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人参皂苷Rg₁对人神经干细胞功能表达的膜片钳研究

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中文摘要:目的:观察人参皂苷Rg₁诱导人神经干细胞(neural stem cells of human,hNSCs)的功能表达。方法:采用全细胞膜片钳技术分析人参皂苷Rg₁诱导hNSCs分化7 d时,神经元样细胞的膜电生理特性以及钠、钾离子通道的功能表达。结果:人参皂苷Rg₁(20 mg·L⁻¹)诱导hNSCs分化7 d时,神经元样细胞的膜静息电位为(-45.70±2.63) mV,膜电容为(26.89±1.91) pF,膜输入阻抗为(877.51±20.44) MΩ与对照组相比P<0.05;电压依赖性的快速激活、快速失活的内向Na⁺电流,检出率50%,平均峰值为(711.48±158.03) pA与对照组相比P<0.05;外向K⁺电流的主要成分快速激活快速失活的瞬时外向K⁺电流和延迟整流外向K⁺电流,其平均峰值为(1 070.42±177.18) pA与对照组相比P<0.05。结论:人参皂苷Rg₁可以促进hNSCs功能表达和成熟。

中文关键词:人参皂苷Rg₁ 人神经干细胞 功能表达 膜片钳

Effect of ginsenoside Rg₁ on functional expression of human neural stem cells:a patch clamp study

Abstract:Objective:To observe the effects of ginsenoside Rg₁ on the functional expression of human neural stem cells (hNSCs). **Method:**The membrane electrophysiological properties and sodium and potassium ion channels in the hNSCs induced by Rg₁ were analyzed using the whole-cell patch-clamp. **Result:**On the 7th day, the neuron-like cells derived from ginsenoside Rg₁ (20 mg·L⁻¹)-induced NSCs show: ① The resting membrane potential: (-45.70±2.63) mV, the membrane capacitance: (26.89±1.91) pF, the membrane input impedance: (877.51±20.44) MΩ (P<0.05 compared with the control group, respectively); ② The detection rate of inward sodium current which is rapidly activated and inactivated in voltage-dependence was 50%, and its average peak value was (711.48±158.03) pA (P<0.05 compared with the control group); ③ The outward potassium currents were composed of rapidly activated and inactivated transient outward potassium current and delayed rectifier outward potassium current, and its average peak value was (1 070.42±177.18) pA (P<0.05 compared with the control group). **Conclusion:**Ginsenoside Rg₁ can promote the functional expression and maturity of hNSCs.

keywords:ginsenoside Rg₁ human neural stem cell functional expression patch clamp

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