



Impregnation of silver nanoparticles into bacterial cellulose: Green synthesis and cytotoxicity

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Abstract: Bacterial cellulose was produced by using Acetobacteroxydans (ATCC 15163). Bacterial cellulose is an interesting material for using as wound dressing since it provide moist environment to a wound resulting in better wound healing but it has not antibacterial activity, which is one of critical skin barrier functions in wound healing. To overcome such deficiency, we developed a novel method to synthesize and impregnate silver nano particles on the surface of bacterial cellulose by using polyvinyl alcohol to form nano porous matrix and reduce the cytotoxicity of the prepared silver nanoparticles compared with those prepared by chemical reduction. Polyvinyl alcohol used to reduce the absorbed silver ion (Ag⁺) on the surface of bacterial cellulose to the metallic silver nanoparticles. (Ag⁰). Silver nanoparticles displayed the optical absorption band around 420 nm. The formation of silver nanoparticles was also evidenced by the X-ray diffraction, TEM, SEM and EDX. Cytotoxicity of the prepared silver nano particles prepared by PVA evaluated Vs. those produced by chemical methods.

Keywords: Acetobacter oxidants; Bacterial cellulose; Silver nanoparticle; cytotoxicity Green synthesis.

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