

BIOCHEMISTRY DEPARTMENT

Biochemistry has played an important role in the progress of chemistry and contributed significant impact on the modernization of biology. By the mid-20th century, biochemistry was widely recognized as a subject distinct from other branches of chemistry and biology. Broadly defined, biochemistry is the study of the chemical composition of living matter and the biochemical processes that underlie life activities during growth and maintenance. Biochemistry therefore works on the chemical structures, mechanisms, and processes observed in all organisms and the regulation of these pathways. Although biochemistry makes important knowledge and practical applications available to medicine, agriculture, nutrition, and industry, its ultimate focus concerns the miracles of life itself. As the widest basic science, biochemistry contains many subbranches such as nutritional biochemistry, physical biochemistry, molecular genetics, neurochemistry, biological organic chemistry, clinical biochemistry, pharmacology biochemistry and immunochemistry. Recent developments in these fields have showed connection between technology, chemical engineering, and biochemistry. Scientists in this field have focused on studying the chemical properties of living organisms by studying the cellular components of these organisms in terms of the chemical composition of these components, the scope their existence and important functions, as well as the study of the various biological interactions that occur in these living cells in terms of metabolism and energy production.

In our Biochemistry Department, “Biochemistry, Clinical Biochemistry and Nutritional Biochemistry courses and elective courses” are given. Within the scope of these areas:

- In the **Biochemistry** course, information is given about the use of macromolecules in our human body for the maintenance of energy and vitality and their interactions with each other, while the cellular roles of vitamins and minerals and their importance for health are emphasized.
- In the **Clinical Biochemistry** course, information is given on the diagnosis of diseases, their differentiation from each other, and the diagnostic tests to be used in the monitoring of treatment and the evaluation of test results.
- In the **Nutritional Biochemistry** course, the effect of nutrition on chemical and physiological processes in the body, its use in the body, and the importance of nutrition in health and disease are emphasized.

The knowledge and methods developed by biochemists are applied in all fields of medicine, chemistry and health-related industry. Some of the research areas listed below:

- Cell biology
- Metabolism, including pathways
- Cellular signaling, endocytosis and trafficking
- Membranes and transport mechanisms
- Regulation of gene expression
- Structural biology and enzymology
- Protein structure and dynamics
- Metabolomics
- Nutrition and biochemistry
- Oxidative stress and its relation with diseases
- Chromatin biology, nucleic acid chemistry
- Development and genetics
- Microbiology
- Systems biology

- Neurobiology and neurobiochemistry
- Molecular medicine and drug discovery
- Infection and disease processes
- Cancer biology, biomarkers for detection and prognosis of cancer
- Biochemical processes underlying the aging of the skin
- Developing sustainable solutions for production in industry
- Development of diagnostic kits

Reference:

1. Singh P, Batra HS, Naithani M. History of biochemistry. Bull Indian Inst Hist Med Hyderabad. 2004 Jan-Jun;34(1):75-86. PMID: 17152615.
2. Lehninger Principles of Biochemistry (International Edition) Eighth by David L. Nelson, Michael M. Cox (ISBN: 9781319381493)

