MIT Industrial Liaison Program Faculty Knowledgebase Report

2025 MIT Health Science Forum

May 8, 2025 9:00 am - 2:00 pm

8:30 AM	Registration and Light Breakfast
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.

9:10 AM	Artificial Intelligence for State-of-the-Art Gene Therapy Jacob Witten

Ionizable lipids are a key component of lipid nanoparticles (LNPs), a leading nonviral messenger RNA (mRNA) delivery technology. Here, we introduce Lipid Optimization using Neural networks (LiON), a deep-learning strategy for designing ionizable lipids. To train LiON, we generated a dataset of over 9,000 lipid nanoparticle activity measurements and fed this data into a directed message-passing neural network to predict nucleic acid delivery across diverse lipid structures.

Lipid optimization using LiON successfully predicted RNA delivery in both in vitro and in vivo held-out test sets and extrapolated to structures distinct from the training set. Next, we evaluated 1.6 million lipids in silico and identified two structures, FO-32 and FO-35, which demonstrated state-of-the-art local mRNA delivery to mouse muscle and nasal mucosa. FO-32 also matched the state of the art for nebulized mRNA delivery to the mouse lung, while both FO-32 and FO-35 efficiently delivered mRNA to ferret lungs—representing the first published example of mRNA delivery to ferret conducting airways.

Overall, this work highlights the potential of deep learning to enhance nanoparticle delivery and introduces LNPs with promising activity for pulmonary gene therapy.

9:40 AM

Innovation in Manufacturing Biomedicines: From New Modalities to Scalable, Accessible Therapeutics

Stacy Springs

Biologic medicines (e.g., monoclonal antibodies, gene and cell therapies, vaccines) are critical to treating and preventing disease. Recent regulatory approvals of exciting new biomedicines such as cell and gene therapies provide new hope to patients who have exhausted alternative therapies or suffer from a rare disease with no other treatment. To help patients access these medicines, biopharmaceutical companies must be able to manufacture very complex molecules safely, reliably, and in the quantities needed, which can range from the very large (industrialized) scale to the very small (personalized) scale. This presentation will review the challenges in manufacturing these complex biologic medicines as well as approaches to modernization of biomanufacturing with the goal of providing broadened access to biologic medicines. Dr. Springs will describe multiple approaches that MIT's Center for Biomedical Innovation and collaborators are taking to achieve this goal, including continuous manufacturing, novel purification strategies, novel analytical technologies for assessing novel product quality attributes, and rapid methods for sterility and viral safety assessment.

10:10 AM

AI Drug Development

10:40 AM

Networking Break

11:00 AM

Diagnosis

11:30 AM

MIT Center for Precision Cancer Medicine

Michael B. Yaffe

12:00 PM

Startup Lightning Talks
Tricia Dinkel
Manager of Partnerships & Engagement, MIT Startup Exchange

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Tricia Dinkel comes to Corporate Relations with several years of experience in the innovation ecosystem and managing relationships with startups and corporates. Tricia previously worked as Director of Navigate (NECEC's flagship innovation program) at the Northeast Clean Energy Council (NECEC) in Boston where she led all operations and partnership development for 400+ startups, 65+ innovation partners, and 200+ investors & corporates in North America and Europe. Prior to that role, Tricia held positions with increasing responsibility in program management at NECEC. Before that, her experience included Director of Data Analytics and Sustainability Reporting Manager at WegoWise Inc. in Boston, Associate Director at the Committee on Capital Markets Regulation in Cambridge, Senior Sustainability Coordinator at A Better City in Boston, and Assistant Director at The Green Alliance in Portsmouth, NH.

Tricia earned her B.A., in Environmental Studies/Natural Resource Policy at the University of Colorado, and her M.A., in Environmental Science Education at the University of New Hampshire. She served on the NECEC Diversity & Inclusion Committee and as a member of the USGBC (U.S. Green Building Council), Massachusetts Chapter.

Wang Wenshou

David Crowley

Willy Reaves

12:40 PM	Lunch
2:00 PM	Adjourn