



LEEDS CITY REGION

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Medical Technologies

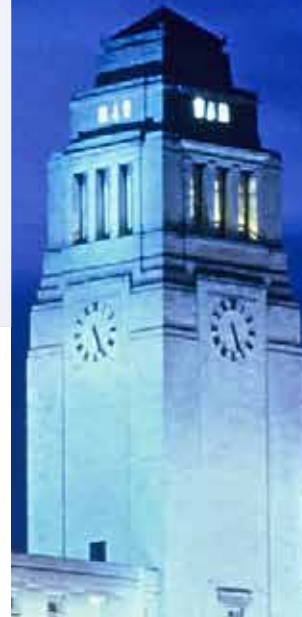
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LEEDS CITY REGION

Located at the heart of the UK, the Leeds City Region represents **the largest economic area in the UK outside London** and the South East, with a **population of 3 million** and a workforce of 2 million. The region's has a strong manufacturing heritage, and is the leading gateway to the UK's advanced manufacturing and engineering industry.

Renowned for precision in advanced manufacturing, the region has developed as a pioneering centre for new technologies across a variety of sectors including healthcare and life sciences.



The unique health ecosystem includes **four out of five NHS England headquarters**, 13 clinical commissioning groups and 12 NHS trusts, offering an unrivalled business opportunity for companies within the medical technologies sector looking to research and develop future devices and instruments.

This ecosystem is further supported by nine higher education institutions and 14 further education colleges training over 115,000 students and producing **38,900 graduates each year, 15,100 of which are in STEM subjects.**

HEALTHCARE – THE OPPORTUNITY

TAP INTO WORLD-LEADING RESEARCH FROM LEEDS CITY REGION'S UNIVERSITIES ACCELERATING R&D ACROSS DIGITAL HEALTH, ASSISTIVE TECHNOLOGY, IMAGING, DIAGNOSTICS AND IMPLANTABLE DEVICES SECTORS.

THINK SCALE



Largest UK city region economy outside London



196,000 health and life sciences jobs



Largest concentration of medical device companies in the UK with a cluster of over 200 different businesses



4 out of 5 NHS headquarters, **13** clinical commissioning groups and **12** NHS trusts located in Leeds City Region

THINK SKILLED



38,900 graduates annually from 9 universities

ANNUAL STEM GRADUATES

LEEDS CITY REGION



GREATER MANCHESTER



GREATER BIRMINGHAM AND SOLIHULL



SHEFFIELD CITY REGION



THINK INNOVATION



World leading Centres of Excellence in translating medical innovation through clinical trials to patient use



36% of Leeds City Region combined university research is world-leading and a further **10% world-class**



Diverse collaborative health ecosystem supports **'living lab'** concept

MEDICAL TECHNOLOGIES

THE UK'S MEDICAL TECHNOLOGIES SECTOR IS GROWING RAPIDLY - WITH 2,683 COMPANIES, GENERATING A TURNOVER OF £17BN AND EMPLOYING MORE THAN 89,000 PEOPLE - IT IS ONE OF THE NATION'S KEY GROWTH SECTORS. OVER 98% OF MED TECH COMPANIES ARE INNOVATIVE SMALL AND MEDIUM SIZED BUSINESSES.

The most significant trend in future healthcare product innovation is the convergence of technologies; for example **artificial intelligence** applied to medical devices; combining medical imaging with **robotics** to automate surgical procedures; **digital health**; and **smart drug delivery** devices. Leeds City Region has core academic excellence and industry strengths in traditional medical devices and materials, orthopaedics and instrument manufacturing. Combined with emerging strengths in biologics and digital, the region is uniquely well-placed to respond to the opportunities associated with technology convergence.

A HISTORY OF MEDTECH IN LEEDS CITY REGION

Leeds City Region has a long tradition of innovation within the healthcare and life sciences sector:

- Sir William Henry Bragg, while at the University of Leeds **invented the X-ray spectrometer**. Together with his son, he later discovered X-ray crystallography essential to study of molecular biology. **Without Bragg's invention, Crick and Watson's work in discovering the structure of DNA would not have been possible**
- **William Astbury, developed X-ray diffraction** at the University of Leeds and is commemorated by the **world-leading Astbury Centre for Structural Molecular Biology** - a multi-million pound research centre which works to understand life at a molecular level
- Charles Thackray a Leeds pharmacist and manufacturer of surgical instruments worked with Sir John Charnley, a orthopaedic surgeon, to **pioneer the hip replacement**. The region is now home to the World Research Centre for DePuy Synthes, part of Johnson & Johnson
- World-leading manufacturing of the finest fabrics in Huddersfield led to **ultra-precision engineering and manufacturing technologies**. Now the region is home to Reliance Precision that **makes most of the quadrapoles that drive all the Mass Spectrometers** and the finger actuators for Steeper who developed the first ever bionic hand

Today this tradition continues with the region pioneering personalised medicine with institutions such as the Leeds Centre for Personalised Medicine and businesses including Covance, in Harrogate and York. Our region's universities work closely with industry. The University of Bradford and Arterius together developed a polymer-based bioresorbable stent.

HEALTH AND INNOVATION IN LEEDS CITY REGION

As a result of an ecosystem which includes one of Europe's largest teaching hospitals - the Leeds Teaching Hospitals Trust (LTHT), which has an annual budget of £1bn, 16,000 staff and treats 1.5m people each year, 12,000 of which are engaged in commercial trials of innovative drug treatments and medical devices, and direct access to 80% of NHS headquarters; there is **unparalleled research and development support available for both national and international businesses**, ensuring they remain competitive in a rapidly-evolving environment.

The region is also home to the NIHR National Clinical Research Coordinating Centre (NCRCC), managing the Clinical Research Network (CRN) on behalf of the Department of Health.

These collective facilities, alongside leading scientific expertise, provide prime opportunities for industrial collaboration and translation.

direct access to
80%
of NHS headquarters

NINE
universities

LEEDS TEACHING HOSPITAL TRUST IN NUMBERS

Annual budget of

£1BN

Employs

16,000
people

Treats

1.5M
people each year

12,000
patients are engaged
in commercial trials
of innovative drug
treatments and
medical devices



CURRENT MEDICAL TECHNOLOGY RESEARCH

At present there is over £100 million of external funding for medical technology-related research in the region. The following institutions are at the centre of these developments:

- The **University of Leeds' Institute of Medical and Biological Engineering**
- The **University of Bradford's Centre for Advanced Materials Engineering**
- The **Digital Health Enterprise Zone, Bradford**
- The **University of Huddersfield's Centre for Precision Technologies**
- **Leeds Beckett University's state-of-the-art clinical skills suite**
- The **University of York's Health Economics Consortium**

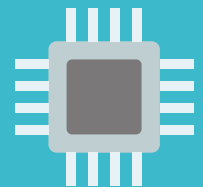
A PROVEN BUSINESS BASE FOR MEDICAL TECHNOLOGY

Leeds City Region is a major contributor to the UK healthcare sector. With an established health ecosystem within medical technology which includes **over 300 Life Science** companies including **over 200 medical technology businesses**, and a concentration of NHS infrastructure to support user-led innovation. As a result the City Region is supporting the drive for innovation in healthcare in order to deliver more affordable health and social care services. Traditional industry strengths in the

region include **implants, surgical instruments, and devices**, for example DePuy Synthes, Surgical Innovations, Xiros and Brandon Medical. More recent start-ups and high growth companies are based on emerging technology areas, including **biological materials and digital health**, for example Arterius, JenValve, Tissue Regenix, Neotherix and Avacta, TPP and EMIS.

LEEDS CITY REGION MEDICAL TECHNOLOGY COMPANIES INCLUDE:

BUSINESS	EXPERTISE
Acelity - Systagenix	Wound Management
Abingdon Health	Lateral Flow Diagnostic Testing, Design & Manufacture
Arterius	Bioabsorbable Stent Manufacturer
Avacta Life Sciences	Engineered Affinity Proteins
De Puy Synthes	Orthopaedic
Innoven	Synthetic Skin for Non-Animal Testing
JenaValve	Heart Valve Manufacturer
Malosa Medical	Single Use Ophthalmic Surgical Instruments
Neotherix	Synthetic Regenerative Medicine Scaffolds
Non-woven Innovation Research Institute	Technical Textiles Design for Wound Management
Paxman Scalp Cooling	Caps for Zero Hair Loss in Chemotherapy
Surgical Innovation	Surgical Instrumentation
Steeper	Engineered Prosthetics & Orthotics
Tissue Regenix	Bio Sourced Regenerative Medicine Scaffolds



Leeds City Region hosts 22% of UK digital health technology jobs



8.9% of MedTech patents submitted by UK inventors originated in the Leeds City Region



250 businesses based in the region specialise in medical technologies



CASE STUDY: DEPUY SYNTHES

A WORLD LEADER IN ORTHOPAEDIC AND NEUROLOGICAL PRODUCTS AND SERVICES

“There were a **multitude of reasons** for choosing Leeds City Region as the location for our global R&D centre. These include the **historical association of innovation** in medical technology, the **availability of the necessary skills, access to the headquarters** of NHS England, and the **long-term support of the Government** to the life sciences industry in the region. We are also able to **support young talent in the area** through apprenticeships, new graduates and PhD programmes, as well as having a **ready talent pool of those with the required experience** to recruit for our high quality R&D roles.

“Our location here also enables our teams of scientific and business experts **to collaborate on a regional, national and global scale with leaders in academia** to accelerate cutting edge science being brought to market as viable healthcare solutions. Having direct access to, and working closely with the **University of Leeds’ world-leading Department of Tribology** was a huge draw, as **their scientific knowledge and expertise has been vital in further developing** our joint reconstruction implants.”

MIKE BARKER, GLOBAL VICE-PRESIDENT OF R&D AT DEPUY SYNTHES

DePuy Synthes, part of the Johnson & Johnson family, offer the world’s largest portfolio of orthopaedic and neurological products and services, designed to increase patient satisfaction, reduce costs and improve clinical outcomes.

Innovation and R&D is at the heart of DePuy Synthes’ vision for growth and the primary focus for the new Beeston R&D Centre, located in the heart of Leeds City Region. Through extensive investment in R&D, this portfolio of products has evolved from functional implants to those which combine the latest technology around kinetics, engineering and materials.

DePuy Synthes’ Customs and Compassionate Care Group develops personalised implants for patients with specific or more complex needs. This is facilitated at the Beeston site whose facilities enable prototype and small scale manufacture, in addition to its R&D capabilities.

In 2013 DePuy Synthes received £4.4million from government’s Regional Growth Fund initiative to help support further R&D and innovation in the sector. The funding was utilised to support the creation of the new Centre of Excellence at Beeston.

depuysynthes.com



CASE STUDY: 50 AFTER 50 AND THE UNIVERSITY OF LEEDS

The University of Leeds boasts exceptional research strengths and a history of successful innovation and commercialisation.

THE CHALLENGE

Life expectancy and average age in the UK continues to increase as a result of advances in biomedicine and healthcare.

This creates significant economic and societal challenges in ensuring a high quality of life for our ageing population. The research at the University of Leeds is addressing these needs and expectations, helping to ensure an active lifestyle for '50 active years after 50®'.

THE OPPORTUNITY

The University's Institute of Medical and Biological Engineering (iMBE) hosts a world class hub of expertise with £50m of research funding (£10m per year). This means Leeds is a national and international centre of excellence for medical technology research and innovation, and is the hub for regional innovation and development within the field.

Multidisciplinary research across engineering life sciences, medicine and digital disciplines is combining to converge emerging and existing technologies to create novel 21st Century combination medical devices, products and services.

The industry taking advantage of this opportunity includes both start-ups and spinouts, while existing medical device companies are seeking to capitalise on the the creation of new divergent technology opportunities.



UNIVERSITY OF LEEDS

THE UNIVERSITY OF LEEDS' INSTITUTE OF MEDICAL AND BIOLOGICAL ENGINEERING (IMBE)

1 NOVEL CAPABILITIES – CO-CREATED WITH INDUSTRY

The Institute houses a dedicated innovation environment for the research and innovation community and is the largest multi-disciplinary orthopaedic engineering research group in Europe.

2 MEDE INNOVATION – THE EPSRC CENTRE FOR INNOVATIVE MANUFACTURING IN MEDICAL DEVICES

MeDe Innovation is a collaborative research project led by the University of Leeds, bringing together expertise from the universities of Bradford, Newcastle, Nottingham and Sheffield. This £9million programme is researching advanced design and manufacturing methods to provide methods for producing cost-effective, reliable and effective devices.

3 MEDICAL TECHNOLOGIES INNOVATION AND KNOWLEDGE CENTRE

This £13 million national centre, funded by the Engineering and Physical Sciences Research Council (EPSRC), facilitates collaboration between companies, engineers, scientists and clinicians to develop innovative technologies by speeding up the route to market.

4 TRANSLATE – REALISING MEDICAL TECHNOLOGIES IN THE LEEDS CITY REGION

Translate is a new partnership of universities in the Leeds City Region with world-class expertise in the development of new medical technologies.

Translate develops nationally leading capability, establishing a sustainable community of academic, industry and clinical partners that work to deliver a strong local economy and patient benefits.

5 LEEDS BIOMEDICAL RESEARCH CENTRE (BRC)

Leeds BRC is an international leader in translational musculoskeletal research hosted within Leeds Teaching Hospitals Trust (LTHT).

6 EPSRC CENTRE FOR DOCTORAL TRAINING IN TISSUE ENGINEERING AND REGENERATIVE MEDICINE, INNOVATION IN MEDICAL AND BIOLOGICAL ENGINEERING

The Centre for Doctoral Training provides multidisciplinary training in an externally focused, collaborative and challenge led research environment. It enables research students to make major contributions to the research, development, manufacturing, regulation, translation and the adoption of new regenerative devices into the health care system - delivering economic and social benefit on a global scale.



YORKSHIRE & HUMBER ACADEMIC HEALTH SCIENCE NETWORKS (YHAHSN)

The YHAHSN is part of the national Academic Health Science Networks (AHSNs), which connects the NHS and academic organisations, local authorities, the third sector and industry. It works as **a catalyst to create the right conditions to facilitate change across whole health and social care economies, with a clear focus on improving outcomes for patients.**

AHSNs also have a unique role to play in international engagement in health innovation and commercialisation of intellectual property derived from, or through the NHS.

Post-Brexit, the Government remains committed to making the UK the best place to invest in health and life sciences. The YAHASN and the LEP's track record in leading and supporting both inward investment and export growth opportunities offers huge potential for the UK health system and economy as we move into a new position internationally.

EXAMPLES OF INTERNATIONAL GROWTH SUPPORTED BY THE AHSN:

- Leading two Open Innovation Workshops in China between UK and Chinese SMEs, resulting in over £1M in Chinese funding for a UK SME partner and the creation of new UK / China joint ventures
- Working with FinPro and Tekkes to deliver UK market access programmes to Finnish tech SMEs, and facilitate a UK health tour with stand presence at NHS Expo 2016
- Promoting UK Clinical Genetics expertise alongside Healthcare UK at Arab Health, and working with Healthcare UK to scope the UK offer for global clinical genetics services

HOW CAN WE HELP?

Invest Leeds City Region offers a comprehensive service to investors from the initial point of enquiry through to soft-landing and aftercare. We can help you identify, secure and fund the perfect solution for your business to grow.

Our services include:

- Property search, match, advice and negotiation
- Support with access to finance and grants
- Soft-landing packages and facilities
- Support with recruitment of core and specialist staff
- Aftercare and ongoing business support
- Provide detailed intelligence and data
- Orientation visits for relocating staff



bebionic3 artificial hand, Steeper

GET IN TOUCH

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