

Studying membrane structure by X-ray diffraction/scattering

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As a key component of cell, membrane is not only a “Wall” to support and protect the cell but also the interface to control the materials to go in and out. By interacting with membrane directly, biological molecules can change either its structure or membrane structure to work well. For example, membrane proteins can fold to functional structure with suitable membrane structure and pore formation protein can change membrane structure to form pore structure to be ion channel or kill the cell. More and more studies shows that many biological processes will accompany structure change of membrane, such as membrane fusion and cell apoptosis. Therefore, the structure determination of membrane is key issue to study these processes. In this study, lamellar X-ray diffraction (LXD) is used to measure membrane structure of lamellar sample on substrate, small angle X-ray scattering (SAXS) is used to probe membrane thickness of vesicle sample in solution, and anomalous X-ray diffraction is used to determine pore structure on membrane induce by peptides. Combining the techniques, we can study the interaction between biological molecules and membrane.