Selectivity and gating properties of a cAMP-modulated, K+-selective channel from Drosophila larval muscle

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The selectivity and gating properties of cAMP-modulated, voltage-independent, K+-selective channel from Drosophila larval muscle were investigated using the patch-clamp technique. In symmetrical 115 mM K+ the channel displayed a linear current-voltage relation with slope conductance of 43 pS. Under biionic conditions (115 mM K+ pipette/115 mM X+ cytoplasmic) the permeability sequence was K+>Rb+>NH+4 ? Cs+,Na+. The channel was impermeable to Ca2+ (PCa/PK < 0.02). Under steady-state conditions and regardless [cAMP], open dwell times showed a double exponential distribution. [cAMP] did not affect the time constants of the two components of open times, or their relative amplitudes. Moreover, successive openings were correlated in open time. Closed dwell times were made of at least three exponential components. Fast application of cAMP to the cytoplasmic side of the channel induced a transient increase in open probability that relaxed to a lower value within seconds. This last result sugges