



# Chemical Engineering

## Spring 2024 Seminar Series

### Recovering Waste Through Biomanufacturing for Sustainable Chemical Synthesis



**Bradley W. Biggs, Ph.D.**

**Lawrence Berkeley National Lab**

**February 22, 2024**

**66-110**

**4:15-5:00pm**

**4:00pm Reception**

Converging motivations are creating a drive for new technologies and approaches for upgrading renewable and waste materials to value-added chemicals. These range from reducing environmental impact by closing the carbon cycle to improving supply chain security by onboarding alternative feedstocks to utilizing localized resources as a matter of efficiency and rural economic development. Biochemical approaches offer tremendous potential to advance such sustainability goals. Not only do biosynthetic processes offer the ability to operate near ambient temperature and pressure, but they reduce the need for harsh acids, bases, and heavy metals. Moreover, by leveraging the power of enzymatic chemistry, these processes remain able to synthesize complex, functionalized products. Even more, biological systems are well suited to handle heterogeneous feedstocks, owing to the flexibility of microbial metabolism. Here, I will walk through key points in my industrial and academic experience with respect to developing biological systems for value-added chemical synthesis. In addition, I will briefly highlight what I believe are future opportunities for the field, specifically with respect to utilizing synthetic microbial communities to onboard hereto underutilized heterogeneous waste streams.

<http://cheme.mit.edu/seminar-series/>