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FutureNorth

The Life Sciences Edition

Protecting greatness

Kate Taylor: Leading the team guarding inventors' work from exploitation

In association with bionow

The North's game-changers

Cream of the region's life sciences celebrated at Bionow's awards dinner

The outstanding contribution made to life sciences by entrepreneur Dr Stephen Little, chief executive of AIM-listed molecular diagnostics company Premaitha Health, was recognised at the 16th annual Bionow Awards.

Dr Little, who led Premaitha through its successful AIM listing in July 2014, has an impressive track record of building biotech businesses and creating value. He is the former CEO of DxS, an innovator in the field of personalised medicine, developing and manufacturing companion diagnostics.

DxS was funded with £3.5m in 2001 and was sold to QIAGEN in 2009 for £85m. Before DxS, Dr Little worked for 20 years in various senior positions in the diagnostic divisions of AstraZeneca and ICI. He holds a PhD from Heriot-Watt University in Edinburgh.

In the highly sought-after Company of the Year category, Keele Science Park-based Cobra Biologics was triumphant. Cobra, an international contract development and manufacturer of biologics and pharmaceuticals, is in the midst of a £15m expansion programme in the UK and Sweden. The company, which manufactures DNA and viral vectors for the gene therapy market, exports 98% of its products.

A £1.4m fundraising by University of Manchester spin-out company Microbiosensor, which develops disposable point-of-care medical devices, was named Investment Deal of the Year, while Peter Chater a research associate at the University of Newcastle won in the prestigious Promising Technologist of the Year category.

Celebrating the outstanding leaders and innovators in the life sciences sector in the North of England, the Bionow awards ceremony was attended by more than 400 people at a gala dinner. "The critical importance of the life sciences sector has been acknowledged in the Government's new Industrial Strategy," said Dr Geoff Davison, chief executive of Bionow.

"It is hugely pleasing to see new financial support and a clear focus on supporting R&D-focused businesses and encouraging collaboration with the NHS as part of this. Locally, it has been great to see a leading international company like QIAGEN announcing plans to grow its presence in the North – a clear vote of confidence in our sector."

Dr Davison added: "As ever we had an incredibly strong shortlist and all are to be commended for their innovation in providing solutions which have the potential to be game-changing in the industry. Steve Little is unquestionably one of the most successful entrepreneurs in our sector and he thoroughly deserves recognition for what he has achieved."

The 2017 awards, which recognised excellence, outstanding achievement and enterprise in a sector that is worth £11bn to the North's economy, were sponsored by Manchester Science Partnerships, Appleyard Lees, and World Courier.

Celebrating the outstanding leaders and innovators in the life sciences sector

The winners

Bionow Start Up of the Year Award (sponsored by RSM)
APCONIX
A team of world-renowned nonclinical safety experts with more than 300 years of drug discovery and development expertise, committed to advancing drug safety. The team covers all safety disciplines, drug technologies and therapeutic areas. The integrated electrophysiology laboratory generates high quality data in a key area of drug safety research.

Bionow Healthcare Project of the Year Award (TRUSTECH)
SKY MEDICAL TECHNOLOGY / JAMES COOK UNIVERSITY HOSPITAL SOUTH TEES NHS TRUST
Project: Reducing the time to surgery for ankle fracture patients. This partnership generated clinical and health economics data which directly lead to the adoption of the geko™ device for the control of pre-operative oedema in ankle fracture patients demonstrating significant patient benefits, NHS cost savings and an NHS derived health economic business case that is now generating revenues internationally.

Bionow Project of the Year Award (Waters Corporation)
UNIVERSITY OF MANCHESTER
Project: Test for the management and assessment of Inflammatory Bowel Disease. The product offers the first efficient way to manage inflammatory bowel disease (IBD). It provides a non-invasive method to differentiate IBD from IBS, reducing the requirement for endoscopies, providing a robust prognosis for improving symptom management and patient care.

Bionow Product of the Year Award (The Innovation Agency)
CRAWFORD HEALTHCARE
Product: KerraContact Ag.A ground-breaking, patented silver wound dressing developed and commercialised in the North West by Crawford Healthcare and available internationally. Clinically proven to be faster acting and more potent than competing products, it is the first and only dressing worldwide to utilise silver in its most active state.

Bionow Technical Service Award (Sponsored by Gateley plc)
COBRA BIOLOGICS
Technical Service: Delivery of Technical Services related to the process development and manufacture of Plasmid DNA for Gene Therapy Products in clinical trials. Cobra has a global reputation for the production of DNA. Within this technical service offering we develop a process model (USP and DSP), scale up and then produce DNA at either non-GMP ("HQ DNA") or GMP. Associated services include QC and analytics, fill/finish and final Drug Product Release.

Bionow Business Services Award (Sponsored by World Courier)
INNOVATION AGENCY
Business Service: Healthcare Business Connect.Providing businesses with access to, and enable collaboration with, the health and social care sector to accelerate the adoption and spread of innovation. The agency helps SMEs to understand the complex systems and commercialise their products / services and supports larger organisations to collaborate on large scale pathway transformation projects.

Bionow Promising Technologist of the Year Award (Sponsored by Seqirus)
PETER CHATER, POSTDOCTORAL RESEARCH ASSOCIATE, NEWCASTLE UNIVERSITY
Peter's achievements include:
- Developed upper Gastro-intestinal model (PCT/GB2014/053449)
- Led market research to identify need/opportunity for integrated GI model
- Secured BBSRC Follow on Funding to develop novel integrated digestion/absorption model
- Secured and delivered commercial projects with: FMC Biopolymer, Suntory, Oxford Pharmascience and more
- Leading spinout activities.

Bionow Investment Deal of the Year Award (Sponsored by QIAGEN)
MICROBIOSENSOR LIMITED
Deal: Series A investment in Microbiosensor by Catapult Ventures and Maven Capital Partners. This deal transforms Microbiosensor Ltd. from a University spin-out company with solid grant funding to a venture-backed business with sufficient capital to CE mark and launch its two lead products. These products have the potential to impact major global medical device markets, and deliver healthcare benefits to vulnerable patient groups, together securing savings of up to £20m p.a. for each European national healthcare provider.

Bionow Outstanding Contribution Award (Sponsored by Sci-Tech Daresbury)
DR STEVE LITTLE, CHIEF EXECUTIVE OFFICER, PREMAITHA HEALTH PLC
Dr Little is a biotechnology entrepreneur, industry pioneer and an expert in the development and commercialisation of molecular diagnostics. A passionate advocate for Manchester and the North West as an ideal location for biotechnology companies, he is a highly respected personality both within the region and throughout the global diagnostics industry. Dr Geoff Davison, CEO of Bionow, commented: "Dr Little is unquestionably one of the most successful entrepreneurs in our sector and he thoroughly deserves recognition for what he has achieved."

Bionow Company of the Year Award (Sponsored by AstraZeneca)
COBRA BIOLOGICS
Cobra provides a comprehensive biologics and pharmaceuticals service offering, with multi-functional and experienced project teams nurturing customers' products from pre-clinical through to clinical and commercial manufacture within three GMP approved facilities.

A not-for-profit membership organisation, Bionow supports the North of England's burgeoning life sciences sector, which currently includes more than 1,000 science and healthcare companies with a combined turnover of around £11bn. Bionow's member base includes start-ups and spin-outs as well as well-established businesses. The services it offers to firms include dedicated business support programmes, shared procurement schemes and recruitment and training support.
www.bionow.co.uk

bionow®

Pharma Manufacturing Conference

AstraZeneca | Allergan | Seqirus A CSL Company | Elanco

Northern Pharma convened in Liverpool

Exploring the challenges and enablers for bio-pharma manufacturing in the North

The high R&D costs involved in discovering new medicines and progressing drugs through clinical trials are well-reported, but the challenges and rewards in pharmaceutical manufacturing attract much less attention. Yet competitive manufacturing and exporting is ultimately where money is made and the very significant pharmaceutical manufacturing sector in the North is an engine for growth in this specialist area of advanced manufacturing.

The sector's strategic importance to the UK economy is recognised by the Government with the Life Science Sector Deal announced in December and £162 million of funding focused on medicines manufacturing from the first wave of the Industrial Strategy Challenge Fund (ISCF).

The Bionow Pharma Manufacturing Conference, sponsored by Allergan, Seqirus, Elanco and AstraZeneca was convened on 23 May in Speke, Liverpool, home to likely the biggest biopharmaceutical manufacturing hub in Europe, with 125 delegates in attendance. The aim of the conference was to explore the challenges and enablers for bio-pharma manufacturing in the North and to start a conversation through which the northern manufacturing sites can work collaboratively in areas of common interest e.g. a shared approach to skills and training, and also begin to address the challenge of manufacturing next generation therapies that offer a preventative or curative effect as opposed to treatment.

Peter Timmins, Chair of the Health & Life Sciences Board for the Liverpool City Region, opened the conference and was followed by Laura O'Brien, Site Director at Seqirus, Liverpool giving a keynote address. She highlighted the skills challenge that the sector faces: "Production volumes are growing and the industry is automating for consistency so it needs to upskill manufacturing operators away from manual tasks and towards managing the process and monitoring performance and trends." Increasingly, entry-level roles in laboratories and production are being filled by graduates. However, despite a high investment in education many lack the practical skills and insights needed to thrive in highly-regulated pharmaceutical manufacturing, so it is a steep learning curve to build experience onto their base knowledge.

At the other end of the spectrum experienced workers and crucially many highly skilled technical staff are approaching retirement. While new technologies, robotics and automation are becoming increasingly deployed, they are dependent on having a flow of motivated graduate scientists and engineers and also skilled process technicians with the skills to adapt to an ever-changing manufacturing environment. The skills workshops, a key element of the conference, examined the issues and perceptions from the viewpoints of school pupils, apprentices, graduates and postgraduates, identifying several areas that need to be tackled, if we are to attract and retain entry-level recruits and unlock their potential.

Precision Medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. This approach allows doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work best in specific groups of people and can improve outcomes for patients and reduce unwanted side effects. Tailoring medicines for individual patient needs takes this approach a step further. Manufacturing new therapies tailored to the needs of each individual patient would massively improve patient outcomes, reducing healthcare costs while increasing healthcare value.

The next generation technologies of cell & gene therapy are increasingly in the news and represent an area of personalised medicine that is growing quickly – with a global market estimated at $11.5bn and expected to reach $18bn by 2025. Although still relatively small compared to a global drugs market of $1000 bn, next generation therapies are game-changing in that they offer the potential to cure life-threatening conditions with a single dose, rather than simply treating the symptoms of a disease or limiting its progression. However, their manufacture brings a whole new set of novel challenges in terms of much smaller batches of highly potent therapies made under sterile conditions, single use/disposable equipment, complex analytics for quality assurance and therefore a high cost-per-dose. That said, there is much that can be learned from other advanced manufacturing industries. In addition, the difficulties in manufacture create a barrier to entry thus enhancing competitive advantage for those who get involved early. The conference examined the new analytical challenges and the demands of sterile manufacture, crucial for the manufacture of new therapies. It also explored the routes to manufacturing process innovation and some of the practical technical manufacturing challenges for new therapies which will need to be overcome if we are to develop new, cost effective manufacturing processes to provide a competitive manufacturing route to market for innovative therapies, so that value can be retained in the UK.

The pharmaceutical sector is highly regulated and new therapies introduce a raft of novel regulatory challenges. Advanced therapies demand a move away from big batches being manufactured in 'fixed' plant which is remote from the patient, towards much smaller batches made in flexible plant much closer to the patient, often a single product for a single patient, the epitome of 'personalised medicine'. How will we regulate and authorise many smaller manufacturing sites and does this present an opportunity to be proactive in our regulatory approach? Can the UK's Regulatory framework help to facilitate innovation and shorten the time to market while ensuring the development of safe and productive processes? David Churchward, a GMP Inspector with the MHRA commented: "The Medicines and Healthcare products Regulatory Agency (MHRA) is both the inspection and licensing authority in the UK, with responsibility for blood components and medicines. MHRA works closely with the UK Human Tissues Authority and is uniquely positioned to convene the best experts to provide specific advice at an early stage. The MHRA is also well connected internationally and can have influence on international standards."

The conference succeeded in its aim to catalyse the connection of Northern Pharma manufacturing expertise and will meet again in 2019 to take this agenda forward.

For more information see www.bionow.co.uk

SPEKE BIOMANUFACTURING CLUSTER

The Speke Biomanufacturing Cluster employs over 1,830 people across the four major sites of:

ALLERGAN BIOLOGICS: The UK R&D Centre of Excellence for Biologics of Allergan plc, a global pharmaceutical company producing treatments for debilitating diseases in eye care, gastroenterology, aesthetics and dermatology and CNS.

ASTRAZENECA, LIVERPOOL: A major biologics site handling all aspects of vaccine strain development and manufacture, producing Drug Substance to support the manufacture of 20 million quadrivalent influenza vaccine doses per year for the global market including supplying the nasal spray influenza vaccine Fluenz as an important part of the Government's extended childhood flu vaccination programme. The site employs approximately 350 employees with more than 4000 in total in the Northwest region.

ELANCO LIVERPOOL: Manufactures products by bulk fermentation of bacterial organisms which are used to prevent and treat disease among farm animals. The site was once the biggest maker of penicillin in the world, after it was built to produce the drug for the army and civilians during the Second World War.

SEQIRUS LIVERPOOL: A Centre of Excellence for advanced influenza vaccine manufacturing. It is one of the biggest biotechnology sites in Europe and the only injectable influenza vaccine manufacturer in the UK.

OTHER SIGNIFICANT manufacturing sites in the North include AstraZeneca Macclesfield which manufactures Zoladex, an injectable treatment for patients with prostate cancer, GSK (Ulverston and Barnard Castle), BMS, TEVA, Sanofi Aventis and CobraBio at Keele. Ipsen and Wockhardt manufacture in North Wales, and the North East Pharma cluster is home to Fujifilm Diosynth, Sterling, Aesica, MSD, Piramal and Wasdell.

A city with clear potential

DLA Piper is helping Liverpool move beyond traditional industries

Sensor City, a joint venture between The University of Liverpool and Liverpool John Moores University; one of only four University Enterprise Zones in the country. Located at the gateway to Liverpool's Knowledge Quarter, the purpose-built innovation hub enables businesses to develop, fund and promote sensor solutions and IoT to a global market.

When former Liverpool FC youth midfield player Terry Nelson was robbed of a career in the beautiful game through kidney disease, he turned creator and designer of what Real Madrid was to describe as the club's secret weapon; a buoyancy suit to help injured players train in water, enabling them to build their fitness when they are unable to exercise normally.

Along the way, Terry constantly defeated the odds by surviving two kidney transplants and a partial leg amputation, all thanks to his determination to make a difference to people like himself; athletes who struggle to achieve fitness in the face of physical injury or wounded military (he trained to be a paratrooper before tests showed that, without a transplant, he would have six months to live).

Yet like for so many entrepreneurs who come up with a breakthrough idea, the corporate world proved to be a minefield and threatened to potentially derail the progress he had made. This had seen him travel to both China and the USA searching for funds and even achieving a PR breakthrough as a result of a feature article in the New York Times.

Fortunately for Terry Nelson, it just so happened that around the same time his company began to suffer from growing pains, Gary Davies, Legal Director at the Liverpool office of DLA Piper, was challenged by its then Office Managing Partner, Ben Miller, to explore how DLA Piper could use its international and sector experience to better support the exciting potential within Liverpool's new Knowledge Quarter, looking at businesses outside the traditional manufacturing and retail sectors.

And one of several areas in which DLA Piper is a world leader is life sciences. Indeed, the firm's client list includes many of the top 20 global pharma and medical device companies. A particular field of expertise relates to innovation in healthcare, an area in which Terry Nelson's Aqua Running International company was struggling to achieve its true potential.

IT IS NOT a new concept that Liverpool is a key contributor to the UK's life sciences sector. Indeed, Speke is home to the largest cluster of biologic manufacturing companies in Europe, and when it opened in 1898, Liverpool School of Tropical Medicine was the first institution in the world dedicated to research and teaching in tropical medicine.

"My feeling was that the opportunities in the sector were already there, but we weren't doing enough to make companies aware of our international expertise, which could help local businesses grow," recalls Gary. "The potential within Liverpool is clear - the city's Knowledge Quarter represents an investment of over £2 billion and the facilities we have are world class".

The meeting of Terry and Gary proved to be a moment of pure serendipity. For Terry Nelson's company it presented the real opportunity to talk with investors with the backing of a global heavyweight; for DLA Piper it became a catalyst for increased support to local businesses, which has seen the Liverpool office evolve into a hub in what is increasingly seen as a boom sector in the North West.

THE RELATIONSHIP came about because Gary had taken the initiative and delivered copies of DLA Piper's legal start-up pack that the firm has designed for early stage companies to Sensor City, the new £25m facility where Terry is based, near Lime Street station. This prompted Terry to set up an initial meeting with Gary, before instructing DLA Piper within a matter of days.

"What we found was a very early stage company looking for investment," recalls Gary. "We needed to make sure Terry had protected his intellectual property and had a sound company structure. Having moved into Sensor City to build sensor technology into the body suit, and with the contacts Terry had already made, we could immediately see the potential for an international business. We are in the process of supporting Terry in his discussions with US investors."

Today Gary Davies heads up a team of 40 local DLA Piper lawyers in the life sciences and technology sectors in the North West, covering both Liverpool and Manchester. And DLA Piper Liverpool is ensuring that the momentum it has achieved to date from this is maintained.

"Prior to the last couple of years, we weren't visible enough in the Life Sciences sector in Liverpool. So, we have really pushed to achieve what we have," admits Gary. The firm now has an extensive network of contacts which has not only embraced life sciences companies but also universities, government bodies and investments funds across Liverpool, Cheshire and Manchester, as well as Bionow, the membership organisation which has done more than any other body to support the life sciences sector in the North.

CONNECTIONS with Liverpool's two universities are also seen as particularly important as they tend to be a breeding ground for life science start-ups. DLA Piper Liverpool has gone one step further than most to help nurture and maintain local talent; every member of staff below the level of Legal Director is currently acting as a mentor to a university student.

DLA Piper Liverpool has also been running monthly seminars for Liverpool's Knowledge Quarter, with the emphasis on collaboration as tenants from different sites are invited to each venue to share ideas. This collaborative initiative has also been extended to embrace knowledge held outside of the region with investors and DLA Piper experts, including Global Co-Chair for Life Sciences, Bonella Ramsay, coming north to share expertise.

"What we are seeing is a genuine interest from investors and my international colleagues about what is going on in Liverpool and that is a breakthrough in itself," insists Gary Davies.

Meanwhile, Terry Nelson is one client who is more than happy to endorse the benefits of having DLA Piper in his home city. "They have helped us in so many ways and have been very important to us," he says. "One of my potential investors in the United States knows DLA Piper very well and were impressed that they were our lawyers. The fact that we have an international company based locally but with such a global reach, you can't do better than that."

Creating a world-leading innovation district

KNOWLEDGE QUARTER LIVERPOOL (KQ LIVERPOOL), home to the largest cluster of science, health, education and cultural minds in the region including the University of Liverpool, Liverpool School of Tropical Medicine, Liverpool John Moores University, Liverpool Science Park, Sensor City, Accelerator, the new £429m Royal Hospital and the £157m Clatterbridge Cancer Centre.

Pragmatic business advice

DLA Piper employs more than 4,200 lawyers in 40 countries with an annual turnover of circa $2.5 billion, yet no matter whether you are in the Liverpool office or Los Angeles, you will still find the Northern-valued traits that set it apart from the competition – straight talking, down to earth, pragmatic business advice remains very much part of the professional ethos.

DLA Piper lawyers spend time with their clients, getting to know both their businesses and products – something that is often sadly lacking in the clock watching, dog eat dog world of the big name legal firms.

"What sets us apart from the rest is our global reach and sector expertise," says Gary Davies. "Very few businesses have such access to global markets and no other law firm in the North West.

"We have connections to take people to a global market and when it comes to the life sciences sector that is where you have to be."

Paddington Village, the 30-acre expansion to KQ Liverpool

£429m New Royal Hospital

£157m Clatterbridge Cancer Centre

£25m Life Sciences Accelerator

Never accepting 'the norm'

Developments in KQ Liverpool are transforming the face of our great city

BY COLIN SINCLAIR

Liverpool's economy is the fastest growing out of all Northern Powerhouse City Regions. Over the next five to years £2bn-worth of investment will be pumped into redevelopment in Knowledge Quarter Liverpool (KQ Liverpool). Having been in post as CEO for just two years now, I wanted to take the opportunity to look back at some of the successes of the KQ Liverpool team, whilst looking forward to what is likely to be announced in the coming months.

Hailed as a landmark investment deal and a key moment for the future of the Northern Powerhouse, back in 2016 the KQ Liverpool partners won a competitive process against Manchester and Leeds, when the Royal College of Physicians (RCP) chose Liverpool as the new home for RCP North. Less than two years later and they are already working out of the University of Liverpool-owned William Henry Duncan building, whilst Liverpool City Council build their new iconic home.

That leads me seamlessly onto Paddington Village, the 30-acre expansion of the KQ Liverpool Mayoral Development Zone, where the new 160,000 sq ft building – The Spine – is being built. As the RCP was the catalyst for the building and are taking 70,000 sq ft for themselves, The Spine will be one of the worlds healthiest buildings and one of the first in the UK to achieve the international WELL standard.

Other standout moments for Paddington Village were fighting off other UK cities to secure the pioneering £35m Rutherford Cancer Centre North West, and the University of Liverpool (UoL) and Kaplan choosing to open one of Europe's largest international colleges there too. More recently, we have appointed an architect and shortlisted the brand for the new hotel that will sit next to The Spine and are already in talks on the few remaining plots.

Just across the road from Paddington is the rapidly changing health campus. Not only are the new £429m Royal Hospital and £157m Clatterbridge Cancer Centre being built, the £25m Life Sciences Accelerator also opened last year and as the old hospital is demolished other NHS Trusts are expected to join the fold, making it one of UKs largest clinical campuses.

Accelerator is a bioscience incubator, offering unrivalled access to both its partners – the NHS and Liverpool School of Tropical Medicine (LSTM) – and was one of three pioneering buildings (Accelerator, Sensor City and Materials Innovation Factory) to open over the last 12 months. It is also now home to the new Centre of Excellence in Infectious Disease Research (CEIDR), a partnership between UoL and LSTM, focused on translational partnering in infectious diseases. The latter of which was identified in the recent Government Science and Innovation Audit as one of Liverpool's world-leading strengths, alongside Materials Chemistry and Cognitive Computing/Artificial Intelligence.

JUST BEHIND THE health campus is the newly created Fabric District, the industrial enclave between London Road and New Islington, which is amidst a huge transformation to see it regain its status as a vibrant part of Liverpool City Centre. At the heart of the Fabric District is the Tapestry – a 25,000 sq ft former print works, which has quietly undergone a huge refurbishment, re-working the industrial site into a multi-functional space where residents and visitors can work, create and relax.

Also opening their doors were Sensor City, a joint-venture between UoL and Liverpool John Moores University (LJMU), which is set to put Liverpool on the map as a global leader in sensor technology and the Materials Innovation Factory, a partnership between UoL and Unilever providing cutting-edge, ultra-flexible, chemistry research facilities.

Also launching were the UoL Centre of Excellence for Sustainable Food Systems (CESFS), a collaboration between academics created to address real world issues affecting both humans and animals, such as climate change and the National Biofilms Innovation Centre, which gives researchers and industrial partners a platform to meet and explore a broad variety of collaboration opportunities.

THERE ARE ALSO very exciting things happening at the other end of KQ Liverpool, between Mount Pleasant, Lewis's and Lime Street Station, in the area we have called KQ Gateway. Working with Liverpool City Council we are helping to create a Spatial Regeneration Framework (SRF), which will help shape it into a vibrant part of the city, with new shops, offices, galleries, bars, restaurants, gyms and university space.

Forming part of the KQ Gateway is the LJMU owned Copperas Hill site. This strategically important site is located close to Lime Street Station and was formerly occupied by the Royal Mail Sorting Office which closed in 2010. This building was demolished in 2017, paving the way for LJMU's new £64m scheme, which includes the development of two major LJMU buildings set within new public spaces and landscaped routes. It will transform that area of the City for students and staff, as well as for the residents and communities around this site.

With so much happening already, you would expect things to start slowing down but that definitely isn't the case. In fact, we've only scratched the surface with the level opportunity that this half of the city has to offer.

Since launching our vision for 'The Lime Line' – a futuristic last-mile transport solution – and 'Lime Square' – a new public space at the heart of the KQ Gateway, we continue to work with the Knowledge Quarter Joint Transport Stakeholder Group and talks are already underway to gather supporting evidence for a potential transport pilot scheme in Liverpool.

A new company is also being created to oversee investment and development in science and tech buildings across Liverpool. The Knowledge Quarter Development Company (KQDC) will be specifically responsible for updating the area's science and technology facilities and delivering new workspace and lab developments as Liverpool consolidates its position as a world class innovation district.

The KQDC is being created by Liverpool City Council, UoL and LJMU, who will each be equal partners in the new company, alongside a private sector investor. Liverpool Science Park, Sensor City and the Accelerator are expected to be among the buildings that could benefit from new investment generated by KQDC, whose partners have identified the need to attract initial investments of circa. £100m as new science and tech buildings are brought forward. Importantly the KQDCs mission is to create a new innovation ecosystem, benefiting all of the city region.

Last, and certainly not least, we are working with the Hope Street Community Interest Company to create a new cultural programme that will run for two years from January 2019, to coincide with the development work at Paddington Village. The KQ Culture! programme is designed to not only engage with locals and visitors alike but to showcase the fantastic cultural assets that Liverpool has to offer.

THE ROLE OF Hope Street to the KQ Liverpool vision is pivotal and is what makes our city stand out from the crowd. There aren't many innovation districts that can boast two cathedrals, theatres, galleries, orchestras, countless cafes, bars and restaurants. It is estimated that Hope Street adds £81 million a year to the Liverpool economy which, in turn, supports a further 1,000 jobs.

KQ Liverpool's world-leading universities, it's new hospitals and a progressive City Council at the heart of a joined-up City Region are proving that the power of partnership really can deliver something far greater than the sum of its parts. We are creating jobs, new discoveries, retaining graduates, starting and growing businesses through what we call disruptive collaboration. By that we mean never accepting the norm, acting in self-interest or being average in what we do; instead, always aiming high and being inclusive and being world-class in everything. The current and future developments happening within our Knowledge Quarter are transforming the face of Liverpool and mark an exciting chapter in our great city's history.

Colin Sinclair is CEO of KQ Liverpool.

Delivering an industrial strategy for the North

On course to unlock £1bn worth of life sciences investment

It was in November last year that the Northern Health Science Alliance (NHSA) was named as the Government's delivery partner for the Life Sciences Industrial Strategy Sector Deal across the North of England.

The NHSA is an alliance of universities, NHS hospitals and Academic Health Science Networks. Through working together with industry, it has identified planned investments of £1bn in life sciences, across the Northern Powerhouse, in the next five years.

But what will an Industrial strategy for the North's life science sector look like? And what will it bring to the North of England?

"The NHSA is partnering with the Government to make sure that the Life Science's Industrial Strategy plays to the region's specific strengths, making the most of its considerable assets, and building towards a healthier and wealthier Northern Powerhouse," said Dr Hakim Yadi OBE, chief executive of the NHSA.

"Our work with industry and leading health partners has identified this vibrant sector already has £1bn of investment planned in life sciences over the next five years and we want that to grow.

"We now have the opportunity to galvanise the North's health innovation economy by working as a partner with Government. We will make sure investments made as part of the Life Science Industrial Strategy sector deals are made in the right areas that increase our infrastructure capacity while supporting the growth of life science business across the North.

"We are thrilled to be working with the Government to deliver a life sciences sector deal that delivers for, and capitalised on the assets of, the North of England."

The NHSA identified seven areas of Life Sciences Industrial Strategy where the North both has strengths but is also best placed to support delivery of the strategy in data, increasing NHS collaboration, skills, growth and infrastructure, delivering components of the newly created Healthcare Advanced Research Partnership (HARP), manufacturing and in reinforcing the UK's science offer.

The North's strengths in health research were also identified last year through the Northern Independent Economic Review which identified Health Innovation as one of the North's four prime sectors ripe for development and growth.

The awarding of a Northern Powerhouse in Health Research Science Innovation Audit in the autumn by the Department for Business, Energy and Industrial Strategy to the NHSA supports the recognition by government that the North is a powerhouse in life sciences and health innovation.

CURRENTLY 13.5% of Government, and third sector funding into health research goes to the North. If this matched that of the current levels invested by private industry at 20% then an extra £200m could be realised for the North's economy each year raising levels over £400m a year.

Dr Yadi said: "The North is creative and innovative and we need support at the same level as the South of the country to grow the expertise and excellence we already have here.

"We carried out an analysis of patents last year which demonstrated the North of England is twice as effective at innovating as Cambridge, and second only to London, when innovation is measured using patent applications published for new life science technologies. This is despite the historic limited access to commercialisation capital and funding from Government."

The North, which receives 13.5% of health research funding, compared to London's 32.1%, produces a similar number of patent applications (386 compared to 401) – making its funding work twice as hard.

According to the MRC it is estimated that for every £1 invested in medical research, there is a 17% annual return to the UK economy, indefinitely. Taking into account the monetised benefits of a healthier population the rate of return rises to between 24% and 28%.

Dr Yadi finishes: "The potential for the North of England if the Life Sciences Industrial Strategy Sector Deal is put in place effectively and with the right level of finance is truly exciting – and not just for the North but for the whole of the UK."

For more information on the Northern Health Science Alliance visit www.theNHSA.co.uk

Drawing investment into the sector

The NHSA offers a bespoke service to industry partners wanting to collaborate with the academic and clinical research infrastructure in the North of England.

With the expertise and capabilities of leading universities, research-intensive NHS organisations and Academic Health Science Networks (AHSNs) – this support spans the health innovation pathway – from concept to patient.

Suzanne Ali-Hassan, Head of Corporate Engagement at the NHSA, said: "We mainly work with companies outside the North of England to get them to invest and work in the region.

"We collaborate with the Department of International Trade to attend conferences and events, promoting the North of England in the context of the wider UK health sciences offer.

"The overall aim of our industry work is to find appropriate academic or clinical partnerships within our member organisations. We support large companies through to SMEs in their therapeutic, diagnostics/medical technology and new digital technology development.

Suzanne Ali-Hassan: 'We hope to introduce our member organisations to exciting, novel technology

"Consequently, we hope to introduce our member organisations to exciting, novel technology coming from all over the world – eventually improving the health of patients in the UK."

Working with the NHSA

MELOQ

Meloq, a Swedish medical technology SME, developed a medical device for measuring the angle of joints and related spasticity during rehabilitation. The device has primarily been used within physiotherapy but they are interested in exploring alternative applications such as neurological conditions.

The NHSA introduced them to colleagues in Liverpool and Sheffield with negotiations underway to integrate the technology into a planned neurological study with Sheffield.

Rui Chen, Chief Technical Officer, Meloq said: "When we decided to work inside the UK we realised the navigation of its health sciences could be difficult – which is why it's been a delight working with the NHSA team who have connected us to several clinicians and researchers. We are now about to start a clinical test thanks to the introductions made by the NHSA."

ONCIMMUNE

Oncimmune approached the NHSA to identify clinical partners to trial their new antibody test for lung cancer and support an application for a Small Business Research Initiative (SBRI) grant. After discussing with the company, the NHSA introduced Oncimmune to Leeds and set up a visit to meet with key personnel from across the City Region.

As a result of the introduction made by the NHSA Oncimmune was successful in its SBRI application and is commencing Phase One of its trial which will demonstrate the health economics of the test and how much money it will save the NHS. It will work with Leeds University, Leeds University NIHR In Vitro Diagnostics Co-Operative and Leeds Teaching Hospital NHS Trust Pathology Department in delivering the trial.

Kate Taylor leads a team of 17 attorneys, 11 of them women

Empowering women at work

Biotech, pharma, and chemistry show highest rates of women named as inventors

While women in STEM was the key theme for Intellectual Property Day earlier this year, it is part of a long-term strategy at HGF, an intellectual property specialist firm with a clear focus on peer support for women.

Intellectual property specialists don't come much bigger than HGF, with 16 offices across the UK, Ireland, the Netherlands and Switzerland. With one of the UK's largest teams of specialist life science attorneys, HGF provides clients with practical, legal and strategic advice on managing their life sciences intellectual property. This extends from protecting new research from the UK's most prestigious universities, to high-profile oppositions and court proceedings on market leading products.

Its support of women in the workplace is perfectly illustrated by the career path of Patent Attorney and Partner Kate Taylor, who heads up the HGF life sciences team. Kate and her team stand between our great inventors and the people who threaten to exploit their work. Through patents, trademarks, copyright and the protection of industrial design, she and her team play a vital role as guardians of the work of researchers, inventors and manufacturers in the thriving life sciences sector.

THE FACT that she combines her high-flying role with being a wife and mother of two young children is testimony to the way she has successfully juggled her work/life balance, along with the support she and others receive from HGF, which positively encourages and empowers women in the workplace.

Research carried out last year by the Intellectual Property Office shows that since 1975, there has been a 500% increase in the proportion of patents involving a female inventor and a 400% increase in the number of individual female inventors, but this comes from a low base. There is still a significant gender disparity, with only 0.3% of patents coming from all female teams.

The fields of biotechnology, pharmaceuticals and chemistry show the highest rates of women named as inventors in international patent applications filed via WIPO. Kate, who leads a team of 17 attorneys (11 of them women) in the life sciences arm of HGF, wants to see more women enter into the STEM sector, and for that talent to be nurtured.

"Lots of progress has been made, and the balance is better now than it was," she said. "More employers need to provide the workplace environment in which women can thrive and more women need to be confident enough to enter into this brilliant field."

HGF has its own dedicated Women in STEM team which provides access to a network of like-minded individuals, topical advice and resources. The team runs events designed to deliver key news, legal updates and practical advice relating to Intellectual Property and the latest developments in the STEM industries, as well as providing networking opportunities. It comprises IP solicitors, patent attorneys and trade mark attorneys, with expertise covering chemistry, engineering, electronics and life sciences.

SUCH IS THE portfolio of HGF, including the world's biggest corporations, the most prestigious educational institutions and Nobel prize-winning innovators, that the company has experts at hand with a wealth of knowledge and insight to share, with an acute understanding of the demands facing women in the STEM industries.

For Kate, based in the York office, it has been a one-employer journey which started 18 years ago when she left the University of Newcastle-Upon-Tyne with a BSc in Genetics and a Masters in Biotechnology. By 2009 she was a partner. She admits she would have struggled to balance work and being a mother if it wasn't for the forward-thinking attitude of her firm.

"I couldn't combine this job with being a mother if it wasn't for the way HGF positively encourages and supports women in the workplace," she said. "I hope I can be an example to others that women and mothers can carve out a brilliant career in science."

Kate has considerable experience of drafting patent applications and developing IP filing strategies in the life sciences field. She coordinates global patent portfolios for spin out companies and international corporations. Kate has a substantial prosecution practice and is highly experienced in acting before the European Patent Office in prosecution, opposition and appeal matters; fighting on behalf of the clients whose inventions and research she is protecting.

HGF is also currently offering specialist support through the Brexit process, during a period of understandable uncertainty over the protection of Intellectual Property during and after the process. HGF has undertaken considerable scenario planning so that the firm is fully prepared and can devise a strategy for Brexit. As far as HGF are concerned, Brexit means business as usual: providing their clients with the best advice to manage their IP.

For more information visit www.hgf.com or email enquiries@hgf.com.

Women leading in STEM

Sheila MacNeil has made a huge difference to people's lives through her ground-breaking life sciences research work – and she is a perfect example of just how much women can achieve in STEM. Sheila is Professor of Tissue Engineering in the Department of Materials Science and Engineering at the University of Sheffield.

Her research focuses on developing biomaterials and tissue engineering which will benefit patients, alongside fundamental work to develop new understanding and tools in the area of tissue engineering. She has filed patent applications across the globe with the support of HGF in order to protect her technology.

MacNeil's group has a long history of working with clinical NHS colleagues using tissue engineered skin to benefit burns patients (from 1992) and more recently patients with chronic ulcers (from 2004) and for patients requiring reconstructive surgery of the urethra (from 2007).

She developed the product Myskin™ (a combination of a biomaterial and patient's skin cells) which was clinically evaluated and developed commercially and has been available in the UK for patients with extensive skin loss due to burns injuries and for patients with chronic non-healing ulcers. This product, available from 2004 to the current time, is currently available through the company Regenerys Ltd.

Additionally, she has developed 3D tissue engineered models used to study a wide range of normal and abnormal conditions spanning wound healing, skin contracture, pigmentation, melanoma invasion, angiogenesis, bacterial infection and skin sensitisation.

Sheila's current projects include developing tissue engineering approaches for reconstruction for burns contractures and using human fat to improve the clinical outcome post grafting of patients who have suffered severe burns.

Her recent patents involve developing new biomaterial approaches to stimulate healing in chronic ulcers (protected by a joint patent filing with colleagues in Pakistan) and she leads a group of scientists and clinicians developing a tissue engineering approach for repair of the weakened tissues of the female pelvic floor - protected by a patent now licensed for translation to the clinic by a new company Symimetics Ltd.

Sheila MacNeil has filed patent applications across the globe with the support of HGF in order to protect her technology

She has also worked with clinical colleagues in India through two projects funded by the Wellcome Trust which has led to a simplification of the current approach to corneal regeneration and to a new methodology to improve early detection of infection in the cornea - projects funded by the Wellcome Trust and protected by patents filed by HGF.

Meeting the 'grand challenges'

Innovation quarter attracting world's leading scientists and hi-tech companies to the North East

In launching the UK's Industrial Strategy last month, Prime Minister Theresa May focussed on four 'grand challenges' reflecting global trends shaping the future; artificial intelligence and data, healthy ageing, the future of mobility, and clean growth.

"We cannot predict the future or guess what technological or scientific breakthroughs might lie just around the corner," she said. "But we can observe the long-term trends that are shaping change in our world today and which will drive and demand innovation in the years ahead."

NEWCASTLE AS A LEADER

Newcastle University and the city is positioning itself as a leader in these fields. The application of artificial intelligence to transform the diagnosis of chronic diseases is a major focus of the National Institute for Health Research (NIHR) Innovation Observatory, located at Newcastle University.

The university also hosts the National Innovation Centre for Ageing, which works with academia, industry, and the public to explore, test and bring to market products which promote healthy ageing and wellbeing.

"More and more life sciences businesses have been attracted to Newcastle over the past few years," said Martin Cox, director of business development and enterprise at the university.

"Our world-class medical school, proximity to one of the UK's leading hospital trusts, and a local authority that is genuinely open to and supportive of business – the combination gives a real edge in terms of translational medicine and means that Newcastle is a really exciting place for life sciences companies.

"The medical school has traditionally been strong, but it's been in the last decade that the partnership with the hospital has led to increasing business opportunities which have really accelerated over the last few years. The partnership with the council has been very important in that; the investments that they have made in infrastructure have been transformational.

"In terms of talent, our life sciences sector is now creating the kinds of highly-skilled posts that mean our medical graduates and science-related PhDs do not have to leave the area for work. People from outside the region, once they come here to see the quality of life for themselves, want to stay. And we have been very successful, in a partnership with Durham University, in attracting chief executives experienced in working with spin-outs and scale-ups."

The university also has more than 100 leading academics specialising in energy. Last year, it launched InTEGReL, with Northern Gas Networks and Northern Powergrid, an energy research and demonstration site. Working with Nissan, it is part of the world's first, large-scale trial of vehicle-to-grid technology.

Partnering with Northern Powergrid, it was one of the founding institutions of the £65m Faraday Battery Institution, looking at recycling, reuse and lifetime extension of batteries. Through its National Centre for Energy Systems Integration and Smart Grid lab, part of a range of major collaborations with Siemens, it is testing innovative energy storage and whole-energy systems solutions.

GLOBAL HUB OF INNOVATION

The university is a partner in Newcastle's global hub for urban innovation which has entered its next phase in development. Newcastle Helix is a £350m flagship project bringing together academia, communities, business, industry and the public sector.

It is a partnership between Newcastle University, Newcastle City Council, and Legal & General, and is already home to the university's award-winning Urban Sciences Building and The Core, a seven-storey home for knowledge-based science and technology SMEs.

The latest building on the site, The Biosphere, will open later this year, providing laboratories and offices for a wide range of scientific based companies, primarily life science and healthcare (see panel).

The site of a former brewery, it is being transformed into an exemplar of urban sustainability; a unique testbed for innovative technologies and solutions that will tackle some of the most pressing challenges facing cities around the world, such as flooding, resilient infrastructure and energy.

Drawing on the expertise of key industry partners such as Siemens, Microsoft, and Northumbrian Water, the aim is for Newcastle Helix to improve the lives of people not just in Newcastle, but all over the world.

A new round of construction and investment is now underway for what is the UK's biggest urban development outside London; an internationally-renowned innovation centre for sustainable engineering, ageing, and data science.

The next two years will see the opening of the National Innovation Centres for Data and Ageing and Newcastle University's £29m Learning and Teaching Centre. Legal & General are underway constructing the site's first private sector building, The Lumen, a 100,000 sq. ft. Grade A office development.

Building on its growing reputation and infrastructure investments, Newcastle expects to attract further innovative businesses to the city, many of whom will locate and grow on Newcastle Helix.

Newcastle-based QuantuMDx, developers of a globally-significant portable diagnostics device, is one example of a company that has benefited from basing themselves in the city and collaborating with Newcastle University. Earlier this year, it raised $12m in a new round of funding.

"Locating our HQ in the innovative North East - in preference to the 'biotech golden triangle" of Oxford/Cambridge/London - was a conscious decision," said Elaine Warburton, QuantuMDx's Chief Executive.

"When we arrived in Newcastle six years ago, we found a city with an incredible genetics network alongside an excellent network of academic, industrial and key opinion leaders, all seeking to support a forward-looking young biotech, with a global vision, that wanted to change the world.

"We were looking for, and continue to do so, research scientists who can take pure research and apply it to everyday life. Newcastle and Northumbria Universities focus on this skill-set offering numerous high calibre graduates and postgraduates from all scientific disciplines including engineering, biology, chemistry, software development.

"This multidisciplinary approach is vital to be able to design and develop such a ground-breaking device as our Q-POC™ portable lab for low resource settings. Newcastle is also a wonderful city to attract staff from all over the globe - with such friendly people and a real buzz."

https://newcastlehelix.com

The Biosphere, Newcastle Helix: The opportunities for businesses to engage and grow here are huge.

At the heart of a £1.1bn life sciences ecosystem

Four months away from opening, The Biosphere has exceeded occupancy expectations, with a significant proportion of the facility assigned to biotech businesses. Interest is high, with a recent showcase event attracting representatives of more than 50 companies from the life sciences sector, supply chain, and fund managers.

The Biosphere has the impressive technical specification expected of a £25m project and the project's strategic partners, Cam-Sci and Ryder Architecture, have ensured flexibility and resilience run throughout the building's design.

But this is much more than a single development plot; its popularity has certainly been boosted by its surroundings. It sits at the heart of the North East's £1.1bn life sciences ecosystem. The laboratories are based on the UK's largest urban development outside London, Newcastle Helix, which itself is at the heart of one of the fastest-growing cities in the UK, Newcastle upon Tyne.

This £350m flagship site bringing together academia, businesses, communities and the public sector, focuses on innovation and collaboration to help us live better lives – easier, healthier, longer, smarter.

"Newcastle is one of the UK's fastest growing cities and we are seeing significant interest from investors," said Matt Bratton, inward investment manager at Invest Newcastle. "We support these companies looking to relocate or expand into Newcastle and highlight how the city can aide growth and give them an edge over competitors.

"The opportunities for businesses locating here to engage early and quickly, and to grow, are huge and we're inviting them to discover what Newcastle has to offer."

For the life sciences sector, the site's proximity to Newcastle upon Tyne Hospitals NHS Foundation Trust – a UK leader in clinical trials - and Newcastle and Northumbria universities, as well as Newcastle International Airport and Newcastle Central Station, are all advantages.

On-site neighbours include Newcastle University's National Innovation Centre for Data and its National Innovation Centre for Ageing, both nationally significant centres of excellence in their fields, as well as the NIHR Innovation Observatory – a world-first in using big data analytics and machine learning to study global health innovation.

The opportunity to locate alongside this expertise and rub shoulders with digital SMEs in adjacent tech hubs are further benefits.

Within an hour's drive, life sciences businesses have access to assets that support the entire bench to bedside pathway. From CPI's National Biologics Manufacturing Centre, to the UK's top performing Clinical Research Network, to sector support networks (including Bionow and First for Pharma), to four world-class universities, to CROs and CDMOs, and centres of excellence in precision medicine, MedTech, and clinical trials.

As well as satisfying commercial laboratory demand, its lively events programme and conferencing space will offer a new centre-point around which the sector can meet, share knowledge, and find collaboration opportunities as the industry continues to flourish.

www.InvestNewcastle.com

A topical treatment that is more than skin deep

Taking SkinBioTherapeutics to an IPO has allowed the company to focus on research, at the same time as raising its profile

SkinBioTherapeutics is harnessing the power of the microbiome to protect sensitive skin, prevent infection, and treat eczema

Originally, SkinBioTherapeutics' CEO Dr Cath O'Neill worked in the field of gastroenterology, investigating the effect of probiotics on the intestinal barrier function, an area which had already seen significant commercial success through health foods and yoghurt drinks.

But after working with a group of dermatologists in her university lab she wondered whether probiotics could also be used to promote skin health by applying them directly to skin. "It wasn't quite a lightbulb moment, but it felt natural to ask the question, whether probiotics could be used topically," said O'Neill.

The idea began as an academic project at the University of Manchester. Researchers, led by O'Neill and Professor Andrew McBain, identified a probiotic extract capable of not only strengthening the barrier effect of skin models, but also improving repair and reducing bacterial load.

Today, this discovery has grown into SkinBioTherapeutics, a UK-based AIM-listed life science company looking to harness the power of the human microbiome - the collective name given to the genetic material of the trillions of microbes that live in and on the body - to promote skin health.

The team first screened various strains of probiotics for efficacy in skin, using real human skin obtained from plastic surgeons from elective procedures as their model. The team decided to use a dead probiotic extract to allay concerns about putting live micro-organisms onto potentially compromised skin, and for ease of formulation.

The company's technology is focussed on cosmetics, preventing healthcare acquired infections, and eczema therapy

They managed to find a particular organism that had "some amazing effects" on the skin model. "This organism enhances the barrier function of the skin. You may not think of the skin as a barrier, but it is in fact a major interface between the body and the outside world, which is quite a dangerous place," said O'Neill. "It stops nasty disease-causing bacteria from sticking to the skin and thus protects against infection whilst also encouraging wound healing."

The study of the human microbiome and its interaction with the skin is in its infancy. However, this has not stopped companies using claims of enhanced microbiome function in skincare products for a number of years. O'Neill speculates that this is purely as a marketing tool.

"There have been very few studies as to the efficacy of whichever bacterium these companies are using, so the products don't actually have any proven probiotic claims. That's why SkinBioTherapeutics is different; we're doing it the right way around."

ALL ITS DATA IS underpinned by robust research published in peer-reviewed scientific publications, a feature that O'Neill remarks is "quite unusual" in the cosmetics industry.

The technology has a number of applications, but the Company is currently focusing on three application types for its technology, SkinBiotix®.

First to market will be the cosmetic, which will be targeted towards sensitive skin. Because the probiotic is so good at inhibiting disease-causing bacteria, or pathogens, it is also useful as an anti-infective agent, particularly in healthcare acquired infections; a particular problem in hospitals. Finally, with eczema therapy, there is room in the market place for a new therapeutic as 20% of the paediatric population in the Western world live with eczema.

"We're committed to taking all three concepts into human studies. Cosmetic products have a lower regulatory threshold, so we can move quite quickly there," said O'Neill. "We have already passed our safety tests and have a human study planned for later in the year. The anti-infective and eczema applications have higher regulatory requirements, so development will take a little longer."

> **"We are very much founded on robust data; it's our USP. Maybe it's my academic brain, but I can only work in that direction"**
>
> Dr Cath O'Neill

Taking SkinBioTherapeutics to an initial public offering (IPO) has taken some of the financial pressure off, allowing it to focus on research, at the same time as raising the Company's profile. It won't be commercialising the technology itself; instead, performing proof of concept studies and then the plan is to partner with larger organisations.

Protecting the intellectual property around its technology is key. SkinBioTherapeutics has been granted three patents, with another 15 at various stages of assessment.

For O'Neill, the experience of a public listing has been enlightening: "It has meant I have had to spend a lot of time in London, but once you are listed, you can tap into that thriving City network. The business ecosystem in the North West is very supportive also, through a great organisation called Bionow."

At her core, however, O'Neill remains a scientist. "Some companies have created a product and are now going back to run clinical studies. We started from absolute grassroots, basic science and are working our way up to human studies. We are very much founded on robust data; it's our USP. Maybe it's my academic brain, but I can only work in that direction."

www.skinbiotherapeutics.com

SCIENTIFIC AND BUSINESS PROGRESS ON TRACK

OCTOBER 2017: SkinBioTherapeutics plc, a life science company focused on skin health, passes third party cellular toxicity tests for its proprietary SkinBiotix® technology, confirming previous in-house observations on its safety and applicability.

APRIL 2018: Company announces the signing of a material transfer agreement (MTA) with a major, global consumer goods company.
"Whilst these are early discussions, we are encouraged that a company of this calibre wants to look at our technology more closely through an MTA," said Dr Cath O'Neill. "Even at this early stage of its development, we are pleased to see that SkinBiotix® is starting to generate a buzz in the skin care industry."

MAY 2018: Design of the human study planned for the third-quarter this year is finalised. It will be conducted independently by Alba Science Limited, a clinical research organisation based in Edinburgh, which has many years of experience in the field of cosmetic testing. In addition, a new method of manufacture that is scalable has been successfully trialled and results indicate no detrimental impact upon the active properties of the SkinBiotix® technology.

The centre's imaginative design includes teaching, learning and collaboration spaces, together with hi-tech laboratories and a state-of-the-art computing suite

Second floor

First floor

Ground floor

On the ground floor a process training laboratory, with small scale bio-reactors, an analytical suite, and a general teaching laboratory. A seminar room and central atrium will facilitate knowledge exchange. The first floor is dedicated to specialist laboratories, and the second floor to microbiology, bio-informatics, molecular biology and bio-chemistry.

New UK asset on the horizon

A £22.3m research, teaching and training facility will drive growth in the bioscience industries

It is less than a year until the completion of the National Horizons Centre (NHC), a major development by Teesside University on Central Park in Darlington, which will address the growth needs of some of the most rapidly expanding UK technology sectors.

Central Park is home to a cluster of nationally important projects, including Teesside University's campus and its Centre for Professional and Executive Development (CPED), the Centre for Process Innovation (CPI), the National Biologics Manufacturing Centre, Darlington College and Grade A offices at Business Central.

The NHC will specialise in providing the full range of skills for the bio industries and in applying digital technologies to improve performance and productivity in advanced manufacturing.

High-value, knowledge intensive processes in biologics and other advanced manufacturing sectors are key to UK growth and competitiveness. Harnessing Teesside University's leading-edge expertise in digital technologies, and its links with the Digital Catapult, will be a key feature of the NHC.

The centre will house academics and business development staff from Teesside University, working in partnership with regional, national and international industry partners, including the CPI and Fujifilm Diosynth Biotechnologies, to provide specialist education and training for the current and future workforce, and to promote industry-focused innovation and research.

"The NHC is a major development, clearly aligned with the Industrial Strategy and the government's investment in bioscience," said Professor Jane Turner OBE, Pro Vice- Chancellorof Teesside University. "We are delighted that the Tees Valley Combined Authority, with support too from the European Regional Development Fund, has enabled this unique opportunity. It puts the Tees Valley and the University firmly at the heart of the bioscience evolution."

"We're really pleased that the NHC will be co-located in the Tees Valley," said Steve Bagshaw, Chief Executive of Fujifilm Diosynth Biotechnologies. "As one of the world's leading biopharmaceutical contract development and manufacturing organisations, the development and training of our people is central to all that we do.

"The NHC on our doorstep will allow us to access best in class training and development opportunities for our staff, and for potential recruits to also accumulate the skills and know how needed to be successful in our day-to-day business."

The centre will work closely with supply chain companies, digital businesses and academics to develop creative digital solutions to industry challenges.

DUE TO BE completed next March and open for business in June, the NHC will have a distinct offer for business. This will include provision of graduate skills in big data, virtual reality and visualisation technology, improving manufacturing efficiency, product quality and training services using ICT solutions, and an open innovation space for project development using data analytics, modelling and simulation, visualisation and process improvement and control.

The centre's imaginative design includes an exciting blend of teaching, learning and collaboration spaces, together with hi-tech laboratories and a state-of-the-art computing suite. Alongside CPI's adjacent National Biologics Manufacturing Centre and the University's CPED, the NHC will be at the heart of an ecosystem of life science excellence.

The investment has been made possible by a £17.5m grant from Tees Valley Combined Authority and over £3.1m of funding received from the 2014-2020 European Regional Development Fund.

It's a key part of Teesside University's ambitious campus masterplan, which will see £300m spent over the next 10 years in transforming its estate to continue to provide an outstanding student and learning experience. The NHC is a nationally significant, purpose-built centre designed to address UK technology sector growth through the provision of world class facilities and equipment.

Regionally and nationally, the NHC is vital. There are low levels of skills, employment, innovation and business growth in the Tees Valley and wider North East. There are skills gaps at all levels countrywide in bioscience, health technology and related sectors. A coordinated approach to skills provision in the biologics and industrial biotechnology sectors is needed.

From a business perspective, there are limited opportunities for research, innovation and education. Similarly, there is a lack of adoption of high-level digital technologies to improve manufacturing performance.

INDUSTRY NEEDS students to develop 'hands-on' and problem-solving skills, to be prepared for GMP (good manufacturing practice) environments, and to gain experience of process equipment. The NHC will provide co-developed short courses and accredited programmes for industry; leadership and management development focused on sector needs and individual business needs; Higher and Degree apprenticeships; and provision for apprenticeship training.

It will address skills shortages in the biosciences, biotechnology, health technology and related sectors by growing the number of technicians, graduates and post-graduates and through continuous professional development for those re-training or in employment. And it will enable growth through industry-led research and innovation.

More than just a building, the NHC will be part of a national research, innovation and skills eco-system. It will be the fulcrum for ideas, strategies, brilliance, foresight and collaboration that will combine to have a profound effect on the bio-economy by training and supplying people for generations to come.

Growing the bio-economy

Teesside University is taking part in a £5m initiative to develop the bio-economy across the Tees Valley, Yorkshire and the Humber region. The THYME project will build on the existing expertise and innovation in the region in a new collaboration between the Universities of Teesside, York and Hull.

The bio-economy uses renewable, biological resources such as plants and wastes to create the greener products of the future - reducing our reliance on fossil resources and minimising waste. It also includes industries using or processing biological materials such as the biopharmaceuticals, food, industrial biotechnology and the chemical and energy sectors.

Teesside University brings expertise in bioprocessing, sustainable technology, environmental protection, artificial intelligence, and machine learning.

Funded by Research England and delivered in partnership with regional industry, Local Enterprise Partnerships (LEPs) and the wider community, THYME (Teesside, Hull and York - Mobilising Bioeconomy Knowledge Exchange) has three key themes:

- Transform: Produce high-value products from bioprocessing and from bio-based wastes and by-products
- Convert: Re-purpose industrial sites for bio-based manufacturing
- Grow: Increase productivity by reducing waste and energy use, adding value to by-products and developing better products using industrial biotechnology.

THYME has been announced just as the National Horizons Centre is taking shape on Darlington's Central Park.

The collaboration with other universities to develop this hugely important sector provides a strong innovation platform for the National Horizons Centre, and will deliver vital skills and knowledge to help grow the regional and national economy.

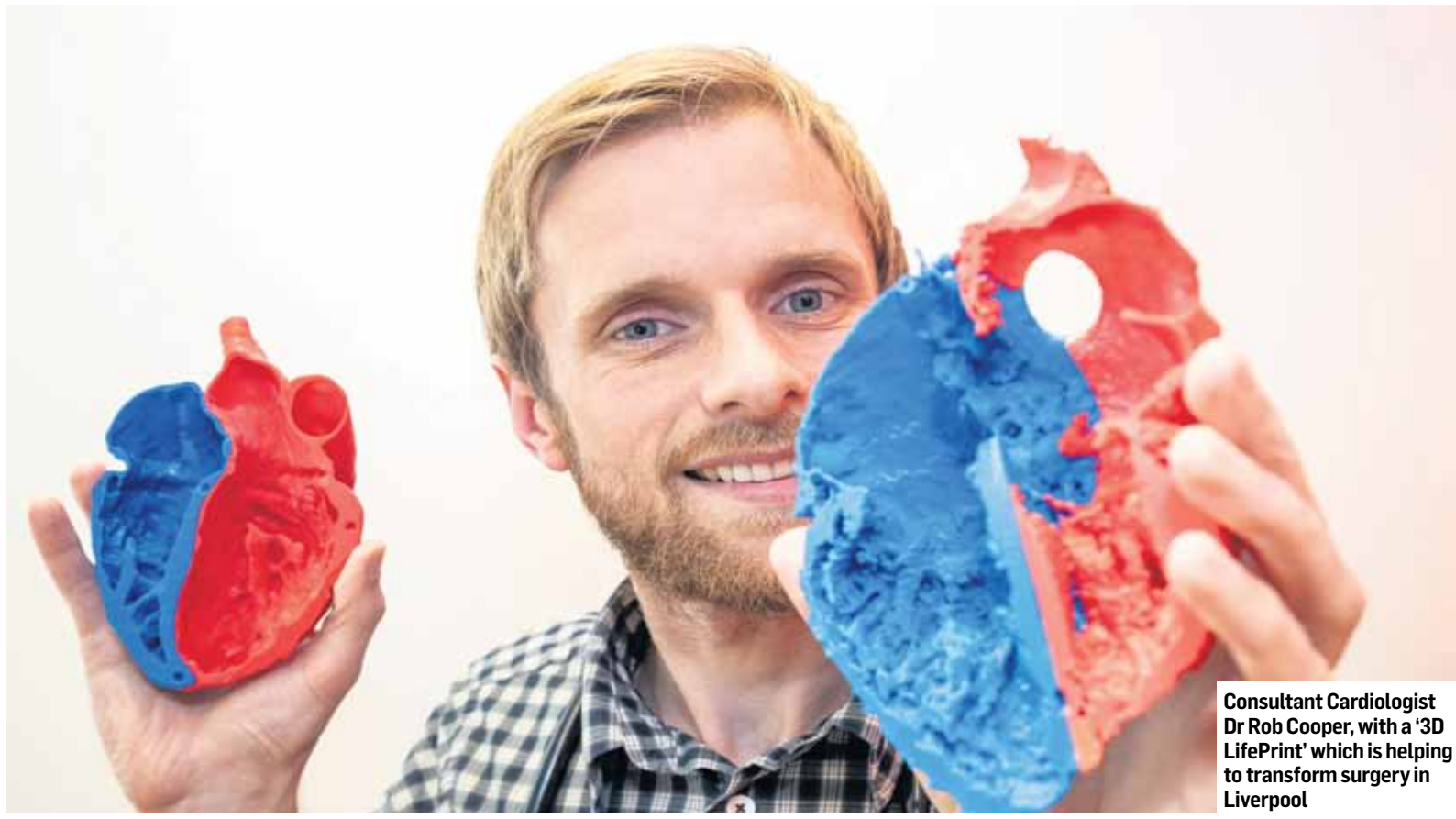
A recent Science and Innovation Audit (SIA) of the bio-economy in the North of England revealed that there are more than 16,000 bio-economy related companies in the North of England, with a total annual turnover of over £91bn, employing around 415,000 people.

The bio-economy is estimated to be worth £220bn GVA in the UK alone, and the Government's industrial strategy is setting ambitious targets to double its size by 2030.

THYME is funded through Research England's multi-million investment in the Connecting Capability Fund which is driving cross-University collaboration and the commercialisation of University research across the country.

Smoothing the way to better health

Agency acts as a bridge between innovative SMEs and the NHS



Consultant Cardiologist Dr Rob Cooper, with a '3D LifePrint' which is helping to transform surgery in Liverpool

Around half a million people in the UK are unaware they are suffering from atrial fibrillation (AF) – the most common form of irregular heart rhythm – which puts 20% of them at risk of dying from a stroke or living the rest of their lives severely disabled.

This means there is a further health time bomb awaiting the NHS who are already spending £2.2 billion annually on stroke survivors left with disabilities and needing treatment. Yet an ongoing initiative across the UK has revealed the optimum way to find the hidden army of potential victims, then subsequently ensuring they receive the correct medication, so dramatically reducing the threat of strokes among the group still most at risk from AF.

This national programme is being driven by the 15 regional Academic Health Science Network (AHSNs) which were set up five years ago to accelerate the spread of innovation in the NHS. Overall the AHSNs have set themselves the objective of identifying 130,000 new cases in the next two years, so preventing more than 4,000 strokes and saving the NHS £81 million in associated costs.

So successful has the outcome been judged that NHS England has recently awarded the AHSNs 6,000 additional pulse testing devices to distribute in their regions. It was the Innovation Agency, the AHSN responsible for the North West Coast, which was one of the first to promote the highly portable heart monitoring devices to detect AF by trialling them in its region – an approach which was quickly adopted by all AHSNs.

WITH A POPULATION of four million people to reach in its vast catchment area, the Innovation Agency has not only been recruiting traditional health professionals such as GPs but also Cheshire Fire and Rescue, housing associations and even individuals as AF Ambassadors to use the portable devices in their campaign to discover those who are suffering from the potentially life-threatening condition.

In the last four years, this has led to the Innovation Agency – which has offices in Daresbury, Liverpool and Preston – to test more than 20,000 people, so identifying 7,000 people at risk and potentially preventing 500 strokes.

The innovative technology used includes a tiny smartphone attachment that works via an app; and a diagnostic baton which also detects problematic heart rhythms, innovative products which provide a more sensitive and specific pulse check rather it being done manually, reducing the necessity for costly and often unnecessary 12-lead ECGs.

Dr Julia Reynolds, Head of Programmes and lead for AF at the Innovation Agency said: "In our region there are around 20,000 people who are unaware they have irregular heart rhythms and of the dangers that this can pose to their health.

"We have highly effective treatments that can prevent these strokes, but early detection is key. Using cost-effective technology, the NHS will now be able to identify people with irregular heart rhythms quickly and easily. This will save lives."

And this is just one of the 90 innovative product led schemes which the agency has spread through the North West coastal region, close to a third of the total of 330 introduced throughout the national AHSN Network.

The Innovation Agency is regarded as a success story within a success story, and that is why the AHSNs have recently had their collective licence extended for a further five years. What the AHSNs have shown to be their USP is in acting as the interface to smooth the way between innovative SMEs working in the health sector and the complex market that is the NHS itself (see panel).

Companies like 3D LifePrints which is transforming surgery in three Liverpool hospitals with its 3D models of patients' body parts, using images from MRI and CT scans which are then printed in a variety of materials which mimic the texture and density of bone and tissue.

THE 3D PRINTED models allow clinicians to better understand the patient's problems pre-surgery, enabling them to perform surgical simulations as well as test the size and placement of any medical devices needed. In addition to improving outcomes, the use of these models can significantly shorten theatre times and so save costs.

3D LifePrints came to the attention of the Innovation Agency due to their presence in the Innovation Hub at the world-famous Alder Hey Children's Hospital, a centre which they part-funded. Since then, the Innovation Agency has been instrumental in 3D LifePrints' expansion to two other major local hospitals through their introductions and by match-funding initial programmes.

Such has been the impact of 3D LifePrints at Alder Hey that consultant surgeon Iain Hennessey, the Clinical Innovation Director, described its potential to revolutionise healthcare as "immense."

Meanwhile, the Innovation Agency's interest in spreading the innovation word has not been confined to disruptive technologies such as 3D printing but has also embraced the potential impact of the now everyday phone app.

This has seen the agency throw its not inconsiderable weight behind health app specialist Dave Burrows and the work his team at Damibu had done in Cheshire to reduce the number of children under five being taken to hospital A & Es unnecessarily by panic-stricken parents.

Known as Catch (Common Approach to Children's Health), it provides concerned parents with NHS approved information, so they become aware of when their child needs medical treatment or when self-care would be more appropriate. A follow up study showed that the number of 0 to 5-year olds discharged from the same A & E with nothing but basic information and advice over a four-month period after the app was launched was 538,155 fewer than the same period the previous year.

NOW, FOLLOWING this success, the Innovation Agency has continued in its mission to spread the innovation benefits by promoting the app along its North West coast region and nationally through the national AHSN Network. Dave Burrows has also been named as an NHS Innovation Fellow, a significant honour in recognition of the app's potential, which is part of the NHS Innovation Accelerator programme.

The momentum behind the Innovation's Agency's flagship AF campaign continues unabated, with its recruitment programme being extended deep into the community it serves. Kim Hughes, a mother of two who suffered a stroke at the age of 33, has recently joined the growing ranks of AF Ambassadors. "It's not easy getting over a stroke, so if I can help to prevent just one person having one, then it's worth it every time," she says of her new role.

Lorna Green, Chief Operating Officer

About the Innovation Agency

The Innovation Agency, like the other AHSNs across the UK, is managed mainly by NHS professionals and staff from associated industries which means they are not only able to open the correct door to the vast NHS market and its silo style budgets but also enable companies to understand what is expected of them on the other side.

Lorna Green, the Chief Operating Officer at the Innovation Agency, spent five years with the NHS before working in a variety of roles within industry providing both help and finance for innovative SMEs seeking to do business with her former employers.

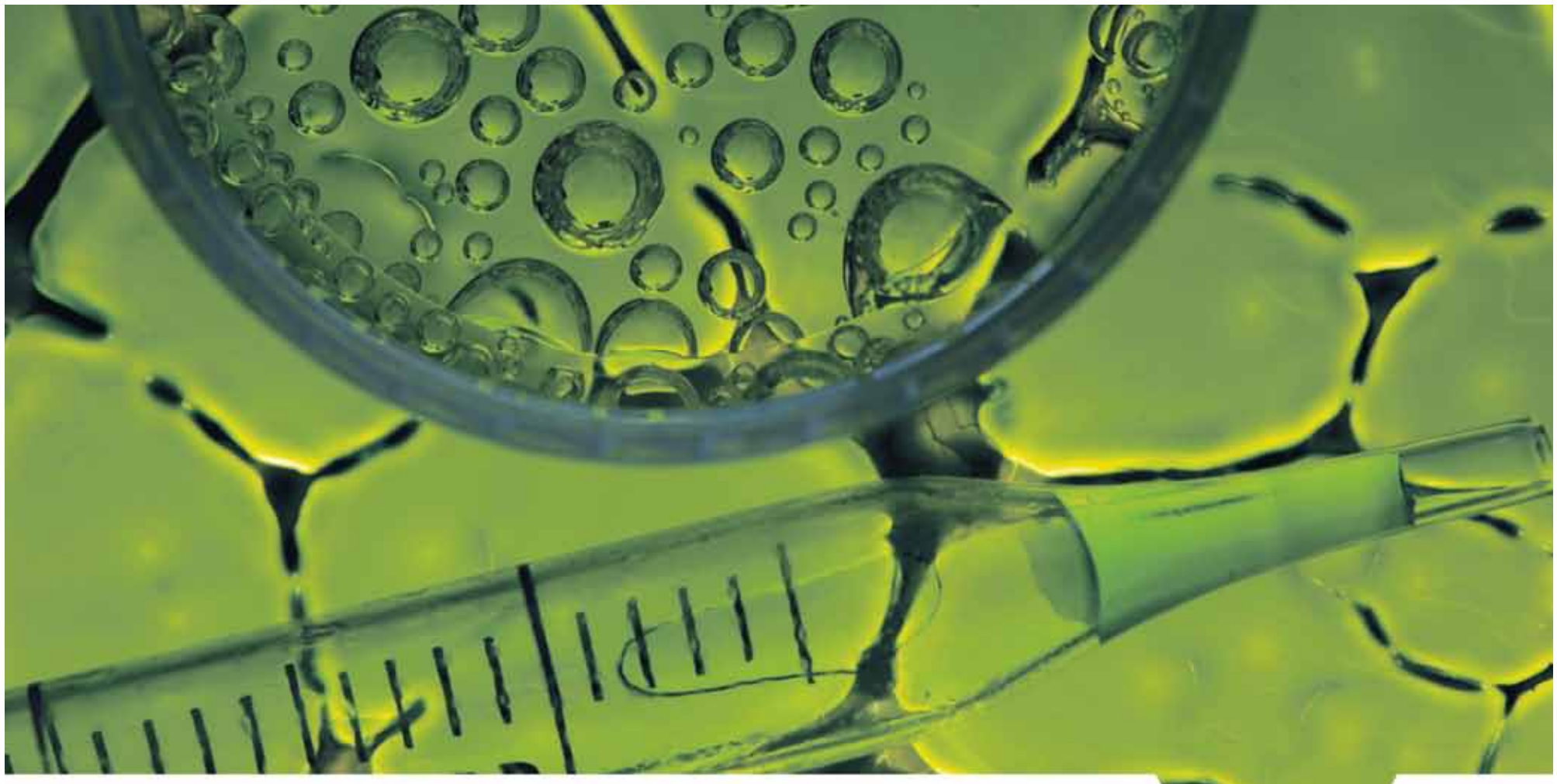
She has an in-depth understanding of the needs of both the NHS and the innovative health companies attempting to break into what is a huge but cash starved marketplace where patient care is paramount. It has become a key role of the agency to evaluate the innovations in order to match their potential to the unique requirements of the NHS.

"The NHS is more receptive since we came on board because we act in a neutral broker role," says Lorna Green. "It is not a case of someone selling them some something. We understand it is about matching needs and solutions, the NHS doesn't know what is out there, they don't have the time to research, so we bring the opportunities to them.

"We have won the latest BioNow award for supporting businesses and have just had our licence renewed for five years. We've also been given extra funding from the Office for Life Sciences to deliver Innovation Exchanges, which means all the AHSNs working together more closely than ever to spread great innovations. That in itself is a vote of confidence, proving we are making a difference."

The Innovation Agency is hosting an event within Liverpool's International Business Festival today (26 June). 'Transforming healthcare - everybody's business' will explore national and international collaborations and opportunities for businesses in health and care.

www.innovationagencynwc.nhs.uk



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