

PRODUCTION OF RHAMNOLIPIDS-PRODUCING ENZYMES OF *PSEUDOMONAS* IN *E. COLI* AND STRUCTURAL CHARACTERIZATION

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Key Words: Biosurfactants; rhamnolipids; RhIA; purification.

Rhamnolipids have a great potential to be utilized in industries due to their surface active properties and non-toxic impact on the environment. Accumulated studies have shown that the major producer of rhamnolipids is *Pseudomonas aeruginosa* (*P. aeruginosa*) which is a pathogenic strain. Despite efforts spent to improve rhamnolipid yield by screening different organisms, optimizing fermentation conditions, and optimizing strains through metabolic engineering, the cost for rhamnolipid production is still very high compared with chemically synthesized surfactants. Therefore, it is necessary to explore an alternative strategy for rhamnolipids production.

Five proteins/enzymes, namely RhIA, RhIB, RhIC, RhIG and RhII, are critical for the rhamnolipids production in *Pseudomonas aeruginosa*. Overexpression of RhIA and RhIB in *E. coli* can result in a strain to produce rhamnolipids. Here we report the high level expression of these proteins in *E. coli*. We show these genes can be expressed in *E. coli* and some of them can be purified in large quantities for structural studies. The purified proteins are confirmed to be folded in solution by using NMR spectroscopy. We also analyzed their structures using homology modeling. These results lay a basis for further structural and functional characterization of these proteins in vitro to favor the rhamnolipids production in vitro.