



Title: Notch Signaling Pathway-Mediated-Olfactory Ensheathing Cells Activate Endogenous Neural Stem Cells after Spinal Cord Injury

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Abstract:

Objective: To explore the possible mechanism of Notch signalling pathway-mediated olfactory ensheathing cells to activating endogenous neural stem cells to participate in nerve repair after spinal cord injury. **Method:** 230-250g healthy SD rats were completely assigned in different groups: ①Blank group(N=20)-only opened the lamina without spinal cord injury ②Control group (N=20)-T10 impact model of spinal cord injury, a certain volume of DMEM-F12 was transplanted to the injury location ③Cell transplantation group (N=20)-T10 impact model, the same volume of OECs suspension were transplanted. **Observation method:** ①The proportion of NF200, GFAP and MBP positive cells in the area of injured spinal cord was determined by immunohistochemistry and flow cytometry to assess the differentiation direction. ②The proliferation of ENSCs was measured by BrdU method. ③Western blot and RT-PCR were used to observe the changes of RBP-J, Hes-1, Hes-5 and Mash-1 levels in spinal cord after 1, 3, 5 and 7 days of transplantation.④7 d after the operation, the nerve function score (BBB score) in each group was assessed.

Results: ①Transplantation of OEC significantly promoted the proliferation of ENSCs and it could affect the direction of differentiation and increase the proportion of NF200 positive cells; ②Transplantation of OEC can inhibit the expression of proteins related to Notch signaling pathway ③BBB score of the rats in the cell transplantation group and the control group were significant lower than in the blank group, besides, the cell transplantation group scored highly than that of the control group ($P < 0.05$).

Conclusion: Olfactory ensheathing cells can activate the proliferation and differentiation of ENSCs, which may also be related to the inhibition of Notch signaling pathway.