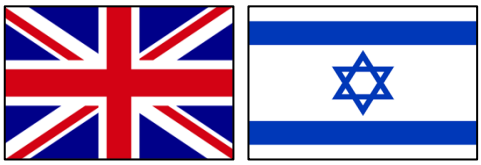
Innovate UK
Knowledge Transfer Network

UK Science & Innovation Network

Innovate UK Global Expert Mission

Bioinformatics in Israel

5th – 9th Nov 2018 | Tel Aviv, Haifa



Innovate UK's Global Expert Missions

As innovation is increasingly a global endeavour and the ambition of UK businesses to become truly international enterprises is at its highest, Innovate UK has launched its new Global Expert Missions. Delivered by the Knowledge Transfer Network (KTN), the Expert Missions will help further Innovate UK's global strategy by providing the evidence base for where it should invest and by providing the opportunities for UK businesses to build partnerships and collaborations with key economies.

Built around UK business, policy and research representation, an Expert Mission aims to achieve the following objectives:

1) To gather market insights and to build expert foresights on new and emerging innovation sectors, in order to ascertain quantifiable benefits and synergistic strengths between the UK and a Partner Country.
2) To build a portfolio of technological and business priorities as the foundation that elevates the UK as the "partner of choice" in future innovation partnerships with strategic global economies.
3) To explore and identify effective and sustainable collaboration model(s) with a Partner Country in specific growing sectors.
4) To set up the groundwork and early dialogues for UK business community to catalyse future internationalisation opportunities.
5) To help align innovation policy direction and unlock regulatory barriers for future international partnerships.

Israel-UK Bioinformatics Expert Mission

Delivered by the Knowledge Transfer Network (KTN) in partnership with the Science and Innovation Network (SIN), Innovate UK's Global Expert Mission aims to help strengthen its global strategy by providing the evidence base for where it should invest and the opportunities for UK businesses to build partnerships and collaborations with key economies.

Following two successful Expert Missions to Israel earlier this year, a new Bioinformatics Expert Mission comprising representatives from Innovate UK, KTN, UK businesses, government agencies and R&D organisations will visit Israel in November 2018.

The Israeli biomedical industry (Biopharmaceuticals, Medical Devices and Digital Health) is one of the fastest growing innovative industries in the country. In 1996, there were 186 companies in this sector while today there are 1,400 companies with 120 new companies being formed every year. 40% of these companies are already generating revenues (Israel Innovation Authority[1]).

In June 2018, the UK government signed an agreement with the Israel Innovation Authority focused on improvements around Artificial Intelligence and Ageing supported by a multi-year £4 million bilateral programme.[2] The programme, receiving £2 millions of funding from each country, will be led by Innovate UK and will support developing new innovative ideas in a number of areas, including AI.

The UK and Israel are both investing in healthcare programs and bioinformatics currently and there is great potential for future mutually beneficial collaborative programmes:

- The Israeli government recently invested NIS 922 million (£203 million) on an ambitious digital healthcare program to not only to improve the healthcare system, but also provide a boost for Israeli companies developing digital healthcare technologies as well as enable predictive, preventive and personalised medicines. It will provide incentives for startups, by enabling them to collaborate both between themselves and with local and international healthcare providers, and train personnel in this sector.

- In 2017, the UK government published its Industry Strategy which identified 4 Grand Challenges, that are focused on global trends to transform our future. The AI and Data Grand Challenge is pervasive and has strong interrelationship with the other three. Under the Industrial Strategy, the government announced an Industry Strategy Challenge Fund (ISCF), which is a core pillar in the government's commitment to increase funding in research and development, by £4.7 billion over 4 years to strengthen UK science and business.

  One programme under ISCF, the Data to Early Diagnosis and Precision Medicine challenge has a significant bioinformatics component – the programme will invest a total of up to £210m in 3 integrated strands of activity, including the creation of 3 – 5 Digital Innovation Hubs (DIHs) across the UK and the support of a network of 5 – 6 centres of excellence in digital pathology, imaging and AI. The DIHs will link routine NHS data with rich data from R&D programmes, providing analytic tools and informatics support for businesses alongside local access to integrated UK-

1 http://www.matimop.org.il

2 https://www.gov.uk/government/news/uk-israel-strengthen-ties-with-new-innovation-agreements

wide data. The programme also has a genomics strand that aims to carry out whole genome sequencing of the 500,000 UK Biobank.

Mission Objectives

This mission seeks to:

- To understand the Israeli bioinformatics innovation landscape, its key stakeholders and the synergies with the UK, including the Digital Healthcare program in Israel.
- To gain clarity on the relevant policy drivers and innovation support mechanisms available to bioinformatics businesses (industry, supply-chain, end user and technology exploitation) and R&D organisations in Israel.
- To encourage discussions around the use of bioinformatics including the omics technologies, drug discovery, technology convergence and precision medicine
- To identify prospective areas for future UK-Israel collaboration on bioinformatics, exploring further opportunities and collaboration models to specifically support industry-led R&D.
- To evaluate the potential synergies and mutual benefit, identify the relative strengths and weaknesses, key stakeholder groups and gauge the level of interest/ambition in bilateral R&D collaboration in bioinformatics.
- To evaluate the market for current UK and Israeli products and services

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Mark Davies
Mark Davies is the VP Biomedical Informatics at BenevolentAI, where he leads a team of 20 bioinformatics, cheminformatics and clinical informatics experts who support the companies Drug Discovery mission through the intelligent usage and analysis of biomedical data. Mark has a background in molecular genetics, bioinformatics (BSc University of Sussex) and computer science (MSc Birkbeck College) and has over 15 years of experience working on biomedical data representation, data analysis and application development. In 2001, he joined the London based biotechnology company Inpharmatica, where he was initially working on mining the output of the Human Genome Project and eventually moved on to building chemogenomics and druggability assessment systems used by pharmaceutical companies, such as Pfizer, Bayer and P&G. Following a brief spell building backend systems for the financial market sector, Mark moved to the European Bioinformatics Institute (EMBL-EBI) as one of the founding members and technical lead for the ChEMBL database. The ChEMBL database is the largest open-source Structure Activity Relationship (SAR) database and is the primary source of training data used by many machine/deep learning approaches that predict drug properties and interactions. Mark was also responsible for the successful transition of the SureChEMBL chemical patent system from Digital Science to the EMBL-EBI. Throughout his career Mark has published on how the use of biomedical data and technologies can improve the drug discovery process and enjoys exploring new approaches and opportunities to collaborate in this space.

Company Funding
BenevolentAI has raised >$200 million and is valued at $2 billion.

Company Growth

BenevolentAI currently employs 200 people who work in a unique, cross functional environment that incorporates leading edge data scientists, computer scientists, mathematicians and drug development R&D scientists working side by side. The company is headquartered in London with further offices in New York and Belgium. BenevolentAI's research facility is located in Babraham Science Park, Cambridge (UK).

Company Success

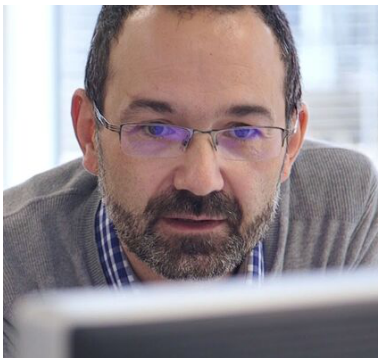
An example of the output of BenevolentAI's platform has been the work on identifying potential treatments for Amyotrophic lateral sclerosis (ALS). Our team, with no previous specific expertise in ALS, were able to rapidly triage these predictions using strategies focused on pathways implicated in multiple ALS processes. The five most promising compounds were taken to the Sheffield Institute for Translational Neuroscience (SITraN), a world authority on ALS. An ALS candidate emerged from a breast cancer drug, which showed delay of symptom onset when tested in the gold standard disease model. More details about the ALS project are available here: https://benevolent.ai/why-it-matters/ and company publications can be found here: https://benevolent.ai/publications/

Why Are We Here?

We are treating this as fact-finding mission to learn more about the commercial and academic opportunities currently available in Israel. We would have specific interests in:

- Learning more about collaborative data opportunities that will support BenevolentAI's target identification, target validation, lead optimisation and patient stratification activities
- Patient-level, biobank and genomic data initiatives happening in Israel
- Connecting with KOLs working on indications linked to neuronal protection, inflammation and stem cell function
- State-of-the-Art experimental platform approaches being developed to support Drug Discovery activities at scale and the informatics tools/methods being used to support the activities
- Bioinformatic tools and machine learning algorithms being developed to support the analysis of biomedical data

Eagle Genomics Ltd



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With over 20 years bioinformatics experience and a scientific background in molecular biology and immunovirology (PhD from the Pasteur Institute, Paris, France), I have got first to grips with bioinformatics tools and code in the early 90s whilst working on viral phylogenetic studies. After my PhD, I joined the effort at Genoscope (Evry, France), the French DNA sequencing centre, in ramping up the human genome project, putting in place the automatic gene annotation system for human chromosome 14. In 2001, I moved to the European Bioinformatics Institute (EBI, Hinxton, Cambridge, UK) where I led the Ensembl comparative genomics team until 2007, under the leadership of Ewan Birney, now director of the EBI.

I then founded Eagle Genomics shortly before graduating from the Cambridge Judge Business School MBA program in 2008.

For the last 10 years I have been one driving force within the executive team at Eagle Genomics as CEO, and since May 2018 as Chief Product Officer, as the company shapes for scale. Eagle Genomics is based in Cambridge UK, on the Wellcome Genome Campus, neighbour of the Sanger Institute and the European Bioinformatics Institute, both world leading organisations in the fields of genomics and bioinformatics.

Over its existence, Eagle Genomics has accumulated tremendous expertise in the extraction of knowledge and insight from Life Sciences R&D data analysis. Eagle Genomics has matured its entreprise software platform to enable the data-driven knowledge management and discovery to support our Life Sciences customers in pushing forward their product development. We focus on 3 main sectors, humand and animal health, personal care and cosmetics, food and nutrition.

Current customers and future targets are in Europe (including Israel) and North America. We have an interest in the Israeli market either because of the presence of target customers (e.g. Teva) or as knowledge centre for collaboration (e.g. Professor Eran Elinav expert in microbiome from the Weizmann Institute).

Since 2013, the company has been revenue generating growing organically year on year, and has at the same time raised over $4m mostly from business angels to support its R&D. The company is about to raise another $3m seed fund from a VC this time, in preparation to series A in 2019 to accelerate its scale up. We are about to expand our R&D workforce with a team in Hyderabad (India). Finally a significant achievement of 2018 was our selection by Microsoft to join their Scale Up program in London. We received support to deploy of our platform on Microsoft Azure, achieved Microsoft co-sell ready status and will announce our partnership with Microsoft Genomics at the ASHG 2018 in San Diego.

European Bioinformatics Institute (EMBL-EBI)

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The European Bioinformatics Institute (EMBL-EBI) hosts the world's most comprehensive range of openly available and up-to-date biological and biomolecular data. EMBL-EBI hosts over forty databases for various molecular types, offering rich resources of carefully curated data and services. These data resources were accessed an average of 38 million web requests per day in 2017. Based on the Wellcome Genome Campus (Hinxton, Cambridge UK), EMBL-EBI freely provides biological data to the global scientific community of academic and industry researchers. In addition to provision of biological data and services, EMBL-EBI activities include bioinformatics research, training, and community data standard development. Within these, EMBL-EBI's expertise lies in the capture, annotation, analysis and management of biological big data, including genomics, transcriptomics, proteomics, metabolomics, molecular pharmacology and biological images

As the utility of genomics and biological data increases and growing translational application of bioinformatics, there is greater demand for broader engagement with both academia, industry and other sectors.

Jessica Vamathevan heads the Strategic Partnership Office and is responsible for strategy development, planning and industry activities within EMBL-EBI, driving and developing activities and processes which contribute to the broader strategic overview of the institute, and of the international bioinformatics landscape. These include managing large-scale scientific projects and developing collaborative activities across cross-cutting areas including fast-growing areas such as medical genomics.

Jessica has a background in pathogen genomics and molecular evolution. She holds a PhD in Bioinformatics from University College London, an MSc in Computer Science from Johns Hopkins University USA and a Bachelor of Medical Science from the University of Sydney, Australia.

Prior to EMBL-EBI Jessica held multiple roles at GSK, most recently as the Operations Director of Open Targets, a public-private partnership between EMBL-EBI, the Wellcome Sanger Institute and several pharmaceutical companies (GSK, Biogen, Takeda and Celgene). Here she oversaw the management of a portfolio of informatics and experimental projects, one product being a computational platform which integrates genetic, protein and literature data for drug target identification and validation. Previous to this, she was a team leader in GSK Computational Biology, working across many therapeutic areas including infectious diseases,

respiratory, immuno-inflammation and rare diseases. She also spent over six years at The Institute for Genomic Research (TIGR) in Maryland, US working on many pathogen-genome sequencing projects and a year at the Wellcome Sanger Institute in human genome annotation.

EMBL-EBI is one of six sites of the European Molecular Biology Laboratory (EMBL), an open science intergovernmental organisation founded in 1974 under a Treaty to promote cooperation among the European States in molecular biology and advanced instrumentation.

EMBL now has a membership base of 25 primarily European countries (as of September 2018), including Israel. EMBL-EBI has a remit to further science within its member states as well as globally, through all of its missions – spanning bioinformatics data services, research, training, industry through to European co-ordination.

EMBL-EBI's Medical strategy involves proactively working towards supporting EMBL Member State countries to transfer genomics technology and knowledge which has been successfully developed at EMBL-EBI to support the embedding of their own national genomics programmes. EMBL-EBI is seeking to facilitate the transfer of its knowledge and expertise in data management and the analysis of big data projects. Along with other partners playing a role in international Bioinformatics infrastructures such as ELIXIR and the GA4GH, we aim to build the foundations for a global integrated Medical Bioinformatics Research Infrastructure with strong pan-European participation.

Genomic England

Dr Liz Edwards
Head of Bioinformatics Partnerships

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Genomics England, with the consent of participants and the support of the public, is creating a lasting legacy for patients, the NHS and the UK economy, through the sequencing of 100,000 genomes. Genomics England is a company set up and owned by the UK Department of Health to run the 100,000 Genomes Project, which will sequence 100,000 whole genomes from NHS patients with rare diseases, and their families, as well as patients with common cancers. The aim is to create a new genomic medicine service for the NHS – transforming the way people are cared for. Patients may be offered a diagnosis where there wasn't one before. In time, there is the potential of new and more effective treatments.

Genomic England aims:

- To bring benefit to patients
- To create an ethical and transparent programme based on consent
- To enable new scientific discovery and medical insights
- To kickstart the development of a UK genomics industry

The project will also enable new medical research. Combining genomic sequence data with medical records is a ground-breaking resource. Researchers will study how best to use genomics in healthcare and how best to interpret the data to help patients. The causes, diagnosis and treatment of disease will also be investigated. We also aim to kick-start a UK genomics industry. This is currently the largest national sequencing project of its kind in the world.

Genomics England was formally established as a company in 2013 as part of the celebrations for the 65th Birthday of the UK's National Health Service. In August 2014, the Wellcome Trust announced that it was investing £27 million in a genome-sequencing hub for Genomics England, allowing the company to become part of the Wellcome Trust Genome Campus, home to the Sanger Institute. On the same date, Prime Minister David Cameron unveiled a new partnership between Genomics England and the sequencing firm Illumina. Illumina's services for whole genome sequencing were secured in a deal worth around £78million. The UK Government also committed £250 million to genomics in the 2015 Spending Review, which ensured the continued role of Genomics England to deliver the project, beyond the life of the project and up to 2021. Genomics England have successfully demonstrated that a whole genome sequence is more cost effective and has superior clinical utility. As such, as of October 2018, the UK Government has announced the expansion of the 100,000 Genomes Project to see 1 million whole genomes sequenced by the NHS and UK Biobank in five years.

Genomics England has grown from a company of five to over 200 in five years. The Company anticipate a slow growth over the next five years and will have core governmental funding as well as commercial revenue. Genomics England will continue to work with academics globally as well as industrial partners, and see the following as key areas for future collaboration:

- Genomics England has built a state of the art pipeline that starts from consent and ends with a clinico-genomic summary of findings, which the clinician can use to support patient diagnosis. Genomics England are constantly looking at new developments in the pipeline that will enhance our offering. This can be in house development as well as working with third party suppliers.
- Genomics England have a lead role with the GA4GH, in setting standards and protocol, and anticipate future collaborations in this space.
- Our experience in establishing and running a successful genomics programme is very beneficial to other countries considering this sort of initiative and/or expanding on a pilot already started.
- Several AI/data science/big data companies are in this space and could also develop better tools/workflows/software if they had access to a data set as comprehensive as the one Genomics England have generated.
- Finally, biotech and industry companies looking to develop drugs, biomarkers and/ or repurpose drugs would also gain a huge advantage by working with the genetic and clinical data Genomics England have.

Dr Liz Edwards
Liz Edwards is the Head of Bioinformatics Partnerships at Genomics England. The Bioinformatics Partnerships Team interfaces with all external parties delivering Bioinformatics technology and services to Genomics England. Liz oversees the initiation, procurement, execution and performance of all active and prospective partnerships in this space for Genomics England. Liz has over 10 years' experience in the genomics sector and worked in both the Academic and Healthcare Industries. Liz gained her PhD in Bioinformatics at the University of Leeds.

Mendelion

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Founder and CEO of Mendelian. London-based AI company to diagnose genetic patients faster than doctors. Providing most accurate virtual gene panels for labs and differential diagnosis for clinicians. Background in Computer Science from Imperial College London.

Growing to 15 people and revenue making by the end of the year, Series A level funding.

In Israel, need to connect with the EHR national systems in Israel to provide screening for Inherited Disease. With global ambition to cover all precision medicine.

Our tools and technology already in use by more than 2000 clinicians from 150+ countries, 3 governments in talks for genetic patients screening pilots.

Repositive

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Founded in 2014 in Cambridge, UK, Repositive is the trusted exchange for genomic assets – connecting genomic researchers with the data they need to cure diseases. Our offerings reinvent the way scientists from biopharma and biotech are finding and accessing data and following the disruption that next generation sequencing has made over the last five years. Founded by ex-Illumina bioinformatics scientist Fiona Nielsen, Repositive has built its brand and value proposition around addressing the needs of biomedical researchers across academia and industry. Repositive is helping these researchers to discover, understand and access genomics data in the rapidly growing market for translational models and pre-clinical research by enabling a marketplace powered by efficient and ethical data access for the benefit of patients.

Repositive Products:

- "Discover" is a free application designed to speed up research. It opens access to huge amounts of data from repositories and researchers. Then helps you keep track of the data you're interested in, work with others to improve the metadata and get feedback on your data too.
- "Cancer Models Platform" makes preclinical cancer models from disparate sources now searchable in one place. Researchers can compare standardised molecular features, create collections and share with their team. While Contract Research Organisations (CROs) keep control of data access, learn which models are most popular and respond direct to customers.

I joined Repositive in early 2018 leading Market Development to find the company's next big opportunities in the biomedical sector. Prior to this, I worked for more than 6 years as a Business Development Manager in the Translation Office at the Wellcome Sanger Institute, developing early stage research discoveries towards commercial engagement. As part of this role, I led on the formation of the Institute's fifth spin out, Microbiotica, a company combining bioinformatics analysis with deep microbiological insights to discover and develop live bacteria-based therapeutics for the treatment of gastrointestinal diseases. My research background encompasses an undergraduate in Biochemistry, a PhD in protein biophysics at the University of Cambridge and a postdoctoral role in the Department of Bioengineering at the University of California, Berkeley. Through my experiences at the Sanger Institute and Repositive, I have become fascinated by the growing use of open source software and open access data to underpin many innovations in the biotech sector, and the challenges leveraging these valuable resources presents in developing commercial opportunities.

I am also passionate about improving the success rate of the preclinical drug development pathway and supporting the industry shift towards developing precision medicines.

Repositive has raised £5.1M to date, doubled its headcount to 38 in the last year and has made the final key appointments for an experienced senior management team. The company is now in discussions with investors for funding the next stage of development, namely, scaling the company's current activities. At Repositive we believe that great science transcends international boundaries and we see sourcing genomic data, and the models and services that support preclinical drug development programmes as a global challenge. Therefore, in addition to the classic north American and EU territories access, we are seeking relationships with biotech and contract research organisations in any territory where there is the opportunity for mutual benefit through our Cancer Models Platform and the community of professionals we are building around it.

As a company, we are keen to understand each stakeholder's contribution to the preclinical development path and where and how both genomic and associated clinical datasets contribute to decision-making processes. Israel has strong activities in biomedical research that benefits from deep connections into clinical infrastructure. Initially, we are looking for contract research organisations (CRO) in the oncology space to join and benefit from our community and share their challenges. We can then raise their profile with biopharma and support the honing of their value proposition. But, we also see the future success of our Cancer Models Platform as not solely dependent on current CROs. We believe, to make a real difference, we need to facilitate the creation of the next generation of contract research organisations. So, we are approaching world leading organisations and research groups in the oncology space to understand how we can support their journey from cutting-edge research capability to commercially available service for the benefit of preclinical drug development.

Repositive's achievements to date:
Discover is the single largest indexed database of publicly available genomic datasets totalling 1.2 million datasets from over 50 repositories with users in over 90 countries.

Cancer Models has >1800 cancer listed on the beta release of the platform and we have recently released a "personal shopper" service to help biopharma find the right model for the preclinical needs. By the end of 2018 we will have >3000 cancer models listed on our platform.

Our skill in harmonising disparate datasets and overlaying our free-text search has secured us a position in the NIH's Data Commons pilot initiative (www.commonfund.nih.gov/commons/awardees). This is a 5-year programme of work that has the objective of creating a cloud-based environment for researchers to explore the colossal biomedical datasets that the NIH has accumulated over decades. In this initiative we are the only European service provider and the only commercial provider of indexing and search capabilities.

Expert Mission Organisers

Innovate UK

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Innovate UK is the business arm of UK Research and Innovation, the organisation that brings together research and innovation funding. Innovate UK helps businesses to identify the commercial potential in new technologies and turn them into the new products and services that will generate economic growth and increase productivity. With a strong business focus, we drive growth by working with companies to de-risk, enable and support innovation.

To do this, we work to:

- Determine which science and technology developments will drive future economic growth
- Meet UK innovators with great ideas in the fields we're focused on
- Fund the strongest opportunities
- Connect innovators with the right partners they need to succeed
- Provide access to state-of-the-art facilities and expertise to commercialise new ideas through our Catapult programme
- Help our innovators launch, build and grow successful businesses

Since 2007, we have committed over £1.8 billion to innovation, matched by a similar amount in partner and business funding. We have helped more than 7,600 organisations with projects estimated to add more than £11.5 billion to the UK economy and create 55,000 extra new jobs.

We support UK business-led innovation to explore global opportunities through a range of connecting and funding programmes, including the Newton Fund and European Funding Programmes including Horizon 2020, Eurostars and Eureka. We have supported UK organisations access over 75 international markets.

The UK and Israel have agreed to support business led research and innovation projects through two planned 'Open' calls, the first of which will open in November 2018. The collaborations we support through the calls will show demonstrable benefits of business co-operation with a view to supporting innovative ideas that target new and/or large global markets and help realise the growth potential of companies. The UK has set aside funding worth up to £2m to support this programme of activity, which will be matched by the Israeli authorities

There are a number of areas of potential complementary strength including bioinformatics, artificial intelligence, advanced materials, battery technologies, water technologies and agritech and we also recognise an impressive track record in technology transfer and private investment into highly innovative companies. However, the initial collaborative calls will not target any specific topics

We have supported a series of expert missions in the area of Advanced Materials and Cyber Security, and a business accelerator mission in one or both areas will be organised in Israel to coincide with the call opening.

Jerome De Barros
Jerome joined Innovate UK in Jan 2015 and is the Horizon 2020 NCP & Global Innovation Lead for Health and Wellbeing and has responsibility to help UK applicants to the Horizon 2020 Health opportunities, input into the content of the calls published under the Health Challenge as a member of the UK H2020 Programme Committee delegation, and support Innovate UK's international strategy.

In Jerome's previous position, he oversaw the evaluation and progress of a portfolio of >100 research & innovation projects across Europe for the Active Assisted Living programme (AAL Programme), a EU funding initiative supporting ICT for Active and Health Ageing.

Dr Gordon Ford
Dr Gordon Ford is the lead for Biomedical Enabling Technologies at Innovate UK. Gordon has 14 years of commercial experience in molecular biology and medical diagnostics markets. Gordon spent ten years at life sciences biotech Promega in a variety of sales and marketing roles before joining Strathclyde University spinout Renishaw Diagnostics as Business Development Manager. Renishaw Diagnostics was sold to Bruker in 2016 and Gordon became European Business Development Manager for the Bruker Microbiology business unit before joining Innovate UK in December 2017. Gordon has a PhD in molecular microbiology and an MBA.

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The Knowledge Transfer Network (KTN) is an impartial, not-for-profit organisation that provides innovation networking for other funders in line with its mission to drive UK growth.

We work closely with Innovate UK – the UK's primary innovation agency – as well as government departments and industry leaders. We also work to strengthen research and innovation partnerships between the UK and economies around the world.

KTN connects UK business to game-changing collaborations. We host horizon-expanding events and provide bespoke support and innovation insights. We link new ideas and opportunities with expertise, markets and finance through our network of businesses, universities, funders and investors. We help business to strengthen the economy and improve people's lives by capturing maximum value from innovative ideas, scientific research and creativity.

In addition to industry links in emerging industries across sectors the KTN has contacts to universities across the UK to track and commercialise innovations that come out of the research base and helps to commercialise these.

Some notable KTN projects include:

- **UK5G** is the new national innovation network dedicated to the promotion of research, collaboration and the commercial application of 5G in the UK. UK5G is a 'network of networks' to facilitate and encourage the engagement and coordination of organisations working on 5G activities across the UK and internationally. https://uk5g.org
- **Immerse UK** brings together industry, researchers and research organisations, the public sector, entrepreneurs, innovators and end users to support the UK in becoming the global leader in applications of immersive technologies: high-end visualisation, virtual, mixed, and augmented reality, haptics and other sensory interfaces with data. www.immerseuk.org
- **Cyber Security Academic Start-ups Programme** - identifies the best commercial opportunities in academia in respect to cyber security. Successful applicants participate in a 6-week programme to determine the value of the idea and, if appropriate, to identify the best commercial route to progress. Industry experts from cyber security support the programme. It includes the development of a detailed value proposition and an associated pitch to private investors.

Emily McKay
Emily is a KTN Project Support Manager for the International and Development team, primarily working on the Innovate UK Global Expert Missions. Emily is a PRINCE 2 Project Manager and Change Manager with experience in the public and private sectors across defence, healthcare and the emerging drone sector. Emily holds a BSc in Microbiology from the University of Birmingham and previously served as a Commissioned Officer in the Royal Air Force with active service overseas.

Giulia Boselli
Giulia works at the Knowledge Transfer Network (https://ktn-uk.co.uk) in the Health Team as Precision Medicine Knowledge Transfer Manager. Her role is to facilitate collaborations among businesses, academia, research institutions and investors that translate research breakthroughs into products and services and, ultimately, drive innovations within the Precision Medicine landscape. It is part of Giulia's daily endeavour to help companies – SMEs in particular – to navigate the complex innovation ecosystem from product idea to commercialisation, which is particularly challenging in this emerging healthcare sector, whereby genetics, bioinformatics and medicine fuse to create a more and more personalised approach to treatment.

Before joining KTN Giulia worked as Product Development Manager at Cochrane Innovation, while in her earlier career she was involved in several research projects overseas, evaluating the cost-effectiveness of new methods of delivering healthcare interventions.

Nigel Banister PhD, MBA
Nigel is an experienced and flexible business consultant/interim manager providing business critical services in product development, market intelligence, business planning, marketing, strategy and securing investment. He focuses primarily on science and technology companies and in particular pharma, medtech, digital health, AI and industrial biotech. Nigel is also the Founder of Rare Biotech Ltd, a start-up company focused on developing therapies for the rare disease/orphan drug market.

Foreign and Commonwealth Office
Science and Innovation Network xxx

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The Science and Innovation Network (SIN) is jointly funded by the Department for Business, Innovation and Skills (BEIS) and the Foreign & Commonwealth Office (FCO). SIN works across the entire UK science and innovation landscape supporting UK stakeholders to make international connections, set up strategic collaborations and leverage research and innovation funding, driving global prosperity and growth. The UK looks at international collaboration as essential to maintaining its research excellence and the competitive advantage of its innovative businesses, for filling capability gaps and for ensuring value by leveraging international resources.

SIN has approximately 100 officers in 31 countries around the world with SIN officers working with the local science and innovation community in support of UK policy overseas, leading to mutual benefits to the UK and the host country.

SIN Israel works with the local community to ensure the UK is a partner of choice, and helps UK companies with ambitions for rapid global growth. Priority areas for SIN Israel currently cover Health and Life Sciences in the fields of Neuroscience and Nanoscience, AMR (antimicrobial resistance) and infectious diseases as a global threats, Agri-technology and water. New areas on the horizon for SIN Israel include Cyber, Clean Energy and Mobility. These priority areas are determined based on both countries national priorities with foreseeable and practical synergies.