TOYOBO
Beyond Horizons

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Toyobo signs joint development agreement with DMC Biotechnologies Inc. to develop and commercialize sustainable, key compounds for plastic raw materials

Toyobo Co., Ltd. recently signed a joint research and development contract related to biomanufacturing with DMC Biotechnologies Inc., a U.S. biotech venture company based in Colorado. The two companies aim to develop and commercialize sustainable key chemical compounds to be used as raw materials for general-purpose plastics by applying synthetic biology technologies to microorganisms.

Biomanufacturing is an innovative technology that utilizes genetic techniques to produce valuable target substances from microorganisms, as well as animal and plant cells. Unlike conventional chemical manufacturing processes that rely on fossil sources, biomanufacturing does not require multiple-stage chemical reactions, and allows production under more natural and mild conditions. These characteristics contribute to reducing greenhouse gas emissions and the use of fossil resources as raw materials, generating high expectations for biomanufacturing as a sustainable manufacturing method to facilitate the green transformation.

Biodegradable plastics, biofuels and biosurfactants are among the useful substances produced in biomanufacturing. In particular, essential chemical compounds that function as intermediates or raw materials for plastics and other substances, can be utilized in a diverse range of applications, raising hopes of achieving significant reductions in greenhouse gas emissions.

However, biomanufacturing faces the challenge of higher production costs compared to conventional chemical processes. This necessitates the development of technologies to enable more efficient production.

Given this situation, Toyobo has signed the development agreement with DMC, to which it directly provided investment funding in March 2022, with the aim of developing and commercializing sustainable and cost efficient chemical compounds. The two parties plan to optimize the growth and production stages of microorganisms by using DMC's "Dynamic Metabolic Control™[*1]", a genetic technology involving the control of metabolic pathways and a precision fermentation process enabling the delivery of scalable bioprocesses. By leveraging this technology, the companies aim to enhance the production efficiency of the target substances or essential chemical compounds.

Toyobo plans to utilize optimized microorganisms designed by DMC as well as its unique fermentation and production optimization technologies with the goal of mass-producing essential compounds for sale. Looking ahead, Toyobo will also explore using the essential compounds, derived from eco-friendly biomass, as raw materials for its films and other plastic products.

In its long-term vision, "Sustainable Vision 2030[*2]", Toyobo has set a goal of contributing to the realization of a "decarbonized and circular society." In the field of biomanufacturing, which aims to reduce the use of fossil resources, Toyobo is developing the production process for mannosyl erythritol lipid, a surfactant naturally derived with the use of microorganisms, and is expanding its use to new applications [*3]. This biomanufacturing project is backed by the New Energy and Industrial Technology Development Organization (NEDO).

Toyobo is committed to advancing a sustainable society by accelerating the commercialization of essential compounds inpartnership with DMC and facilitating their use of these materials to reduce environmental impacts in manufacturing.

■ About DMC Biotechnologies Inc.

The company is a U.S. biotechnology company that manufactures products by using precision fermentation and synthetic biology applied to microorganisms. By employing its proprietary technology to standardize, stabilize and enhance the efficiency of the fermentation process, the company optimizes the process of producing biochemical products.

Since joining DMC's fund procurement drive in March 2022[*4] , Toyobo has collaborated with the startup on projects aimed at promoting biomanufacturing.

DMC website: https://dmcbio.com/

*1 Dynamic Metabolic Control™ is the trademark of DMC Biotechnologies Inc.
*2 Toyobo's Sustainable Vision 2030 :https://www.toyobo-global.com/sustainability/group_sustainability/vision/
*3 Toyobo press release dated February 6, 2024 (Japanese only): https://www.toyobo.co.jp/news/2024/release_1578.html
*4 Toyobo press release dated March 8, 2022: https://www.toyobo-global.com/news/2022/release_465.html

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