EH O 3

Novi materijali za obloge za rane sa elektrohemijski sintetisanim nanočesticama srebra

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Nauka i inženjerstvo biomaterijala u poslednje vreme pokazuju sve veću težnju ka pronalaženju novih materijala za obloge za rane, gde su naročito važna poboljšana svojstva kao što su apsorpciona moć, mehanička svojstva i niska adhezivnost. Umrežene matrice hidrogelova su odlični potencijalni nosači za kontrolisano otpuštanje antibakterijskih agenasa, kao što su nanočestice srebra. Hitozan je posebno interesantna komponenta obloga za rane, zbog svoje prirodne antibakterijske aktivnosti i sposobnosti stabilizacije nanočestica. Cilj ovog rada je priprema novih obloga za rane na bazi polivinil-alkohola i hitozana sa elektrohemijski sintetisanim nanočesticama srebra, u obliku hidrogela. Dobijene su sferne nanočestice srebra, prečnika oko 5-10 nm, što je potvrđeno UV-vidljivom spektroskopijom i transmisionom elektronskom mikroskopijom. Bubrenje i otpuštanje srebra je praćeno u fosfatnom puferu koji imitira fiziološke uslove, dok je antibakterijska aktivnost potvrđena na bakterijskim sojevima *Staphylococcus aureus* i *Escherichia coli*. Dobijeni netoksični hidrogelovi (što je utvrđeno MTT testom) imaju izuzetan potencijal za primene kao obloge za rane nove generacije.

Novel wound dressing materials containing electrochemically synthesized silver nanoparticles

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Recently, the biomaterials science and engineering fields have seen a shift towards novel hydrogel materials, especially for wound dressing applications where improved properties, such as high sorption ability, good mechanical properties and low adhesiveness are of utmost importance. The cross linked hydrogel matrices are excellent potential carriers for controlled release of antibacterial agents, such as silver nanoparticles (AgNPs). Chitosan is an especially attractive option for wound dressing applications, because of its intrinsic antibacterial activity and the ability to stabilize AgNPs. The aim of this work is the production of poly(vinyl alcohol) and chitosan based hydrogel matrices with electrochemically synthesized AgNPs for wound dressing materials applications. The obtained AgNPs were spherical with 5-10 nm diameters, as confirmed by UV-visible spectroscopy and transmission electron microscopy. The swelling and release behaviors of AgNP-embedded hydrogels were evaluated in phosphate buffer, mimicking physiological environment, and the antibacterial activity was confirmed against both *Staphylococcus aureus* and *Escherichia coli*. The obtained non-toxic hydrogel materials (as affirmed by MTT test) have excellent potential to be used as novel antibacterial wound dressings.