

# Voltage-controlled gating in a large conductance Ca<sup>2+</sup>-sensitive K<sup>+</sup> channel

(hslo)

Stefani, E.

Ottolia, M.

Noceti, F.

Olcese, R.

Wallner, M.

Latorre, R.

Toro, L.

Large conductance calcium- and voltage-sensitive K<sup>+</sup> (MaxiK) channels share properties of voltage- and ligand-gated ion channels. In voltage-gated channels, membrane depolarization promotes the displacement of charged residues contained in the voltage sensor (S4 region) inducing gating currents and pore opening. In MaxiK channels, both voltage and micromolar internal Ca<sup>2+</sup> favor pore opening. We demonstrate the presence of voltage sensor rearrangements with voltage (gating currents) whose movement and associated pore opening is triggered by voltage and facilitated by micromolar internal Ca<sup>2+</sup> concentration. In contrast to other voltage-gated channels, in MaxiK channels there is charge movement at potentials where the pore is open and the total charge per channel is 4-5 elementary charges.