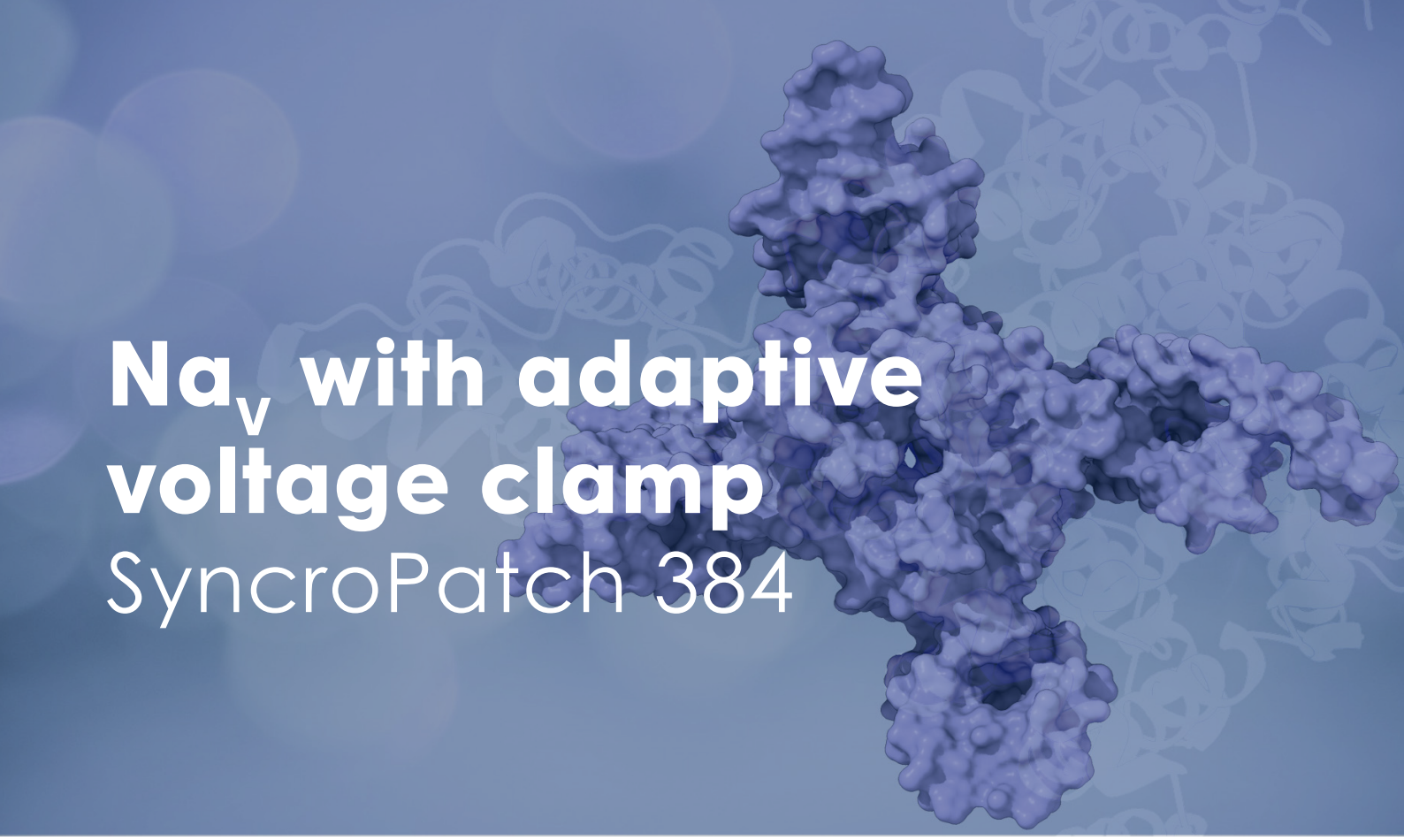


Na_V with adaptive voltage clamp

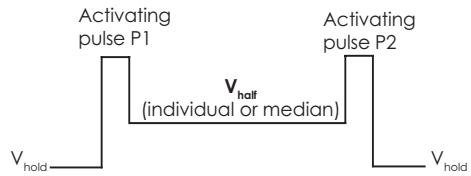
SyncroPatch 384

Investigating Na_V using adaptive voltage clamp

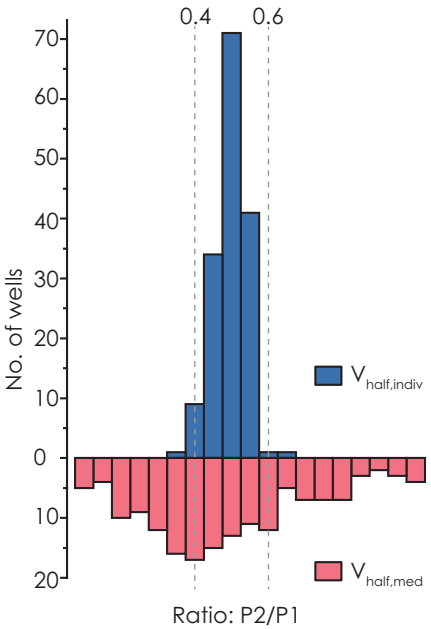
Voltage-gated sodium channels (Na_V) are important targets for the development of new medical strategies given their crucial importance in physiology and pathophysiology. Na_V channels exhibit complex gating characteristics involving transitions between open, closed, and inactivated states depending on membrane potential changes during an action potential. To find effective drugs targeting particular Na_V channels it is important to understand the molecular mechanisms of drug actions with respect to their gating transitions.

We have developed a special software feature in PatchControl 384 for the SyncroPatch 384 which enables the V_{half} (or other V_x) to be calculated for each individual well and fed back into the voltage protocol during the recording. This ensures lower variability in the data and more confidence in compound potency.

Contact us today



Two pulse protocol to study state-dependent effects of compounds.



Use of individual V_{half} significantly lowers data variability across the NPC-384 chip.

nanion

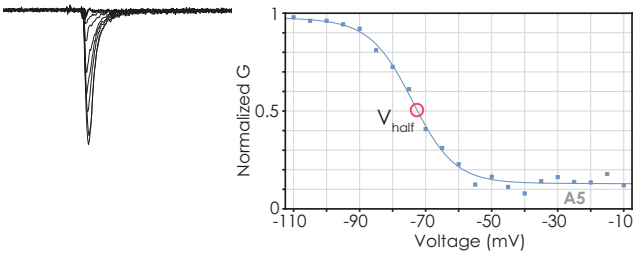
Adaptive voltage clamp

Optimized voltage protocols for each cell

How it works:

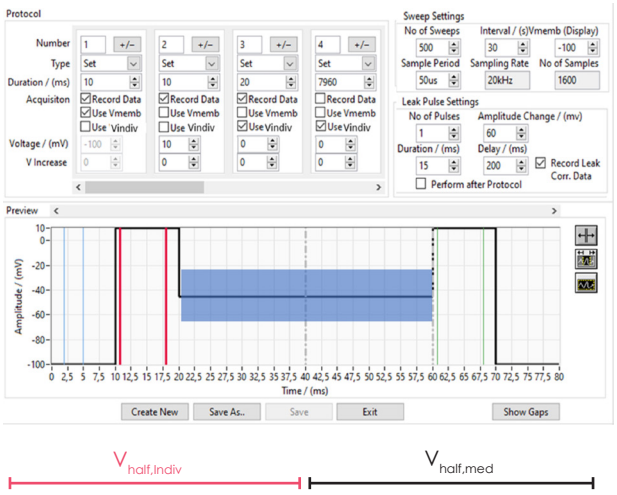
Step 1: Run and analyze inactivation IV

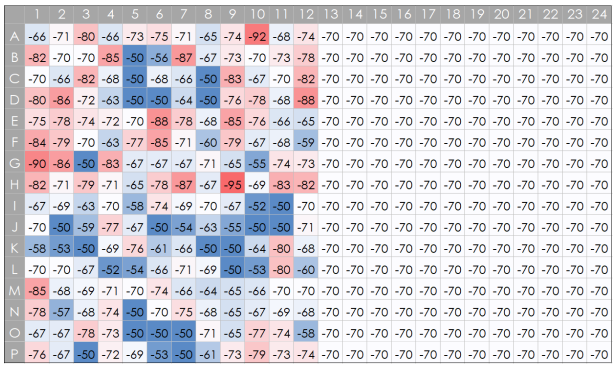
First, the SyncroPatch 384 runs an inactivation IV protocol. Then, the online Boltzmann fit is performed automatically for each cell and the V_{half} (or any other desired V_x) value is calculated individually for each cell.



Step 2: Feedback individual V_{half} values into the voltage protocol

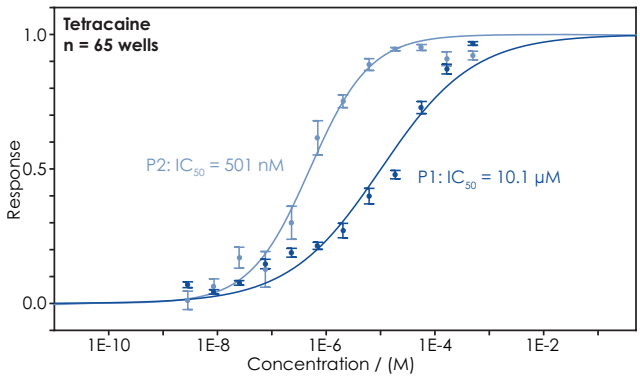
The calculated V_{half} (or other calculated V_x) values are fed back automatically into the voltage protocol for each individual well in PatchControl 384. Then the individual V_{half} values are used for each well in the two-pulse protocol. Alternatively all wells can receive the same mean or median V_{half} value.





Step 3: Run experiment at V_{half} and analyze CRCs

Use the two-step pulse protocol to investigate state-dependent effects of compounds. Compare IC_{50}s on resting and inactivated states and ensure more confidence in compound potency and lower occurrence of false positives/negatives.



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