



Stably Transfected Cell Line - Product Data Sheet
hK_v4.3/KChIP2.2-CHO
Catalog Number CT6171

Related Services and Products

FastPatch[®] and ScreenPatch[™] automated patch clamp services
Replicating hK_v4.3-HEK cell line. Cat. No. CT6144
Additional information available at www.chantest.com

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1 Cell Line Description

1.1 Background

K_v4.3 is a voltage-gated, K⁺-selective channel expressed in the heart, central nervous system, and smooth muscle. KChIP2.2 is an auxiliary subunit that increases current density and modulates channel gating. In heart, K_v4.3 mediates a transient outward current, I_{to}, responsible for phase 1 action potential repolarization. The channel is a potential therapeutic target in atrial fibrillation.

1.2 Pore-forming subunit identifier: hK_v4.3

Class: Voltage-gated potassium channel
Species: Human
Gene name: KCND3

1.3 Auxiliary subunit identifier: KChIP2.2

Class: Potassium channel-interacting protein
Species: Human
Gene name: KCNIP2

1.4 Sequence Information

The cDNA sequences of the KCND3 and KCNIP2 genes used to create this cell line were confirmed prior to transfection. The hK_v4.3 and KChIP2.2 amino acid sequences encoded by the transfected cDNAs are identical to the translated sequences for GenBank accession numbers NM_004980.3 and NM_00173195.2, respectively.

1.5 Expression System

CHO (Chinese hamster ovary) cells, constitutive expression.

1.6 Product Format

Cryopreserved cells, 1 x10⁶ cells/vial.

1.7 Mycoplasma Status: Negative

The absence of mycoplasma species in this cell line was confirmed with the MycoAlert Kit (Lonza Rockland, Inc.).

1.8 Cell Line Stability

Current amplitudes remained stable for at least 36 passages.

2 Validated Test Platforms

Electrophysiological and pharmacological verification of the functional properties of the cloned channels was assessed in the following test platforms:

QPatch™ (Sophion)

2.1 QPatch™ Representative Data

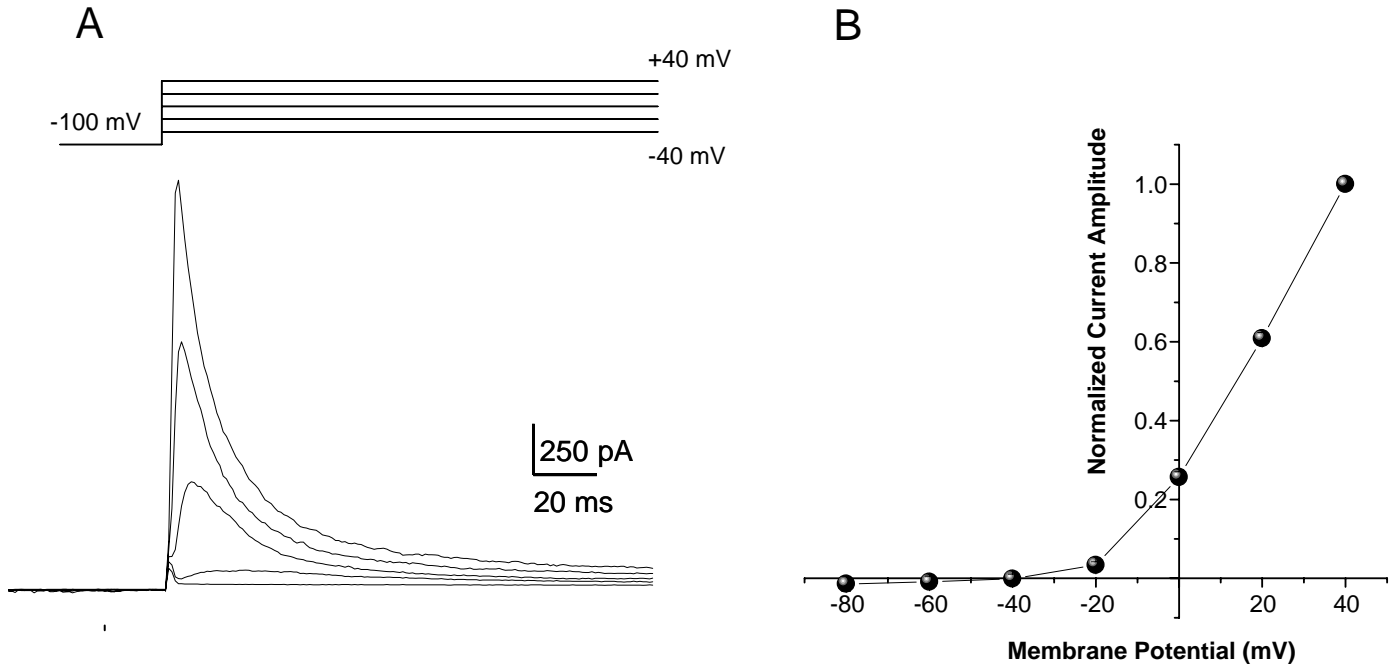


Figure 1. Voltage-dependent activation of Kv4.3/KChIP2.2 in QPatch™ HT

A: Outward currents elicited by test pulses from -40 to +40 mV in 20 mV increments, following a 500-ms prepulse to -100 mV, holding potential -80 mV.

B: Current-voltage relationship. Peak current amplitudes normalized to maximum current at +40 mV (n = 5 cells).

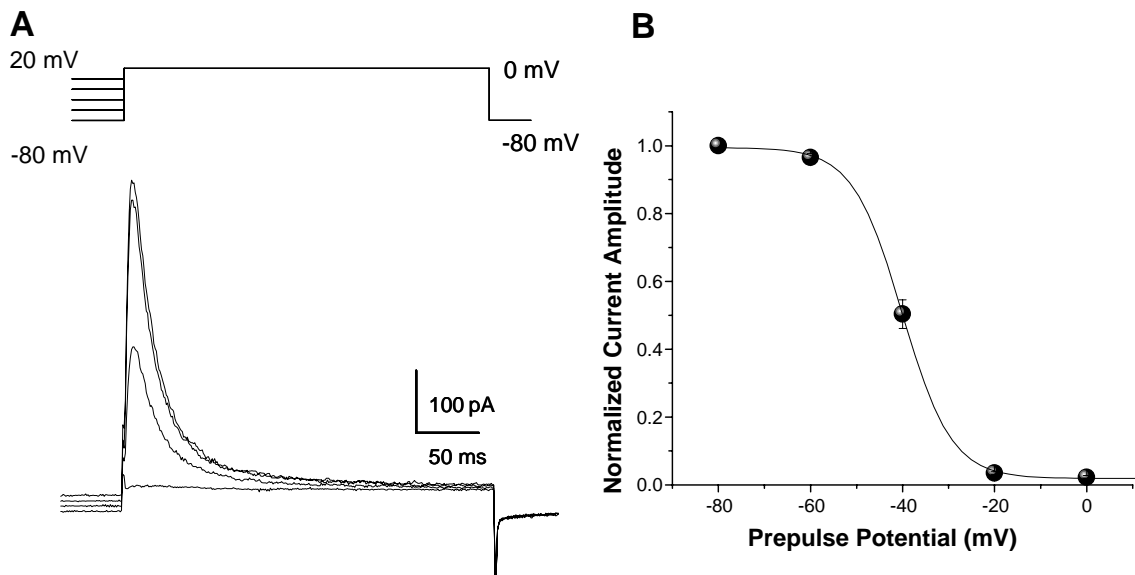


Figure 2. Steady-state inactivation in QPatch™ HT

A: Current traces elicited by test pulses to 0 mV, following 300-ms conditioning prepulse varying in amplitude from -80 mV to -20 mV in 20 mV steps.

B: Voltage-dependence of inactivation. Peak test pulse current amplitude normalized to maximum current (Mean \pm SD, n = 5). The midpoint potential = -40 mV.

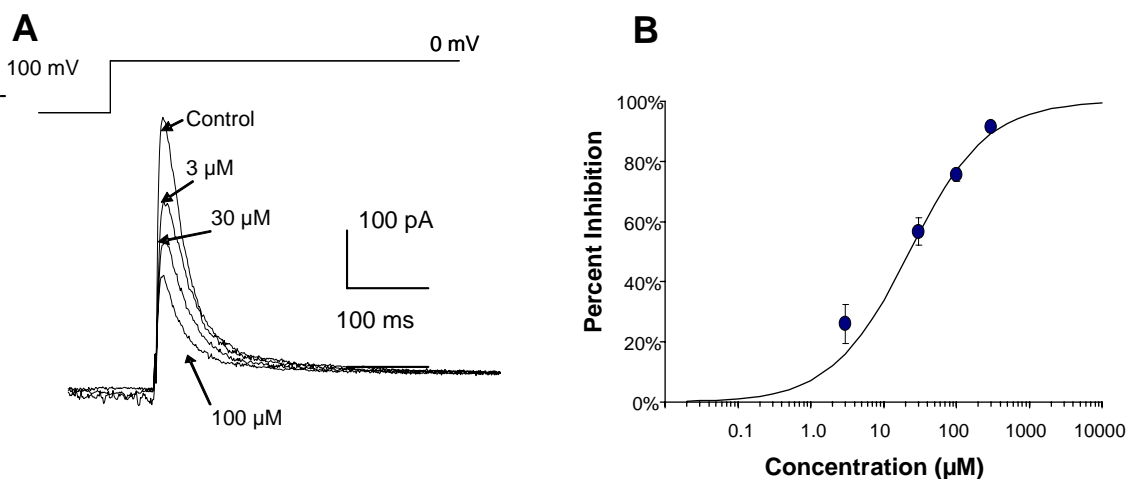


Figure 3. Concentration-Dependent Flecainide Block

A: Current traces elicited by test steps to 0 mV of flecainide inhibition of Kv4.3/KChIP2.2 outward current. **B:** Concentration-response relationship (Mean \pm SD, n = 3 - 8 cells/concentration). IC_{50} = 22.7 μ M.

3 References

Decher et al. 2001. hKChIP2 is a functional modifier of hKv4.3 potassium channels. Cardiovascular Research 52:255-264.

Dilks et al. 1999. Cloning and expression of the human Kv4.3 potassium channel. *J Neurophysiol* 81:1974-1977.

Dixon et al. 1996. Role of the Kv4.3 K⁺ channel in ventricular muscle. *Circ Res* 79: 659-668.

Gutman GA, et al. 2005. International Union of Pharmacology. LIII. Nomenclature and molecular relationships of voltage-gated potassium channels. *Pharmacol Rev.* 57:473-508.