

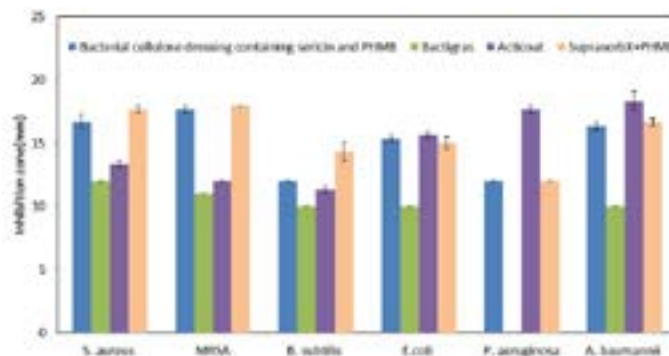
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Properties of bacterial cellulose wound dressing containing sericin and polyhexamethylene biguanide

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The ideal wound dressing should be a moist and oxygen-permeated environment, exudate adsorption, enhanced wound closure, and infection protection. The bacterial cellulose wound dressing containing sericin and polyhexamethylene biguanide (PHMB) is a natural wound dressing that is easily produced from bacterial cellulose (*A. xylinum* strain in coconut water medium), silk sericin (protein from silk cocoon), and antiseptic (PHMB). Components of this dressing contain many benefits closely to the ideal wound dressing properties. For the dressing production, the bacterial cellulose dressing was loaded with 1% w/v silk sericin followed by 0.3% w/v PHMB loading. All processes were carried out in sterile conditions. After preparation, the dressings were sterilized with gamma radiation at 25 kGy. The properties of the dressing were tested in term of sericin and antimicrobial releasing, antimicrobial property, and collagen type I production test comparing with commercial product. The results showed that the sufficient concentration for elimination of all bacteria (*S. aureus*, MRSA, *B. subtilis*, *E. coli*, *Paeruginosa*, *A. baumannii*) of PHMB was released from the dressing within 30 minutes and optimal concentration for collagen type I production of sericin was released within 4 hours. The dressing was superior in terms of antimicrobial activity against all bacterial strains than Bactigras[®]. In comparison with silver-loaded Acticoat[®], the antimicrobial activity of the dressing was better against Gram-positive bacteria often found in chronic wounds (*S. aureus* and MRSA). The antimicrobial difference between the dressing and Suprasorb[®]X + PHMB was only noticed for *B. subtilis*. Moreover, the cells cultured from the released solution of our novel dressing produced significantly higher amount of collagen type 1 than those cultured with the bacterial cellulose wound dressing without silk sericin. Therefore, the bacterial cellulose wound dressing containing sericin and PHMB contains many advantages to be the ideal wound dressing.



Biography

Supamas Napavichayanun is a PhD student at the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand. She earned a BSc from Faculty of Pharmaceutical Sciences, Chulalongkorn University in 2010. Her research experience has ranged from protein including silk proteins and biomaterials. She also did clinical researches in the area of dermatology especially materials for wound healing application.

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