

## Using Neutron Scattering in Biology: The Case for Membrane Proteins and Lipoprotein Particles

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### Abstract

The interest in biomimetic membrane development has increased lately, in part due to the consensus that lipid function goes beyond cell compartmentalization: Lipids are not only the main barrier to reach the cell but also they can regulate membrane protein function. The exact lipid composition of each type of cell is complex and varies significantly depending on the type of cell and/or organism. In my group, we use biomimetic membranes to study two particularly challenging scientific cases in Life Science: membrane proteins and lipoproteins. Membrane proteins only exist in a fully functional environment in the lipid bilayer, and are the main target of pharmaceutical drugs. Thus, a major challenge is the need to use biomimetic surfaces for *in situ* studies on the effects of protein function/structure in a native like environment. Lipoproteins, on the other hand, are the main carriers of fat in the body and constitute the main clinical markers for the risk to develop atherosclerosis. Despite the importance of mapping lipid dynamics between lipoproteins and cell membranes, only few studies to date address this point likely due to the system's complexity. We have developed methodologies to study lipid dynamics between lipoproteins and model cellular membranes that now can be applied to systematically assess, for example, the role of lipoprotein type. In this talk I will present the efforts done in my group to develop biomimetic systems to study lipid effects on membrane protein structure and lipoprotein dynamics.