

Development of pore-spanning lipid membranes and its application to chiral separation

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Different enantiomers result in different effects in various industries, which has required optically pure enantiomers and stimulated the development of new and effective chiral separation methods. In this research, pore-spanning lipid membranes are created by using a porous polymer substrate with hundreds of nanometer-sized pores, resulting in significantly improved membrane stability, and are applied to separation of various chiral molecules. For the chiral molecules that cannot pass through the lipid membrane as a passive diffusion, membrane permeabilization process is conducted, using surfactants, pore-forming peptides, etc. The amount of molecules that permeate to the lipid membrane is measured by UV-Vis spectroscopy. The enantiomeric excess after membrane transport was identified via circular dichroism (CD) spectroscopy or chiral HPLC. Further optimization is needed to increase the chiral selectivity and to suggest the proper membrane design.