

Therapeutic potentials of bacterial cellulose composites with polymeric and nanomaterials

Mazhar -ul-Islam, Shaukat Khan, Muhammad Wajid Ullah, , , *

(parkjk@knu.ac.kr*)

Bacterial cellulose (BC), a promising biomaterial has recently received immense interest in various fields of life. The porous scaffold shaped structure of BC offers good chances of composite synthesis with a variety of materials. The main limitations which have currently overshadowed the broad range applicability of BC are its lower biocompatible and bactericidal properties. These shortcomings have been addressed by synthesizing BC composites with bactericidal and biocompatible materials. We have developed BC composites with polymeric and nanomaterials through a variety of composite synthesizing approaches. Impregnation of BC with nanomaterials like ZnO and TiO₂ etc. resulted in highly bactericidal composites. These composites (BC-ZnO and BC-TiO₂) were biocompatible and non toxic to animal skin and bone cells. The biocompatibility of BC was highly enhanced by synthesizing its composites with biocompatible polymers like chitosan, gelatin and polyethylene glycol etc. The BC composites with nanomaterials and polymers can overcome the major limitations of BC and recommend high prospective of medical applicability.