INTERNATIONAL SYMPOSIUM

Where is Life Science Heading in the Future?

Technology driven science and healthcare: New opportunities and potential risks

Engelsbergs Bruk
9-10 May 2019
THURSDAY PROGRAM

13:30  **Welcome**
- Peter Elmlund - *Director, Urban City Research, Axel and Margaret Ax:son Johnson Foundation*
- Cecilia Schelin Seidegård - *Chairman of the board, Stockholm Science City Foundation*
- **Moderator Ingrid Heath** - *Senior Advisor, Adlerson Heath*

13:40  **Artificial intelligence - an introduction**
What is artificial intelligence?
How will artificial intelligence affect our society and industries?
How can we live and work in harmony with intelligent machines?
- Magnus Boman - *Professor of Intelligent Software Systems, KTH Royal Institute of Technology*
- Stefan Larsson - *Associate Professor in Technology and Social Change, Lund University*

**Panel discussion**

15:15  Coffee

15:45  **Artificial intelligence in healthcare**
How is artificial intelligence applied in healthcare today?
What are the opportunities and challenges?
From scientific applications to clinical practices - how to implement safely?
- Indra Joshi - *Clinical Lead, Digital Health & Artificial Intelligence, National Health Services UK*
- Henrik Grönberg - *Professor of Cancer Epidemiology, Karolinska Institutet*

**Panel discussion**

17:00  Break

17:15  **Engineering living things - a practical perspective**
- Andrew Hessel - *CEO, Humane Genomics Inc.*

18:15  Drinks

19:00  Dinner
FRIDAY PROGRAM

09:00 ADVANCED BIOTECHNOLOGY MADE ACCESSIBLE - EXTENSIVE OPPORTUNITIES AND POTENTIAL RISKS
In which ways can large scale genetic screening improve the current healthcare situation? How are new tools for genetic engineering used to better understand biology and medicine? Making genetic engineering accessible to everyone: what are the benefits and foreseeable risks of "DIY science"? New tools provide considerable possibilities, what is ethical and what isn't? Furthermore, what should be prioritized from an investment point of view?

• Lili Milani - Head of Personalized Medicine & Research, Estonian Genome Centre
• Fredrik Lanner - Department of Clinical Science, Intervention and Technology, Karolinska Institutet
• Bethan Wolfenden - Co-founder, Bento BioWorks Ltd.
• Lars Sandman - Professor and Director, National Centre of Priority Setting, Linköping University

PANEL DISCUSSION

11:00 Coffee

11:30 HEALTH, BIOTECHNOLOGY AND INTELLIGENT MACHINES: HOW DO WE PREPARE FOR THE FUTURE?
Technological breakthroughs are happening fast and in every field. How do we design strategies for the future? How can policies keep the pace with science and technological progress? For instance, how can individual integrity be balanced with the growing need for data to advance health care technologies and ensure steady progress in medical research? An ever-increasing number of diseases are becoming treatable - great news! But it will ultimately result in greater pressure on healthcare budgets. What and where should we prioritize?

• Jenni Nordborg - Director, National Coordinator Life Sciences, Government of Sweden. Head of Health Division, Vinnova
• Milan Popovic - Programme Officer, European Commission, DG Connect E-Health, Well-being and Ageing

PANEL DISCUSSION

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• Milan Popovic - Programme Officer, European Commission, DG Connect E-Health, Well-being and Ageing
• Lili Milani - Head of Personalized Medicine & Research, Estonian Genome Centre
• Andrew Hessel - CEO, Humane Genomics Inc.
• Stefan Larsson - Associate Professor in Technology and Social Change, Lund University

12:50 CONCLUSIONS: WHAT DO WE KNOW AND WHERE DO WE GO FROM HERE?

• Stefan Nordlund - Professor of Biochemistry and Biophysics. Member of the board, Stockholm Science City Foundation

13:00 Lunch

14:30 Bus departure to Stockholm
SPEAKERS

MAGNUS BOMAN - Professor of Intelligent Software Systems at KTH Royal Institute of Technology
Magnus Boman is a professor in Intelligent Software Services at KTH, Stockholm. He has 30 years’ worth of experience of AI research, in the last dozen years almost exclusively applied to human health. After ten years in epidemiology, he has lately focused on mental health, in particular on building learning machines for Internet-based cognitive therapies. Boman is working with clinicians and researchers in Sweden (Karolinska Institutet) and the UK (King's College, London). He just left RISE, where he was responsible for the Precision Medicine initiative. Boman is a Fellow at the Royal Society of Medicine, London, where he recently co-arranged the third in a series of roundtables on AI and Data Science for Mental Health. He is an alumnus of IIASA, Vienna.

HENRIK GRÖNBERG - Professor of Cancer Epidemiology at Karolinska Institutet
Henrik Grönberg's current position is as Professor at Karolinska Institutet, Departement of Medical Epidemiology and Biostatistics and also Process Owner, Prostate Cancer Center at St Görans Hospital in Stockholm.
His main research area is prostate cancer genetics and he has authored approximately 300 peer-reviewed articles in international scientific journals. He has been the PI of the clinical trial STHLM3 including over 58,000 men, in which a new test prostate cancer has been developed. He has also an on-going large research project; ProBio II – An adaptive and randomized multi-arm biomarker driven phase 2 study in men with castrate resistant prostate cancer (CRPC).
He has received several awards among others; Fernström Prize in 2001, Nordiska Medicinpriset in 2016 and EIT Innovation Award in 2017 for the Stockholm3 test.

ANDREW HESSEL - CEO at Humane Genomics Inc.
Andrew Hessel is the founder of Humane Genomics Inc., an early stage biotechnology company working on synthetic viruses targeting cancer, starting with dogs. Andrew is also the co-founder of the Genome Project-write (GP-write), the international scientific effort advancing the design, construction, and testing of large genomes, including the human genome. He is based in San Francisco, California.

INGRID HEATH (moderator) - Senior Advisor, Adlersson Heath
Ingrid Heath has broad experience from media, public affairs and the life science industry. She has served as Vice President and Director of Policy at SwedenBIO, the Swedish Life Science Industry Organization, where she oversaw the organisation's public affairs agenda and served on the Swedish Government's Senior Advisory Board for Life Science. She has held several managing positions in media, including the role as editor-in-chief at Swedish trade media Läkemedelsvärlden and Life Science Sweden. Ingrid holds an MSc in Molecular Biology from Lund University and a Master's Degree in Journalism from Stockholm University.

INDRA JOSHI - Clinical Lead Digital Health and Artificial Intelligence, National Health Service (NHS) UK
Dr. Indra Joshi is the Clinical Lead for NHS England's Empower the Person Portfolio overseeing the national citizen facing digital initiatives within the NHS with a focus on evidence, data, digital health standards and policy for AI. Indra has a unique portfolio with experience stretching across policy, governance, digital health and marketing, national project strategy and implementation; whilst remaining true to her professional training as an emergency medic. She is the Clinical Director of One HealthTech – a network which campaigns for the need and importance of better inclusion of all backgrounds, skillsets and disciplines in health technology. Alongside she is a Vice Chair for the British Computer Society (Health), an international speaker and consultant on digital health and an expedition medic.

STEFAN LARSSON, Associate Professor in Technology and Social Change, Lund University
Stefan Larsson is a lawyer, Senior Lecturer / Associate Professor in technology and social change at LTH, Lund University, and head of the Digital Society Program at Swedish think tank Fores. He has a PhD in Sociology of Law and a PhD in Spatial Planning. His research focuses on issues of trust and transparency on digital, data-driven markets, and the socio-legal impact of autonomous and AI-driven technologies.

FREDRIK LANNER
Assistant Professor at Department for Clinical Science, Intervention and Technology, Karolinska Institutet
Fredrik Lanner works to understand how the first cell types are specified and how pluripotency is controlled in the human embryo. Fredrik Lanner undertook his PhD thesis at the Karolinska Institutet, Stockholm in 2008 followed by postdoctoral research at The Hospital for Sick Children, Toronto. In Toronto he studied the role of FGF signaling in the early mouse embryo and embryonic stem cells. Having returned to Karolinska Institutet, he started his independent research lab in 2013 with the aim of translating knowledge established in the mouse to the human embryo. The lab has so far established a gen-road map describing human embryo development during the first two weeks of life. These studies will shed light on causes of infertility and how to safely use embryonic stem cells in regenerative medicine. His laboratory is now using genome engineering to understand the function of these genes.
LILI MILANI, **Head of Personalized Medicine & Research, Professor at Estonian Genome Center**

Lili Milani has a PhD degree in molecular medicine from Uppsala University, Sweden (2009). Her main areas of research have been epigenetics and pharmacogenetics – studying the genetics of inter-individual variation in drug response. She is now a research professor and head of the personalized medicine initiative at the Estonian Genome Center, University of Tartu. She is actively participating in preparing and implementing the national strategy for personalized medicine in Estonia in close collaboration with the Ministry of Social Affairs and Institute for Health Development. She was also a SciLifeLab fellow at the Department of Medical Sciences, Uppsala University.

JENNI NORDborg

**Director, National Coordinator Life Sciences, Government of Sweden & Head of Health Division at Vinnova**

Dr. Jenni Nordborg is also National Coordinator and Director of Life Sciences at the Government Offices of Sweden. The Office for Life Sciences coordinates policy between the Ministry of Social Affairs, the Ministry of Research and Higher Education, the Ministry of Enterprise and Innovation, and is responsible for forming a new Swedish Life Science Strategy. Dr. Nordborg is active in strategic innovation policy development and implementation within health and life science on national and international level. Her research background is from Chalmers University of Technology. She has experience from senior management positions in both the private and public sector, and entrepreneurial background from commercialization of research, and international marketing and sales experience. She also has experience in board level positions both in private companies and governmental organizations and is currently active on the Board of Nordic Innovation.

STEFAN NORDLUND

**Professor of Biochemistry, Department of Biochemistry and Biophysics, Stockholm University. Member of the Board, Stockholm Science City Foundation**

Stefan Nordlund has a PhD in Biochemistry from Stockholm University. His research has been in understanding regulation of enzymes, with focus on enzymes involved in nitrogen fixation and assimilation in the photosynthetic bacterium Rhodospirillum rubrum. He has also been head of the Department of Biochemistry and Biophysics and the Faculty of Science at Stockholm University. Stefan Nordlund is member of the board of Stockholm Science City Foundation.

MILAN POPOVIC

**Programme Officer, European Commission, DG Connect E-Health, Well-being and Ageing**

Milan Popovic is a Programme Officer at the Unit for E-Health, Well-Being and Ageing in DG CONNECT. He is monitoring a portfolio of projects on the use of digital technologies for diabetes and psychiatric disorders and contributes to policy initiatives in genomics. He previously worked in the Unit for Data Policy and Innovation (DG CONNECT), the Innovative Medicines Initiative Joint Undertaking, the Unit for Innovative and Personalised Medicine (DG RTD) and the pharmaceutical company Roche. His educational background includes a Master of Science in Human Evolution and Behaviour and a Bachelor of Science in Biochemistry. As part of his thesis on the Future of Personalised Medicine, he examined the scientific, socio-economic and ethical issues that need to be resolved for the effective translation of pharmacogenomics into wide-spread clinical practice.

LARS SANDMAN

**Professor and Director at National Centre of Priority Setting in Healthcare, Linköping University**

Lars Sandman is professor of health-care ethics and Director for the National Centre for Priorities in Health at Linköping university. His research focus on resource prioritization, ethical analysis of new health technologies and shared decision-making. He is a frequently used ethics consultant at different levels of the health-care sector and is part of the following boards and councils: The National Board of Health and Welfare’s ethics council, The Swedish Agency for Health Technology Assessment and Assessment of Social Services scientific council, The New Therapies Council, Sahlgrenska University Hospital ethics council, The Program and Priorities Council in Västra Götaland region, and he is also Scientific consultant for The Swedish Dental and Pharmaceutical Benefits Agency.

BETHAN WOLFENDEN

**Co-founder of Bento Bioworks Ltd.**

Bethan Wolfenden is one of the creators of Bento Lab, the world’s first easy-to-use laptop-sized DNA laboratory. She and her team are on a mission to do for biotechnology what Raspberry Pi has done for electronics and computing – making it accessible and affordable to all. Before Bento Lab, she studied Biochemistry and Synthetic Biology at University College London. She is passionate about STEM education, science literacy and citizen science.
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