Expansion of biosurfactant MEL

News release

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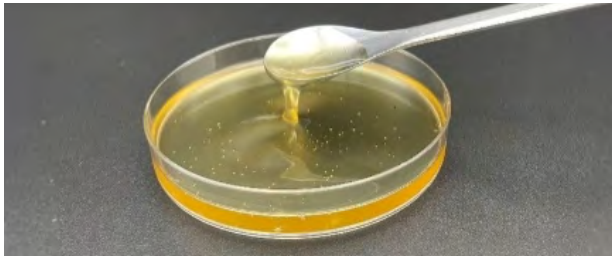
Environmental issues to address

In response to environmental challenges such as reducing greenhouse gas (GHG) emissions and the use of fossil resource materials, there is a growing need for new, sustainable manufacturing technologies that differ from traditional chemical production processes based on fossil resources. These technologies involve using genetic modification techniques to produce useful substances from cells of microorganisms, plants, and animals. One such example is Toyobo's mannosylerythritol lipids (MEL), which has been adopted under the Bio Manufacturing Revolution Promotion Project by the New Energy and Industrial Technology Development Organization (NEDO).

Development background of MEL and the impact of NEDO adoption

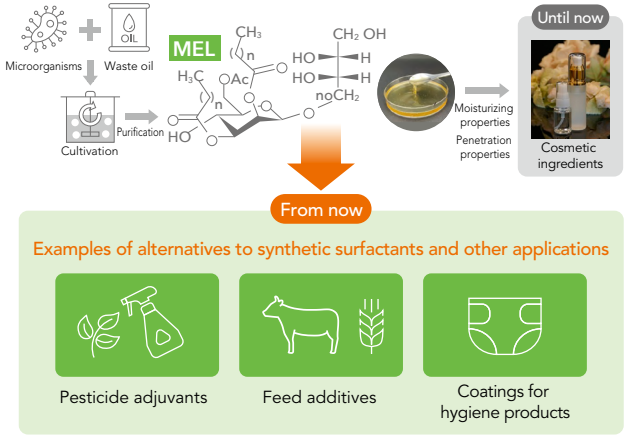
Development of MEL began around 20 years ago as a raw material for functional cosmetics using biotechnology. Toyobo discovered that ceramides, lipid components that protect skin moisture, have a structure similar to MEL, a naturally derived component produced by microorganisms (yeast). This similarity has highlighted MEL as a promising sustainable surfactant in the cosmetics industry. The adoption of MEL in the fiscal 2024 NEDO project has accelerated research, expanding its potential applications beyond cosmetic ingredients. This development significantly enhances the possibility of contributing to a decarbonized and circular society.



Biosurfactant, mannosylerythritol lipids (MEL)

Features and strengths of MEL

MEL is commercialized as a moisturizing ingredient in cosmetics, but it also possesses excellent surfactant properties even at low concentrations. It is naturally derived, ensuring advanced safety and biodegradability. Moving forward, we aim to develop a revolutionary production system to reduce production costs. By around 2025, we plan to introduce MEL in high-value applications such as pesticide adjuvants that reduce chemical pesticide usage, feed additives that lower methane emissions from cattle, and coatings for hygiene products, thereby contributing to its broader societal implementation.



Social impact and enhancement of corporate value

Surfactants are used in a variety of products, including pharmaceuticals and processed foods such as fish paste, emulsifiers, and surface treatment agents. While many commercially available surfactants are derived from fossil fuels such as petroleum, providing naturally derived surfactants through biotechnology is expected to contribute to the realization of a decarbonized and circular society. Toyobo holds several patents for MEL, and we anticipate that improvements in productivity will significantly expand our business scope into areas such as agriculture, pharmaceuticals, and film processing.

Enhancing Toyobo's corporate value

Toyobo has recently initiated an eight-year plan for MEL, which has been in research and development for about 20 years. Beginning in February 2024, this new development plan will focus on establishing a high-precision continuous cultivation system. While we are currently trailing behind Europe and the United States globally in this field, we view it as a vital endeavor for generating value for Toyobo and Japan's future.