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Design of an Artificial Oil Body-Cyanogen Bromide Technology Platform for the Expression of Small Bioactive Peptide, Mastoparan B

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Abstract : In this study, we attempted to develop a recombinant oleosin-based fusion expression strategy in Escherichia coli (E. coli) and coupled with the artificial oil bodies (AOB)-cyanogen bromide technology platform to produce bioactive mastoparan B (MP-B). As reported, the oleosin in AOB system plays a carrier (fusion with target protein), since oleosin possess two amphipathic regions (at the N-terminus and C-terminus), which result in the N-terminus and C-terminus of oleosin could be arranged on the surface of AOB. Thus, the target protein fused to the N-terminus or C-terminus of oleosin which also is exposed on the surface of AOB, and this process will greatly facilitate the subsequent separation and purification of target protein from AOB. In addition, oleosin, a unique structural protein of seed oil bodies, has the added advantage of helping the fused MP-B expressed in inclusion bodies, which can protect from proteolytic degradation. In this work, MP-B was fused to the C-terminus of oleosin and then was expressed in E. coli as an insoluble recombinant protein. As a consequence, we successfully developed a reliable recombinant oleosin-based fusion expression strategy in Escherichia coli and coupled with the artificial oil bodies (AOB)-cyanogen bromide technology platform to produce the small peptide, MP-B. Take together, this platform provides an insight into the production of active MP-B, which will facilitate studies and applications of this peptide in the future.

Keywords : artificial oil bodies, Escherichia coli, Oleosin-fusion protein, Mastoparan-B
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