

Arothron Stellatus Fish Skin Collagen Based Composite Biosheet Incorporated with Mupirocin as a Potential Dermal Substitute for Skin Tissue Regeneration

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Abstract : Collagen is the abundant protein found in the skin of the animal body that has been designed to provide adequate structural support for the adhesion of cells. The dressing material widely used for tissue engineering and biomedical application has to possess good swelling and biological property for the absorption of exudates and cell proliferation. Acid solubilised collagen from the fish skin of the *Arothron stellatus* was extracted. The collagen with hydroxypropyl and carboxy methyl cellulose has the better biological property to enhance the healing efficiency. The inter property of collagen with interesting perspectives in the tissue engineering process leads to the development of biomaterial with natural polymer with biologically derived collagen. Keeping this as an objective, the composite biomaterial was fabricated to improve the wound healing and biological properties. In this study the collagen from *Arothron stellatus* fish skin (ACO) was uniformly blended separately with hydroxypropyl methyl cellulose (HPMC) and carboxyl methyl cellulose (CMC) as biosheets. The casted biosheets were impregnated with mupirocin to get rid of infection from the microbes. Further, the results obtained from differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), tensile studies and biocompatibility of the biosheets were assessed. The swelling, porosity and degradation of the casted biosheets were studied to make the biosheets as a suitable wound dressing material. ACO-HPMC and ACO-CMC biosheets both showed good results, but ACO-HPMC biosheet showed better results than ACO-CMC and hence it can be used as a potential dermal substitute in skin tissue engineering.

Keywords : arothron stellatus, biocompatibility, collagen, tensile strength

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