Compartmentalization strategies for engineered metabolic pathways

John E. Dueber, University of California, Berkeley, USA

My lab is endeavoring to construct the upstream part of the benzylisoquinoline alkaloid (BIA) pathway in *Saccharomyces cerevisiae*. This pathway suffers from a step that condenses two substrates, one of which is highly reactive and likely a substrate for one or more endogenous yeast enzymes and the other secreted. As a potential solution to this problem, we are repurposing an organelle for compartmentalizing the engineered BIA pathway to insulate it from the rest of the cellular milieu via a lipid bilayer membrane. In this manner, we aim to concentrate the reactive intermediates to productively condense in the organelle before undesired cross-reactions can occur in the cytosol. In this talk, I will discuss efforts in both areas towards our ultimate goal of high flux through the top part of the BIA pathway in *S. cerevisiae*.