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IISER Bhopal develops strategy to link proteins with chemical tags for facilitating drug development

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Contributing to basic biological research by enabling the imaging of proteins within human cells



Researchers at the Indian Institute of Science Education and Research Bhopal (IISER Bhopal) have developed a technology named ‘BHoPAL’ for attaching chemical tags to proteins, an important process in the development of drugs. Through this technology, necessary chemical moieties can be linked to specific sites of a protein without harming the protein’s efficacy.

This process is essential for two main purposes:

- Attaching proteins to fluorescent chemical tags for their visualization inside cells enabling studies focused on understanding how they perform cellular functions.
- Linking drugs to antibody proteins for selective drug delivery to diseased cells such as cancerous cells preventing undesirable side-effects of these drugs.

Proteins are extremely prone to loss of function when treated with chemical reagents. However, for the first time, IISER Bhopal’s novel technique eliminates this problem. This technology is called ‘Baylis Hillman orchestrated Protein Aminothiol Labelling’ (BHoPAL) which efficiently tags chemicals to proteins without compromising their function.

Elaborating on the objectives of this research, Dr Dimpy Kalia, Assistant Professor, Department of Chemistry, IISER Bhopal, said, “Proteins are cellular entities that play crucial roles in all cellular functions. Protein dysfunction results in major life-threatening diseases such as Alzheimer's disease, Parkinson's disease, etc. Hence, developing effective approaches to study proteins in cells is crucial for developing therapeutic approaches targeting them.”