In vivo Tyrosine Modification of Recombinant Mussel Adhesive Protein by Tyrosinase Co-expression in *Escherichia coli*

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Mussel adhesive proteins (MAPs) have been considered as promising marine-derived biomaterials due to their water-resistant adhesion ability in various surfaces. In nature, tyrosine residues of MAP are modified into 3,4-dihydroxyphenyl-L-alanines (L-DOPAs), which enable MAP to crosslink and adsorb quickly in the presence of water. In our previous research, fp-151, a recombinant MAP, was successfully over-expressed in *Escherichia coli*. However, *in vitro* tyrosine modification was required after production for higher adhesion property of recombinant fp-151. In the present study, tyrosinase and fp-151 were co-expressed in *E. coli* to modify tyrosine residues *in vivo*. In this co-expression system, fp-151 was over-expressed and mainly obtained from soluble fraction, whereas fp-151 in sole expression system was over-expressed as a form of inclusion body. In addition, some modified tyrosine residues in the soluble-expressed fp-151 were detected in MALDI-MS/MS analysis. This study showed one possible strategy for *in vivo* tyrosine modification of MAPs. The approach can be applied for economic and efficient modification of tyrosine residues of MAPs.