

The Future of Phage and Synthetic Biology

Location – Room 702, Cabot Center, the Fletcher School, Tufts University

Date – Friday, October 3rd, 2014

Schedule

(8:00 – 8:30 AM)	Set-Up
(8:30 – 9:00 AM)	Arrival
(9:00 – 11:30 AM)	<u>Workshop</u> – <i>Initial Presentations and Discussion</i>
(11:30 – 12:30 PM)	<u>Workshop</u> – <i>Closing Discussion and Document Compilation</i>
(12:45 – 1:30 PM)	Lunch
(1:15 – 1:45 PM)	Select Arrival – <i>Lunch and Informal, Pre-Forum Discussion</i>
(1:45 – 2:00 PM)	Arrival
(2:00 – 4:00 PM)	<u>Presentations & Panel</u>
(4:00 – 5:00 PM)	<u>Public Forum</u> – <i>Informal Discussion</i>

Summary

The conference incorporates two main events. The first is a professional workshop, to be held under Chatham House rules, to discuss and advance a pre-written framework for bacteriophage application and associated safety and regulatory considerations. This will be followed by a public forum to present and discuss the results and implications with a more general audience before shifting to guided and informal discussion.

Public Forum

1. Opening Remarks – *President Anthony Monaco*
2. Biology of Phage – *Tufts Synthetic Biology*
3. Phage History & Current Use – *Anna Kuchment*
4. Current Research: Natural Phage – *Dr. Andrew Camilli*
5. Current Research: Engineered Phage – *Mark Mimee*
6. Distributive Justice – *Christopher Ghadban*

--- *Intermission* ---

7. Panel – *Anna Kuchment, Dr. Robin Pierce, Dr. Andrew Camilli, Mark Mimee*

Dr. Andrew Camilli – Bacteriophage Research

Tufts University, Department of Molecular Biology and Microbiology & Howard Hughes Medical Institute

Dr. Andrew Camilli is a Professor of Molecular Biology and Microbiology at the Tufts Sackler School of Graduate Biomedical Sciences. He studies the pathogenicity and transmission of *Vibrio cholerae* and *Streptococcus pneumoniae* focusing on genetic and molecular biological approaches. He is also involved with vaccine development for these pathogens and has begun to explore the role of bacteriophage in attenuating cholera outbreaks and the potential of bacteriophages for therapy or prophylaxis.



Mark Mimeo – Bacteriophage Research

Massachusetts Institute of Technology, Microbiology PhD Candidate, Lu Lab, MIT Synthetic Biology Center

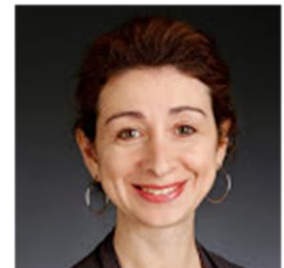
Mark Mimeo is a PhD candidate in the lab of Professor Timothy Lu in the Microbiology Program at the Massachusetts Institute of Technology. He graduated with a B.S. in Microbiology and Immunology from McGill University in 2009 where he pursued undergraduate research on characterizing virulence factors in EHEC and EPEC. Mr. Mimeo's research focuses on using synthetic biology to design novel antimicrobial agents, particularly in engineering designer probiotics and bacteriophages.



Anna Kuchment – Bioethics, Public Perception

Dallas Morning News & Contributing Editor, Scientific American

Anna Kuchment is a staff writer at The Dallas Morning News and a contributing editor at *Scientific American* magazine. Ms. Kuchment authored *The Forgotten Cure* in 2011 about the history and rekindled interest in bacteriophage therapy. She has held previous positions as the Senior Editor at *Scientific American* and as a Writer and Editor at *Newsweek International* and *Newsweek* magazine.



Dr. Robin Pierce – Regulation and Policy, Translational Medicine

Senior Law and Ethics Associate, Petrie-Flom Center, Harvard Law School

Dr. Robin Pierce is Senior Law and Ethics Associate on Petrie-Flom's collaboration with Harvard Catalyst. She obtained her PhD from Harvard University where she addressed policy, legal, and ethical aspect of integration of genetic technology into the healthcare system. Dr. Pierce is affiliated with several European institutions, including the Rathenau Instituut of the Netherlands. Dr. Pierce is a frequent international speaker on the policy, ethics, and legality of advancing biotechnology and translational medicine.



Robert Citorik – Bacteriophage Research

Massachusetts Institute of Technology, Microbiology PhD Candidate, Lu Lab, MIT Synthetic Biology Center

Robert Citorik is a PhD Candidate in the lab of Professor Timothy Lu in the Microbiology Program at the Massachusetts Institute of Technology. He graduated with a B.S. in Microbiology from the University of New Hampshire where he explored toxin production in EHEC. Mr. Citorik continued in the field of pathogenic bacteria as a research assistant in the Infectious Disease department at Massachusetts General Hospital exploring the virulence factors in *Salmonella* and *Vibrio cholerae*. His current research focuses on the interface of synthetic biology and infectious diseases, specifically involving antibiotic resistance and enteric pathogens.



Dr. Sebastien Lemire – Bacteriophage Research

Massachusetts Institute of Technology, MIT Synthetic Biology Center

Dr. Sebastien Lemire is a post-doctoral fellow in the lab of Professor Timothy Lu in the Research Laboratory of Electronics at the Massachusetts Institute of Technology. He obtained his PhD in Microbiology and Bacterial Physiology from the University of Paris IX Orsay pursuing the genetic regulation of *Salmonella* prophages and their role in the spread of virulence factors. He then moved to Osaka to study an uncommon anti-T4 mechanism and its influence on the evolution of the T-even superfamily of phages. Mr. Lemire spent the last three years in Denmark where he got in touch with synthetic biology through mentoring two iGEM teams. His current research bring together his diverse background in an effort to combat bacterial pathogens through the use of engineered phages.



Tufts Synthetic Biology

Dr. Nikhil Nair – Synthetic Biology

Tufts University, Department of Chemical and Biological Engineering

Dr. Nikhil Nair is a professor in the Chemical and Biological Engineering Department of the Engineering School of Tufts University. His research focuses on altering various aspect of microbial physiology with the aim of not only engineering them for applications, but also to understand why various features of life evolved the way they did. He believe that, as an engineer, building a synthetic system is one of the most powerful methods to understand the intricacies of that system. Dr. Nair is the advisor of the Tufts Synthetic Biology team.



Christopher Ghadban – Synthetic Biology

Tufts Synthetic Biology, Founding Director

Christopher Ghadban graduated from Tufts University in May, 2014 with a B.S. in Chemical Engineering and Biotechnology. As a founding director of Tufts Synthetic Biology, he believes the organization provides an opportunity for to experience more self-directed research than is otherwise available to undergraduate students.



Peter Cavanagh – Synthetic Biology

Tufts Synthetic Biology, Director

Peter Cavanagh is a junior at Tufts University majoring in Biochemistry and Engineering Science. He is interested in pursuing interdisciplinary research efforts to solve pertinent problems in biology, chemistry, medicine, and public health, and translate his research from the lab bench to the world. Mr. Cavanagh does bio-analytical research in the Walt lab and, since his freshman year, has worked to develop a platform for massively parallel single-cell genomic analysis.



Connor McBrine – Synthetic Biology

Tufts Synthetic Biology, Director

Connor McBrine is a junior at Tufts University pursuing majors in Biology and Biotechnology. In addition to his work with Tufts iGEM, Mr. McBrine works to better understand DNA repair pathways in *Drosophila* with CRISPR-Cas9 genome editing. He hopes to eventually see this technology develop therapies and even cures for genetic disorders.

