

Antimicrobial and biocompatible bacterial cellulose–zinc oxide nanocomposites films for biomedical applications

Mazhar-ul-Islam, Waleed Ahmad Khattak, 강민경, 박중곤*
경북대학교
(pakrjk@knu.ac.kr*)

Bacterial cellulose being widely utilized in biomedical fields especially in wound dressing and wound healing processes lacks antibacterial properties. BC nanocomposites with bactericidal elements such as zinc oxide nanoparticles (ZnONP) can overcome such limitations and improve its applications. We synthesized BC–ZnONP nanocomposite to impart antibacterial properties in the BC. Antibacterial test conducted against *E. coli* revealed that the BC–ZnONP strongly inhibited the bacterial growth. A visible inhibition zone was observed in BC–ZnONP samples compared to negligible effect of pure BC. The cell growth activities found through the UV absorption also indicated that the BC–ZnONP reduced the cell number in few hours and the effect remains till the observed 12 hours of incubation. On other hand cell growth quickly enhanced when incubated with the pure BC. The BC–ZnONP composites showed successful human epithelial cell attachments with very low toxicity. The BC–ZnONP composites having significant antibacterial and biocompatible properties could be safely utilized in wound dressing materials with the potential of quick and safe wound healing.