Kendall Square Convergence 2016

9:00am – 7:00pm, June 1, 2016
Koch Institute at MIT
500 Main Street, Cambridge, MA 02142

9:00am – 9:30am	**Registration Check-in and Continental Breakfast**
9:30am – 9:45am	**Welcome Remarks** Andrew W. Lo, MIT
9:45am – 10:15am	**The Origins and Future of Kendall Square** Phil Sharp, MIT
10:15am – 11:30am	**Session I: Gene Control Medicines for Diseases** *Drugging Transcription* Rick Young, MIT *Fireside Chat* Nancy Simonian, Syros Pharmaceuticals Rick Young, MIT *Taming a Master Regulator* Angela Koehler, MIT
11:30am – 11:45am	**Break**
11:45am – 1:00pm	**Session II: Immune Engineering/Immunotherapy** *Engineering the Next Generation of Cell Therapies for Cancer* Darrell Irvine, MIT *Fireside Chat* Darrell Irvine, MIT Ulrik Nielsen, Torque *Investigating Tumor-Immune Interactions Using Genetically-Engineered Mouse Models of Cancer* Tyler Jacks, MIT
1:00pm – 2:00pm	**The 21st Century's Technology Story: The Convergence of Biology with Engineering and the Physical Sciences** Susan Hockfield, MIT
2:00pm – 2:15pm	**Break**

2:15pm – 3:30pm	**Session III: Nanomedicine** *Nanolayered Delivery Packages – From Wound Healing to Cancer* Paula Hammond, MIT *Fireside Chat* Paula Hammond, MIT Ken Mandell, LayerBio *Using Deep Vision to Detect Tiny Ovarian Tumors* Angie Belcher, MIT
3:30pm – 4:00pm	**Break**
4:00pm – 5:15pm	**Session IV: Common Health Challenges and Uncommon Solutions** *Convergence, Biomaterials and Biotechnology: From the Discovery of the First Angiogenesis Inhibitors to the Development of Controlled Drug Delivery Systems and the Foundation of Tissue Engineering* Robert Langer, MIT *Fireside Chat* Robert Langer, MIT Terry McGuire, Polaris Partners *From Bugs to Drugs: Lessons Learned from Fecal Microbiome Transplants in Recurrent Clostridium Difficile Infection* Eric Alm, MIT
5:15pm – 5:45pm	**Science-Based Innovation and Venture Creation – Reinventing the Biotech Value Chain** Noubar Afeyan, Flagship Ventures
5:45pm – 7:00pm	**Reception**

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Speaker Bios*

Noubar Afeyan is founder, Senior Managing Partner and CEO of Flagship Ventures, a leading venture creation and investment firm. Since 2000, he has been a Senior Lecturer at MIT's Sloan School of Management where he has taught courses on technology-entrepreneurship, innovation, and leadership. Noubar has authored numerous scientific publications and patents since earning his Ph.D. in Biochemical Engineering from MIT in 1987. During his 28-year career as inventor, entrepreneur, CEO and venture capitalist, Noubar has co-founded and helped build over 30 life science and technology startups. He was founder and CEO of PerSeptive Biosystems, which was acquired by Perkin Elmer/Applera Corporation in 1998. He became Senior Vice President and Chief Business Officer at Applera, where he initiated and oversaw the creation of Celera Genomics. He was a founder and investor in several highly successful ventures including Chemgenics Pharmaceuticals (acquired by Millennium Pharmaceuticals), Color Kinetics (acquired by Philips), Affinnova (acquired by AC Nielsen) and Adnexus Therapeutics (acquired by Bristol-Myers Squibb). Currently, Noubar is lead director/chairman of several company boards, including Moderna Therapeutics, Seres Therapeutics and Pronutria Biosciences.

Eric Alm is Co-Director of the Center for Microbiome Informatics and Therapeutics at MIT and Massachusetts General Hospital. His research program is focused on practical applications of microbial ecology, with a special interest in the human microbiome. His lab recently spun off a successful non-profit organization, OpenBiome, to provide fecal microbiota transplants to patients suffering from recurrent Clostridium difficile infection. His past research has helped to elucidate the earliest events in the evolution of life, helped to define the concept of a bacterial species, and mapped the horizontal transfer of genes across microbial species using a combination of new molecular technologies and computational algorithms.

Angela Belcher is a biological and materials engineer with expertise in the fields of biomaterials, biomolecular materials, organic-inorganic interfaces and solid-state chemistry and devices. Her primary research focus is evolving new materials for energy, electronics, the environment, and medicine. She received her B.S. in Creative Studies with an emphasis in biology from The University of California, Santa Barbara. She earned a Ph.D. in inorganic chemistry at UCSB in 1997. Following her postdoctoral research in electrical engineering at UCSB, she joined the faculty at The University of Texas at Austin in the Department of Chemistry in 1999. She joined the faculty at MIT in 2002. Some recent awards include 2015 NAI (National Academy of Inventors) Fellow, the 2013 $500,000 Lemelson-MIT Prize for her Inventions, 2010 Eni Prize for Renewable and Non-conventional Energy, and in 2009 Rolling Stone Magazine listed her as one of the top 100 people changing the country.

Paula T. Hammond is the David H. Koch Chair Professor of Engineering and the Department Head of the Chemical Engineering Department at the Massachusetts Institute of Technology, as well as a member of MIT's Koch Institute for Integrative Cancer Research. Her research in nanotechnology encompasses the development of new biomaterials to enable drug delivery from surfaces with spatial and temporal control. She investigates novel responsive polymers for targeted nanoparticle drug and gene delivery. Professor Hammond was elected into the 2013 Class of the American Academy of Arts and Sciences. She is also the recipient of the 2013 AIChE Charles M. A. Stine Award, which is bestowed annually to a leading researcher in recognition of outstanding contributions to the field of materials science and engineering, the AIChE Alpha Chi Sigma Award for Chemical Engineering Research and the Department of Defense Ovarian Cancer Teal Innovator Award. Prof. Hammond serves as an Associate Editor of the American Chemical Society journal, *ACS Nano*. She was one of the Top 100 materials scientists named by Thomson-Reuters, and World's Most Influential Scientific Minds in 2014. Professor Hammond's work on multilayer tattoos for transdermal DNA vaccines was featured on the PBS Nova program, "Making Stuff" with David Pogue, and her work in cancer was most recently featured in a TED talk and PBS special; she was also featured in the Chemical Heritage Foundation's Catalyst Series: Women in Chemistry.

A noted neuroscientist, **Susan Hockfield**, Ph.D., was the first life scientist and the first woman to serve as President of the Massachusetts Institute of Technology, from 2004 to 2012. Previously, she held the positions of Provost and Dean of the Graduate School of Arts and Sciences while she was the William Edward Gilbert Professor of Neurobiology at Yale University. She has received honorary degrees from universities around the world. She is president-elect of AAAS and is a director of the General Electric Company, the Council on Foreign Relations, the World Economic Forum Foundation, Partners HealthCare System and the Belfer Center for Science and International Affairs at the Harvard Kennedy School of Government, and a trustee of the Boston Symphony Orchestra.

Darrell Irvine, Ph.D., is a Professor at the Massachusetts Institute of Technology and an Investigator of the Howard Hughes Medical Institute. He also serves on the steering committee of the Ragon Institute of MGH, MIT, and Harvard. His research is focused on the application of engineering tools to problems in cellular immunology and the development of new materials for vaccine and drug delivery. Current efforts are focused on problems related to vaccine development for HIV and and immunotherapy of cancer. Dr. Irvine's work has been recognized by numerous awards, including a Beckman Young Investigator award, an NSF CAREER award, selection for Technology Review's 'TR35', election as a Fellow of the Biomedical Engineering Society, election as a fellow of the American Institute for Medical and Biological Engineering, and appointment as an investigator of the Howard Hughes Medical Institute. He is the author of over 100 publications, reviews, and book chapters and an inventor on numerous patents.

Tyler Jacks is the Director of MIT's Koch Institute for Integrative Cancer Research, a David H. Koch Professor of Biology, and a Howard Hughes Medical Institute Investigator. His lab has made seminal contributions to the understanding of the effects of mutations of several common cancer-associated genes. This research has led to novel insights into tumor cell development, normal cell development and other cellular processes, as well as new strategies for cancer detection and treatment. Jacks currently chairs the National Cancer Advisory Board, and co-chairs the White House Cancer Moonshot Task Force's Blue Ribbon Panel. He is a member of the Board of Directors of Amgen and Thermo Fisher Scientific, and an advisor to several biotechnology and pharmaceutical companies. In recognition of his contributions to the study of cancer genetics, he has received numerous awards, including the AACR Outstanding Achievement Award and the Paul Marks Prize for

Cancer Research. He was elected to the National Academy of Sciences and the Institute of Medicine of the National Academies in 2009, the American Academy of Arts and Sciences in 2012, and the inaugural class of Fellows of the AACR Academy in 2013. In 2015, Jacks received the Killian Award, the highest honor the MIT faculty can bestow upon one of its members.

Angela Koehler is the Karl Van Tassel Assistant Professor in the Department of Biological Engineering at MIT and an intramural member of the David H. Koch Institute for Integrative Cancer Research at MIT. She is also an Associate Member of the Broad Institute. Her research group aims to discover and develop functional small-molecule probes of transcriptional regulators, including chromatin modifying enzymes and oncogenic transcription factors. Validated probes may be used to advance the understanding of transcription in development and disease. Selected probes may be developed into imaging agents, diagnostic tools, or therapeutic leads. Angela received her B.A. in Biochemistry and Molecular Biology from Reed College in 1997. In 2003, she received her Ph.D. in Chemistry from Harvard University. Upon graduation, she became an Institute Fellow in the Chemical Biology Program at the Broad Institute and a Group Leader for the NCI Initiative for Chemical Genetics. She serves as Faculty Co-Director of the High-Throughput Sciences Facility in the Swanson Biotechnology Center at the Koch Institute and serves on the Chemists in Cancer Research steering committee for the American Association for Cancer Research. Honors include being named a Genome Technology Young Investigator and a Merkin Institute Fellow.

Robert Langer is the David H. Koch Institute Professor at MIT (there are 13 Institute Professors at MIT; being an Institute Professor is the highest honor that can be awarded to a faculty member). He has written more than 1,350 articles and has over 1,100 issued and pending patents worldwide. His many awards include the US National Medal of Science, the US National Medal of Technology and Innovation, the Charles Stark Draper Prize (considered the engineering Nobel Prize), Albany Medical Center Prize (largest US medical prize), the Wolf Prize for Chemistry, the 2014 Kyoto Prize and the Lemelson-MIT prize, for being "one of history's most prolific inventors in medicine." Langer is one of the very few individuals ever elected to the National Academy of Medicine, the National Academy of Engineering and the National Academy of Sciences.

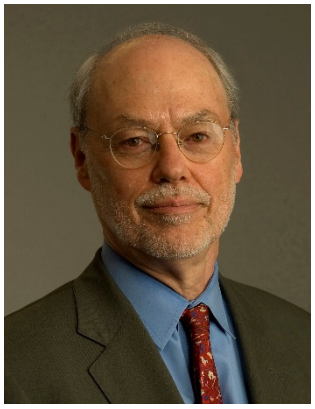
Andrew W. Lo is the Charles E. and Susan T. Harris Professor at the MIT Sloan School of Management, the director of MIT's Laboratory for Financial Engineering, and principal investigator at MIT's Computer Science and Artificial Intelligence Lab. His most recent research focuses on systemic risk, evolutionary models of investor behavior, and applying financial engineering to develop new funding models for biomedical innovation. He has published extensively in academic journals and his most recent book is *Hedge Funds: An Analytic Perspective*. His awards include Sloan and Guggenheim fellowships, the Paul A. Samuelson Award, the Harry M. Markowitz Award, the CFA Institute's James A. Vertin Award, and election to Academia Sinica, the American Academy of Arts and Sciences, the Econometric Society, and Time Magazine's 2012 list of the "100 most influential people in the world." He has also received teaching awards from the University of Pennsylvania and MIT. He received a B.A. in economics from Yale University in 1980, and an A.M. and Ph.D. in economics from Harvard University in 1984.

Kenneth J. Mandell, M.D., Ph.D. is President & CEO of LayerBio, Inc., an MIT spinoff developing novel drug delivery technology for ophthalmology, wound care and orthopedic applications. He also currently serves as Chief Medical Officer of Noveome Biotherapeutics and as a consultant to Aldeyra Therapeutics and EyeGate Pharma, and Massachusetts Eye & Ear Infirmary/Harvard Department of Ophthalmology. He was previously a Research Affiliate in the Hammond Lab at MIT prior to forming LayerBio. Dr. Mandell received an M.D. and Ph.D. from Emory University and completed his residency training in ophthalmology at Harvard University. He has authored numerous patents and publications in the fields of ophthalmology, translational research and drug delivery technology.

Terry McGuire brings 30 years of successful early stage investing experience to the healthcare industry. He has invested in more than 50 companies, co-founding MicroCHIPS, Inspire Pharmaceuticals and Advanced Inhalation Research. Mr. McGuire serves on the boards of 480 Biomedical, Adimab, Alector, Iora Health, MicroCHIPS, Arivale, Pulmatrix (PULM); Acceleron (XLRN); and Ironwood (IRWD). Mr. McGuire chairs the Board of Overseers of the Thayer School of Engineering, Dartmouth College; and serves on the boards of MIT's Koch Institute for Integrative Cancer Research, the Rock Center for Entrepreneurship, Harvard Business School; and the Scientific Advisory Board at Brigham & Women's Hospital. He is Chairman of the Global Venture Capital Congress and Chairman Emeritus of the National Venture Capital Association. He has been named to Forbes Midas list multiple times, and was listed as one of Scientific American's Worldview 100. Mr. McGuire holds a MBA from Harvard Business School, a MS in

engineering from The Thayer School, Dartmouth College, and a BS in physics and economics from Hobart.

Ulrik B. Nielsen, Ph.D. is founder, president and CEO of Torque. Ulrik was previously a founder of Merrimack (NASDAQ: MACK) and served as its CSO until 2015. He continues to serve as a board member. At Merrimack, his team put eight novel anti-cancer molecules into development – including three bi-specific antibodies, the first antibody-targeted nanoparticles, and the first mixture of three monoclonal antibodies. At Merrimack, he was also a founder of Silver Creek (a majority owned Merrimack subsidiary) where he continues to serve as a board member. Silver Creek is developing the first tissue-targeted growth factors designed to support tissue survival and regeneration in a number of indications. Ulrik trained at University of California, San Francisco and MIT, and holds a Ph.D. in molecular biology from the University of Copenhagen.



Phillip A. Sharp is Institute Professor at MIT and member of the Department of Biology and the Koch Institute for Integrative Cancer Research. He joined the faculty in 1974 and his research interests have centered on the molecular biology of gene expression relevant to cancer and the mechanisms of RNA splicing. His landmark work in 1977 provided the first indications of "discontinuous genes" in mammalian cells. The discovery fundamentally changed scientists' understanding of gene structure and earned Dr. Sharp the 1993 Nobel Prize in Physiology or Medicine. Dr. Sharp has authored over 420 papers. He is an elected member of the National Academy of Sciences, the Institute of Medicine, the American Academy of Arts and Sciences, and is the recipient of the National Medal of Science. Dr. Sharp earned a B.A. degree from Union College, Barbourville, KY, and a Ph.D. in chemistry from the University of Illinois, Champaign-Urbana. He is co-founder of Biogen Inc and Alnylam Pharmaceuticals Inc.

Nancy Simonian, M.D., is founding CEO of Syros Pharmaceuticals, a privately held biotech company pioneering the understanding of the non-coding region of the genome to advance a new wave of medicines that control expression of disease-driving genes. The company is focused on cancer and immune-mediated diseases and is advancing a growing pipeline. Nancy has a track record of value creation in biotechnology. Under Nancy's leadership as Chief Medical Officer at Millennium, VELCADE® became a mainstay of treatment for multiple myeloma. Nancy led Millennium's clinical pipeline including NINLARO® for hematologic malignancies and ENTYVIO® for

inflammatory bowel disease. At Biogen, Nancy played a central role in developing AVONEX® and TYSABRI® for multiple sclerosis. Nancy started her career as an assistant professor at Harvard Medical School and Massachusetts General Hospital (MGH). She trained in neurology at MGH, received her M.D. from University of Pennsylvania and graduated from Princeton. She is on the board of directors of Seattle Genetics, Damon Runyon Cancer Research Foundation and the BIO's Emerging Companies Board.

Richard A. Young is a Professor at the Whitehead Institute and MIT. Dr. Young studies gene regulation in health and disease. He has served as an advisor to the World Health Organization, the National Institutes of Health and numerous scientific societies and journals. Dr. Young's honors include Membership in the National Academy of Sciences and Scientific American has recognized him as one of the top 50 leaders in science, technology and business. He has founded and advised companies in the biotechnology and pharmaceutical industry, and is currently a member of the Board of Directors of Syros Pharmaceuticals. Dr. Young is also an aviator and holds a commercial pilot license.