

JBIMS Workshop: Microbiome Theory

March 19th, 2019

Workshop Objectives

The goals of the Theory Workshop are to foster collaboration and synergistic research efforts that leverage the breadth of expertise across Berkeley and Berkeley Lab. We hope to highlight prime areas for disruptive thinking and discuss opportunities for true collaboration between empiricists, data scientists, modelers, and theoreticians. The workshop will provide a brief overview of existing progress and hurdles in microbiome theory, but will focus primarily on discussion aimed at identifying opportunities for local development of microbiome theory and determining how best to position ourselves as leaders in this space.

Agenda

12:00-12:15 Lunch will be served

12:15 Introduction to JBIMS (Britt Koskella)

Topic 1: The potential for application of existing approaches and theories

- **12:20** – Brent Mishler, UCB
- **12:30** – Mary Power, UCB
- **12:40** – Senay Yitbarek, UCB

12:50 Discussion (30 minutes)

Discussion questions (tentative):

- *What are the existing strengths relating to microbiome theory at UCB and LBNL?*
- *What are the highest impact scientific questions we could address with development of novel theory, and what types of approaches would be needed to achieve this?*

1:20 Break (10 minutes)

1:30 Topic 2: Approaches for development of microbiome theory

- **1:30** – Hans Carlson, UCB
- **1:40** – William Riley, LBNL
- **1:50** – Eoin Brodie, LBNL
- **2:00** – Britt Koskella, UCB

2:10 Discussion (30 minutes)

Discussion questions (tentative):

- *Do we need specific theory relating to the microbiome, or does the existing theory apply?*
- *What would the tangible outcomes from such microbiome-specific theory be?*
- *How does what we measure in microbiome sciences relate to how existing theory was developed, and if we developed theory with existing technology and microbiome data in mind, would it look any different?*
- *What opportunities are there for training and curriculum development in microbiome theory?*

2:40 Break (10 minutes)

2:50 Group discussion: what do we hope to get out of this initiative?

Feedback of key points from individual table discussions (20 minutes)

Whole group discussion questions/synthesis

- *What type of funding would be most useful for the rapid development of microbiome theory?*
- *What type of foundations/agencies might be amenable to supporting this component of the initiative?*
- *What would increase the potential success of collaboration between theoreticians and empiricists across Berkeley and Berkeley Lab?*