Analysis of Genes for Succinoyl Trehalose Lipid Production and Secretion of *Rhodococcus* sp. SD-74

Tomohiro Inaba, Yuta Tokumoto, Yusuke Miyazaki, Naoyuki Inoue, Toshiaki Nakajima, Hiroo Uchiyama and Nobuhiko Nomura
University of Tsukuba, Japan

Biosurfactants (BS) are surface-active compounds produced by a variety of microorganisms. BS has been indicated to have roles in uptake of insoluble organic matters in marine bacteria. Succinoyl trehalose lipids (STLs) are glycolipid biosurfactants produced from *n*-alkanes by *Rhodococcus* sp. bacteria. These compounds show not only unique interfacial properties but also versatile biochemical actions. Whereas the chemical structure of these STLs has been determined (Tokumoto *et al.*, J. Oleo Sci., 2009), the genetic basis for their biosynthesis and regulation is largely unknown. In this study, we identified for the first time three types of gene involving in STLs biosynthesis, and investigated the mechanism involved in transport of STLs. The genes termed *orf1*, *orf8* and *alkB* were showed to be essential in STLs production. Furthermore, our study showed that the secretion of STLs necessitates a transmembrane protein gene termed *orf3*. Our result showed that ORF3 is a transporter specific to STLs secretion and is driven by proton motive force. Our study unveiled the genetic mechanism involeved in production and secretion of STL, which will contributes to better understanding of the BS production in marine bacteria.