

Nanosilver Loaded Biomaterial for Wound Healing Applications: In Vitro Studies

Authors : Sathish Sundar Dhillip Kumar, Nicolette Houreld, Heidi Abrahamse

Abstract : Silver nanoparticles (AgNPs) are classified as metal-based nanomaterials and have received considerable attention globally for wound healing and tissue engineering applications. Naturally available materials are a significant source of medicinal products to treat numerous diseases; polysaccharides are among them. Polysaccharides are non-toxic, safe, and inexpensive, and it has good biocompatibility and biodegradability. Most polysaccharides are shown to have a positive effect on wound healing processes, including chitosan and gum tragacanth. The present study evaluated the improvement of cellular wound healing by nanosilver-loaded polysaccharide-based biomaterial (CGT-NS) in WS1 cells. The physicochemical properties of prepared CGT-NS were studied using different characterization techniques, and it exhibited better stability and swelling properties in various pH conditions. Surface morphology was studied using scanning electron microscopy, and it revealed the porous morphology of the synthesized CGT-NS. The synthesized biomaterial displayed acceptable antibacterial properties against Gram-positive and Gram-negative bacterial strains, and it may prevent infection. The biocompatibility of the synthesized CGT-NS biomaterial was studied in WS1 cells, where it may lead to promote increased cell adhesion and proliferation properties. Thus, the CGT-NS biomaterial has good potential as a biomaterial in wound healing applications.

Keywords : biomaterial, wound healing, nano, silver nanoparticles

Conference Title : ICNB 2021 : International Conference on Nano and Biomaterials

Conference Location : Vienna, Austria

Conference Dates : December 27-28, 2021