

**Osteoblast cell behaviors on titanium surface with artificial extracellular matrix mimics based on mussel adhesive protein**

조윤기, 최봉혁, 차형준\*  
포항공과대학교 화학공학과  
(hjcha@postech.ac.kr\*)

Dental implant prosthesis greatly depends on primary stability and biocompatibility through a correct and stable osseointegration between titanium fixture and bone cell for tissue regeneration. The concept of artificial extracellular matrix (ECM) has been the focus of attention with its significant biological activities in tissue engineering. Recently, we reported artificial ECM mimics based on fusion of mussel adhesive protein (MAP) with the bioactive ECM peptides. Adhesive properties of MAP enabled efficient immobilization of ECM peptides without any protein and/or surface modifications, which significantly enhanced cellular behaviors on each ECM mimic. Diverse biological activities such as spreading, adhesion, proliferation, and differentiation on artificial ECM mimic-coated titanium surfaces were investigated for several osteoblast cell lines. We found that artificial ECM mimics showed superior abilities (spreading, proliferation, and differentiation) on cells to single component ECM mimic. Thus, artificial ECM based on bioactive peptide-conjugated MAP can provide favorable environment for tissue regeneration in implant prosthesis.