

Functional Recombinant Mussel Adhesive Protein

차형준*, 황동수

포항공과대학교 분자생물공학연구실

화학공학과, 분자생명과학부 및 해양생명환경기술연구소

*Telephone: (054) 279-2280; e-mail: hjcha@postech.ac.kr; internet:
<http://www.postech.ac.kr/ce/magic>.

Mussel adhesive proteins have been studied as a water-resist, environmental-friendly, and medical adhesive. In this research, cDNA of novel mussel adhesive protein, *Mytilus galloprovincialis* foot protein-5 (Mgfp-5), was obtained from foot of mussel and genetically expressed in *Escherichia coli* expression system. cDNA of Mgfp-5 with 357 bp was cloned for the first time in this research and its nucleotide sequence was almost elucidated except a few signal sequence part. Recombinant Mgfp-5 which is fused with (His)₆ affinity ligand was successfully expressed as a soluble form in *E. coli* and was purified with high purity using one step immobilized metal affinity chromatography. Purified recombinant Mgfp-5 was modified by mushroom tyrosinase and its adhesion force was compared with commercial extracted mussel adhesive proteins as a positive control and bovine serum albumin as a negative control by using bio-atomic force microscope and coating on slide glass. Recombinant Mgfp-5 revealed similar adhesion force to that of extracted mussel adhesive proteins in nano-scale measurement. Even though we need further bulk-scale measurement of adhesiveness, we could conclude that recombinant MgFP-5 has a comparable adhesive ability and could be successfully employed as a potential commercial bioadhesive.

참고문헌

1. 차형준, 황동수, 홍합접착단백질 Mgfp-5 및 이의 생산방법, 한국특허, 출원번호 2002-0047815.
2. Waite, J. H. (1998), Adhesion in byssally attached bivalves. *Biology Review* **58**, 209-231.
3. Deming, T. J. (1999), Mussel byssus and biomolecular materials, *Current Opinion in Chemical Biology* **3**, 100-105.