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Probing the Structure and Function of Tethered Bilayer Membranes by Neutron Reflection.

Tethered Bilayer Membranes (TBMs) are a versatile system for studying models of the cell membrane bilayer architecture and form the basis of a number of medical nano-sensing devices. These systems are typically tethered to a conductive substrate to enable the electrical signal, indicating the functionality, of the device to be recorded. The fact that these devices operate fully immersed in solution and rely upon organic/biochemical molecules (low electron density) against a gold surface (high electron density) rule out many structural experimental probes, including x-rays. Fortunately neutrons provide both the penetrating power to enable the interface to be probed and the appropriate contrasts to allow one to study submerged biomolecules on a gold surface at high resolution.

This presentation will give a taste of two current projects, firstly fundamental studies of bilayer architecture and the impact of solution pH and hence hydrogen bonding, on the bilayer porosity and thickness. Secondly I will also outline work undertaken on producing a bilayer that mimics the structure of the Gram Negative Bacteria (GNB), including interactions with currently used antibacterial drugs. Understanding the mechanism of antibacterials gives confidence in applying this platform for screening of new drugs.

Topic

Biology

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