UK Government

Scottish Government
Riaghaltas na h-Alba

AI for Engineering Biology:

Transatlantic cooperation on data, models and standards

Event hosted by the UK's Department for Science, Innovation and Technology (DSIT) in partnership with the University of Edinburgh and supported by the Scottish Government.

Scan to view the live event agenda

eil.ac/sym-live

THE UNIVERSITY of EDINBURGH

EDINBURGH INNOVATIONS

Dame Angela McLean

Government Chief Scientific Adviser, Government Office for Science

I am delighted to welcome you to this symposium, co-organised by the UK Government's Department for Science, Innovation and Technology (DSIT) and the University of Edinburgh and supported by the Scottish Government.

The event, which is multi-stakeholder and multi-disciplinary, convenes experts to discuss a strategic question: how can we ensure that our collection, storage and use of biological data support AI-enabled approaches at the frontier of engineering biology?

The DSIT team which planned this symposium spoke to more than forty experts in preparation, many of whom are participating. They heard that AI-enabled approaches in biology make the way we collect and handle our data significantly more consequential than in the past. Those hoping to capitalise on the AI opportunity in engineering biology will need to evolve their methods and perspectives.

Over the two days, we should think about this in terms of three Cs: challenges, catalysts, and coalitions.

- **Challenges:** What is currently not possible in engineering biology that we would like to be possible, and where might AI realistically help?
- **Catalysts:** What does it mean to have suitable data which enables successful AI-enabled interventions? If we are going to generate and steward the data required, how should we do it?
- **Collaboration:** How can we work together to achieve the greatest positive impact? Whose interests and perspectives must our work reflect and respect?

The UK and the US are wise to go on this journey together. The US's Genesis Mission is audacious, and the US will doubtless pursue it with a confidence and at a scale implausible for any other country. But the UK's AI for Science Strategy tells a startlingly similar story about the opportunity we have in front of us and what should be done to grasp it. Coordination of scientific effort here is often nimbler than in the US, and the biology and computer science talent here is equal to that found anywhere else.

Among our group for the next two days are experts in engineering biology, AI, data engineering, research engineering, philosophers, ethicists, social scientists, funders and government officials. The interests of all these communities must be reflected in our discussions. We will have to engage with empathy and understanding to overcome differences in expertise and orientation.

I look forward to taking this important first step alongside you.

- Dame Angela McLean

Aaron Payne

Head of International Policy, Engineering Biology, Department for Science, Innovation and Technology

Aaron shapes DSIT's international strategy for engineering biology, and led the preparations for this symposium. He specialises in the intersection between international relations and technology policy. In previous roles he strengthened the government's support offer to universities with security-sensitive research programmes, authored a Cabinet Office review of the GREAT Campaign's communications strategy, and worked on the counter-disinformation response to the 2018 Salisbury poisoning. He started his career at the Daily Mail newspaper, and retains a keen interest in strategic communications.

Ajikumar (Aji) Parayil

Founder & Chief Executive Officer, Manus

Ajikumar "Aji" Parayil is an entrepreneur with more than 20 years of experience in technological innovation and commercialization. He is the Founder and CEO of Manus, the proven bioalternatives scale-up platform.

He developed Manus' core technology platform at the Massachusetts Institute of Technology (MIT), founded the company in 2011, and has since led the successful commercialization of multiple products – bioalternatives – made through precision fermentation. At Manus, he drives the acceleration of the transition to BioAlternatives by delivering the benefits of biomanufacturing, today.

Notably, Aji has pioneered several novel methods for engineering chemistry using biology to biomanufacture complex natural chemicals.

Alice Chappell

AI and Technology Engagement Manager, Government Office for Science

Helping ensure policy makers have access to the latest evidence on AI and other emerging technologies. Connect experts with decision makers, building relationships across government to make sure we're bringing AI insights together at the right time.

Ally Chang

Senior BD Director – AI and Alliances,
Wyss Institute at Harvard University

Innovation leader, scientist and business leader committed to drive AI in biology and corporate innovation. 20 years of experience in three continents across biomedical research, startup, deal transaction, business strategy and innovation in Fortune 500 life sciences.

Currently, Ally is the Senior Director of Business Development at Wyss Institute at Harvard University leading Translational AI Catalyst and Alliances Management

Amanda Collis

Executive Director – Research Strategy and Programmes,
UK Research and Innovation - Biotechnology and Biological Sciences Research Council (BBSRC)

Dr Amanda Collis has extensive experience across the UK research and innovation landscape, with particular interests in discovery and mission-driven research, international partnerships, multidisciplinary approaches and research infrastructures. As Executive Director for Research Strategy and Programmes at UKRI's Biotechnology and Biological Sciences Research Council, she leads frontier and interdisciplinary research, horizon scanning, responsive and strategic programmes, international partnerships, and research infrastructures. Amanda chairs the OECD Global Science Forum and serves as a UK delegate and Vice Chair of the EMBL Council. She is a Fellow of the Learned Society of Wales and the Royal Society of Biology, and holds a degree in Plant Sciences and a PhD in fungal molecular biology.

Amanda Hildebrand

Vice President, Science and Technology,
The Good Food Institute

I serve as Vice President of Science and Technology at the Good Food Institute (GFI), where I lead efforts to catalyze scientific advances that accelerate alternative proteins' path toward sensory, price, and scale parity with conventional meat. GFI does this by identifying the most critical technical gaps and bottlenecks, directing funding toward high-impact research, and building and steering a global research and education ecosystem that supports the field's growth.

Amy Strange

Head of Software Engineering and Artificial Intelligence, The Francis Crick Institute

Amy Strange is Head of Software Engineering & AI at the Francis Crick Institute, leading a multidisciplinary team of research software engineers and machine learning specialists. Since joining in 2016, she has driven the delivery of secure, reproducible and high-quality software to accelerate scientific discovery and translation into clinical impact. With over 15 years' industrial leadership experience, Amy champions best practices in engineering, reproducibility and open science. She collaborates widely across academia, industry and hospitals, co-leads national consortia, and oversees AI partnerships with major pharmaceutical and international research organisations.

Angela McLean

Government Chief Scientific Adviser, Government Office for Science

Professor Dame Angela McLean DBE FRS is the UK Government Chief Scientific Adviser, a role she assumed in April 2023.

A mathematical biologist, she previously served as Chief Scientific Adviser at the Ministry of Defence and was Professor of Mathematical Biology at the University of Oxford. Her research focuses on using mathematical models to understand the evolution and spread of infectious diseases. She is a Fellow of the Royal Society and recipient of the Gabor Medal (2011) and Weldon Memorial Prize (2018). She received her damehood in 2018

Austin Che

Founder, Ginkgo Bioworks

Austin is a co-founder of Ginkgo Bioworks. Ginkgo operates at the convergence of biotech, AI, and advanced laboratory robotics, building the tools to make biology easier to engineer. Autonomous labs developed by Ginkgo bridge the gap between bits and atoms, enabling the generation of massive, high-fidelity datasets and AI-driven science. Austin holds a Ph.D. in Electrical Engineering and Computer Science from MIT and an undergraduate degree from Stanford.

Carole Goble

Professor, The University of Manchester / ELIXIR UK

30+ years at the forefront of technology/policy for FAIR digital infrastructure, data, and computational workflows. Head of ELIXIR-UK national node of ELIXIR, European Research Infrastructure for Life Science Data; founded the digital infrastructure for IBISBA European Research Infrastructure for Industrial Biotechnology and Biomanufacturing ; co-lead of FAIRDOM consortium Systems Biology data/model sharing. Co-founder UKRI's national Digital Research Infrastructure for Bioscience (BioFAIR); UK expert representative G7 Open Science Working Group; member of UKRI DRI Advisory Group for Data.

Carolina Grandellis

Head of Biofoundry, Earlham Institute

Carolina Grandellis is a molecular biologist specialiing in plant–microbe interactions and engineering biology applied to agriculture. She is Head of the Earlham Biofoundry at the Earlham Institute (UK), where she leads the development of automated platforms and highthroughput screening for synthetic biology projects. She obtained her PhD in Plant Biology from the University of Buenos Aires, investigating genetic regulation of potato development. Before joining the Earlham Institute, she worked at BIOCERESINDEAR and in the 2Blades group at The Sainsbury Laboratory, focusing on resistance genes to improve disease tolerance in maize and soybean.

David Ross

Project Leader, NIST Living Measurement Systems Foundry, National Institute of Standards and Technology

David Ross is a project leader at the National Institute of Standards and Technology (NIST), where he currently leads the Living Measurement Systems Foundry. David's work focuses on the development of protocols and standards for the generation of large-scale AI-ready datasets to enable prediction of protein function from sequence. David received a B.S. in physics from Caltech and a PhD in physics from the University of California, Irvine. After a postdoctoral stint at the École Normale Supérieure in Paris, David took a position at NIST in 1999, where he is now a senior scientist and project leader.

Debora Marks

Professor, Harvard Medical School

Dr. Debora Marks is a computational biologist, with focus on developing new AI methods to accelerate biotherapeutic and sustainability discovery. Her lab developed novel machine learning methods specifically for biological data with an emphasis on interpretability and causality. Marks' lab was able to predict 3-dimensional protein structures from sequence alone, predict fitness effects of human genetic variation, and make robust generative models for protein, antibody, and deimmunization and vaccine designs. Marks has received numerous awards including an NIH Director's Transformative award for antibody design (2020). Marks leads a multi-institutional team funded by CEPI for Predictive Modeling for Vaccine Escape.

Deepti Tanjore

Director of the ABPDU and Head of the Department, Process Engineering and Analytics, Lawrence Berkeley National Laboratory

Deepti Tanjore interfaces with several scientists from industry, academia, and start-ups in strategizing and resolving scale-up challenges for their synthetic biology-based technologies. Her research focuses on developing self-driving bioreactor capabilities by modeling the impact of bioprocess conditions on microbial heterogeneity and developing in-line analytical tools for real-time adaptation of process development. She has a PhD from Penn State University in Biological Engineering, BTech from Andhra University in Chemical Engineering, and an MBA from Haas School of Business.

Diego Oyarzún

Professor of Computational Biology & Head of ML Engineering, University of Edinburgh / Generative Biology Institute, Ellison Institute of Technology Oxford

Prof Oyarzún works at the interface of biology and computation, specializing in biological sequence optimization using AI and machine learning. His portfolio includes applications in gene therapy, sustainable manufacturing, and environmental remediation. Prof Oyarzún has led multiple initiatives at the interface of biology and AI, including the £8M UKRI Centre for Doctoral Training in Biomedical Artificial Intelligence, and has had roles with global multi-stakeholder bodies (World Economic Forum, G20, OECD). In his current role at Generative Biology Institute, he leads the AI/ML strategy, infrastructure, and innovation in Engineering Biology across the organisation.

Duygu Dikicioglu

Associate Professor in Digital Bioprocess Engineering, University College London / Department of Biochemical Engineering

Duygu Dikicioglu is an Associate Professor in Digital Bioprocess Engineering at UCL. Her research focusses on the use of automation, modelling, data management, analytics and statistics in systems bioengineering and systems biology. Her group develops tools and pipelines to address specific digitalisation and data challenges in AI and ML applications in bioprocess industries.

Fergal Martin

Lead for Ensembl Genome Annotation, EMBL-EBI

Fergal has over two decades of experience in the field of genomics. His team produces genome annotations for the Ensembl project, used by hundreds of thousands of researchers per year. He is a leader in biodiversity and human genomics and serves as Head of the GENCODE consortium, overseeing the development of the human and mouse reference gene sets. His primary interests are in building new systems for genome annotation through deep learning, provision of AI-ready datasets and the application of agentic AI to workflows.

Florence Chaverneff

Senior Science & Innovation Officer, UK Science and Technology Network

Florence Chaverneff joined the UK Science & Technology Network at the British Consulate in San Francisco as Senior Science & Innovation Officer in 2021. In this role, she identifies and creates opportunities in emerging technologies in Northern California and the Pacific Northwest for UK stakeholders through strategic partnerships at the academic, industrial, and policy levels, and provides policymakers with information for evidence-based decision-making. Florence is the Science & Technology Network Lead for Quantum, liaising with Whitehall, developing the sector plan, and coordinating activities across the U.S. network. Florence is a neuroscientist and stem cell biologist by training.

Filippo Menolascina

Professor of Engineering Biology,
University of Edinburgh

Filippo Menolascina holds the Chair of Engineering Biology at the University of Edinburgh. An Electrical Engineer and Computer Scientist by training, with his doctoral work, Prof Menolascina pioneered the field now known as cybergenetics. Prof Menolascina is the current Director of the Centre for Engineering Biology at the University of Edinburgh; he is a serial entrepreneur and advisor to Venture Capital firms.

Giovanni Stracquadanio

Professor of Engineering Biology,
University of Edinburgh

Giovanni Stracquadanio is a Professor of Engineering Biology at the University of Edinburgh, where he also serves as Deputy Director of the Centre for Engineering Biology and Co-Director of the Edinburgh Genome Foundry (EGF).

His research focuses on uncovering the genetic and molecular mechanisms underlying human diseases and translating these insights into next-generation therapeutics using generative AI and engineering biology. His group currently works on developing next-generation therapies for Lysosomal Storage Diseases (LSDs. In addition, Dr. Stracquadanio is the co-founder and CEO of ZYTHERA, a University of Edinburgh a start-up dedicated to developing next-generation LSD therapies.

Gos Micklem

Professor of Computational and Molecular Biology,
University of Cambridge

Gos Micklem is Professor of Computational and Molecular Biology at the University of Cambridge. His career has included two spells in biotech companies. The most recent was a year spent as Special Advisor to Colorifix, which is synthesising dyes in microbes as a cleaner alternative to the highly polluting dyeing industry. This provided many interesting molecular and computational challenges including in current areas of AI. He runs a wet and dry lab with interests in enzyme design and directed evolution, large-scale data integration and analysis, and tackling antimicrobial resistance.

Hannah Boardman

Director for Technologies, Growth & Security, Department for Science, Innovation and Technology

Director for Technologies, Growth & Security in the Department for Science, Innovation and Technology. Responsible for the secure proliferation of emerging technologies including Engineering Biology, Quantum Technologies, Robotics and Advanced Materials, determining how Government invests, regulates and partners with academia, industry and other countries. Hannah also leads core elements of the UK's Industrial Strategy focused on the high growth Science and Technology sectors and is responsible for the direct investment activity of the National Security Strategic Investment Fund (NSSIF) as a core intervention in the security and growth of emerging technologies.

Hannah Hunter

AI-Bio Policy Lead, Engineering Biology, Department for Science, Innovation and Technology, HMG

Hannah is the Policy Lead for the AI-Bio portfolio in the Engineering Biology team as part of the Department for Science Innovation and Technology. The portfolio considers the opportunities arising from AI-Bio convergence for sector growth and innovation, in addition to how government can best understand risks arising from AI-Bio convergence, and where interventions can foster secure and resilient economic growth and adoption of AI capabilities.

Hannah has recently undertaken a secondment as a Visting Fellow in AI -Bio convergence at the Centre for Emerging Technology and Security, as part of the Alan Turing Institute.

Huimin Zhao

Professor, Director of NSF AI Institute for Molecule Synthesis, NSF iBioFoundry, and NSF Global Center for Biofoundry Applications, and Editor in Chief of ACS Synthetic Biology,

Dr. Huimin Zhao received his B.S. degree in Biology from the University of Science and Technology of China in 1992 and his Ph.D. degree in Chemistry from the California Institute of Technology in 1998. Prior to joining UIUC in 2000, he was a project leader at the Dow Chemical Company. Dr. Zhao has authored and co-authored over 480 research articles and over 30 issued and pending patent applications. His primary research interests are in the development and applications of synthetic biology, artificial intelligence, and laboratory automation tools to address society's most daunting challenges in health, energy, and sustainability.

Ian Graham

Weston Chair of Biochemical Genetics, University of York

Ian is the Weston Chair of Biochemical Genetics in the Centre for Novel Agricultural Products at the University of York, with research focused on understanding plant metabolism and genetic improvement through engineering of plants and microbes for production of small molecule natural products. Much of his research is in partnership with industry (for example Croda and Sun Pharmaceuticals), with funding also from UKRI.

Ian is a Science Trustee of the Royal Botanic Gardens, Kew, Chair of the Royal Society Industry Fellowships Scheme, Academic lead for BioYorkshire, and until January 2026 was Director of the BBSRC funded High Value Biorenewables Network.

Isabel Webb

Deputy Director, Technology Strategy and Security, Department for Science, Innovation and Technology

Dr Izzy Webb is Deputy Director for Technology Strategy and Security at the UK Department for Science, Innovation and Technology (DSIT). She leads policy on critical and emerging technologies including robotics, engineering biology and advanced materials.

Izzy has previously held senior roles in the Prime Minister's Policy Unit and the Business Secretary's Office, covering science, innovation and technology. She began her career as a scientist, holding a PhD in molecular microbiology.

Isobel Merrett

Engineering Biology International Senior Policy Adviser, Department for Science, Innovation and Technology (DSIT)

Isobel works on the UK's bilateral and multilateral engineering biology policy and supported preparations for the symposium. She contributes to the UK's international approach to engineering biology, working with partners to deepen collaboration and respond to the opportunities and risks of emerging technologies. Before joining DSIT, Isobel served in the Foreign, Commonwealth & Development Office (FCDO), including on European affairs. She has a strong background in international strategy, cross-government coordination and science diplomacy.

James McCafferty

Chief Information Officer, Wellcome Sanger Institute

James is Chief Information Officer at the Wellcome Sanger Institute, where he leads research data, informatics and AI infrastructure supporting large-scale genomics and engineering biology. He has established institute-wide AI-ready data standards, embedding provenance, metadata quality, interoperability and secure governance across more than 90 petabytes of biological data. James has overseen high-volume sequencing pipelines and integrated compute platforms spanning HPC and cloud, enabling reproducible, model-ready datasets. He advises various UK national bodies on research data infrastructure and transformative technologies, with a focus on standards-based, responsible AI deployment to accelerate engineering biology and AI-driven science.

Jane Calvert

Professor of Science and Technology Studies, University of Edinburgh

Jane Calvert is Professor of Science and Technology Studies at the University of Edinburgh. Her research is on the social studies of the life sciences, particularly synthetic biology. She works in close collaboration with scientists, engineers, artists, designers and policy makers.

Jeantine Lunshof

Philosopher Ethicist, Senior Research Scientist, Harvard Medical School

Jeantine Lunshof studied Philosophy and Tibetan Language and Culture in Hamburg and Amsterdam. She obtained her PhD from VU University Amsterdam with a thesis on advanced genomic technologies and innovation in Ethics. Jeantine was awarded a Marie Curie Fellowship by the European Commission. She developed the practice model of Collaborative Ethics on the workfloor of the lab. Jeantine's research interests are in philosophical research ethics in genomic sciences and biological engineering where disruptive technological innovations call for epistemological and normative exploration; current focus is on xenobots, cyborg organoids, expanded DNA alphabets, AI-agents.

Jhuma Sadhukhan

Professor, University of Surrey

Professor Jhuma Sadhukhan (FIChemE, CEng and CSci) is the Associate Director and Data Manager for the Global Center for Sustainable Bioproducts and Carbon-Loop Advanced Manufacturing Hub. She Co-leads ELEMENTAL Metal Engineering Biology Mission Hub and EBNet. Being in the top 1% most cited researchers and author of Wiley's Advanced textbook, Biorefineries and Chemical Processes: Design, Integration and Sustainability Analysis, Jhuma is a world-leading specialist in LCA/TEA, scale-up, process integration, biorefineries, and circular bioeconomy. She is the Founder of Clove Circle Ltd., specialised in LCA/TEA education and CPD, engineering design and platform technology licensing.

John Basl

Associate Professor of Philosophy,
Northeastern University

John Basl is a scholar working in AI ethics, especially on issues of governance and ethics infrastructure and transparency in AI systems. He leads AI and Data Ethics Initiatives for the Northeastern Ethics Institute.

Julian Braybrook

Director, National Laboratories, LGC & UK Government Chemist, LGC Limited

Director, National Measurement Laboratory & UK Designated Institute for chemical & bio-metrology, with responsibility for establishing & implementing sovereign measurement science strategy & delivery, including partnerships. >30 years' proven track record in developing & implementing successful measurement research strategy & responsible innovation, knowledge transfer & exploitation for private & public sector businesses, & in independently informing government & commercial policy, standards & regulation.

UK Government Chemist providing the independent statutory referee role for food & feed & advisory role to government.

Chair & UK Lead for national & international documentary standards committees for biotechnology.

Member, BIA Advisory Committees.

Jussi Taipale

Senior Group Leader, Wellcome Sanger Institute

I am a biochemist with experience in both experimental and computational work. The focus of my career was initially signal transduction; during the course of work in my independent laboratory, we started to focus more on gene expression and its regulation by transcription factors.

My laboratory has a long-standing interest in growth control and cancer, and specifically on how genetic variation affects cancer risk. For this purpose, we have developed several technologies and led the field in mouse modelling of cancer risk variants

Kathryn Richmond

Vice President, Science, Fund for Science and Technology

Kathy Richmond helps guide the Fund for Science and Technology's bioscience strategy and is a scientist with over 25 years of executive experience in philanthropic foundations and nonprofit research organizations. Richmond previously served as an Executive Vice President at the Allen Institute leading their Office of Science and Innovation and worked with Allen Family Philanthropies to drive over $250M of philanthropic investments. She currently is a trustee of the Board of Directors at the Morgridge Institute and participates in multiple advisory groups within the philanthropic sector.

Lorraine Kerr

Director of Strategic Initiatives,
Edinburgh Innovations, The University of Edinburgh

Lorraine leads the Strategic Initiatives team at Edinburgh Innovations, the commercialisation service of the University of Edinburgh. She works extensively in the engineering biology space developing larger propositions, strategic partnerships with key companies and novel funding mechanisms. With wide-ranging experience and connections in the bioeconomy sector, she is also member of the Scottish Bioeconomy Council and sits on the Advisory Board for the Edinburgh Genome Foundry.

Lucia Marucci

Professor of Systems and Engineering Biology, EPSRC Fellow, University of Bristol

Lucia Marucci is a computational and systems biologist with experience spanning engineering biology, mathematics, automatic control engineering and AI. Lucia directs the BBSRC/EPSRC Centre for Doctoral Training in Engineering Biology, and the recently funded Digital Engineering Biology Accelerator in Bristol. She secured >£33M (>£17M as PI, including an EPSRC fellowship) from cross-disciplinary agencies (EPSRC, BBSRC, MRC, Horizon2020). She is part of the management committee of the BBSRC AI-BIOUK network. Key research contributions include the development of control-based strategies for automatic cell programming and the integration of whole-cell models with machine learning for predictive genome design.

Marianne Ellis

Professor of Bioprocess & Tissue Engineering, University of Bath

Marianne Ellis, BEng, PhD, CEng, MIChemE, is Professor of Bioprocess & Tissue Engineering at the University of Bath and Director of the EPSRC-funded Sustainable Manufacturing Hub 'CARMA'. Her research focuses on bioprocess design and sustainable manufacturing for cellular agriculture, alongside scaleup of nonanimal technologies and cellbased systems. A founding member of the UK cellular agriculture community, she has advised UK and international government bodies on responsible innovation and advanced biomanufacturing for cellular agriculture. Marianne has twice translated university research into industry, cofounding two companies, including Cellular Agriculture Ltd.

Mary Shin

Senior Science & Technology Officer, UK Science & Technology Network

Mary Shin, MSc, MPhil, is a Senior Science & Technology Officer for the UK Science & Technology Network in the US, based at the British Consulate-General in Boston. While focusing on the New England region, she also leads the engineering biology subsector for the US Network, and supports the biosecurity subsector. Mary received a BS in electrical engineering with a double major in psychology from Johns Hopkins University, an MPhil in technology policy from the University of Cambridge, UK, and an MSc in Bioethics from Harvard Medical School.

Max Ryadnov

NPL Fellow in Biometrology, Head of Engineering Biology, National Physical Laboratory

Max leads Engineering Biology at NPL. He is an NPL Fellow in biometrology, Professor of biophysics, Director of the UK's reference biofoundry and holds a PhD in Chemistry. In his role Max is responsible for pre-normative research, metrology and standardisation with an emphasis on sector-agnostic biomanufacturing. His team has delivered 3rd party projects with over 80 UK companies across TRLs, having secured a substantial grant portfolio from UKRI, ISCF, ISPF, EURAMET, STFC and industry. He is a member of standardisation and metrology fora (ISO, CCQM) and chairs a technical working area in VAMAS, which provides international leadership for standardization in EngBio.

Megan Sperry

Senior Scientist, Wyss Institute for Biologically Inspired Engineering at Harvard University

Megan Sperry, PhD, is a computational biologist at the Wyss Institute for Biologically Inspired Engineering at Harvard University. She leads an interdisciplinary research group focused on integrating transcriptomics, proteomics, metabolomics, and advanced computational modelling to uncover disease mechanisms and accelerate therapeutic discovery. Her work leverages AI-driven approaches to interpret high-dimensional biological data and identify drug repurposing opportunities, with current applications spanning neurobiology, metabolism, and radiation injury in human organ-on-chip systems.

Mohammed AlQuraishi

Professor of Systems Biology, Columbia University

Mohammed is an Assistant Professor in the Department of Systems Biology and a member of Columbia's Program for Mathematical Genomics, where he works at the intersection of machine learning, biophysics, and systems biology. The AlQuraishi Lab focuses on two biological perspectives: the molecular and systems levels. On the molecular side, the lab develops machine learning models for predicting protein structure and function, protein-ligand interactions, and learned representations of proteins and proteomes. On the systems side, the lab applies these models in a proteome-wide fashion to investigate the organization, combinatorial logic, and computational paradigms of signal transduction networks.

Michael Ball

Associate Director of Data Science,
The Medical Research Council

Dr. Michael Ball has worked in roles bridging science, strategy, and policy to support data science and research infrastructures in MRC, BBSRC and ESRC since joining BBSRC in 2008. Currently serving as Associate Director of Data Science at the MRC (Medical Research Council), he oversees strategic development and management of projects, such as Health Data Research UK and UK Biobank.

Neil Hall

Director, Earlham Institute

Professor Neil Hall has worked in the field of genomics and data science for over 20 years.

Neil is the Director of the Earlham Institute, a BBSRC funded research organisation developing technology in genomics, engineering biology and data science to accelerate discovery in food security and human health.

Neil's previous roles include leading The Centre for Genomic Research at the University of Liverpool, and research groups at the Wellcome Sanger Institute and The Institute for Genomic Research (TIGR). His research has focused on understanding evolution of virulence of parasitic protists including Plasmodium falciparum, Trypanosoma brucei. He has also led efforts to decode plant genomes including that of bread wheat.

Nigel J. Mouncey

Director, DOE Joint Genome Institute

Dr. Mouncey serves as the Director of the U.S. Department of Energy's Joint Genome Institute, a National User Facility, that serves more than 2500 users with large-scale data and advanced genomics capabilities. He also leads JGI's Secondary Metabolites Science Program that weaves together sequencing, genome mining, synthetic biology and metabolomics to discover novel secondary metabolites, their biosynthetic pathways and functional characterization. Prior to joining JGI, Dr. Mouncey served for almost 20 years in R&D leadership roles in Industrial Biotechnology directing R&D teams that focused on the discovery, development and commercialization of novel production organisms and fermentation processes.

Nicola Patron

Associate Professor, University of Cambridge

Nicola is an Associate Professor in the Department of Plant Sciences. Her research uses synthetic biology approaches to understand plant growth and metabolism, with the aim of driving innovation in agriculture and biomanufacturing. Her lab aims to develop new knowledge and technologies to optimise crops performance and to provide sustainable access to natural products used in medicine and agriculture.

Paul Freemont

Professor / Co-director of SynbiCITE,
Imperial College London

Professor Paul Freemont is co-founder and co-director of the National UK Innovation and Knowledge Centre for Synthetic Biology (SynbiCITE - since 2013) and director of the London BioFoundry (since 2016). His research focuses on developing automation and integrated biofoundries for synthetic biology applications. He is a council member of US Engineering Biology Research Consortium and recently led an international Task Force on Engineering Biology Metrics and Technical Standards for Global Bioeconomy. He also co-chairs the newly formed UK Governments Ministerial Engineering Biology Advisory Panel. He is co-founder of Solena Materials Ltd and SynBioVen Ltd, an early-stage seed investment company.

Peter Burlinson

Research Strategy and Programmes, UKRI: BBSRC

I work within the Biotechnology and Biological Sciences Research Council (BBSRC), part of UK Research and Innovation (UKRI). I serve as one of the Heads of Research Strategy and Programmes, with a focus on fundamental discovery research. My team is responsible for a diverse portfolio of strategic activities, including:

Large-scale team science initiatives, support for research networks, high-risk, exploratory research grants, & development of interdisciplinary scientific themes, such as the integration of artificial intelligence in bioscience.

My academic background is in molecular biology and biochemistry. Prior to joining BBSRC I worked as a postdoctoral researcher in Canada and France.

Pete Kelly

Co-founder, Head of Science, The Align Foundation

Pete Kelly is Co-Founder and Head of Science at The Align Foundation, a nonprofit building AI-ready biological datasets to advance predictive biology. He leads multi-institution collaborations that generate standardized, scalable data for machine learning, including protein engineering benchmarks and large genotype-to-phenotype programs. Align partners with academia, government, industry, and philanthropy to create open datasets and evaluation frameworks that accelerate model-driven discovery.

Peter Koo

Associate Professor, Cold Spring Harbor Laboratory

Dr. Peter Koo is an Associate Professor at the Simons Center for Quantitative Biology at Cold Spring Harbor Laboratory in the United States. He leads a research group at the intersection of artificial intelligence and genomics, focused on developing interpretable and generalizable machine learning models to decode gene regulation. His work integrates computational modeling with functional genomics to understand how DNA sequence drives cell type–specific gene expression and disease risk, with additional applications in histopathology. He received his Ph.D. in Physics from Yale University and completed postdoctoral training at Harvard University before transitioning into AI-driven genomics research.

Pierre-Aurélien Gilliot

ML Research Scientist, Constructive Bio

PA is a ML Scientist specializing in genetic sequence modelling. His work spans deep predictive and generative models for mRNA and genetic systems — built and deployed within lab-in-the-loop campaigns where computational design and experimentation actively co-evolve. A central thread of his work is making each iteration maximally informative: aligning models to experimental data, reasoning under uncertainty, and developing standardized assay frameworks that turn biological measurements into reliable learning signal. His broader ambition is to show that this closed-loop paradigm — when done right — can accelerate, and in some cases enable, engineering campaigns from programmable genetic parts to de novo genome design.

Rennos Fragkoudis

Head of Edinburgh Genome Foundry,
The University of Edinburgh

Dr. Rennos Fragkoudis heads Edinburgh Genome Foundry, specialising in engineering biology and high-throughput DNA assembly and phenotyping. He leads the development and delivery of complex synthetic biology projects, combining high-level automation, data-driven design, and precision workflows. His efforts focus on optimising the EB design-build-test-learn cycle ensures scalable, reliable engineering of biological systems that accelerate responsible research and innovation across academia and industry in health, sustainable manufacturing, and biotechnology.

Ricardo Valencia

Postdoctoral Research Scientist,
Earlham Institute

Postdoctoral Scientist, Earlham Institute. PhD University of Edinburgh. My current research focuses on deep learning and mathematical modelling of the microbiome and metabolism, spanning both quantitative and molecular approaches. I am currently working on foundation models for the microbiome, and molecular datasets for non-human diseases.

Rohan A. Shirwaiker

James T. Ryan Distinguished Professor in Industrial & Systems Engineering and Director of Bezos Center for Sustainable Protein, NC State University

Rohan A. Shirwaiker is an interdisciplinary educator, researcher, and thought leader working at the intersection of advanced manufacturing and biotechnology. His technical expertise spans product, process, and systems engineering for regenerative medicine and sustainable food applications. He leads the Bezos Center at NC State, whose mission is to address critical precompetitive challenges in the biomanufacturing of plant-based, cell-cultivated, and fermentation-enabled proteins. Dr. Shirwaiker is a Fellow of IISE and a recipient of awards including the NSF CAREER and SME Outstanding Young Manufacturing Engineer. He is actively engaged in various regional, national, and international scholarly and community initiatives.

Robert Deller
Programme Manager, Medical Research Council

Programme Manager at the Medical Research Council within UK Research and Innovation. Situated within the Molecular and Cellular Medicine Board with interests relevant to Engineering Biology particularly in the context of improving human health.

Sara Molinari
Assistant Professor,
University of Maryland College Park

Dr. Sara Molinari earned her Ph.D. from the Systems, Synthetic, and Physical Biology program at Rice University, where she focused on programming genetic differentiation in bacteria. As a postdoctoral researcher, she developed the first macroscopic living material grown from engineered cells. This material can hierarchically assemble cells across five orders of magnitude and allows for genetic control of its mechanical properties. Currently, in her lab at the Department of Bioengineering at the University of Maryland College Park, she focuses on uncovering the design principles for creating new engineered living materials from various bacteria, aiming to broaden their practical applications.

Satnam Surae
CTO, Co-Founder, Twig Bio

Satnam is CTO/co-founder of twig bio, a venture-backed AI-native engineering biology start-up. At twig, he leads activities across ML/AI, computational biology, bioinformatics, software development and automation. Prior to twig, he was a product leader at enterprise software platforms, Peak AI and Aigenpulse and in the sustainability group for chemicals company, Invista. He is pioneering the development of AI/ML for sustainable bio-based production. Satnam holds a PhD in Computational Biology from University College Dublin, an MRes in Computational Biology from University of York/University of California at San Diego, and a BSc in Biochemistry from the University of York.

Sophie Stone

Research Fellow, University of Edinburgh

Dr Sophie Stone is a Science and Technology Studies (STS) Research Fellow in the UKRI Engineering Biology for Advanced Therapeutics Mission Hub at the University of Edinburgh. She investigates the social and political dimensions of advanced therapeutics (including cell and gene therapies) and collaborates with Hub colleagues to develop capacity for responsible research and innovation. Her research examines how advanced therapeutics are made, manufactured, governed and understood; the politics of scaling EB; and more recently, the intersections between EB and AI. She also has a keen interest in collaborative practice and exploring the spaces in which EB takes place.

Suzanne Robb

Senior Market Strategy Manager – Engineering Biology, CPI (Centre for Process Innovation)

Suzanne Robb is a Senior Market Strategy Manager at CPI and chair of the High Value Manufacturing (HVM) Catapult's Biomanufacturing group covering the breadth of Engineering Biology. Combining strategic leadership with handson technical expertise, she has extensive experience in highthroughput experimentation, scale-up, automation, and digital integration for bioprocess development. Suzanne drives crosssector collaboration to support the adoption of interoperable data standards, generation of curated data, AIenabled tools, automation, machine leaning, and predictive modelling. Her work supports industry, academia, and government in developing frontier capabilities, infrastructure, and partnerships needed to translate engineering biology breakthroughs into scalable, sustainable manufacturing impact.

Susan Rosser

Professor of Synthetic Biology, The University of Edinburgh

Susan Rosser is Director of the UK Centre for Mammalian Synthetic Biology and Co-director of the Edinburgh Genome Foundry. She holds a Royal Academy of Engineering Chair in Emerging Technologies and leads the Engineering Biology for Advanced Therapeutics Hub. She previously served on the Scottish Science Advisory Council, Scotland's highest level science advisory body and currently sits on the UK Engineering Biology Advisory Panel, an expert group advising and assisting UK Government on engineering biology policy work.

Stephen Piccolo

Associate Professor, Brigham Young University

Stephen Piccolo advances biology and human health through computational discovery, with a strong emphasis on data curation and stewardship. His lab works to ensure that large-scale molecular datasets—especially generated through genomics and transcriptomics—are findable, interoperable, and reusable (FAIR). By integrating biology, computer science, medicine, and statistics, the team develops methods to harmonize, annotate, and aggregate complex public data resources. This “dry lab” approach enables robust, reproducible analyses that uncover subtle drivers of disease. The lab also promotes bioinformatics education, exploring inclusive teaching practices and the use of artificial intelligence to broaden access to computational biology skills.

Sotirios A. Tsaftaris

Director, Causality in Healthcare AI Hub,
Canon Medical/RAEng Research Chair in Healthcare AI,
Chair in Machine Learning and Computer Vision

Professor Sotirios A. Tsaftaris is Chair in Machine Learning and Computer Vision at the University of Edinburgh and holds the Canon Medical/Royal Academy of Engineering Chair in Healthcare AI. He directs the EPSRC Causality in Healthcare AI Hub (CHAI) and is an ELLIS Fellow. He also serves as a DSIT Fellow (AI for Science Expert Adviser). His research develops trustworthy deep, causal and multimodal AI for multimodal data.

Theresa Meacham

Head of International, UK Research and Innovation - Biotechnology and Biological Sciences Research Council (BBSRC)

Dr Theresa Meacham is Head of International for the Biotechnology and Biological Sciences Research Council.

Theresa has extensive experience of developing international R&I partnerships, having worked within the International Team of BBSRC since 2016. She has led on the development of funding programmes across the globe, including the NSF led Global Centres programme, lead agency agreements and other memoranda of understanding. Prior to joining BBSRC, Theresa was an analyst with the UK’s Global Food Security Programme.

Theresa studied Biological Sciences at the University of Oxford and completed a PhD at the University of Edinburgh, focused on improving the understanding of below-ground Carbon stocks in forest ecosystem models.

Thierry Le Goff

Commercial Director,
National Measurement Laboratory

Thierry is the commercial director at the National Measurement Laboratory and UK's designated institute for chemical and bio-measurement. He leads diverse teams across program management, business development, and analytical quality training. He is responsible for commercial and partnerships activities with industry and leading research institutions, and initiatives to integrate metrology and standards into key innovation areas such as in engineering biology, vitro diagnostics and novel food.

He holds a PhD and Postdoctoral research in Environmental Analytical Chemistry.

Thomas Gorochowski

Professor of Biological Engineering,
University of Bristol, UK

Thomas Gorochowski has worked across industry at DSM, Netherlands and academia at the Massachusetts Institute of Technology, USA before founding his research group at the University of Bristol in 2016. His research aims to better understand the computational architecture of biological systems, from the molecular to the ecosystem level, and his group develops experimental and computational tools to rationally engineer functionalities across these scales. He leads the UKRI CYBER Engineering Biology Mission Award to de-risk environmental applications of synthetic biology and has advised funders and governments on emerging technologies in this space.

Yonatan Chemla

NIH K99 Research Scientist,
Massachusetts Institute of Technology

Yonatan Chemla is an NIH Pathway to Independence Research Scientist at MIT and a synthetic and computational biologist developing AI-guided design principles for engineering biology beyond the laboratory. He earned a B.Sc. in Biological Engineering and a Ph.D. in Biology from Ben-Gurion University, as well as a B.A. in History. His research integrates high-throughput experimentation, machine learning, and quantitative modeling to understand and program mRNA translation and engineered microbiomes in complex environments. By generating large-scale kinetic datasets, building predictive AI frameworks and studying policy and governance he advances safe, scalable bioengineering strategies to address challenges in environmental and human health.

Kathryn Porter

Consul General,
United States Consulate General Edinburgh

Kathryn Porter assumed charge as U.S. Consul General in Edinburgh in August 2024.

Prior to her current post, she served as a Senior Operations Management Officer in Washinton DC, overseeing management, innovation, and outreach at the State Department Operations Center, the Secretary of State's 24-hour crisis management and communications center.

She previously served as a Consul at the U.S. Embassy in Moscow. Other overseas tours include a variety of Consular positions at the U.S. Consulates in Krakow, Toronto, Johannesburg, and Tijuana. Early in her career she served in Washington as a Watch Officer in the State Department Operations Center.

Robert Felstead

Deputy Director – Engineering and Health,
UKRI - EPSRC

Robert Felstead is Deputy Director for Engineering and Health at the Engineering and Physical Sciences Research Council (EPSRC).

Robert joined the EPSRC Senior Leadership Board in October 2021 having first joined EPSRC in 2012 working on Physical Sciences, Living with Environmental Change and Manufacturing. He then moved to UK Research and Innovation International to work on the Global Challenges Research Fund (GCRF) where he led the GCRF Challenge Leader Network. Robert is responsible for oversight of the EPSRC Healthcare Technology and Engineering themes and is the EPSRC senior lead for Engineering Biology and the Life Sciences.

Kjiersten Fagnan

CIO DOE Joint Genome Institute,
Lawrence Berkeley National Laboratory

Kjiersten Fagnan is the Chief Informatics Officer at the Department of Energy's Joint Genome Institute (JGI) and has been working at the interface of biology and computing for more than 15 years. She has worked with interdisciplinary teams to deploy distributed data management and scientific computing infrastructure across the Department of Energy national laboratories. Dr. Fagnan was a co-PI on the National Microbiome Data Collaborative (NMDC) project overseeing the development and implementation of infrastructure to support multi-omics data standards.

Geoff Baldwin

Professor of Synthetic & Molecular Biology,
Imperial College

Professor Geoff Baldwin is Co-Director of the Imperial College Centre for Engineering Biology and Director of the EPSRC Centre for Doctoral Training in BioDesign Engineering. His research develops cutting-edge synthetic biology tools to accelerate the design of new biological systems, including DNA-BOT, an automated DNA assembly platform based on the BASIC method. These innovations underpin his vision for the "Self-Driving Lab," where automation and human-interpretable AI transform the speed and scale of metabolic engineering. His work applies these approaches to engineer microbial systems for the sustainable production of valuable compounds, advancing both scientific discovery and real-world impact.

Suresh Kumar

Deputy Director for Innovation and Industries,
Scottish Government

Dr Suresh's policy focus is on industrial transformation, innovation policy and critical technologies, guiding national initiatives that support productivity, sustainable growth and public value. His portfolio includes the Green Industrial Strategy, the establishment of Scotland's Technology Council, national cluster development across sectors such as space, advanced manufacturing and AI, and the delivery of Scotland's Life Sciences Strategy 25–35. With more than twenty years' experience, across the UK and Europe, he led major research portfolios, digital and organisational transformation, and crosssector partnerships involving government, academia and industry. He brings deep expertise in innovation ecosystems, strategic investment, public–private collaboration and the delivery of complex programmes at pace.

Scott Allen

CoHead of Engineering Biology,
Department for Science, Innovation & Engineering

Scott Allen is CoHead of Engineering Biology at DSIT, leading the department's work under the UK Biological Security Strategy and shaping policy at the intersection of AI and engineering biology. He oversees national responsibilities for economic security, responsible innovation, and partnerships with the Ministry of Defence. Scott's background spans national security and resilience policymaking, following 12 years of service in the Royal Air Force and subsequent roles in the Cabinet Office and DSIT. His work focuses on advancing safe, secure and globally competitive engineering biology capabilities for the UK.

Dong-Thu Caohuu

Political-Economic Chief, U.S. Consulate General in Edinburgh, U.S. State Department

Dong-Thu Caohuu is a Foreign Service Officer with the U.S. Department of State since 2015. Since April 2023, she has been serving as the Political/Economic Chief at the U.S. Consulate General in Edinburgh. Prior to her current posting, Dong-Thu worked in Washington D.C. in the Office of Russian Affairs covering U.S. science and technology policy and EU industrial policy in the Office of European and EU Affairs. Her previous overseas tours were in Bishkek, Kyrgyzstan and Shanghai, China. She is originally from the Bay Area, California.

Mukesh K. Jain

Senior Associate Provost for Life Sciences, Senior Vice President for Health Affairs, Dean of Medicine and Biological Sciences, Professor of Medicine and Molecular Biology, Cell Biology and Biochemistry, Brown University

Dong-Thu Caohuu is a Foreign Service Officer with the U.S. Department of State since 2015. Since April 2023, she has been serving as the Political/Economic Chief at the U.S. Consulate General in Edinburgh. Prior to her current posting, Dong-Thu worked in Washington D.C. in the Office of Russian Affairs covering U.S. science and technology policy and EU industrial policy in the Office of European and EU Affairs. Her previous overseas tours were in Bishkek, Kyrgyzstan and Shanghai, China. She is originally from the Bay Area, California.

Jeffrey Anthony

Engineering Biology Partnerships Lead, National Physical Laboratory

Jeffrey Anthony joined NPL in 2019 and works as part of NPL's Life Sciences & Health Partnerships Team. With a focus on the building collaborations across the Life science sector Jeffrey works with collaborators across industry, academic and public sector.

Jeffrey's technical background is in microbiology, and he has worked in roles across quality assurance, and both product and business development. His experience includes the pharmaceutical sector, the development of genomic marker technologies in agritech and activities in cell biology. In his current role his time is dedicated to building partnerships across the UK and internationally supporting Standards and metrology in Engineering Biology and helping companies in their quest to scale and commercialise at pace.

Cat Gillen

Private Secretary to the GCSA,
Government Office for Science

I am a Private Secretary supporting Angela in her role as Government Chief Scientific Adviser. My work focuses on enabling evidencebased policy across emerging technologies, including AI and engineering biology. I coordinate crossgovernment engagement on research, innovation, and datadriven approaches, ensuring scientific insight informs strategic decisionmaking.

Andrew Crawford
Head of Policy – Sovereign AI
Department for Science, Innovation and Technology

Andrew Hickl
CTO, Allen Institute

Antonia Theodorakopoulou
Programme Manager, Renaissance Philanthropy

Ben Lehner
Head of Generative Genomics,
Wellcome Sanger Institute

Eric Rosenthal
Associate Professor, Co-Chair NIH Bridge2AI Steering Committee Harvard Medial School / Mass General Brigham

Farren Isaacs
Professor, Yale University

Risha Patel
Life Science Partnerships
Google DeepMind

India Hook-Barnard
CEO, Engineering Biology Research Consortium (EBRC)

Mark Basham
Science Director for AI and Informatics,
Rosalind Franklin Institute

Melissa Davis
Director, Computational Biology,
Isomorphic Labs

Mo Ebrahimkhani
Associate Professor, Associate Professor

Neil Chue Hong
Senior Research Fellow - Software Sustainability Institute
University of Edinburgh

Sheng Lin-Gibson
Chief of the Biosystems and Biomaterials Division
National Institute of Standards and Technology (NIST)

UK Government

Scottish Government
Riaghaltas na h-Alba

Edinburgh Innovations is the University of Edinburgh's commercialisation service.

We benefit society and the economy by helping researchers, students and industry drive innovation. We seek opportunities, we build partnerships for mutual benefit, we make the journey easy, and we add value at every stage.

WE MAKE IDEAS WORK FOR A BETTER WORLD

Visit us at: **eil.ac/EI**

THE UNIVERSITY of EDINBURGH

EDINBURGH INNOVATIONS