

**Motivation**

Cellular membrane is composed of various different lipid molecules and is non-uniform, which has recently been reported to affect on the function of the buried membrane proteins. We examine the characteristics of membrane protein by reconstituting them into different lipid membranes.

**Originality**

By changing lipid compositions, we succeeded in fabricating the lipid membrane containing high and low domains. We also discovered that the membrane protein has preferences in reconstituted into specific lipid membrane.

**Impact**

Understanding the characteristics of membrane proteins can be an implement to revealing the mechanism of biological systems. Beyond that, it can allow us to develop ultra-small devices with biological functions such as nanobio devices, including single protein sensors and implantable communication devices.

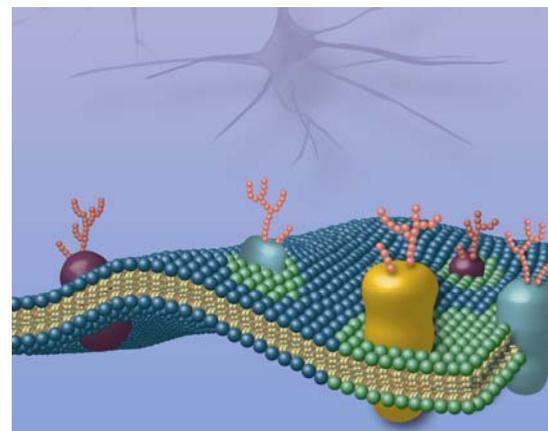
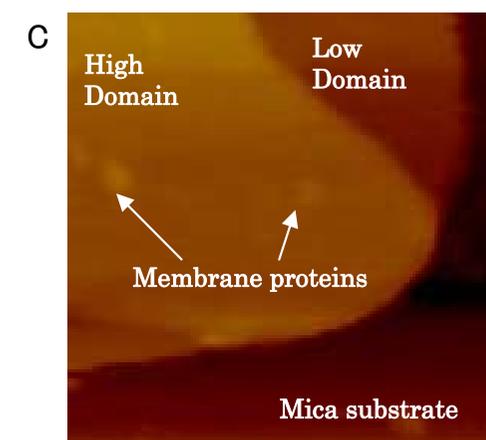
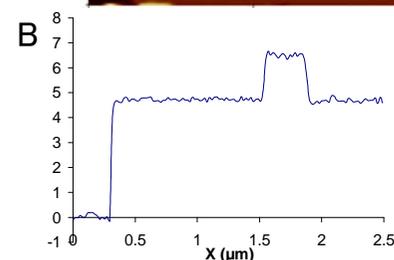
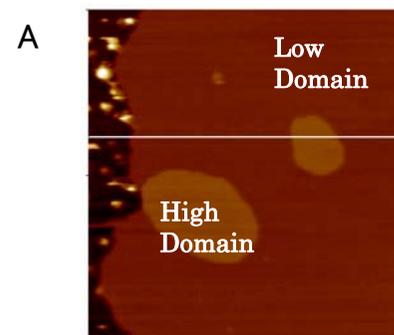


Illustration of cell membrane. Lipid composition is not uniform.



A: Succeeded in fabrication of artificial non-uniform lipid bilayer containing high and low domains. ( $2.5 \times 2.5 \mu\text{m}$ )  
B: Height profile at white line in A.  
C: Membrane proteins reconstituted into non-uniform lipid membrane. ( $0.5 \times 0.5 \mu\text{m}$ ) Preference of membrane protein in high domain was observed.



This study has been done as collaboration with University of Oxford.

