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A novel nano scaffold was used in combination with cell therapy to assist in wound

Parand Khadivar

professor of Department of Nanotechnology, Iran

The speech I, Dr Parand Khadivar, am planning to have in the upcoming congress is about my recent research in which a novel nano scaffold was used in combination with cell therapy to assist in wound healing process. The details are summarized below:

Profound wounds might result in massive infections or malfunction of organs. Natural physiological process may not be able to regenerate the skin, flawlessly. Conventional therapies like skin grafting have their own drawbacks and the outcome may not be satisfactory.

Tissue engineering could offer a substitute therapy for wound regeneration. During this study, a pre-synthesized novel nano scaffold made of nano cellulose, collagen type I, and Carboxymethyl diethyl amino ethyl cellulose was used combined with cell therapy to observe their synergic effect on wound healing in rats. The scaffold is completely novel with respect to structure and it shows higher water absorption and cell adhesion tendency compared with cellulose or collagen scaffold, alone. The synthesized scaffold was completely characterized with various chemical, physical, and biological methods. Then, bone marrow derived Mesenchymal stem cells (MSCs) were differentiated to keratinocytes by using EGF, BMP4, and FGF7. The differentiated was confirmed using real-time PCR and immunocytochemistry to screen for cytokeratin 18 and 19. Finally, in an in vivo assay the scaffold alone and in combination with MSCs and differentiated cells were used to observe their effect on wound healing in wistar rats. The results showed the scaffold alone and in combination with cell therapy could assist in wound healing. The most effective treatment was the usage of the scaffold and differentiated cells, simultaneously. The details of this research are published in the form of two papers. One part is already published in journal of material research and technology, Q1, IF 6.27. The second part is under review process and will be available on line soon.

Biography

Parand Khadivar is an associate professor of the Department of Bioprocess and Polymer Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi. She is also a research fellow in the Institute of Bioproduct Development.