Discussant/Moderator Bios

Kate Adamala

Kate is a biochemist building synthetic cells. Her research aims at understanding chemical principles of biology, using artificial cells to create new tools for bioengineering, drug development, and basic research. The interests of the lab span questions from the origin and earliest evolution of life, using synthetic biology to colonize space, to the future of biotechnology and medicine. She received a MSc in chemistry from the University of Warsaw, Poland, studying synthetic organic chemistry. In grad school, she worked with professor Pier Luigi Luisi from University Roma Tre and Jack Szostak from Harvard University. She studied RNA biophysics, small peptide catalysis and liposome dynamics, in an effort to build a chemical system capable of Darwinian evolution. Kate's postdoctoral work in Ed Boyden's Synthetic Neurobiology group at MIT focused on developing novel methods for multiplex control and readout of mammalian cells.

Jef Boeke

Dr. Boeke, the founding director of The Institute for Systems Genetics at NYU Langone Health, is known for foundational work on mechanistic and genomic aspects of retrotransposition. He is a pioneer of synthetic genome construction, as he synthesized the first artificial yeast chromosome de novo. He also leads an international consortium that built the highly engineered genome of the first synthetic eukaryote, Yeast 2.0. Using big DNA technology to build mammalian gene loci in yeast and then delivering those loci and their variants to stem cells, Dr. Boeke and his team are working to understand the “instruction manuals” that specify how human genes are expressed. This research has informed technology that enables the rapid design and development of humanized mouse models for studying the treatment of diseases. Boeke has founded several biotechnology companies, including Avigen Inc., CDI Labs, and Neochromosome, Inc. Most recently, his lab developed a highly automated RT-PCR workflow and software infrastructure that was central to a COVID testing pipeline deployed by another company he helped found, the Pandemic Response Lab.

Christopher Kempes

Christopher Kempes is a professor at the Santa Fe Institute. In the broadest terms Chris is interested in finding theories and principles that apply to a wide range of biological scales and hierarchies. Chris generally focuses his work on biological architecture—which may include phenomena ranging from explicit biological morphology to metabolic and genetic network structure—as an intermediate between organism physiology and environmental conditions. Mathematical and physical theories lie at the heart of his methodologies to predict how evolution has shaped architecture and how this, in turn, forms a foundation for reliable predictions of environmental response and interaction. His work spans the scales of genetic information architecture to the morphology of microbial individuals and communities to the regional variation of plant traits and their feedback with climate and available resources

Mary Elting

Dr. Elting’s interest in biophysics was first sparked as an undergraduate in the Weninger Lab in the NCSU physics department. She went on to complete her PhD in Applied Physics at Stanford University in 2006, where she modularly engineered myosin molecular motors to explain how molecular structure supports mechanical force generation. As a postdoc at the University of California, San Francisco, she next probed

how biological macromolecules self-organize to generate force at the cellular, rather than molecular, length-scale in the mitotic spindle. Dr. Elting returned to the NCSU Physics Department as an Assistant Professor in Fall 2017. She is also a member of the Quantitative and Computational Developmental Biology cluster through the Chancellor's Faculty Excellence Program. In collaboration with others in that cluster, she plans to apply her approaches to understanding how biological force scales not only from the molecular to the cellular level, but also between cells and across tissues.

Eric Gaucher

Gaucher was guided in biochemistry by Peter Tipton and Bayesian Theory by George Smith. Gaucher subsequently earned his Ph.D. from the University of Florida under the tutelage of Steve Benner and Michael Miyamoto.[1] Gaucher received the Walter M. Fitch Award from the Society for Molecular Biology and Evolution for his graduate work.[2] He then did postdoctoral work with NASA's Astrobiology Institute in conjunction with a National Research Council Fellowship. After the two-year fellowship, Gaucher served as President of the Foundation for Applied Molecular Evolution. Gaucher was hired as an Associate Professor by the Georgia Institute of Technology in 2008 [1][3][4] The Gaucher group conducts basic and applied research at the interface of molecular evolution and synthetic biology. As of February 2016, his h-index, as calculated by Google Scholar, is 25.[5] Gaucher is also the founder and president of the early-stage biotechnology company General Genomics. His company exploits novel platforms to engineer proteins for the biomedical and industrial sectors.

Allen Liu

Allen Liu received a B.Sc. degree in Biochemistry (Honors) from the University of British Columbia in 2001. He obtained his Ph.D. in Biophysics in 2007 from the University of California-Berkeley and received his post-doctoral training at The Scripps Research Institute-La Jolla. He started his group in 2012, and he is currently an Associate Professor in Mechanical Engineering, Biomedical Engineering, and Biophysics at the University of Michigan. His current research interests lie in cellular mechanotransduction and he uses tools from quantitative cell biology, synthetic biology, biophysics, and microfluidics. He is a recipient of the NIH Director's New Innovator Award, a Young Innovator by Cellular and Molecular Bioengineering (CMBE), a Rising Star from CMBE-BMES, and Future of Biophysics Burroughs Wellcome Fund Symposium speaker. He is a recipient of the Endeavour Executive Fellowship (Australia) and the Alexander von Humboldt Fellowship for Experienced Researcher (Germany).

Sindy KY Tang

Prof. Sindy KY Tang is the Kenneth and Barbara Oshman Faculty Scholar and Associate Professor of Mechanical Engineering and by courtesy of Radiology (Precision Health and Integrated Diagnostics) at Stanford University. She received her Ph.D. from Harvard University in Engineering Sciences under the supervision of Prof. George Whitesides. The micro-nano-bio lab under the direction of Prof. Tang aims to develop innovative micro and nanoscale devices that enable precise manipulation, measurement, and recapitulation of biological systems, in order to understand the "rules of life" and accelerate precision medicine and material design for a future with better health and environmental sustainability. She was a Stanford Biodesign Faculty Fellow in 2018. Prof. Tang's work has been recognized by multiple awards including the NSF CAREER Award, and invited lecture at the Nobel Symposium on Microfluidics in Sweden. Website: http://web.stanford.edu/group/tanglab/

Corey Wilson

Corey J. Wilson is a Professor in the School of Chemical & Biomolecular Engineering at the Georgia Institute of Technology. Professor Wilson is the Director and lead investigator of the NSF Growing Convergence Research Program for Biomolecular Systems Engineering at Georgia Tech. Prior to his current appointment, he was an Associate Professor at Yale University in the Department of Chemical and Environmental Engineering. Preceding his first faculty appointment he was a Gordon E. Moore Postdoctoral Scholar at the California Institute of Technology. Professor Wilson's research program seeks to engineer novel synthetic biological systems of bespoke function for high-impact applications. Professor Wilson's lab leverages a unique blend of iterative protein engineering and genetic engineering to design novel synthetic biological systems. Current efforts are focused on the area of engineering cooperative systems of functional proteins and cognate genetic elements to create intelligent microorganisms, next-generation biological security & bio-cryptography tools, living therapeutics, and next-generation biosynthesis & biomanufacturing technologies. He was recently elected to the American Institute for Medical and Biological Engineers (AIMBE - class of 2021) for his efforts in developing the field of Biomolecular Systems Engineering. Professor Wilson recently contributed to the National Academies workshop on "Strategies for Preventing, Countering, and Responding to Bioterrorism" as a panelist and speaker in July of 2022.