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Title: Wnt7a gene stimulates mesenchymal stem cell proliferation and differentiation into neuron-like cells

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摘要: 目的 研究Wnt7a基因过表达对大鼠骨髓间充质干细胞(mesenchymal stem cells, MSCs)增殖和向神经元样细胞分化的影响。 方法 构建Wnt7a腺病毒,利用病毒感染MSCs, MTT法检测Wnt7a基因腺病毒感染前后MSCs增殖情况, Western blot检测细胞质和细胞核中β-catenin及CyclinD1表达的变化,比较诱导后向神经元样细胞的分化率。 结果 与对照组细胞相比, Wnt7a腺病毒感染组细胞增殖能力明显增强 ($P<0.05$); 细胞质和细胞核中β-catenin 蛋白表达量均明显增加 ($P<0.05$); CyclinD1的蛋白表达量也明显增加 ($P<0.05$); 诱导后向神经元样细胞分化率明显提高。 结论 Wnt7a蛋白表达上调,可能通过提高β-catenin和CyclinD1表达来促进MSCs细胞增殖, Wnt7a蛋白同时促进MSCs向神经元样细胞的诱导分化。

Abstract: Objective To explore the effect of up-regulation of Wnt7a on mesenchymal stem cells (MSCs) proliferation and differentiation into neuron-like cells. Methods An adenovirus vector expressing Wnt7a protein was constructed, and then MSCs were transfected with the recombinant vector. MSCs proliferation was detected by MTT assay, and the protein expression of cytoplasmic β-catenin, nuclear β-catenin and CyclinD1 was detected by Western blotting. The rates of MSCs differentiating into neuron-like cells were compared after transfection. Results Compared with the control MSCs, the MSCs

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transfected with Wnt7a recombinant adenovirus vector exhibited an increase in cell proliferation, and the protein expression of cytoplasmic β -catenin, nuclear β -catenin and CyclinD1 significantly increased ($P<0.05$). The rate of neuron-like cells in the MSCs transfected with Wnt7a recombinant adenovirus vectors was significantly higher than that in the control group and the non-transfection group ($P<0.05$). Conclusion Overexpression of Wnt7a protein promotes MSCs proliferation through up-regulating β -catenin and CyclinD1 expression, and stimulates MSCs differentiation into neuron-like cells, which provides further foundation for the therapy for spine cord injury.

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