

〈シンポジウム II〉

『環境を考えた化粧品テクノロジー』

バイオプロセスを活用した機能性素材の製造技術

—バイオサーファクタントの生産と用途開拓—

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Fermentative Production of Bio-Based Materials and Their Functional Developments

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Abstract

Biosurfactants (BS) are functional amphiphilic compounds produced by a variety of microorganisms. They show unique properties (e.g. mild production conditions, lower toxicity, and environmental compatibility) compared to chemically synthesized counterparts. The numerous advantages of BS have prompted applications not only in the food, cosmetic, and pharmaceutical industries but in energy and environmental technologies as well. Mannosyl erythritol lipids (MELs) are one of the most promising BS known, and are produced at yields of over 100 g/l from vegetable oils by yeast strains belonging to the genus *Pseudozyma*. MELs exhibit excellent surface-active and self-assembling properties leading to the formation of different lyotropic liquid crystals such as sponge (L_3), bicontinuous cubic (V_2) and lamella (L_α) phases. Especially, MEL-B that is produced by *P. tsukubaensis* shows efficiently forms L_α phases at a broad range of concentrations and temperatures. Recently, MELs was found to display high moisturizing property toward damaged skin cells comparable to that of natural ceramide, and are now commercially used as a new skin care ingredient in cosmetics. The yeast BS should thus open a new avenue for the application of bio-based materials in advanced technology fields.

Key words: bio-based material, yeast, biosurfactant, moisturizer, self-assembling.