Large scale biomimetic membrane arrays

To establish planar biomimetic membranes across large scale partition aperture arrays, we created a disposable single-use horizontal chamber design that supports combined optical-electrical measurements. Functional lipid bilayers could easily and efficiently be established across CO2 laser micro-structured 8 x 8 aperture partition arrays with average aperture diameters of 301 +/- 5 μm. We addressed the electro-physical properties of the lipid bilayers established across the micro-structured scaffold arrays by controllable reconstitution of biotechnological and physiological relevant membrane peptides and proteins. Next, we tested the scalability of the biomimetic membrane design by establishing lipid bilayers in rectangular 24 x 24 and hexagonal 24 x 27 aperture arrays, respectively. The results presented show that the design is suitable for further developments of sensitive biosensor assays, and furthermore demonstrate that the design can conveniently be scaled up to support planar lipid bilayers in large square-centimeter partition arrays.

General information
State: Published
Organisations: Bioanalytics Group, Biomedical Micro Systems Section, Department of Micro- and Nanotechnology, Polymeric Enabling Microsystems Group, Polymer Micro and Nano Engineering Section, Biophysics and Fluids, Department of Physics, Aquaporin A/S
Contributors: Hansen, J. S., Perry, M., Vogel, J., Groth, J. S., Vissing, T., Larsen, M. S., Geschke, O., Emméus, J., Bohr, H., Helix Nielsen, C.
Pages: 719-727
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: Analytical and Bioanalytical Chemistry
Volume: 395
Issue number: 3
ISSN (Print): 1618-2642
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.08 SJR 0.978 SNIP 0.921
Web of Science (2017): Impact factor 3.307
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.03 SJR 0.99 SNIP 1.044
Web of Science (2016): Impact factor 3.431
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.07 SJR 1.059 SNIP 1.072
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.26 SJR 1.126 SNIP 1.212
Web of Science (2014): Impact factor 3.436
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.55 SJR 1.236 SNIP 1.279
Web of Science (2013): Impact factor 3.578
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.51 SJR 1.354 SNIP 1.279
Web of Science (2012): Impact factor 3.659
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1