TECHNOLOGY

Microfluidic Mass Spectrometer Utilizing Protein Nanopores

OVERVIEW

NOT REVIEWED BY INVENTOR

Artificial BLMs have been widely used to investigate fundamental electrophysiology kinetics including ion channel formation and transduction. Standard macro-scale approaches suffer from well known issues, mainly poor BLM lifetimes, laborious formation techniques, and limited data collection throughput. Recently microfluidic technology has been applied to BLM formation and sensing. A PMMA microfluidic device with multiple sites has been previously demonstrated; however the individual sites were not addressable. In a related device the array sites were open-faced, thus limiting BLM lifetime and testing duration due to evaporation. The present work addresses these issues by automating the membrane formation process in a fully enclosed microfulidic chip.
In-situ formation of bilayer lipid membranes can be formed at any of the three fully enclosed, electrically addressable array sites. The array format allows for single or multiple simultaneous electrophysiological testing depending on desired testing conditions.
Researchers at the University of Maryland College Park have realized an In-situ formation of BLMs in an enclosed array format with integrated AgCl electrodes capable of low-noise current measurements from individually addressable membranes. The 3 element array explored here comprises a first step towards a fully integrated system for multiplexed ion channel measurements from BLM arrays. Future efforts will be directed towards eletrophoretic transport of transmembrane proteins to populate individual membranes, and electrophoretic analyte separation prior to delivery to the sensing sites.
For additional information, please contact the Office of Technology Commercialization, University of Maryland College Park, via e-mail at letscher@umd.edu or phone at 301-405-3899.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Nanotechnology + Nanoparticles + Nanomaterials
- Devices
- Microfluidics

EXTERNAL RESOURCES

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