MIT Industrial Liaison Program Faculty Knowledgebase Report

2018 Healthcare Technologies of the Future (Oxford)

September 27, 2018 10:30 am - 4:00 pm

10:30am	Coffee, Registration & Networking
11:00am	Welcome - Oxford University Gavin Screaton Head of Medical Sciences Division, University of Oxford

Gavin Screaton
Head of Medical Sciences Division
University of Oxford

Gavin Screaton is Head of the Medical Sciences Division at Oxford University. He was previously appointed to the Chair of Medicine at Hammersmith Hospital, Imperial College and became Dean of the Faculty of Medicine. Screaton is a Fellow of the Academy of Medical Sciences and of the Royal College of Physicians, and was made a Founder Senior Investigator in the NIH for Health Research. He is also a member of the MRC Strategy Board and a Non-Executive Director of Oxford University Hospitals NHS Foundation Trust. Screaton holds his first degree from Cambridge and completed his medical studies and PhD at Oxford University.

The current interests of his laboratory revolve around the immunology of infectious diseases with a special interest in dengue haemorrhagic fever and Zika, where his research is currently funded by the Wellcome Trust, with active research collaborations in South-East Asia.

11:05am

Welcome - MIT
Karl Koster
Executive Director, MIT Corporate Relations
Director, Alliance Management
MIT Office of Strategic Alliances & Technology Transfer

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Karl Koster is the Executive Director of MIT Corporate Relations. MIT Corporate Relations includes the MIT Industrial Liaison Program and MIT Startup Exchange.

In that capacity, Koster and his staff work with the leadership of MIT and senior corporate executives to design and implement strategies for fostering corporate partnerships with the Institute. Koster and his team have also worked to identify and design a number of major international programs for MIT, which have been characterized by the establishment of strong, programmatic linkages among universities, industry, and governments. Most recently these efforts have been extended to engage the surrounding innovation ecosystem, including its vibrant startup and small company community, into MIT's global corporate and university networks.

Koster is also the Director of Alliance Management in the Office of Strategic Alliances and Technology Transfer (OSATT). OSATT was launched in Fall 2019 as part of a plan to reinvent MIT’s research administration infrastructure. OSATT develops agreements that facilitate MIT projects, programs and consortia with industrial, nonprofit, and international sponsors, partners and collaborators.

He is past chairman of the University-Industry Demonstration Partnership (UIDP), an organization that seeks to enhance the value of collaborative partnerships between universities and corporations.

He graduated from Brown University with a BA in geology and economics, and received an MS from MIT Sloan School of Management. Prior to returning to MIT, Koster worked as a management consultant in Europe, Latin America, and the United States on projects for private and public sector organizations.

11:15am

Intro to MIT's Startup Innovation Ecosystem
Sheryl Greenberg
Program Director, MIT Industrial Liaison Program

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Sheryl Greenberg initiates and promotes the interactions and development of relationships between academic and industrial entities to facilitate the transfer of new ideas and technologies between MIT and companies, and has created numerous successful partnerships. By understanding the business, technology, and commercial problems within a company, and understanding the technologies and expertise of MIT researchers, Greenberg identifies appropriate resources and expertise to foster new technology applications and collaborative opportunities.

Prior to MIT, Greenberg created and directed the Office of Technology Transfer at Brandeis University. In the process of managing intellectual property protection, marketing, and licensing, she has promoted the successful commercialization of technologies as diverse as new chemicals and manufacturing, biotechnology, food compositions, software, and medical devices. She facilitated the founding and funding of new companies, as well as creating a profitable technology transfer program. She also facilitated the patenting, marketing, and licensing of Massachusetts General Hospital technologies. In addition to her cellular, biochemical, and genetic research experience in academic and corporate environments, she has also created intellectual property for medical uses. Greenberg has been an independent intellectual property and business development consultant, is a U.S. Patent Agent, and has previously served the Juvenile Diabetes Research Foundation as Co-Chair of the Islet Research Program Advisory Committee and grant reviewer. She currently also mentors startup companies and facilitates partnering them with large life science and healthcare companies.

Session A – Chair Introduction
Paul Ashley
Head of Licensing & Ventures – Life Sciences, Oxford University Innovation

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Oxford University Innovation

Paul Ashley is the Head of Licensing and Ventures for the Life Sciences at Oxford University Innovation (OUI). OUI works hard to bring Oxford's best ideas to bear for societal and economic benefit by supporting Oxford University researchers who wish to commercialize their IP, assisting with licensing and spinout formation, and liaising with technology seekers, investors, and other external parties. Each year OUI sees around 400 new ideas come from the full breadth of research activities at the university and hospitals. Named Technology Transfer Office of the year, OUI produced 25 new companies in 2017.

With a research background in neurophysiology, Ashley joined OUI in 2011, following roles in early-stage spin-outs and large pharma. He has helped to commercialize early-stage science throughout his career, launching companies and licensing technologies in a broad range of disciplines, including drug development, med-tech, genomics, diagnostics, and digital health.

11:20am

Industry Keynote
Paul Drayson
CEO, Sensyne Health

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CEO
Sensyne Health

Lord Drayson is an engineer and science entrepreneur who has over 25 years of experience in founding and leading successful businesses in food manufacturing, bioscience and motorsport research and development.

Lord Drayson was trained as an engineer in the car industry, has a degree in engineering and a PhD in robotics. In 1986, he founded Lambourn Food Company, a business based on novel manufacturing technology that he developed successfully over seven years with venture capital backing. Following Lambourn's acquisition, in 1993 Lord Drayson co-founded with his wife, Lady Elspeth Drayson, the University of Oxford spin-out company PowderJect Pharmaceuticals Plc. He floated PowderJect on the London Stock Exchange in 1997 and over ten years as Chief Executive Officer he built PowderJect into a profitable FTSE 250 business and one of the world's leading vaccine companies with operations in the United Kingdom, United States and Scandinavia. PowderJect was sold in 2003 via an agreed US$890 million cash acquisition by Chiron.

Lord Drayson has been interested in science and innovation policy since the 1990s, was Chairman of the BioIndustry Association 2001-2002 and was appointed to the House of Lords in 2004. He served as a Defence Minister in the British government from May 2005 to May 2010 and from October 2008 to May 2010 he attended cabinet as Minister for Science and Innovation.

In 2013, Lord Drayson set three FIA World Land Speed Records and four British Land Speed Records for electric vehicles driving the Drayson B12/69EV wirelessly charged prototype electric racing car developed by Drayson Racing Technologies. He is a member of Her Majesty's Privy Council, a Fellow of the Institution of Engineering and Technology, a Fellow of the Royal Academy of Engineering and a non-executive director of Airbus.

In August 2018 Lord Drayson floated his medical artificial intelligence company Sensyne Health in London with a capitalisation of £225m. Sensyne Health is a healthcare technology company that creates value from accelerating the discovery and development of new medicines and improving patient care through the analysis and commercialisation of real-world evidence from large databases of anonymised patient data in collaboration with NHS Trusts.

Lord Drayson will present his experiences from 25 years of working to commercialise science with particular reference to the development and adoption of healthcare innovations.

11:50am Startup Lightning Talks

- **Asimov**: Programming living cells to bring impossible biotechnologies to life
- **Catalia Health**: Scalable chronic disease management using interactive robotics
- **Ginkgo Bioworks**: Manufacturing custom microbes for cross-industry applications
- **twoXAR**: Artificial intelligence-driven drug discovery
- **Genomics plc**: Develop and apply cutting edge analysis and algorithms to our world-leading database of genomic and phenotypic data to uncover the relationships between genetic variation and human disease
- **Nightstar Therapeutics**: A leading clinical-stage gene therapy company focused on developing and commercializing novel, one time treatments for patients suffering from rare inherited retinal disease that would otherwise progress to blindness
- **Oxehealth**: Oxehealth's secure optical system is an assistant for when staff can't be there, paying attention to every room. It gives staff more time for hands-on care when and where they are needed most.
- **OxSyBio**: Developing 3D printing techniques to produce a range of tissue-like and functional tissues for medical research and clinical applications

Alec Nielsen
Founder & CEO, Asimov

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Alec Nielsen is founder and CEO of Asimov, a startup which programs living cells to create previously impossible biotechnologies. Asimov's genetic engineering platform combines computer-aided design, artificial intelligence, and synthetic biology.

Cory Kidd
CEO and Founder, Catalia Health

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Cory Kidd is the founder and CEO of Catalia Health, a patient care management company. The company develops a hardware and software platform that uses a combination of psychology and artificial intelligence to engage patients through interactive conversations. These conversations happen through mobile, web, and interactive robotic interfaces; together these interfaces create a relationship that can reach patients at any time they need support. The data reported back through the system gives Catalia Health's customers valuable information to understand the daily activities and needs of their patients.

Kidd is a serial entrepreneur who has been working in healthcare technology for nearly two decades. He received his MS and PhD at the MIT Media Lab in human-robot interaction and his BS in computer science at the Georgia Institute of Technology.

Ena Chan Cratsenburg
Chief Business Officer, Ginkgo Bioworks

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12:50pm Lunch with Startup Exhibit

Session B

1:50pm MIT Hacking Medicine and the Last Mile of Care Delivery

Over the past five years, digital health innovation has consistently attracted billions of dollars in venture capital amid healthcare payment reform and care redesign. Ancient problems are being attacked in different ways and dogma overturned with real world data. However, complex healthcare bureaucracies, giant vested interests by incumbents, and slow change by healthcare professionals continue to slow the adoption of the best solutions. Examples will demonstrate how startups and entrepreneurs are attacking old problems with new business models and tech-enabled solutions that scale care while collapsing costs.

Zen Chu

Co-Founder and Faculty Director, MIT Hacking Medicine
Senior Lecturer, MIT Sloan School of Management

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Zen Chu serves as Faculty Director of MIT's Hacking Medicine Initiative, and is a Senior Lecturer in Healthcare Innovation for both the MIT Sloan School of Management and Harvard-MIT Health Sciences & Technology program.

In partnership with Professors Martha Gray and Bill Aulet, Zen created and directs HST.978 MIT Healthcare Ventures, a graduate course that teaches entrepreneurship, business models, and venture creation around technology that can transform healthcare. Zen actively consults companies in pharma, health tech, and healthcare systems struggling to adapt to global digital healthcare transformation and emerging markets.

As managing director of Accelerated Medical Ventures, Zen specializes in building early-stage medical technology and healthcare service companies, usually serving as cofounder and first investor. AMV's portfolio spans Boston, Silicon Valley, and China, including PillPack.com, Call9.com, Figure1.com, NuRx.com, 3D-Matrix Medical [JASDAQ: 7777], Sofi.com, Curoverse Genomics (acq Veritas Genomics), BitGym.com, DirectDermatology.com, and a few companies still in stealth mode.

Alongside MIT professors Shuguang Zhang, Alex Rich, Alan Grodzinsky, and Bob Langer, Zen cofounded and served as ceo for 3D-Matrix Medical Inc., a venture-backed MIT regenerative medicine company with a successful IPO in 2011. 3D-Matrix has wound-healing and drug-delivery products on the market outside of the US and multiple human clinical trials in process.

He has managed and led new ventures for Harvard Medical School, Harvard's Wyss Institute for Bioengineering, NetVentures, and Hewlett-Packard. Zen earned a BS in biomedical/electrical engineering from Southern Methodist University and an MBA from Yale University. He is married to Katie Rae, a serial entreprenuer and CEO of MIT's Engine Fund. They are raising three aspiring entrepreneurs in Brookline, MA.

View full bio

2:20 Advanced Delivery Technologies for Nucleic Acid Drugs

Nucleic acid drugs are genomic medicines that have the potential to deliver a paradigm shift in healthcare via the development of novel precision medicines for degenerative diseases, rare diseases, and cancers. Such drugs include those for modifying gene expression (single stranded oligonucleotides), silencing genes (double stranded siRNA), switching on genes (mRNA), and editing genes (CRISPR RNA). The challenge of nucleic acid drug delivery is widely acknowledged as the major barrier to realizing the full potential of this new class of medicines. Thus, while their potential is transformational, successes at present are modest and limited to relatively straightforward targets, such as liver or local delivery indications. We are developing a series of disruptive nucleic acid drug delivery technologies (peptide and nanotechnologies) that will advance the next generation of nucleic acid drugs and accelerate the widespread application of genomic medicines.

Matthew Wood
Professor of Neuroscience, Department of Physiology, Anatomy and Genetics; Fellow of Somerville College, University of Oxford

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University of Oxford

Matthew Wood is currently a professor of neuroscience, deputy head of the Medical Sciences Division at the University of Oxford, directs the Laboratory of RNA Biology and Neuromuscular Disease, and directs Oxford University Innovation. In 2016, Wood directed and established the Oxford Centre for Translational Neuromuscular Science. As a pioneer of oligonucleotide therapies, Wood co-leads the International MDEX Consortium. He also has global influence in exosome / extracellular vesicle biology, which led to his founding and directing of Evox Therapeutics. Wood also is a director on the board of MedCity.

2:50pm Networking Break

Session C

3:20pm Future Healthcare Technologies to Enable Disruption in Patient Care and Delivery

Every healthcare system is amidst a transformation to change the way patients receive care, and with the aging population, management of health and chronic illnesses will be very different compared to how it occurs today. This could occur through a shift to value-based care or improving access to diagnostics and therapies. Advances in biology, computing, artificial intelligence, and engineering will be used to change healthcare practice. GE is constantly striving to enable such technologies to translate from research and early development to the clinic, where they can become impactful for patient care.

Rabia Ahmad
Director-Strategy, Search and Evaluation, GE Healthcare

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Rabia Ahmad is Director of Strategy, Search, and Evaluation at GE Healthcare, where she is focused on identification of trends and opportunities for life sciences business. Prior to this role, Ahmad managed the early stage neurology portfolio in GE Healthcare's core imaging business and worked on programs to develop novel imaging agents for diagnosis and therapy monitoring of patients with neurological disorders, such as Alzheimer's, Parkinson's, and multiple sclerosis. Ahmad completed holds a bachelors in biochemistry from Surrey University and a PhD in neuroscience from Roehampton University.

3:55pm

Wrap-up
Constantin Coussios
Director, Oxford Institute of Biomedical Engineering

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Director
Oxford Institute of Biomedical Engineering

Constantin Coussios is the Director of the Institute of Biomedical Engineering at the University of Oxford and the recipient of the 2017 Silver Medal of the UK's Royal Academy of Engineering. In 2008, he co-founded OrganOx Ltd., which developed the world's first normothermic perfusion device for improved organ preservation prior to transplantation. In 2014, Coussios was the lead academic founder of OxSonics Ltd., which exploits nanobubbles and ultrasound to enhance drug delivery to tumors. In 2016, he co-founded OrthoSon Ltd., which is developing a new minimally invasive technique for repair and replacement of the intervertebral disc. Coussios holds an MEng and PhD from the University of Cambridge.

4:00pm

Adjournment