

### **Model Lipid Membranes and Ion Channels: Investigating Their Mutual Interactions**

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Ion channels, as well as other transmembrane proteins, play a crucial role in our bodies. For instance, they are responsible for maintaining proper cellular homeostasis. Unfortunately, due to the complex nature of biological membranes, studying the properties of individual protein types remains challenging. Model lipid membranes provide a valuable tool for the incorporation of various proteins. Such models also enable the application of surface-sensitive techniques, which on a micro/nano scale provide essential information about protein-membrane interactions or their interactions with potential inhibitors.

Using these models, we have successfully recreated a system that accurately reflects the effect of alpha-hemolysin on the membrane, as well as a system with gramicidin A, which forms a pore in the membrane. In the latter case, we demonstrated that the process of blocking this channel by calcium ions is not as straightforward as previously thought. Calcium itself also interacts with the membrane, altering its fluidity, which in turn leads to pore closure.