



Stably Transfected Cell Line - Product Data Sheet
hK_v1.3-HEK
Catalog Number CT6134

Related Services and Products

FastPatch[®] and ScreenPatch[™] automated patch clamp services
Replicating hK_v1.3-CHO cell line. Cat. No. CT6133
Additional information available at www.chantest.com

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1 Cell Line Description

1.1 Background

K_v1.3 is a voltage-gated, K⁺-selective channel expressed in the central nervous system, lymphocytes, liver, prostate, skeletal muscle, and microglia. The channel is a potential therapeutic target in multiple sclerosis, cancer, obesity, diabetes, asthma, immune diseases, and allergic contact dermatitis.

1.2 Pore-forming subunit identifier: hK_v1.3

Class: Voltage-gated potassium channel
Species: Human
Gene name: KCNA3

1.3 Sequence Information

The cDNA sequence of the KCNA3 gene used to create this cell line was confirmed prior to transfection. The amino acid sequence encoded by the transfected cDNA is identical to the translated sequence for GenBank accession number NM_002232.2

1.4 Expression System

HEK293 (human embryonic kidney) cells, constitutive expression.

1.5 Product Format

Cryopreserved cells, 1 x10⁶ cells/vial.

1.6 Mycoplasma Status: Negative

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

1.7 Cell Line Stability

Table 1. Stability of hK_v1.3 Current

Passage Number	Current Amplitude (pA)	n
25	1.46 ± 0.19	5
29	15.39 ± 1.85	7
37	10.59 ± 0.97	8
45	8.32 ± 1.38	13
53	2.45 ± 0.45	8

* cells incubated ~ 24 hours at 27°C prior to recording

A frozen vial at P21 was thawed and passaged for stability measurements. hK_v1.3 current amplitudes recorded by PatchXpress[®] (mean ± standard deviation). Table 1 shows that current amplitude measured from hK_v1.3-HEK remains stable for at least 32 passages beyond the original frozen vial.

2 Validated Test Platforms

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

Manual Patch Clamp
PatchXpress[®] (MDS-AT)

2.1 Representative Manual Patch Clamp Data

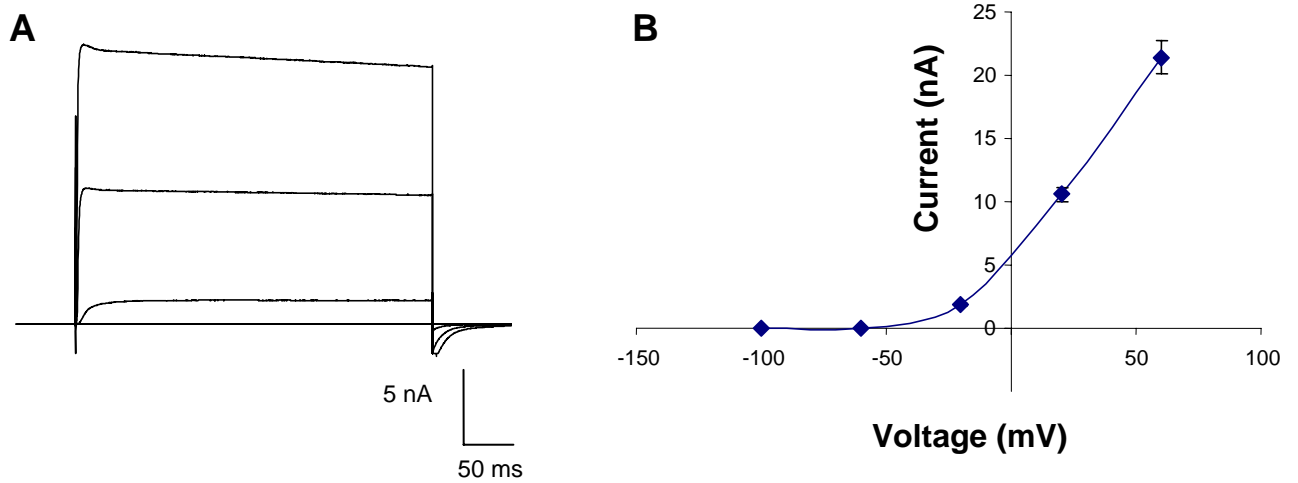


Figure 1. Voltage-dependent Gating in Manual Patch Clamp

A: hK_v1.3 current traces elicited by 300-ms depolarizing pulses from -100 to +60 mV in 20 mV increments, holding potential of -80 mV. **B:** Steady-state current-voltage relationship. Mean \pm SEM (n = 4 cells).

4-AP Kv1.3 Concentration-Response

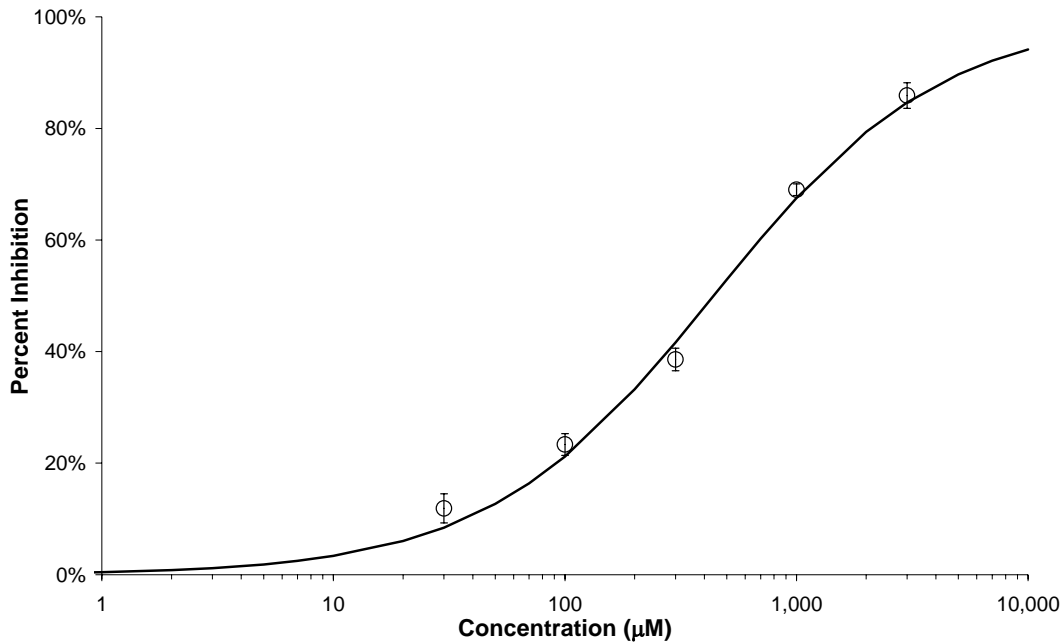


Figure 2. 4-Aminopyridine (4-AP) block in Manual Patch Clamp

Concentration-response relationship. Mean \pm SEM (n = 3 – 6 cells/concentration).
IC₅₀ = 438.2 μ M.

2.2 PatchXpress® Throughput Capability

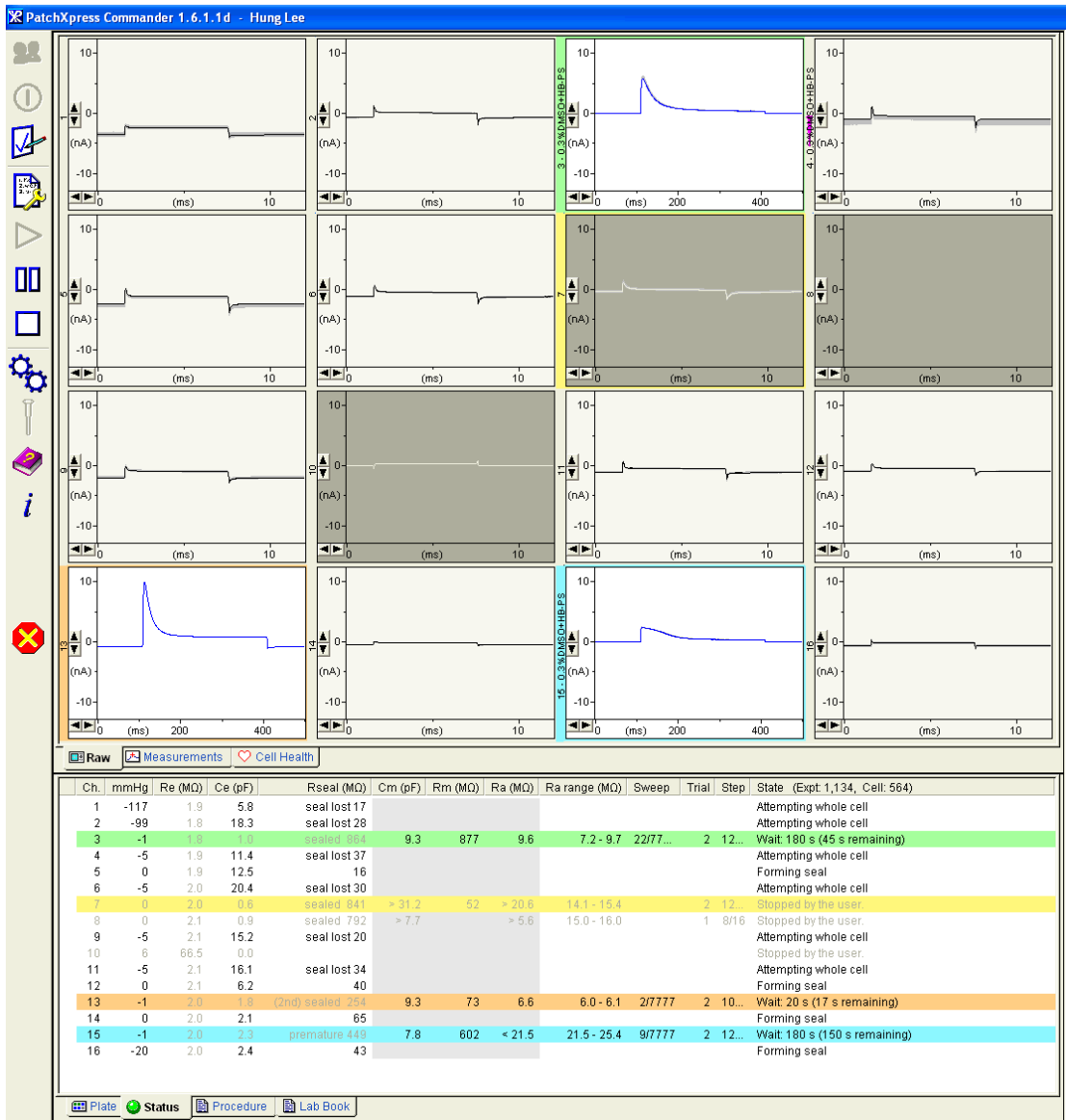


Figure 3. PatchXpress® hK_v1.3-HEK Throughput Capability

Throughput capability in PatchXpress® depends upon many factors which may result in success rate variability. The screen capture shows a typical PatchXpress® experiment. In this example, cells were dispensed to 15 of the 16 chambers, 3 seals were formed, whole-cell configuration was achieved in 3 cells, and all cells showed characteristic hK_v1.3 current waveforms with little leak current and peak current amplitudes > 1.5 nA.

2.3 Representative PatchXpress Data

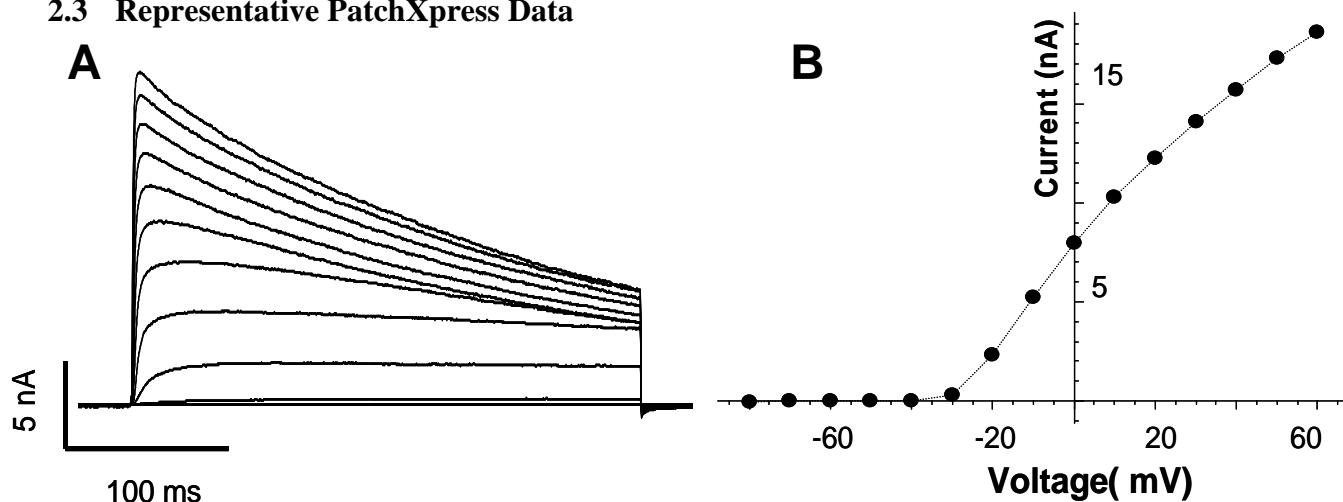


Figure 4. Voltage-dependent Gating in PatchXpress

A: hK_v1.3 current traces elicited by 300-ms depolarizing pulses from -80 to +60 mV in 10 mV increments, holding potential of -80 mV. **B:** Steady-state current-voltage relationship.

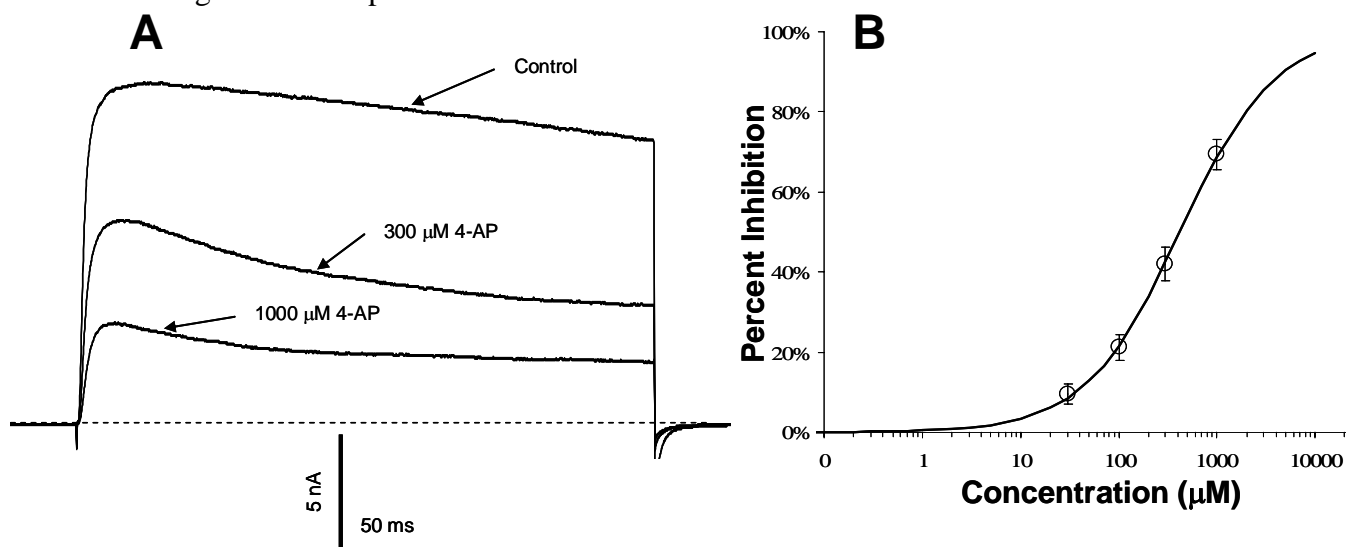


Figure 5. 4-Aminopyridine (4-AP) block in PatchXpress[®]

A: Superimposed current traces elicited by 300-ms test pulses to 0 mV in the absence (control) and presence of 4-AP. **B:** Concentration-response relationship (Mean \pm SEM, n = 3 - 4, IC₅₀ = 296 μ M).

3 References

Grissmer S, et al. 1994. Pharmacological characterization of five cloned voltage-gated K⁺ channels, types Kv1.1, 1.2, 1.3, 1.5, and 3.1, stably expressed in mammalian cell lines. *Mol Pharmacol* 45:1227-1234.

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