

KWANGHUN CHUNG**"Revolutionizing
Bioimaging to Elevate
Human Health"**

Wednesday

November 29, 2023

3:30 PM

Wu and Chen Auditorium
Levine HallAssociate Professor
Chemical Engineering
Massachusetts Institute of Technology**ABSTRACT**

Holistic imaging of diverse functional, anatomical, and molecular architecture that span multiple levels, from cells to an entire system, remains a major challenge in biology. In this talk, I will introduce a series of technologies that enable integrated multiscale imaging and molecular phenotyping of both animal tissues and human clinical samples. I will discuss how we engineer (1) the physicochemical properties of biological tissues, (2) molecular interactions, and (3) molecular transport all together to achieve integrated organ-wide 3D molecular analysis at unprecedented speed and resolution. I will also discuss how these technologies can be commercialized and deployed synergistically to study a broad range of biological questions.

BIO

Kwanghun Chung is currently an Associate Professor of Chemical Engineering at MIT, as well as a Core Member of the Institute for Medical Engineering and Science (IMES). He is also a Core Member of the Picower Institute for Learning and Memory, and an Associate Member of the Broad Institute. He received his B.S. in Chemical Engineering from Seoul National University in 2005, and then moved to Georgia Institute of Technology for his Ph.D. training under the mentorship of Dr. Hang Lu, where he developed automated and integrated microsystems for high-throughput imaging, molecular/behavioral phenotyping, and cell microsurgery of a broad range of living systems. Following his graduation in 2009, Dr. Chung joined the Karl Deisseroth Lab at Stanford University for post-doctoral training in 2010, where he invented a novel technology termed CLARITY (Chung, Nature, 2013), which enables system-wide structural and molecular analysis of large-scale intact biological samples. In 2013, Dr. Chung joined MIT and has been leading an interdisciplinary team to develop and apply novel methods for holistic understanding of large-scale complex biological systems. His group has developed a host of technologies (SWITCH [Cell, 2015], Stochastic Electrotransport [PNAS, 2015], MAP [Nature Biotechnology, 2016], SHIELD [Nature Biotechnology, 2019], and ELAST [Nature Methods, 2020]) that enable rapid and scalable 3D imaging and phenotyping of both animal models and human clinical samples. He cofounded LifeCanvas Technologies to commercialize his inventions, which has enabled rapid adoption of the technologies by over 400 labs and core facilities in leading institutions, and companies across 14 countries. Chung was the recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE) 2019, the NIH New Innovator Award 2016, the Mcknight Technological Innovations in Neuroscience Award 2016, the Packard Fellowships for Science and Engineering Award 2015, the NARSAD Young Investigator Award 2015, the Yumin Awards for Creativity 2014, the Searle Scholars Award 2014, and the BWF Career Award at the Scientific Interface 2012.