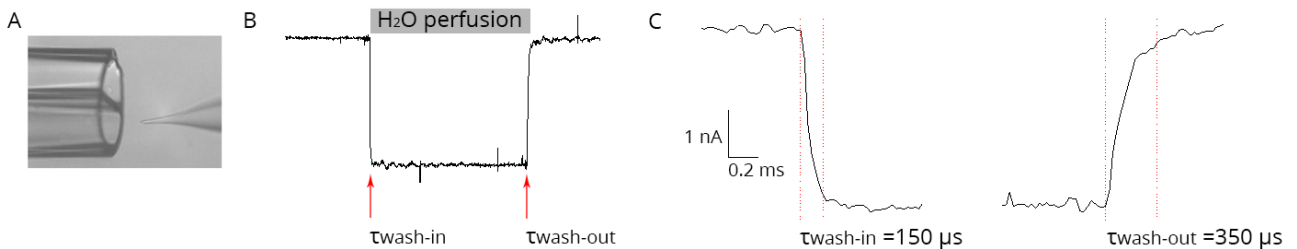


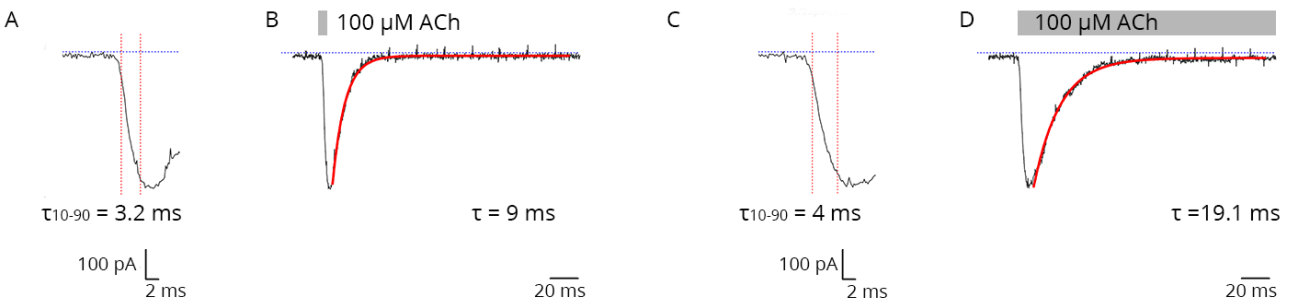
Ultra Fast Compound Application

Is your target a **ligand-gated ion channel**?

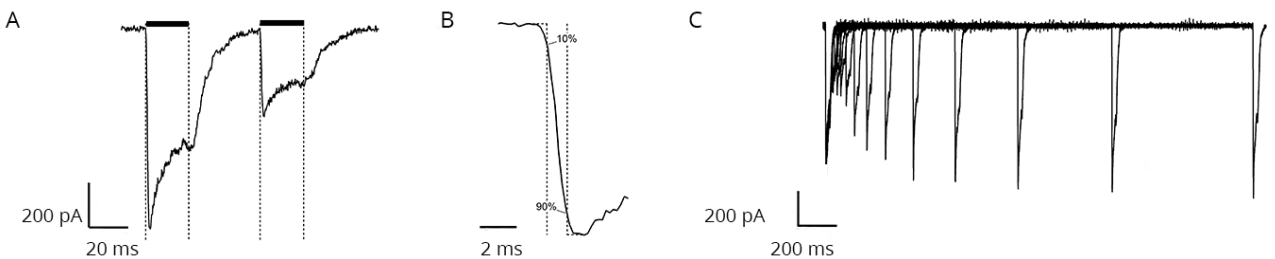
We offer automated patch clamp services with ultra fast compound application using the PatchServer. This device is based on classical recording pipettes and offers high-quality gigohm seals, optical control, cell selection, and low cell consumption.



Our automated patch clamp system uses a sophisticated piezo driven device that holds a theta tube for ultra fast application (A), obtaining an optimal performance that enables compound exchange within milliseconds. Before usage, we calibrate and validate the correct positioning of the theta tube in a cell-free experiment, which consists of recording a liquid junction potential shift by perfusing pure water (B). Thus, confirming that our system achieves solution exchange rates in the range of a few hundred μ s (C).



The ultra short exposure times enables to distinguish between deactivation and desensitization. In this validation study, we used TE671 cells, which express $\alpha 1\beta 1\gamma \delta$ nicotinic acetylcholine receptors constitutively. TE671 cells were stimulated with short (2 ms; A-B) and long (1 s; C-D) pulses of 100 μ M ACh. In line with the literature, we obtained deactivation and desensitization time constants of 9 and 19.1 ms, respectively.



Our system has an impressive ability to perfuse solutions ultra fast and precisely timed. For instance, in this study we used TE671 cells, which express $\alpha 1\beta 1\gamma \delta$ nicotinic acetylcholine receptors constitutively. We stimulated the cells with 1 mM ACh during 20 ms every 40 ms (A), to avoid the full desensitization of $\alpha 1\beta 1\gamma \delta$ nicotinic acetylcholine receptors. (B) Close-up of the onset of nACh-induced current from A. (C) Series of superimposed double applications with varying interpulse intervals showing recovery from desensitization.