

Immobilized Polydiacetylene Vesicles on Supported Lipid Bilayer for Biosensor

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Cell membranes play the important roles in sensing and interacting with the external materials. So there are many studies about the cell membrane around the world. One of them is the sensory system that mimics the cell membrane. Another approach is supported lipid bilayer (SLB) system that maintains the fluidity like cell membrane. The objective of our study is to detect the target materials and simultaneously measure the fluidity of SLB by fusing two approaches. For this strategy, we have employed the polydiacetylene (PDA) as sensing material on SLB. PDA has the intriguing characteristics that change color from blue to red and emit the red fluorescence upon external stimuli, which is possible label-free detection. We have employed amine group functionalized PDA and carboxylic acid group functionalized phospholipids. By amide binding, PDA has bound to SLB. And the fluidity of SLB has been measured by fluorescence recovery after photobleaching (FRAP) of NBD-labeled phospholipids. On the basis of these simple results, we will develop the system which is simultaneously possible the label-free bio-detection and the measurement of the fluidity of SLB. This system is expected to be applicable to the diagnostic biochip, drug screening, etc.