

SINGLE CHANNELS MEASUREMENTS OF ATP REGULATED POTASSIUM CHANNEL FROM RAT BRAIN MITOCHONDRIA

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It was proved that among various types of ion channels in mitochondria two from the inner mitochondrial membrane: mitochondrial ATP-regulated potassium channel (mitoK_{ATP}) and mitochondrial Ca-activated large conductance potassium channel (mitoBK_{Ca}) are involved in cytoprotection but the mechanism of this event is still unclear.

We measured single channel activity after reconstitution of inner mitochondrial membrane from rat brain into a planar lipid bilayer. The potassium channel with a mean conductance of 219 ± 15 pS in symmetrical 450/450 mM KCl (*cis/trans*) solution was recorded. The effect of different channel modulators on single channel activity was examined. The channel activity was inhibited by complex ATP/Mg²⁺. The effect was reversed by BMS 191095 and the channel activity was reduced because of the presence of magnesium ions. Magnesium ions change channel activity only after addition to the *trans* compartment in our experimental conditions. Inhibitor of mitoBK_{Ca} channel – iberiotoxin IbTx and inhibitor of mitochondrial voltage gated potassium channel (mitoKv1.3) – margatoxin MrTx have no effect on channel activity. Additionally, inhibitor of mitoK_{ATP} channels – 5-hydroxydecanoid acid (5-HD) does not change channel activity. Thus, we conclude that the mitoK_{ATP} is present in rat brain mitochondria but in opposite to mitoK_{ATP} from other tissues it is insensitive to 5-HD.

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