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IIT-B explores role of lipids for treating infectious diseases

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Using biologically active lipid molecules as chemical biology tools to elucidate their biological disease-causing function

Recipient of the Inspire Faculty Award instituted by Department of Science and Technology, Govt. of India, Dr. Shobhna Kapoor from IIT Bombay is using biologically active lipid molecules as chemical biology tools to elucidate their biological disease-causing function.

Her group has recently shown that mycobacterial lipid insertion induces the re-modeling of the host plasma membrane and alters the host autophagy signaling pathway. Thus, their collective work is substantiating the host cell membrane insertion and modification of cellular immune processes as a well-accepted mode of action of virulent mycobacterial lipids.

The mechanism of action of Mtb lipids on human host membrane and related cellular events represents a golden opportunity to deepen the understanding of the function of Mtb lipids in membrane-dictated bacterial survival, pathogenesis, and drug resistance.

Dr Shobhna also investigates the role of Mtb lipids in drug-membrane interactions, underscored by the fact that lipids critically dictate the molecular interactions of drugs with membranes influencing drug diffusion, partitioning, and accumulation, thereby underpinning a lipid-composition specificity.

The outcome of her research has myriad implications in drug discovery, basic sciences, and biotechnological applications. Using the Inspire fellowship she will pursue further research for discovering novel approaches to tackle tubercular infections and antibiotic resistance-associated problems in general.