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Perkins, B. & Ford, D. (2014). *Life Science Exchange: Opportunities for Growth 2014 Report*. Cardiff, Wales: TeamWorks Design.

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# life.

The Life Science Exchange



OPPORTUNITIES FOR GROWTH  
2014

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Report compiled by Brian Lee Perkins,  
Life Science Exchange  
with support from MediWales

## FOREWORD



In March 2012, the Welsh Government launched 'Science for Wales', which set out a vision for where Wales should be heading in the future. Three Grand Challenge priority areas were identified where Wales has a track record for excellence. Life Sciences and Health is one of these three Grand Challenge priority areas.

Considerable development has already occurred in this area, including the establishment of the Life Sciences Sector Panel, Team, Hub, and Fund operating together with organisations like MediWales and the Institute of Life Science. There are several Life Sciences centres of excellence within Welsh academia, and NISCHR provides a dynamic focus for NHS Wales R&D. The population of Wales is an appropriate size for R&D activities, and the centrally managed NHS IT infrastructure enables national level research.

These infrastructure elements and knowledge bases create an outstanding R&D environment, but do not yet constitute an integrated pipeline of commercialisation that supports development from discovery through to clinical application. Wales now has an excellent opportunity to 'join the dots' to create this environment within Life Sciences.

In September 2012, Swansea University (in partnership with Cardiff University and MediWales) was tasked by the Welsh Government to lead a Knowledge Exchange Project (KEP) for the Welsh Life Sciences and Health area. The aim of the KEP programme was to increase interaction, develop more effective knowledge exchange mechanisms, and stimulate the formation and maintenance of long-term collaborative relationships between industry and academia.

We created Life Science Exchange as a process, not an organisation. Our vision was to create a mechanism which could continuously poll all the stakeholders in Wales' complex life science ecosystem, in a way that allowed all to be involved. The object is to allow participants to interact with other stakeholder communities (clinical, academic, business, governmental), exchanging perspectives, and then to support them by thinking about how Wales could improve its performance. To provide focus, we streamed this work into groups representing Wales' major subsectors.

This report draws on the primary focus group work conducted by the Life Science Exchange project and also reports on the outcomes from collaborative projects identified and facilitated. The aim is to provide stakeholder views of the sector and deliver key recommendations to policy makers (e.g. Welsh Government). We hope the report will influence and shape the thinking in determining a Life Sciences policy as well as further knowledge exchange support measures.

The Life Science Exchange is a beacon for how Wales should support its stakeholders, providing a process and resources for networking, knowledge exchange, and exploration of over £2 million in new opportunities. Moving forward, we hope to continue this excellence in our multi-disciplinary approach to the Life Sciences sector.

I would like to thank my fellow colleagues and partners of the Life Science Exchange for their continued support through the last two years, as well as the many stakeholders who took the time to attend our events and contribute to this process.

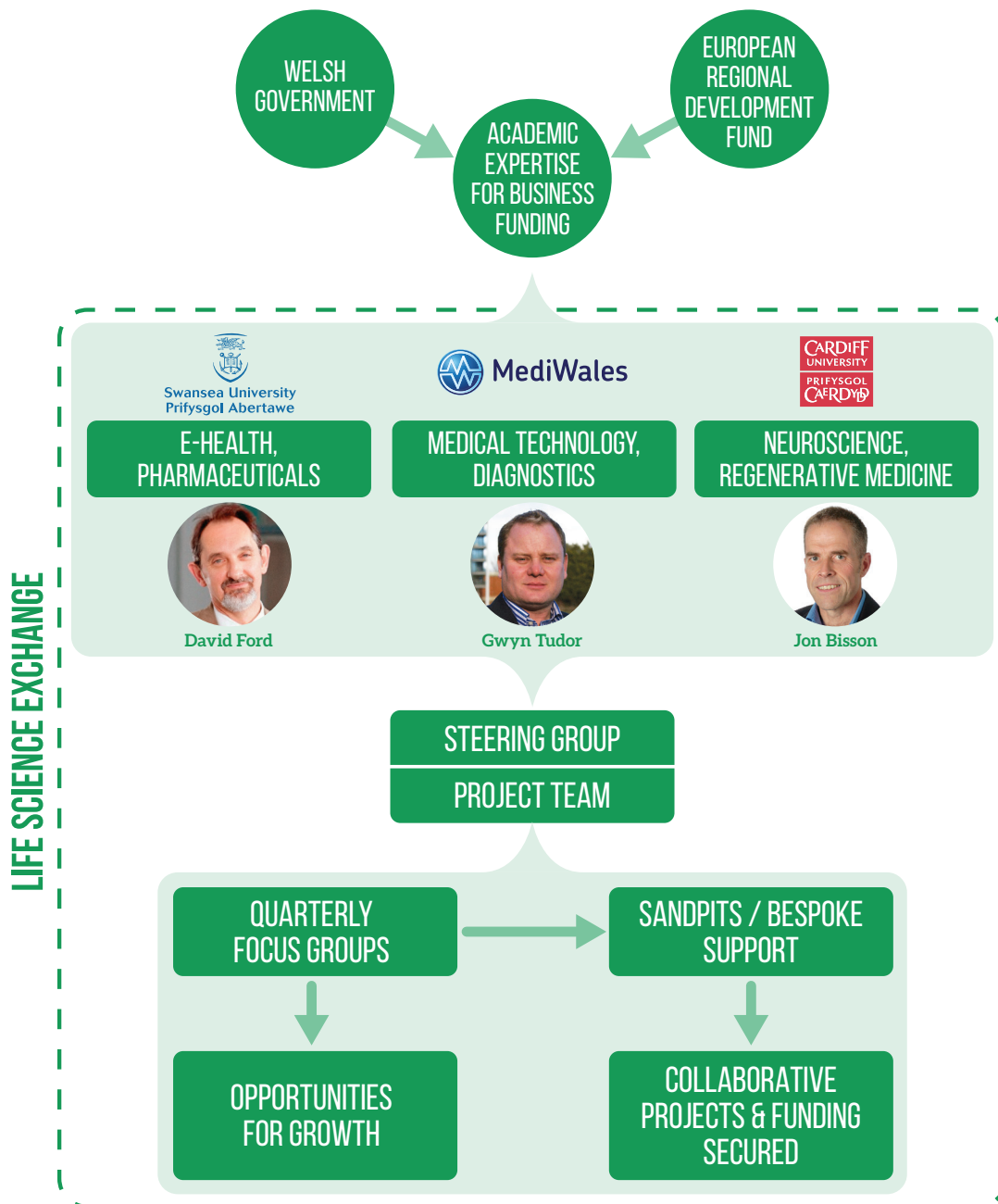
I have great confidence in a bright future for the Welsh Life Sciences sector.

**David Ford**  
Professor of Health Informatics  
Swansea University

# EXECUTIVE SUMMARY

The aim of the Life Science Exchange is to identify and develop effective innovative academic, public and private sector knowledge exchanges that deliver the results and impacts necessary to effect economic change. The Life Science Exchange has been funded through the Academic Expertise for Business (A4B) programme. A4B is a programme of support funded by the Welsh Government and European Structural Funds aimed at providing a simplified, integrated package of support for knowledge transfer from academia to business. The aim of the overall programme is to promote a high value-added economy and to maximise the economic impact of academia and business through knowledge transfer and the creation of a stronger science, engineering and technology base with clear commercial potential.

The project was overseen by an executive level Steering Group, comprising senior representatives of all stakeholder groups within the Life Sciences sector, including academia, business, NHS Wales, and Welsh Government. This group set the strategy for the project, agreeing the areas in which detailed research should be undertaken and the approach to be taken by the project team. The work of the Focus Groups and overall project management of the Life Science Exchange was undertaken by a small project team led by Professor David Ford.



# PROJECT OUTCOMES

The six specialist areas (Diagnostics, eHealth, Medical Technology, Neuroscience, Pharmaceuticals, and Regenerative Medicine) were selected to encompass the twelve Life Sciences areas prioritised in 'Science for Wales'. Six Focus Groups were established and included participants from academia, industry, the Welsh Government and NHS Wales. Each Focus Group was chaired by one of the partner institutions and addressed specific aspects of the Welsh Life Sciences sector to strengths, challenges, and opportunities identified in each specialty area. As an outcome of the Focus Groups, each produced a confidential report outlining the significant barriers in their respective areas, made recommendations to overcome them, and identified the stakeholder groups which needed to take action. Although Welsh Government and NHS Wales staff attended the Focus Groups, as this project was funded from the A4B programme, many of the recommendations are from the academic and business perspective. Furthermore, a second outcome was a stakeholder-driven mapping exercise for each area of focus. These detailed reports and mapping exercises have been supplied to the Welsh Government's Life Sciences Sector Team and the Life Sciences Sector Panel to inform policy and strategy. They will be made available to quintessential stakeholders by the Welsh Government upon request. This Life Science 'Opportunities for Growth' report has softened and abbreviated the confidential recommendations into 'opportunities'. Descriptions for each opportunity can be found in the following sections of this report. To provide a global overview of the opportunities identified in the Focus Groups, they have been categorised and summarised into the table below – each opportunity represented by a coloured dot.

SUMMARISED OPPORTUNITIES	LIFE SCIENCES SPECIALIST AREAS					
	DIAGNOSTICS	EHEALTH	MEDICAL TECHNOLOGY	NEUROSCIENCE	PHARMACEUTICALS	REGENERATIVE MEDICINE
Establishment of a new special interest group			■	■	■	■
Mapping, sector knowledge and communication		■	■		■	■
NHS Procurement and technology adoption	■	■	■		■	
NHS engagement and clinical access	■	■ ■	■		■	■
Growing a skilled and trained workforce	■		■	■	■	
Enhanced research capacity	■	■		■ ■ ■ ■		■
International conferences and marketing	■				■	■

Each of the Focus Groups had unique characteristics and stakeholders, which are reflected in the diverse opportunities they identified. The organisations in the Neuroscience Group appeared to be more active in earlier stage research and development and recognised opportunities in enhancing Wales' neuroscience research capacity. Those that have more of an industrial base (e.g. eHealth, Diagnostics, Medical Devices and Pharmaceuticals) focused their attention on NHS engagement, procurement and technology adoption. All of the summarised opportunities found in the table above were discussed in each Focus Group, however some were not identified as a recommendation for their respective subsector. The project also promoted networking and a 'joined up' working between all stakeholder groups, leading to the identification and facilitation of collaborative projects. This created a powerful stimulus for the existing Welsh Life Sciences sector and a potent incentive for inward investment by international companies, leading to significant benefits to the Welsh economy. Collaborative projects identified during either Focus Groups or stakeholder engagement were further developed in sandpit events (an intensive, interactive workshop designed to produce innovative research proposals) or through bespoke support. This has led to more than £2 million of funding being successfully secured on behalf of Life Science Exchange support.

## FUNDING SECURED AND INVESTMENT INDUCED

Funder	Institution	Amount
TSB, Small Business Research Initiative (SBRI)	ABMU Health Board	£800,000
WG, Health Technology and Telehealth Fund	AliveCore, ABMU Health Board	£772,208
NISCHR/NIHR i4i	Confidential until money secured	~£400,000
Welsh Government A4B	Digital Health Conference	£50,000
Betsi Cadwallder SBRI	Sym1Connect	£40,000

**TOTAL £2,062,208**



# FOCUS GROUPS AND SANDPITS

The Life Science Exchange organised quarterly meetings for the Steering Groups and Focus Groups over the period of 24 months. Collaborative projects identified were supported by sandpit events to further develop the ideas.

 **STEERING GROUP**

## FOCUS GROUPS

 **DIAGNOSTICS**

 **EHEALTH**

 **MEDICAL TECHNOLOGY**

 **NEUROSCIENCE**

 **PHARMACEUTICALS**

 **REGENERATIVE MEDICINE**

## SANDPIT EVENTS

 **FINANCE & FUNDING**

 **EPSRC BRIDGING THE GAP**

 **HEALTH CLOUD**

 **ABERTAWE BRO MORGANNWG UHB  
SMALL BUSINESS RESEARCH INITIATIVE**

 **NHS WALES PROCUREMENT**

 **TRANSCRANIAL MAGNETIC STIMULATION**

 **PHARMACEUTICAL SPECIAL INTEREST GROUP**

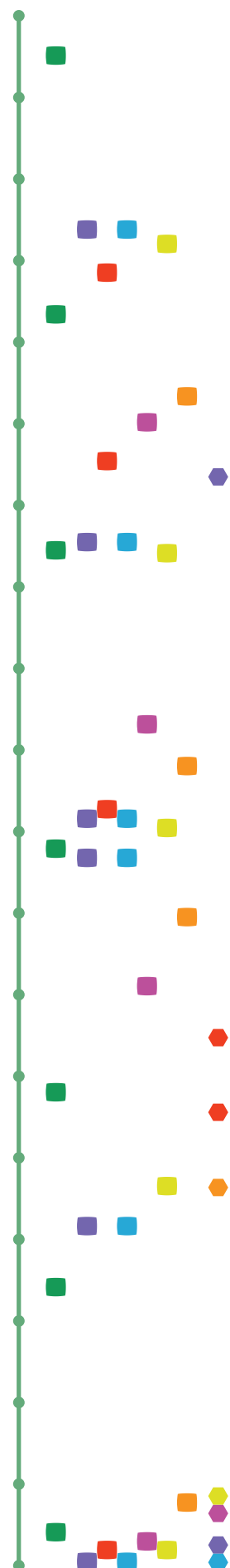
 **MEDICAL RESEARCH COUNCIL  
REGENERATIVE MEDICINE PLATFORM**

DECEMBER 2012

JUNE 2013

DECEMBER 2013

JUNE 2014



# FOCUS GROUP REPORTS

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*Each of the six Life Science Exchange Focus Groups authored reports outlining their stakeholders' perspectives.*

*The following sections highlight the key strengths, challenges, and opportunities identified in each specialty area.*







# DIAGNOSTICS

## OVERVIEW

Medical diagnostics are the technologies concerned with the determination of a disease or condition causing a person's signs and symptoms. Technologies produced in Wales include in-vitro diagnostics, molecular diagnostics, medical imaging and eHealth. In-vitro diagnostic tests are typically used in health professional settings or for consumers to use at home. Molecular diagnostics are technologies used to analyse biological markers in the genome and proteome by applying molecular biology to testing. Diagnostic imaging covers the capturing and interpretation of images for the purpose of medical diagnosis. Diagnostic technologies in eHealth are concerned with the collection and aggregation of patient level health data for monitoring purposes. Companion diagnostics is a new field embedded in the strategy of personalised medicines and involves genetic tests which provide information on a person's likelihood of developing a specific disease or if certain drug treatments work effectively. Of the 207 life science companies based in Wales, 33 (16%) are medical diagnostics companies. In-vitro diagnostic technology is the largest sub sector with 16 companies (7% of the UK total).

## STRENGTHS

The devolved Welsh NHS is a unique and important asset to the diagnostics sector, as a research collaborator, a customer and as a supplier of clinical expertise. While most companies introduce their new products into global markets, adoption by the NHS can be an important reference site for demonstration, and stepping stone to achieving international sales. The work of NISCHR, NISCHR AHSC and specifically Health Research Wales is credited with playing an important role in improving engagement between industry and clinical experts. The Welsh Cancer Bank is also regarded as an excellent resource that has simplified the process of accessing tissue samples.

Close collaboration between academic institutions and manufacturers is an important feature of the Welsh life science sector. MediWales is the networking organisation that supports collaboration between Industry, academic and clinical professionals. The new Welsh Government Life Science Hub is intended to bring together the sector under one roof. Work is being carried out to address skills gaps in the diagnostics sector. In South West and Mid Wales the Regional Learning Partnership has carried out a survey to identify skills needs in the sector while Cardiff University is discussing the introduction of 'Education for Industry' courses. The Life Science Exchange has established an ongoing life science skills group to identify areas of need in the Welsh life science sector. Business incubator facilities are offered by Swansea University and the Cardiff Medicentre and industrial 'grow on' space is available at the Sony UK site in Pencoed.

## CHALLENGES

Assessment and adoption of new diagnostic technologies by the NHS across the UK is a concern for diagnostics companies producing innovative solutions. There is currently no equivalent to the pharmaceutical assessment and adoption process for diagnostics. The general shift in the NHS market towards adoption of higher throughput diagnostic solutions and full service third party provision could become a barrier to adoption of niche technological innovations. Access to patient and infectious disease samples is an issue for R&D led diagnostics companies. An inadequate supply of UK clinical samples has created a bottleneck in the industry.

The sector suffers from skills shortages in regulation, intellectual property, project management and practical laboratory skills. Undergraduate students are often unaware of the range of roles available in the diagnostics sector including sales, marketing and regulation. Regulatory skills are an area of particular need for diagnostics companies. The regulatory burden on diagnostics technology companies is increasing. For new companies and SMEs, this regulation is a major barrier to market entry. Regulation is also a barrier to international trade. Given the international nature of the diagnostics sector, this is a priority issue. There is a feeling that current laboratory and manufacturing facilities that suit the needs of the diagnostics companies are inadequate to meet the growth aspirations of the sector. For many smaller companies another limiting factor to international trade is the cost of specialist cold chain logistics. Diagnostic tests are more price sensitive than drugs but drug distribution can dictate the pricing of specialist logistics.

# OPPORTUNITIES

## TECHNOLOGY ADOPTION AND UNMET CLINICAL NEEDS

Wales has the opportunity to lead the UK in the implementation of a formal diagnostic technology appraisal and adoption process. Alongside this process the Diagnostics Focus Group would like to work with clinical colleagues to identify and address 'unmet clinical needs' in the diagnostics sector. To this end a Diagnostics Special Interest Group (SIG) is proposed, potentially as part of ongoing Life Science Exchange activity and with the support of MediWales.

## BIOBANK

The Diagnostics Focus Group would strongly support the provision of ethical and appropriate access to anonymous patient samples for research and testing. A 'bio bank' created using a similar model to the Wales Cancer Bank is proposed. This specific recommendation reflects a wider opportunity for close NHS / Industry engagement.

## INTERNATIONAL

Given the proportion of business done outside of Wales, companies stress the need to support international activity as a priority. A specific action is for companies to collaborate, with a view to reducing the cost of international trade for smaller companies and niche products, to share capacity and to negotiate prices of specialist cold chain distribution.

## SKILLS

There is a need to raise awareness of career options in the sector to undergraduates and to provide specialist training in subjects such as intellectual property, project management and practical laboratory skills. Companies can work together to create a critical mass of applicants required to make the provision of part time courses in these subjects. There is a specific need to develop the regulatory skills required for the future. Government assistance in the provision of regulatory support and training would be a valuable service to businesses. The continuation of the Life Science Exchange Skills Initiative could be an overarching forum for collaboration in this area.

## FACILITIES

There is a need for appropriate laboratory and mixed-use business accommodation for diagnostic companies if sector growth is not to be curtailed by a lack of appropriate research, development and manufacturing facilities.

*"The help given by the Life Science Exchange team in helping demystify Horizon funding has been timely, extremely helpful and very supportive. Such a support system is badly needed in this sector given how complex it is to access grant funding which helps sustain business development in Wales."*

**- Louisa Harry-Thomas, Operations Manager, Acuitas Medical Ltd**



## OVERVIEW

The NHS Wales Informatics Service (NWIS) has adopted the new definition for eHealth in Wales developed by the eHealth Industries Innovation (ehi<sup>2</sup>) Centre, which is: eHealth is better healthcare and a healthier life through digital technology. Examples include health information networks, electronic health records, telemedicine services, wearable and portable personal health systems and many other information and communication technology (ICT)-based tools assisting disease prevention, diagnosis, treatment and follow up.

In a written Cabinet Statement on 23 April 2014, Mark Drakeford, Minister for Health and Social Services, announced a refresh on Welsh Government policy regarding eHealth and Care in Wales. He stated, "Our opportunity now is to focus on how eHealth and Care can help us to manage demand, empower us to take a more active role in decisions about our health and care, and deliver better quality services in the most effective and efficient way".

A feasibility study performed in 2011 by ehi<sup>2</sup> based out of Swansea University identified 70+ companies operating within Wales that were or had the intention to enter, the emerging market of eHealth. This multi-billion dollar global opportunity was seen by all as a major opportunity for Welsh businesses and also, if Wales were to leverage its major assets in the area – its university-based expertise, and its local NHS - Welsh companies could enter the UK and international markets with a significant competitive advantage.

## STRENGTHS

Wales has competitive strengths in the eHealth sector which spans University, NHS and industrial sectors. Particular strengths lie in health informatics, big data, and associated Research Council-funded centres of excellence. Key eHealth companies in Wales specialise in healthcare data capture, management, and extraction; clinical decision support; and early warning tools. Wales has significant assets in a devolved NHS, areas of health research excellence in a number of universities and strengths in the life sciences sector. Wales' success in the development of a single electronic patient record and the secure anonymised information linkage database makes it an attractive location for medical trials and epidemiological work. Wales also boasts a range of support institutions including, but not limited to, eHealth Industries Innovation Centre (ehi<sup>2</sup>), the Electronic and Software Technologies Network for Wales (ESTNet), and MediWales. These groups provide key guidance to and act as a voice for the eHealth sector in Wales.

## CHALLENGES

In order to realise the potential of Wales as a leader in eHealth innovation, it is essential that the development of eHealth products and services is supported in a co-ordinated and consistent fashion at every stage of their development. Availability of funding, access to academic facilities and expertise and clear guidance on market requirements and technical standards are all important in supporting innovation. In particular, being able to secure input and collaboration from NHS Wales at appropriate points from initial concept, through design and up to and including adoption of new innovations for market testing within an NHS environment is essential.

Many of the issues discussed in the Focus Groups refer to the need to increase access to NHS Wales at both a pre and post procurement stage of product development. Whilst Wales represents a very small part of the global health market, products which have been developed in partnership with NHS clinicians and tested within NHS premises (either on a pre-procurement or post procurement basis) carry a great deal of credibility in the international health market and have a significantly improved potential for international commercialisation. The Welsh NHS as a market is small, but the benefits to companies in being able to develop products which are suitable for adoption within it are significant.

There are equivalent benefits to NHS Wales in encouraging collaboration too – addressing development of products and services to meet current needs, access to free or reduced cost products and services and potential IP shares from new innovations which go on to break into international markets.

# OPPORTUNITIES

## ANNUAL LIFE SCIENCE RESEARCH PRIORITY STRATEGY

Annual life science research priority strategy: Life Science Exchange eHealth focus group members questioned whether research and development in health informatics (and Life Science as a whole) was sufficiently co-ordinated. Too often research and innovation activities are designed and developed within single organisations, based on their perceptions of priorities and requirements, without wider linking to the sector as a whole. This has a number of disadvantages, including duplication of effort and development of solutions which are not required, not fit for purpose or do not satisfy an unmet clinical need. The Life Science Exchange group has suggested the need for a joined up strategy across the whole Life Sciences sector (encompassing government, NHS, Academia and the private sector). This strategy would identify agreed research priority areas every year, and would focus the research effort within Wales around achieving these. Projects which addressed priority areas should be given a co-ordinated development pathway from initial concept, through development to final trial in an NHS environment.

## PROCUREMENT OF EHEALTH SOFTWARE

NHS Wales procurement processes are a significant issue for eHealth SMEs operating and innovating in Wales. NHS Wales is understandably keen to ensure that it works with companies which are reputable, stable and able to support NHS contracts into the future. However, current eligibility criteria effectively exclude small and medium sized companies from breaking into the market. The Life Science Exchange eHealth focus group members propose that NHS Wales (Shared Services Partnership) and NWIS should review the procurement models used in NHS Wales with the aim of creating a competitive environment for SMEs whilst still keeping risk within NHS procurements to an acceptable level.

## NHS WALES STANDARDS DOCUMENT

Life Science Exchange stakeholders recognise that the technical and strategic direction of NHS Wales in relation to eHealth is driven by NWIS. Stakeholders suggested that NWIS should be involved in priority setting and identifying areas of unmet need (see above). The focus group welcomes the recent development of an NHS Standards toolkit, which provides a framework for companies to develop their software with existing data systems. The group feel that further work to promote this documentation and to embed it into research projects and development activities would be of great advantage to the sector.

## SECTOR KNOWLEDGE AND COMMUNICATION

Stakeholders have shared concerns regarding a lack of sector knowledge throughout each of the Focus Groups. Generally, there is a need from all stakeholders for a global view of the resources, infrastructure, activities, events, products, and services that exist across the sector. In order to make the information about the Welsh Life Sciences sector clear to stakeholders, (all) information relevant to the sector should be available through one point of contact or organisation, which could also provide a comprehensive signposting service for accessing resources and support.

## NHS ENGAGEMENT AND CLINICAL ACCESS

The size of Wales and its integrated NHS IT systems mean that it could be a fantastic place for clinical research, but more needs to be done to take advantage of this. Steps need to be taken to incentivise and promote clinical research, both at the institution and individual levels.

*“SymlConnect is an ILS based company dealing with ICT in healthcare. We found the LSE team very helpful, especially their events which supported our networking and knowledge transfer. The information flow, both during the events and via email communication, helped us understand and identify relevant opportunities. We are happy to announce that we recently won the Betsi Cadwaldr Heath Board’s SBRI challenge, which was facilitated by one these informed exchanges via the LSE.”*

– Sabarna Mukhopadhyay, CEO, SymlConnect





# MEDICAL TECHNOLOGY

## OVERVIEW

The 'medical technology' sector includes companies whose major business activity involves the development, manufacture, or distribution of medical devices as defined by the European Union Medical Devices Directive (93/42/ECC) and companies who have significant activity in supplying specialist services to the medical technology sector.

Of the 207 life science companies based in Wales, 146 (71%) are medical technology companies. This figure represents around 5% of the companies based in the UK. The Welsh medical technology sector has a turnover of around £1,017m (6% of UK turnover) and employs around 6,367 people (8% of UK employment). The sector has experienced significant growth in employment, with 2012-13 showing a growth of 8.6% in a single year. Annual turnover has increased since 2009 by a compound annual growth rate (CAGR) of 2.2%. The global market is expected to continue to grow at a rate of 4.5% per annum reaching global sales of £291bn by 2018.

A wide variety of medical technology products are produced in Wales. In-vitro Diagnostics is the largest sub sector with 16 companies (7% of the UK total). Assistive Technology is the second largest sub sector with 13 companies (4% of the UK total). The ICT and eHealth sub sector has 11 companies (6% of the UK total). Hospital hardware and single use equipment each have 10 companies (6% and 4% of the UK totals respectively). 16 companies provide specialist business services to the medical technology sector. Anecdotal evidence suggests that most medical products made in Wales are sold abroad.

## STRENGTHS

Given the importance of access to clinical markets and expertise the key strength identified by the Medical Technology Focus Group is the role played by the NHS in Wales. One Focus Group member remarked, "They share the desire to see Welsh companies thrive." A strong home NHS market is a prerequisite for UK and export sales. The Welsh NHS is recognised as being generally approachable and willing to help. Health Boards are increasingly more receptive to ideas that save time, reduce risk or increase capacity.

## CHALLENGES

It is felt that navigating the NHS procurement landscape is complicated, with numerous different routes for different products and companies who may use different tactics. Support for companies to navigate and take advantage of these opportunities is considered a priority for the sector. The Welsh NHS Shared Services Partnership is recognised for helping and guiding Welsh SMEs. Sell 2 Wales is also regarded as an excellent tool for accessing UK wide contracts.

It is noted by the Medical Technology Focus Group that a significant barrier to selling to the NHS is getting products to the approved vendor list. It is felt that there needs to be a mechanism for reducing the cost burden of approvals by the NHS so that it can undertake this activity faster and more often.

The unique roles of The Surgical Materials Testing Laboratory in Bridgend (SMTL) and CEDAR (NICE Evaluation Centre) are recognised and it is felt that these facilities could be further enlisted to help with assessment and approvals, which would also enhance the quality and perception of the Welsh medical technology sector.

Health Research Wales is recognised as presenting a significant opportunity to promote a strong clinical base for trials and testing to benefit both the population of Wales and indigenous businesses. The newly established Welsh Wound Innovation Centre may also contribute to the technology evaluation challenge.

# OPPORTUNITIES

## NHS TECHNOLOGY EVALUATION AND ADOPTION

There is an opportunity for the Welsh NHS to introduce a clear and appropriate access point for new technology appraisal and adoption and to use procurement to encourage adoption of innovations where better patient outcomes or reduced costs can be achieved. Clinical specialists could be helped to engage with suppliers specific to their clinical specialty in order to address unmet technology needs.

## LIFE SCIENCE 'KNOWLEDGE' EXCHANGE

Many of the needs expressed by the Medical Technology Focus Group concern access to information, specifically the need to map the route to market for medical technology in the NHS; a directory of qualified regulatory and QA consultants; information about international markets and data that demonstrates the extent and value of international trade carried out by Welsh companies; regular and timely notifications of regulatory changes; and more up-to-date, timely, specific funding information.

## COLLABORATION

Wales has a highly collaborative life science community. A number of novel suggestions were made by the Medical Technology Focus Group aimed at transforming this collaboration into tangible benefits. Closer interaction and a 'bridging of cultural differences' can be achieved between industry and NHS staff through a 'job exchanges' or an 'embedded staff' programme intended to facilitate NHS and industry staff spending time together in manufacturing and clinical settings.

Wales also has a strong industry base across a number of advanced manufacturing sectors with expertise that can translate into the medical technology sector. Cross sector collaboration between these groups should be facilitated and encouraged. Greater collaboration between the medical technology sector, commercial property agents, architects and builders to generate new mixed 'fit for purpose' facilities and support the projected growth in the sectors also proposed.

Each of these opportunities could be progressed through the continuation of a sub-sector Special Interest Group tasked with improving collaboration between academia, industry and the NHS.

## SKILLS

The need for graduates whose skills meet the needs of the life science sector was expressed across all Focus Groups. In the Medical Technology Focus Groups, it was felt that there is a growing need for staff to be trained in GMP and that this could be delivered through engineering degree courses and bespoke courses for small businesses.

*"The Life Science Exchange has been for us a key partner in starting our healthcare business in Wales, and part of the attraction to being at the Institute of Life Science. Life Science Exchange has, since the very beginning, proven knowledgeable and proactive in providing us with information about funding, key stakeholders and potential collaborators and supporting us in building our supply chain and facilitating business meetings, with a same or next day service, and often at very short notice when we have sent a request.*

*We would certainly recommend the Life Science Exchange to anyone in the life science industry and are counting on the service to help support our innovation and business growth needs across the Medical Device, Diagnostics and eHealth sectors, in these critical early stages of our business."*

**- Dr. Ali Anjomshoaa, Managing Director, RhythmCare**





# NEUROSCIENCE

## OVERVIEW

Neuroscience collectively encapsulates all branches of science and technology which aim to understand and interact with brain function. This is not restricted to fundamental neuroscience research using cellular or model systems or brain imaging, but also includes neuropsychiatric genetics, animal behaviour studies, cognitive neuroscience, and clinical neurosciences including psychiatry, neurology, neurosurgery and clinical/behavioural psychology. Clinically, neuroscience addresses conditions such as dementia, depression, schizophrenia, epilepsy, acquired brain injury (trauma and stroke), learning difficulties, autism and other neurodevelopmental disorders. All these areas place a huge burden on the Welsh, as well as global, health services and economy. These challenges will only be addressed with an integrated neuroscience research programme of the type that Wales is well placed to deliver.

Brain disorders present some of the major societal challenges and health care needs. This is a critical time where advances in basic neuroscience research can be combined with large clinical cohorts and technology development to address these issues. Wales is now at the beginning of a new period when our knowledge will take a big step forward, and lead to major innovations in health and social care and commercialisation in the next few years and decades. This brings with it the potential of curing some neurological and mental disorders and ameliorating the impact of many others, making it an important area to invest in.

## STRENGTHS

Wales has internationally competitive strength in neuroscience that spans University, NHS and industrial sectors. Particular strengths lie in gene discovery and genomics, neuro imaging, medical technology, eHealth and is emerging in stem cell biology. Key anchor companies in Wales specialise in product manufacture and service provision for 'big pharma', including diagnostics, outsourcing of pharmacological testing and stem cell production. These could synergise well with the Universities, NHS-led research and local SMEs to offer robust foundations for the rapid expansion into a world-leading neuroscience research and development (R&D) community.

## CHALLENGES

Early on the Welsh Neuroscience Focus Group identified the need for a more cohesive, collaborative, and country-wide approach to neuroscience research, development and commercialisation. A neuroscience network has been established in North Wales to ensure the development and delivery of high-quality services. Furthermore, the Focus Group identified five areas of high potential where Welsh neuroscience could use additional support, which span basic research, clinical translation and commercialisation. These areas include:

- Genomic Medicine
- Neuronal Stem Cell Biology
- Systems Neurosciences
- Neuroimaging, Neuromodulation, and Medical Technology
- Informatics and eHealth

Furthermore, the continuation of Welsh excellence in neuroscience cannot be achieved without highly skilled people. Technical, research or managerial experience in the areas such as clinical provision, technology development and commercialisation or advanced skills in use of state-of-the-art neuroscience related technologies. The Welsh Neuroscience Focus Group has also recommended a sixth key area highlighting the need to be able to recruit, retain and train these individuals to achieve maximum delivery.

# OPPORTUNITIES

## A WELSH NEUROSCIENCE NETWORK

A Welsh Neuroscience Network should be tasked to coordinate strategic capacity building, support integration across University, NHS and Industrial sectors within the region and promote Welsh neuroscience on the global stage. Public involvement and support is critical to the success of technology development, its medical and commercial application and for the total Welsh neuroscience research effort. The Network would provide an interface to inform and involve the public from the very beginning.

## INFORMATICS AND COMPUTATIONAL ANALYSIS

Wales needs to ensure that HPC Wales is fully utilised and integrated into the neuroscience research network, and that there are plans for sustainability and development in the long term. It may be necessary to consider grants and scholarships to individuals and organisations to promote the uptake of training. In addition, a professional network to support, develop and promote best practice may act to enhance integration across sectors and research areas. Finally, Sêr Cymru support could be prioritised to recruit a world-leader in neuro computation or genomics.

## HIGH THROUGHPUT GENOMIC SEQUENCING

The capacity to carry out cost-effective high throughput sequencing is going to become vital across University research, NHS health services and commercial development. It is not only essential to develop and maintain this capacity for research and diagnostics, it also offers a clear opportunity to develop an information-based commercial regional export, particularly if this is coupled to the informatics and computing capacity described above.

## NEURONAL STEM CELLS

The ability to differentiate human neurons from stem cells will have a major impact on research, health provision and commercial activity of the future, and research in this area is an emerging strength within Wales. The ultimate success of these high potential medical and life science technologies will require a competitive and supportive environment to maximise research capacity. A key component not present within Wales is a collective stem cell core facility and supply chain. This currently places the region at a competitive disadvantage to other global leaders.

## ENHANCED CAPACITY FOR TRANSGENIC IN-VIVO RESEARCH

A vital component of basic and preclinical research in University and commercial sectors is the ability to create and study in-vivo systems which model disease states. Recent technology advances have revolutionised our ability to create genetic models. These new approaches will reduce time and cost, whilst increasing sophistication in the types of models. Currently, there is no academic or commercial transgenic provision within Wales, or even the UK, and researchers currently import them from overseas. There is a growing need, and major opportunity, for generation and supply of these new in-vivo models within Wales.

## SKILLED AND TRAINED WORKFORCE

The development of educational and training courses can provide and maintain the necessary skills and technical knowledge within the Welsh neuroscience sector to enhance the attractive pull of employment in industry, the NHS and universities. The Group propose the creation of a professional body of neuroscientists in Wales (aligned to the Welsh Neuroscience Network) which would develop a supportive community who would offer career development, including mentorship, and be a voice for all neuroscientists. Working with the Life Science Sector Hub, the professional body could monitor and advise on infrastructural and technical skills that are required for provision and competitiveness in technologies, such as PET and other imaging capabilities, informatics and cell-based therapies.



# PHARMACEUTICALS

## OVERVIEW

The term 'pharmaceuticals' is used collectively to encapsulate the institutions, departments, and people whose major activity is R&D of therapeutic products, which includes contract manufacturers, contract service organisations, and pharmaceutical wholesalers (as defined by the UK Department for Business, Innovation & Skills). This is not restricted to any particular technology, but does not include medical technology, medical biotechnology (i.e. biologics), or industrial biotechnology. Major clinical applications for pharmaceuticals include cancer, pain management, diabetes, hypertension, infection, and many others, which place a huge social and financial burden on Wales, as well as global health. These challenges will be best addressed with an integrated pharmaceutical R&D programme of the type that Wales is well placed to deliver.

In general, the pharmaceutical sector is a high-risk, high-value industry. It drives economic growth through 'multiplier effects' for employment, personal income, gross value added (GVA) and tax revenue, which also generates products that clearly benefit society and human health. For example, it has been shown that each job in the pharmaceutical sector provides almost double the average salary in the overall economy. Furthermore, pharmaceutical companies invest more than ten times the amount of R&D per employee than manufacturing industries overall. Research and development lies at the heart of the pharmaceutical industry, which invests more than any other industrial sector in the UK, with up to approximately £11.5 million spent every day.

## STRENGTHS

Wales has competitive strengths in the pharmaceutical sector that span university, NHS and industrial sectors. Particular strengths lie in drug discovery, clinical trials, and pharmaceutical services. Key anchor companies in Wales specialise in manufacturing and service provisions for 'big pharma', including cold chain logistics, manufacturing, drug delivery and clinical trials. These could synergise well with the universities, NHS-led research and local SMEs to offer robust foundations for the rapid expansion into the R&D community. Furthermore, Health Research Wales has identified opportunities to promote services of Welsh companies, universities and clinical trial units abroad.

## CHALLENGES

Drug development is a global enterprise which has become concentrated into a small number of large multinational companies. This industry is at a crossroads with a common experience that the massive research costs are not always returned in the rate of development of new drugs; as a consequence 'big pharma' is withdrawing and downsizing in many areas including some which are considered areas of major unmet needs. There is a crisis in drug development for many important clinical fields. As a consequence, we are moving into a new era, where research collaboration and commercial outsourcing are the norm. Wales has never been a core part of the global pharmaceutical industry, and this global change in pharmaceutical strategy presents opportunities, rather than threats, for Welsh life sciences. Industrial sector activity in Wales relevant to pharmaceuticals encompasses sub-sector activity in contract drug development and manufacture. These will benefit from the development of new technologies and the need for large companies to outsource.

Wales has key strengths in the pharmaceutical sector which make it competitive on the world stage. Although this is the case, stakeholders shared concerns regarding a lack of sector knowledge throughout each of the Focus Groups.

In order to bring more pharmaceutical activity, a range of activities need to be supported through policy and initiatives, including international marketing, NHS Wales clinical access, medicines adoption, academic research translation, and recruitment, retention and training.

# OPPORTUNITIES

## INTERNATIONAL MARKETING

Wales has considerable strengths in pharmaceutical manufacturing and providing clinical services. This is a key enabler for pharmaceuticals across the university, NHS and industry sectors and is the basis for strong therapeutics. Unified support to market these strengths internationally is required to grow the sector.

## NHS ENGAGEMENT AND CLINICAL ACCESS

This enables efficient delivery across the community, primary care practices and hospitals. One of the unique selling points for Wales is that the NHS is devolved and fully integrated, with only ten NHS organisations, (seven regional Health Boards and three NHS Trusts). A major stepping stone in the drug development process is engaging with lead clinicians to guide pharmaceutical research and development, especially when executing regulated clinical trials. Steps need to be taken to incentivise and promote clinical research at the institution and individual levels within NHS Wales.

## MEDICINES ADOPTION

Poor uptake of new drugs in the UK in general, but Wales in particular, is becoming a significant barrier to Wales' involvement in forthcoming commercial trials. NHS Wales and the All Wales Medicine Strategy Group should take into account first and foremost the impact on the patient (e.g. safety, efficacy) and cost-effectiveness to Wales, but should also consider the impact of their decisions regarding medicines adoption on the broader economic impact beyond healthcare budgets.

## SECTOR KNOWLEDGE

Academic research translation: Wales has a few strong case studies for translation of pharmaceutical innovations into commercial spinouts, e.g. Protides at Cardiff University. Nonetheless, the best pathway to commercialisation of a product or service is not always clear. Translation of pharmaceutical-related academic research into commercial products in Wales appears to require a cultural change. A greater level of academic, NHS Wales and industry collaboration needs to be forged.

## RECRUITMENT, RETENTION AND TRAINING

Recruitment, retention and training: A key driver for future success is the ability to attract and retain highly skilled individuals. Whilst the university sector can focus on the development of training and education in key skills, retention requires growing the life sciences cluster to provide sustainable employment opportunities across NHS Wales, academia, and industrial partners.

*"With the exciting current developments in the Welsh life sciences sector, it is important that initiatives such as the Life Science Exchange exist to bring key stake holders together on a regular basis to share experiences, knowledge and provide networking opportunities for the benefit of the whole sector."*

**- John Roberts, Commercial Director, Penn Pharma**

*"Life Science Exchange has been extremely proactive in helping me build networks within Wales which would have been difficult to establish otherwise; also, their organised events are professional and well run, covering topics relevant to both to my business and the wider international life sciences arena. A welcome addition to Welsh Government's support for the sector."*

**- Hedley Rees, Managing Director, Pharmaflow**





# REGENERATIVE MEDICINE

## OVERVIEW

Regenerative medicine encapsulates a wide range of technologies and applications for the benefit of human health. According to the United Kingdom's (UK) Technology Strategy Board (TSB), "Regenerative medicine is a broad term for innovative medical therapies that aim to replace or regenerate human cells, tissues or organs, to restore or establish normal function. It is not a single technology but a multidisciplinary approach, which can bring together tissue engineering, developmental and stem cell biology, gene therapy, cellular therapeutics, biomaterials (scaffolds and matrices), nanotechnology, bioengineering and chemical biology". The UKTI Life Science Investment Organisation (LSIO) claims that regenerative medicine products surpassed \$1 billion revenue in 2012 and are expected to grow to over \$35 billion by 2019. According to the Medical Research Council, "Regenerative medicine is an emerging discipline that holds the promise of revolutionising patient care in the 21st century. The UK is a leading player globally in the science that underpins regenerative medicine."

## STRENGTHS

UK strengths in regenerative medicine include a world-leading research base, a unified healthcare system providing access to large numbers of patients and a highly organised blood transfusion and transplant service. The UK is also at the forefront of much of the underpinning science in this area and regenerative medicine has been recognised by the Government as one of 'eight great future technologies' in which the UK can be world-leading. The TSB identifies regenerative medicine as an important area of investment focus in 2008. An initial £8m commitment in 2009 leveraged an additional £10m of Government Strategic Investment, along with support from the Research Councils for development of a £21m programme for companies developing regenerative medicine and cell therapies during 2009-12.

The Welsh University sector conducts world-leading research in the area of regenerative medicine. This is recognised by prestigious funding awards, for example, the Arthritis Research UK Biomechanics and Bioengineering Centre at Cardiff University and the UK Regenerative Medicine Platform's "Disease/Systems focused award" at Swansea University. A major anchor company operating within the regenerative medicine field in Wales is GE Healthcare, located on a 30-acre site in Cardiff. It is involved in delivering breakthroughs in R&D and in biopharmaceutical manufacturing. Wales also hosts a series of SMEs focussed on cellular therapies, wound healing products and artificial tissues and organs. Lastly, Wales boasts a range of support institutions, including, but not limited to the Cardiff Institute of Tissue Engineering and Repair (CITER), Great Western Alliance (GW4) and MediWales. These groups provide key guidance to and act as a voice for the regenerative medicine sector in Wales.

## CHALLENGES

Although Wales accounts for nearly 5% of the United Kingdom's (UK) population, the data from the UK Research Council & TSB's A Strategy for UK Regenerative Medicine (2012) state that Wales accounts for only 3% of the grant funding from UK Research Councils and TSB. Significant support will be required to grow the existing Welsh regenerative medicine sector and capture external opportunities. To show its support of regenerative medicine sector, on 1 April 2014, Welsh Government announced it was allocating up to £500,000 to support the TSB's funding competition for R&D projects designed to advance regenerative medicine and cell therapies. Economy Minister Edwina Hart stated, "Life sciences is one of our priority economic sectors and regenerative medicine is fast becoming an emerging area for Wales thanks to the presence of some world class researchers."

Current strengths and activities in the regenerative medicine sector have high potential to deliver impact and growth. These will lead to new clinical therapeutic strategies and health delivery; new products and commercialisation opportunities, but also feedback as part of a virtuous circle to support and grow our capacity to deliver world-leading research excellence. The Life Science Exchange Regenerative Medicine Focus Group proposes five areas of high potential where the Welsh regenerative medicine sector could excel in basic research, clinical translation and commercialisation.

# OPPORTUNITIES

## REGENERATIVE MEDICINE SPECIAL INTEREST GROUP

The Life Science Exchange has identified a key opportunity in the regenerative medicine sector to improve on leadership, organisation, information dissemination, communication, interaction, and collaboration Wales-wide. It is proposed that a Welsh Regenerative Medicine Special Interest Group (RMSIG) be formed, tasked to coordinate strategic capacity building, support integration across University, NHS and Industrial sectors within the region and promote Welsh regenerative medicine on the global stage.

## SECTOR KNOWLEDGE AND COMMUNICATION

Stakeholders have shared concerns regarding a lack of sector knowledge throughout each of the Focus Groups. Generally, there is a need from all stakeholders for a global view of the resources, infrastructure, activities, events, products and services that exist across the sector. In order to make the information about the Welsh regenerative medicine sector clear to stakeholders, (all) information relevant to the sector should be available through one initiative rather than several.

## NHS ENGAGEMENT AND CLINICAL ACCESS

A major stepping stone in the drug development process is engaging with lead clinicians to guide regenerative medicine research and development, especially when executing regulated clinical trials. Steps need to be taken to incentivise and promote clinical research at institution and individual levels. Support for Health Research Wales, clinician research time and research facilities is required to leverage the strengths of the Welsh regenerative medicine sector.

## ENHANCED RESEARCH CAPACITY

Wales has world-leading regenerative medicine research developing within academia and industry. Nonetheless, there is not always a clear idea of the route to commercialising a product or service. Translation of regenerative medicine-related academic research into commercial products in Wales requires greater support for collaborative research facilities, information (see Sector knowledge and communication, above) and commercial incentives.

## INTERNATIONAL CONFERENCES

Wales has considerable strengths in the regenerative medicine sector. This is a key enabler for regenerative medicine across the University, NHS and industry sectors and has the basis for strong therapeutics. Unified support to market these strengths internationally is required to grow the sector.

*“Reconstructive Surgery and Regenerative Medicine is a rapidly expanding area of research excellence in the College of Medicine at Swansea University. The LSE has organised a set of workshops focused on regenerative medicine, exploring the strengths and opportunities in Wales. These have been very useful in understanding the landscape in Wales, and clearly seeing the strengths that Swansea's College of Medicine and Centre for NanoHealth bring to this important area of growth in Wales.”*

**– Prof. Steve Conlan, Director, Centre for NanoHealth**





# CASE STUDIES

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*The Life Science Exchange delivered a range of events and activities throughout the two-year project.*

*The following case studies provide a flavour of what the project has supported to date.*



## THE PHARMACEUTICAL SECTOR IN WALES: AREAS OF FOCUS

**WHEN** 10th February 2014  
**WHERE** Waterton Centre Bridgend  
**WHO** Life Science Exchange and ABPI

This event was designed to gauge the strengths, weaknesses and opportunities within the pharmaceutical sector from the perspectives of Welsh academics, NHS representatives and pharmaceutical businesses. Attended by around forty delegates, the day included presentations from opinion leaders in the sector:

- John Roberts, Penn Pharma - GMP development and manufacture of new medicines
- John Harris, ABMU Health Board - NHS Perspective: Pharmacy and ABMU Health Board
- Hedley Rees, PharmaFlow - Wales, Supply Chains and the opportunities
- Marc Clement, Swansea University - Academic perspective: New Developments

The panel of speakers were joined by Sian James (Health Research Wales) and Joanne Ferris (ABPI Cymru) in a panel discussion to answer questions, with interactive contributions made by members of the audience. The Life Science Exchange then used the information gathered at the event to inform focus group discussions and to help for the recommendations presented in this report.

**Output:** This event resulted a number collaborative projects moving forward, including a GlaxoSmithKline workshop for respiratory diseases arranged by SEWAHSP and a Pharmaceutical Special Interest Group by MediWales.



*"Life Science Exchange and ABPI Cymru Wales co-sponsored an event 10th February, 2014 in South Wales, attended by colleagues from the pharmaceutical industry, academia, Welsh Government and NHS Wales. The administration of the event was handled entirely by LSE seamlessly. We look forward to working with them further."*

- Joanne Ferris, Operations Manager, ABPI Cymru

*"We have been working closely with the LSE and have found their networking, engagement and support to be highly valuable. For example, they recently ran an exemplary event 'The Pharmaceutical Sector in Wales - Areas of focus'. This event was extremely well attended with representatives from the widest breadth of the Sector; ranging from local SMEs to the biggest global organisations, and yet small enough to make introductions. This has led to further collaboration with a workshop with GSK focusing on how we can develop joint R&D in the areas of COPD and Asthma. These are key areas for improving the Health and Wealth of Wales."*

- Robyn Davies, Manager, Cardiff University



## EPSRC SANDPIT EVENT: BRIDGING THE GAP

**WHEN** 21st May 2014  
**WHERE** National Waterfront Museum  
**WHO** Life Science Exchange and ehi<sup>2</sup>



Swansea University  
Prifysgol Abertawe

### EPSRC

Pioneering research  
and skills

This EPSRC funded event aimed to promote ideas for innovative new technologies and methods for the effective management of chronic conditions in the NHS. A large group of forty delegates from academic, industrial and clinical backgrounds were mixed together in working groups. Each group considered current NHS chronic diseases management and identified the areas of 'unmet need'. The discussions continued to conceptualise solutions to the identified gaps, while identifying opportunities for new collaborative projects. The event provided a valuable forum for networking and ideas sharing between the numerous disciplines represented.

**Output:** The sandpit produced several project ideas, one of which resulted in a significant NISCHR/NIHR i4i grant application awaiting final stage approval.



*"The participants at the Sandpit event have generated a number of exciting ideas regarding effective management of long-term conditions, affecting two-thirds of the UK population and is an increasing burden to the NHS. More than just a networking event; it has facilitated the formulation of novel and exciting ideas, where participants can develop these ideas further and work together through research grant applications."*

- **Dr Vincent Teng**, Swansea University

*"There was a good deal to be positive about. I will be putting together a strong proposal for grant funding with the organiser, and would be interested to see more proposals coming forward as a result of the event."*

- **Iain Elder**, Managing Director, Pulse Medical Technologies Ltd

*"I believe there is a mutual benefit for industry and healthcare from these Sandpit events. Industry does not always have appropriate access to those on the ground within healthcare systems, while healthcare workers, patients and carers are not immediately likely to turn to industry to help them solve an identified problem. There were clearly a few light bulb moments where participants suddenly understood why certain problems exist. By engaging all parties and engendering mutual understanding the first steps can be made on bridging this gap."*

- **Dr Robin Clark**, General Practitioner

*"The sandpit was a great environment for freely discussing new and innovative project ideas. I was impressed with the range of expertise at the event, and came away from the day with some really strong connections."*

- **Gavin Jones**, EKF Diagnostics





# EHEALTH ABMU SBRI

**WHEN**  
**WHERE**  
**WHO**

11th December, 2013  
Village Hotel, Swansea  
Life Science Exchange, ehi<sup>2</sup>, Swansea University and ABMU Health Board



ehealth industries  
innovation centre

One of the projects the eHealth group identified was the three-year Small Business Research Initiative (SBRI) Catalyst Programme, also funded by the Technology Strategy Board, which aims to boost the research and development industry, increase commercialisation of new technologies and create jobs and wealth.



Swansea University  
Prifysgol Abertawe

A project to improve Abertawe Bro Morgannwg University Health Board in partnership with Swansea University has received £800,000 funding towards their £950,000 project to support health services in Swansea, Bridgend and Neath Port Talbot through the better use of patient records and data.



GIG  
NHS  
Abertawe Bro Morgannwg  
University Health Board

The SBRI came about following a simple discussion in an eHealth focus group, which was led by a member who had prior experience of undertaking SBRI's outside of Wales. Also at that meeting was the manager from the eHealth Industries Centre in Swansea University who subsequently identified the SBRI opportunity and engaged with ABMU. ABMU identified a challenge and have been extremely receptive and supportive of the SBRI process. The eHealth group then discussed the opportunity and many attended the two events hosted by Life Science Exchange with ehi<sup>2</sup> and Welsh Government.



Several companies have subsequently been selected through an application process and have been awarded a contract to find the best way to use data from Swansea University's Secure Anonymised Information Linkage (SAIL) databank to improve services.

**Output: £800,000 grant for eHealth Small Business Research Initiative (SBRI).**

*"The unique SAIL databank allows us a more complete picture of an individual's health records from a variety of sources. This will help us better understand the health needs of our citizens and predict how these might change in the future. It will also help us monitor the effectiveness of measures we are taking now to improve public health, such as tackling childhood obesity and reducing levels of smoking. We expect it will also lead to a much more efficient use of resources and help us improve the services our patients need and improve the health and well-being of the communities we serve."*

- **Professor Andrew Davies**, Chairman, ABMU Health Board

*"I am absolutely delighted that we will be working with ABMU to help them to engage with innovative companies to deliver new ways in which the SAIL Databank can be used to support ABMU's work. Our partnership with ABMU and companies that will become involved in the initiative will undoubtedly develop some outstanding new software products that leverage the power of SAIL databank for patient benefit."*

- **Professor David Ford**, Co-Director, SAIL

*"The Welsh SBRI Innovation Catalyst Programme is a new collaboration between the Welsh Government and the Technology Strategy Board. By encouraging new innovative public sector projects, this programme will create more research and development contracts for Welsh businesses to bid for, helping that sector to grow and create jobs. I hope that, ultimately, SBRI will be used throughout the Welsh public sector for promoting innovation and providing new opportunities for businesses in Wales."*

- **Edwina Hart**, Economy Minister



## SIGNPOSTING AND BID FACILITATION

**WHEN** January 2014  
**WHO** Life Science Exchange, ABMU Health Board and AliveCor



US company AliveCor manufacture a cost effective heart monitors that can be used with most mobile technology. In January 2014, the Welsh Government introduced AliveCor to the Life Science Exchange project team. The Life Science Exchange and Prof. Halcox of Swansea University identified cardiologist Dr. James Barry as an appropriate champion to lead a collaborative Health Technology and TeleHealth Fund bid. The Life Science Exchange introduced Swansea University Health Economist Prof. Ceri Phillips and Prof. Mike Gravenor, who were able to address important health economics and statistical analysis elements of the project, respectively. The Life Science Exchange team continued to contribute with input into the governance, project management, value creation and economic value sections of the bid as well as obtaining an essential letter of support from the ABMU R&D Office.

**Output:** In April 2014, the bid for £652,208 with £120,000 inward investment from AliveCor.

*“The Life Science Exchange provided an invaluable service while preparing a successful Health Technology and Telehealth Fund bid. The professional networking and administrative assistance as well as guidance were all very useful resources to be fortunate enough to have access to.”*

– **Dr. James Barry**, Consultant Cardiologist and Electrophysiologist, ABMU Health Board

*“Small, disruptive innovators such as AliveCor need access to networks such as the Life Science Exchange as they are vital to stimulate new ideas, innovations, and opportunities for collaboration. Working with Life Science Exchange, we were able to find the appropriate collaborators, which resulted in us securing a significant grant. Further to the grant, they continue to support our inward investment activities from the United States into Wales.”*

– **Francis White**, EU General Manager, AliveCor

*“We are pleased about the work that Morriston Hospital, Swansea University and the Welsh Government will be conducting with the AliveCor Heart Monitor. It is our hope that we can help give more patients across the world with suspected or diagnosed heart conditions, and those at risk of heart conditions, the ability to track their heart health anytime, anywhere.”*

– **Euan Thompson**, President and Chief Executive, AliveCor



# PHARMACEUTICAL SUPPLY CHAIN EVENT

**WHEN** June 2014  
**WHERE** Norgine, Hengoed  
**WHO** Life Science Exchange, Norgine and MediWales



In June 2014, MediWales facilitated a Life Science Exchange Sandpit. The event, hosted at the Norgine factory in Hengoed, was attended by 23 delegates from 13 companies, universities and healthcare providers, all of whom are involved in pharmaceutical research, drug development, formulation, manufacture, packaging, trials or distribution.

As a result of the meeting the group have identified an opportunity to work together to deliver and promote a full range of services to the pharmaceutical sector. Under the brand name Clinical Trials Services Wales, with ongoing support from MediWales, the group will continue to meet regularly. They are now developing a brand identity, mapping clinical trials services in Wales against the pharmaceutical route to market and developing marketing, promotional material and a programme of activity for the coming year.

**Output: Clinical Trials Services Wales Pharmaceutical Special Interest Group.**

*"The LSE has played an important and timely role in the flourishing life sciences sector in Wales. It has strongly supported the development of the Hub via the dissemination of information and has also fed back valuable data to the Hub from its groups. The networking and knowledge exchange activities the project undertakes are very valuable to the Hub and the Life Science sector as a whole. I look forward to working with the excellent staff in the LSE as we move into operational mode in the Hub."*

- **Professor Chris McGuigan**, Executive Chair, Welsh Life Sciences Hub

*"Health Research Wales has participated in all the LSE working groups which address all aspects of the Life Science ecosystem in Wales. As a result, Health Research Wales has gained many valuable insights into the requirement of industry and academia, which prove invaluable to the delivery of Health Research Wales' services."*

- **David Powell**, Industry Manager, Health Research Wales

*"LSE stimulated great interest in Welsh Companies wanting to do business abroad and also enabled us to attract a number of new clients to whom we have promoted the Enterprise Europe Network together with the Welsh Government's initiatives to support local business. Thank you LSE - great team work!"*

- **Lawson Coombes**, Business Development Officer, EEN Wales



## CONCLUSIONS

The Life Science Exchange project strived to deliver true engagement with the Welsh life science sector in order to provide authentic insight into the strengths, challenges, and opportunities for Wales. The significant contribution made by representatives from the Welsh life sciences academic, industrial and clinical organisations has culminated in the detailed findings of the Life Science Exchange project. This report provides evidence of the appetite of these stakeholders to work together in order to address the challenges and take advantage of the opportunities in this exciting sector. Detailed conclusions have been made by each of the sector Focus Groups with a number of both common and unique themes across all of the groups.

There is a recognised need for the discussions instigated by the Life Science Exchange to continue into the future. In some cases, specific challenges and opportunities need to be crystallised into detailed proposals with specific objectives, deliverables, budgets and time-scales. A number of organisations have expressed the desire to maintain the momentum of their respective Focus Groups as Special Interest Groups operating under the Life Science Exchange brand.

The need for an accessible, cost-effective, up-to-date source of sector specific information relating to funding, regulation, international trade and market intelligence has been consistently expressed by the stakeholder Focus Groups. This represents a significant and ongoing opportunity to provide Welsh life science organisations with a valuable resource offered in addition to what is currently available.

The vital role that the Welsh NHS plays in providing access to clinical expertise, facilities and ultimately as a customer has been widely expressed. While the relationship between the NHS, academia and industry in Wales is considered to be a significant national strength, there is a need to improve the evaluation and adoption of new Welsh innovations when they can demonstrate the opportunity for improved patient outcomes and cost savings. Furthermore, academics and industry expressed a strong desire for NHS Wales to increase its level of engagement and receive clinical access for research and development.

Significant strengths in Wales' life sciences research activity have been demonstrated across the entire Welsh life sciences sector. To build upon these strengths, further support through provision of facilities and resources is required to close specific gaps in research capacity.

A key driver for future success is the ability to attract and retain highly skilled individuals. Whilst the University sector can focus on the development of training and, where feasible, accredited education in key skills, retention requires growing industrial SME clusters to provide sustainable employment opportunities across Wales. An all-Wales life sciences skills group consisting of key academics has organised discussions on delivering apprenticeships, CPD and degree-level training in close collaboration with Welsh Government, NHS Wales and the life sciences industrial sector.

The Focus Groups make a strong case for ongoing support for international trade and promotion. Most life science sector products occupy global markets and numerous Welsh companies sell the majority of their products outside of Wales. To support this activity, Focus Groups have requested continued or additional support to attend trade shows and conferences.

The output of the Life Science Exchange is a valuable body of intelligence that represents the collective expertise of a wide range of expert contributors. This work should serve to inform future policy and planning across the sector and will help to align support activities with the needs of companies, universities and health care providers. Specific, actionable recommendations have been provided in the detailed reports provided by the Life Science Exchange to the Welsh Government. Ultimately, this work should be used to improve innovation, health, and the wealth in Wales.

Last, but not least, the Life Science Exchange process must be applauded for bringing together hundreds of stakeholders in a sub-sectoral approach to the Welsh National Innovation System. This has resulted in a multitude of collaborations, projects, inward investment opportunities, and special interest group formations, in addition to securing over ten times its weight in funding for Wales. Processes such as the Life Science Exchange should be continued to be supported by the Welsh Government and the process can be held up as a shining example of best practice for knowledge exchange to the rest of the world.

# DELIVERY TEAMS

## PROJECT LEAD

Professor David Ford

Swansea University

## FOCUS GROUP CHAIRS

Diagnostics  
eHealth  
Medical Technology  
Neuroscience  
Pharmaceuticals  
Regenerative Medicine

Gwyn Tudor  
Jon Smart  
Gwyn Tudor  
Jon Bisson  
Brian Lee Perkins  
Phil Stephens

MediWales  
Swansea University  
MediWales  
Cardiff University  
Swansea University  
Cardiff University

## STEERING GROUP

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Carys Thomas  
Greg Baily  
Gwyn Tudor  
Ifan Evans  
Jon Bisson  
Jon Smart  
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Mike Day  
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Steve Bain  
Steve Conlan  
Terry Stubbs

Swansea University  
NISCHR  
Life Science Exchange  
EST, Welsh Government  
NISCHR  
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The Academic Expertise for Business Fund (A4B) is managed by the Welsh Government's Department for the Economy and Transport, and is financed by the Welsh Government and the European Union