ACh multiple compound analysis

Parallel agonist application increases throughput

Ion channel:
ACh

Cell type:
GH4C1

Chip type:
DF-48

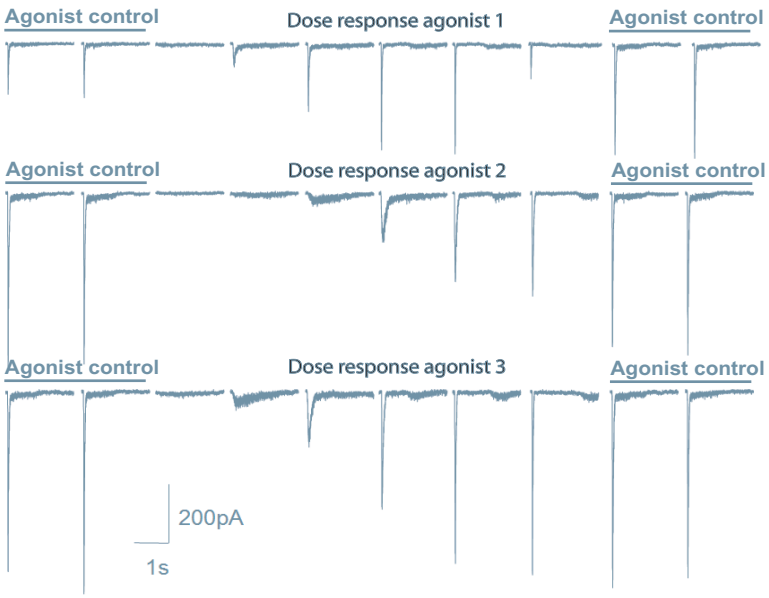
Data courtesy of GlaxoSmithKline, Verona, Italy

Methods

The aim of this study was to investigate the effects of several different agonists on Acetylcholine receptors (ACh receptor subtype not disclosed) expressed in GH4C1 cells. The DF-48 chip was used to obtain complete dose responses for three agonists on the same cell. The highly parallel chip makes it possible to run dose response analysis as well as expose the cells to control substances in between agonist application.

In the experiment below, a DF-48 chip was loaded with 100 µL of increasing concentrations of 3 different substances. Cells were voltage-clamped in the perforated-patch configuration at a holding potential of -60mV. Control currents were elicited by fixed concentrations of control agonist to monitor any variability in the current amplitude. Cells were exposed to the agonist for 1 second followed by a 60 second buffer wash. Note - the traces shown have been cut, only showing responses to substance containing channels.

Figure 1



Easy to extract several full dose-responses from a single cell

Current response to agonist applications can be seen in **Figure 1**. Current responses to agonist 1 and 3 indicate that these are full agonists, inducing maximal current response at high concentrations. In contrast, it is evident that agonist 2 is a partial agonist when comparing the current response to agonist with the control. In the first row, initial applications of control did not induce a maximal current response. This may be due to a not yet fully established perforated patch configuration. The following control applications on the other hand induce highly reproducible current amplitude (row 2 and 3).

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