
HONEY AND PAPAYA EXTRACT LOADED POLYURETHANE BASED BIO-NANOFIBROUS SCAFFOLD FOR SKIN REGENERATION

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Keywords: Honey, papaya, skin regeneration, electrospinning

Introduction: Skin regeneration is vital for chronic or acute wounds healing. Honey and Carica papaya fruit extract are rich source of various proteins, amino acids, vitamins and essential minerals. These naturally available biomolecules have proven antioxidant, anti-microbial, anti-inflammatory, anti-scarring and healing properties. The advent of electrospinning technique has provided a platform for the synthesis of various advanced scaffolds with natural substances for effective skin regeneration.

Methods: In this research, a novel polyurethane based bio-nanofibrous scaffold loaded with tualang honey (HN) and Carica papaya (PA) extract was fabricated through one-step electrospinning technique.

Results: The developed scaffold membrane had a mean diameter of 190 ± 9.93 nm with pores of size 4-50 μm , which ensures native ECM structure, effective infiltration of nutrients and gas exchange. Moreover, the availability of HN and PA based active biomolecules confirmed by the FTIR and contact angle analysis express the possible local delivery of nutrients required for regeneration. In addition, the ability to delay contact activation of coagulation cascades and decreased hemolysis index of bio-nanofibrous scaffold determined through in vitro hemocompatibility assays confirms its non-toxic nature.

Conclusion: Fabricated PU-HN-PA bio-nanofibrous scaffold is anticipated to support the regeneration of various skin cells without initiating any undesired host reactions.