

Issue 27  
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nexxusscotland.com

# nexxusnews

Connecting & communicating life sciences in Scotland



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a leading centre for science and research

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## Nexxus Events

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### SME TOOLBOX

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Edinburgh

### HORIZONS IN BIOMEDICINE

Parasitology/Infectious  
Diseases  
27 September 2010,  
Edinburgh

### NEXXUS BIOSCIENCE CLUB

Career Paths in Life Sciences  
4 October 2010, Edinburgh

### SPEEDNETWORKING

5 October 2010, Glasgow

### HORIZONS IN BIOMEDICINE

Synthetic Biology  
20 October 2010, Glasgow

### HORIZONS IN BIOMEDICINE

Ageing  
28 October 2010, Edinburgh

### NEXXUS AWARDS (WEST AND EAST)

Annual Nexxus Life Science  
Awards and showcase of  
images for the Nexxus 2011  
Life-Sci Visions Calendar  
10/16 November 2010,  
Glasgow/Edinburgh

For further info about the  
above free events see  
[www.nexxusscotland.com](http://www.nexxusscotland.com).  
NB some dates still tbc.

## Other Scottish Events

### WS SOCIETY LIFE SCIENCES CONFERENCE

(supported by Nexxus)  
23 September 2010,  
Edinburgh

# Changing landscapes



**AS I WRITE**, the web is filled with chat about the Sanofi-Aventis acquisition of Genzyme and it is only a few weeks since, regrettably, MSD announced its intention to close its operation in Newhouse. It is clear that the certainties of the past are just that. As we move into the second decade of the new century the landscape in life sciences is changing ever more rapidly, new issues are being faced and new opportunities are there to be seized. It goes without saying that Nexxus will do whatever it can to support Scottish life science in these times.

And so it was serendipitous that I came across an article in the Sunday Times Magazine that claimed that the 1960's hippie band - the Grateful Dead - were the inspiration for world leading companies such as Apple, Google and Yahoo! I had never gone to a 'Dead' gig or even been aware of listening to their records, so was intrigued by the idea that Apple et al used the 'Dead' as a business model and

'...to improvise, to embrace errors as a source of learning and to listen.' The claim is that companies such as Apple have brought a fan-like passion into customer relationships. I don't want to carry this comparison too far but at the height of their success the band was grossing \$100M per year - so perhaps there is money in learning from setbacks, building community and really knowing your customer.

Apart from securing and keeping customers, one of the most frequently raised issues in the Nexxus community is the availability of finance for growth. It is often a topic for debate at Nexxus events and on the LinkedIn group. With this in mind, I attended a meeting of European financiers and Bioregions to discuss innovative financing for biotechnology. It is a source of pride that Scotland is recognised as a key player both in terms of its companies and the support infrastructure and there was a great deal of interest in the Nexxus presentation. More importantly there was agreement on a number of follow up actions, such as forming a European network of life science/biotech angel investors and helping companies access European Investment Bank (EIB) funding. We will be working on these over the next few months and I will keep you informed of developments.

I also had the pleasure of hosting the first get together of Nexxus LinkedIn Group members. The aim was to build on the thread about lessons to be learned from the life sciences industry in Israel. It was a very

insightful discussion, especially when you consider that Israel had less than 10 VCs with \$100M in funds in 1992 and that this has risen to 80 local firms with over \$10BN in funds in 2010 - now that's what I call community building.

I can't end without a shameless plug for our new 'water cooler' mentoring service. The aim of this service is to provide guidance on business issues - from little niggling questions to big, overarching business challenges - over a quick telephone call or cup of coffee. We have managed to secure the services of some of Scotland's leading life science entrepreneurs to share their experience and knowledge. So if you are you looking for a mentor - or perhaps you'd like to offer your services as one - contact one of the Nexxus team to take things forward.

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PS I look forward to seeing you at some (or all) of the many exciting events we have planned between now and the end of the year - see left for details. If there's something specific you'd like us to run an event on, just get in touch.

# Antibody drug conjugate experts

## PIRAMAL HEALTHCARE LTD

is a global pharmaceutical and healthcare company specialising in development and manufacture of innovative drugs as well as contract research. It is one of the largest custom manufacturing companies in the world, with consolidated revenues of \$770M in 2010 and a global footprint of assets across North America, Europe and Asia.

The Piramal Healthcare facility located in Grangemouth, Scotland is part of the larger Piramal Group based in India. Worldwide the pharmaceutical solutions division has 5 facilities in India, UK operations at Morpeth, Grangemouth and Wilton, as well as Torcan in Canada. The Group spans a broad spectrum of industries including healthcare, contract manufacturing, diagnostics, original drug discovery, glass manufacturing, and real estate. Led by one of India's most dynamic business visionaries, Mr Ajay Piramal, this set of diverse business ventures as a whole aims to offer sustainable support to populations in need through programmes in disease prevention, education, hygiene and access to healthcare.

The Group is committed to fighting globally pervasive problems like poverty and exclusion by reducing the burden of disease.

Piramal Healthcare's Grangemouth facility is one of a very limited number in the UK and Europe that offers integrated, single-site experience and capabilities across both conventional pharma synthesis and bioprocessing of high potency compounds - a unique combination of skill sets required for successful antibody drug conjugate (ADC) development. These compounds - antibody drug conjugates (ADCs) - combine a cancer-defeating toxin attached to a specific antibody. They represent a novel means of delivering a synthetic, potent drug to tumour cells while also limiting the drug's effect on normal non-cancerous cells and are yielding positive outcomes in previously untreatable cancers. The ADCs are a special focus of Piramal's development and manufacturing facilities in Scotland.

The Grangemouth facility has been a major contract manufacturer of such cytotoxics since the late 1980s. Having

manufactured over 200 ADC batches at scales ranging from 2 - 500g, Piramal considers itself as a leader in ADC process technology and manufacturing.

In August 2009, Piramal announced a further investment in its production facility for high-potency substances, such as the ADCs, at the Grangemouth facility. The two-year, £1M investment is now underway to prepare and validate one of its 6 production suites for commercial scale production of ADCs. The project received funding from Scottish Enterprise and will support the planned launch of an ADC currently in development by a US biotech company, with which Piramal has worked closely for years.

The ongoing expansion begun in 2009 follows an investment of \$270,000 in 2008 to commission a sixth cGMP scale-up suite and a \$500,000 programme in 2006 which added more cGMP capacity for clinical trial material manufacturing. Piramal currently has 3 ADC-dedicated manufacturing suites at Grangemouth, a suite dedicated to the manufacturing of a veterinary prostaglandin, and suites available for expansion. The site has specialised R&D, QC laboratories and experienced staff who develop and scale up ADC processes with the necessary specialist analytical methods. The site has a long history of knowledge and compliance allowing it to provide an expert service to the growing interest from the pharmaceutical industry in ADC technology.

With current activity across over 20 different products for a range of global pharma and biotech customers, business growth -

especially for early phase bulk drug substance supply - has seen employment numbers at the site double to 90 in just over 2 years.

'The unique aspect of Piramal is a combination of our people, facilities and location,' said Stewart Mitchell, Piramal's Grangemouth Site Lead. 'Our highly experienced staff give us the capability to work with cutting edge technology, and work closely with clients and partners to overcome technical and scientific obstacles that arise in scaling up processes from laboratory to manufacturing for clinical trials and commercial manufacture.'

Many of the employees at Piramal's Grangemouth site are specialist scientists including protein scientists, organic chemists, analytical chemists and microbiologists.

Looking ahead, the company is assessing opportunities to widen its product portfolio to expand its capabilities even further. Simultaneously, the company will be shepherding several of its compounds from clinical trial stage through to market launch and commercial manufacture.

'In the end, the most thrilling thing for us is that with every success we have in the development and manufacture of innovative drugs, we're making a meaningful difference to people's lives,' said Stewart.

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# Life sciences in Germany



**TWENTY YEARS** after German reunification, Berlin is Germany's political capital, a cultural metropolis, an attractive business location and one of Europe's leading centres for science and research.

Life sciences have been one of the main focuses of the innovation policy in Berlin-Brandenburg for more than 10 years now.

The conditions in this region of Germany were ideal for building up a productive biotech cluster with international influence. The high number of research facilities concentrated in the area leads to an almost inexhaustible pool of resources from which many young, innovative companies have emerged.

Today more than 190 biotech companies work in the Berlin-Brandenburg region. Many of them are spin-offs from the 9 universities and 15 research facilities of the Max Planck and Fraunhofer Societies as well as the Helmholtz and Leibniz Associations, where approximately 350 work groups are engaged in life sciences research. Thanks to the commitment of the states' governments, 6 biotechnology parks were created, providing ideal

starting conditions for young companies in particular. The parks differ in their offerings and strategic focus, and provide good conditions for a range of newcomers. More than half of the companies in the cluster have taken advantage of the infrastructure of a publicly or privately managed park.

## Efficient networks

Nowadays research and development in high technology segments are furthered by a worldwide flow of know-how and by international cooperation. A cluster can never be self-sufficient. Rather it is a point marking a hub on the international roadmap. When you look closer though, you will find out that this point is a dense network itself.

The biotech region of Berlin-Brandenburg is a very good example of such a place. The concentration of expertise in core areas of biological basic research, biotechnology and biomedicine is a special characteristic of the region. These areas, and the potential for collaboration and interaction they offer, form the basis of Berlin-Brandenburg's status as

an internationally recognised centre for life sciences.

Owing to these strengths, many stimuli from outside can be integrated. The close relationship of strong partners from science and industry within the networks ensures an efficient transfer of technology and thus the fast implementation of results from basic research into widespread use.

The networks in the region dedicate themselves to areas such as drug discovery and development, the combination of microsystems technology and biotechnology, bioinformatics, functional genomics, glyco-biotechnology, molecular diagnostics, nutrition and plant genome research, structural biology, regenerative medicine, and RNA technologies as well as industrial biotechnology.

The close interlocking of basic research with clinical research is another great strength of the region. The Charité, being one of the biggest university hospitals in Europe with more than 2,000 scientists, provides research facilities as a competent partner for clinical research covering all indication areas. Clinicians and

basic research scientists work together under one roof in special centres like the Experimental and Clinical Research Center (ECRC), the Berlin Brandenburg Center for Regenerative Therapies (BCRT) or the NEUROCURE excellence cluster.

## BioTOP Berlin-Brandenburg

At the interface between science and business, BioTOP Berlin-Brandenburg supports a wide spectrum of networking and technology transfer in biotechnology. BioTOP was founded in 1996 by the 2 federal states Berlin and Brandenburg. It is not a membership organisation and hence receives no fees from companies. Instead, funds for the not-for-profit organisation come from local government, the European Union, and income generated from various projects. It is part of the TSB Technology Foundation Berlin Group, an independent regional organisation that sponsors science and research in selected technology sectors, promotes innovative projects, and conducts strategic dialogues on technology policy matters in Berlin.





BioTOP has close links to various other bioregions. It is a member of the Council of European Bioregions (CEBR) as well as the Scanbalt Network. The Director of BioTOP, Dr Kai Bindseil, is the spokesman of the Council of German Bioregions.

The key services provided by BioTOP include:

- Technology transfer between science and industry
- Initiation and support of networks
- Support for technology-oriented start-ups
- Funding support for innovative projects
- Building and coordination of scientific and interdisciplinary networks, and establishing contacts between experts from all disciplines
- Design and organisation of events
- Public relations work for the biotech region Berlin-Brandenburg

## On a growth curve

Approximately 10 new biotech companies are founded in Berlin-Brandenburg every year. Due to this, almost 200 companies are now based in the region and the industry is well represented. The companies are young and innovative, which means that many of them are also still small. They typically focus on research and development, their business concepts primarily aim at co-operation with big pharmaceutical and chemical enterprises. Companies like this do not represent dramatic growth but sustainable growth with an annual increase in jobs of about 5 per cent over the past 10 years. And they attract the attention of international life science corporations and bring them into the region. In this way companies like Sanofi-Aventis, Pfizer, Shire,

DSM, STRATEC and Thermo Fisher Scientific have come to the region in recent years. The internationally leading contract research organisation Parexel also has a branch in Berlin, employing 1,500 people.

Together with the companies in medical technology, the biotech companies are the technological basis of, and thus a driving force behind, the altogether well positioned health industry in Berlin-Brandenburg. The region is home to 6 million people who are not only potential customers but also a pool of highly qualified potential employees. The availability of well-educated staff is a key priority when companies look for places to locate their activities. Due to the number and high quality of regional research institutions and educational institutions in the area, the Berlin-Brandenburg biotechnology cluster is able to provide the human resources needed for high level R&D activities.

Dr Kai Bindseil is very confident about the future of the Berlin-Brandenburg life science cluster. 'In the late 1990s,' he said, 'the Berlin biotech industry started almost from scratch. Due to excellent scientific institutions and strong political support, today the region has a leading position in Europe. At the moment we are putting a strong emphasis on molecular diagnostics, regenerative medicine and drug development. These are major innovation areas for the rapidly growing health sector.'

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 W: [www.biotop.de](http://www.biotop.de)

# CRO news

**BIOOUTSOURCE LTD** has recently formed a strategic alliance with Millipore Corporation, a leading provider of technologies, tools and services for the global life science industry. The industry knowledge, scientific strength and modern facilities of the 2 companies combine to offer a world-class biosafety testing partner that biopharmaceutical manufacturers can rely on as an extension of their own quality assurance teams.

The collaboration will enable Millipore and BioOutsource to bring a full range of biosafety services to industrial clients who seek a world-class supplier.

'This alliance offers manufacturers a new alternative for contract testing which will allow them to deploy their resources in other critical areas. For example, these resources can be refocused on drug development or manufacturing and ultimately reduce a product's time to market. The complementary nature of both companies' offerings means customers can benefit from a best-in-class biosafety portfolio, with technical and scientific strength second to none,' said Andrew Bulpin, Millipore's VP, Services and Solutions and Upstream Processing.

**ClinTec International** unveiled a significant expansion into the US marketplace in July, with the launch of its New York office.

To date, ClinTec has grown its business operations organically from its European

base and expanded into over 40 countries worldwide - with its US operations centred on servicing major international companies on global projects by partnering with US CROs that had no or limited international presence. The launch of American headquarters will enable ClinTec to offer prospective US clients the chance to access global clinical research capabilities through a single partner.

President & CEO of ClinTec, Dr Rabinder Buttar commented, 'Our new Associate Director of (US) Operations, Susan Pavone, has extensive knowledge of international clinical research and the new US facilities will prove an invaluable asset to American companies looking to tap into our globalised resources and expertise.'

And earlier this year, **Vitrology Limited** was approved as a subcontractor for research and development projects by the French Ministry of Research.

The approval process required the company to present a recent development project that demonstrated their competence as a subcontractor and as an innovator. Private companies subject to corporate tax in France will now be able to claim R&D tax credits for work subcontracted to Vitrology. The organisation already has a number of French companies amongst its client base and this agreement will support future business growth.

# Time saving technology

**WHETHER STARTING** a company, researching an idea, or trying to get a project done by deadline - time is at a premium for scientists. Here are just a few recent technological developments that can help make certain aspects of scientific research more efficient. If you have time saving tips or technologies to share, let us know at [info@nexxusscotland.com](mailto:info@nexxusscotland.com)!

## Behaviour recognition solutions

Actual Analytics develops behaviour-recognition solutions for industry and academic laboratories across Europe, Asia and North America to help increase data quality and reduce costs. This allows researchers to spend more time analysing results, rather than capturing data.

Analysing animal behaviour is central to early drug development, yet available technologies for collecting, interpreting and managing behaviour data lag behind those available in other fields. As a result, behaviour analysis is typically time-consuming work with highly subjective results.

'Our technology ensures this data is captured in an objective fashion, improving the quality of the data on which decisions are made, whilst also significantly reducing the time involved,' said Neil Campbell.

The technology takes video footage of animals and automatically identifies specific behaviours. The solution was developed as part of work

undertaken at the University of Edinburgh where *Drosophila* (fruit fly) studies yielded quantities of data unfeasible for manual processing.

Later this year, Actual will release 2 new products priced to suit academic labs and specifically designed for rodent, Zebrafish and *Drosophila* research, which are intended to save time and improve data quality.

Actual are keen to hear from academic labs undertaking behavioural work and would be delighted to speak with Nexxus members about Actual's Founders Network which gives early access to products pre-release at significantly reduced costs.

*Further information from Neil Campbell - T: 0131 208 3934, E: [getintouch@actualanalytics.com](mailto:getintouch@actualanalytics.com) or see [www.actualanalytics.com](http://www.actualanalytics.com).*

## ScreenTape

ScreenTape provides a fast solution for automated electrophoresis of DNA, RNA and protein. The DNA ScreenTape range is applicable in clinical laboratories in the molecular diagnostics market as well as in university, pharma and bioprocessing research and development activities.

The system comprises a consumable - ScreenTape; an instrument - the TapeStation; and a choice of software packages for research and diagnostics. ScreenTape was designed by Lab901 specialists including molecular biologists, biochemists, polymer scientists and engineers.



The RNA ScreenTape is initially targeted at RNA quality control and provides users with an objective metric for assessing total RNA degradation. ScreenTape allows for streamlining of complex protein purification workflows.

Richard Rowling, Sales and Marketing Director at Lab901 said, 'By using ScreenTape, our customers can achieve considerable efficiency gains. On multiple protein and antibody analysis, SDS-PAGE and full analysis can be completed within minutes instead of hours. This is particularly important to customers seeking to achieve more with fewer resources. The speed and versatility of ScreenTape cut out hours of detailed analysis in a single run.'

'One client in Korea uses ScreenTape to test for respiratory viruses, including avian and swine flu. We're able to automate the analysis of these tests so results are delivered within minutes.'

*Further information from Richard Rowling - E: [RRowling@Lab901.Com](mailto:RRowling@Lab901.Com) or see [www.lab901.net](http://www.lab901.net).*

## Electronic lab notebook

Axiopie, a spinout of Edinburgh's Informatics Division, released the latest version of its online electronic lab notebook, eCAT, in July.

eCAT 3.3 lets lab members create, import and share research data; communicate using a simple notifications system; and work in the lab or remotely in a secure, integrated collaborative environment.

Rory Macneil, Axiopie's CEO said, 'Scientists don't have time to adopt tools with a steep learning curve, but they want to work in an integrated electronic environment. eCAT's interface is modelled on Google Docs, and it's a big step beyond wikis, which are often the first collaborative tools labs try.'

Professor Mike Shipston, Director of the University of Edinburgh's Centre for Integrative Physiology, whose research includes molecular biology, protein biochemistry, high resolution cell imaging, and animal behavioural studies, started using eCAT in his lab earlier this year.

Mike says, 'We have a lot of people coming into the lab for short periods and our biggest challenge is keeping track of that data and integrating it with existing projects. With eCAT, each member of the lab has their own folders for their experiments, but it's easy to integrate it together.'

*Further information from Rory Macneil - T: 0131 516 2963, E: [rmacneil@axiopie.com](mailto:rmacneil@axiopie.com) or see [www.axiopie.com](http://www.axiopie.com).*

# Infrastructure boost

## THE WELLCOME-WOLFSON

Capital Awards initiative recently invested more than £30M in large-scale university infrastructure projects across the UK. Scottish institutions won 3 of the 7 grants awarded, totalling more than £14M.

The biennial Capital Awards initiative was launched in 2007 and this year is funded through a partnership between the Wellcome Trust and the Wolfson Foundation to invest in UK research infrastructure. This year's awards were announced in July.

'World class science needs to be supported by world-class infrastructure, which requires significant investment,' said Sir Mark Walport, Director of the Wellcome Trust. 'The capital awards partnership between the Wellcome Trust and the Wolfson Foundation will provide an important injection of cash

into our universities at a time when they face uncertainty about future capital funding.'

The Medical Research Council - University of Glasgow Centre for Virus Research (CVR) has been awarded £4.8M. Research programmes at the CVR will tackle questions about viruses, from the fine details of structure to the spread of viruses in human and animal populations. The CVR award application was led by its newly appointed Director, Professor Massimo Palmarini and Jim Neil, Professor of Virology and Molecular Oncology. The funding from the Wellcome-Wolfson initiative will be supplemented by a further £28M over 5 years from the Medical Research Council and the University to develop the CVR.

The Institute of Genetics and Molecular Medicine (IGMM) at

the University of Edinburgh won £3.5M for a new state-of-the-art centre to support research in the emerging discipline of systems medicine. The application was led by Professor David Porteous, Chair of Human Molecular Genetics and Medicine. The planned four-storey facility, to be located at the Western General Hospital, will allow for the addition of chemists, physicists and computer scientists to the 500 medical researchers already working at the 3 institutes of the IGMM: the Molecular Medicine Centre, Edinburgh Cancer Research Centre and the Medical Research Council Human Genetics Unit. Their research spans birth defects to end of life care, including brain, cardiac, kidney, eye, bones, joint, lung, intestine, cancer and ageing. The University is actively working towards raising the additional £10M needed to fully fund the project and plans to begin building in 2012.

The University of Dundee received £4.88M to establish a new Centre for Translational and Interdisciplinary research at the College of Life Sciences. The Centre is expected to double the University's capacity in drug discovery, allowing for more translation of basic biomedical research to benefit patients through the interdisciplinary work of physicists and computational biologists and chemists. The application was led by Professor Mike Ferguson, Dean of Research. The Centre's total cost is estimated at £12.5M, and the University is currently developing plans to complete the funding package.

## Milestone achieved

### HER ROYAL HIGHNESS

Princess Anne officially opened Life Technologies new Fountain Crescent building at the company's Inchinnan site in July.



*New Fountain Crescent Building*

Life Technologies acquired the building last year and with contribution from the Scottish Government embarked on a refurbishment which brought new jobs to the site through the consolidation of shared services. The work was completed in February.

During her visit, the Princess was also shown changes made to the campus' other building, Fountain Drive, including a new customer experience centre and demonstration labs, new office facilities for Operations and IT staff, and a new health facility.

The formal opening of the Fountain Crescent building marks a significant milestone for the Inchinnan site in its development as the headquarters for Life Technologies in Europe, Middle East and Africa.



*Massimo Palmarini*



# Gender equality is good for business

*Suzanne Motherwell is a Development Officer with Close the Gap, a partnership project working with those who can influence the gender pay gap and those who are affected by it. The project recognises that equal pay is a productivity issue as well as an issue of fairness and equality. Here she explains why narrowing the gender pay gap is good for business, even during a recession.*

**THIS YEAR** is the 40th Anniversary of the Equal Pay Act and yet in Scotland the average difference in pay between women and men is 12% when full-time earnings are compared and 32% when men's full-time earnings and women's part-time earnings are compared.<sup>1</sup>

The causes of the pay gap are not unique to Scotland, or to particular sectors of the economy. Occupational segregation, lack of flexible working practices and discrimination in pay and grading structures all contribute to the pay gap. It is not only an issue of fairness and equality, but the impact is bad for businesses and bad for Scotland's economic growth.

Maintaining the focus on gender equality and equal pay makes good business sense as those companies who take action show increased profitability. This is even more crucial during an economic recession where human

resource arguments for gender equality might appear to be less salient. Evidence shows that gender equality and equal pay in the workplace reduces associated costs to the employer, such as reduced staff turnover, employee absence and the risk of employee litigation under equalities legislation.

Furthermore, there is substantial qualitative evidence to suggest that workplaces that promote family friendly and flexible working practices attract and retain the best talent. A more diverse senior management team tasked with R&D are likely to be more innovative and creative, bringing better products to market. And as both women and men are consumers, a gender balance in senior management can help open up new business opportunities and secure untapped markets. These benefits do not diminish under a recession, and employers who maintain a focus on gender equality can gain, in the long term, a significant advantage over competitors.<sup>2</sup>

## Taking action in life sciences

It is suggested that 70% of women with science, engineering and technology (SET) qualifications are not working in these areas.<sup>3</sup> This implies that a significant number of potential employees are being lost to employers.

SEMTA published a report in 2008 which assessed the skills required for life science industries in the UK. It found that:

- 27% of companies cannot expand because they lack the skilled people they need.
- 26% of companies look outside the UK for the skilled people they need.
- 29% of companies report skills gaps in the current workforce.<sup>4</sup>

SEMTA argues the life science sector is in danger of losing its world-leader status if skills gaps are not addressed. In Scotland, the number of women working across the sector is much less than the number of women studying biological sciences, indicating a leakage of skills and talent at a time when the life science sector should be building a sustainable workforce to meet future demands. This is more acute in senior positions where women are underrepresented;<sup>5</sup> more commonly known as the 'glass ceiling' effect.

Although companies do not actively exclude women, a workplace culture and environment can have a different impact on women and men. The barriers cited by women working in life sciences include a lack of obvious flexible working practices, lack of female role models in senior scientific positions, and a lack of clarity over career progression routes and pay.

If steps are taken to address these issues then companies will benefit from retaining female employees' accrued knowledge, skills and portfolio of clients and create a positive, vibrant and productive workplace. In turn this attracts a much wider pool of talent helping the life science sector to grow and develop. Overall, businesses always benefit from taking steps to promote gender equality and equal pay in the workplace.

*Close the Gap provides free and confidential training and consultancy to companies and businesses looking to identify actions to increase gender diversity and help attract and retain the best talent.*

*For more information contact Suzanne Motherwell  
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<sup>1</sup>Office for National Statistics (Annual Survey of Hours and Earnings 2009) [http://www.statistics.gov.uk/downloads/theme\\_labour/ASHE-2009/2009\\_gor.pdf](http://www.statistics.gov.uk/downloads/theme_labour/ASHE-2009/2009_gor.pdf) accessed July 2010

<sup>2</sup>Thompson E (2009) *Valuing Diversity: the business case for gender diversity during an economic downturn, Close the Gap: Glasgow*

<sup>3</sup>Wittenberg-Cox and Maitland (2008) *Why women mean business: understanding the emergence of our next economic revolution: Wiley, Chichester, England*

<sup>4</sup>SEMTA (2007) *Bioscience Sector Skills Agreement Stage 3: Gap analysis Scotland. Retrieved from www.semta.org.uk on October 2008*  
<sup>5</sup>ibid



# First product launch



(L to R) Unciti-Broceta and Mark Bradley with the new product

**A NEW** spin out from the University of Edinburgh, Deliverics Ltd, is launching its first product. The company has been set up to commercialise new products and kits to deliver molecules into cells and its first product, SAFECTin™, is based on technology developed at the University.

Almost 2 years ago, the University of Edinburgh was awarded a Scottish Enterprise Proof of Concept grant to develop the technology. Professor Mark Bradley and Dr Asier Unciti-Broceta, the new company's Chief Scientific Officer, have developed a series of non toxic compounds that enable cells to take up DNA, and now the technology is ready for commercialisation. The market size for these types of product has been estimated at \$2BN per year by 2012.

Commenting on the upcoming product launch Professor Bradley said, 'Over the last few years there has been significant interest in gene therapy as a route to treat diseases like cystic

fibrosis. Our new technology offers the opportunity to deliver therapeutics into cells in a non toxic and highly efficient manner, and we are in discussions with pharmaceutical companies.' Dr Unciti-Broceta added, 'In the first instance we are offering SAFECTin™ as a simple to use kit for researchers and we have plans to extend the technology into other exciting areas. The past 2 years have been leading up to our first commercial launch and now the product is available.'

The University appointed Innova Partnerships Ltd to establish the company and spin out the technology. The team at Innova were so impressed by the technology and its potential that they are leading an investment round to enable the commercialisation of the first product and set up of operations in Edinburgh.

Dr Steve Howell, Innova Chief Executive said, 'The technology developed by the team at the University has considerable commercial potential and we

are excited by the prospect of significant early revenues. I would encourage more early stage start ups to focus on early revenue generation from their products as this will improve their chance of success.'

Deliverics is just one of a number of early stage Scottish businesses that Innova, a life science investment and partnering company, has helped since its foundation in 2006. Others include the award winning design company Lightweight Medical Ltd who have commercialised products such as the ambulance child restraint that is now available in many of the ambulances across the UK, and Burdica Biomed Ltd, the biotechnology and medical devices company selling products based on novel biopolymers.

Innova's philosophy is one of 'early to revenue' where it seeks to identify ways in which companies can accelerate their business plans and become more profitable. Earlier this year, it was selected as a Scottish Enterprise preferred supplier to deliver 'Expert Help' to businesses. Having operated a virtual business model for the past 4 years, a move to new purpose built premises in Perthshire - just an hour away from Dundee, Edinburgh and Glasgow - ensure it is ideally placed to continue to assist fledgling Scottish life science companies.

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## Promotion, promotion, promotion

**ACCORDING TO** website statistics, more than 1,000 people look at the Nexus Company and Organisation Listing every month! If you're a central Scotland life science related organisation and would like to promote yourselves and make new contacts completely free of charge, it's **the** place to be.

Anyone who visits the site can browse the listing, search alphabetically, or find what they're looking for with a keyword search. Each listing can include information about your company or organisation's activity, the products and services you offer, skills, and facilities available, as well as contact information and link to your own company website. Make new contacts, generate business, and increase your organisation's visibility with Nexus!

To add your details simply go to [www.nexusscotland.com/life\\_science/companies](http://www.nexusscotland.com/life_science/companies). (And don't forget to let us know about any contacts generated as a result!)

And if you're one of the 225 companies already listed, why not take the opportunity to review your entry? Any updates should be send to [info@nexusscotland.com](mailto:info@nexusscotland.com).

# Improving healthcare services - by design

**IN THINKING** about how we can create healthcare services which are more effective and appropriate to customers' individual needs, how many of us would think of enlisting the services of a School of Art? Normally perhaps associated in our minds with fine art and architecture, it might surprise you to discover that a team of design researchers based at The Glasgow School of Art (GSA) headed by Professor Alastair Macdonald, Senior Researcher in the School of Design, has in fact been working for some time now with groups of healthcare professionals to explore this very issue.

Alastair explains, 'Activity in the School of Design is far from restricted to silversmithing, jewellery, textiles and ceramics, rather it encompasses a wider spectrum including design of products, interiors and communication, and also work in diverse areas such as healthcare where we see working with healthcare professionals as a logical extension of our expertise.'

A range of current projects include the redesign of rehabilitation and exercise pathways using innovative visualisation tools, developing a responsive and customised food service for vulnerable older hospital patients, and anticipating user needs for the next generation of telehealthcare services.

The approach driving this research is one which uses participative and 'co-design' methods which recognise the need for a multidisciplinary

approach. Healthcare services involve a broad range of different disciplines in their delivery. Often, research and collaboration between these different disciplines is fragmented, resulting in a lack of a 'joined-up' approach and a less-than-satisfactory customer experience. Engagement of end-users in the design of these services can also be cursory, not fully utilising their insights, experience and potential to guide professionals to provide the best care pathway for them. With the changing population demographic, chronic diseases and co-morbidity will become more prevalent as the population ages, posing some challenging healthcare issues.

One example is reduced mobility across the lifespan where injury, illnesses and ageing factors can affect the musculoskeletal or neurological systems, in turn reducing one's capacity to live an independent life. A cornerstone of many physical rehabilitation issues is a biomechanical understanding of the problem and its solution. However, despite more than 3 decades of developments in the field, the potential of biomechanics to fully influence rehabilitation in the NHS has remained under-exploited due to the problematic nature of communicating complex biomechanical data. The GSA team however has developed an innovative method for visualising dynamic biomechanical data, understandable to a wide range of healthcare professionals and to lay people. This allows all stakeholders to share

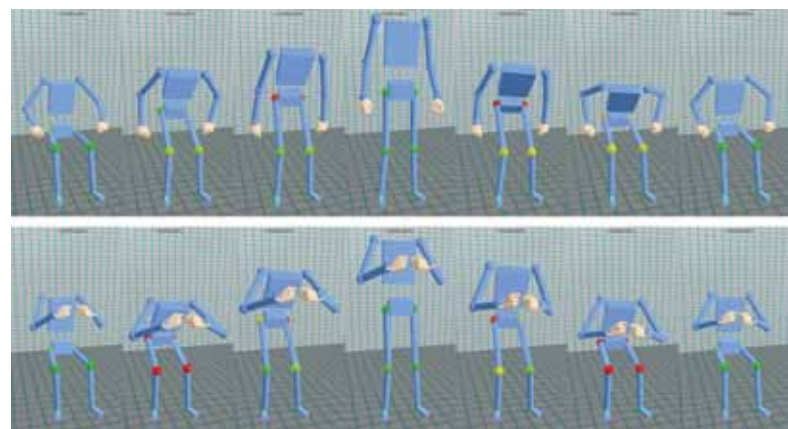
in discussions leading to a better understanding of more appropriate rehabilitation.

This innovation, developed by GSA's Dr David Loudon, uses a software tool to generate an animated 3D human 'stick figure' on which the biomechanical 'functional demand' (ie how hard the muscles are working relative to their maximum capability) is represented. The data used to compile this are derived from 3D motion capture, reaction forces from force plates, and the individual's maximum muscle strength - all captured during lab-based exercises.

This development has been the result of a successful on-going collaboration with the University of Strathclyde's Bioengineering Unit. Evaluation of a prototype version of this visualisation method, supported by the cross-research council New Dynamics of Ageing initiative, revealed that the method had the potential

to improve the uptake and integration of biomechanical expertise and understanding into design and healthcare practice.<sup>1</sup>

Significantly, in addition to mediating discussion between different professions, the visualisation method allowed older adults to articulate mobility problems and issues to the healthcare professionals in a significantly improved manner. This insight has allowed the team to include the participation of end-users of rehabilitation, along with physiotherapists, occupational therapists and other relevant healthcare disciplines in the development and evaluation of visualisations which will be customised for eg rehabilitation following stroke or knee replacement, to encourage participation in exercise and to help minimise falls. These are to be tested in a series of random controlled trials in a new 'envisage' project<sup>2</sup> led by the University of Strathclyde's



*Examples of stills from animations - comparison of a 67 year old male with a history of back problems and a history of fractures performing an activity in 2 different ways. Top row rising from a chair using arm-rests, bottom row rising from the chair without using arm-rests.*



Professor Philip Rowe, where the GSA team will be leading the development of the visualisation and participative methods.

As Professor of Rehabilitation Science within the Department of Bioengineering at the University of Strathclyde, Philip's main research areas lie in movement analysis, functional analysis and biomechanics of the human body in motion. 'A cornerstone of many physical rehabilitation techniques is a biomechanical understanding of the problem and its solution. But the use of biomechanical data has been limited in clinical practice because it is difficult to communicate,' he explains. 'We have had a very productive collaboration over a number of years with GSA as they have at last been able to unlock and find a simple and effective way of communicating our complex data.'

Another example of the GSA team's research approach can be seen in the development and prototyping of a new food service for older patients vulnerable to in-hospital nutritional problems.<sup>3</sup> This is a multidisciplinary collaboration being led by Paula Moynihan, Professor of Nutrition & Oral Health, at Newcastle University. The research team includes GSA designers, food scientists, dietitians, medical sociologists, ergonomists and technologists. The wider team includes key stakeholders and a 'food family' of NHS staff, carers and older people.

In the first phase of the project the team were focused on 'mapping' the current food service, understanding the food provision from patients' perspectives, and identifying opportunities for improving the service.<sup>3</sup> The detailed work by the GSA team in the design of a series of stakeholder and 'food family' workshops was particularly productive in understanding the



status quo, identifying key issues, and exploiting latent knowledge and ideas. Major opportunities for service redesign have been identified through an inclusive and participative design methodology. This is leading the team towards a new prototype food service that will include new food products, tableware, the patients' bedside eating environment including furniture, and a responsive information management system. The approach recognises the particular strengths and skills of front-line ward and catering staff but also how new technologies and interfaces can be introduced to manage information customised to the needs of each patient, and to monitor food consumption.

In addition to the technological and managerial aspects, the ergonomic, aesthetic and social aspects of the eating environment are being considered. This work aims to enhance and differentiate the eating experience from the more clinical aspects of ward life. Meanwhile at Reading University, work is underway to develop new foods which meet the preferences and nutritional needs of older patients. The people-centred design methods, detailed and developed by GSA design researcher Gemma Teal, have been particularly synergistic

in bringing together all the project's separate disciplines to ensure that the focus remains on a positive patient eating experience. The project team is now shaping these elements into a coherent prototype food service proposal which will be unveiled in Autumn 2011.

Along with colleagues in a number of other disciplines, the GSA researchers are exploring further healthcare service opportunities such as the customised design of pharmacy services and exercise provision for older adults. In all of these examples, a participative co-design methodology is central to the way in which the research is designed.

Professor David Stott, David Cargill Chair of Geriatric Medicine at the University of Glasgow who has worked with the GSA team said, 'Design thinking seems to be 'boundary-less' or at least to cut across traditional boundaries in medicine, that is one of its strengths. This approach can assist the patient or the staff perspective with more ease than someone who works in the medical world.'

The on-going challenges for the GSA researchers are two-fold. One is in demonstrating the value of integrating a qualitative mixed-methods approach into the design of research with colleagues from disciplines much more used to treating end-users solely as subjects to be tested through clinical trials. The second challenge is in understanding that successful solutions to complex healthcare challenges require a multi-disciplinary approach where the expertise and value of each area can be clearly communicated to and exchanged with the others.

Early involvement of the GSA team can influence not only the conceptualisation and development of research proposals but also the way in which research teams function, optimising outputs and research impact. Alastair is clear, 'Successful collaborations occur when research team leaders are open to our people-centred methods, which can often explain the 'why' of our research outcomes. This frequently requires a change of priorities at the early stages of a research programme to enable team synergy and to ensure the human dimension is included.' This cross-discipline approach has been encouraged through recent initiatives such as the cross-council New Dynamics of Ageing and the Medical Research Council's Lifelong Health and Wellbeing initiatives where GSA's input has secured a number of grants.

*For further information, contact Professor Alastair Macdonald, GSA E: a.macdonald@gsa.ac.uk.*

<sup>1</sup>Findings can be downloaded from [www.newdynamics.group.shef.ac.uk/files/172.pdf](http://www.newdynamics.group.shef.ac.uk/files/172.pdf)

<sup>2</sup>Funded by the Medical Research Council's Lifelong Health and Wellbeing programme

<sup>3</sup>A summary of the nutrition project 'mappmal' can be viewed at [www.newdynamics.group.shef.ac.uk/projects/29](http://www.newdynamics.group.shef.ac.uk/projects/29)

# Coordinating Scotland's R&D permissions

**WITH A POPULATION** of 5.3 million people, each with unique patient identifiers linked to clinical records, Scotland is ideal territory for clinical research. The new NHS Research Scotland Permissions Coordinating Centre (NRS Permissions CC) is building on this foundation to further Scotland's reputation as an excellent place to conduct clinical research trials.

The NRS Permissions CC acts as a central point of contact for industry and non-commercial investigators wishing to carry out multicentre research in NHS Scotland. This dedicated administrative team based in Aberdeen facilitates feasibility assessments and manages and tracks the streamlined process for obtaining NHS R&D permission for all Scottish sites.

NRS Permissions CC is part of the wider NRS network, also made up of the 14 Scottish Health Boards, within which experienced R&D office staff conduct the technical reviews/permissions for research projects; the national web-based database, SReDA, which helps manage the process and make it more efficient; and members of the Chief Scientist Office (CSO) responsible for NHS research infrastructure and policy.

The Coordinating Centre collates the national document set, uploads it onto the web-based database (SReDA), assigns a Generic Reviewer from an R&D office, and alerts participating Health Board R&D offices to conduct local



Alison Walker

governance checks. The beauty of this coordinated system is that project documents need only be submitted once to Scotland.

Feedback from industry in the past highlighted that Pharma companies specifically wanted faster R&D permission times and one point of contact for project submissions. The NRS initiative, implemented by the CSO of the Scottish Government and Health Boards, meets this demand to a great extent by coordinating R&D offices through NRS Permissions CC to streamline the process.

Prior to the NRS Permissions CC being established in Spring 2009, R&D permission times (from full document set to issue of local management permission) for non-commercial projects were of the order of 46 working days (median). This delivery time was significantly reduced to 24 working days for the period January - June 2009 and reduced further to 20 working days for January - June 2010 (an overall reduction of

54%). Impressive timelines for commercial projects have so far been consistently achieved since May 2009, with a median R&D permission time of 21 working days for May - December 2009 and 17 working days for January - June 2010.

'With the creation of NRS Permissions CC, the R&D community is more focused to improve the efficiency and ease of the R&D permissions process in Scotland further. We have generated an NRS performance questionnaire for our customers so we can act on their direct feedback to assist us in this objective,' said Dr Alison Walker, NRS Permissions CC National Coordinator.

Innovative approaches unique to Scotland which have helped increase the efficiency of the R&D permissions process include establishment of active project management systems, such as regular circulation of project alert reports to R&D offices and twice-weekly NRS teleconferences with key R&D office staff; standardisation of documentation, and introduction of best practice meetings across NRS. Maintenance of a register of Scottish clinical investigators willing to undertake research enables the Permissions CC to put organisations in touch with Scotland's leading academic investigators, and is a key tool for supporting feasibility assessments.

A key priority for NRS Permissions CC going forward is to build on the successes to date to

maintain a high performance and standard of service to encourage researchers to bring their studies to Scotland.

Research applicants can help speed up the process by applying for NHS R&D permission at the same time as ethics approval, submitting documents electronically and obtaining Principal Investigators' support early. Commercial customers should also get in touch early on with the Centre to discuss the need for Confidentiality Agreements and to be put in touch with the lead Commercial Manager of the lead R&D office to initiate study contract and finance discussions.

*The NRS R&D permissions process is simple, but may vary depending on whether a study is single or multicentre, part of a UK-wide study, and where the lead R&D office is based.*

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# Systems biology unveiled

**THE 11TH INTERNATIONAL CONFERENCE** on Systems Biology will be held in Edinburgh this October, attracting researchers from around the world. To many of the rest of us, 'Systems Biology' remains a nebulous concept. It can help develop drugs and reveal metabolic pathways in cells. It can inform many different fields and make sense of great complexity. Systems biology, if it hasn't already, may soon affect your own scientific field and, eventually, your daily life. But what is it?

'There is no generally accepted definition of systems biology,' says Dr Galina Lebedeva, the Scientific Manager for Modelling at the Centre for Systems Biology at Edinburgh (CSBE). 'I would describe it as an interdisciplinary approach to bioscience research which attempts to quantitatively understand biological systems combining cutting edge experimental technologies with the power of mathematics and advanced computation.'

Systems biology is the study of complex biological networks. It allows scientists to look at huge, complex, messy systems in their entirety. Systems biology examines an entire web of interactions at once, such as all the genes and proteins in a cell. Some systems biology studies can be large-scale - looking at an entire genome, and others can be smaller - where part of the system, a certain enzymatic pathway, is the focus of research. Either way, researchers can see a lot looking at this 'big-picture' that they might have missed by looking at each part of the system separately.

'Traditionally, biological methods for studying at the molecular level have tended to look at the components in isolation,' said Dr Lorraine Kerr, Project Manager for Experiments at CSBE. 'In contrast, systems biology studies the molecules in context as a part of a larger pathway or network. There is undoubtedly a move toward systems biology becoming a more generalised approach and being incorporated into all types of labs.'

Usually, systems biology researchers ping-pong back and forth between the laboratory and the computer. The science of studying large systems calls for massive computing power to build models. But, to create a model, scientists must begin with 'real-world' information from laboratory experiments. The researchers then design more laboratory experiments to test the accuracy of their models, gradually making the computer model better at simulating reality.

'Practically, this approach can be used to help guide 'wet' experimental work, which is expensive, thus getting better

value for money,' said Dr Colin Moran, Project Coordinator of the Regulation of Biological Signalling by Temperature (ROBuST) project at the University of Edinburgh.

'Through iterative cycles of modelling and experimentation - when models and experiments mutually inform each other - an insight into mechanisms underlying complex function and behaviour is gained,' said Galina.

'Doing such work is a large undertaking,' added Lorraine. 'It requires specialised high throughput methods and equipment such as our Kinetic Parameter Facility that includes mass spectrometry, biophysical protein characterisation, and robotised qPCR.'

Once a model approximates the real life situation as well as possible, then researchers can put unknown starting conditions into the computer model to see what would happen to the system. Colin explained, 'Developing models allows us to make predictions about experiments that haven't been done. For

example, our research focuses on how plants cope with normal variations in temperature. The difference between maximum and minimum temperature each month in Edinburgh is about 20 degrees centigrade at all times. Understanding how plants cope with this may allow us to make better predictions about future effects of global warming.'

'Another example of systems biology's importance is the quickly developing branch of systems medicine,' said Galina, 'That uses systems approaches to develop prognostic and predictive models for diagnostic and therapeutic applications. Modelling supported by experimentation enables identification of novel drug targets, diagnostic biomarkers, and rational, model-based advice on therapeutic interventions.'

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*The Centre for Systems Biology at Edinburgh (CSBE) develops broadly-applicable methods and large-scale infrastructure for modelling the temporal aspects of biological phenomena, with an emphasis on tightly linking diverse data and models. For further information see [www.csbe.ed.ac.uk](http://www.csbe.ed.ac.uk).*

*The 11th International Conference on Systems Biology will be held in Edinburgh from 11 - 14 October 2010. For further information see [www.icsb2010.org.uk](http://www.icsb2010.org.uk).*



*Lorraine Kerr at the qPCR machine*

# Parasitology thrives in Scotland

**WHEN HENRY MORTON STANLEY** bushwhacked his way into the depths of Tanzania to find David Livingstone in 1871, the heyday of Scottish tropical medicine was about to begin. Many diseases associated with the tropics are caused by parasites - organisms that live within or on other organisms - including malaria, sleeping sickness, and Leishmaniasis.

Scotland's rich history of explorer-scientists like Livingstone established Scotland at the centre of the study of tropical parasitic diseases. Today a resurgence of much-needed research in this field is underway.

Scotland initially gained expertise in tropical parasitic disease research in the mid to late 19th century because the Scottish education system, unlike the English one, was open to anyone. Since they weren't part of the wealthy elite, the Scots needed to work after university, but they often couldn't break in to English-run industry at home. Fortunately, with the British Empire spreading around

the globe, the Scots had many opportunities for work if they didn't mind travelling.

'These guys were incredibly motivated as natural scientists and philosophers. Pasteur had just come up with the idea that microbes cause disease, and you had all these Scottish doctors with microscopes in the tropics - it was inevitably they who discovered the diseases,' said Professor Michael Barrett, a parasitology researcher at the University of Glasgow's Wellcome Trust Centre for Molecular Parasitology.

By the early 20th century, Scottish scientists had made many tropical disease discoveries including identification of the trypanosome as the cause of sleeping sickness and its transmission by the tsetse fly; Glaswegian William Leishman identified the parasites causing the disease now named after him - Leishmaniasis; and Patrick Manson from Aberdeenshire, widely known as the 'father of tropical medicine,' discovered that the mosquito is a vector

for some parasitic diseases. Manson encouraged Ronald Ross, the first British recipient of a Nobel Prize, to prove that malaria is carried in this way.

This surge in parasite research lasted until the 1950s, but as European rule faded from the tropics, control measures faltered, and disease resurged.

Modern science is still wrestling with many of the same diseases that Scottish scientists identified over 100 years ago. Vaccines have been difficult to develop, parasites are adept at developing resistance to drugs, and some treatments are expensive, difficult to administer, or toxic. Big pharma cited the extremely high cost of drug development and impossibility of making adequate returns as their rationale for not rushing into the tropical disease market. Many drugs in use have been the same for 50 years.

Recently, however, non-profit organisations and their collaborators have gradually built a new model for drug development for sub-Saharan Africa and other parts of the developing world where most parasitic diseases strike. Many organisations including Médecins sans Frontières, the Medicines for Malaria Venture, the Wellcome Trust, the Bill & Melinda Gates Foundation, the Drugs for Neglected Diseases initiative (DNDi), and the Consortium of Parasitic Drug Development (CPDD) now support tropical disease research and drug development.

'These organisations evolved because of an acceptance that the traditional drugs-for-profit

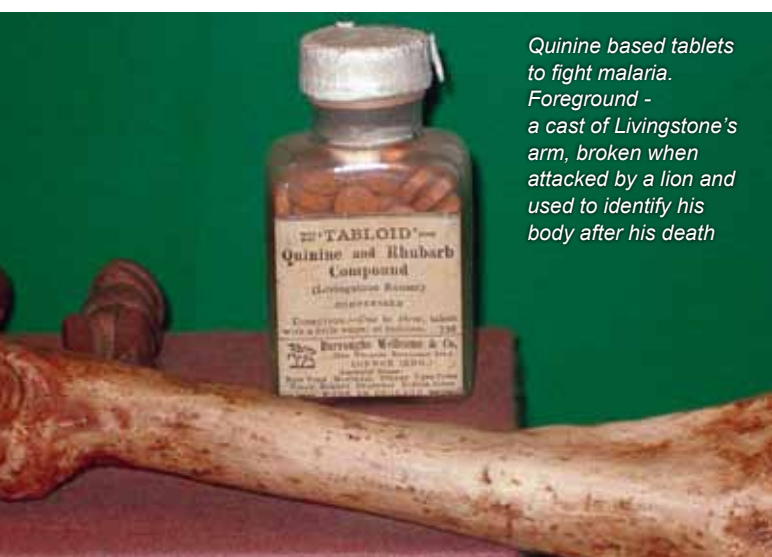
model was not applicable for these diseases of the world's poorest people. They've gone around the world to academia and industry and looked for new ideas, new chemicals, and they're beginning to have success with a fraction of the money that industry needs because they join things up - find one academic group that's made a series of compounds and then find another who knows how to do the chemistry around those lead compounds to accelerate development,' explained Michael.

As this network expands and requires more parasitic disease research capability, Scotland's expertise comes to the fore again.

The Wellcome Trust Centre for Molecular Parasitology in Glasgow works on understanding the basic biological working of parasites. This then informs the development and improvement of chemical compounds that have potential to fight diseases like trypanosomiasis.

In the high-tech fight against parasitic disease, researchers look for compounds that can capitalise on differences between parasites and human cells, such as specific enzymes or reactions present only in parasitic cells. One strategy is to take an old, imperfect drug molecule and look for others in the same class or category with potentially better properties as a drug, such as lower toxicity or better ability to cross the blood-brain barrier.

Encouragingly, the pharmaceutical industry rapidly engaged with the non-profit



*Quinine based tablets to fight malaria. Foreground - a cast of Livingstone's arm, broken when attacked by a lion and used to identify his body after his death*





Trypanosomes  
in blood

organisations' efforts, which allow them to get involved without having to explain to shareholders any big investments with minimal financial returns. Recently, GlaxoSmithKline introduced a 'Patent Pool' for medicines for Neglected Tropical Diseases. The initiative, which includes other big pharma companies, makes some intellectual property and small

molecule libraries available to the collaborative pool, which includes biotech, patient groups, NGOs and universities.

Barrett and colleagues at the Wellcome Trust Centre have been working with CPDD to develop drugs for trypanosomiasis. CPDD had a promising drug in development, pafuramidine, the first orally available drug to treat trypanosomiasis. Unexpected renal toxicity that emerged late into clinical development, however, led to the programme being discontinued. Fortunately, CPDD can draw on an extensive library of diamidine derivatives - the class that pafuramidine came from - and several novel classes of compound and is exploring the potential of other molecules with different pharmacokinetic profiles to carry this forward. With funding from the Gates Foundation and CPDD, Barrett's group also plans to speed development of these new drugs

by developing bioluminescent parasites. The standard screening procedure for a new drug compound takes over 6 months, but with a bioluminescent parasite visible through a microscope, they get real-time data back about how a potential drug molecule affects the parasite. This greatly decreases the time it takes to cycle back and forth between identifying and then testing potential drugs. Three compounds in preclinical models are now under consideration to go into clinical trials.

'It's tricky - but we're seeing the first success with trypanosomiasis,' said Michael, 'And Scotland is still an astonishingly active place in parasitology and tropical disease research.'

*The book 'The Scottish Encounter with Tropical Disease' by M.P. Barrett, E.A. Innes & F.E.G. Cox is available online at: [http://www.gla.ac.uk/media/media\\_136389\\_en.pdf](http://www.gla.ac.uk/media/media_136389_en.pdf)*

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"Dr Livingstone, I presume?"

## Local parasitology research

The **Wellcome Trust Centre for Molecular Parasitology** focuses on parasitic diseases of humans and livestock including trypanosomiasis, malaria, and leishmaniasis. Researchers examine basic biological processes of fundamental importance to the parasites with the ultimate aim of developing new approaches to control parasitic diseases.

**SULSA's Scottish Metabolomics Facility** makes available mass spectrometry, separations technology and bioinformatics capabilities to help researchers determine

exactly how a given drug kills parasites. Most drugs inhibit enzymes in metabolic pathways, and looking at concentrations of substrates and products of enzymatic reactions can pinpoint the mechanism of action, helping researchers better tailor their drug design.

At the **University of Dundee**, the Drug Discovery Unit's major initiative is to study neglected tropical diseases, working to develop validated lead series and candidate drugs to enter formal preclinical development. The DDU works on trypanosomiasis, leishmaniasis and malaria and

has accumulated its own library of chemicals to screen against potential drug targets.

In Edinburgh, the **MoreDun Research Institute** conducts extensive research in parasitic diseases in livestock, particularly focusing on immunopathogenesis and parasite control. The Institute also recently received the largest grant ever to be awarded by the EU in the field of animal health to develop vaccines for parasites which infect livestock. At the **University of Edinburgh's Institute of Immunology and Infection Research**, study of

fundamental immunology, immune regulation of disease and host-pathogen population biology often involves parasitology research. For example, Dr David Cavanagh's research group investigates the immunobiology of the human malaria parasite and development of vaccines. Professor Rick Maizels' group examines how parasites evade and direct host immune systems to their own advantage. Achieving this sort of control over the immune system could be useful for human diseases such as Crohn's disease or asthma.

# Corker of a project

**LACK OF** data on agricultural pollution in diverse forest locations and ongoing pressure on forest management - mainly due to different regulatory systems within and outwith the EU - provides opportunity for ample interdisciplinary research, to address management and remediation opportunities. And, potential for these restricted substances to enter the human food chain adds impetus to the need to gather comprehensive information.

University of the West of Scotland's Professor and Geochemistry expert Andrew Hursthouse, together with a number of European partners, is co-directing a NATO Science for Peace project. The project aims to strengthen collaborations between scientists in NATO countries and those bordering NATO members. The project involves a mix of research teams with very different scientific backgrounds to address a critical issue in relation to the contamination of cork oak forests in Southern Europe and North Africa.

Cork oak forests are sustainable, often ancient, manmade environments, covering over 2.7 million ha in Portugal, Spain, France, Italy, Algeria, Morocco and Tunisia. They represent one of the highest levels of biodiversity in forest habitats and support 100,000s of human inhabitants who gain livelihood from cork processing or agriculture within the forests. Cork bark is harvested from the trees every 10 years or so, and the recent decline in the use of cork stoppers in wine is likely to impact greatly

on forest management and threatens livelihoods. There are many interrelated reasons for changes in stopper use, but one often cited is the 'cork taint' problem, which costs the wine industry billions of US dollars per year. The taint is attributed to the presence of trichloranisol (TCA) and other chlorinated anisols, as fungal metabolites of chlorophenols. The exact sources are debated, but have been attributed to environmental contamination by Persistent Organic Pollutants (POPs), such as pesticides common in many locations of Europe. Whilst POPs contamination is a global concern, accumulation specifically in cork forests is suspected to explain observations of chlorinated pesticides in cork slabs and formed stoppers, highlighting contamination at early stages in production.

The project, which started in 2007, brought together research groups with complementary experience in cork mycology, taxonomy, biochemistry, bacteriology and environmental biotechnology with soil science, hydrology, environmental geochemistry and analytical



*Sampling surface soils in Tunisian cork oak forests*

science. Led by ITQB, Lisbon, Portugal, researchers in UCSC, Piacenza, Italy; IRNST, Haman Lif, Tunisia; and University Hassan-II, Casablanca, Morocco have been working with Andrew and his colleagues at UWS to provide a thorough understanding of the impact of human activities on these forests. The behaviour of pentachlorophenol - widely used in wood preservation - has been particularly identified as a target POP and research has focused on tracing its presence to identify human impacts from forest soil ecology through to cork manufacture.

'This project will have a critical role in identifying good practice in forest management,' said Andrew. 'It also provides us with a salutary lesson on the interaction between human activities and natural resources - cork forests can only survive with human intervention, but when the quality of the main product is questioned, the system is on a knife edge, with wider repercussions for regional ecology.'

'This research has been a valuable exercise in building links between life and environmental/chemical sciences. We have been lucky to recruit and train very talented researchers and PhD students and give them the opportunity to work across disciplines as well as in different cultures. The icing on the cake has been the opportunity to undertake fundamental research with this group and find the justification to keep a healthy (but responsible) interest in good wine!'

The project will finish at the end of 2010 but Andrew already has plans to extend the work and collaborations established to further investigate these ecosystems.

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## The beauty of science

**NOTHING REVEALS** the beauty of science like an amazing image of it - whether it be of cells in a dish, animals in the field or high tech equipment in a lab.

Images of all kinds are invited from life science related organisations in central Scotland for consideration for the Nexxus 2011 Life-Sci Visions Calendar. All submissions will be showcased on the Nexxus website, displayed at the Annual Nexxus Awards events in November and the 12 selected entries will be reproduced in c 3,000 copies of our calendar in December which will be distributed with the Winter issue of Nexxus News. Closing date for submissions is 22 October 2010.

*For more information see [www.nexxusscotland.com/calendar](http://www.nexxusscotland.com/calendar).*

# My Job



*Ross McLennan, Academic-Industry Collaboration Coordinator, Scottish Health Sciences Collaboration*

**Q: So, for those of us who don't know - what does the Academic-Industry Collaboration Coordinator at Scottish Academic Health Sciences Collaboration (SAHSC) actually do?**

SAHSC brings together the Universities of Aberdeen, Dundee, Edinburgh and Glasgow, the associated NHS Boards, Scottish Enterprise and the NHS Chief Scientist's Office to establish a world-leading clinical research platform for patient oriented research. It builds on the close healthcare and academic partnerships already existing in Scotland and is supported by significant re-investment in NHS research infrastructure in key areas such as scanning capability, tissue banking, clinical research support and IT capacity. The SAHSC provides a harmonised and streamlined system for the contracting and costing

of clinical studies, working closely with NRS Permissions Coordinating Centre. The Collaboration Coordinator is responsible for fostering and coordinating collaborations between the SAHSC partner organisations to meet the needs of industry. This position supports the development of national collaborations where SAHSC academic and industry partners will work together to provide their intellectual and developmental expertise to a collaboration.

My work with SAHSC ties in very well with my ongoing role as Programme Manager with TMRI Ltd - a company set up to connect industry partners with Scotland's clinical and translational research capabilities. Significantly, TMRI Ltd has led the management of the Translational Medicine Research Collaboration - a unique partnership between Scotland and Pfizer (formerly Wyeth).

**Q: Tell us about a typical day (or is there no such thing?).**

I suppose that the 'typical' aspects of my role are communication and facilitation. This is an exciting time to be involved in the Scottish clinical research environment with a range of exciting developments across the public and commercial sectors. I find myself in the privileged position of being able to work across many different organisations and speaking to some of Scotland's leading researchers, as well as representatives from major international Bio-Pharma companies in order to help create collaborative research projects.

Another recurring theme to my working day is the opportunity to work with some fantastic people. There is a great deal of experience and knowledge in the Scottish life science community and I am constantly learning something new. Often this is the output of an exciting piece of research (which as a scientist is a dream come true), but equally common are novel approaches to 'doing business' - this ensures that I am constantly learning and striving for improvements in my personal performance.

**Q: So what's taken up most of your time recently?**

SAHSC was officially launched last summer and the outreach activity with which I am involved only got going earlier this year. As a result, a great deal of my time has been spent working with SDI, the CSO and others to pull together materials describing the key strengths of the Scottish clinical research capabilities.

Subsequently I have been involved in many meetings with biotech and pharmaceutical companies to articulate this message and generate interest in placing collaborative research studies in Scotland.

**Q: What's on the cards for the next few months?**

The next few months will be focused on converting the promising leads that have been generated so far into real opportunities for the Scottish research community. This will undoubtedly involve spending more time with individual researchers, to continue to scope out the potential areas of interest, and hosting a number of

workshops. In addition, there are a number of exciting initiatives that TMRI Ltd is currently developing - so I've certainly got enough to keep me busy!

**Q: What would you want to do if you weren't doing this job?**

Whilst the route my career has taken has not been planned too far in advance I am fortunate to have worked with a wide range of people and have been involved in some ground-breaking initiatives. For this reason, it's difficult to think of other jobs that I would rather be doing at the moment.

It's at this point that I'm supposed to admit to a secret hankering to be a rock star or play in a symphony orchestra - however, my friends, family and I know from painful experience that I simply don't have the talent to follow a career in music! Playing sport was always a passion, before a succession of rugby and cricket injuries persuaded me that, again, this wasn't where my future lay. If I could do anything (irrespective of ability).....it would be to play for Liverpool FC; I'm not greedy, just one season at current salary levels would be sufficient! I could then spend more of my time with my two young children - ideally in the Canadian mountains so that my wife and I could find time to remember how to snowboard!

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# New knowledge exchange hub

A NEW initiative will help strengthen SMEs' relationships with the University of Strathclyde by making funding and Project Champions available to them.

The Strathclyde Institute of Pharmacy & Biomedical Sciences (SIPBS), embarked on the establishment of a Knowledge Exchange (KE) Hub in April 2010 thanks to a funding package of £1.05M primarily from the European Regional Development Fund (ERDF). The aim of the Hub is to foster collaborative links with industrial partners, particularly Scottish-based SMEs.

Rather than creating yet another new entity however, the KE Hub is a synthesis of successful initiatives within the University of Strathclyde, namely the Drug Discovery Portal (DDP) and Strathclyde Innovations in Drug Research (SIDR). The DDP is a computational platform for identifying drug leads from academic institutions worldwide, founded in 2007 by a group of researchers with expertise in virtual screening, whilst SIDR identifies commercial opportunities for drug leads, develops them through proof-of-principle stage and then seeks industrial partners for further development.

The Hub provides a KE resource to these 2 initiatives and others emerging from SIPBS through its appointment of a KE Manager, Co-ordinator and Assistant. The Hub also contracts with entrepreneurs on individual research projects to help galvanise commercial propositions and use their experience to raise interest and ultimately funding.

A particularly exciting element of the Hub is that some of the funds will be used to support post-doctoral staff in spending up to one day a week undertaking project management and/or commercialisation of technologies emerging from SIPBS and gaining experience of the commercialisation process through Research and Knowledge Exchange Services (R&KES). In addition, Knowledge & Innovation Training (KIT), tailored to life sciences commercialisation will be provided under the auspices of the University's new Knowledge Transfer Account.

Hub Manager Dr Catherine Breslin explains, 'If you're not sure what type of technological expertise the University has to offer, or how to engage with us, it really couldn't be more straightforward. Simply contact Debbie Stack, our KE Hub Administrator, with even a half-formed idea and we'll endeavour to do the rest. Thereafter it's a case of meeting with Project Champion and investigator(s) to map out the project and complete the application form. Lastly, if eligible, you'll receive the funds to carry out the project whilst your Champion supports your company in accessing further funding/opportunities/people exchange.'

Project Champions are post-doctoral or post-graduate level researchers employed by the University who have shown an interest in engaging in knowledge exchange activities, either to enhance their own skill sets or to help make a career transition. Project Champions have access to a pool of entrepreneurial



Catherine Breslin

mentors and are receiving training that incorporates elements of Strathclyde's world-renowned MBA course.

'Project Champions are valuable assets and can support your company in a variety of ways depending on your particular requirements,' said Catherine. 'They can help complete the Hub application form, identify further funding, perform an IP audit, undertake market assessment and generally be the person to nudge things along when you are short of time.'

'As an example, Project Champion, Dr Eileen McBride, recently co-ordinated a proposal for a £1.5M multidisciplinary project that was submitted to the MRC Lifelong Health and Wellbeing scheme where the primary aim is to enhance periocular drug delivery in a controlled and targeted manner. The ultimate aim is to combine the approach used with sight-saving drugs to enhance patient quality of life and reduce blindness in the ageing population.'

'The project team in this instance spans 3 Scottish Universities, and the NHS, with input from the pharmaceutical industry (GlaxoSmithKline) and it brings together a unique group of individuals essential to the success of the project who come from the diverse fields of pharmaceutical sciences, physics, ophthalmology, and microelectronics. The output of the project is highly commercially viable, and there has already been significant interest from key industrial players.'

In terms of funding available, an average level of funding per project would be c £5K, though Catherine is keen to emphasise that if a company can demonstrate a genuine intention to strengthen its relationship with the University by, for example, jointly applying for further research and knowledge exchange-related funding, including KTPs, then higher levels of funding will be considered. Finally, while eligibility for funding is restricted to Scottish SMEs, all companies - regardless of size and geographical location - are eligible to receive Project Champion support.

*For further information on working with the new Hub contact Debbie Stack, KE Hub Administrator  
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SIPBS KE Hub

# Lessons to be learned from Israel's approach to life sciences

**IN JUNE 2010** Ivor Campbell, of Snedden Campbell, attended the ILSI-Biomed 2010 Conference in Tel Aviv. This annual event looked at cardiology, vaccines, oncology, cell therapy, personalised medicine, metabolic diseases and aesthetic medicine markets. There were approximately 60 presentations given by Israeli medical device and biopharma companies and 6,000 or so 'industry players', engineers, scientists and VCs present, with some 800 presenting/exhibiting participants from 35 countries. In addition a one-on-one meeting forum ran for the three days of the event that enabled no fewer than 2,500 meetings. Ivor's opinion is that this was a really well planned and useful event from which he feels Scottish life science could learn a lot and here he shares with us his experiences.

'For a start, we were encouraged to attend the event by no less than the Minister of Commercial Affairs at the Embassy of Israel in London,' Ivor explained. 'His staff organised our schedule and also arranged a couple of off-site meetings with potential clients - a far cry from being discouraged to attend the event by certain organisations here on the basis that Snedden Campbell are 'the wrong sort of business'!

The event itself was opened by Shimon Peres, President of the State of Israel, former Prime Minister and winner of the Nobel Peace Prize. 'This was not a token appearance though,' said Ivor, 'He didn't just say 'Hi', he actually gave a 15 minute presentation on nanotech and its importance to the

Israeli economy (he championed this in Israel over a decade ago). He really knew what he was talking about. Think of Her Majesty the Queen opening the Nexus Awards evening and making a detailed presentation about the future of stem cell research and you've got the picture.

'Also, the company pitches I saw were professional and well thought through - so much so that at the end of most presentations, VCs were literally queuing up to hand over their business cards.'

Part of the event involved a trip to the huge Chaim Sheba Medical Center facility outside Tel Aviv which, amongst other things is a major medical-scientific research powerhouse. 'In essence,' explained Ivor, 'If you're a junior doctor and want to progress through their Advanced Technologies Center, then, as I understand it, your PhD and subsequent advancement is predicated on your ability to produce genuinely commercial products and services.'

Ivor was so impressed that on his return from Israel he posted a short note on the Nexus LinkedIn Group that summarised his experiences which said, 'I'm just back from a truly eye opening trip to Israel - a country only slightly bigger than Scotland but doing more to develop life science business than the whole of the UK. The differences between Scotland and Israel in exploiting academic ideas and VC fund raising alone are enough to make one question if we're all resident on the same planet!'

And some months on, that's still his feeling - an almost visceral frustration that the Scottish life science industry can't get its act together.

'Politicians,' he asserts, 'need to understand the business of life science a whole lot better, whether they want to or not. This is not, repeat not, asking for intervention but a strong suggestion that all politicians need to be made aware of the possibilities of the sector not through 'gee whizz' announcements but by a firm grasp of the nuts and bolts of what a successful life science business is.

'Graeme Boyle points out that there are presently 80 VC firms in Israel with over \$10BN in funds - just over a decade ago there were fewer than 10 with around \$100M. Oddly, this used to be the size of the Scottish VC sector at that time and, guess what, it still is! We can't increase the size of the sector in Scotland by two orders of magnitude simply by wishing it to be so; but surely we could all take responsibility for coaching fledgling businesses to give VCs something worth investing in?

'One thing that might help - persuade our Cabinet Secretary for Health and Wellbeing and her senior civil servant to visit Chaim Sheba (I'm sure the Embassy in London would be delighted to help). All they'd have to do is look and listen. Why shouldn't the NHS generate income by commercialising the skills and abilities of its brightest staff? This has to be a lot better than charging patients to stay overnight for instance.....'

*Snedden Campbell are headhunters - they specialise in life sciences and spend their time identifying senior people for clients throughout Western Europe. They're particularly active in medical devices and diagnostics. To contact Ivor T: 01877 330495 E: [ivor@sneddencampbell.co.uk](mailto:ivor@sneddencampbell.co.uk)*

*Registration for the 2011 ILSI-Biomed Conference taking place from 23 - 25 May 2011 is already open. For further information see <http://www2.kenes.com/biomed/Pages/Home.aspx>.*



*Shimon Peres (centre) surrounded by delegates at the ILSI-Biomed 2010 Conference*

# First for Scotland



Dr McGinn (L) inserts the implant under Ailsa's skin

**A NEW PAIN RELIEF** implant using Wii-style technology for people with chronic nerve pain was used in Scotland for the first time in July.

Ailsa MacKenzie-Summers, 42, from East Kilbride who has suffered from severe pain in her leg for a number of years as a result of nerve damage, became the first to benefit from the new technology when NHS Greater Glasgow and Clyde's Dr Gordon McGinn fitted the new neurostimulator implant under local anaesthetic at Glasgow's New Victoria Hospital.

The implant uses state-of-the-art Wii-style motion sensing technology to provide pain relief when a patient moves around. At present most implants require the patient to constantly adjust the amount of pain relief according to their movements but the new device does this automatically.

The new implant is only suitable for certain patients with chronic pain caused by nerve irritation that medication has not been able to treat.

Dr McGinn said, 'The new neurostimulator implant is an excellent step forward in pain relief for patients with chronic neuropathic pain such as sciatica and other pain caused by severe nerve irritation.

'Electrodes are inserted onto the spinal cord and when activated they create an electric field around it. The electrodes then stimulate the nerves around the spinal cord and effectively mask the pain by generating a pleasant tingling feeling.

'It's almost like when you bang your elbow and then rub it to mask the pain. The new implant has the same pain masking effect.'

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## MEMBERS OF THE STEERING GROUP

Nexus promotes and supports research excellence, innovation and knowledge transfer within the life science community Scotland. Since its launch in 2003, it has been guided by representatives from all aspects of the life science community in Scotland including: universities, further education colleges, NHS Trusts, professional service suppliers and life science industry representatives.

Current members of the West Steering Group are :

Chris Packard (Chair), NHS Greater Glasgow and Clyde; Fiona Godsman (Vice Chair), Kelados; Alison Bennett, Scottish Enterprise; Kevin Cullen, University of Glasgow; John Bremner, Link Technologies; Alastair Muir, Vistage; John Waller, Schering Plough; Graeme Milligan, University of Glasgow; Janet Halliday, Controlled Therapeutics; Kevan Gartland, Glasgow Caledonian University; Catherine Breslin, University of Strathclyde; Louise Rice, BioReliance; Jim Hay, Scottish Colleges Biotechnology Consortium (acting representative).

Current members of the East Steering Group are :

Till Bachmann (Chair), University of Edinburgh; Jennifer Shipston (Vice Chair), Charles River Laboratories; Fiona Godsman, Kelados; Lee Innes, Moredun Research Institute; Patrick McCarthy, Genecom; Ruth Murray, Immunosolv; Barry Shafe, Edinburgh Science Triangle; Alison Bennett, Scottish Enterprise; Aidan Courtney, Roslin Cells; Jane Kennedy, Roslin BioCentre; Christine Phillips, NHS Lothian; Bob Millar, MRC Human Reproductive Sciences Unit.

For further information about Scotland's life science industry or to tell Nexus about a news story or event which would be of interest to the community, contact Nexus at :-

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