

Charybdotoxin, a protein inhibitor of single Ca^{2+} -activated K^{+} channels from mammalian skeletal muscle

Miller, Christopher

Moczydlowski, Edward

Latorre, Ramon

Phillips, Marcia

The recent development of techniques for recording currents through single ionic channels¹ has led to the identification of a K^{+} -specific channel that is activated by cytoplasmic Ca^{2+} (refs 2-12). The channel has complex properties, being activated by depolarizing voltages and having a voltage-sensitivity that is modulated by cytoplasmic Ca^{2+} levels. The conduction behaviour of the channel is also unusual, its high ionic selectivity being displayed simultaneously with a very high unitary conductance^{2,4,12}. Very little is known about the biochemistry of this channel, largely due to the lack of a suitable ligand for use as a biochemical probe for the channel. We describe here a protein inhibitor of single Ca^{2+} -activated K^{+} channels of mammalian skeletal muscle. This inhibitor, a minor component of the venom of the Israeli scorpion, *Leiurus quinquestriatus*, reversibly blocks the large Ca^{2+} -activated K^{+} channel in a simple bimolecular reaction. We have partially purified the active compo