

# SUPER NORTH

THE LIFE SCIENCES EDITION

## Dr Holmes leads early detection

...of osteoporosis

Fighting to fund  
the life sciences

Science alliance  
aids life balance

In association with

**Deloitte.**

**bionow.**



In the front line: Dr Anthony Holmes, battling against the brittle bone disease: page 2



# The challengers

The North of England, it seems, was recognised as a potential powerhouse in life sciences long before George Osborne devised his plan to rebalance the UK economy by offering the often-overlooked region what appears to be a good commercial deal.

With more than 1,000 Northern life sciences companies, the sector is now challenging the dominance of what has long been known as the “golden triangle” of Oxford, Cambridge and London.

In this issue of Super North, we look at the organisation that is emerging as the voice of the region’s life sciences business sector – Bionow – along with its member companies, whose innovations are giving us a better quality of life with breakthroughs such as early detection of osteoporosis and relief of post-operative pain.

We also check out the Northern Health Science Alliance (NHSA), a group ensuring that the medical breakthroughs being achieved will reach patients in the shortest possible timescale.

Finally, we move to the North East to report on Newcastle Academic Health Partners, whose work currently involves stimulating co-operation between life sciences businesses and the local university and NHS Trusts to achieve breakthroughs in areas such as psoriasis and chronic fatigue.

Also in the North East, we examine the groundbreaking work that Northumbria University is achieving in provision of a healthy diet and helping throat cancer victims to eat after successful treatment. It appears, then, that the North is not only set to get wealthier, but healthier too.

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## Bionow Awards

# And the winner is... the people’s health

Medical breakthroughs win deserved recognition for three top Northern firms, reports **Mike Cowley**

It remains to be seen, but history may judge that the work being carried out in the booming life sciences sector in the North of England will eventually eclipse even the region’s contribution to the Industrial Revolution, due to its impact on something critical to all of us: our health.

A method of early detection for the potential killer osteoporosis, less painful post-operative recovery and a way of repairing chronic wounds such as serious leg ulcers in the elderly – these were just three of the medical breakthroughs from Northern companies singled out for commendation in 2015.

Each of these medical advances was judged outstanding as part of the annual awards from Bionow, the key regional umbrella membership organisation which is helping the Northern sector to write a new and healthier chapter at a time when austerity appears to threaten even the NHS.

All of this is happening in the context of what has become an increasingly vicious circle, namely that as we prolong life, so the need for treatments increases exponentially in line with the demands of an ever-ageing population – a situation known in health circles as the silver tsunami.

Dr Anthony Holmes of Cheadle Hulme-based Optasia Medical is



In the front line: Dr Anthony Holmes

well aware of this, as he finds himself in the front line in the battle against osteoporosis, a bone disease which is treatable if caught early enough but which can, if not, lead to broken thighs and an early death or significant reduction in quality of life for the elderly. In statistical terms, 10 per cent of patients die in hospital after their hip repair, 20 per cent

die within a year and up to half are unable to walk independently afterwards.

In collaboration with the University of Manchester and the Central Manchester NHS Foundation Trust, the specialist imaging company of which Dr Holmes is chief executive has developed a system which potentially offers mass early detection for a disease that will affect half of women and one in five men over the age of 50 in the UK. (It is worth noting that men tend to think of osteoporosis as a woman’s disease.)

In fact, one in 12 of all women over the age of 50 have osteoporosis without being aware of it. Once discovered, patients can be offered low-cost treatments which will reduce risk by between 50 and 70 per cent, thus lowering the number of future costly fractures.

Simple wrist fractures in older people can suggest osteoporosis, but hard-pressed NHS staff have little or no time to investigate underlying conditions. It has been estimated that, worldwide, approximately 80 per cent of osteoporosis patients are never assessed for the disease, hence missing the opportunity for it to be managed.

Optasia won the Bionow healthcare project of the year award for coming up with a detection method to identify and analyse vertebral fragility fractures of the spine – the most common form of osteoporosis and one which tends to go unnoticed because there is often no pain involved.

The fractures can be seen in specialist DEXA (dual energy x-ray absorptiometry) bone scans used to diagnose osteoporosis, but the signs are also there in thousands of x-rays and CT (computerised tomography) scans requested each year from radiographers for a range of other conditions where the spine is also in the image.

Building on its existing work in DEXA scans, Optasia has developed a software system which uses computer algorithms to monitor a hospital’s database of relevant images for anything suspicious.

After completing development, Optasia will apply for regulatory clearance for the system to be used in hospitals. “It was actually the idea of offering the software as part of a service to hospitals that won us the award,” says Dr Holmes, “in that radiographers are simply too busy to pull up another piece of software – plus the fact it can be done anonymously. Once we have that, then it will be a game-changer.”

Another potential game-changer – this time in terms of significantly reducing post-operative pain – comes from Winsford-based Advanced Medical Solutions (AMS), manufacturer of world-leading wound care and wound closure products.

The company won the Bionow product of the year award with a device for hernia repair, an operation that involves areas known to surgeons as the “triangle of

doom” and the “triangle of pain”, names that give a clear indication of what some patients might expect following the repair. There is also significant potential for the device to be used in areas such as orthopaedics and gynaecology.

What it offers is a replacement for the staples and tacks traditionally used to hold surgical mesh in place, instead attaching it directly to the sensitive areas where nerves can be found by using non-toxic superglue. Although such glue has been around for a couple of decades, it is the delivery method developed by AMS which has achieved the breakthrough.

Surgical superglue, like its better-known commercial cousin, can stick anything together and is therefore potentially dangerous when used internally. However, AMS has developed a formulation of glue and a surgical instrument which enables the surgeon to safely spot-weld using dabs of glue during keyhole surgery.

“That last thing surgeons want is sticking the wrong parts together,” says



Giving surgeons control: Chris Meredith

Chris Meredith, the AMS chief executive. “Ours is the first device to give surgeons complete precision and control, thereby avoiding the much higher-risk practice of drawing glue up into a syringe and injecting it down a tube.” All this is a long way from the time when industrial glue was used to close wounds, often with disastrous results along the lines of an episode of M\*A\*S\*H.

Launched in Europe in January 2015, the AMS Liquiband Fix8 has already been used in 5,000 surgical procedures. Mr Meredith and his team are now planning to make progress in the US, which has the potential to at least double the company’s market for the product. This is likely to take three years and several million dollars, as it requires Food and Drug Administration (FDA) approval for what will be a unique product.

Another significant breakthrough – this time in relation to repairing complex chronic wounds such as leg ulcers in the elderly – saw York-based Neotherix named as Bionow project of the year. Neotherix is a regenerative medicine company working

as part of a consortium of five partners, and its RegeniTherix Wound Theranostic System involves building a polymer scaffold over a wound to enable the healing process.

Ordinarily, wounds heal from the outside edges inwards – but polymer structures made up of components less than one-hundredth of the thickness of a human hair can be used to support the migration of cells making collagen and elastin, which then combine to make healthy tissue across the full area of the wound.

Seen as an alternative to skin grafts and expensive specialised products, the ability of the RegeniTherix scaffolds to improve the healing process will prove a major boon to the NHS which is struggling to cope with an increase in diabetic foot ulcers and leg ulcers in an ageing population. Dealing with these and other wounds currently costs the NHS in excess of £5 billion, around 3 per cent of its total budget.

Not only do the scaffolds aid the healing process, but the cosmetic result is also much improved, an important factor for patients after the excision of skin cancers from the face and neck (in this case via



Another milestone: Dr Mike Raxworthy

another Neotherix product, EktoTherix). The scaffolds themselves dissolve after their human reconstruction work is complete, so there is no need for removal.

Having won the Bionow project of the year award, RegeniTherix is due to go into a clinical trial involving diabetic foot ulcers shortly. This will be another milestone in the career of Dr Mike Raxworthy,



All together now: Winners celebrate at Bionow awards ceremony

chief executive of Neotherix, who has spent almost three decades in the chronic-wound field, starting with skin grafts for burns victims. It is also a continuation of his work at Smith & Nephew in York, from where he spun out his current venture.

Overall, it has taken a decade to reach the clinical trial stage – not unusual for a life sciences company developing medical treatments – but Dr Raxworthy would have liked this to have been achieved earlier in order to help his 85-year-old father who has had a number of skin cancers removed and so would have been an ideal patient for the system.

The chief executives of all three of these award-winning companies readily admit that their membership of Bionow has helped smooth the path to where they are today, as the life sciences membership organisation has been instrumental in developing an ecosystem in the North which is helping companies compete with their better-known peers in the “golden triangle” of Oxford, Cambridge and London.

The most successful parts of this ecosystem were also recognised in the Bionow presentations – now in their fourteenth year – with ten awards being sponsored, respectively, by Waters Corporation, North West



None of these success stories could have been achieved without the new breed of Northern life sciences people

Coast Academic Health Science Network, NHS Trustech, Cheshire East Council, the Royal Society of Medicine, Seqirus, Sci-Tech Daresbury, QIAGEN Manchester, UL EduNeering and AstraZeneca.

The increasingly important BioHub at Alderley Park, which itself provides an ecosystem of innovation, incubation and business support for small and medium-sized enterprises (SMEs) in the life sciences sector, won the business services award. In just over two years, the BioHub has supported 147 companies and 475 employees at the Cheshire site, where the Bio-Entrepreneur Boot Camp programme increases the chances of survival and success for start-ups.

Support for the sector in the North has also been increased with investment in Manchester by Intertek Pharmaceutical Services, considered of such significance that it picked up the Bionow technical service of the year award. The new facility will deliver world-class scientific services to support the growing pipeline of biologic medicines being developed globally. Intertek’s new Centre of Excellence for Biologics is a facility of national importance and supports the growth of the North as a significant region for UK scientific innovation.

The Northern ecosystem is creating a successful new wave of start-ups – and one

of these, ChiroChem Ltd, won the Bionow start-up of the year award. The Liverpool-based company has licensed a process that enables the commercial production of chemicals which serve as building blocks in discovering and producing new drugs, with the first 40 products having already appeared.

Not that such success is simply the domain of start-ups, however. Well-established Cyprotex won the Bionow company of the year award, having successfully expanded into the US courtesy of its method of understanding drug toxicity and how a drug substance is absorbed, distributed, metabolised and excreted. Cyprotex has its headquarters in Macclesfield, but operates laboratories in Watertown, Massachusetts and Kalamazoo, Michigan.

The raising of funds – critical to any sector – has benefited from the increasingly high profile of the North thanks to Bionow, and this was reflected in two companies sharing the investment deal of the year award. Sky Medical Technology completed a £3 million equity investment from a Japanese multinational which will market and distribute its products.

Redx Pharma plc shared the award after having been admitted to the Alternative Investment Market (AIM) of the London Stock Exchange. The deal resulted in a £15m initial public offering (IPO) fund-raise at a market capitalisation of £55.2m, and in just five years Redx has created 170 jobs across the North West, establishing a portfolio of 13 proprietary, patent-protected drug programs.

None of these success stories could have been achieved without the new breed of Northern life sciences people. Of these, Dr David Brough – a lecturer at the University of Manchester and an inventor and innovator – was singled out in the Bionow awards as the most promising technologist. Dr Brough has spent seven years leading a research programme to uncover the biological mechanisms that control the inflammatory response and its implication in diseases as wide-ranging as psoriasis, stroke and Alzheimer’s.

Overall, therefore, the future success of the life sciences sector in the North – and its role in the Northern powerhouse – seems to be in good hands.

# He’s ‘creating jobs and passing on the knowledge’

The life sciences sector is often regarded as a new part of the Northern economy, whereas in reality its roots run deep with pharmaceutical companies having emerged from the long-established chemicals sector – and it has produced at least one outstanding pioneer in the form of Dr Peter Jackson, who has held senior positions with ICI, Zeneca and Avevia.

ICI first entered the field with a pharmaceuticals division at Alderley Park in the late 1950s, then transferred into Zeneca when it was spun off and went on to become AstraZeneca – which made the North a force to be reckoned with in the field.

Since then, Dr Jackson has been instrumental in helping to build what is now regarded as the Bionow cluster in the North, an achievement duly recognised when he won the membership organisation’s

outstanding contribution award late last year.

When asked what motivates him, Dr Jackson says simply: “Creating jobs and passing on the knowledge”, and it is a well-based claim, given that he has created more than 200 highly skilled scientific jobs over the past 15 years.

Working with investor groups, high-net-worth individuals, institutional investors and Government inward investment agencies, Dr Jackson has been responsible for the launch of some of the most innovative small and medium-sized enterprises (SMEs) within the Northern cluster, having championed Reaxa (2005), Bradford Pharma (2007) – which became Redx Pharma in 2010 – ADC Biotechnology (2010) and YProTech (2011).

The eventual Redx Pharma started with two scientists in a laboratory in



Facing up to funding: Dr Peter Jackson

Liverpool and went on to raise £27 million in equity funding, creating more than 170 jobs in the cancer and infection research divisions in

Liverpool and at Alderley Park, culminating in a successful flotation on the Alternative Investment Market.

Most of those hired were in their first jobs after leaving university, and this marked a transformation from when Dr Jackson first arrived on the scene. Graduates were now joining innovative SMEs in the Northern cluster rather than feeling they had to head for corporate giants such as AstraZeneca or relocate to the “golden triangle” of Cambridge, Oxford and London.

As someone who has launched a clutch of successful SMEs in the North, Dr Jackson believes that a “regional grant mentality” may be handicapping the ambition of many potential start-ups. He sees this in part as a hangover from the 2007-08 crash, when the only money available to the sector came in the form of grants.

He is also convinced that funding for life sciences projects could be transformed if the Government extended its tax relief for high-net-worth individuals to more of a retail offering which could sit alongside ISAs.

Dr Jackson argues that the sector in the North needs to look increasingly to the private sector for funds, “as there is a wealth of money out there which could be leveraged”. Despite constrained public funds, however, he is convinced that the Government “is listening to and values the sector”, as shown by its treatment in the recent Spending Review.

“We have now got an industry voice that stretches from North Wales to Newcastle and which can articulate our needs,” Dr Jackson says – confirming that this noted player in the Northern life sciences sector believes firmly that recent progress and success is due, at least in part, to Bionow.



# North's formidable line-up challenges the golden triangle

But funding is vital to help 500 companies prevail, say the sector's leading figures. Mike Cowley reports

As with the Northern powerhouse in which it is poised to play a key role, the booming life sciences sector in the North of England has need of a strong voice to represent the interests of the increasingly diverse range of companies to be found within the region.

The North today has a formidable line-up of approximately 500 life sciences companies, or 1,000 if you add in the supply chain. Numerically at least this makes it bigger than Cambridge – which has around 300 such companies – and on a par with Oxford and Cambridge combined. It even compares favourably with Basel at 320 and Munich at 370, and is on equal terms with pace-setter Singapore at 500.

Only the US is much bigger in terms of life sciences, but even in that comparison the North of England is far from insignificant, be it in terms of size or big-name players.

The much-needed voice of the Northern sector on the national and international stage is increasingly seen as being Bionow, the membership organisation that best reflects the rich diversity of the sector and represents a true cross-section of life



Opportunity: Bionow's Dr Geoff Davison

Liverpool, Manchester, Newcastle and Sunderland – and as a strategic partner in United Life Sciences, the UK-wide body – Bionow has become a key lobbyist in the North. It helps to ensure, for example, investment in what are known as Precision Medical Catapult centres of excellence in both Manchester and Leeds.

Bionow and its partners are eyeing-up the £400 million Northern powerhouse fund as a potential pot for small life sciences businesses in the North. Of this, £50m relates to antimicrobial research, with £4m already allocated to establish an Antimicrobial Resistance Centre of Excellence in Research and Development at Alderley Park in Cheshire.

Bionow has also hosted a series of high-profile sector events which have attracted 1,500 delegates from across the region, in-

Also, working through United Life Sciences, Bionow was behind a recent appeal to the Chancellor, George Osborne, which saw 200 signatories to a letter published in the *Financial Times*, making the UK's case for helping life sciences companies in the spending review.

Little wonder, then, that Bionow membership has grown to 270, and that the organisation is increasingly regarded as an integral part of the Northern powerhouse initiative. Indeed, this was the message that came out loud and clear from a specially convened Super North Forum on life sciences – itself an event held in association with Bionow – which attracted the largest-ever turnout in the ongoing series of high-profile business platforms for the North.

The Forum saw delegates call on Bionow to further establish itself as the lead voice of the Northern sector, in order to deliver the message of what was happening in life sciences in the region. Typical of these calls was that from Dr Neil Murray, chief executive of multiple award-winning drug development company Redx Pharma. "It is all about getting the message out," Dr Murray said. "There are lessons we can learn globally. If you go to Boston, the voice is huge and everyone in the sector buys in and really pushes the message of why you should be doing business with them."

"You've got the same for all the big clusters in the US. Here in the UK there is no space in Cambridge any more, so companies should be looking at the North." Mr Murray then turned to Dr Geoff Davison, the Bionow chief executive. "I think this is your job," he said.

The Forum – hosted by Deloitte in its Manchester offices – was chaired by Alasdair Nimmo of Super North, and he had opened proceedings by asking what the sector needed. At this, inevitably, the subject turned to money – or rather the lack of it.

It was Dr Murray who took the lead. "In the UK funding really is the issue," he said, "in that we don't have the luxury of the US where they can go and raise £20m or £30m and properly capitalise the business. We have to get away from the mentality that we should be drip-feeding funding into early-stage companies and then being surprised when they fail due to a lack of capital."

He went on to point out that the idea of giving a company £100,000 to write a business plan in the hope of getting another £500,000 – as happens now – "is something which holds back the sector not just in the North but across the UK".



Dr Davison agreed that while funding remained the primary issue for small to medium-sized enterprises (SMEs), "it is probably not the bigger companies' number one requirement".

Jane Theaker, who represents QIAGEN – a global company with a large facility in Manchester – also saw this as being the case. "The bigger need for the bigger company is science infrastructure," she said. "The ability to grow a business is reliant on finding excellent staff, and this is often a limiting factor. Then, of course, other sorts of services become important, such as expertise in tax and transport."

Dr Fiona Marston, chief executive of one of the smaller companies on the panel, Absynth Biologics, noted that the infrastructure requirement was not just limited to the big firms. "These are our issues as well," she said, "in particular staff recruitment. When you are at an early stage you need good laboratories that actually offer something, and you need reasonable access to equipment, facilities and staff."

From the North East point of view, Dr Emma Banks of Datatrial said it was the retention of highly skilled people which was the main issue in her region. "Even though we've got four amazing universities and we do get incredible graduates, our problem lies in retaining them," she said. "Keeping people in the North East and not having them head down south is our mission."

Dr Sam Whitehouse, chief operating officer of the QuantuMDx group, argued that the answer to the skills shortage in the North East lay in a wider recruitment net rather than in hoping to recruit locally. "Bringing people in is a lot easier," he said.

He also took issue with the claim that there was not enough investment for the sector. "It is very easy to sit here and say there isn't enough investment available. There

needs to be an international focus when it comes to fundraising."

Paul Maddison of Deloitte also saw financial benefits in looking abroad, particularly when marketing the North to the US. "There are a lot of opportunities around San Francisco, Chicago and Boston," he told the Forum. "At Deloitte, we are well aware of the potential for attracting investment from the US, especially at the moment with the strong dollar."

Dr Stephen Little, chief executive of Premaitha Health, then took a contrary view of the traditional areas of funding, stating his preference for tax credits over large injections of capital. "If I was given the choice between an extra £100m or an extra 5 per cent tax credit," he said, "I'd take the tax every time because I'd know exactly what to do with it."

It fell to Dr Davison to counter the popular notion that it was easier to raise money in the "golden triangle" of Cambridge, Oxford and London than it was in the North. "I think there is a perception," he said, "that all those dinners going on down there end up with people going to the Government and getting millions of pounds, but that's not what people in Cambridge and Oxford tell us – they say it's the same all over."

Neil Murray also took up the perception theme. "When people talk about the 'golden triangle'," he said, "they regard it as the cradle of life sciences, everything that is good about biotech in the UK. When people talk about biotech in the rest of the UK – apart from certain standout companies – it is in the context of disaster. You are always on the back foot trying to get across the story of the North being an exciting prospect."

There was agreement from John Nicholson, chairman and chief executive of Genentech. "If people from the US were going to set up in Europe," he said, "their initial reaction would be to set up somewhere

in the 'golden triangle'. That's why it is key to get the message out about what is happening in the North."

Dr Peter Simpson, director of the N8 Research Partnership, added that if the North wished to be a serious player then "it needs to work together more than Oxford needs to work with Cambridge, because the situation is different. It is about the North having the confidence to do something different."

The need for collaboration across the North was another theme running through the Forum, although it was tempered by references to continuing problems of "localism", with competition between Manchester and Liverpool being cited as the prime example.

The only dissenter in terms of the need for collaboration was Dr Little. "I don't think collaboration counts," he said. "I simply want a lot of businesses like mine so they can nick me or I can lure their staff. One of the problems is that there just isn't enough opportunity at the moment to do this."

Collaboration generally being seen as the way forward brought the discussion back to the need for a strong central voice as a means of letting the world know what is happening in life sciences in the North. The bottom-line problem – as reiterated by the panellists – was lack of publicity, as this limited the opportunities to promote the region.

"We need good promotion and good PR," Fiona Marston said. Addressing Geoff Davison, she added: "and because you represent so many of us, this [Bionow] is a good place to start."

The last word thus went to the man from the organisation on which the panellists appeared to be pinning many of their hopes. "We manufacture the majority of the UK's pharmaceutical products," Dr Davison said. "We've got the businesses, we've got the big names, and we've got a real opportunity."

## Who was who, speaking out on the future

**Pictured, from left to right:**  
 ■ John Nicholson – chairman and chief executive, Genentech Ltd, testing for genotoxicity in drugs and other chemicals across a wide range of chemistry-driven industries; also a non-executive director of the North West Fund.  
 ■ Dr Mike Raxworthy – chief executive, Neotherix, a York-based company developing products for soft tissue repair.  
 ■ Dr Geoff Davison – chief executive, Bionow, the umbrella membership organisation for the life sciences sector in the North.  
 ■ Jane Theaker – associate director, head of IVD (in vitro diagnostic) technology at QIAGEN

Manchester, manufacturer of diagnostic products and infectious disease products.  
 ■ Dr Neil Murray – chief executive, Redx Pharma plc, a drug development company active in cancer, infectious disease and immunology.  
 ■ Alasdair Nimmo, Super North, in the chair.  
 ■ Dr Peter Simpson – director, N8 Research Partnership, a collaboration of eight intensive-research universities in the North of England.  
 ■ Dr Stephen Little – chief executive, Premaitha Health plc, which has developed a non-invasive prenatal screening test.

■ Dr Emma Banks – chief executive, Datatrial Ltd, a boutique clinical data operation which helps to turn new ideas into commercial success.  
 ■ Dr Fiona Marston – chief executive, Absynth Biologics, a development company working on vaccines to prevent infections including MRSA.  
 ■ Dr Sam Whitehouse – chief operating officer, QuantuMDx, a world leader in hand-held medical diagnostic tools.  
 ■ Paul Maddison – director, Deloitte financial and advisory team, working on mergers and acquisitions in healthcare and in the life sciences sector.

## 'Completely different' view of support flow

The controversial issue of the change of approach by the Government agency Innovate UK, previously a primary investment source for leading life sciences companies, became a significant issue during the Forum discussion. The austerity drive has meant that Innovate UK is likely to become a source of loans or "non-grant products", rather than a grant provider.

"The Government doesn't really understand the issue of funding round the life sciences sector," said Dr Emma Banks of Datatrial, "and that's been highlighted by the fact that they are pushing for Innovate UK to provide loans, not grants."

"This will turn Innovate UK into an investment group and not a body as it is at the moment. Innovate UK has been very successful for us, so it's a scary time."

Dr Fiona Marston of Absynth Biologics suggested that although the Government once seemed to understand life sciences, "if this is the way they are going then we've lost that at the moment". She continued: "There's a short amount of time for us to lobby about this, but as the North, we need to be actively lobbying."

Dr Mike Raxworthy of Neotherix believed, however, that there was a glimmer of hope, as the result of the Government's Spending Review was better than he had anticipated. "I was with the Innovate UK people last month," he said, "and they weren't even sure they would exist after the Spending Review. They exist



Dr Fiona Marston: Time running short for more active lobbying



Jane Theaker: Focus on staff factor

had £2 million from Innovate UK."

Dr Peter Simpson of the N8 Research Partnership entered the debate by saying he saw this as an opportunity for the sector to make sure its needs were included in the bids. "These bids will be led by Local Enterprise Partnerships," he said, "so those from the North should reflect what we want the Government to know about the strengths of life sciences in the region."

It was left to Dr Geoff Davison of Bionow to wrap up discussion of the potential impact of changes at Innovate UK. "A grant is an asset you can leverage," he said, "and that is versus a loan which looks like a liability. It's a completely different way of doing things, one which is going to be difficult for businesses in this sector to deal with."



Attracting skilled people: Dr Emma Banks and Dr Sam Whitehouse discuss

sciences companies, from start-ups to the well-established corporate high-fliers.

Working ever closer with its university sponsors – Durham, Lancaster, Leeds,

cluding the BioCap conference and investor dinner which saw the launch of the £45m Greater Manchester and Cheshire Life Sciences Fund.

“We have to get away from the idea that we should be drip-feeding funding into early-stage companies



# When less-than-good health gets in the way of your path to wealth

Enter, the North East Local Enterprise Partnership (LEP) working on an innovative project to turn that challenge into a business opportunity, reports **Gordon Arnott**

“There’s nothing more important than our good health – that’s our principal capital asset” – words spoken by the late US presidential candidate and healthcare reformer Senator Arlen Specter in relation to the world’s biggest economy, but equally applicable to the North East of England.

Healthcare professionals, economists and public policy officials agree that a healthy workforce drives economic growth and social wellbeing. The North East is a developing economy looking to seize all the opportunities that innovation presents to business, but the current high levels of poor health outcomes and economic inactivity due to ill health form a barrier to greater wealth creation and prosperity. This is something which the region needs to address.

The North East has the highest rate of economic inactivity in England. Between July 2014 and June 2015, 25.3 per cent of the working age population of the region was economically inactive, with over a quarter of that inactivity being due to ill health.

The regional unemployment rate remains the highest in the UK at 7.9 per cent, while life expectancy is lower than the English average: men and women in the North East typically live over a year less than the national average of 79.4 years and 83.1 years respectively.

The region’s premature mortality rate – the loss of lives for reasons considered preventable – stands at 224.9 per 100,000 of the population, compared to the English average of 182.7. There have been many policies and programmes over the years aimed at improving health and social progress in the region, with varying degrees of success.

The North East Local Enterprise Partnership (LEP) is working with partners to develop an innovative project that will turn these health issues into a business opportunity – capturing the best new ideas and innovations to tackle health outcomes, with a positive impact on the local economy.

Organisations from all sectors will be encouraged to pitch innovative ideas to tackle these issues as part of a Health



On your bike: It’s time to adopt a new lifestyle, says Dr Arnab Basu



“Our aim is to create a healthier, happier and more productive population to re-energise the economy

Grand Challenge. The challenge will seek bright new ways to generate healthier outcomes in the population, aiming to support some of those who are out of work through ill health back into employment and those with a health condition to stay in work.

The North East has a world-class business, medical and academic base on its doorstep from which to lead the fight against health inequalities. The region already pioneers drug discovery, supplies research tools and produces speciality chemicals alongside cutting-edge academic discoveries into age-related diseases and debilitating genetic conditions.

The Health Grand Challenge looks to continue and expand these opportunities, and proposals will be sought from companies across the innovation spectrum to tackle three themes that encompass the health challenges of the North East:

- Giving children and young people the best start in life.
- Ensuring that the working age population is as healthy and productive as possible, supporting people to manage long-term conditions and to stay in work or return to work.
- Improving longevity and increased years of good health for older people.

Acclaimed entrepreneur Dr Arnab Basu, chief executive of Kromek, a County Durham-based developer of radiation detection solutions for medical, nuclear and security screening, is chairing a steering group to drive the challenge forward. “The impact that the population’s poor health has on the North East economy cannot be overestimated,” he says. “It reduces the number of active workers required to drive the economic growth of the area.

“Health is an extremely pressing problem to deal with in terms of the regional economy. Our Health Grand Challenge hopes to target these health and

social challenges by providing innovative solutions that reduce the region’s drivers to poor health.”

The North East LEP has developed one of the most comprehensive, imaginative and impressive innovation programmes in the UK, with the aim of becoming a European innovation hotspot. “Ultimately, the Health Grand Challenge will harness processes of redesign, technological and social innovation to tackle the key barriers to good health that currently exist for the population of the North East and provide new business opportunities,” Dr Basu says.

“Creating a healthy and more productive workforce is immensely important for businesses to grow and thrive in our region. Any organisation from any sector that has an innovative idea to address our defined health issues will be able to pitch to be part of the challenge.

“Our aim is to create a happier, healthier and more productive population, re-energising the North East economy by helping to achieve the primary North East LEP objective of creating more and better jobs. This is in line with our aspiration to stimulate and enable new products, processes and applications to come to market as detailed in our strategic economic plan.”

The LEP is exploring a number of funding options to deliver the Health Grand Challenge, and hopes to launch a pilot challenge in the summer. “Health is a key driver of economic growth but can often be seen as a separate issue,” says North East LEP economist Fiona Thom. “However, improving our health outcomes and inequalities is fundamental to the prosperity and sustainability of the North East.

“A healthier population means a healthier supply of innovative, productive workers with benefits for businesses in terms of increased productivity, and benefits for wider society in terms of improved wellbeing. The healthier you are, generally the more productive you are at work, and most work is good for your mental and physical health.

“The main focus of the challenge will be to generate innovative ideas which will target the social health barriers to work, inequalities and worklessness in the region, and support people to manage their own and their family’s health on a day-to-day basis.”

The high levels of economic inactivity in the North East are partly due to the heavy industrial past which left some people too ill to work. Other socioeconomic factors such as high levels of deprivation and generations of households without work are also acknowledged as playing their part.

“The Health Grand Challenge is one of the beacon projects for the North East LEP,” says Hans Möller, the LEP’s innovation director. “It could make a real difference in terms of finding new solutions to one of the challenges we have, which is health.

“Opportunities will be available to business to develop solutions in collaboration with the public and with the voluntary sector. New and radical ways of dealing with our health issues are needed to create a better quality of life for people and to create great jobs within those successful companies.

“We could see these innovative products or services in place in five to ten years from now. I would see success as having picked the right health challenge, finding the solutions to address that and thereby creating business opportunities for people in the region and potentially beyond.”

# Partnership’s aim is seamless delivery of medical excellence

Newcastle collaborators on target for world-class health care, says **Michael Cape**



Changing: Professor Nick Reynolds

With medical research being essential to the development of treatments for a variety of conditions and illnesses, experts at university research facilities, hospitals and life sciences companies are striving to make the next significant breakthrough that will save lives.

To achieve the best outcomes, it is important that those involved in research projects work together to make the most of their pioneering findings, and the recently launched Newcastle Academic Health Partners (NAHP) is leading the way in collaborative working, as it brings together two NHS Foundation Trusts – Newcastle Upon Tyne Hospitals and Northumberland, Tyne and Wear – with Newcastle University to deliver world-class healthcare.

Newcastle has an international reputation as a centre of excellence for clinical trials, topping the UK league table for the past seven years as regards the number of trials carried out annually. It is also the only city awarded competitive national funding for both a Medical Research Council (MRC) pathology node and a Diagnostic Evidence Co-operative.

These two pieces of clinical research infrastructure enable Newcastle to deliver diagnostic and health improvements, and are the reason why a North East company was able to get its diagnostic test for flu up

and running in the winter of 2014-15 in a timeframe that had previously been thought impossible.

When you add in that the region is both an NHS Genomics Medicine Centre and a National Institute for Health and Care Excellence Technology and Evaluation Centre, it is easy to appreciate why the life sciences cluster in the North East is in growth mode.

This meets one of NAHP’s objectives (alongside targets to improve physical and mental health in age-related diseases such as dementia, and enhancements in the treatment of cancer), namely to mobilise all three of its partners “in support of economic growth”. Improvement in health is linked to enhancing the wealth of the region.

NAHP is reaching out to the life sciences industry for co-operation in projects in a way that has never before been seen, as historically this has been – and remains – a highly competitive sector where the rewards are significant for those involved.

“We are on the right track but we have not yet cracked it

The North East has a long-standing reputation of co-operation between clinical medicine, life sciences and industry. Recognising a knowledge gap across the three sectors, however, researchers at Newcastle University were successful in attracting MRC funding to promote greater engagement.

This scheme, led by Professor Nick Reynolds of the university’s Institute of Cellular Medicine, is called Proximity to Discovery and is designed to ensure that medical research in the North East genuinely engages with industry.

A clear indication that this approach is working comes with the news that, earlier this month, scientists from five major pharmaceutical companies attended a week-long educational conference on dermatology and rheumatology at Newcastle University – held in conjunction with Newcastle Upon Tyne Hospitals NHS Foundation Trust – where they discussed potential new projects and ways of working together.

It also indicates that Newcastle University is recognised as a centre of excellence in dermatology, and this is reinforced by an ongoing MRC grant-funded research project into severe psoriasis. The Psoriasis Stratification to Optimise Relevant Therapy (PSORT) consortium, led from Manchester, involves Newcastle and London (King’s College London along with Guy’s and St Thomas’ hospitals) as the core centres in developing personalised delivery of new and more effective “biological” psoriasis drugs.

An additional ten pharmaceutical companies around the UK have signed up to be involved in the research – which

Professor Reynolds says is “a sure sign that things are changing out there and that industry sees the real benefits of joining and contributing to such a consortium”.

The research is seeking to identify markers to indicate which one of a possible family of three new drugs will prove most beneficial to individual patients. Currently the drugs are administered by trial and error, often in rotation until the right one is found. Not only can this cause side effects or delays in response in patients, it can also prove expensive given that a year-long course of any one of the drugs costs £10,000.

While affecting about 2 per cent of the population overall, psoriasis is regarded as an umbrella term and has several sub-classifications. There appear to be real differences, for example, between early onset (usually late teens / early twenties) and late onset (aged 50-plus) psoriasis, including potential responses to individual therapies.

“The objective of the PSORT consortium is to develop a combination of clinical, biochemical and gene markers to predict which patients are likely to get better results using drug x rather than drug y,” Professor Reynolds says. “We are on the right track but haven’t yet cracked it. However, we wouldn’t have even got this far without this multidisciplinary collaboration.”

NAHP has delivered a five-year plan that includes recruiting and training the next generation of researchers and providing national leadership in healthcare education. It is an exciting time, as this collaborative approach is helping to attract some of the brightest researchers and practitioners to Newcastle and the North East.

# New understanding of chronic fatigue syndrome

If you have ever felt that chronic fatigue syndrome (CFS) was ruining your life but have heard the urban myth that there is no such medical condition, then Professor Julia Newton, director of Newcastle Academic Health Partners (NAHP), is able to prove conclusively that there is one after all.

The Clinical Professor of Ageing and Medicine at Newcastle University, who also works within Newcastle Upon Tyne Hospitals NHS Foundation Trust, oversees a specialist NHS Cresta (Clinics for Research and Service in Themed Assessments) fatigue clinic. The team at the clinic are very aware of the reality of CFS, having already treated some 400 sufferers from across the UK who live with the debilitating symptoms.

Researchers at the clinic have made a major breakthrough in

understanding the condition, having found for the first time an abnormality of a protein known as AMPK which could open the door to new drugs and treatments for CFS sufferers.

A total of 40 people – 20 with CFS and 20 without – took part in the groundbreaking study, exercising in an MRI (magnetic resonance imaging) scanner while experts measured how much acid accumulated in their legs. Participants were recruited via Newcastle Upon Tyne Hospitals NHS Foundation Trust, and staff at Northumberland, Tyne and Wear NHS Foundation Trust screened those involved for symptoms of depression to ensure that any abnormalities found were linked solely to CFS rather than to anything else.

Initial findings revealed that CFS patients developed 20 times more acid in their muscles

than those without the illness, highlighting the defect with AMPK. Muscle biopsies were then obtained from ten patients with the condition and ten without, and muscle cells were grown in a laboratory to analyse what changes occur during exercise.

“Our study focused on whether there were any biochemical changes,” says Professor Newton, “so that we can start to understand what happens in the muscle with fatigue and, therefore, explore if there are drugs we can use to reverse this. What we have been able to identify is that production of AMPK is impaired in patients with CFS compared to those without. This is an important finding because there are drugs currently available that we know will modify this abnormality.

“The next step is to carry out experiments to see whether or

not we can reverse changes in AMPK with drugs that might ultimately form the basis of clinical trials. In a condition where we have no clinical trials of treatments ongoing in the UK at the moment, this is an exciting step towards that holy grail of trialling medicinal products.”

The pioneering nature of the clinic’s work becomes clear given that fatigue is the main reason UK residents visit their GP, even more so than stress. It is believed that the condition affects around 600,000 people in the UK, causing severe muscle pain that can create long-term disability.

As a result of its work, the clinic won the Bright Ideas in Health award, an example of the effectiveness of NAHP in delivering the best care possible for patients.



‘Exciting step to holy grail’: Professor Julia Newton



# Alliance of science that fosters new life balance

This North-first initiative has the potential to see Bradford help Guildford, hears **Mike Cowley**

If you live in Bradford, Yorkshire, then your lifespan is likely to be 19 years less than that of someone living in Guildford, Surrey. This is nothing to do with quality of healthcare, rather it is the impact of social determinants shaped by the distribution of money, power and resources.

Times, however, are changing and the North is now challenging the long-accepted differential norm by seeking to establish itself as the engine room of health innovation – initially for the benefit of deprived areas in the region, then across the UK, then throughout the rest of the world.

This is not some fuzzy political promise, but is founded in the reality of a body known as the Northern Health Science Alliance (NHSA). Formed before the Northern powerhouse initiative was even a gleam in George Osborne's eye, in many ways the NHSA set the template for what followed, in that it showed how effective collaboration could be within the region.

Just as the Chancellor's idea was to assist in rebalancing the economy, so the NHSA was set up to challenge the imbalance caused by the dominance of the "golden triangle" – Oxford, Cambridge and London – which had effectively eclipsed the health research work going on in the North.

Until the NHSA was formed in 2011, it was recognised that Northern firms in the sector were being regularly, almost routinely, overlooked in terms of deals in favour of their peers in the higher-profile and better-organised South East.

It fell to Professor Ian Jacobs – at the time vice-president of the University of Manchester and dean of its faculty of medical and human sciences, and now vice-chancellor of the University of New South Wales – to be the catalyst for the NHSA and to convince the key players of the benefits of collaboration.

Whereas the South East and Scotland had enjoyed recognition as being home to life sciences clusters, the North of

England had only been looked on in terms of major centres such as Manchester and Leeds.

The North already had, however, all the credentials to challenge what was happening elsewhere. This was shown clearly by the NHSA's initial membership, which comprised the medical schools at the formidable N8 group of universities – Newcastle, Durham, Lancaster, Leeds, Liverpool, Manchester, Sheffield and York.

Collectively, these have more than 19,000 academic staff (14.7 per cent of the UK total), with a research income of over £800 million (19.4 per cent of the UK total), and the universities being joined by the eight research-intensive NHS teaching trusts in the region ensured that here, collectively, was a force with which to be reckoned.

The North also has a burgeoning cluster of life sciences businesses – some 1,000 in all, employing more than 38,000 people and with total exports in excess of £10 billion – and the region leads the UK in terms of the number of clinical trials.

In 2012, the founding universities and NHS teaching trusts were joined by the region's four newly formed Academic Health Science Networks, which proved to be the final piece in the jigsaw in that these networks provided links to the regional academic and clinical specialities not already part of the membership.

Before the NHSA arrived on the scene, the potential of the sector was off the Government's radar, as there had been no joint representation, no voice to make its case, no organisation to be an enabler, nothing that allowed it to work coherently for the benefit of the 15 million residents of the North.

"That's why the North was being overlooked," says Dr Hakim Yadi, chief executive of the NHSA and someone who had built a high-flying career in the "golden triangle" by ensuring co-operation in the health sector across the South East.

Dr Yadi also knew that the NHS was teetering on the edge of a precipice. "With the UK spending almost 10 per cent of its GDP [gross domestic product] on health, and the US double that," he says, "you are obviously aware that this is unsustainable and that a new model for health research and innovation is needed."

Today, Dr Yadi finds himself in charge of trialling that new model in the North.



NHSA chief executive Dr Hakim Yadi: Trialling a new Northern model for health research and innovation

“What I found were eight cities ready to put aside their petty differences and work together... which in itself was unique

The NHSA is ensuring that health research projects work across the region, using the best facilities from each of the great Northern cities. Ultimately, the aim is to decrease the time taken for innovations to reach patients. It is a new collaborative model with the potential to be rolled out across the UK to underpin the future of research in the NHS.

Under Dr Yadi's guidance, the NHSA acts as a single portal bringing together the best of what the North has to offer in terms of research, health science innovation and commercialisation. Having never previously worked north of Cambridge, the chief executive was surprised at what was happening in the North when he arrived.

"What I found were effectively eight cities prepared to put aside all their petty differences and work together, which in itself was unique," Dr Yadi recalls. "And they really wanted to do it."

Investment, as always, was the key – and in Dr Yadi the NHSA had found someone who was not only on the money but who also knew how to obtain it, having already helped UK Trade & Investment to develop a private-public sector model for delivering inward investment.

To achieve this for the North, Dr Yadi was aware that the Government of the day needed to be on-side – and the NHSA proved it had achieved that when the Chancellor announced, in the 2015 Budget, a £20m pot to fund the Connected Health Cities project as the initial stage of the Health North programme.

What this involves is the first large-scale use of information to drive reform in health, social and civic care. It is intended to remove what has become a major stumbling block in the health pathway – as anyone who has ever waited for information from a consultant to arrive at his or her GP will testify.

Rather than impose a top-down approach as has happened in the past, things will now be bottom-up with citizen juries across the North being consulted on what information they are happy to be shared – and what they are not. "This can't be done to people, it has to be done with people," as Dr Yadi puts it.

One of the key reasons that the Government has agreed that this trial should be in the North – before, potentially, rolling out the scheme across the UK – is because one of the many fields

where the region's expertise is unsurpassed is health informatics, the key discipline needed to implement the project.

"This all shows the Government has started to recognise what is going on in the North and the fact that it is contributing to the UK economy," Dr Yadi says, "and this has never happened before."

There is further endorsement in that George Freeman, the minister for life sciences, has recently taken to talking about "the golden triangle, Scotland and the North" as being the key players in his sector. However, despite the continued success of health in establishing itself as a powerhouse in the North, Dr Yadi is concerned that the lack of physical connectivity between member cities is limiting its true potential – just as for the Northern powerhouse itself.

"My concern is that there is too much emphasis on improving connectivity between the North and London such as with HS2," he says, "when what is really needed is interconnectivity between our cities up here. Manchester to Liverpool is the same distance as the Central Line on the London Underground, yet it takes so much longer to get between our cities."

"Once this has been sorted out, the quicker we will get to the stage where what we achieve in Bradford will help the people of Guildford."

■ The importance of the four recently formed Academic Health Science Networks in the North cannot be underestimated, which is why the next issue of Super North in *The Times* – to be published on March 17 – will be dedicated to the work done by the region's AHSNs and their growing impact on health in the North through innovation.

# Beet route to food's future

Feeding the world could depend on research by Northumbria University, reports **Mike Cowley**

According to the Food and Agriculture Organization of the UN, by 2050 the world's population will be 34 per cent greater than it is today. This will place increasing pressure on the planet's natural resources and further the need to find innovative ways to overcome these challenges.

Northumbria University has responded to this by investing significant resources in multidisciplinary research into new but sustainable utilisation of natural products, a field known as the bioeconomy.

Working with external organisations including the NHS, multinationals and small and medium-sized enterprises or SMEs, the university's faculty of health and life sciences is delivering diverse research projects which range from helping survivors of head and neck cancer to overcome eating difficulties, to assisting Parkinson's patients to walk.

Dr Nikos Mavroudis, a food science researcher in the faculty's applied science department, is on a mission to build sustainable and financially viable technologies for food production and the utilisation of byproducts. These technologies can generate healthy ingredients cost-effectively and make healthy food available to everyone – not just to those who can afford it.

Although the research by Dr Mavroudis, based on beetroot, might at first seem mundane, this is far from being the case. The Romans first noticed the benefit of beets as an aphrodisiac, and the vegetable has latterly become known as the "natural Viagra" because it helps to release nitric oxide into the body, widening blood vessels and increasing blood flow to the sex organs, just like its modern patented counterpart.

Ever since Roman times, there have been claims suggesting that beetroot can be good for us – for instance one study showed that consumption of around 500 millilitres of beetroot juice per day has a positive effect on blood pressure and can thus contribute to a healthy heart.

Beetroot also contains betacyanin, which provides the red colour. Betacyanin is an antioxidant, and antioxidants are known to protect healthy cells from damage by free radicals. Beets and their juices are also useful for pregnant women, as they are a rich source of folic acid, a necessary nutrient for the development of the baby's spinal cord during the first three months of pregnancy.

Add in that beetroot is said to decrease the level of bad cholesterol, improve sports performance, relieve fatigue, boost brain function, stimulate the immune system, combat constipation and even cheer us up, and it appears to be a very valuable and healthy food, one which should be consumed frequently.

Now for the bad news. According to work conducted by Dr Mavroudis and his team, while beetroot and its juice confers a



Dr Nikos Mavroudis: Food science researcher at the University of Northumbria, who says affordability is important

number of short-term health pluses, these require frequent, possibly daily consumption for enduring benefit – and beetroot also contains things that, with increased intake over the longer term, could make us seriously ill and even kill us.

Beetroot is naturally rich in oxalate – a known antinutrient – that can cause adverse health effects ranging from mild stomach irritation up to kidney stones, gout or kidney failure following long-term ingestion. Beetroot juice is also naturally rich in sugars that significantly increase the calorific content, something viewed negatively by nutritionists and consumers in developed markets given that excess sugar in foods is seen as a major cause of obesity, the current plague of Western society.

This is why Dr Mavroudis and his team are aiming to develop a process for generating a sugar- and oxalate-free beetroot juice (SOFBJ) without any compromise on its health benefits. The production and characterisation of SOFBJ from beetroot – and from byproducts that would otherwise be disposed of as waste – will open the way for improved utilisation of beetroot in the food industry.

One of the goals of the research is to generate SOFBJ that contains functional foods with a variety of benefits for consumers, such as antihypertensive benefit, increased mental acuity and sport performance. What this means in layman's terms is that when the Northumbria University team comes up with a process to remove the bad bits of beet and offer the good bits to food manufacturers, it

could increase the availability of cheap and healthy foodstuffs for a wider range of consumers – including those on lower incomes.

Affordability is important, given the division in society between the better-off who are eating healthily and those on lower incomes who are not. In ac-

cordance with Government and EU initiatives, and joining forces with other industrial partners and academic institutions, the Northumbria University bioeconomy team aims to provide affordable and healthy ingredients that can be added to a wide range of processed foods without any taste compromise.

## Bringing back taste

Head and neck cancer (HNC) patients often find themselves faced with eating difficulties following treatment – difficulties ranging from loss of taste buds through to severe problems in swallowing.

The Northumbria University food science team found that a detailed assessment of the ability of HNC survivors to sense basic tastes such as sweet, sour, salty or umami provides a way of establishing the level of damage to taste buds.

Overcoming this damage is the next challenge. Experience of food is governed by a combination of taste, via taste buds, and smell which occurs in specific areas of the nose. Due to this it has been possible to derive a compensatory approach to loss of taste, through use of aromas.

In cases of complete loss of taste, such as when HNC survivors are unable to detect umami (for instance the yummy taste of a good Sunday roast) in their tongues, the addition of suitable aroma compounds detected via relevant areas in the nose was found to be successful. These aromas are commercially available and can be used as "condiments" by HNC survivors.

For partial taste impairment, increasing the concentration of compounds that generate specific tastes such as sourness could compensate for the inability to detect taste. Providing HNC survivors with this advice can lead to solutions as simple as adding sourness in the form of lemon juice.

“Beetroot is a valuable and healthy food which should be consumed frequently



# Made-in-the-North innovation goes out to a global audience

As the speed of technology and innovation boost the global ambitions of George Osborne's powerhouse, **Lucy Lamont** documents the rapid rise of Crawford Healthcare and its chief executive Richard Anderson

When George Osborne opened the new offices of Crawford Healthcare in 2012, he urged the business to "lead from the front and take UK success into international markets" – and the Cheshire-based group has gone on to provide a prime example of what the Northern powerhouse is built on, with innovation made in the North but playing to a global audience. The advanced wound and skin care business has more than delivered on the vision outlined by the Chancellor. Fuelled by exceptional 43 per cent annual growth, Crawford Healthcare has become the fastest-growing business in its field and the fourth largest in the UK, keeping company with multinational giants such as Smith & Nephew.

This growth, according to Crawford's charismatic chief executive Richard Anderson, is due to sales and marketing excellence, a fast research and development operation and growing demand in international healthcare for new approaches to wound treatment.

"Wound care has been crying out for research and development innovation for years," Mr Anderson says. "Globally, we have an ageing population and an increasing number of people spending time in hospitals with chronic wounds such as diabetic ulcers, venous ulcers and at risk of developing pressure sores, and in many cases these wounds are infected.

"Typically, these wounds have been managed with antibiotics and dressings that have no real impact on the wound infection. With increasing resistance to antibiotics, the world has come to recognise how ineffective these treatments are, so the need for new approaches to treatment has become all the more urgent.

"We recognised that concern and, since acquiring the wound care aspect of the business in 2011, have invested in new silver-based technologies that destroy more bugs, faster and longer than any other dressings, with no known resistance. The key to our success is that we're more specialist than the other global companies, so we can be extremely fleet of foot in developing new products and bringing them to market."

It is evolutionary research and development which has seen the Institute of Directors recognise Richard Anderson as director of the year for science and innovation in the North West, and it places



Crawford Healthcare on a trajectory of major expansion in Europe and the US. As Mr Anderson points out, the outlook is very different from in 2005, when he acquired the family-run dermatology business with just a handful of staff.

Today, it boasts a turnover run rate in excess of £20 million and has created over 100 new jobs in the past two years alone, part of a process described by its chief executive as a long-term project to build "a world-class business capable of transforming medical practice in global healthcare".

Replicating the success of Crawford Healthcare's highly profitable UK business overseas is high on Richard Anderson's agenda, as he previously held senior positions with AstraZeneca and Taro Pharmaceuticals in New York, leading mergers and acquisitions growth for the latter, which helped to deliver a growth in value from \$375m to almost \$2 billion for the NASDAQ-listed business.

"Our future as a business lies in international markets, particularly Germany and the US," Mr Anderson says. "We're currently building a best-in-class international sales and marketing team with exceptional knowledge of local markets that will help us deliver UK innovation to a worldwide audience. We're already seeing the benefits of that approach in the US, where our sales force is beginning to make real inroads into the world's largest market.

"We also have an experienced joint venture partner in Europe who is overseeing the successful introduction of our products into the continent's largest wound care market, Germany. It's an extremely exciting time to

**Movers and hand-shakers: Chancellor George Osborne congratulates Crawford Healthcare's Richard Anderson on the company's success**

be leading the business and flying the flag for science in the North."

With the breakup of AstraZeneca at Alderley Park, you could be forgiven for thinking that the North's life sciences sector has taken a hit. But Mr Anderson insists that North West businesses are benefiting from a larger pool of research and development talent than the region has ever had, supported by world-leading research institutes.

"If you look at the level of investment in science in the North West, it's staggering," he says. "We have world-class academics on our doorstep and it's our job as a business to ensure their work has a positive impact on patient care, whether that's in the UK or overseas.

"To that end, we've developed close links with the University of Manchester, which is producing groundbreaking work in relation to biofilms and wound care."

For those less well-versed in such matters, biofilms are essentially plaque-like barriers that form over chronic wounds such as venous and diabetic foot ulcers and pressure sores, trapping in harmful bacteria. The silver-based technology used in Crawford Healthcare's dressings is proven to destroy these barriers while being the only formula on the market to kill the most resistant bacteria. It is fast, hard-hitting and could play a major role in the World Health Organization's fight against antibiotic resistance.

It is this necessity for a global solution that drives Crawford's commercial model and sees it spend more on research and development as a percentage of overall sales than does its competitors. The company has even secured total exclusivity on patented technology with

a Canadian advanced materials developer to protect its growth trajectory – an agreement which the chief executive believes will prove to be a watershed moment for the business.

"This technology will be the cornerstone of how we manage wounds in the future," Mr Anderson says. "With exclusive rights to its use, we essentially have an unrivalled platform to tackle the issue of chronic and stalled wounds, with or without infections, faced by clinicians the world over. We're in a position now to significantly bolster our portfolio of products and that will only serve to boost our growth."

With its newly expanded manufacturing site, and the ability to assess and test products rapidly through the University of Manchester, the future vision for Crawford Healthcare is clearly mapped. It has reinvested over £16m of profit into international expansion, research and development, manufacturing and intellectual property over the last five years – a strong statement from a company whose organic growth allows it to realistically target being a global force, quadrupling turnover in the coming years.

"We're approaching the perfect storm in terms of global wound care," Mr Anderson says. "The market is estimated to be worth \$26bn by 2018. With the rise of diabetes and obesity, we can confidently predict that 1 to 2 per cent of the population in developed countries will experience a chronic wound in their lifetime.

"Crawford holds the key to the next generation of treatment. It's our task now to take it from the North of England to the rest of the world." ■ [crawfordhealthcare.com](http://crawfordhealthcare.com)

“It's a really exciting time to be leading the business and flying the flag for science in the North

# They patently have the intellectual property to protect the best ideas

Legal protection is vital in selling innovative ideas. **Barry McDonald** meets a Northern law firm that offers a special service to inventors in life sciences

The fast-evolving life sciences sector is already delivering the next generation of therapies and diagnostics, but as the sector gathers pace, so patent laws around the world struggle to keep up. As patents are so fundamental to many life science businesses, it is not surprising that companies in the sector are diverting resources to filing an increasing number of patent applications to protect their technologies.

At leading patent attorney firm Appleyard Lees, a constant eye is kept on developments in Europe and the rest of the world to ensure that the advice and patents being drafted are fit for both the domestic and all overseas markets.

With dedicated life sciences and pharmaceutical departments, Appleyard Lees – which has bases in Manchester, Leeds, at the BioHub at Alderley Park and also in Halifax – covers an array of technologies, with the added advantage of a team of attorneys who have undertaken laboratory research and who are keen to learn and become involved with new and innovative technologies.

The attorneys are collaborative by nature and provide the right mix to handle hybrid technologies such as bio-electric sensors, medical diagnostic devices and bioinformatics.

Having a team with hands-on experience is integral to the attorney-client relationship, says Simon Bradbury, head of life sciences at Appleyard Lees. "We try to make sure the people we recruit have different but complementary technical backgrounds, so we can provide advice for the whole range of technologies for the sector. We have attorneys who are protecting a range of innovations, from medical devices all the way through to highly complex biologic therapies."

Bobby Smithson, a partner in the firm, agrees that having attorneys with very specific technical know-how strengthens the relationship between attorney and client. "It gives us the ability to talk with inventors who are often in and out of the laboratory all day," he says. "By talking on that level with them, we find



Simon Bradbury: Keeping up with evolution

that the inventors are a bit more at ease because we have a good feel for the technology right from the start."

Appleyard Lees acts for a number of multinational corporations, well-known brands and universities, as well as for small and medium-sized enterprises (SMEs), and has earned a reputation for handling complex technical subject matter and providing clear and strategic advice on the best options to maximise return on investment. The company has just been shortlisted for UK patent prosecution firm of the year at the Managing Intellectual Property Global Awards.

But it is the firm's approach to client care that sets it apart from the crowd, according to Mr Bradbury. "One thing we're very keen on is getting to know the client and getting to know their business and their long-term commercial strategy," he says.

"One of the ways we do that is to think and act more like their in-house counsel and really get to know what their long-term ambitions are, and sometimes it is not to grow into a large company but to exit, maybe a flotation or an asset sale



Bobby Smithson: Technical know-how helps relationships with inventors

so they can plough the money back into other areas of research."

With regard to client care, "it is about putting the client first and it's something lots of people say they do," Mr Smithson adds. "We differentiate ourselves on the basis that client care can mean a number of things. For some, it is responding to an email within an hour. That's all well and good, but in our view that's just responding to an email with no thought.

"Client care in our mind is more about understanding a client's business and putting what they want to achieve at the forefront and working with them to get to that. We want to feel like we're part of every client's business." The result of that focus on client care is strong client retention along with the acquisition of new clients through personal recommendations.

In the business of innovation, patents are vital tools. No matter in which field of life sciences you operate, Appleyard Lees has a technical specialist who can work with you to understand your invention in the context of your business and provide advice on the best strategy to suit your needs – whether that involves keeping competitors at bay, securing investment or pursuing licensing income.

For Simon Bradbury, one of the biggest challenges facing the sector is that, with technology evolving very quickly, it takes a little longer for the law to evolve with it. "It's always lagging," he says, "and the challenges are how we make sure we protect potentially some very valuable inventions for our clients.

"We also produce a life sciences and pharmaceutical newsletter twice a year, a high-level summary of what's going on in patent law for the sector around the world. That helps us, and our clients, to track what's happening in patent law. I make sure the whole team gets involved in reading all the cases and writing articles.

"It's very easy to focus on patent drafting and prosecution in the UK or Europe, but most of our clients operate globally and we can't be that blinkered. We need to look at patents that will be suitable for a number of markets and jurisdictions, in particular the US. We have a number of very close links with highly regarded foreign attorneys and we visit them regularly and get a lot of updates."

As well as providing first-class patent support, Appleyard Lees offers vital business development support through its growth fund. Launched in 2012, the fund is an annual pot of financial assistance to the tune of £50,000. Organisations with winning ideas and a proven track record of innovation, backed by sound strategic approach, will be eligible for financial support.

"The fund can provide assistance with some of the early stage patent costs for small start-up companies," Mr Bradbury says. "It's often very difficult for companies to get funding without having patents in place, so we will look to support financially the cost of patent findings.

"A number of clients have accessed this fund and have gone on to attract the right investment, and one has even now gone on to float on the AIM [Alternative Investment Market]. All that we ask in return is that the company agrees to us publicising their success story for our website and our marketing material."





# Regener8-IKC Annual Conference 2016

"Building the Regenerative Devices Industry"

Horizon Conference Centre, Leeds • Friday 1 July 2016

Share and discuss the impact of university-industry collaborations in the field of regenerative therapies and medical technologies

Sessions include:

- international keynote speaker, Professor Boris Chichkov
- accelerating the development of regenerative devices nationally
- sharing our expertise with others
- question panels
- networking time, including poster presentations and exhibition
- clinical value delivered
- community-sourced session: presentations from the UK med tech community



**Delegate registration  
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### Want to present at the event?

Our community-sourced session is open for submissions. Propose a challenge within the scope of Regener8, including collaborative approaches to solving it.

**Sponsorship  
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For more information visit:  
**medical-technologies.co.uk**  
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