

Development of GPCR biochips

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Context G-protein-coupled receptors (GPCR) are a large family of membrane receptors and are important pharmacological targets. Most existing assay systems of GPCR utilize cells harboring GPCR or the membrane isolated from those cells. An abundant expression and display of GPCR to the cell membrane is required which is often difficult. A general approach is awaited that is applicable to a wide variety of GPCRs where most of their target remained to be unraveled.

Objectives The objective is to develop a microdevice suitable for high-throughput screening of GPCR function. Such devices may be used for a fundamental research to understand cellular response to various stimulations as well as for applications such as drug screening and high-sensitive biosensors.

Methods Highly reproducible method to form planar lipid bilayers on the surface of microchambers has been developed in the host laboratory. In vitro translation systems will be used to produce the GPCR proteins. In vitro translation systems are often advantageous to synthesize proteins that are difficult to be expressed in the cells, for example proteins that are toxic for the cells, insoluble etc. The produced protein will be inserted into the lipid bilayer.