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树突状细胞通过NT-3/TrkC信号通路调控神经干细胞

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Title: Dendritic cell-induced neural stem cell survival *via* NT-3/TrkC signaling pathway

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关键词: 神经干细胞; 树突状细胞; NT-3; TrkC; 存活; 信号通路

Keywords: neural stem cell; dendritic cell; NT-3; TrkC; survival; signal pathway

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摘要: 目的 研究共培养状态下树突状细胞(dendritic cell, DC)对神经干细胞（neural stem cell, NSC）存活的影响及其作用机制。 方法 体外分离、纯化SD大鼠原代DC和NSC，将二者用Transwell技术共培养，用NT-3特异性抗体中和NT-3的表达；然后采用qRT-PCR方法检测DC中神经营养素-3（neurotrophin-3, NT-3）的mRNA水平，流式细胞术检测NSC凋亡；同时用免疫荧光、Western blot技术确定NSC表面NT-3特异性受体Trk C的表达。 结果 与DC单独培养组相比，共培养体系中，DC表达NT-3水平显著性增强（$P<0.05$）；同时共培养能显著增加NSC存活，该效应能被NT-3特异性中和性抗体阻断；共培养能够增加NSC中NT-3特异性受体TrkC表达（$P<0.05$），并上调TrkC磷酸化水平，而NT-3特异性抗体能够抑制TrkC表达和磷酸化上调（$P<0.05$）。 结论 DC和NSC共培养能够增加DC中NT-3表达，高表达的NT-3则通过NSC膜上的TrkC受体促进NSC的存活。

Abstract: Objective To study the effect of dendritic cell (DC) on neural stem cell (NSC) survival when they were cocultured *in vitro*. Methods Primary DC and NSC isolated and purified from SD rats were cocultured by Transwell technique *in vitro*. The expression of neurotrophin-3 (NT-3) mRNA in DC was determined by qRT-PCR, and the apoptotic ratio of NSC was detected with flow cytometry. In

addition, the expression of NT-3 specific receptor tropomyosin receptor kinase C (TrkC) in NSC was detected with immuno flourescence and Western blotting. Results Compared with simple DC group, the expression of NT-3 significantly increased in the DC cocultured with NSC (P<0.05). The survival of NSC markedly increased and the effect was selectively blocked by a NT-3 specific neutralizing antibody. In addition, the levels of expression and phosphorylation of NT-3 specific receptor TrkC significantly increased in NSC (P<0.05), and the increase could also be inhibited by the NT-3 specific neutralizing antibody. Conclusion Coculture of DC and NSC upregulates the expression of NT-3 in DC and promotes the survival of NSC in a NT-3/TrkC-dependent manner.

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