

Building on the Foundations of UK Genomics



Background

Genomics is ‘the study of the total or part of the genetic or epigenetic sequence information of organisms, and attempts to understand the structure and function of these sequences and downstream biological products’.¹

The field of genomics relies on collecting genetic information about global populations. Biobanks – databases of biomedical records – have been set up worldwide to gather and store data for use by the scientific community to understand the genetic causes of disease. For example, the [UK Biobank](#) holds in-depth genetic and health information from half a million volunteers in the UK. This includes blood samples, scan images, and lifestyle and physical data.

Genomic data is vital for ongoing research into the most common and life-threatening diseases. More personalised treatments can be developed if the genetic cause can be established. There is hope that by building on our genomics foundation, it will become easier to prevent diseases.

The UK is a world leader in the industrialisation of genomic data and its use in healthcare. Since 2017, UK genomics companies have raised £1.8bn of venture investment and £35.7m in public grants².

¹[World Health Organization](#)

²[Genomics Nation 2022 report](#)

Challenge

Investment in the genomics sector is helping young SMEs establish themselves to secure the nation's position as a world leader in this space.

In March 2022, the UK government published its [Genome UK Shared Commitments](#). It sets out how genomics groups across the UK will work together from 2022-2025 to progress its vision for genomic healthcare. The aim is to 'deliver UK-wide, coordinated approaches to data and standardise how genomic data is recorded'.

However, to achieve this, the key challenges of working on multiple datasets must be overcome. Many of the UK's world-leading facilities housing genomic data work in isolation for specific reasons.

Another challenge for genomics is to recruit talented people with the expertise required to scale-up operations in the UK.

Genomics companies need various skills, from lab knowledge to data analysis and software engineering. There is a shortage of these skills in the UK. While good candidates are available from other countries, hiring from overseas comes with challenges.

The sector needs investment to both help develop talent pipelines through higher education or vocational training like apprenticeships, and to support SMEs when recruiting from outside the UK.

Solid foundations are in place. To make further progress and secure the future of genomics, the UK needs a mixture of skills, collaborations between public and private organisations, and patients' consent to provide their data to the cause.

Output

[Medicines Discovery Catapult \(MDC\)](#), the [UK BioIndustry Association \(BIA\)](#) and the [Wellcome Sanger Institute](#), published the [Genomics Nation 2022](#) report in July 2022.

The report explores genomics in the UK, providing insights from a survey of 121 genomics companies headquartered here.

The report highlights the genomics sector to investors and other policymakers to:

- Provide ammunition for increased investment
- Highlight the UK as the home of genomics
- Showcase the subsectors of epigenetics and transcriptomics
- Factors to enable sector needs growth

Outcome

The valuable insights gathered from Genomics Nation 2022 reflect one of the most exciting sectors in the UK's innovation economy. According to the report³, the UK's high-growth genomics sector:

- Consists of 121 companies employing over 3,500 highly skilled people
- Has a market cap of over £3.5bn, based on deals since 2017
- Is young and growing, with half at the early or seed stage
- Has a higher proportion of spin-outs (34%) compared to other sectors (2.7%)
- Relies on a range of skilled professionals:
 - o 82% of the genomics SMEs surveyed for the report said that finding employees with appropriate skills was their main challenge
 - o Computer science, data science and machine learning skills were quoted by 70% of respondents as the most difficult to recruit.

Creating a clearer picture of the companies thriving within the sector helps to map out the true ecosystem of spin-outs, scale-ups and SMEs that contribute to the growth of genomics in the UK. The companies highlighted in the report are young compared to their life science peers. However, they are already proportionately more successful than those companies. By showing the challenges these companies are facing, the Genomics Nation 2022 report aims to create investment in interventions that will cement the continued growth and development of the field.

Genomics Nation 2022 has been viewed almost 10,000 times and was well-received across social media.

By sharing the key findings within this report with audiences across the life sciences sector, the community has further insights to enable future growth. It provides a snapshot of what the genomics sector has already achieved, and future growth drivers to become a vibrant hub bringing skills and employment to the UK.

Impact

Working with partners in the sector, MDC has highlighted the importance of using the foundations of the UK genomics sector to attract more investment and support its continued growth. There is huge potential for the technologies used by genomics companies to change the nation's well-being, and improve our understanding of human biology.

By bringing together biotech, healthcare and academic communities and encouraging the continued flow of public and private investment, UK genomics companies can unlock major advances in how diseases are treated and prevented.

Attracting highly skilled experts to join the thriving life sciences industry in the UK will contribute to further breakthroughs for better patient outcomes.

By collaborating on industry reports like Genomics Nation 2022, MDC promotes the UK's position as a driving force of medicines discovery and continues to attract the resources needed to help the life sciences ecosystem flourish.

[Download the report here.](#)

³Genomics Nation 2022 report

Quotes taken from the Genomics Nation Report publication announcement 27 July 2022



Professor Chris Molloy, CEO of Medicines Discovery Catapult, said:

“As genomics is the foundation of life, it should be the foundation of life sciences R&D. On this firm basis, robust programmes with greater chances of success can be built and build we must.

“The UK leads the world in industrialising genomics research, and its use in healthcare. However, pioneering is not establishing. A high-tech industrial structure is needed on this foundation to deliver functional genomics and proteomics, where medicines matter.

“Now – behind this leading edge – the UK is starting to secure a post-genomic future for R&D by harnessing its biotech, healthcare, and academic communities. By establishing singular purpose and combining public with private sector assets it has the potential to build a wonder of the modern world on this foundation.”



Adrian Ibrahim, Head of Technology Transfer and Business Development at the Wellcome Sanger Institute, said:

“The UK continues to generate an enviable number of genomics companies, many of these originating from our world-leading academic programmes. Whilst there remains a strong concentration of outstanding young companies around Cambridge, Oxford and London, the report highlights the development of genomics companies across the UK, seeding opportunities for distributed genomics hubs in multiple regions.

“Seed and Series A investors are backing our early genomics innovation. To realise the potential of our maturing sector we will need to actively address the growing demand for exceptional talent in the genomics and biodata fields and ensure the availability of scale up capital to support our globally competitive genomics industry.”



Steve Bates OBE, Chief Executive of the BIA, said:

“Innovative UK Genomics companies are vital to the future wealth of our nation. With the right investment, skilled people and partnership working with the NHS family, UK small and medium sized enterprises are ideally placed to be key global players in the growing subsectors within genomics such as functional genomics, epigenetics, transcriptomics and pharmacogenomics.

“The application and industrialisation of this technology is transforming both healthcare and the pharmaceutical industry. Our growing industry needs great people who can use computational and data science skills to deliver our transforming health projects.”



Baroness Nicola Blackwood, Chair of Genomics England, said:

“We welcome the latest Genomics Nation report from the BIA, MDC and Wellcome Sanger Institute which indicates that the UK’s genomics sector continues to go from strength to strength. Clearly, the UK is leading the way in continuing to develop a rich genomic ecosystem which is growing across academia, healthcare and private companies.

“Genomics England draws on these talents and innovations to drive forward our programmes and partnerships with the NHS and other stakeholders. We need to work together to develop more talent, close the skills gap, and strengthen our ecosystem. This will help us achieve our goals of improving patient outcomes and making the UK the best place in the world to do genomic research.”