

## **Abstract**

To improve the regeneration of soft tissues, wound coatings were developed, containing nanofibres, different in composition and functional features. The work concentrates on chitosan and composite scaffolds containing chitosan. Porous nanofiber materials based on chitosan are the most promising nanofibers for the regeneration of soft tissues. Chitosan exhibits pH-sensitive behavior due to the large number of amino groups on its chains, which makes chitosan nanofibers promising carriers for the delivery of macromolecules. To increase the efficiency and accelerate the regeneration of soft tissues, nanofibers are functionalized with bioactive substances of various types: antimicrobial, analgesic, growth factors, etc., as well as functional polymers. To stabilize nanofibers and to improve the physical characteristics, treatment using glutaraldehyde, glyoxal, genipin or heat treatment are used.

Chitosan is used to inhibit fibroplasia during wound healing and to promote tissue growth and differentiation in tissue culture. The efficiency of antibacterial activity of chitin-glucan complex with nanofibers for wound healing was shown. Reconstruction of deeper wounds, in which skin and soft tissues are damaged, requires measures for spatial reconstruction and stimulation of regeneration processes in the volume of the defect. In this case, the use of platelets, cellular components and cell secretion products is productive. As a new strategy for nanofiber functionalization, the drug delivery system using nanovesicles (liposomes and niosomes) in combination with nanofibers for regenerative medicine is promising.

**Keywords:** regeneration, functionalization, nanofibres, chitosan, wound healing, nanovesicles, niosomes, regenerative medicine.