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JOURNAL ARTICLE

Characterization of K currents in cultured human corporal smooth muscle cells

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In order to gain more mechanistic insight into the regulation of corporal smooth muscle tone, we conducted electrophysiological studies on homogeneous explant cell cultures of human corpus cavernosum smooth muscle. Patch clamp analyses in the whole cell mode revealed a mean resting potential of -43 ± 4.9 mV ($n = 12$ cells). Large whole cell outward K currents were very prominent in these cells, and ranged from 0.5 to 1.5 nA. In some cells, a transient, voltage-dependent A current accounted for a significant portion of the observed whole cell currents. Furthermore, stimulation with the calcium channel agonist BAY K 8644 or the K channel agonist pinacidil doubled the magnitude of the whole cell K current, as would be expected for maxi-K (KCa) and metabolically gated K channels (KATP), respectively. Single channel recordings in the detached patch mode consistently revealed the presence of at least two K channels: 1) a KCa channel, with a conductance of approximately 190 pS; and 2) a putative delayed rectifier channel with a conductance of approximately 50 pS. Furthermore, all channel types showed some degree of voltage and/or calcium sensitivity. In conclusion, the large magnitude of the whole cell K currents and the observed K channel heterogeneity indicate a potentially important role for these channels in modulating corporal smooth muscle tone.

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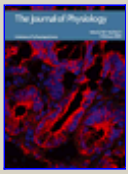
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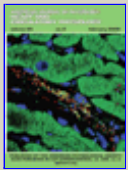
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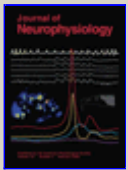
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