Lipid Bilayer Formation Using Sessile Droplets
Tech ID: 29863 / UC Case 2010-054-0

SUMMARY
UCLA researchers in the Department of Bioengineering have developed a method to form a biologically functional lipid bilayer in a high-throughput and automated fashion.

BACKGROUND
Currently medium throughput ion channel measurements are conducted using automated patch-clamping. This technique involves directly attaching to a cell and measuring the current through a specific ion channel embedded in the cell membrane. The process of automated patch-clamping is a relatively slow and costly technique. Artificial bilayers, which are created in a laboratory for ion channel insertion and study, are attractive since the measurement is much easier and the experimenter has greater control over the surrounding biological environment. Yet, as a technology, artificial lipid bilayers are also characterized by low throughput and relatively high costs associated with its manual technique.

INNOVATION
Researchers at UCLA have developed a method to form a biologically functional lipid bilayer in a high-throughput and automated fashion. The ionic current that flows through the channel proteins incorporated into the bilayer can be directly monitored.

APPLICATIONS
▶ High throughput formation of lipid bilayers
▶ Can house ion channels and other transmembrane proteins
▶ Measurement of ion channels in high quality, high throughput manner
▶ Reduce cost and time associated with drug discovery process

ADVANTAGES
▶ High throughput bilayer generation – can generate 1000 bilayers per hour
▶ High throughput electrical measurement of bilayer without compromising bilayer integrity
▶ Requires less expertise than traditional methods
▶ Less expertise required than traditional method
▶ High control over biological environment - refresh upper solution using sessile aqueous droplets

STATE OF DEVELOPMENT
This technology has been successfully demonstrated in the laboratory.

RELATED MATERIALS
▶ T. Thapliyal, J. L. Poulos, and J. J. Schmidt, Automated lipid bilayer and ion channel measurement platform, Biosensors and Bioelectronics, 2011.

PATENT STATUS
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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS
▶ Method For Indefinite Storage And Preservation Of Membrane Precursors