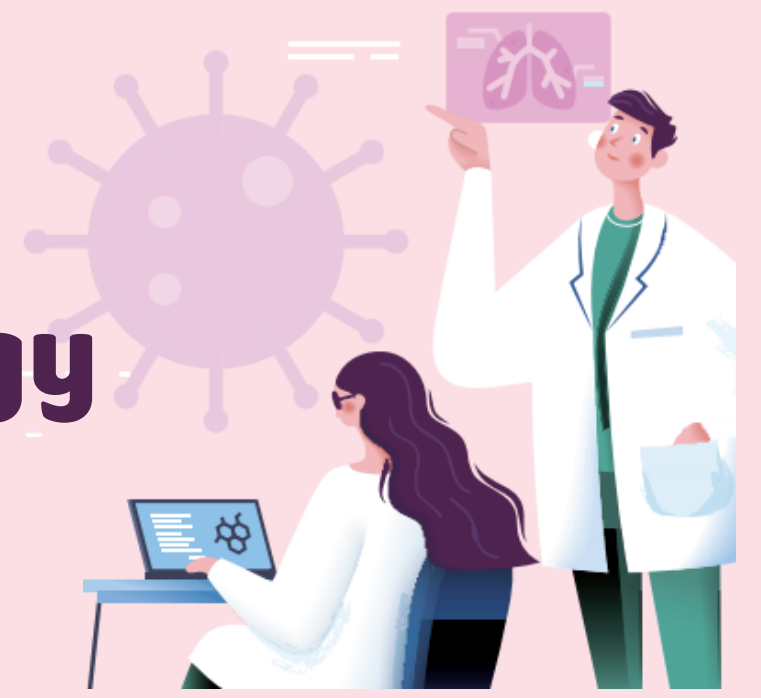


Synthetic Biology for Next-Generation Microbial Biotechnology



• Time: 2026.06.02. (Tue) 16:00-17:15

• Place: 104-E206 Classroom

Speaker

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Abstract

Advances in synthetic biology enabled the creation of the first artificial bacterial genome in 2010. Since then, genome synthesis technologies have expanded beyond bacteria and are now being actively explored in organisms such as yeast and other microbes. More recently, genome design approaches assisted by large language models have begun to emerge as a new paradigm in the field. Although significant challenges still remain before fully optimized genomes can be rationally designed and constructed, microbial biotechnology is entering a new technological era.

In this presentation, we will discuss our attempts at T4SS genome design and engineering. We will also introduce synthetic biology-based genome engineering technologies supported by the standardization and automation platform, KRIBB Biofoundry-beta. In addition, current applications of these technologies to *Streptomyces* strains producing secondary metabolites will be presented. Finally, the potential of synthetic biology equipped with the Design-Build-Test-Learn (DBTL) framework to overcome current technical limitations in microbial metabolic engineering will be explored.