

## Efficient Production of Cell-Adhesive Motif From Human Fibronectin Domains to Design a Bio-Functionalized Scaffold for Tissue Engineering

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**Abstract :** Understanding cell adhesion and interaction with the extracellular matrix is essential for biomedical and biotechnological applications, including the development of biomaterials. In recent years, numerous biomaterials have emerged and were used in the field of tissue engineering. Nevertheless, the lack of interaction of biomaterials with cells still limits their bio-integration. Thus, the design of bioactive biomaterials to improve cell attachment and proliferation is of growing interest. In this study, bio-functionalized material was developed combining a synthetic polymer scaffold surface with selected domains of type III human fibronectin (FNIII-DOM) to promote cell adhesion and proliferation. Bioadhesive ligand includes cell-binding domains of human fibronectin, a major ECM protein that interacts with a variety of integrins cell-surface receptors, and ECM proteins through specific binding domains were engineered. FNIII-DOM was produced in bacterial system *E. coli* in 5L fermentor with a high yield level reaching 20mg/L. Bioactivity of the produced fragment was validated by studying cellular adhesion of human cells. The adsorption and immobilization of FNIII-DOM onto the polymer scaffold were evaluated in order to develop an innovative biomaterial.

**Keywords :** biomaterials, cellular adhesion, fibronectin, tissue engineering

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