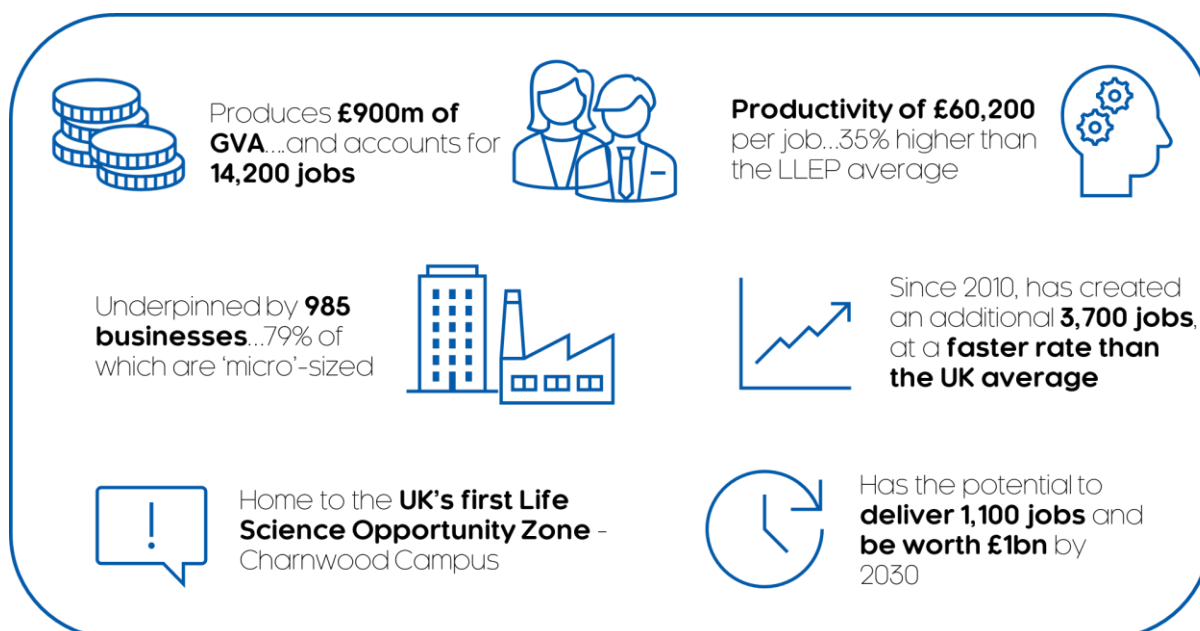


Sector profile: Life Sciences and Biotech in Leicester and Leicestershire



Source(s): See Economic and growth indicators

Defining Life Sciences and Biotech

Within life sciences and biotechnology ('biotech') there is an incredibly diverse range of business activities, which include the following categories:

- **Pharmaceuticals** (Discovery, development, testing, production and marketing of drugs/vaccines licensed to use as medication)
- **Biotechnology** (drug discovery and therapies developed from new biotechnologies such as gene, cell and tissue therapies as well as associated platform technologies/services)
- **Medical technologies** (the market for any instrument, apparatus, appliance, material intended by the manufacturer to be used for human medical treatment or health)
- **Industrial biotechnology** (the use of biological substances, systems and processes to produce materials, chemicals and energy)

Market and economic outlook

Global market

The global life science analytics market size was valued at USD 7.7 billion in 2020 according to Grandviewresearch and is expected to expand annual at 7.8% from 2021 to 2028. The emergence of advanced analytics in various specialties of life science companies such as regulatory compliance, supply chain, clinical trials, R&D activities, pharmacovigilance, and sales and marketing is bolstering the segment growth. The rising adoption of big data

analytics and data mining techniques to analyse high-risk target populations and devise appropriate strategies and measures is supporting market development.

Major trends that existed before the Covid-19 pandemic, will continue, and have a massive impact on life sciences and biotechnology. The global population continues to age – with the population of over-80s expected to triple between 2015 and 2050. The global genomics market continues to growth – [and is expected](#) to reach \$23.9 billion in sales in 2022.

The application of new technologies to healthcare is forecast to continue to grow rapidly. [According to Business Insider](#) the global healthcare sector will invest \$410 billion in IoT (Internet of Things) devices, software, and services in 2022 – up from \$58.9 billion in 2014. The growth of IoT technologies in healthcare will be driven by a variety of factors including a steep rise in the global elderly population thanks to longer life expectancies, higher prevalence of diseases like diabetes and obesity, and increasing demand for health and fitness monitoring solutions. Currently, IoT devices for healthcare are dominated by wearables, which make up 60% of the connected medical device market. Fast growth is predicted for implantable medical devices such as connected pacemakers and implanted sensors that allow for real time patient monitoring.

UK market

The UK is a global leader in life sciences, employing over 248,000 in over 5,800 life sciences companies. The competitive strengths of the sector are based upon the country's strong life science research base and business community and their substantial and combined activities and assets across the value chain. The UK has two of the top three universities in the world for life sciences and ranks first in the G7 for life sciences impact by citations. Another strength lies in applying convergent technologies to the life sciences market. Adjacent research and business areas support the growth of convergent technologies and combination products - such as advanced engineering, nanotechnology and micro-electronics. One in four companies featured in the 2020 Global Digital Health 100 list are from the UK. Beyond these assets are the sector specific support networks and research funding charities, and consumer markets such as the National Health Service (NHS).

Business impacts of Covid-19 and Brexit

The Covid-19 pandemic has brought life sciences to the fore of public consciousness and has led to accelerated vaccine development and collaboration between traditional competitors. The following trends are now a feature of the global life sciences industry:

Increasing adoption of virtual healthcare. [According to Deloitte](#), one of the effects of the pandemic was the rapid adoption of virtual care, which enables sharing of data and insights across the complete circle of care—from disease prevention to treatment to monitoring. This shift in health care delivery is likely to provide a better understanding of the role and effectiveness of pharmacology in treatment. Eased regulations during the pandemic increased adoption of telemedicine in many countries, but reimbursement and regulatory policies post-pandemic will be key to permanent uptake and growth. While eased regulations in some countries such as the United States, Canada, China, and Singapore are likely to remain, more work is needed in other countries.

Digital first, and home testing have accelerated. New digital health initiatives have the support and funding of governments, and tech companies are playing a major role in helping the move toward digital-first. Home testing and point-of-care testing are undergoing a revolution, and medtech companies can expect continued competition from consumer tech.

Speeding up clinical trials. Accelerated digital transformation during the pandemic saw agile teams, increased speed to market, and release of the minimum viable product. The rapid development of novel vaccines for COVID-19 demonstrates that streamlining and efficiency is possible. After a legacy of lengthy clinical trials - companies are adopting various strategies for shortening timelines, including new trial designs and new technologies such as artificial intelligence. Regulators are becoming more flexible about clinical trial design and the speed of trials. With support from regulatory bodies, there is a trend toward more decentralized, patient-centric trials in the long term, and they offer many advantages. More trials will be hybrid trials going forward, a combination of in-person and virtual visits.

More flexible regulators. As the pandemic progressed, the US Food & Drug Administration (FDA) reviewed over 2,300 emergency use authorization (EUA) requests and provided EUAs to more than 600 products, enabling therapies to be available to patients faster. The European Medicines Agency (EMA) uses the rolling review for vaccines, one of their expedited regulatory tools for emergencies that also includes rapid scientific advice, accelerated marketing authorizations, and compassionate use programs. Developers were allowed to use platforms approved in other areas, such as mRNA, for new development, provided they had the data to support it.

Activities and key organisations in Leicester and Leicestershire

The life sciences sector in Leicester and Leicestershire is booming, with more than 4,500 people working at 135 life science firms, and phenomenal growth in the area over recent years. DNA fingerprinting was invented at the University of Leicester by Professor Sir Alec Jeffreys in 1984 and today the UK's Centre for Excellence in Teaching and Learning in Genetics (GENIE) is internationally renowned. Leicester and Leicestershire has specialisms in chronic disease prevention, sport and exercise science and rehabilitation. Renowned life sciences firms located in Leicester and Leicestershire include Inspiration Healthcare, Morningside Pharmaceuticals, Spirit Healthcare, Thermo Fisher, and Myoderm.

The region is also home to the UK's first Life Science Opportunity Zone - Charnwood Campus - situated in Loughborough, Leicestershire. It offers an environment to inspire discovery, encourage collaboration and accelerate business growth for the Med-Tech and Biopharma community. The campus is a legacy biopharma site. It covers 70 acres comprising development land alongside high quality, modern laboratories and production plants, designed as a fully integrated drug discovery and development capability to support drug development projects, from target identification through to late-phase development and registration.

Building on the success in attracting over £20m of investment on site from existing partners that moved into the site, Almac and ARM Holding (who have subsequently left the site), a consortium of partners from life sciences industry, academia and government from across

the region was formed to plan how to work together to realise the campus' potential; support the growth of the UK Life Sciences industry; develop Charnwood Campus as a key regional asset within the UK Life Sciences infrastructure; and become the UK's first Life Science Opportunity Zone. Key firms occupying the site include Almac, Charnwood Molecular, Kindeva, and 3M Drug Delivery Systems (which is now comprised of Kindeva which was divested from 3M, and 3M Healthcare offices which remain on the site).

Medilink Midlands is the Midlands Life Sciences industry association whose aim is to help companies establish, develop and grow. Its network of more than 5,700 contacts in over 2,300 organisations represents all aspects of the sector from multi-nationals to high potential start-up companies, as well as the NHS and Universities. Working alongside the Midlands Engine and other strategic alliances, Medilink Midlands' helps stimulate additional and value-added growth of the Midlands' prosperous community for Life Sciences.

R&D activities and key organisations in Leicester and Leicestershire

Loughborough University is in the top 10 of UK Universities for Biosciences, with the STEMLab facility representing a recent £17 million investment in new state-of-the-art laboratory facilities. The university has international R&D expertise in sports science, injury management, health and wellbeing, exercise medicine and rehabilitation, and health technologies.

Leicester University's College of Life Sciences as almost one-thousand staff and approaching 4,000 students in its four schools, which cover the biological, medical and human sciences. Research achievements include the development of DNA fingerprinting, vital advances in fighting heart disease, cancer, respiratory diseases and diabetes, and developments in forensic psychology. The College of Life Sciences is home to two research institutes: Leicester Precision Medicine Institute (LPMI), and Leicester Institute for Structural and Chemical Biology (LISCB); and four research centres - the Cancer Studies Research Centre, The Centre for Systems Neurosciences, the Diabetes Research Centre, and the Leicester Microbial Sciences and Infectious Diseases Centre (LeMID).

The Faculty of Health and Life Sciences at De Montfort University (DMU) is home to our wide range of pharmaceutical, healthcare, lab based and social science courses

Rehabilitation is a key specialism for Leicester and Leicestershire and an identified High Potential Opportunity by the HMG Department for International Trade – particularly building on The Defence and National Rehabilitation Centre, which uses cutting edge technology of international significance. The region offers:

- A unique combination of Rehabilitation MedTech-focussed research, development, manufacturing and clinical assets and has potential for substantial and sustained growth.
- Access support and space to grow and develop innovative solutions and technologies at Leicester Life Sciences Accelerator, Charnwood Campus, BioCity Nottingham, Loughborough University Science & Enterprise Park.
- Access to a large and diverse patient population: home to one of the largest NHS trusts in the UK and the Midlands only Patient Recruitment Centre enabling clinical

research and Phase 3 and 4 commercial trials across a broad spectrum of the population.

- Integration with globally leading research centres: including The Defence and National Rehabilitation Centre and the National Centre for Sport and Exercise Medicine
- Collaboration with the Centre for Biological Engineering at Loughborough University – that carries out world-leading research, can test and implement ideas into clinical and industrial settings and create next-generation platforms for manufacturing regenerative medicines.

Economic and growth indicators

Table 1: Summary of key economic and growth indicators for the Life Sciences and Biotech sector in Leicester and Leicestershire

	Value, 2019	% of economy total	% of economy total (UK average)
GVA (£m)	853	3.5%	3.3%
Jobs	14,200	2.6%	2.3%
Businesses	985	2.0%	2.0%
Productivity (£)	60,200	135.2%	142.2%
	Value, 2010-19	% change p.a.	% change p.a. (UK average)
Real GVA growth (£m)	90	1.2%	2.2%
Jobs created	3,700	3.5%	2.8%
New businesses	340	53.2%	45.0%
Productivity growth	-	-2.1%	-0.6%

Source: ONS, Cambridge Econometrics.

Worth £900m and accounting for 14,200 high-value jobs (according to official statistics - see [Table 1](#)), Leicester and Leicestershire hosts a unique, fast-growing and research-intensive life sciences and biotech cluster.

Recent growth has been employment-led, with 3,700 additional jobs created since 2010, at a significantly faster rate (3.5% p.a.) than the UK average (2.8% p.a.). Accompanying productivity growth however has been subdued, contracting by 2% p.a. (4 times slower than the UK average), pulling down headline GVA growth (only +£90m).

Resultantly, this has widened the productivity gap for the sector relative to the UK average, which now stands at over 10% – at the start of the decade, sectoral productivity in the LLEP area had been in line with the UK average. The sector is still some two-fifths more productive than the LLEP average though.

The sector comprises of almost 1,000 local businesses, of which more three-quarters are 'micro'-sized (employing <9 people). Showing strong entrepreneurial activity, an additional 340 businesses have been created in the sector since 2010 – an increase of more than 50%.

Additional evidence and research

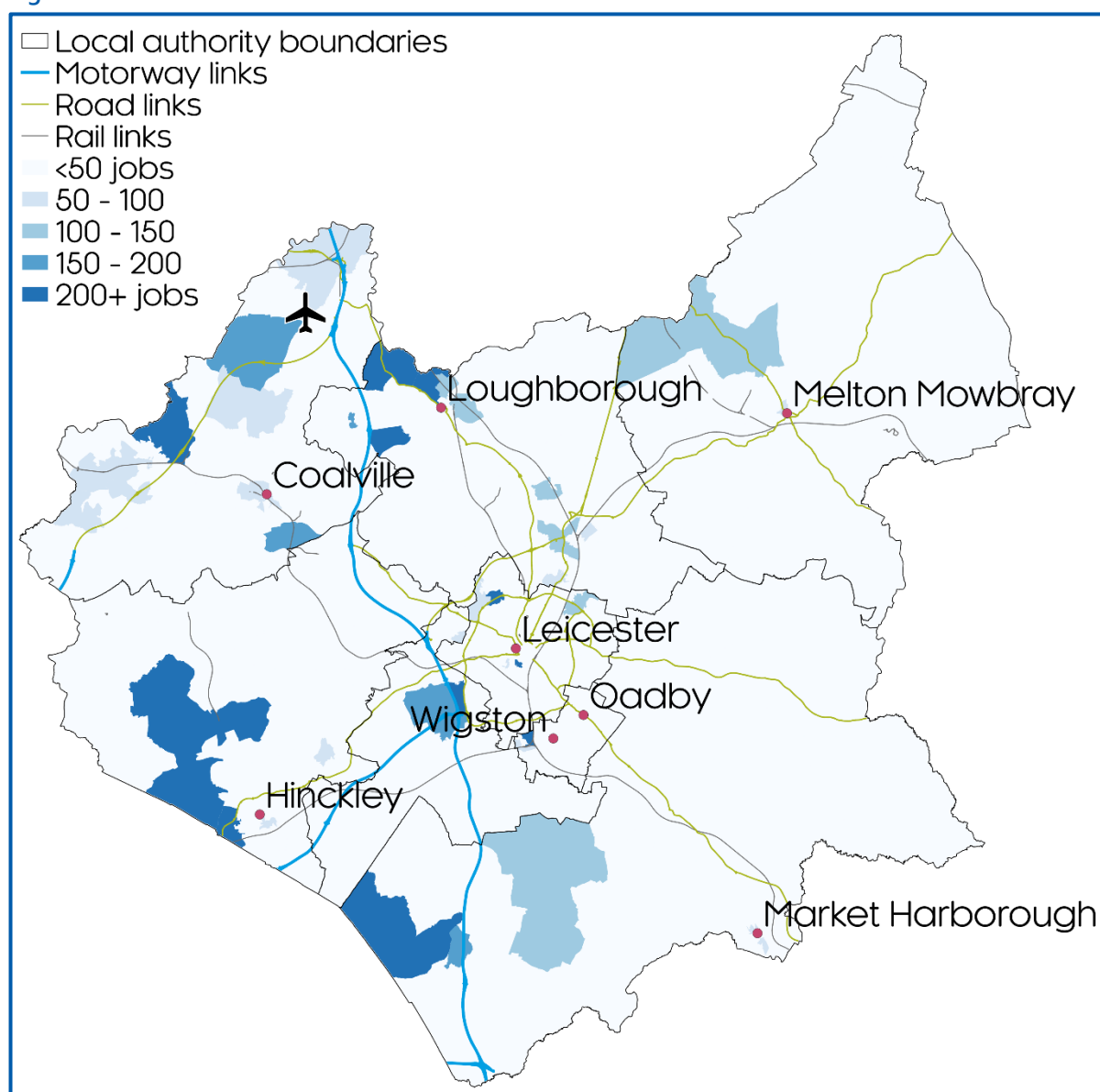
Additional indicators and research on the sector in Leicester and Leicestershire show:

- The sector helps drive £690m of R&D spend in Leicestershire, [according to Eurostat](#), though as a proportion of total GDP (1.2%) this is lower than the UK average (1.7%), and below the UK Governments target of 2.4%
- The [REF](#) showed some 1,500 research staff are affiliated to Leicestershire's universities. On a per capita basis, Leicester and Leicestershire has the fourth highest incidence of university research staff in England (ranked out of 38 LEP areas)
- Over 2011-15, the sector supported 1,600 patent applications in Leicestershire, [according to the EPO](#), though on a per capita basis (17.7) this was lower than the national average (20.2)

Spatial structure and clusters

There is an extensive clustering of activity around Loughborough, reflecting the presence of Charnwood Campus - the UK's first Life Science Opportunity Zone, as Figure 1 below shows.

Figure 1: Life Sciences and Biotech clusters in Leicester and Leicestershire



Source: ONS, Cambridge Econometrics.

Further complimenting this cluster is Loughborough University Science and Research Park, hosting additional knowledge-based activity in the sector. Processing and distribution-led activity is also evident along the M1 corridor, particularly around Magna Park to the south and Segro Logistics Park to the North.

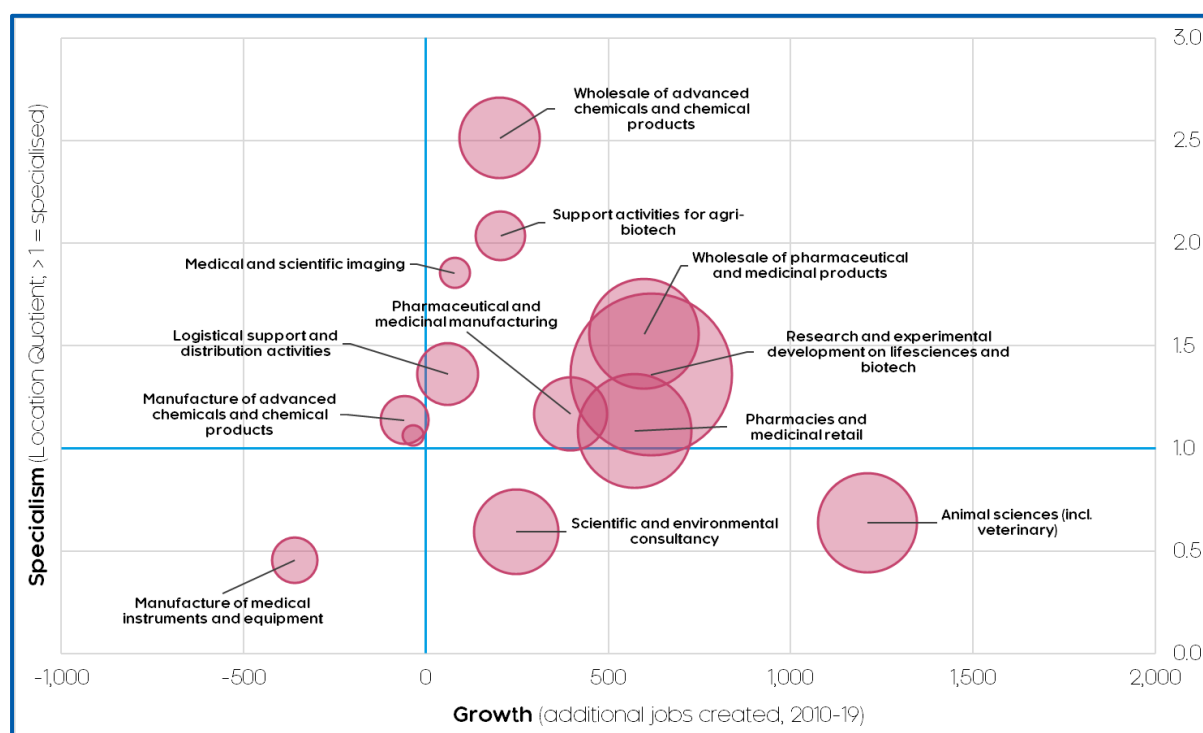
The activity of the University Hospitals of Leicester (UHL) academic and research trust is also notable within parts of Leicester. Clustering is also observable around smaller market towns including Hinckley and Ashby.

Industry structure and specialisms

Leicester and Leicestershire's life sciences sector is represented by some internationally recognised and growing specialisms, as Figure 2 below shows, with established links to other sectors (e.g. agri-food, sports and physical health) and local research assets:

- **Wholesale of advanced chemicals and chemical products** – 1,000 jobs; is the most specialised activity within the sector locally
- **Support activities for agri-biotech** – 400 jobs; with strong links to local agri-food
- **Pharmaceutical and medicinal manufacturing and wholesale** - combined 2,700 jobs, £250m GVA; with a further 600 jobs in logistical support and distribution
- **Research and experimental development on life sciences and biotech** - 4,000 jobs and £280m GVA; capturing a diverse, cross-cutting range of research activities and assets, from universities to the private and public sector
- **Animal sciences (incl. veterinary)** - 1,500 jobs; with strong links to local agri-food

Figure 2: Local specialisms and growth within Life Sciences and Biotech



Source: ONS, Cambridge Econometrics. Note: Size of bubbles relate to size of activity (in jobs terms). Bubbles above the blue horizontal indicate a specialism. Bubbles to the right of the blue vertical indicate growth (in jobs terms).

Sector prospects in Leicester and Leicestershire

Economic impact and recovery from Covid-19 and Brexit

As a result of the Covid-19 pandemic and the associated public health challenge, demand is expected to increase and remain high as the sector leads the global pursuit for a swift and successful resolution to the virus.

With the sector operating largely uninterrupted even during strict ‘lockdowns’, any adverse impacts are expected to be minimal - in fact, some 700 additional jobs have been created in the LLEP area to manage increased demand and the associated backlog in the sector, as [Table 2](#) below shows.

Table 2: Covid-19 impacts and recovery prospects for the Life Sciences and Biotech sector in Leicester and Leicestershire

Forecasted Covid-19 impact (2020)			
	Value, 2020	% change	% change (UK average)
GVA impact (£m)	-16	-1.9%	-0.1%
Jobs impact	700	5.0%	-1.8%
Productivity impact	-	-6.6%	1.8%
Forecasted Covid-19 recovery (2021-30)			
	Value, 2021-30	% change p.a.	% change p.a. (UK average)
Real GVA growth (£m)	119	1.3%	1.9%
Jobs created	1,100	0.7%	0.8%
Productivity growth	-	0.6%	1.2%

Source: Cambridge Econometrics Spring 2021 Forecasts.

Post-2020, there is the potential for further investment-derived growth to manage and oversee increased demand for health and medicinal services and research, and within other disciplines such as sports science, agri-food, the environment and low-carbon. There are also opportunities for diversification from advanced manufacturing/engineering and supply chain companies.

The sector could support the creation of an additional 1,100 highly skilled roles and drive £120m of growth, being worth a potential £1bn to the Leicester and Leicestershire economy by 2030.

Skills needs and challenges

Skills needs in the sector are fast-moving, characterised by continuous technological change and development, and a globally competitive talent pool.

Highly-technical, STEM-based skills – to oversee and coordinate increasingly advanced and digitised research methods and production processes – as well as softer skills and

management aptitude – to manage and navigate complex supply chains and highly competitive research and product markets – will be necessary.

Industry players stress the need for individuals with cross discipline skills rather than highly specialised in a particular field (e.g. who can apply biological processes to AI/digital health, or combine engineering to living systems).

By 2024, [UKCES expects](#) over two-thirds (68%) of the life sciences workforce in the East Midlands will require high-level (QCF4+, typically STEM-based) qualifications, the highest share of any sector in the region. A further quarter of the workforce could require post-degree qualifications (such as doctorates), again the most of any sector, emphasising the technical and demanding skills needs in the sector.

Appendix A: Sector definition and sources

Data has primarily been sourced from [Cambridge Econometrics LFM](#). For a full and detailed overview of definitions, sources and forecasting methodology, please refer to the Technical Summary report accompanying this profile.

The sector has been defined using 5-digit [Standard Industrial Classifications \(SICs\)](#), detailed as follows. These have been informed by government and/or industry recommended definitions, and aim to capture as much of the sectors value chain as possible:

- 01610: Support activities for crop production
- 01629: Support activities for animal production (other than farm animal boarding and care) nec
- 20130: Manufacture of other inorganic basic chemicals
- 20140: Manufacture of other organic basic chemicals
- 20150: Manufacture of fertilisers and nitrogen compounds
- 20200: Manufacture of pesticides and other agrochemical products
- 20590: Manufacture of other chemical products nec
- 21100: Manufacture of basic pharmaceutical products
- 21200: Manufacture of pharmaceutical preparations
- 26600: Manufacture of irradiation, electromedical and electrotherapeutic equipment
- 26701: Manufacture of optical precision instruments
- 32500: Manufacture of medical and dental instruments and supplies
- 46460: Wholesale of pharmaceutical goods
- 46750: Wholesale of chemical products
- 47730: Dispensing chemist in specialised stores
- 47741: Retail sale of hearing aids in specialised stores
- 47749: Retail sale of medical and orthopaedic goods (other than hearing aids) nec, in specialised stores
- 49200: Freight rail transport (10.6% of SIC code only)
- 49410: Freight transport by road (4.5% of SIC code only)
- 50200: Sea and coastal freight water transport (0.4% of SIC code only)
- 50400: Inland freight water transport (0.4% of SIC code only)
- 51210: Freight air transport (0.4% of SIC code only)
- 52101: Operation of warehousing and storage facilities for water transport activities of division 50 (1.8% of SIC code only)
- 52102: Operation of warehousing and storage facilities for air transport activities of division 51 (1.8% of SIC code only)
- 52103: Operation of warehousing and storage facilities for land transport activities of division 49 (1.8% of SIC code only)
- 52211: Operation of rail freight terminals (1.8% of SIC code only)

Sector profile: Life Sciences and Biotech

52219: Other service activities incidental to land transportation, nec (not including operation of rail freight terminals, passenger facilities at railway stations or passenger facilities at bus and coach stations) (1.8% of SIC code only)

52220: Service activities incidental to water transportation (1.8% of SIC code only)

52230: Service activities incidental to air transportation (1.8% of SIC code only)

52241: Cargo handling for water transport activities of division 50 (1.8% of SIC code only)

52242: Cargo handling for air transport activities of division 51 (1.8% of SIC code only)

52243: Cargo handling for land transport activities of division 49 (1.8% of SIC code only)

52290: Other transportation support activities (1.8% of SIC code only)

71122: Engineering related scientific and technical consulting activities

72110: Research and experimental development on biotechnology

72190: Other research and experimental development on natural sciences and engineering

74202: Other specialist photography (not including portrait photography)

74901: Environmental consulting activities

75000: Veterinary activities

82920: Packaging activities (1.8% of SIC code only)

