

A BK (Slo1) channel journey from molecule to physiology

Contreras, Gustavo F.

Castillo, Karen

Enrique, Nicolás

Carrasquel-Ursulaez, Willy

Castillo, Juan Pablo

Milesi, Verónica

Neely, Alan

Alvarez, Osvaldo

Ferreira, Gonzalo

Gonzalez, Carlos

Latorre, Ramon

Calcium and voltage-activated potassium (BK) channels are key actors in cell physiology, both in neuronal and non-neuronal cells and tissues. Through negative feedback between intracellular Ca^{2+} and membrane voltage, BK channels provide a damping mechanism for excitatory signals. Molecular modulation of these channels by alternative splicing, auxiliary subunits and post-translational modifications showed that these channels are subjected to many mechanisms that add diversity to the BK channel α subunit gene. This complexity of interactions modulates BK channel gating, modifying the energetic barrier of voltage sensor domain activation and channel opening. Regions for voltage as well as Ca^{2+} sensitivity have been identified, and the crystal structure generated by the 2 RCK domains contained in the C-terminal of the channel has been described. The linkage of these channels to many intracellular metabolites and pathways, as well as their modulation by extracellular natural agents, has been