

# The Vesicle Prep Pro<sup>®</sup>

Liposomes made easy.



Vesicle Prep Pro<sup>®</sup>

**nanjilon**

# Vesicle Prep Pro<sup>®</sup> Liposomes made easy

- Easy and quick preparation of GUVs
- Solvent free membranes
- Optical monitoring of GUV formation
- Temperature control
- High reproducibility
- Stable bilayers for ephys recordings

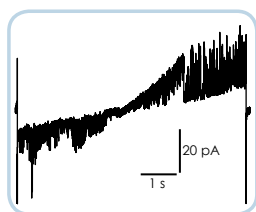
Giant unilamellar vesicles (GUVs) are an essential component of techniques used in the investigation of biophysical properties of e.g. lipid membranes, electrogenic transmembrane proteins, lipid raft formation, and lipid-DNA interactions. The Vesicle Prep Pro is an automated device for preparation of these GUVs. Solvent-free GUVs ranging from 1 – 30  $\mu\text{m}$  in diameter are formed by means of electro-swelling (hydration of dry lipid film in an oscillating electric field). The Vesicle Prep Pro offers a standardized and robust way to reliably and reproducibly generate GUVs of homogeneous size distribution with high yields. The chamber used for vesicle formation consists of two glass cover slides. The slides are coated with indium tin

oxide (ITO) turning them into electrodes. This leaves the chamber transparent so that vesicle formation and growth can be monitored optically throughout the entire process. Integrated features, including flexible protocol design and temperature control, allow generation of GUVs from lipids with high charge or high melting temperature.

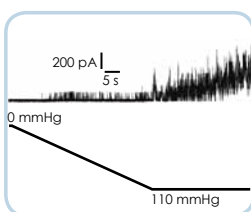
The electrophysiological data shown below has been collected with Nanion's Port-a-Patch. Highly resistive membranes are formed within seconds across an aperture (diameter  $\sim 1 \mu\text{m}$ ) for studies of native or recombinant proteins, either in crude membranes or purified. Due to the bilayer's small size, ultra-low noise recordings with high resolution of single channel activity are possible.

## Data Examples

KscA

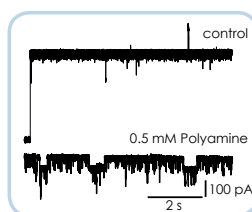


MscL



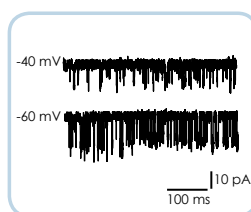
Data by Boris Martinac, University of QLD, Brisbane, Australia

OmpF



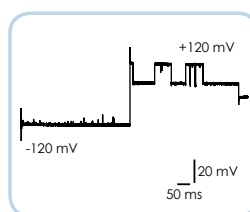
Data by Mathias Winterhalter, Jacobs Universität, Bremen, Germany

IP<sub>3</sub>R



Data by Colin Taylor, University of Cambridge, Cambridge, UK

$\alpha$ -Hemolysin



Courtesy of Fritz Simmel, TUM, Munich, Germany

### Successfully tested:

#### Lipids:

DPhPC, DPhPE, DPhPS, POPC, *E.coli* total extract, POPG, L- $\alpha$ -PG, etc.  
(+ sterylamine, cholesterol)

#### Purified proteins:

Ion channels: KcsA, IP<sub>3</sub>R, K<sub>v</sub>1.2, NaChBac, MscL, MspA, TRPA1,  $\alpha$ -hemolysin, gramicidin, alamethicin.  
Porins: OmpF (WT & mutants), OmpC, Tom Core Complex, Tom40.  
Transporters: TolC, LmrA.

#### Proteins in membrane fractions:

Ion channels: CIC, NMDA, Cav1.2.  
Gap Junctions: Cx43, Cx26.

Success rate GUV formation:	100 %
Vesicle size:	1 - 30 $\mu\text{M}$
Average size:	10 $\mu\text{M}$ (60 - 70 %)
Preparation time:	20 - 300 minutes (lipid/protocol dependent)
Voltage amplitude:	0 - 5 V
Amplitude resolution:	> 10 mV
Frequency:	0 - 500 Hz
Output current:	max. 100 mA
Capacity of liquid:	200 $\mu\text{l}$ - 900 $\mu\text{l}$
Temperature range:	RT - 70°C
Maximum salt concentration:	50 mM (NaCl or KCl etc.)

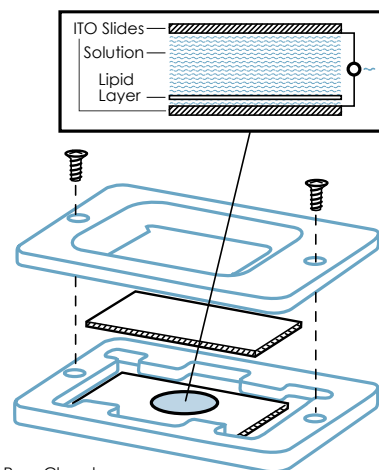
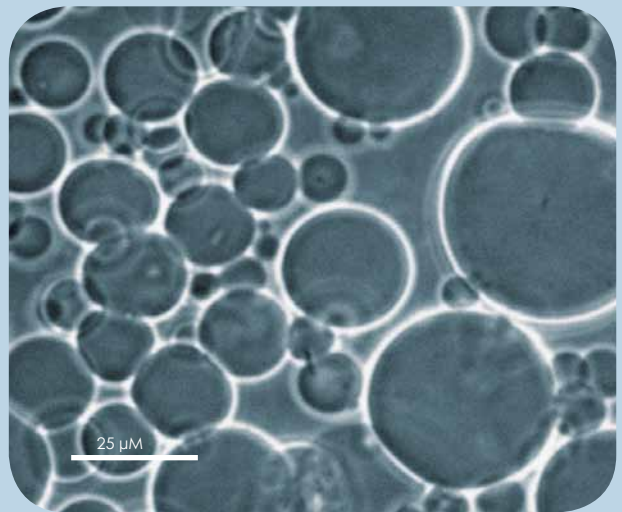
## Technical Specifications

### The Vesicle Prep Pro System includes:

- Vesicle Prep Pro®
- Vesicle Prep Chamber
- Integrated temperature control
- ITO slides
- VesicleControl software (Windows)

### Size and weight:

- Vesicle Prep Pro® station:  
Size (l x w x h): 16 x 14 x 6.5 cm  
Weight: 1.8 kg
- Vesicle Prep Chamber:  
Size (l x w x h): 8.3 x 6 x 1.3 cm



Vesicle Prep Chamber

*"We are using the Vesicle Prep Pro and Port-a-Patch in our laboratory to study recombinant channel proteins reconstituted in planar bilayers. The system is easy to use and it makes experiments very efficient. Besides the great equipment, Nanion, with their widespread expertise, is also providing excellent continuous support, helping with methodology optimization and problem solving."*

*Colin Taylor, Professor of Cellular Pharmacology, Department of Pharmacology, University of Cambridge, Cambridge, UK*

*"The Vesicle Prep Pro has been of great utility in our Bioelectronics research, allowing students and researchers with limited electrophysiology background to easily form giant unilamellar vesicles (GUVs). The electronic control lets us alter the size and density of the GUVs, and the transparent chamber allows for excellent visualization of the electro-swelling process."*

*Eric Stava, PhD, Research Assistant, University of Wisconsin-Madison, WI, USA*

*"Our planar lipid bilayers are obtained from GUVs prepared with the Nanion Vesicle Prep Pro setup. Together with the Port-a-Patch, Nanion's state-of-the-art automated patch clamp platform, the efficiency of characterization of pore-forming peptides (and other ionophores from natural sources) in artificial bilayers has greatly increased. Both systems are straightforward and easy to use, allowing high quality, low noise, single channel recordings."*

*Marisa Rangel, PhD, Researcher, University of Sao Paulo, Butantan Institute, Sao Paulo, Brazil*



**800.998.MATE | [www.autom8.com](http://www.autom8.com) | 650 University Ave #5, Berkeley, CA 94710 USA**  
**tel 510.845.6283 | fax 510.665.3975 | e-mail [info@autom8.com](mailto:info@autom8.com)**

**Europe**

Nanion Technologies  
Erzgiessereistr. 4  
80335 Munich  
Germany  
phone: +49 89 218997972  
fax: +49 89 218997960  
[info@nanion.de](mailto:info@nanion.de)  
[www.nanion.de](http://www.nanion.de)

**USA**

Nanion Technologies Inc.  
675 US Highway One  
North Brunswick, NJ 08902  
USA  
phone: 1-888-9-NANION  
[info@naniontech.com](mailto:info@naniontech.com)  
[www.naniontech.com](http://www.naniontech.com)

**Russia**

Biotechnologies Ltd.  
Thorez pr. 44  
194223 St. Petersburg  
Russia  
phone: +7 812 2942206  
fax: +7 911 1017781  
[K.Bolshakov@biotechnologies.ru](mailto:K.Bolshakov@biotechnologies.ru)  
[www.biotechnologies.ru](http://www.biotechnologies.ru)

**India**

Medi Analytika India Pvt. Ltd  
6, Adyar Bridge road  
Adyar, Chennai - 600 020  
India  
phone: +91 44 24460988  
fax: +91 44 24463931  
[mediana@vsnl.com](mailto:mediana@vsnl.com)  
[www.medianalytika.com](http://www.medianalytika.com)

**Singapore**

Bronjo Medi  
Block 16 Kallang Place #03-10  
Kallang Basin Industrial Estate  
Singapore 339 156  
Singapore  
phone: +65 6 4764011  
fax: +65 6 3920551  
[bronjo@singnet.com.sg](mailto:bronjo@singnet.com.sg)

**China**

Quantum Design China  
Room 502-04, Tower B, COFCO Plaza  
No. 8 JianGuoMenNei Avenue  
DongCheng District, Beijing, 100005 PRC  
phone: +86 10 85120277  
fax: +86 10 85120276  
[info@qd-china.com](mailto:info@qd-china.com)  
[www.qd-china.com](http://www.qd-china.com)

**Korea**

Quantum Design Korea  
517-18 Kyungbin Bldg. 4F, Dogok-dong  
Kangnam-gu, Seoul  
Korea, 135-270  
phone: +82 2 20572710  
fax: +82 2 20572712  
[qdk@qdkorea.com](mailto:qdk@qdkorea.com)  
[www.qdkorea.com](http://www.qdkorea.com)

**Taiwan**

Sunpoint Scientific Instrument  
9F-1, No. 146, Wunsing Rd.  
Gueishan, Taoyuan Hsien 333  
Taiwan, R.O.C  
phone: +886 3 3273889  
fax: +886 3 3273908  
[sunp55@ms36.hinet.net](mailto:sunp55@ms36.hinet.net)  
[www.sunpointworld.com](http://www.sunpointworld.com)

**Japan**

Bio Research Center Co., Ltd  
2-28-24, Izumi, Higashi-ku  
Nagoya 461-0001  
Japan  
phone: +81 52 9326421  
fax: +81 52 9326755  
[ohsuki@nanion.de](mailto:ohsuki@nanion.de)  
[www.brck.co.jp](http://www.brck.co.jp)