

The world's smallest patch clamp setup.
Providing biggest results.



The Port-a-Patch[®] NPC[®]-1

nanji[on]

The Port-a-Patch® Enjoy electrophysiology

- Increased throughput with high data quality
- Easy-to-use – also for non-experts
- High success rates for stable whole cells
- Versatile liquid handling
- Compatible with most amplifiers
- Whole-cell and single channel recordings
- Successful with primary cells
- Voltage and ligand gated ion channels
- Ultra-low noise bilayer recordings
- External and internal perfusion and temperature control

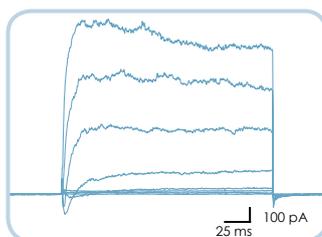
The Port-a-Patch® is a miniaturized patch clamp system enabling the user, regardless of experience, to rapidly generate high quality data. The system has been successfully validated with numerous ion channels expressed in different cell lines, and in a number of different primary cells. The Port-a-Patch® is a turn-key system, with a quick and easy start up for learning patch clamp. High-quality measurements with giga-seals and high success rates can be performed in whole-cell, cell-attached, perforated patch and bilayer recording configurations.

A borosilicate glass chip, NPC®-1, containing a micron sized aperture is used for recordings. A cell is captured from solution, automatically sealed to the chip and the program continues to apply suction pulses until the whole-cell configuration has been reached. Versatile add-ons such as external perfusion, internal perfusion, temperature control and the fluorescence microscope slide make the Port-a-Patch® a very useful and flexible tool for ion channel research.

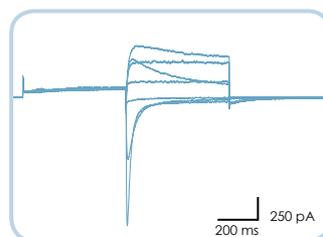
We offer the Port-a-Patch® with an EPC10 amplifier, but the system is compatible with most amplifiers on the market.

Data Examples

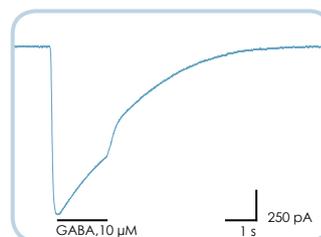
Primary BK / Ca_v



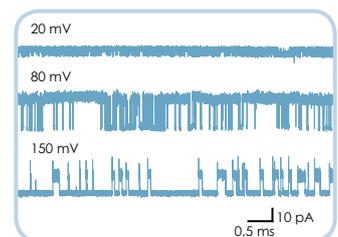
HEK – hERG



HEK – GABA_A



Bilayer – IP₃



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⁺)*

Other voltage gated channels:

Na_v1.2, Na_v1.5, Na_v1.7 and other Na_v's, hEAG, K_v1.3, K_v1.5, Shaker, and other K_v's, Ca_v3.1 and other Ca_v's

Other ligand gated channels:

GABA_A, hGlyRa1, P2X7, CNG, HCN, ASICs, TRPV1, TRPA1, TRPC, TRPM2, TRPM3, TRPM8 etc.

Other single channel recordings:

K_v1.2, IP₃, OmpF, MscL, bacterial cytolysin, gramicidin, alamethicin, connexins (Cx26, Cx43), NaChBac, KcsA, K_{Ca}1.1 etc.

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

chip resistance:	2 - 3.5 M Ω (customized resistances available)
seal resistance:	> 1 G Ω
whole cell resistance:	> 1 G Ω
series resistance:	< 10 M Ω
liquid consumption:	~ 30 μ l/compound
perfusion time constant (Perf. Sys.)	~ 100 ms
internal perfusion time constant:	~ 5 sec
avg. whole cell stability:	~ 20 min
successful whole cell recording:	70 - 90 % (consistent between cell lines)
throughput:	20-50 dp/day

Technical Specifications

A Port-a-Patch[®] system includes:

- Port-a-Patch[®] recording station (including Faraday top)
- Port-a-Patch[®] Suction Control, USB-controlled (no house vacuum needed)
- Maintenance Kit
- Electrophysiological Recording Solutions Kit
- 500 NPC[®] -1 chips
- PatchControl software (Windows) including sophisticated graphical tools for logging of events
- EPC-10 USB amplifier (HEKA Electronics), system compatible with other amplifiers
- Desktop PC or Notebook
- On-site installation support and training

Add-ons:

- Port-a-Patch[®] External Perfusion System with laminar flow chamber
- Port-a-Patch[®] Internal Perfusion System
- Port-a-Patch[®] Temperature Control
- Port-a-Patch[®] Microscope Slide for simultaneous fluorescence measurements



Size and weight:

- Port-a-Patch[®] recording station:
Size (l x w x h): 17.5 x 9 x 7.5 cm
Weight: 1.4 kg
- Port-a-Patch[®] Suction Control:
Size (l x w x h): 13 x 9 x 7.5 cm
Weight: 1 kg

"The Port-a-Patch is a state-of-the-art automated patch clamp platform that allows trainees at Hydra without prior experience in electrophysiology to quickly learn how to generate high quality patch clamp recordings. It substantially speeds up the teaching process as well as giving us an easy-to-use platform for efficient, accurate screening of ion channel active compounds."

Chris Fanger, Director of Lead Discovery, Hydra Biosciences, Boston, MA, USA

"The Port-a-Patch enables students and young researchers lacking formal training in electrophysiology to rapidly generate research grade data. Within the courses given at the Institute for Biomolecular Systems and Bioelectronics, the students gain hands-on experience in basic membrane biophysics and electrophysiology, which is of great value for their education."

Professor Simmel, Technical University of Munich, Munich, Germany



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