Synthetic and Systems Approaches to Interrogate Spatiotemporal Processes in Cancer

Virtual Workshop Series

Co-Chairs of the Workshop Series

Lukas Bugaj

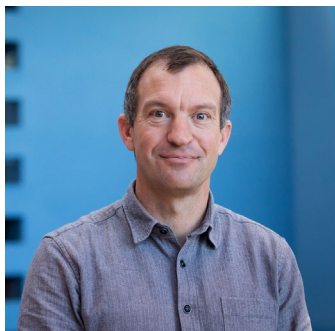University of Pennsylvania

bugaj@seas.upenn.edu

Lukasz Bugaj is an Assistant Professor in Bioengineering. He earned his BSE in Biomedical Engineering at Johns Hopkins University. He then earned his Ph.D. in Bioengineering with David Schaffer at Berkeley, where he pioneered some of the first methods for light-activated 'optogenetic' control of mammalian cell signaling. He then completed a postdoctoral fellowship with Wendell Lim at UCSF, where he applied optogenetic technology to uncover functional signaling defects in cancer cells. The Bugaj Lab at Penn combines optogenetics and synthetic biology to understand and engineer biological control, including within therapeutic cells.

Relevant Publications: https://www.nature.com/articles/s41592-024-02572-4 & https://www.nature.com/articles/s41467-024-53451-7

Zev Gartner

University of California, San Francisco

Zev.gartner@ucsf.edu

Dr. Gartner completed his undergraduate studies in Chemistry at UC Berkeley where he worked as a Beckman Fellow with Dr. Yeon-Kyun Shin. He received a PhD in Chemical Biology as a National Science Foundation Graduate Research Fellow with David Liu at Harvard University, and completed training as Jane Coffin Childs Postdoctoral Fellow with Carolyn Bertozzi

at UC Berkeley. He is currently a Professor in the Department of Pharmaceutical Chemistry at the University of California, San Francisco and co-director of the NSF Center for Cellular Construction. His lab is working to understand the principles governing the self-organization of human tissues, with the goal of engineering tissues for regenerative medicine and stabilizing tissues for cancer prevention. His work has been honored with the NIH New Innovator Award and the DOD Era of Hope Scholars award. He was selected among the Popular Science "Brilliant 10" in 2015 and as a Chan/Zuckerberg Biohub investigator in 2017.

Laura Heiser

Oregon Health & Science University

heiserl@ohsu.edu

Dr. Laura Heiser is Associate Professor and Vice Chair of the Department of Biomedical Engineering at Oregon Health & Science University, Associate Director of Complex Systems Modeling at the Knight Cancer Institute Cancer Early Detection Advanced Research Center, and Co-Leader of the Knight Cancer Institute Quantitative Oncology Program. Her laboratory is focused on understanding the phenotypic and molecular responses of cancer and normal cells to diverse stimuli, with a particular interest in elucidating mechanisms of therapeutic response and resistance in cancer. Dr. Heiser has served as co-PI on an NHGRI U54 LINCS Center grant designed to interrogate the influence of microenvironmental factors on diverse epithelial cell types and as PI on an NCI U54 Cancer Systems Biology Consortium Center grant, focused on understanding the role of microenvironmental signals in modulating cell state heterogeneity and therapeutic response. She has had leadership roles in the development of international DREAM challenges and led a multi-center LINCS Common Project designed to deeply profile the dynamic molecular and phenotypic responses of mammary epithelial cells to diverse microenvironmental factors. She was inducted into the 2025 class of the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows.

Ajit Nirmal

Harvard University

anirmal@bwh.harvard.edu

Dr. Ajit Johnson Nirmal is a Faculty at Harvard Medical School and Brigham and Women's Hospital. His research is focused on investigating the role of the tumor microenvironment on tumor progression and drug resistance. Dr. Nirmal utilizes

spatial omics techniques and computational analysis to integrate large datasets to decipher the regulatory networks contributing to cancer development and drug resistance. Ultimately, he aims to establish personalized medicine frameworks that can provide clinically relevant therapeutic strategies tailored to individual patients.