



Assoc. Prof. Mary Dunlop

Title:

Using light to control single-cell gene expression in bacteria

Abstract:

This talk will discuss progress towards controlling gene expression in single bacterial cells using light. A key advantage of optogenetic approaches is that light can be spatially localized to target individual cells. We are working on methods for achieving this to enable real time feedback or event-based updates to experiments that target individual bacteria. In addition to describing progress towards these goals, I will discuss enabling tools we have developed including a light-inducible Cre recombinase and image processing software for rapidly identifying cells within an image.

Bio:

Mary Dunlop is an Associate Professor of Biomedical Engineering at Boston University with appointments in Bioinformatics and in the Molecular Biology, Cell Biology & Biochemistry program. She graduated from Princeton University with a B.S.E. in Mechanical and Aerospace Engineering and a minor in Computer Science. She then received her Ph.D. from the California Institute of Technology and was a postdoctoral scholar at the Joint BioEnergy Institute (JBEI) / Lawrence Berkeley Lab. Her lab engineers novel synthetic feedback control systems and also studies naturally occurring examples of feedback in gene regulation. In recognition of her outstanding research and service contributions, she has received many honors including a Department of Energy Early Career Award, a National Science Foundation CAREER Award, and the ACS Synthetic Biology Young Investigator Award. She is also the recipient of several teaching awards, including Boston University's Biomedical Engineering Professor of the Year Award (2019) and the College of Engineering Teaching Excellence Award (2020).