

세미나 초록

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발표 주제	Macroalgae Biorefinery: New Opportunity of Metabolic Engineering
발표 내용	<p>Bio-based chemicals industry has been attracting great attention as the most environmentally benign chemical production route. However, feedstock cost and availability are known to be an important part to develop an economically feasible bioprocess. Expansion of supply of feedstocks obtained from agriculture including starch and lignocellulosic biomass might be limited by the availability of land area. On the other hand, huge area is currently available for aquaculture of macroalgae to provide the feedstock of bio-based chemical production. Therefore, macroalgae biorefinery based on marine biomass should have the huge opportunity in metabolic engineering specialized for utilizing macroalgal biomass. Although brown macroalgae has an enormous potential as an alternative feedstock, its utilization by conventional microbial platforms has been limited due to the inability to metabolize one of the major carbohydrate, alginate. Here, we isolated <i>Vibriosp. dhg</i>, a novel, fast-growing bacterium that can efficiently assimilate alginate. Based on systematic characterization of the genomic information of <i>Vibriosp. dhg</i>, we were able to develop a genetic toolbox for its engineering, and successfully demonstrated its ability to rapidly produce a broad spectrum of chemicals (ethanol, 2, 3-butanediol, and lycopene) from brown macroalgae sugar mixtures with a high productivity and yield. Collectively, the <i>Vibriosp. dhg</i> strain is a powerful platform for the conversion of brown macroalgae sugars whose usage will dramatically accelerate the production of value-added biochemicals.</p>