

Ph.D. POSITIONS AVAILABLE

Build programmable microbes for food, health, and sustainability

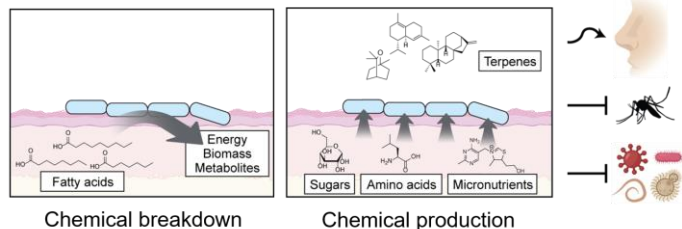
Our goal is to engineer microorganisms and synthetic biological systems with new chemical and functional capabilities. We combine synthetic biology, metabolic engineering, and bioprocess engineering to create programmable microbial platforms that operate at the microbe-environment, host-microbe, and microbe-microbe interfaces. Our work builds on prior research in developing a hybrid chemical-biological process that converts waste polyethylene into nutritionally valuable microbial biomass and engineering the human skin bacteria to degrade host-derived fatty acids and biosynthesize volatile terpenes.

RESEARCH DIRECTIONS



MICROBIAL FOOD & SUSTAINABLE BIOMANUFACTURING

- Engineer edible and food-compatible microorganisms as both production chassis and final food products
- Convert unconventional or waste-derived feedstocks into protein, vitamins, and other valuable nutrients
- Develop minimal and chimeric synthetic-cell platforms with programmable substrate use, metabolism, and nutritional output
- Integrate strain engineering with bioprocess design, sustainability analysis, and scale-up



COMMENSAL & MICROBIOME ENGINEERING

- Use skin-associated microbes for biosynthesis, metabolite degradation, sensing, and localized bioactivity
- Explore natural products and engineered interactions that control microbial communities
- Design multi-species systems that reveal and exploit host-microbe and microbe-microbe interactions

WHO WE'RE LOOKING FOR

- Curious, collaborative students excited by interdisciplinary research
- Backgrounds in chemical engineering, bioengineering, biotechnology, biology, chemistry, or related fields
- Eligible to start in Spring 2027/Fall 2027
- Prior research experience is valued, but enthusiasm, independence, and willingness to learn are essential

JOIN A NEW LAB — HELP SHAPE IT

- Work closely with the PI to establish a new research program
- Faculty profile: [TTU Faculty Profile](#)
- Google scholar: [Publication List](#)
- LinkedIn: <https://www.linkedin.com/in/danielyyoo/>
- Website: <https://danielyoophd.com/>
- Email: daniel.yoo@ttu.edu

INTERESTED IN JOINING?

Please contact Dr. Daniel Yoo with your CV and cover letter with a brief description of your research interests