

CHAPTER V

CONCLUSION

Preparation of porous supporting fabric-embedded bacterial cellulose composites for wound dressing application was successfully developed. The strength of BC composites could be improved both in wet and dry state, giving the benefit on reducing the damage from tearing in large scale production.

Hydrophilicity and surface roughness of fabrics were improved by DBD plasma treatment, could lead to the increasing of the number of cell attachment of bacterial cells on the fabrics. The water vapor transmission rates of BC composites were different from that of pure BC, due to BC/Cotton composite consist of cotton fabric could hold water vapor.

From the in cytotoxicity and cytocompatibility experiment, it could be suggested that pure BC and BC/composites have a good potential in wound healing. BC/Cotton is appropriate wound dressing materials.

Surface pretreatment of cotton fabrics and cell immobilization were applied to prepare BC/cotton fabric composites in order to improve the attachment between BC and cotton fabrics. The cotton fabrics were subject to DBD plasma treatment, acetic acid pre-treatment or citric acid pre-treatment prior to cultivation in culture medium. Two cell immobilization techniques, i.e. absorption cell immobilization and crosslink cell immobilization, were investigated and compared with traditional method. Surface pretreatment by citric acid and absorption immobilization were promote best condition. The utilization of cell immobilization techniques could not only reduce the amount of inoculum but also provide the better uniformity of BC deposited on the cotton fabric. Without applying cell immobilization, surface pretreatments of cotton fabrics by citric acid higher yields than that of other pre-treatment because *Acetobacter xylinum* cell like acid condition. For a large scale production of BC/cotton fabric composites, a combination of citric acid pretreatment of cotton fabrics and absorption cell immobilization appeared to be a good solution to obtain the appreciable attachment between cotton fabric and BC.