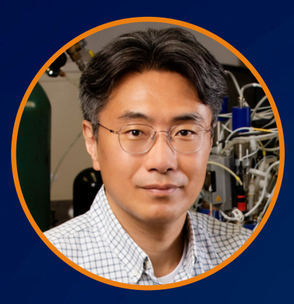
SINERGY AND CREATE WORKSHOP 2022

Precision Fermentation and Sustainability: Urban Solutions for Singapore

Sustainable, safe, and nutritious food supply is indispensable for human well-being. This workshop seeks views from the community to identify technological solutions for the cost-effective and sustainable production of safe, nutritious, and delicious foods through precision fermentation and food/bioprocessing backed by synthetic biology and systems-level optimization. Currently, alternative meats and animal products are produced from three protein sources: cultivated meats, plant-based products, and mycoproteins. The vision of the workshop seeks to identify the formulation of various food ingredients manufactured by precision fermentation, that is necessary to improve the sensory and functional properties of alternative meats and animal products. This workshop further seeks inclusive efforts to support Singapore's initiatives for food security and sustainability while advancing the fundamental sciences to implement sustainable food systems for urban populations.

<u>Promises and Challenges of Precision Fermentation</u>

Precision fermentation backed by metabolic engineering, synthetic biology, and bioprocess optimization can enable the production of food ingredients and fermented foods. Many startup companies aiming to produce biomolecules capable of providing nutrients, tastes, and textures of foods are commercializing precision fermentation. Nonetheless, more scientific and technological advances will be necessary to improve the safety, economics, sustainability, and consumer reception of precision fermentation. Specifically, food grade microbial host strains, novel food processing technologies, and resource recycling systems will need to be developed for successful implementation of precision fermentation.



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