



## Analytical and Bioanalytical Techniques, Novel Optical Sensor and Biosensors

Sudhansu Sekhar Patra\*, MITS School of Biotechnology

Biochemistry or biological chemistry, is the study of chemical processes within and relating to living organisms. A sub-discipline of both chemistry and biology, biochemistry may be divided into three fields: structural biology, enzymology and metabolism. Over the last decades of the 20th century, biochemistry has become successful at explaining living processes through these three disciplines. Almost all areas of the life sciences are being uncovered and developed through biochemical methodology and research. Biochemistry focuses on understanding the chemical basis which allows biological molecules to give rise to the processes that occur within living cells and between cells, in turn relating greatly to the understanding of tissues and organs, as well as organism structure and function. Biochemistry is closely related to molecular biology which is the study of the molecular mechanisms of biological phenomena. Much of biochemistry deals with the structures, functions, and interactions of biological macromolecules, such as proteins, nucleic acids, carbohydrates, and lipids. They provide the structure of cells and perform many of the functions associated with life. The chemistry of the cell also depends upon the reactions of small molecules and ions. These can be inorganic (for example, water and metal ions) or organic (for example, the amino acids, which are used to synthesize proteins). At its most comprehensive definition, biochemistry can be seen as a study of the components and composition of living things and how they come together to become life. In this sense, the history of biochemistry may therefore go back as far as the ancient Greeks. However, biochemistry as a

specific scientific discipline began sometime in the 19th century, or a little earlier, depending on which aspect of biochemistry is being focused on. Some argued that the beginning of biochemistry may have been the discovery of the first enzyme, diastase (now called amylase), in 1833 by Anselme Payen, while others considered Eduard Buchner's first demonstration of a complex biochemical process alcoholic fermentation in cell-free extracts in 1897 to be the birth of biochemistry. Some might also point as its beginning to the influential 1842 work by Justus von Liebig, Animal chemistry, or, Organic chemistry in its applications to physiology and pathology, which presented a chemical theory of metabolism, or even earlier to the 18th century studies on fermentation and respiration by Antoine Lavoisier. Many other pioneers in the field who helped to uncover the layers of complexity of biochemistry have been proclaimed founders of modern biochemistry. Emil Fischer, who studied the chemistry of proteins,[16] and F. Gowland Hopkins, who studied enzymes and the dynamic nature of biochemistry, represent two examples of early biochemists. The term "biochemistry" itself is derived from a combination of biology and chemistry. In 1877, Felix Hoppe-Seyler used the term (biochemie in German) as a synonym for physiological chemistry in the foreword to the first issue of *Zeitschrift für Physiologische Chemie* (Journal of Physiological Chemistry) where he argued for the setting up of institutes dedicated to this field of study. The German chemist Carl Neuberg however is often cited to have coined the word in 1903, while some credited it to Franz Hofmeister.

\*Corresponding author: Sudhansu Sekhar Patra, Research Scholar, MITS School of Biotechnology, India, Tel: +9734583227; E-mail: [patra.su@gmail.com](mailto:patra.su@gmail.com)

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