

多巴胺D₁类受体对神经肽Y受体介导的促血管平滑肌细胞增殖的影响(PDF)

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Title: D₁-like dopamine receptor suppresses neuropeptide Y-induced proliferation in vascular smooth muscle cells

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关键词: 多巴胺受体; 神经肽Y Y₁受体; 细胞增殖; 血管平滑肌细胞

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摘要: 目的 探讨多巴胺D₁类受体对神经肽Y (neuropeptide Y, NPY) 受体介导的Sprague-Dawley(SD)大鼠原代血管平滑肌细胞 (vascular smooth muscle cells, VSMCs) 增殖的影响。方法 以NPY(10⁻⁸~10⁻¹¹ mol/L)刺激SD大鼠胸主动脉培养的VSMCs, 观察在D₁类多巴胺受体激动剂Fenoldopam(10⁻⁸ mol/L)存在的情况下, 神经肽Y促VSMCs增殖作用的变化。细胞增殖的检测采用^{[3}H]胸腺嘧啶核苷 (^{[3}H] TdR) 掺入率的变化表示及MTT方法。结果 NPY呈浓度依赖性促进SD大鼠VSMCs的异常增殖, 最高增殖幅度达 (77±9) % (P<0.05), 该增殖作用由NPY Y₁受体亚型介导。多巴胺D₁类受体激动剂Fenoldopam对VSMCs无增殖影响, 但Fenoldopam可抑制NPY Y₁亚型受体介导VSMCs的增殖作用, 该作用通过PKA途径发挥作用。结论 多巴胺D₁类受体激活抑制NPY 受体介导的促VSMCs增殖作用, 可能参与心血管疾病的发生、发展过程。

Abstract: Objective To determine the effect of D₁-like dopamine receptor on neuropeptide Y (NPY)-mediated proliferation in primary cultured vascular smooth muscle cells (VSMCs) derived from thoracic aorta of Sprague-Dawley(SD) rats. Methods After VSMCs were isolated from SD rat thoracic aorta and identified by morphology and immunocytochemistry, the cells at passage 4 to 8 were treated by 10⁻⁸ to 10⁻¹¹mol/L NPY in presence or absence of D₁-like receptor agonist fenoldopam (10⁻⁸ mol/L), blocker BIBP3226 (10⁻⁶mol/L), or antagonist SCH23390 (10⁻⁸mol/L) to observe NPY-mediated proliferation in VSMCs. The proliferation of VSMCs was investigated by [³H]-TdR incorporation and MTT assay. Results NPY resulted in an increased proliferation of VSMCs in a concentration-dependent manner, with a maximal proliferative amplitude of (77±9)% (P<0.05). D₁-like receptor agonist, fenoldopam, completely blocked the NPY Y₁-mediated proliferation in VSMCs, although the agonist had no effect on the proliferation of VSMCs by itself, which might be through protein kinase A pathway. Conclusion Activation of D₁-like receptor inhibits NPY Y₁-mediated proliferation in VSMCs, which might be involved in the pathogenesis of cardiovascular diseases.

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