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Survey of role SDF- 1 / CXCR4 pathway on cutaneous wound healing of rat by hair follicle stem cells

Maliheh Nobakht
Iran University of Medical Science, Iran

Introduction: The main aim of medicine is Wound healing in a shorter time and with fewer side effects. Cell therapy, especially treatment with stem cells has become as a possible solution for wound healing. In this study we evaluate the effect of hair follicle stem cells transplantation and SDF-1/CXCR4 axis in cutaneous wound healing in Rats.

Materials and Methods: Animals (male Wistar rats) were divided into five groups: 1) Control (non-treated), 2) Vehicle (PBS), 3) AMD (treated with AMD), 4) HFSCs treated with AMD) , and 5) HFSCs (treated with HFSCs). (AMD is inhibitor of SDF-1/CXCR4 axis). The Bulge region of rat whiskers was isolated and cultured in DMEM/F12. Then transplanted to wound site. At the end of the treatment period, histological assessments (H&E, Masson's trichrome staining), and molecular assays (ELISA, q- PCR) were performed.

Results: The diameter of epidermis, Amount of collagen, wound healing percent as well as expression of SDF-1, CXCR4 and VEGFR2 in HFSCs groups were significant compared with control group ($P<0.05$). In AMD group, these parameters were significantly low compared with control group ($P<0.05$).

Conclusion: Transplantation of hair follicle stem cells had potential capability for cutaneous wound healing in Rats. However with increasing the SDF-1 expression level in in the injured area, HFSCs can recruit other stem cells and contribute to wound repair with SDF-1/CXCR4 axis.

Biography

Maliheh Nobakht is a full Professor of Medical Histology and Embryology in Iran University of Medical Sciences. She is a board certified Histologist and Embryologist and is engaged in education and is a basic Science Scientist known an Investigator at Iran University. She has expertise in wound healing and stem cell biology, scaffold and Neuroscience. She graduated from Tehran University in 1985, with a Bachelor of Science degree in Biology. Then, she received Master of Science degree on Histology and Embryology in 1987. She received her PhD degree from Tarbiat Modarres University on Histology in 1992. Subsequently, in 1994, she completed her Post-doctoral training in Molecular Biology and Electron Microscopy under supervision of Professor Leblond and Dr. Lee at McGill University and Shriner's Hospital in Montreal, Quebec, Canada. She became a full Professor in Histology Medicine in 2011 and at the same time, she was appointed to be the Co-director of the vice of education.

nobakht@yahoo.com

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