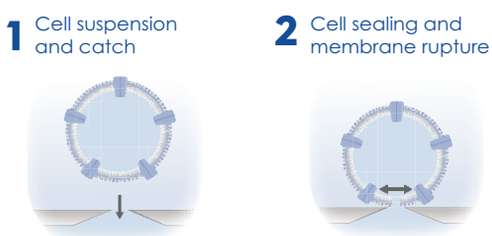
Acid-sensing ion channels
Automated patch clamp

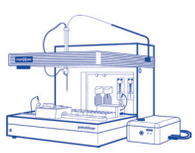
Investigating ASICs using automated patch clamp

Acid-sensing ion channels (ASICs) are proton-gated, sodium-selective ion channels highly sensitive to extracellular acidosis and have been implicated in neurological conditions such as pain, ischemia, and inflammation. Among them, ASIC3 is linked to non-adaptive pain associated with tissue acidosis, while ASIC1a is involved in synaptic plasticity and learning.

Given their transient activation and fast desensitization, recording ASIC channel activity can be challenging, demanding precise timing and low exposure times. The automated patch clamp systems, Patchliner and SyncroPatch 384, offer the sensitivity, flexibility and control needed for reliable ASIC current measurements, enabling high-quality data in medium to high throughput for basic research and drug discovery.

Explore ASICs research





Patchliner
up to 8 cells

SyncroPatch 384
up to 384 cells

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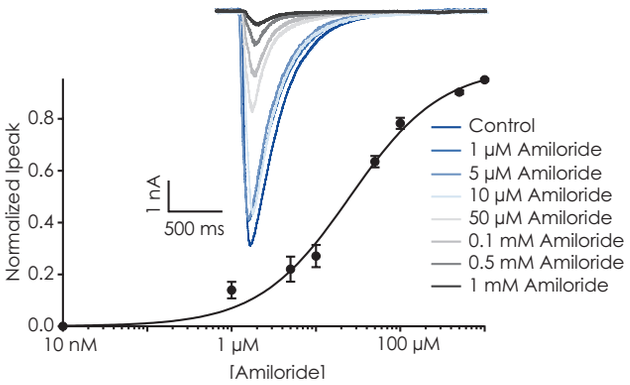
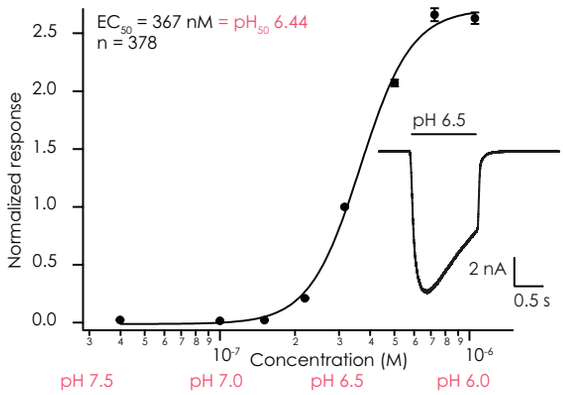
Patchliner and SyncroPatch 384

For all your electrophysiology needs



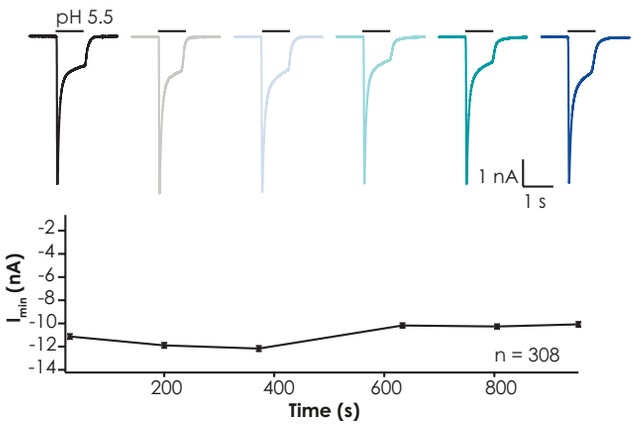
Reliable pharmacology of ASIC3

Patchliner delivers accurate pharmacological results from hASIC3-expressing HEK293 cells. Shown is a typical current response to pH 5.5 at -70 mV, with clear inhibition by increasing concentrations of amiloride. The resulting concentration-response curve yields an IC_{50} of 26.0 ± 3.3 µM (n = 14), demonstrating robust and reproducible data.



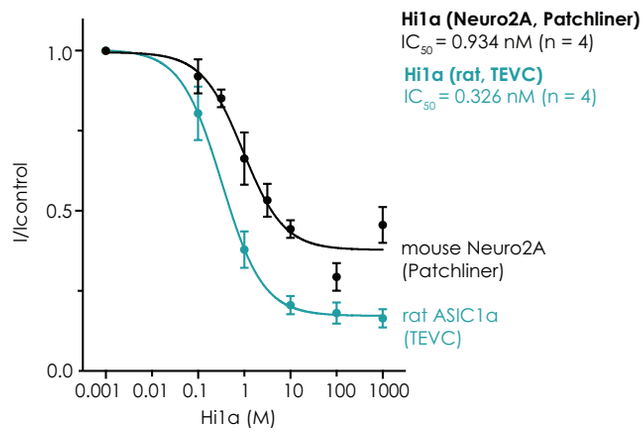
High-throughput ASIC1a activation

SyncroPatch 384 enables parallel recordings from ASIC1a-expressing CHO cells with exceptional consistency. Upon 1-second pH 6.5 application, robust activation was observed across 378 wells. The resulting $pH_{0.5}$ of 6.44 aligns closely with literature, confirming high assay reliability and reproducibility. Unlimited applications of solution can be made.



Repetitive activation of ASIC1a

ASIC1a currents were reproducibly activated on the SyncroPatch 384, with consistent peak amplitudes observed across at least six consecutive stimulations using low pH (5.5). This ensures confidence in reliability of pharmacological data due to low desensitization and little or no current rundown.



Recording endogenous ASICs channels

The spider venom peptide Hi1a effectively blocked ASIC currents in Neuro2A cells in a concentration-dependent manner. The observed potency aligns with values obtained by TEVC on rASIC1a, confirming the isoform identity and demonstrating Patchliner's reliability for characterizing peptide-channel interactions.

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