CHEMICAL & BIOMEDICAL ENGINEERING GRAD STUDENT SEMINAR

Engineering Non-model Microorganisms for Chemicals Production: Challenges and Opportunities

Friday, December 4
11:00 AM
COE B221



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PROFESSOR
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ABSTRACT: Future biomanufacturing of industrial products will use novel synthetic biology tools and advanced bioprocesses to convert abundant biomass and waste resources into value-added products with comparable or superior properties to replace current petroleum-based products, thus enabling circular bioeconomy with affordable energy, economic growth, and innovation in renewable energy and chemicals production. However, biomanufacturing faces many challenges in its development that requires fundamental research in synthetic biology and novel bioprocesses involving multidisciplinary teams and academic-industry partnerships. My research group has developed several bioprocesses for production of bio-based chemicals and biopolymers, including butanol, short-chain fatty acids, and dicarboxylic acids (e.g., malic acid). These chemicals have wide applications in food, pharmaceutical, and chemical industries.

In my talk, I'll discuss some of the major challenges and opportunities in industrial production of biobased chemicals from biomass and carbon dioxide. Novel technologies in engineering microbial cells for the biosynthesis of butanol and polymalic acid (PMA) and novel bioreactors and bioprocesses with in-situ product recovery for economical production of these chemicals at an industrial scale will be highlighted.

This event is sponsored by FAMU-FSU College of Engineering and Department of Chemical & Biomedical Engineering

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