Application Report

CHO-Kv1.5 Voltage-gated potassium channels on QPatch
IV characteristics and dose-response results were achieved by using Kv1.5 channel blocker

Summary
The voltage-gated potassium channel Kv1.5 is a homotetrameric protein present in the heart. It is a delayed rectifier, participating in the early phase of the heart action potential. This report shows data from CHO cells stably expressing Kv1.5 tested on the QPatch platform. The cells are obtained through a collaboration with STZ (Germany).

Introduction
The voltage-gated potassium channel Kv1.5 is a homotetrameric protein present in the heart. It is a delayed rectifier, participating in the early phase of the heart action potential. This report shows data from CHO cells stably expressing Kv1.5 tested on the QPatch platform. The cells are obtained through a collaboration with STZ (Germany).

Results
Experiments were conducted to evaluate the IV-relationship of Kv1.5 as well as dose-response for inhibitors.

Figure 1 shows the currents elicited at potentials ranging from -90 mV to +50 mV in a representative experiment with CHO-Kv1.5. The corresponding IV plot for both maximum and steady-state current is shown in Figure 2.

The response of Kv1.5 to a known blocker was also tested. Figure 3 shows the raw data traces of the steady-state response to six different concentrations of 4-aminopyridine. Figure 4 and Figure 5 show the corresponding current versus time (IT) plot and Hill fit, respectively. The resulting IC$_{50}$ for 4-aminopyridine is 63.8 µM.
Conclusion

IV characteristics and dose-response experiments with a Kv1.5 channel blocker was successfully obtained using QPatch. Kv1.5 shows its characteristic outward rectification and an IC\textsubscript{50} for 4-aminopyridine within range of reported literature values (e.g. Gutman et al., Pharmacological Reviews 57:473-508, 2005, 270 µM).

Methods

Cells: CHO cells stably expressing Kv1.5 were obtained from STZ. Cells were cultured and harvested for QPatch experiments as described in the Sophion SOP. Data shown here is from STZ CHO-Kv1.5 clone 16.

References: