MIT Industrial Liaison Program Faculty Knowledgebase Report

2026 MIT Tokyo Life Science Symposium

June 16, 2026 9:00 am - 2:00 pm

8:30 AM	Registration
9:00 AM	Welcome and Introduction Miki Kato Program Director, MIT Industrial Liaison Program

Miki Kato
Program Director
MIT Industrial Liaison Program

Miki Kato joined the MIT Industrial Liaison Program as a Program Director in October 2021. Mr. Kato has over 20 years of experience in new business development, including various activities with MIT.

Prior to joining the ILP, Kato worked at FUJIFILM Corporation for 40 years in various new business development sectors. He was President of FUJIFILM Pharmaceuticals U.S.A., Inc., conducting the clinical trials of FUJIFILM pipeline drugs and leading the joint research project in drug delivery with MIT's Koch Institute. During his tenure, he also collaborated with the Department of Electrical Engineering at MIT for digital camera's CMOS image sensors and the Department of Materials Sciences and Engineering for high-speed photodetectors.

Kato has presented at several conferences at the Cambridge Innovation Center, including the 2018 Japan Innovation Forum with the Consulate General of Japan and the 60th-anniversary Kyoto-Boston sister city celebration Life Science Forum (2019) with the City of Boston, the Japan Society of Boston, and the Consulate General of Japan.

He holds an M.E. in Polymer Chemistry from Kyoto University and an M.S. in Management of Technology from MIT.

Shunichi Takahashi

9:15 AM

CMOS-Integrated Solid-State Nanopores for AI-Driven Molecular Sensing

Ahmad Bahai

The convergence of innovations across health sciences, semiconductor technology, and artificial intelligence is poised to fundamentally reshape personalized healthcare. Advances in biochemistry, microelectronics, and AI have already transformed nearly every aspect of modern life; their intersection now presents a particularly compelling opportunity in health and life sciences.

Real-time monitoring of biomarkers with clinical-grade accuracy enables deeper insight into disease progression and supports more precise and timely diagnostic and therapeutic interventions. At the same time, the growing availability of large, high-quality datasets—coupled with increasingly sophisticated AI algorithms—creates new pathways for understanding disease mechanisms at the molecular level.

A notable example of this convergence is the use of solid-state nanopores for single-molecule detection. Nanopore technologies are driving a new generation of biosensing and sequencing platforms. Unlike biological nanopores, solid-state nanopores are fabricated in materials such as silicon nitride membranes using advanced lithographic techniques, offering superior robustness and design flexibility. Their higher signal-to-noise ratio (SNR), along with compatibility with CMOS integration, is critical for scalable, high-throughput implementations.

Key technical challenges remain, including improving the consistency of pores and the controlled slowdown of molecular translocation to improve detection resolution. Addressing these challenges, along with seamless integration with CMOS, will enable increasingly complex systems that combine microfluidic, electronic, and photonic components. Emerging architecture which incorporates photonic waveguides to enhance sensitivity—illustrate the potential of these hybrid platforms to significantly advance next-generation biosensing technologies.

10:00 AM

Identifying & Counteracting the Impact of Environment Stresses on Tissue Dysfunction

Alex Shalek

During chronic stress, cells must support both tissue function and their own survival. Hepatocytes perform metabolic, synthetic, and detoxification roles; with chronic nutrient imbalances, metabolic stress can precipitate metabolic dysfunction-associated steatotic liver disease (MASLD, formerly NAFLD/NASH). Despite prior work on stress-induced drivers of hepatocyte death, the functional impact of chronic stress on surviving cells remains unclear. In my talk, I will discuss how we used cross-species longitudinal single-cell multi-omic profiling to show that ongoing stress drives developmental and cancer-associated programs in non-transformed hepatocytes while reducing mature functional identity – significantly before transformation and predicting worsened human survival. Further, I will outline how we developed and applied integrative computational methods and experimental validations to uncover master regulators perturbing hepatocyte functional balance, increasing proliferation under stress, and directly priming future tumorigenesis. I will also explain how we utilized human tissue microarray spatial transcriptomics and geographic regression to reveal spatially-structured multicellular communities and signaling interactions shaping stress responses. Finally, toward counteracting these core mechanisms driving tissue dysfunction and instability, I will present our development of a new information-rich, high-throughput phenotypic screening platform, with reduced required sample, labor, and cost requirements, that can be leveraged to help discover strategies to improve tissue health and resilience.

10:45 AM

Panel Discussion
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11:15 AM

Talk Title: TBD

12:00 PM

Networking Lunch