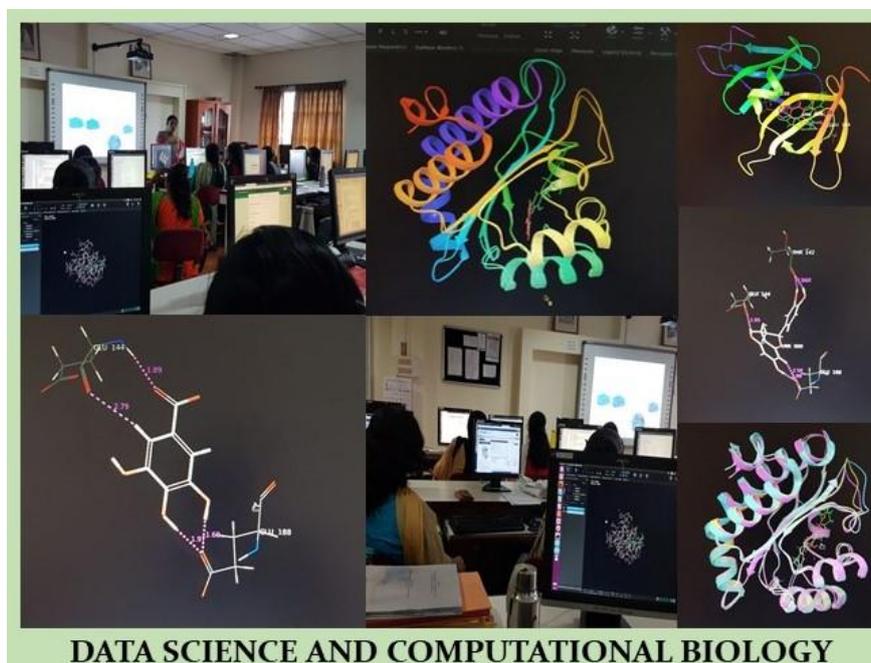**Enzyme Technology and Environmental Studies**

Enzymes, the eco-friendly protein molecules are in great demand these days and they are gradually replacing many of the processes involving chemicals in several industries. A lot of wastes are generated on a daily basis, which pose potential hazards to the environment. This thrust area aims to formulate solid waste management strategies by using the wastes as novel sources of commercially and industrially valuable enzymes, proteins and other value-added products, which could be commercialized in the future thereby opening up the possibility of income generation apart from reducing solid waste pollution.

Enzyme Technology and Environmental Studies

Data Science and Computational Biology

Data Science and Computational Biology thrust area focuses on identification of bioactive compounds for various diseases from plants and synthetic compounds using molecular docking and molecular dynamics, identification of potential target using genomics and proteomics approach, development of predictive model using artificial intelligence and machine learning algorithm for drug design, target identification and clinical diagnosis and metagenomic analysis of samples from different environment to identify microbial population and their functional role in the environment.

DATA SCIENCE AND COMPUTATIONAL BIOLOGY