

Designing of SNARE assembly-modulating peptides and the control of membrane fusion

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SNARE proteins play a crucial role in the membrane fusion between presynaptic membrane and synaptic vesicle. The SNARE assembly drives membrane fusion and the formation of fusion pore, through which neurotransmitters are released¹. SNARE complex is composed of 3 proteins and generate fundamental force that is required for the membrane fusion. It is thought that the regulation of this SNARE assembly may inhibit membrane fusion leading to the inhibition of neurotransmitter release².

In the present study, we developed SNARE folding modulators by rational peptide design. By carefully purifying transmembrane SNARE proteins and reconstituting them into chemically defined liposome, we could construct in vitro membrane fusion assay system. Based of the fluorescence resonance energy transfer (FRET), lipid mixing is kinetically measured in high throughput manner³. We tested rationally designed peptides to control membrane fusion and drew some candidate materials. We envision that the found materials can be usefully employed for the fundamental understanding of membrane fusion event and development of functional cosmetics and drug.

References

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