

The Patchliner®.
Because quality does matter.



The Patchliner® NPC®-16

nanji[on]

The Patchliner[®] Electrophysiology in the fast lane

- Sophisticated and efficient platform
- Unprecedented flexibility and user control
- High success rates
- Voltage and current clamp recordings
- Premium data quality and GΩ seals
- Whole cell and single channel recordings
- Voltage- and ligand-gated channels
- Primary cell and stem cell recordings
- Versatile liquid handling
- Temperature control

The Patchliner is a fully automated, bench-top patch clamp platform, recording from up to eight cells simultaneously with GΩ seals. The whole cell recordings are stable over prolonged periods of time, allowing full dose response analysis from each individual cell.

By offering full user control and experimental flexibility, the Patchliner facilitates a wide variety of experiments ranging from screening to sophisticated research experiments. Useful features include external and internal solution exchange, temperature control and current clamp.

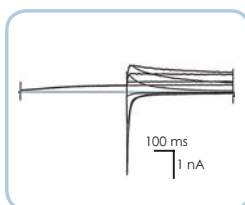
The NPC-16 consumable contains a glass substrate for seal formation and micro-fluidic channels for liquid delivery. Thus, low volumes are required. Rapid replacement of the solutions (20 - 100 ms, concentration

dependent) around the captured cell and brief exposure times (>500 ms) are possible.

The temperature control feature enables experiments at physiological temperature or brief temperature pulses up to 60 °C to be applied which is essential for investigation of heat activated channels such as TRPV1. Many different ligand- and voltage- gated ion channels in a plethora of cell types have been investigated using the platform, including primary cells and stem cell derived cardiomyocytes. By offering a substantial throughput increase and cost efficient consumables, in combination with an unprecedented experimental flexibility, the Patchliner is an excellent choice for screening efforts, safety testing and academic research.

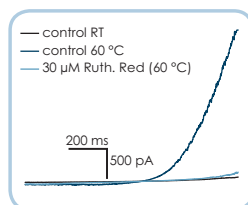
Data Examples

HEK – hERG

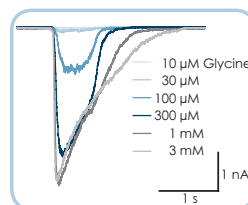


Courtesy of Evotec AG

CHO – TRPV1

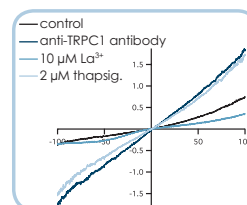


L-tk – hGlyRα1



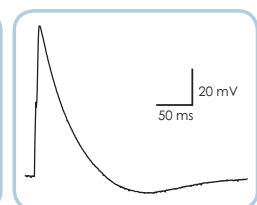
Courtesy of AstraZeneca

Primary – TRPC



Data by C. Milligan, University of Leeds, UK

Action potentials



Courtesy of Axiogenesis

Successfully tested:

Primary cells (ion channels):

Hippocampal Granule (BK/Ca_v), hSynoviocytes (TRPC)*, rAstrocytes (K⁺)*, hNeutrophils (K⁺)*, hVascular smooth muscle cells (TRPC)*, hT-lymphoblasts (K⁺)* etc.

*Nature Protocols, 2009, 4(2), 244-255

Voltage-gated channels:

Na_v1.2, Na_v1.5, Na_v1.7, ENaC, hERG, hEAG, K_v1.3, K_v1.5, Shaker, Ca_v1.2, Ca_v2.1, Ca_v3.1, CFTR, CIC etc.

Ligand-gated channels:

GABA_A, hGlyRα1, P2X2, P2X3, P2X7, CNG, HCN, ASICs, TRPV1, TRPA1, TRPC, TRPM2, TRPM3, TRPM8 etc.

Other:

Current clamp recordings from embryonic stem cell derived cardiomyocytes (Cor.At, Axiogenesis), bilayer recordings, single channel recordings.

chip resistance:	2 M Ω (customized resistances available)
seal resistance:	> 1 G Ω
series resistance:	< 10 M Ω
liquid consumption:	~ 25 μ l/compound
perfusion time constant:	20 - 100 ms (concentration dependent)
minimum exposure time:	500 ms
avg. whole cell stability:	~ 30 min
successful whole cell recording:	70 - 90 % (consistent between cell lines)
throughput:	250 - 500 dp/day

Technical Specifications

A Patchliner[®] system includes:

- Patchliner Double: 2 amplifier channels or;
- Patchliner Quattro: 4 amplifier channels or;
- Patchliner Octo: 8 amplifier channels
- PatchControlHT software, integrated with PatchMaster (HEKA Elektronik)
- Igor-based data analysis software, for visualization of traces and corresponding pharmacology
- EPC10 – amplifiers Double, Quadro, or two Quadros
- Desktop PC and 24" screen
- On-site installation support
- Recording solution kit

Add-ons:

- Temperature control
- Continuous waste solution removal

Size and weight:

- Size (l x w x h): 62 x 56 x 53 cm
Weight: 20 kg



PatchControlHT:

A graphical user interface is used to program and execute up to 48 unattended recordings. User intervention is possible at any time during an experiment. The software offers advanced user control in combination with versatile experimental possibilities. The PatchMaster (HEKA) software is integrated in PatchControlHT, for acquisition of data and powerful online analysis of the recorded data. The data output and compound information is compatible with most database formats.

"Xention is a company specialising in ion channel drug discovery and development, and we have invested in Patchliners because their flexibility and adaptability allow us to utilise this technology to meet the differing needs of our various screening projects. The targets we study require high quality electrophysiological recordings, and we have found that the Patchliner can deliver such output with a high success rate for a range of different ion channels and heterologous cell lines. Nanion has been extremely helpful in customising the software to fit our screening requirements, and I would happily recommend the Patchliner to anyone who needs reliable patch clamp instrumentation for their ion channel screening purposes."

Dr. Marc Rogers, Principal Scientist, Xention Ltd., Pampisford/Cambridge, UK

"To invest in the Patchliner was a straightforward choice for the Vanderbilt Screening Center. This instrument combines a set of features that was particularly important to us. (...) Unlike other planar patch clamp devices we considered, the Patchliner gave us full access to the electrophysiology modes we require for a broad range of experimental protocols including voltage clamp, current clamp, standard whole cell, cell attached, and perforated patch configurations combined with a facile ability to exchange the internal solution. (...) In a short time the Patchliner has already begun to expand Vanderbilt investigators' horizons regarding what they can accomplish with electrophysiology."

Dr. David Weaver, Research Associate Professor of Pharmacology, Director of the Chemical Biology's High-Throughput Screening Facility, Vanderbilt University, Nashville, TN, USA

"In Evotec's continued effort to provide the most valuable services to our customers and increase our capabilities in our ion channel platform, we have invested in multiple Patchliner instruments. These have allowed us to complement our existing patch clamp capabilities and substantially increase our throughput in a number of electrophysiology and screening projects, including hERG screening. The Patchliners provide us with high quality data, are easy to operate with minimal assay development time, and we are particularly happy with the first class support Evotec receives from Nanion."

Dr. Clemens Möller, Team Leader Electrophysiology, Evotec AG, Hamburg, Germany

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