Research to explore, analyze interactions between organisms

Development of Microbe-Plant Interaction Technology for GX

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Summary :

The objective of the project is to create next-generation technologies based on a new perspective of "Interaction Technology". We plan to capture and understand interactions between microorganisms and between microorganisms and plants. By utilizing and improving these interactions, we will achieve GX goals such as improved material production and reduced CO_2 emissions. Microorganisms and plants exist like a single organism through interactions rather than living in isolation, and these interactions enable material production and growth. While breeding of individual microorganisms and plants has been conducted in the past, this research aims to analyze and improve the entire interaction mechanisms to improve material production, CO_2 emission reduction, and promotion of plant growth, which cannot be achieved by breeding individual

microorganisms and plants. Using multi-omics and bioinformatic technologies, we will develop methods to comprehensively analyze the genes, metabolic pathways, and chemical substances involved in the interactions In addition, microorganisms involved in the interactions will be identified using microbial microdroplet technology. Cultivation techniques for difficult-to-culture microorganisms, genes and chemical substances will be analyzed, and the transport pathways of interacting substances will be elucidated. This will enable " Interaction Technology " to improve interactions between organisms by clarifying the overall picture of interactions and their effects on the phenotypes of organisms, and by predicting, searching for, and analyzing interaction regulators and microorganisms.



