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TOPIC(s) : Enzyme discovery and engineering

Elucidation and optimisation of the glycosyl-polymerisation activity of the RlpE variovoracin enzyme for synthesis of novel sugar-based biosurfactants

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PURPOSE OF THE ABSTRACT

Surfactants are required in formulations of many products, enabling oil and aqueous mediums to mix and be stable. There has been increased interest in biosurfactants made by microorganisms, as traditional surfactants are derived from petrochemical sources. One such biosurfactant, variovoracin, is produced by the bacteria *V. paradoxus* and is classed as a glycolipopeptide. The structure consists of a hydrophobic lipid oligomer covalently linked to a peptide chain, a carbohydrate moiety, and a serine- leucinol dipeptide link, which possesses excellent surfactant properties. Within the biosynthetic pathway the gene RlpE, coding for a rhamnosyltransferase, is responsible for adding a second rhamnose moiety to the variovoracin structure, however, structures with 3 and 4 additional rhamnose moieties have been detected in trace amounts which improves hydrophilicity. The aim of this project is to optimise reaction conditions and characterise the enzyme. With the end goal being to generate a panel of RlpE mutants that access these longer chain biosurfactants for industrial application.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

Glycosyltransferase | Biosurfactant

BIBLIOGRAPHY

EP. Pat., EP3440179B1, 2020.