

Preparation of Low-Molecular-Weight 6-Amino-6-Deoxychitosan (LM6A6DC) for Immobilization of Growth Factor

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Abstract : Epidermal Growth Factor (EGF, Mw=6,045) has been reported to have high efficiency of wound repair and anti-wrinkle effect. However, the half-life of EGF in the body is too short to exert the biological activity effectively when applied in free form. Growth Factors can be stabilized by immobilization with carbohydrates from thermal and proteolytic degradation. Low molecular weight chitosan (LMCS) and its derivate prepared by hydrogen peroxide has high solubility. LM6A6DC was successfully prepared as a reactive carbohydrate for the stabilization of EGF by the reactions of LMCS with alkalization, tosylation, azidation and reduction. The structure of LM6A6DC was confirmed by FT-IR, 1H NMR and elementary analysis. For enhancing the stability of free EGF, EGF was attached with LM6A6DC by using water-soluble carbodiimide. EGF-LM6A6DC conjugates did not show any cytotoxicity on the Normal Human Dermal Fibroblast(NHDF) 3T3 proliferation at least under 100 μ g/ml. In the result, it was considered that LM6A6DC is suitable to immobilize of growth factor.

Keywords : epidermal growth factor (EGF), low-molecular-weight chitosan, immobilization

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