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Conjugated gel for tissue growth and repair (GRG)

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Abstract

The present technology offers opportunities for the development of a novel biocompatible gel for recovery of peripheral nerve with massive loss defect. The Guided Regenerative Gel (GRG) composition was invented by a team of Israeli researchers, including Dr Shimon Rochkind, Director of the Division of Peripheral Nerve Reconstruction from the Tel Aviv Sourasky Medical Center and Prof Zvi Nevo from the Department of Human Molecular Genetics and Biochemistry, Sackler Faculty of Medicine at the Tel Aviv University. The proposed technology is a biocompatible and biodegradable gel enhancing axonal growth and nerve regeneration. It is composed of a complex of substances comprising transparent, highly viscous gel that is almost impermeable to liquids and gasses, flexible, elastic, malleable and adaptable to various shapes and formats. The gel resembles the extracellular matrix (ECM) and was found to support three dimensional growth and differentiation of various cell types including embryonic and adult stem cells in culture, neuronal precursor cells and neuronal accompanying cells. Pre-clinical proof of concept in peripheral nerve damage rat model, conducted under supervision by Teva Pharmaceutical Industries, showed that the gel enhanced nerve regeneration when placed in nerve conduits enabling massive nerve loss recovery previously unbridgeable. Potential applications of this technology are: Tissue reconstruction and cell therapy; Regeneration of massive regional losses in tissues and organs; Nerve healing, wound healing, preservation of human and animal tissues. The GRG technology is a promising platform for stem cells therapy, spinal cord injury, stroke and Parkinson's disease.

Biography

Zvi Nevo serves as a Professor Emeritus in the Department of Human Molecular Genetics and Biochemistry at the Sackler School of Medicine, Tel Aviv University. He runs an active laboratory, directing 3 PhD students and 3 students for Master Degree, supported by grants from the Israeli Academy of Science and GIF German Israeli Binational Foundation. His field of expertise is in general developmental, maturation and aging of connective tissues in health and disease, with special emphasis on cartilage and cartilage repair with composite implants. Prof. Nevo serves as a member of the Editorial Board of the American Journal of Cell Transplantation, Cartilage Section. Prof. Nevo sponsored during the years 15 PhD students, 12 students for Master Degree and 25 MD for basic science training projects. He has one hundred scientific articles, ten chapters in books and 23 patents.