**SERB Women Excellence Awardee’s work has potential to discover resistance-free membrane-centric drugs for infectious diseases**

Dr.Shobhna Kapoor, Assistant Professor at **IIT Bombay** who’s study of roles played by lipids in infectious diseases at molecular level and inventorying the pathogenic lipid-induced effects in host cell membrane properties, has tremendous potential to discover and design resistance-free membrane-centric drugs/drug targets for infectious diseases has received the SERB Women Excellence Award for 2021. **Lipids** are molecules that contain hydrocarbons and make up the building blocks of the structure and function of living cells. Examples of **lipids** include fats, oils, waxes, certain vitamins (such as A, D, E and K), hormones and most of the cell membrane that is not made up of protein.

The award instituted by **Science and Engineering Research Board (SERB)**, Department of Science and Technology (DST), recognises and rewards outstanding research achievements of young women scientists in frontier areas of Science and Engineering.

Dr.Shobhna Kapoor’s work at the interface of physical and life sciences inspires the development of lipid chemical tools for probing fundamental problems in biology by leveraging the physical chemistry modules that dictate membrane structure and function.

Pathogens, including Mycobacterium Tuberculosis that causes Tuberculosis, and SARs-COV-2 that causes COVID-19, have evolved to use their lipids to modify processes in the host cell during infection as well to mitigate action of drugs. These observations bring biomembranes to the forefront for developing novel anti-infective strategies that rely on affecting membrane structure and function, which has rarely been investigated. This is the major focus of Dr. Shobhna’s research.

The recent SARS-CoV-2 pandemic has created a massive push to develop effective anti-infective therapies against this and future viral and bacterial pandemics. An exciting paradigm for broad-spectrum, anti-infective intervention relies on targeting the lipid membrane, which is currently being pursued in her group.

Using structurally diverse pathogenic lipids from mycobacterium tuberculosis (Mtb) as chemical biology tools, her group has investigated the correlation between host lipid membrane structural modification and modulation of membrane-associated signaling.Their work has substantiated the host cell membrane insertion and modification of cellular immune processes as a previously unknown mode of action of virulent Mtb lipids, wherein Mtb can fine-tune its interaction with the host governed by the nature of its exposed lipids. Their output provides avenues for developing lipid-centric therapeutic approaches against mycobacteria and other infectious agents, which up till now remained unexplored. In future, Dr. Shobhna seeks to validate the viral and bacterial membrane as novel drug targets and screening platforms for drug action.



**[For more details, Dr. Shobhna Kapoor (kapoor\_shobhna@yahoo.co.in) can be contacted.]**

**Source**

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