Guest Lecture on

"Enzymes in Biological Processes"

30th August, 2019

Organized by: Department of Zoology

Lecture by Dr. Debashis Das, IISc, Bangalore

Students at the Guest Lecture

Felicitation to Dr. Debashis Das by Dr. V. Subhashini & Dr. A. Samba Naik

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30th August 2019.
By
Dr. Debashis Das, Asst. Prof. IISC Bangalore.

REPORT

A Guest Lecture was organised by the Department of Zoology on "Enzymes in Biological Processes" on 30th August 2019. The resource person is Dr. Debashis Das, Asst. Prof. IISC, Bangalore. He gave a brief account on the necessity of enzymes in biological processes and added a note on enzyme separation techniques.

The brief introduction given by him on enzymes is that Enzymes are the catalysts involved in biological chemical reactions. They are proteins that control the speed of chemical reactions in the body. Without enzymes, these reactions would take place too slowly. Enzymes also help cells to communicate with each other, keeping cell growth, life and death under control.

He gave examples of how some household products use enzymes to speed up chemical reactions. Enzymes in biological washing powders break down protein, starch or fat stains on clothes, and enzymes in meat tenderizer break down proteins into smaller molecules, making the meat easier to chew.

Enzymes work by lowering the activation energy of reactions. Various conditions affect enzyme function. Enzymes are proteins that perform the everyday work within a cell. This includes increasing the efficiency of chemical reactions, making energy molecules called ATP, moving components of the cell and other substances, breaking down molecules (catabolism) and building new molecules (anabolism).

Enzyme purification

Within the cell, enzymes are generally found along with other proteins, nucleic acids, polysaccharides and lipids. The activity of the enzyme in relation to the total protein present (i.e. the specific activity) can be determined and used as a measure of enzyme purity. A variety of methods can be used to remove contaminating material in order to purify the enzyme and increase its specific activity. Enzymes that are used as diagnostic reagents and in clinical therapeutics are normally prepared to a high degree of purity, because great emphasis is placed on the specificity of the reaction that is being catalysed. Clearly the higher the level of purification, the greater the cost of enzyme production. In the case of many bulk industrial enzymes the degree of purification is less important, and such enzymes may often be sold as very crude preparations of culture broth containing the growth medium, organisms (whole or fragmented) and enzymes of interest. However, even when the cheapest bulk enzymes are utilized (e.g. proteases for use in washing powders), the enzyme cost can contribute around 5–10% of the final product value.