

大黄素升高豚鼠结肠带细胞 $[Ca^{2+}]_I$ 的特征和GDP的抑制作用

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利用Fluo-3荧光探针检测细胞内自由 Ca^{2+} 浓度($[Ca^{2+}]_I$),研究了大黄素升高豚鼠结肠带细胞 $[Ca^{2+}]_I$ 的量-效关系和动态变化特征,及GDP和胞外 Ca^{2+} 浓度对其的影响。较低浓度大黄素随药物浓度增加使 $[Ca^{2+}]_I$ 显著升高,更高浓度大黄素有超最大抑制效应。GDP对大黄素升高细胞 $[Ca^{2+}]_I$ 的抑制作用随其浓度增加而增强。GDP和胞外 Ca^{2+} 浓度影响大黄素诱发的 $[Ca^{2+}]_I$ 动态变化的结果表明:GDP使 $[Ca^{2+}]_I$ 峰消失,胞外无 Ca^{2+} 导致 $[Ca^{2+}]_I$ 随时间显著下降,大黄素升高 $[Ca^{2+}]_I$ 作用趋向消失。

CHARACTERISTICS OF EMODIN EVOKED $[Ca^{2+}]_I$ AND INHIBITION OF GDP IN GUINEA PIG TAENIA COLI CELLS

Intracellular free Ca^{2+} concentration ($[Ca^{2+}]_I$) was detected using Fluo-3 fluorescence probe. Relationship between emodin concentration and intracellular $[Ca^{2+}]_I$ as well as kinetics of $[Ca^{2+}]_I$ in guinea pig taenia coli cells were studied. In the range of lower emodin concentration, $[Ca^{2+}]_I$ rose remarkably with increasing of drug concentration. Supermaximal stimulation of emodin inhibited rising of $[Ca^{2+}]_I$. Inhibition of GDP on rising of $[Ca^{2+}]_I$ enhanced with increasing of GDP concentration. Effects of GDP and extracellular Ca^{2+} -free on rising kinetics of emodin evoked $[Ca^{2+}]_I$ were studied. Peak of $[Ca^{2+}]_I$ disappeared by adding GDP. When extracellular Ca^{2+} -free, $[Ca^{2+}]_I$ decreased remarkably with prolonging of time, rising of emodin evoked $[Ca^{2+}]_I$ tended to disappear. These results suggest that emodin could evoke Ca^{2+} release from intracellular Ca^{2+} pool by activating receptor coupled G protein and promote extracellular Ca^{2+} influx by depolarizing cell membrane potential.

关键词

大黄素 (Emodin); 豚鼠结肠带细胞 (Guinea pig taenia coli cells); $[Ca^{2+}]_I$; GDP; 动力学 (Kinetics)