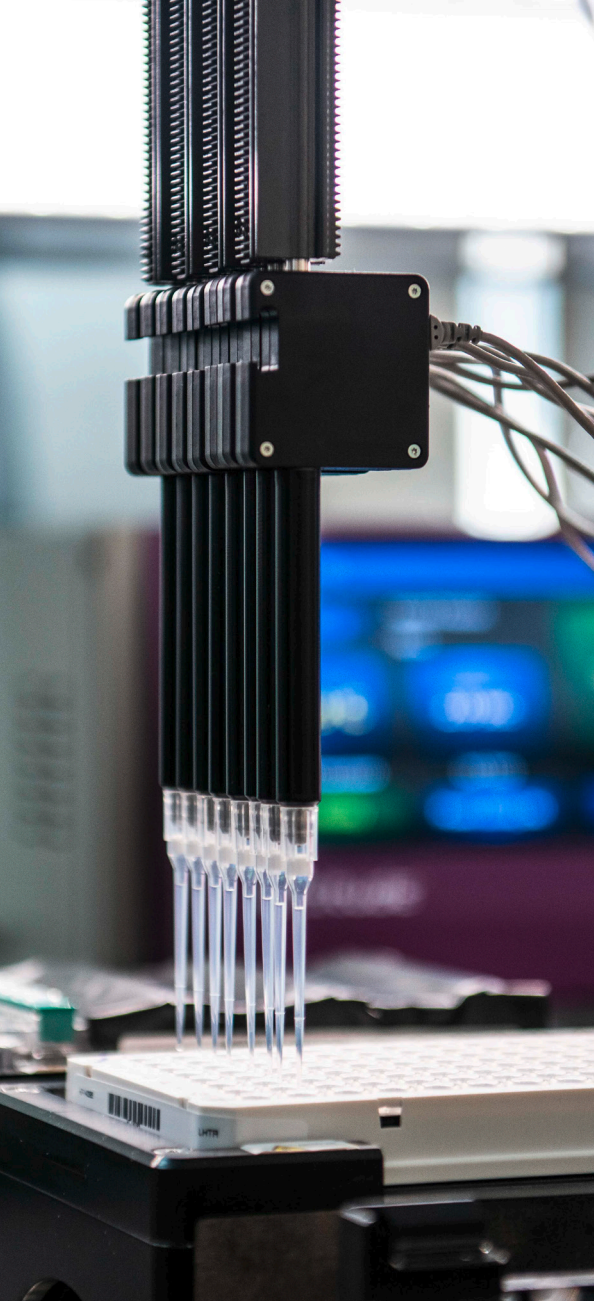
Department for Business & Trade

UK Genomics Spotlight 2024: Celebrating success and looking ahead

GREAT
BRITAIN & NORTHERN IRELAND



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How the Department for Business and Trade (DBT) can help

This document highlights the UK's depth and breadth of expertise for export as world leaders in the field of genomics, as well as opportunities for investing in the UK. We describe the ecosystem which has enabled the delivery of genomic medicine in the UK and expertise in various national initiatives and programmes which are contributing to the genomics landscape of the future.

The offer includes illustrative examples of UK companies and suppliers capable of exporting, which are just a small selection of the breadth of what the UK can offer.

DBT can help UK companies in new markets, help to identify suppliers for specific needs, and facilitate investment. Please get in touch for details: lifescience@businessandtrade.gov.uk or find out more at https://eu.eventscloud.com/website/6238/life-sciences

Foreword

Professor Dame Sue Hill, Chief Scientific Officer for England and Senior Responsible Officer for Genomics, NHS England

Genomics has increasingly become a critical part of the next generation of healthcare and the journey of genomics in the UK has been nothing short of transformative. It reflects the nation's commitment to advancing healthcare through cutting-edge research and rapid adoption of technology. Investment in genomics by the UK Government and the NHS over the last decade, including through the groundbreaking 100,000 Genomes Project, laid the foundations for the expanded use of genomics and particularly, whole genome sequencing in routine clinical care. Consequently, the UK is now home to a world leading genomic medicine service, supported by leading global universities and collaborative partnerships, a research and data infrastructure and a growing pool of talent, delivering cutting-edge benefits for patients and their families.

Looking to the future, it is critical that we continue to push boundaries to improve care and treatment options for patients, harnessing the power of new technologies, developing shared clinical and genomic data access standards, introducing new testing and analytical platforms, and an interoperable informatics infrastructure. As we stand at the forefront of genomic medicine, the opportunities for collaboration between the public sector, industry, trade organisations and international partners have never been greater. We need now more than ever, to work together to continue to deliver ground-breaking advances in genomics and to enable an all-encompassing ecosystem for genomics to grow. Together, we have the potential to harness the power of genomics to address some of the most pressing challenges in healthcare to improve the quality of life of patients and our population.

Mike Emery, Director for Digital, Innovation and Life Sciences for Wales and Welsh Policy Lead for Genomics

Wales is open for business and ready for collaboration – the newly opened Canolfan Iechyd Genomig Cymru / Wales Genomic Health Centre provides a state of the art facility for industrial partners to work with NHS Wales and the academia in modern scalable laboratories, patient clinics and working areas, integrating research and clinical service delivery.

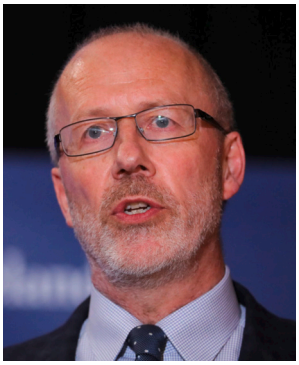
Genomics Partnership Wales work closely in partnership with Welsh Government and other stakeholders, to harness advances in the understanding and application of genomics to transform public health strategy and delivery of care. The QuicDNA project is an example where we collaborate with industrial partners to do just that, in evaluating liquid biopsy as a diagnostic tool for cancer.

Professor Catherine Ross, Chief Scientific Officer for Scotland and representative of the Scottish Government on the UK National Genomics Board

The 2024 Genomics Spotlight clearly demonstrates the vibrancy and innovation across our NHS, academic centres, and life sciences industry. I am delighted to see the publication of this report which showcases the UK's expertise in genomics and welcome the opportunity to highlight both ongoing work in Scotland, and our ambitions in this space.

In Scotland we remain fully committed to the Genome UK strategy and to the development, as set out within our five-year national strategies on genomic medicine and pathogen genomics, of an equitable, person-centred and population-based genomic healthcare system. We are working to integrate genomic information into Scotland's already rich national data ecosystem to accelerate research and translate innovation into service, working in partnership with academia, the third sector and industry. We also want, in conjunction with our evolving healthcare science strategy, to celebrate and develop the expertise of our healthcare professionals – particularly our healthcare scientists, and data scientists who are so critical to genomics and the delivery of improved patient outcomes for our population.

Professor Ian Young, Chief Scientific Advisor for Northern Ireland and representative of the Northern Irish Government on the UK National Genomics Board



Genomics in Northern Ireland has grown exponentially in the past decade to help transform healthcare delivery. In the Health and Social Care sector, a multimillion pound investment to establish the Regional Molecular Diagnostic Service has directly benefited our patients by delivering comprehensive specialist genomic testing for cancer, haematological conditions and rare genetic disorders, leading to improved diagnosis, treatment and management of our patients. Northern Ireland also has a thriving health and life sciences research and development sector. Our two Universities and local companies such as Randox, Almac and GenoME Diagnostics, are leading the way in terms of cutting-edge research and translation of innovation into practice, and we are keen to collaborate with commercial partners in the context of our Department of Health led Genomics Partnership for Northern Ireland. This will bring together delivery partners from across government and the HSC, public health, industry, research and academia, with patient input, to deliver an integrated genomics service for the population.

Spotlight on UK opportunities

The UK harnesses the power of genomics for healthcare – via the NHS Genomic Medicine Service (GMS) – and genomic science to provide evidence to improve health. Both companies and the UK government appreciate the importance of, and contribute to, the UK's genomics capabilities to bolster its position as a powerhouse for the life sciences revolution.

These achievements are enabled and supported by ambitious policy from successive governments and a renewed commitment to work in partnership with business to seize opportunities in this sector. Genomics, and life sciences as a whole, are therefore poised to play a key role in delivering economic growth and building an NHS fit for the future.

How UK export can benefit you:

- Work with companies who have gone through world-renowned regulatory and guidance bodies, using evidence from a health system serving a population of 67+million people, with world-first programmes to integrate genomics, AI, early diagnosis, and preventative population medicine.
- Companies have emerged from a world-class science environment and a growing pool of talent, with globally-leading universities, expert research and data infrastructure, and over 300,000 people employed in the life sciences industry.
- Benefit from partnership and vision in the UK's comprehensive innovation ecosystem, with a long track record of collaborative working between industry and government alongside academia, charities, and the NHS.

Why invest in the UK:

- Critical research infrastructure and a positive genomics ecoystem, including world leading institutions and initiatives such as UK Biobank, the Wellcome Sanger Institute, and Genomics England.
- A large, and growing, set of diverse patient data from a single health system with high ethical standards, including the Genomics England research environment.
- Access to world-leading research cohorts such as UK Biobank, NIHR Bioresource, Genomics England and Our Future Health.
- Collaboration, sustained funding and long term genomics strategies from all four nations, to improve outcomes for patients with better genomic testing and access to clinical trials.
- Access to the NHS Genomic Medicine Service where genomics is being adopted at scale and pace.

The UK's genomics history

The UK has long been a world leader in genomics. From the discovery of the structure of DNA over 70 years ago, through our contribution to the Global Human Genome Project, to the delivery of the 100,000 Genomes Project which commenced in 2013, the UK remains at the forefront of genomics research.

- **2000** – "Working draft" of the human genome sequence announced by The International Human Genome Sequencing Consortium (IHGSC)
- **2004** – Finished human genome sequence published by IHGSC
- **2006** – UK Biobank launched
- **2007** – Welsh SAIL Databank pilot study
- **2007** – NIHR bioresource launched
- **2011** – The Northern Ireland biobank established to facilitate translational biomarker research
- **2012** – 100,000 Genomes Project announced by the UK government
- **2013** – First NHS multi-gene sequencing diagnostic test for tumour profiling
- **2013** – Establishment of Genomics England
- **2014** – First participants recruited to the 100,000 Genomes Project
- **2015** – First participant diagnoses returned as part of 100,000 Genomes Project
- **2017** – Genome-wide genotype data on all 500,000 UK Biobank participants released
- **2018** – Genomic Medicine Service (GMS) rolled out by NHSE and First National Genomic Test directory published
- **2018** – 100,000 genomes sequenced for the 100,000 Genomes Project
- **2019** – £200 million investment from government, industry and charity securing the WGS of all UK Biobank participants
- **2020** – Genomics England Trusted Research Environment (TRE) established
- **2020** – UK government's 'Genome UK: the future of healthcare' published
- **2020** – First whole genome sequenced in the NHS GMS. NHS becomes the world's first national healthcare system to offer WGS as part of routine care
- **2021** – NHS Galleri trial launched
- **2022** – NHS GMS establishes the world's first national rapid whole genome sequencing service for acutely unwell babies and children
- **2022** – Our Future Health launched with £250 million investment from government, industry and charity
- **2022** – 2022-2025 The Genome UK implementation plan for England released
- **2023** – Complete sequence for all 500,000 participants of the UK biobank released and first 1 million participants joined Our Future Health
- **2024** – First participant recruited into the Generation Study

England

The Genome UK: 2022 to 2025 implementation plan for England shows examples of previous funding commitments for advancing genomics capabilities, including:

- **£105 million** for a newborn genomes research programme (the Generation Study)
- **£22 million** for Genomics England to look at diversity in genomic data and reference datasets
- **£26 million** for an innovative cancer programme
- Up to **£25 million** Medical Research Council-led funding for a 4-year functional genomics initiative

NHS England Genomic Medicine Service (GMS)

In 2018, the launch of the NHS GMS created a step change in the use of genomics in the NHS, becoming the first national healthcare system in the world to offer Whole Genome Sequencing (WGS) as part of routine care.

Genomic testing for the NHS in England is carried out by a national network of seven NHS Genomic Laboratory Hubs (NHS GLHs), with a shared aim to standardise testing, reduce variation, ensure equity of access, meet growing demand and provide access to the latest genomic technology. Through the NHS GLHs, the NHS GMS delivers over 800,000 genomic tests every year for common and rare and inherited disease, pharmacogenomics, and cancer, as outlined in the **National Genomic Test Directory** and through a range of techniques, from WGS to the latest Next Generation Sequencing (NGS) technology.

The NHS GMS has facilitated a move to a consolidated cancer genomic testing strategy through extensive panel testing using cutting edge high throughput NGS technology. This technology enables testing for a larger number of genetic variations to give a more precise diagnosis, identify biomarkers to target treatment and opportunities to access innovative medicines, and can support enrolment into molecularly stratified clinical trials.

Further to this, the NHS GMS has expertise in developing and introducing cutting edge technologies and validating them for clinical use, working with industry to evaluate these in real world settings, such as the current pilot utilising **Guardant** and **Roche's** circulating tumour DNA testing technology to support the diagnosis of patients with suspected non-small cell lung cancer. The pilot will allow for the evidence on clinical utility, impact on pathways and health economics to be reviewed and a decision made on the adoption into an NHS clinical service.

The NHS GMS also includes seven **NHS GMS Alliances** which are driving the strategic systematic embedding of genomics into mainstream end-to-end clinical specialities and pathways. They also support a range of life sciences projects such as the Generation Study with Genomics England and innovative transformation projects to ensure the NHS GMS remains cutting edge in the adoption of genomics technologies and their implementation. Further strengthening the data and digital standards and infrastructure across the NHS GMS is the development and delivery against the Genomics Data and Digital Framework, as well as the introduction of automation and high-throughput analytical platforms, so that test results can be provided more efficiently across the country.

There are many internationally recognised academic collaborations linked to the NHS that demonstrate strength and research excellence. The NHS GMS takes a pioneering approach through supporting early access to clinical trials and aligning trial targets to standard of care testing, and supporting a range of discovery and translational research projects and initiatives. NHS Genomic Networks of Excellence are new partnerships between the NHS GMS, academia, the third sector and industry, to generate evidence and models of adoption for new technology, testing and new discoveries linked to clinical and laboratory practice.

The NHS GMS is driving the use of precision treatments through being responsive to approvals for newly licensed precision medicines with a genomic target to supporting timely access for patients and enabling entry into clinical trials. The NHS GMS also systematically introduces pharmacogenomic testing for defined medicines, driving the optimal use of medicines to reduce adverse drug reactions in line with National Institute for Health and Care Excellence guidance.

Whole genome sequencing for Glioblastoma in Cambridge, NHS Genomic Medicine Service

The **Minderoo Precision Brain Tumour Programme**, taking place at the Addenbrooke's Hospital in Cambridge, is bringing genomics-based personalised treatment to brain cancer patients for the first time. The project, a collaboration with the Minderoo Foundation and the Tessa Jowell Brain Cancer Mission, will investigate whether rapid whole genome sequencing can improve care for patients with glioblastoma, the most aggressive and fatal type of brain tumour. If successful, the personalised treatment plans will help improve survival rates and give patients confidence that they are getting the very best treatment option available to them by reducing the prescription of ineffective treatments. The genomes sequenced as part of the project will also be a valuable resource for researchers to identify targets for new therapies. If the study demonstrates a benefit to patients, the approach could be rolled out nationally and help establish rapid genomic sequencing for brain tumour patients as part of the NHS Genomic Medicine Service.

The Department of Health and Social Care funds research through the National Institute for Health and Care Research (NIHR). The NIHR invest significantly in genomics research projects as well as centres of excellence, facilities and services to enable and deliver research in England, which form the NIHR infrastructure. NIHR infrastructure supports genomics research via its Biomedical Research Centres (BRCs), 15 of which have research themes on genomics, gene therapy and precision medicine, and its Clinical Research Facilities (CRFs).

Genomics England Ltd

Genomics England is a key delivery partner in the Government's genomics strategy, established in 2013 as a company owned by the Department of Health and Social Care to deliver the 100,000 Genomes Project in collaboration with the NHS. They are a global leader in enabling genomic medicine and research, with a vision of creating a world where everyone benefits from genomic healthcare.

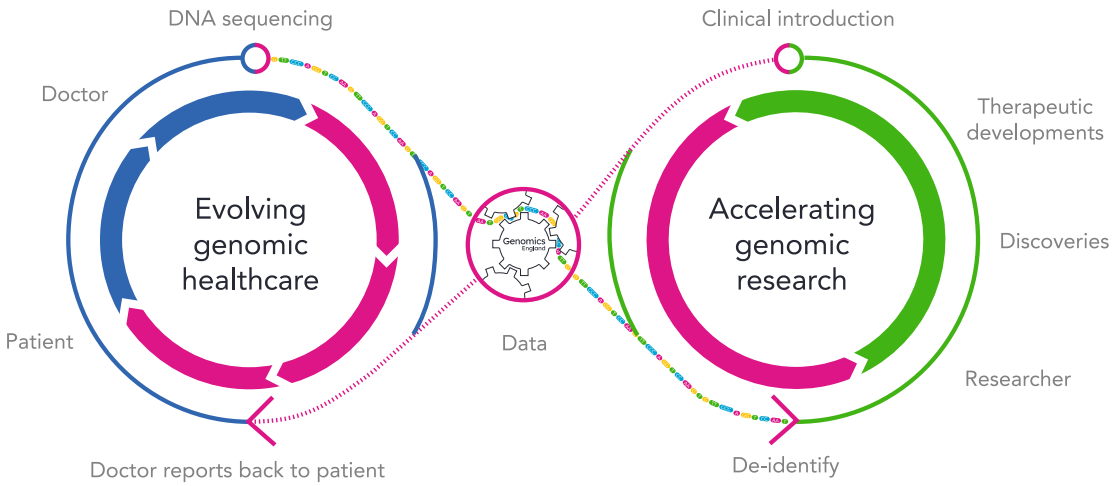
Building on the 100,000 Genomes Project, Genomics England now supports the NHS to deliver the world-first national whole genome sequencing service. They also run the **National Genomic Research Library** and major research projects with industry and academia – all in the service of innovating to help enable better patient outcomes and bolster the UK Life Sciences sector.

Genomics England's work covers healthcare and research, shown by their **"infinity loop"** (depicted below) – where the clinical service delivered by the NHS GMS supports the generation of data that drives research, and the insights from research drive the transformation of healthcare in the NHS.

The Generation Study – Genomics England

The Generation Study is a ground-breaking research study aimed at establishing whether sequencing the whole genomes of 100,000 newborns can help to discover rare genetic conditions. From nine conditions tested in the "heel prick" test today, the intention is to look at over 200 rare conditions caused by genetic changes that affect young children, and move those who need treatment onto the correct clinical pathway as soon as possible. The study also aims to contribute to genetic research by adding consented, de-identified genomic and health data from newborns to the National Genomic Research Library, for potential reanalysis of participants' genomes as needed. This data will be accessible to vetted academic, clinical, and biopharma healthcare researchers to then develop new diagnostics, treatments, and potentially improve existing therapies.

The Infinity Loop



Llywodraeth Cymru
Welsh Government

Wales

NHS Wales' national programmes for genomics, pathology, imaging and advanced therapies are supported by the Welsh Government to embed precision medicine into healthcare, underpinned by the Government's Genomics Delivery Plan for Wales 2022-25.

Genomics Partnership Wales (GPW) provides a united approach to genomics in Wales, supporting the delivery of precision healthcare in NHS Wales.

Key organisations in the GPW include:

- **The All Wales Medical Genomics Service (AWMGS)**, which is the single provider of both NHS laboratory and clinical genomic services in Wales. It has strong links across the UK, and leads on the delivery of specialist rare disease, pharmacogenomics and the development of precision medicine services in oncology.
- **Wales Gene Park (WGP)** collaboratively works with academic and clinical researchers to provide expertise in the field of next generation sequencing and bioinformatics and also supports public and professional engagement and education, participation and involvement in research incorporating genetics and/or genomics.
- **Public Health Wales' (PHW) Public Health Genomics Programme** delivers genomics services to protect and improve health and well-being and reduce health inequalities, including specialist genomics services for diagnostics, surveillance and outbreak control.
- The seven health boards within NHS Wales, which each deliver genetics services to their population.

Canolfan Iechyd Genomig Cymru / Wales Genomic Health Centre, a new state of the art genomics facility at Cardiff Edge Life Sciences Park, was opened in December 2023 to physically bring together service delivery and research and create an environment which promotes the sharing of knowledge and expertise between NHS Wales, industrial partners and the academia.

To ensure patients benefit from the rapid developments in precision medicine, Wales are actively collaborating with industrial partners for patients to receive the best services available, and offer opportunities to collaborate with NHS Wales, clinicians and many specialist research institutes.

Within the area of Genomics, Wales offers the following benefits:

- A 'one Wales' seamless service for genomics health, care and research within the NHS.
- An internationally recognised trusted population databank, the **Secure Anonymised Information Linkage** (SAIL) databank, which contains anonymised healthcare data for the population of Wales. The SAIL team have extensive expertise on safe and secure access to linked clinical and health data for

research, meaning outcomes can be further improved.

- Areas of clinical and research strengths including rare diseases, oncology, pathogen genomics and neuropsychiatric disorders.
- Development and validation of molecular information, bioinformatics and clinical phenotyping technologies with NHS partners.

Liquid Biopsy for lung cancer management in Wales

Liquid biopsy, a tool in genomic medicine which holds promise for simple, accessible, and reliable cancer detection, prognosis prediction, personalised treatment, and less invasive monitoring for cancer recurrence. Lung cancer, the fourth most common cancer in Wales and a leading cause of cancer deaths, is being addressed through a clinical study facilitated by **AWMGS** and **Illumina** at various partner organisations. The study aims to assess the benefits of liquid biopsy in individuals with suspected lung cancer. It explores how early non-invasive blood sampling can enhance and expedite diagnosis, reduce the time from diagnosis to treatment, and potentially extend to other suspected cancer types. This study exemplifies the Welsh Government and NHS Wales's commitment to transforming diagnostic services in Wales, as outlined in the **Diagnostic Recovery and Transformation Strategy for Wales 2023-25.**

Scotland

NHS Scotland's genetic and molecular pathology services are commissioned through NHS National Services Division (NSD) and delivered across a network of laboratories to provide a consistent and equitable service for the whole of Scotland.

The **Scottish Strategic Network for Genomic Medicine (SSNGM)** was established in August 2022 to provide overall strategic leadership and oversight for genomics in Scotland. The SSNGM supports the development and delivery of the Scottish national genomic test directories and, through a dedicated transformation team, the ongoing reform of the laboratory network. It also serves as a single point of contact for the genomics community in Scotland to engage nationally, ensuring all of Scotland can benefit from the equitable expansion in genomic medicine.

In March 2023 the Scottish Government published a strategic intent document which outlined their commitment to the development of a robust national genomic medicine service. After extensive consultation with stakeholders across Scotland this was followed, in 2024, by a five-year strategy entitled 'Genomics in Scotland: Building our Future' which sets out a vision for an equitable, person-centred and rights-based genomic medicine service that can improve health outcomes for people in Scotland and better enable the use of genomic information to support disease prevention and early detection. This is published in conjunction with a 5-year Pathogen Genomic Strategy by Public Health Scotland and Scottish Government. Cancer and rare conditions are core clinical priorities within the Genomics in Scotland Strategy, supporting the work of the wider Cancer Strategy for Scotland 2023-2033 and the Rare Disease Action Plan.

The Genomics in Scotland Strategy, closely aligned with the work of the SSNGM, focuses on the following areas:

- **Developing the range and scope of genomic testing** available in Scotland and promoting the greater use of genomic information to improve patient outcomes by drawing on the expertise of NHS and academic centres, data innovation hubs, a thriving life sciences sector and third sector organisations.
- **Education and workforce development** in conjunction with both the wider Scottish health and social care workforce and developing healthcare science strategies.
- **Data and digital infrastructure development** to ensure that genomic data is integrated into Scotland's wider digital architecture to support citizen and staff access to relevant information and preventative programmes, and to ensure that health and care planners, researchers and innovators have secure access to genomic data alongside the wider healthcare data needed to increase the efficiency of our health and care system.
- **Building research and innovation into services** by design, drawing on existing work by the Chief Scientist Office supporting national resources promoting genomic research, the Precision Medicine Alliance Scotland programme and the Innovation Design Authority's Accelerated National Innovation Adoption pathway.

Northern Ireland

Northern Ireland Executive

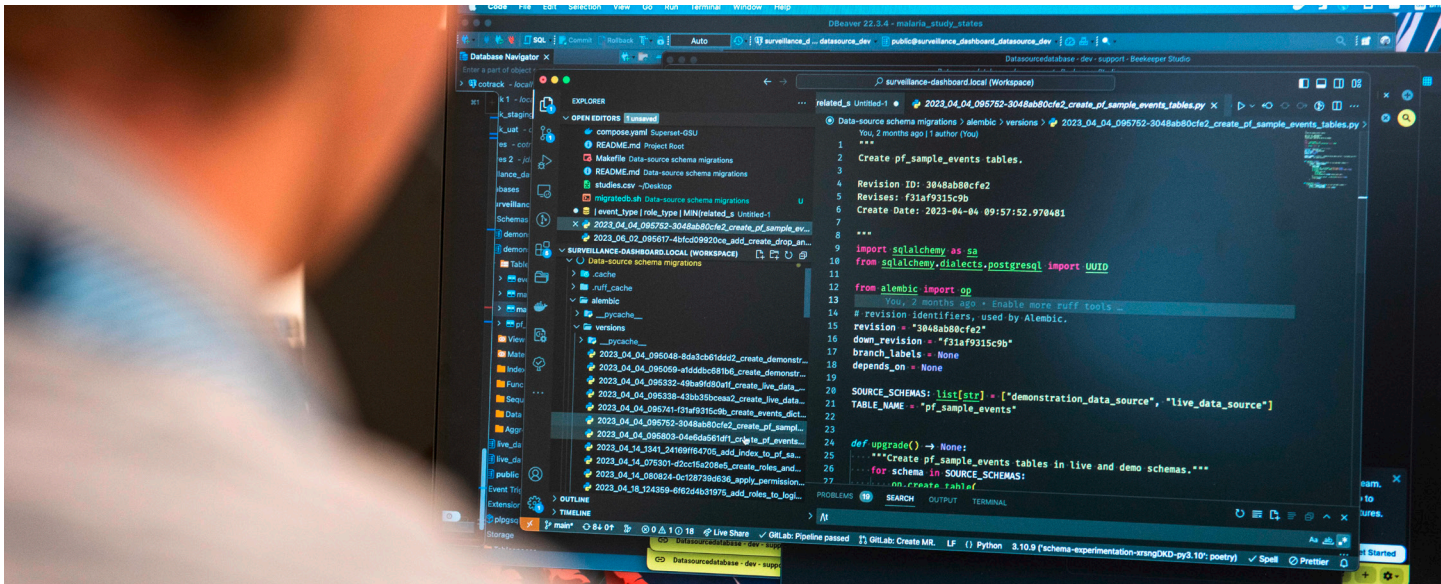
Northern Ireland is a hub for life sciences in the UK, employing over 19,500 people in over 250 businesses, who export to over 145 countries. It is recognised by the UK government as a fast-growing region which excels in advanced precision diagnostics and has expertise in diagnostics, artificial intelligence and data analytics. The region has renowned Universities, Queen's University and Ulster University, and 1000+ researchers working across 17 Centres of Excellence in life and health sciences, with 75% of university spinouts originating from this thriving sector.

The genomics ecosystem and integrated health system make Northern Ireland a promising testbed for population size clinical trials. The nation is developing an electronic patient record system, 'encompass', which will create a single digital care record for every citizen of Northern Ireland who receives health and social care, with completion in all five Trusts expected by the end of 2025.

As part of a £1.3 billion package of government investment, Northern Ireland is committed to cementing its reputation as a prime location for life and health sciences. Up to £200 million will be invested through City and Growth Deals across Northern Ireland to grow the sector.

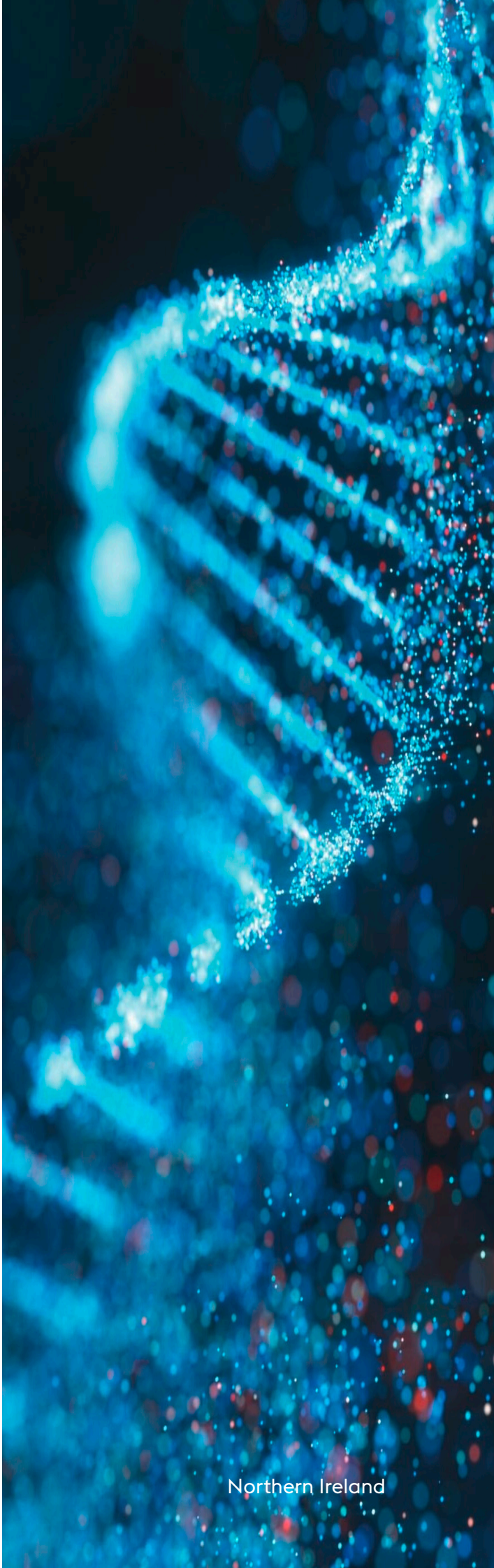
Precision Medicine Centre of Excellence

The Precision Medicine Centre (PMC) at Queen's University Belfast (QUB) collaborates with Belfast Health & Social Care Trust (BHSCT) to integrate genomics, digital pathology, and big data analytics for cancer research. It aims to develop diagnostic algorithms and risk stratification for early and late-stage cancers, partnering with industry and academic institutions. The PMC consists of two interconnected sections—Genomics and Tissue Hybridization & Digital Pathology—supported by Bioinformatics and management teams. Integrated with the Northern Ireland Biobank (NIB), it builds upon significant research funding and infrastructure investments, contributing to a genomics innovation ecosystem. QUB also hosts the Genomics Core Technology Unit (GCTU), offering cutting-edge research services internationally.



Leadership and collaboration in the genomics ecosystem is provided by:

- **Companies** focused on genomics include Randox, Almac, GenoME Diagnostics, Blokbio and 42 Genetics.
- **Centres of Excellence as outlined below.**
- **Centre for Genomic Medicine at Ulster University**, which is using cutting-edge genomic technologies to better understand the genetic basis of various degenerative diseases in order to identify individuals at risk and ultimately improve patient health outcomes.
- **Queen's University** which is working with i-REACH Health, a collaboration between researchers, industry, clinicians and the NHS to create a unique ecosystem for clinical trials, testing of new drugs and their integration into care. The Northern Ireland **Genomic Medicine Centre**, also part of the University, aims to tackle the diagnosis and treatment of rare genetic disease. The **Belfast Experimental Cancer Medicine Centre**, also at Queens, facilitates effective translational and clinical research in experimental cancer medicine. The Centre has worked with over 40 pharmaceutical companies and has a strong focus on precision medicine and a track record in novel genomic biomarker identification and development through established industry collaborations.
- The **Northern Ireland (NI) Biobank** based at Queen's University is funded by the HSCNI Research and Development Division. NI Biobank has become a regional research infrastructure across the NI Health Trusts to undertake approved studies.



Spotlight on UK expertise

UK businesses harbour significant expertise across various genomics applications. Renowned as a global hub for innovation, the country boasts a reputation as a small and medium enterprise (SME) innovation powerhouse, nurtured by the collaborative efforts between the NHS, research institutions, and businesses. This environment also renders the UK an attractive destination for multinational corporations looking to establish headquarters for genomics-focused ventures.

This ecosystem has enabled UK expertise across numerous specialisations, allowing for the application of genomics in diverse aspects of disease management. Consequently, patients benefit from innovative diagnostic and therapeutic solutions tailored to their genetic predispositions.

The following companies are illustrative of the UK's life sciences sector and is not meant to be exhaustive. Inclusion in this list does not imply endorsement of companies or their technologies.

1. Drug discovery and precision medicine approaches

AstraZeneca

AstraZeneca, a leading global biopharmaceutical company driven by science, is committed to advancing genomic approaches throughout research and development. This commitment includes ambitious goals such as analysing up to two million genomes by 2026 to identify new drug targets and the use of cutting-edge gene editing tools like CRISPR, multi-omics, and functional genomics to enhance understanding of disease biology and investigate disease mechanisms. Notably, AstraZeneca collaborates with the MRC and the Milner Therapeutics Institute at the University of Cambridge to establish a world-class functional genomics laboratory that supports discovery research in chronic diseases. This genomics research is propelling their diverse portfolio of next-generation therapeutics, encompassing gene therapies, oligonucleotides, and cell therapies.

Genomics plc

Genomics plc is a pioneering healthcare company that uses large-scale genetic information to develop innovative precision healthcare tools and to bring new understanding to drug discovery. Formed in 2014 at the University of Oxford, the company is now collaborating with some of the world's leading healthcare organisations and helping them to predict, prevent, treat, cure – dramatically reducing the human and financial cost of common diseases like cancer, diabetes and heart disease.

C4X Discovery

C4X Discovery (C4XD) stands at the forefront of drug discovery, specialising in the exploration and development of small molecule medications tailored for immuno-inflammatory conditions. Its distinctive approach integrates advanced molecular design techniques and patient stratification capabilities, resulting in the creation of small molecule drug candidates targeting various immuno-inflammatory diseases. C4XD utilises 'PatientSeek,' its precision medicine platform designed to identify patients likely to benefit from specific medications based on their genetic profiles. Powered by C4XD's proprietary mathematical approach, PatientSeek employs sophisticated data analysis to identify crucial genetic biomarkers for informing clinical trial designs and selecting patients likely to respond favourably to targeted therapeutics. C4XD is actively exploring the application of PatientSeek subgroups in immuno-inflammatory diseases to pioneer tailored precision medicine approaches for these patient populations.

GSK

GSK, a UK-based global healthcare company, focuses on delivering a new generation of differentiated, needed vaccines and medicines, using the science of the immune system and advanced technologies to get ahead in four therapeutic areas – infectious diseases, HIV, respiratory/immunology, and oncology. Functional genomics, combined with human genetics insights and AI/Machine Learning, enables GSK to identify disease causes more accurately and rapidly, facilitating the expedited delivery of genetically validated drug targets.

Nucleome

Nucleome Therapeutics Ltd is a biopharmaceutical company specialising in decoding disease-linked genetics in the non-coding regions of the human genome to develop precision medicines. Led by a management team of experts in gene regulation and drug development, Nucleome focuses on the uncharted "dark matter" of the genome, where over 90% of disease-linked genetic changes occur. With unparalleled precision in linking variants to genes, Nucleome aims to pioneer precision medicines for lymphocytes and autoimmune diseases while building a robust pipeline of drug assets.

2. Sequencing

2.1 Sequencing platforms

Illumina

Illumina is a leading developer, manufacturer, and marketer of life science tools and integrated systems for large-scale analysis of genetic variation and function, with their European HQ in Cambridge, UK. Their innovative sequencing and array technologies are enabling groundbreaking progress in life science research, translational and consumer genomics and molecular diagnostics. Illumina has been given responsibility for the design, manufacture and assessment of a custom genotype assay for **Our Future Health**. They are working closely with the genotyping service provider, Eurofins, to ensure smooth processing of all 5 million samples using the Illumina array.

Oxford Nanopore Technologies

Oxford Nanopore Technologies is a leader in the sequencing field with their patented new generation DNA/RNA sequencing technology. It is the only sequencing technology that offers real-time analysis (for rapid insights), in fully scalable formats that can analyse native DNA or RNA and sequence any length of fragment to achieve short to ultra-long read lengths. Strong internal R&D and external collaborations enable their disruptive innovations evidenced by the vast patent portfolio of more than 2,600 patents. Oxford Nanopore technology is being used by Genomics England to investigate and validate at increasing scale the benefits of sequencing to improve patient care and develop new treatments. A successful pilot programme in partnership with Guy's and St Thomas' NHS Foundation Trust has resulted in government funding to embed rapid pathogen genomic sequencing capability into clinical research settings to improve patient outcomes and biosecurity.

2.2 Sequencing- based diagnostics and therapies

Broken String

Broken String Biosciences is a pioneering genomics company founded with the mission to propel the advancement of the next generation of safer, more precise, and efficient cell and gene therapies through its state-of-the-art technology platforms. Among these platforms, INDUCE-seq™ is a Next Generation Sequencing (NGS)-based DNA break mapping platform, empowering companies engaged in the development of cell and gene therapies to precisely gauge and quantify unintended genetic alterations, thereby assessing the resultant genetic ramifications. This platform technology furnishes data-driven, actionable insights across the spectrum of discovery, pre-clinical, and clinical development phases, thereby propelling gene editing initiatives forward and positioning itself as the benchmark for evaluating off-target effects within the genome.

Enhanc3D Genomics

Enhanc3D Genomics is a functional genomics company focused on exploring the 3D organisation of DNA in health and disease. Through their GenLink3D platform, they uncover the impact of genetic mutations in non-coding regions on remote genes, elucidating their role in disease progression. Leveraging 3D genome maps, GenLink3D identifies new biomarkers and treatment targets for cancer, ageing, and autoimmune conditions. The proprietary platform utilises capture Hi-C technologies to profile 3D genome folding, linking gene enhancers and non-coding genetic variants to their target genes, thereby unlocking their therapeutic potential.

Sectra

Sectra is a leading medical IT software company specialising in diagnostic IT software for radiology and pathology, with four UK offices. With a 10-year track record as a “Best in KLAS” PACS provider, Sectra collaborates closely with customers to offer an enterprise imaging platform that streamlines diagnostics for cancer, neurological, and cardiovascular conditions amongst others. Through a collaboration with Penn Medicine, Philadelphia, Sectra has developed a robust IT system for sequencing diagnostics, covering the entire workflow from sample to molecular reports. By integrating the genomics module into the Sectra Enterprise Viewer ecosystem, Sectra offers a comprehensive platform that facilitates efficient workflows across diagnostic disciplines, triaging, and coordination, while providing a complete medical history with multimodality information spanning radiology, pathology, and genomics.

3. Genome-based testing, diagnostics and treatment strategies

Almac

Almac Diagnostic Services has clinical and research laboratories in the UK and the USA offering: genomic services through a range of platforms and technologies, sample management and data sciences; clinical trial assays; and companion diagnostics development, manufacture and commercialisation. They provide clients with a range of cutting-edge genomics platforms, producing high-quality data from both DNA and RNA. Almac's dedicated Data Sciences team has created proprietary, cutting-edge bioinformatics solutions, assisting clients in extracting valuable insights from genomic data which contribute to uncovering novel research findings that drive progress in drug development.

Genedrive

Genedrive plc is a leading global provider of genomic testing for emergency medicine. Genedrive designs, develops, manufactures, and sells products capable of detecting patients' genetic variants in as little as 27 minutes from a buccal swab, empowering clinicians with crucial information for treatment decisions linked to antibiotic induced hearing loss and stroke management. Their Genedrive® System features a compact benchtop design for placement at the point of care, a user-friendly touch screen interface with barcode scanning capability, RFID-enabled reagent lockout to prevent the use of expired tests, and rapid automated operation designed for time-critical situations prior to treatment prescription.

GenoME

GenoME Diagnostics specialises in developing cost-effective assays for early and precise disease detection, particularly targeting diseases with unmet clinical needs. Their assays, focusing on detecting circulating tumour DNA with high sensitivity, aim to facilitate earlier and more accurate detection of diseases like ovarian cancers, along with more accurate relapse detection. Using a cutting-edge digital PCR platform, they identify DNA methylation changes in tissue and liquid biopsies, designed for unparalleled sensitivity and precision. GenoME Diagnostics plans to expand its portfolio beyond ovarian cancer through in-house development, partnerships, collaborations, and external services. Their flagship product, currently in development and validation stages, measures patented DNA methylation markers in blood samples using digital PCR to provide a more accurate and early detection of ovarian cancer.

Informed Genomics

Informed Genomics is a private genomic testing laboratory providing innovative molecular testing services and solutions to the NHS and private sector.
Its hereditary cancer testing service is accredited to UKAS ISO 15189:2012 and its laboratory adopts the highest quality standards across all clinical diagnostics and genomic research services. As well as hereditary cancer testing, Informed Genomics offers a novel bladder cancer testing service, exome sequencing, RNA sequencing, tumour profiling and custom panel design.

Nonacus

Nonacus is committed to tackling the challenge of high cost and invasiveness of current cancer screening methods. Alongside their established Cell3 Target technology, they have developed an advanced liquid biopsy platform named GALEAS. By integrating ultra-sensitive genomic techniques with state-of-the-art bioinformatics, GALEAS utilises the distinctive molecular signature of tumours to guide treatment decisions, detect cancer earlier, and monitor recurrent disease enhancing patient outcomes, facilitating the decentralisation and democratisation of cancer genomics. Their cfDNA products enhance understanding and research in non-invasive healthcare and optimise patient care through the innovative use of cfDNA technology, allowing for non-invasive diagnostics.

Randox

Randox provides a wide range of genomic services, including exome and genome sequencing, pharmacogenomics, nutrigenomics, targeted genotyping, Sanger sequencing and microbial genomics, catering to pharmaceutical, biotech, academic, and healthcare sectors. The company provides fully automated benchtop and point-of-care platforms for scalable molecular testing. Additionally, Randox offers the full Olink® proteomic biomarker discovery suite in areas such as cardiometabolism, inflammation, neurology, and oncology. Their Genomics Services department is equipped with state-of-the-art facilities and specialised personnel to provide end-to-end sequencing utilising various platforms, and delivering customisable services for research, development, and validation of genomic tests.

Canon Medical Research Europe

With the goal of enabling precision medicine, the centre employs machine learning and AI to analyse and integrate multi-omic data provided by project partners. Models are under development to stratify the risk of future adenomatous polyps, which are precursors of colorectal cancer in certain individuals. In a collaboration focused on non-small cell lung cancer, Canon Medical will explore the relationship between genetic mutations and CT imaging. Located in Edinburgh near several leading universities, Canon Medical Research Europe fosters productive academic collaborations. The organisation's AI Centre of Excellence brings together scientists, software engineers, and clinical specialists, enabling them to undertake diverse projects covering medical imaging, natural language processing, and bioinformatics.

Congenica

Congenica is a digital health company specialising in innovative software and solutions for genomic data analysis and interpretation. Their mission is to drive Precision Medicine on a large scale, easing the burden on healthcare systems worldwide by delivering rapid and automated analysis, diagnosis and treatment options to healthcare providers and patients. As the exclusive Clinical Decision Support Partner for the **NHS Genomic Medicine Service**, they have a global presence supporting leading laboratories, medical centres, hospitals, and biopharmaceutical companies. Their products combine state-of-the-art technology, market-leading automation, and machine learning to unlock actionable insights across all areas of human disease where genomic information is crucial. Initially focused on Rare & Inherited Diseases, they have expanded into Somatic Oncology, Pharma Insights, and Pathogen Surveillance. Their platform consolidates all services and CE-marked products into one scalable, automated and integrated analysis solution. Their highly customisable software enables rapid analysis and interpretation of next-generation sequencing data at scale, whether on-premise or as a SaaS solution.

IQVIA

IQVIA (NYSE:IQV) is a leading global provider of advanced analytics, technology solutions, and clinical research services to health systems and the life sciences industry. As the world's leading provider of clinical research services, IQVIA has wide-ranging expertise in delivering precision medicine and clinical trials. IQVIA also has an extensive network of laboratory facilities which are equipped with state-of-the-art technology based in Livingston, Scotland which offers complete lab services and processes c.5million biological samples every year from across the world. IQVIA facilitates genomic research through a growing network of over 60 data and technology partners, across 40+ countries. Its capabilities include primary data collection, genomic data enrichment, and customised solutions such as genomic sequencing and biomarker development through collaborations with biobanks. IQVIA's E360™ Genomics platform enables rapid cohort development and powerful analytics while ensuring genomic patient privacy through patented anonymisation technology.

Sano Genetics

Sano's mission is to accelerate the future of personalised medicine by streamlining the precision medicine clinical trial process with a 360° platform that connects each piece of the trial process, accelerating research fivefold and cutting costs tenfold. Sano aims to overhaul the traditional drug development process by connecting researchers with the right patients at the right time. Developed in collaboration with **Genomics England** and adopted by biomedical resources such as **NIHR BioResource**, the Sano platform addresses the major hurdles of participant recruitment, genetic testing and engagement while facilitating the reuse of patient data for future research. This has been demonstrated through Sano's Genetics of Long COVID (GOLD) study, which collected genetic data from 3,750+ individuals, enabling an analysis that uncovered 73 genes associated with Long COVID, including 42 that are targetable for drug development. This pioneering work attracted pharmaceutical company interest and has shown relevance to Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS).

Supporting genomics

The UK has a range of service expertise which support the genomics ecosystem, enables genomics innovation to be made available for patients and ensures safe application:

- Data and enabling resources to support effective use of genomic data
- Training and education to build capacity for genomic-based clinical decisions
- Governance and ethics to ensure safe and ethical usage of genomic data

Data and enabling resources

Accessing a database of genomic data and securely exchanging data between biobanks and pharmaceutical companies is crucial. The UK systematically collects health research data and ensures the utilisation of enabling technologies such as cloud, digital, imaging, and machine learning. This facilitates effective receiving, storing, processing, accessing, using, and reusing of genomics data to enable innovation.

UK Biobank stands as the world's most significant resource for health research, offering in-depth genetic, health, and lifestyle information from half a million GB volunteers. This includes the completion of the world's largest set of whole genome sequences (500,000 people), and the world's largest project scanning people's whole bodies (already over 75,000 people). This resource enables approved researchers worldwide to access unparalleled de-identified data, contributing to medical breakthroughs in various fields, from treating cardiac disease to Alzheimer's. This was a culmination of a £200m project involving UKRI, Wellcome and four large pharmaceutical companies. The 30 petabytes of data can be accessed through the UK Biobank Research Analysis Platform. UK Biobank is a not-for-profit organisation, and researchers in low- and middle-income countries can have their access and computing fees paid for via UK Biobank's Global Researcher Access Fund.

Lifebit, a global leader in genomics and health data software founded in the UK, empowers organisations to leverage sensitive biomedical data securely for vital research and precision medicine. In collaboration with **Genomics England**, Lifebit contributed to securely cleaning and transforming clinical and genomic data from 135,000 patients, making it more usable for research. Furthermore, Lifebit has announced major collaborations worldwide to enhance diversity in genomic data studies, including with Flatiron Health, to accelerate cancer research.

Training and education

GeNotes

Developed by the National Genomics Education Programme, GeNotes is an innovative digital resource developed by certified medical professionals to aid NHS clinicians in accessing genomic testing for their patients conveniently. Designed for use during or just before patient appointments, GeNotes offers timely information centred around clinical scenarios. It covers the process of requesting appropriate genomic tests, interpreting results, and aligns with NHS England's National Genomic Test Directory.

Clinical Pathway Initiative (CPI)

The Clinical Pathway Initiative (CPI) aims to integrate genomic competencies into NHS workforce education, aligning with patient pathways. Led by the NHS England Genomics Education Programme, NHS England's Genomics Unit, and the Academy of Medical Royal Colleges, CPI maps clinical pathways to required competencies, identifies workforce needs, and ensures consistent education delivery.

National Genomics Education Programme

The National Genomics Education Programme funded by NHS England has a strategic framework to integrate genomic medicine into pharmacy education over a period of three years. This involves integrating genomic awareness, building networks, identifying needs, and educating and developing the pharmacy workforce for genomics application in healthcare. There are also other developments across the whole of the multiprofessional workforce.

Genomic Counselling

Genomic counselling is a specialised service aimed at providing comprehensive support and guidance to individuals and families dealing with genetic conditions or contemplating genomic testing. It is conducted by highly trained professionals with expertise in genetics, counselling techniques, and the ethical, legal, and social implications of genetic information. Training is regulated by professional bodies like the Genetic Counselling Registration Board (GCRB) and the British Society for Genetic Medicine (BSGM) and the individual genomic counsellors are statutory regulated by the Health and Care Professions Council. Counselling plays a critical role in empowering individuals and families to make informed decisions about their genetic health, ensuring access to high-quality, patient-centred care tailored to their specific needs and circumstances. These services are primarily available through NHS genetics clinics, which offer a multidisciplinary approach to care involving genetic counsellors, clinical geneticists, nurses, and other specialists.

Scientist training programmes

There are a range of programmes available from the NHS England National School for Healthcare Science that train clinical scientists in genomics inclusive of cancer and rare disease and in bioinformatics leading to statutory regulation with the health and care professions council. These programmes are both at the entry level for clinical scientist training and at higher scientific specialist levels that in genomic scientists can underpin application for fellowship of the Royal College of Pathologists. Work is ongoing to develop a professional career pathway for clinical technologists in genomics.

Governance and ethics

The **Genomics Clinical Reference Group (CRG)** supports the NHS Genomic Medicine Service (GMS) by advising on clinical policy and strategy, overseeing the annual review of the National Genomic Test Directory, raising awareness of genomics across clinical specialties, and developing guidance and service specifications. Further to this, the newly established **NHS Genomics Ethics, Equity and Legal Advisory Group** provides expertise on ethical and legal themes within the NHS GMS whilst also ensuring that the NHS GMS provides equitable access to all patients. Additionally, there is a focus on the ethics of genomics data banks, led by the Nuffield Council on Bioethics, highlighting the UK's commitment to diverse datasets for equitable genomic provisions.

The **UK National Screening Committee (UK NSC)** is working with Genomics England to look carefully at the implications of using whole genome sequencing for screening in the UK. This includes whether it is ethical and acceptable to test for certain conditions, and how genomics could usefully add to existing newborn screening programmes in the future. The recent independent review on equity in medical devices, commissioned by the UK Government, highlighted recommendations in a number of areas including genetics and particularly polygenic risk scores, to support future research and guidance on risk communication to patients, and to reduce health inequalities.

Professional groups

There are also professional groups which act to support and promote the use of genomics in healthcare, support professional development, coordinate policy development, and represent a wide group of stakeholders in genomics from clinicians to patients and their families. Examples of these groups include the Joint Committee on Genomics in Medicine, run collaboratively by the Royal College of Pathologists, The Royal College of Physicians and the British Society for Genetic Medicine; The Academy of Medical Royal Colleges professional partnership group; and the Rare Diseases Forum.

Forward view

There are many exciting initiatives which will continue to build on the progress already made in genomics in the UK, underpinned by government support and continued investment from UK Research and Innovation (UKRI). We can expect to see continued expansion in the range of conditions where genetic testing and particularly whole genome sequencing becomes routine – already being seen in rare diseases – and 'genomics first' approaches are becoming more widely adopted in the management of cancer. We can also expect to see pharmacogenomics being introduced into the mainstream health service and faster delivery of genomic testing. Current developments in UK genomics are focused around expansion of genomics datasets, precision medicine, and advances in rare disease and cancers.

Expansion of genomic datasets

Research initiatives

The UK has recently established its largest health research programme to date – **Our Future Health** – which is aiming to recruit five million participants that reflect the full diversity of the UK population to a long-term prospective research cohort. It will be a catalyst for the discovery and translation of research findings to help everyone live longer and healthier lives. Our Future Health will combine lifestyle, physiological, health-related records, and genetic data. Researchers will be able to access these data and baseline blood samples as well as invite selected participants to take part in research studies including clinical trials for rapid translational insights. The Our Future Health resource will play a central role in generating evidence for how new types of information – including genetic data – can be used to predict risk and prevent common, chronic diseases including diabetes, cardiovascular disease, dementia and cancers.

Bioresources

The **National Institute for Health and Care Research (NIHR) BioResource** is a resource of data and samples donated by over 200,000 volunteers recruited from cohorts covering rare diseases, common diseases and healthy populations. Volunteers also allow access to their health records. The BioResource Portal allows authorised researchers to access the genotype and phenotype data from participants. The aim is to study genetic and environmental factors in health conditions, aiding in disease understanding and treatment development. The resource has supported over 340 studies and plays a crucial role in advancing medical research and improving healthcare outcomes.

The **Genomic Surveillance Unit** (GSU), based at the **Wellcome Sanger Institute**, translates the latest genomic and epidemiological research into practical public health services globally. By leveraging cutting-edge sequencing technologies and bioinformatics pipelines into accessible and flexible tools, the GSU supports international partners with training, open-source genomic datasets, and adaptable bioinformatics platforms, empowering them to confidently sample, sequence, and analyse pathogen threats in near real-time.

Precision Medicine

Understanding how genetic, lifestyle and other environmental factors influence disease will ultimately be the key to the development of truly personalised and precision healthcare. The UK is making advances in precision medicine including in the areas of biomarkers and diagnostics which are essential for patient stratification, diagnosis and treatment. Examples of where the UK is already building on this growing market include:

Queen Mary University of London | NHS Barts Health NHS Trust

BARTS LIFE SCIENCES

DISCOVERY / DIVERSITY / DELIVERY

The **Barts Health Precision Medicine Platform** is a cutting-edge health data portal offered by Barts Life Sciences in East London. It includes an integrated data access service to the extensive electronic health records of a diverse community of over 2.5 million people held by Barts Health NHS Trust. The platform facilitates data-led innovation while prioritising patient confidentiality, fairness, and equity, and complies with data security, legal and ethical standards for patient data analysis. Data sets are being explored in projects by researchers within Barts Life Sciences and globally in the academic and commercial sectors.

Research carried out by **Ulster University's Personalised Medicine Centre** and Altnagelvin Hospital (Northern Ireland) is pioneering drug-gene testing – pharmacogenomics – to reduce the risk of serious side effects for patients on prescription medicine. The Centre supports an integrated ecosystem to accelerate scientific, clinical and commercial research and development for personalised medicine. Studies led by the team include research into long-term conditions such as cardiovascular disease, diabetes, blood cancers, vision disorders, neurodegenerative disorders and arthritis. Companies collaborating with the Centre can work at the bridge between the UK and EU.

Advances in rare diseases and cancers

The UK has a thriving sector in advanced therapeutic medicinal products (ATMPs) and has grown Europe's largest advanced therapies industry cluster. The Cell and Gene Therapy Catapult collaborates with academia, industry and healthcare providers to develop innovative cell and gene therapies, and drive innovation in this area. They have expertise in early-stage development, manufacturing technology, facilitating adoption, market access and regulatory issues.

Support is shown through the **2021 UK Rare Diseases Framework** which prioritises access to specialist care treatment and drugs. Further, in November 2023, the UK Government announced its support for the **Rare Therapies Launch Pad**, a programme that will develop a pathway for children with rare conditions to access individualised therapies. The first project will look to use individualised therapies known as antisense oligonucleotides (ASOs) to treat children with ultra-rare and life-threatening brain conditions.

Government support for rare diseases is further underpinned by the **2024 England Rare Diseases Action Plan**, with a £14 million commitment from the Medical Research Council and NIHR to Rare Disease Research UK. The not-for-profit medical research organisation LifeArc, have also announced £100 million into rare disease research by 2030, through its Rare Disease Translational Challenge.

In cancer, there is an increased focus of using the power of genomics to support early detection of diseases. The **NHS-Galleri trial** is looking into the use of a circulating tumour DNA blood test to see if it can detect cancer early alongside existing cancer screening. Genomics is also increasingly being used to support prescription of novel therapeutics, which target a patient's tumour based on its genetic profile, not where in the body the tumour has been detected. Other types of therapeutics being explored include cancer vaccines – the UK Government has announced major partnerships with Moderna and BioNTech to conduct clinical trials into personalised mRNA-based cancer immunotherapies. An **NHS Cancer Vaccine Launch Pad** linked to the NHS GMS is key to the delivery of these trials.

A genomic future

The UK offers access to a thriving and innovative genomics ecosystem, with an estimated and growing turnover of £3.6bn. This includes world-leading diverse genomics datasets, a dynamic industry sector and the opportunity to carry out research with and within an integrated national health system. There will be further developments in terms of more widespread use of sequencing technologies in clinical genomics, including long read sequencing and single cell 'omics.

Genomics is also increasingly being combined in research and clinical practice with other technologies such as transcriptomics, proteomics and epigenomics, and within approaches such as functional genomics, predictive healthcare models, and AI models. These areas are rich with possibility for both the companies already working in them, and for further investment. Together, these approaches will expand opportunities to explore diverse datasets and develop the innovative health technologies of the future.

About DBT and partners

Department for Business and Trade

The UK's Department for Business and Trade (DBT) brings business and trade together, redrawing rules to ensure businesses thrive, markets are competitive, and consumers are protected. The Department has overall responsibility for securing investment, unlocking exports, and opening up new markets through trade deals and removing barriers, supporting UK businesses to grow.

Department of International Relations and Trade, Wales

The Department of International Relations and Trade is a part of the Welsh Government that focuses on trade policy and promoting the best conditions for Welsh business. It works closely with the UK government to ensure that Welsh interests are promoted. It sits alongside Business Wales which offers Information, guidance and support for businesses in Wales.

Directorate of the Chief Operating Officer, NHS Scotland

The Directorate of the Chief Operating Officer, NHS Scotland is part of the Scottish Government that seeks to achieve the best health and care outcomes for people by ensuring the provision of high-quality health and social care services. Their function includes national strategies on cancer, clinical services and improving healthcare quality, ensuring patient-centred care.

Genomics England

Genomics England is a British company that was set up and owned by the UK Department of Health and Social care. Building on the UK Government's 100,000 Genomes Project, Genomics England supports the NHS's world-first national whole genome sequencing service and runs the growing National Genomic Research Library.They now aim to help everyone benefit from genomic healthcare by connecting genomic research and clinical care at national scale as well as enabling immediate healthcare benefits and advances for the future.

Office for Life Sciences

The Office for Life Sciences exists to improve the health and wealth of the nation by growing a resilient and innovative life sciences sector in the UK, and by bringing new technologies and treatments into the NHS to transform healthcare.

Innovate UK

Innovate UK, part of UK Research and Innovation (UKRI), is the UK's innovation agency. It works to create a better future by inspiring, involving and investing in businesses developing life-changing innovations. Its mission is to help companies to grow through their development and commercialisation of new products, processes and services, supported by an outstanding innovation ecosystem that is agile, inclusive and easy to navigate.

Invest Northern Ireland

As the regional business development agency, Invest NI's role is to grow the local economy. Invest NI do this by helping new and existing businesses to compete internationally, and by attracting new investment to Northern Ireland. Invest NI are part of the Department for the Economy and provide strong government support for business by effectively delivering the Government's economic development strategies.

NHS England

NHS England (NHSE) leads the National Health Service in England and promotes high quality health and care for all through the NHS Long Term Plan (LTP). NHSE made a considerable investment in the NHS contribution to the 100,000 Genomes project. In 2018, NHSE launched the NHS Genomic Medicine Service (NHS GMS), enabling the NHS to harness genomic technology and science to improve the health of the population. The NHS GMS has enabled NHSE to deliver on the genomics commitments in the NHS LTP and the Accelerating Genomic Medicine in the NHS strategy, published in October 2022.

Scottish Enterprise

Scottish Enterprise (SE) is a non-departmental public body of the Scottish Government and Scotland's primary economic development agency. SE has a core offering across life sciences and supports a range of health-focused innovation centres in partnership with the Scottish Funding Council. It works with partners across both the public and private sectors to identify and capitalise on the best opportunities in Scotland.

With thanks also to **UK Biobank** and **Our Future Health** for their contribution and with a special thank you to **PHG Foundation** for their expertise in curating this document.

UK trade associations

UK trade associations provide multiple services to their members, engage across the ecosystem, and work with DBT to facilitate a positive business environment.

ABHI is the UK's leading industry association for health technology. They represent the industry to stakeholders, such as the government, NHS and regulators. ABHI's 400 members account for approximately 80% of the sector by value.
www.abhi.org.uk

The ABPI exists to make the UK the best place in the world to research, develop and use new medicines and vaccines. They represent companies of all sizes across the UK who invest in discovering the medicines of the future. Their members supply cutting edge treatments that improve and save the lives of millions of people. They work in partnership with Government and the NHS so patients can get new treatments faster and the NHS can plan how much it spends on medicines.
https://www.abpi.org.uk/

AXREM is the UK trade association representing the interests of suppliers of diagnostic medical imaging, radiotherapy, healthcare IT and care equipment including patient monitoring in the UK. Their group is comprised of most of the industry supply companies, meaning AXREM members supply the majority of diagnostic medical imaging and radiotherapy equipment installed in UK hospitals.
www.axrem.org.uk

The BioIndustry Association (BIA) is the voice of the innovative life sciences and biotech industry, enabling and connecting the UK ecosystem so that businesses can start, grow and deliver world-changing innovation. Helping biotech and life sciences sector to influence, connect and save.
www.bioindustry.org

BIVDA is the UK industry association for the manufacturers and distributors of IVD products and has 180 members representing IVD companies active in the UK. This ranges from the UK subsidiaries of multinationals through UK manufacturers and distributors and start-up companies such as spinouts from academia. BIVDA members currently employ over 8,500 people in the UK, with a total industry turnover of £1.1 billion in 2020.
www.bivda.org.uk

GAMBICA is the Trade Association for Instrumentation, Control, Automation and Laboratory Technology in the UK. Gambica forms a community that shares knowledge and best practice, influences policy, standards and regulation for the benefit of the industry, publishes unique market forecasts and helps members develop business through exhibitions and events.
www.gambica.org.uk

Medilink UK is the largest association of Life Sciences companies, with thousands of members. Through seven regional offices, the network brings together the NHS, industry and academia to increase innovation and improve patient care. Its primary focus is on fast tracking the development of Life Science companies through connectivity and expertise, supporting UK based companies with Innovation, Regulation, Commercialisation and International Trade.
https://www.medilinkuk.com/

HIRANI is a cluster organisation, established in 2021, that acts as a single voice for the sector with a focus on promoting life and health sciences capabilities.
(HIRANI) Health Innovation Research Alliance Northern Ireland (hira-ni.com)

Department for Business and Trade

We are the UK's department for economic growth. We support businesses to invest, grow and export, creating jobs and opportunities across the country.

We are responsible for:

- Redrawing our rules to ensure businesses thrive, markets are competitive and consumers are protected.
- Securing investment from UK and international businesses.
- Advising, supporting, and promoting British businesses to grow and export.
- Opening up new markets for businesses by removing barriers and striking trade deals.
- Promoting free trade, economic security and resilient supply chains.

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DBT disclaimer

This brochure provides an overview of examples of solutions and innovations that the UK life sciences sector offers. It is not meant to be an exhaustive, complete representation of all UK genomic organisations and shows just a selection of the breadth of the UK sector.

This brochure is intended as an initial engagement tool to support dialogue with other countries, health systems, companies, and industries to encourage these parties to take a closer look at the UK.

This document is not a policy position paper from UK Government.

Parties interested in learning more about the UK and solutions, or suppliers tailored to their needs should contact their local Embassy, High Commissioner or Consulate to start a discussion, or if they are UK based, to get in contact with lifescience@businessandtrade.gov.uk