

“Repurposing the Translation Apparatus for Synthetic Biology”

171 Durham, April 20th, 2017 at 11:00 a.m.



Dr. Michael Jewett
Associate
Professor,
Northwestern
University

Imagine a world in which we could adapt biology to manufacture any therapeutic, material, or chemical from renewable resources, both quickly and on demand. Industrial biotechnology is one of the most attractive approaches for addressing this need, particularly when large-scale chemical synthesis is untenable. Unfortunately, current approaches to engineering organisms remain costly and slow. This is because cells themselves impose limitations on biobased product synthesis. It is difficult to balance intracellular fluxes to optimally satisfy a very active synthetic pathway while the machinery of the cell is functioning to maintain reproductive viability. Further, chemical reactions take place behind a selective barrier, the cell wall, which limits sample acquisition, monitoring, and direct control. In addition, cells are adapted to a relatively simple chemical operating system (*i.e.*, a few common sugars, 20 amino acids), which presents researchers a limited set of accessible molecules with which to work. To overcome these limitations, my group is developing new strategies that widen the aperture of the traditional model of biotechnology. In one direction, we seek to create a new paradigm for engineering biocatalytic systems using cell-free biology, which provides an unprecedented freedom of design to modify and control biological systems. We are also catalyzing new directions to repurpose the translation apparatus for synthetic biology. Our new paradigms for biochemical engineering are enabling a deeper understanding of why nature’s designs work the way they do, as well as opening the way to novel therapeutics, sustainable chemicals, and new materials that have been impractical, if not impossible, to produce by other means.

Refreshments
will be provided
in 2061 Sweeney
Hall at 10:30 a.m.

If you plan to attend,
email a question to
bellinda@iastate.edu
and the speaker will
answer your question!



Chemical and
Biological
Engineering

2016-2017

Graduate
Seminar
Series

[*www.cbe.iastate.edu/events*](http://www.cbe.iastate.edu/events)
IOWA STATE UNIVERSITY
Department of Chemical and Biological Engineering