Kv1.3 - **Potassium voltage-gated channel subfamily A, member 3**

Product specification

Acronym: Kv1.3
Class: Ion channel
Origin: Mouse
Molecular weight: 58 kDa
Application: Screening & display technologies, Structural biology

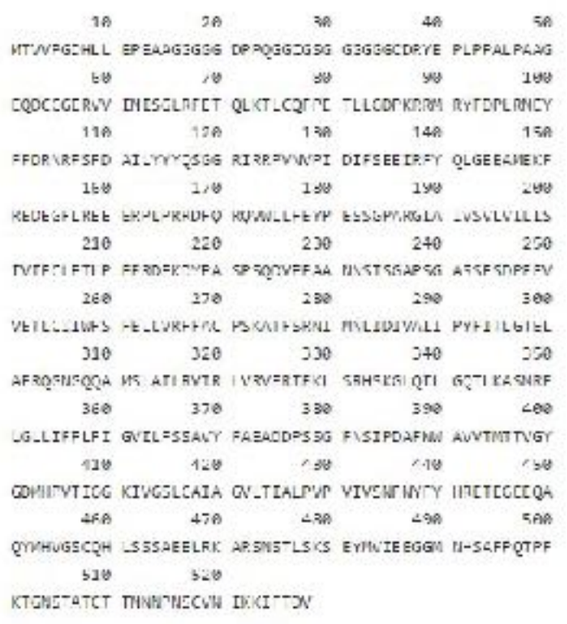
Purity: >60%
Activity: Validated by Patch clamp
Length: Full length
TMD: 6
Biological function: potential neuronal action , transmembrane potassium transport

Product description

Kv1.3 is a voltage-gated potassium channel that participates in cellular processes such as neuronal excitability, epithelial electrolyte transport, smooth muscle contraction, apoptosis, cell volume regulation, and T cell stimulation. Kv1.3 channels have been proposed to be crucial in the pathogenesis of multiple sclerosis and other autoimmune diseases Assuming opened or closed conformations in response to the voltage difference across the membrane, the protein forms a potassium-selective channel through which potassium ions may pass in accordance with their electrochemical gradient.

Protein Source: mouse Kv1.3 wild type protein.

Fig.1: AA sequence of Kv1.3 protein



Affinity Tag: Histidine tag fused to the N-terminal end of the protein.

Production conditions: mKv1.3 is expressed in a cell-free expression system, in the presence of lipid vesicles. 100 µg can be produced and qualified in about 1 week.

Quality analysis

Purity: Typically > 60% as determined by SDS-Page and Coomassie Blue staining.

Purification procedure: As standard, Kv1.3 proteoliposomes are purified on a sucrose gradient. Further purification steps can be added if required.

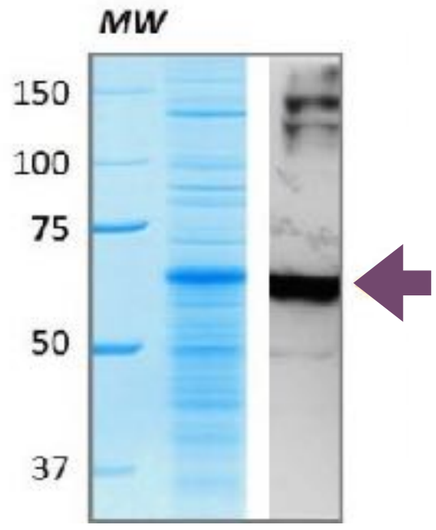


Fig.2: Proteoliposome mKv1.3 after purification (Coomassie Blue quantification and WB identification)

Assessment of the functionality

Methods

The mouse potassium voltage-gated channel member 3 was expressed in Synthelis' cell-free system in the presence of lipid vesicles. The functionality of the ion channel was evaluated by measurement of the potassium channel activity using a Port-a-Patch® instrument (Nanion Technology) in presence of the ShK known blocker toxin (from the venom of the Caribbean sea anemone Stoichactis helianthus, provided by Smartox Biotechnology).

Results

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Potassium channel activity

The figure 3 below shows the conductance at +50mV of a single mKv1.3 channel embedded into the lipid bilayer of liposomes

Figure 1: Single channel recording of mKv1.3 channel. The signals were acquired after incorporation of mKv1.3 proteoliposomes into Giant Unilamellar Vesicles (GUVs) previously used to form the bilayers on the Port-a-Patch. The recordings were done at 25, 50 and 100mV (only a zoom of the recording at 50mV is shown). The recording was done at room temperature in presence of 200mM KCl.

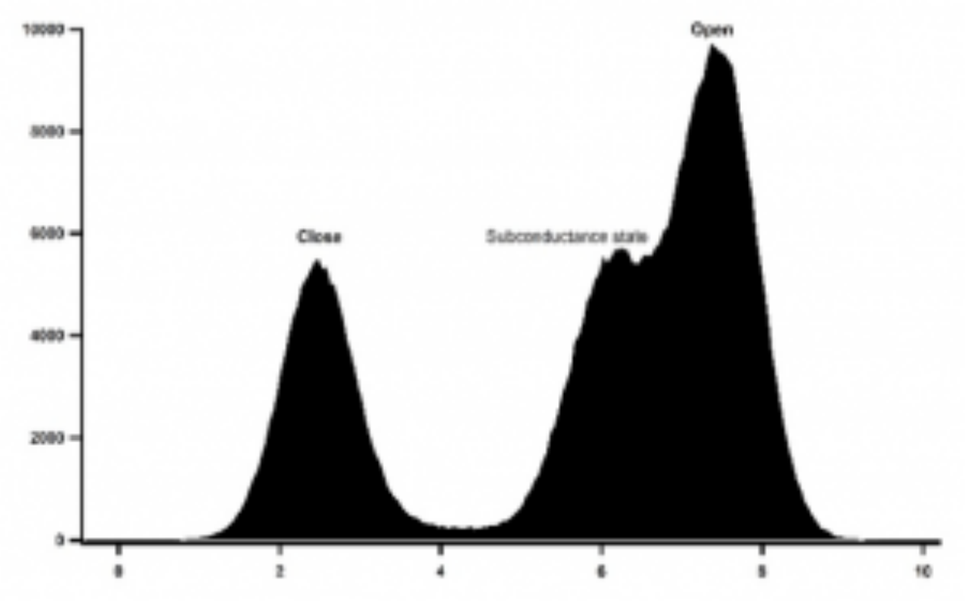

Figure 2: Histogram of mKv1.3 activity at +50mV in absence of drugs. The conductance of mKv1.3 was as well calculated using all point histogram of 1800 single channel events, G=98,4 ± 6 pS at +50mV. The activity showed a voltage asymmetry of the activation, with single channel activated for voltages higher than -25mV and reaching a high open probability at +50mV. Subconductance states are also observed.

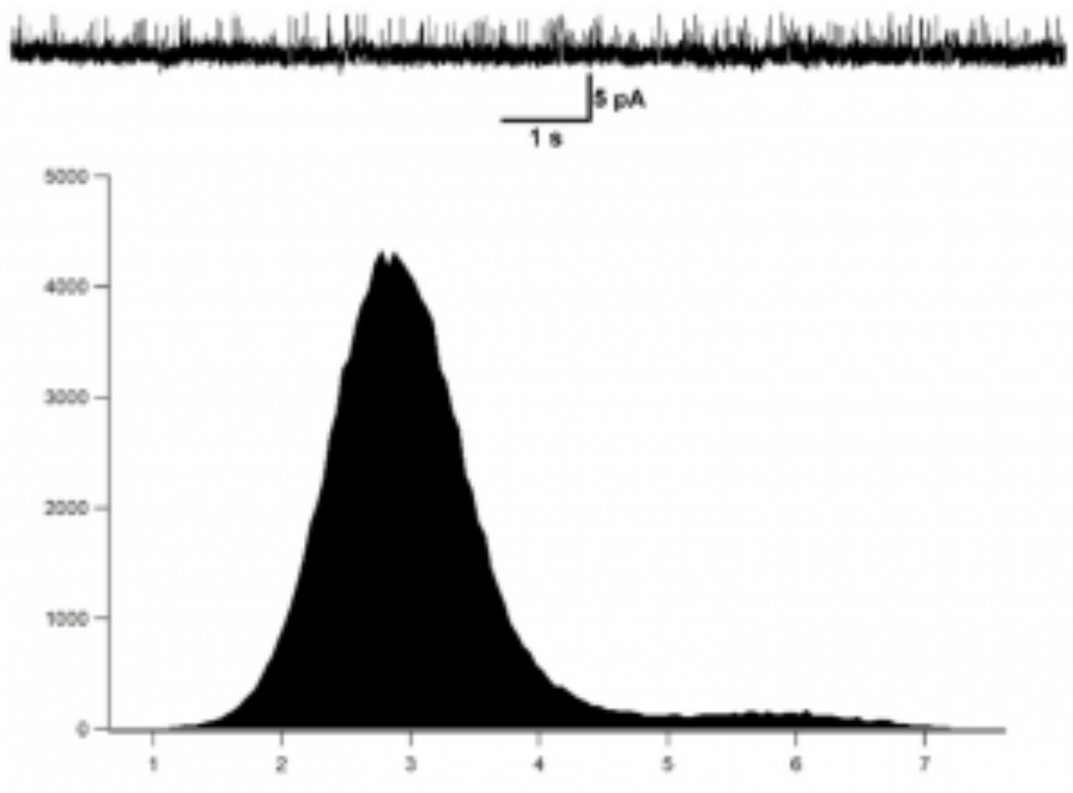

Figure 3: Histogram of mKv1.3 activity at +50mV in the presence of 100nM of the ShK toxin inhibitor. The conductance of mKv1.3 was as well calculated at 50mV. The application of the ShK toxin at 100nM blocks clearly the mKv1.3 activity.The conductance of mKv1.3 was as well calculated at 50mV. The application of the ShK toxin at 100nM clearly blocks the mKv1.3 activity.

Formulation

Buffer: Available in Tris 50mM, pH 7.5. Other buffers or customized formulation can be provided upon request.

Customized Hydrophobic matrix: Customized formulation with specific lipids like PEGylated or biotinylated lipids can be used upon request, as well as targeting molecules.

Storage/Stability: Store at +4°C for up to one week or several months at -80°C. Aliquot for storage. Do not freeze-thaw after aliquoting.

Use restrictions: For life science research use only.

Available sizes: 10µg, 20µg ,100 µg , 200 µg, 500 µg,bulk

Need a specific amount, a quote or any additional information?
Contact-us

Synthelis

T : +33 (0)4 76 54 95 35
E: contact@synthelis.fr
www.synthelis.com