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## **Investigation of the effect of Fibronectin on the viability and adhesion of mouse fibroblast cells on the rat decellularized sciatic nerve scaffold in-vitro**

**Submission Author:** Hananeh Ahmadnia

Hananeh Ahmadnia<sup>1</sup>, Morteza Behnam-Rasouli<sup>2</sup>, Muthana Sarem Hamzah Alftle<sup>3</sup>, Mona Taghizade Salari<sup>4</sup>

1. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
2. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
3. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
4. Department of Biology, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

**Background and Aim :** Traumatic injury often causes peripheral nerve lesions. These lesions can lead to the loss of sensation and motor function and decrease the quality of life. After a serious injury that destroys part of the nerve tissue, the recovery process needs proper treatment. Therefore, researchers in the field of engineering are trying to replace the lost nerve tissue using biological scaffolds and stem cells. It seems that the combination of scaffolds obtained from decellularization of peripheral nerves and mouse fibroblast cells is a suitable alternative for nerve xenograft to replace lost peripheral nerves. In the present study, decellularized scaffolds were prepared from the sciatic nerve of male Wistar rats, and the amount of viability and adhesion of mouse fibroblasts on these scaffolds were investigated in the presence of fibronectin.

**Methods :** In this research, samples were taken from the sciatic nerve of rats and, after decellularization by Sandel's method, they were tested. Control group: mouse fibroblast cell + culture medium, experimental groups 1, 2, 3, 4 and 5: mouse fibroblast cell + culture medium + concentrations of 2.5, 5, 10, 20, and 40 ng/ml fibronectin, experimental group 6: mouse fibroblast cell + culture medium + decellularized scaffold of the sciatic nerve of male Wistar rats and experimental groups 7, 8, 9, 10 and 11: mouse fibroblast cell + culture medium + decellularized scaffold of the sciatic nerve of male Wistar rats + concentrations of 2.5, 5, 10, 20, and 40 ng/ml of fibronectin.

**Results :** Addition of fibronectin in concentrations of 2.5, 5, 10, 20, 40 ng/ml and in two time periods of 72 and 144 hours not only did not have a positive effect on the increase in viability of fibroblasts but also led to a significant decrease in the amount of their viability in some groups



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( $p < 0.001$ ). On the other hand, fibronectin did not have a positive effect on cell adhesion to the decellularized scaffold of the sciatic nerve of male Wistar rats.

**Conclusion :** The findings of this research showed that the addition of fibronectin to the culture medium of mouse fibroblast cells cannot increase the viability of the cells, and the addition of decellularized scaffold of the sciatic nerve of male Wistar rats into the culture medium of mouse fibroblast cells also does not affect the amount of viability and adhesion of cells. The possibility, however weak, that interspecies differences may play a role in this should not be overlooked.

**Keywords :** Sciatic Nerve; Decellularized Scaffold; Fibroblast; Fibronectin; Viability; Adhesion