Synthesis of self-assembling peptides conjugated with integrin-targeting peptides as biomaterials for cancer cell culture

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Malignancy of tumors is not only dependent on cellular properties, but also dependent on the milieu around tumor tissues, which is called tumor microenvironment. In the tumor microenvironment, one of the key components is extracellular matrices (ECMs). ECM proteins can bind to integrins on cancer cell membranes. The integrin can regulate various activities of cancer cells—adhesion, proliferation, apoptosis, metastasis and etc[1,2]. Many biologically active motif sequences which can bind to integrins have been identified from ECM proteins.
Previously, we developed a short self-assembling peptide $(FFiK)_2$ which could self-assemble into beta-sheet structure and form stable and transparent hydrogel for cell culture scaffolds[3]. However, $(FFiK)_2$ does not have biological activities to regulate cancer cell functions. The conjugation of integrin-targeting bioactive sequences with $(FFiK)_2$ can regulate cancer cell bioactivities via ECM-integrin interaction.
In this research, $(FFiK)_2$ derivatives conjugated with integrin-targeting peptides were designed and synthesized. Then, cell adhesion and proliferation activities of functionalized $(FFiK)_2$ derivatives were investigated.

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