London BioScience Innovation Centre
WHERE ENTERPRISE COMES TO SUCCEED

Summer 2016

LBICnews

From the London BioScience Innovation Centre

The booming Bioeconomy

Interest in the life science sector continues to grow in the UK, evidenced by record numbers of clients at LBIC, with new enquiries every week.

Part of this growth can be traced back to the launch five years ago of the government's Strategy for UK Life Sciences. In Autumn 2012, George Freeman (now the Minister for Life Sciences) wrote in LBIC News that "the life sciences are about the appliance of bioscience to solve societal problems – principally in the three core markets of medicine, agriculture and energy". It is this wide applicability that makes it such a varied and attractive sector, both for entrepreneurs and investors.

In healthcare, media coverage and recent infectious disease outbreaks, including influenza strains, Ebola and the Zika virus, have driven efforts to find new preventative measures. Equally, the aging population in developed countries increases the need for treatments and diagnostics to address non-communicable diseases.

Technological advances combined with improved systems of communication are contributing to ever wider applications of

Continued on page 3.

WELCOME

This edition highlights some of the ways in which LBIC clients are tackling crucial issues facing society. The life science industry continues to thrive, and companies are finding innovative new solutions to problems.

At LBIC we have access to a brilliant range of services, including the facilities and expertise of the Royal Veterinary College (see page 8) and also the Bio-Analysis Centre, where clients can run analyses without purchasing equipment – see page 5 for details.

Life science businesses need to attract investment to flourish, which is not always an easy task. Turn to page 7 to learn how to use your website effectively in order to impress investors.

Finally, we feature an update on progress at the Francis Crick institute, our new neighbours who will soon be fully up and running.

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Lucy Garnsworthy, Editor

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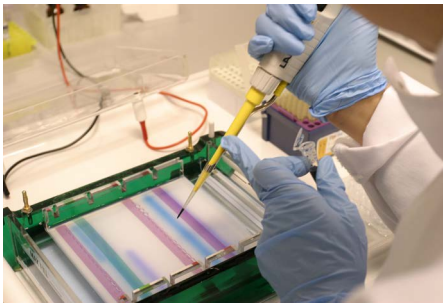
€2 million investment in Aglaris' stem cell bioreactor

Aglaris has received a €2 million investment from CRB Inverbío, a leading Spanish Venture Capital firm, to complete beta testing of its automated cell culture bioreactor, the Aglaris Facer 1.0. The Aglaris Facer 1.0 will use patented technology to systematise and integrate all stages of production, enabling fully automated mass production of stem cells. Stem cells are a key component of regenerative medicine, with the potential to treat diverse conditions ranging from Parkinson's to burns to diabetes.

Vasgen developing innovative therapeutics

Vasgen is one of 12 companies shortlisted to present at the UK Health & Life Science Investment Showcase managed by Innovate UK (previously the Technology Strategy Board) to connect the UK's most innovative early-stage companies with investors. Around 50 companies were invited by Innovate UK to apply for the opportunity to pitch for up to £2 million from a total fund of £11 million from the participating investors. Vasgen is developing innovative ocular and cancer therapeutics to meet unmet clinical needs, utilising AbIMP®, a novel antibody-based platform. Vasgen's lead product under development targets pathological angiogenesis in models of ocular neovascular disease.



Domainex collaboration wins late-stage award to progress novel lung cancer drug candidate

Queen's University Belfast and Domainex will use a recent late-stage award from the Wellcome Trust Seeding Drug Discovery scheme to further develop a potential treatment of non-small cell lung carcinoma (NSCLC), utilising the cell death regulatory protein FLIP, believed to be a key regulator of tumour cell survival. NSCLC represents around 90% of all lung cancers diagnosed and accounts for the highest rate of cancer death worldwide.

The award will allow the partners to accelerate the optimisation and early development of first-in-class small molecule inhibitors that block FLIP's pro-survival functions. The partners will complete pre-clinical studies and progress the inhibitors to first in human phase 1 clinical evaluation following regulatory approval.

deltaDOT technology used in NHS trials

New biological drugs based on monoclonal antibodies (mAbs) are increasingly being used by the NHS. Mimicking human immune responses, mAbs attach to a key disease protein and prevent it performing the disease function. This means mAbs potentially have wide applicability, from cancer to viral infection. The complex nature of mAbs necessitates an array of tests to demonstrate stability. deltaDOT's High Performance Capillary Electrophoresis technology was utilised to perform such stability trials at National Health Service Quality Control North West (QCNW) Liverpool Labs. These studies could support more efficient use of NHS resources through extended shelf life for patient-specific preparations of mAbs.

Dr Stuart Hassard, CSO of deltaDOT said "The trial has now been completed to the full satisfaction of the NHS QCNW Labs. The vast amount of data from the trial is being collated and a full report prepared for the stakeholders. deltaDOT are delighted with this strong validation of one of our core applications, the high-level analysis of monoclonal antibodies. Our label-free technology has now been used throughout the production lifetime of these vital and evolving therapeutic agents". deltaDOT are now working on further analytic service work for the QCNW lab.

LBIC welcomes these new clients to the Centre:

- **Biohellenika Bioscience**
- **Biotecnol**
- **Clean Cells**
- **Guidewave**
- **Jobs in Oncology**
- **Jupiter Diagnostics**
- **NALIA Systems**
- **NanoRegMed**
- **Nexine**
- **Novintum Bioscience**
- **Senzer**
- **SpeeDx**
- **Tailored Clinical Research Solutions (TCRS)**

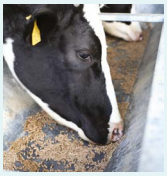
Continued from front page

life science, with a particular emphasis on disruptive technologies. When the UK government announced its 'Eight great technologies to watch', it stated that "the most valuable applications are likely to come when companies develop new combinations of these technologies". At LBIC we see such combinations not just from the 'eight great' technologies, but in companies utilising knowledge from other sectors, including physics, engineering and even fashion.

Examples of how LBIC clients are working on new solutions to key societal problems:

Food

Unibio's sustainable food technology



Unibio has developed an innovative Single Cell Protein production technology called the U-Loop that converts methane into a highly concentrated protein (UniProtein®) for sustainable food production, targeting the animal feed market.

Unibio plans to construct and commission a commercial plant with multiple U-Loop fermentors in 2017, and a recent licence agreement with a commercial client will enable the company to expand this capacity in the following years. Once operational, the Unibio plant will supply the European and Russian markets with UniProtein®, which is approved in the EU for all fish and animals.

Unibio's funding includes a grant from Innovation Fund Denmark, and the company has a collaboration with the Technical University of Denmark (DTU), where its pilot plant is based. In November 2015, Unibio won the Ernst & Young Entrepreneur of the Year award in the Life Sciences category.

World health emergencies

Flu and Zika vaccine development at SEEK

SEEK is working with former LBIC client hVIVO in a joint venture investment in a new company Imutex, to develop vaccines against influenza and mosquito-borne disease agents including the Zika virus.

SEEK has developed a 'universal' flu technology called FLU-v that targets proteins common to all flu strains, which enables a single vaccine effective against flu viruses. Imutex will employ the hVIVO platform to conduct a Phase IIa clinical study of FLU-v to evaluate the efficacy and safety of this novel vaccine.

Imutex will utilise another of SEEK's vaccine technologies in an upcoming Zika Phase I clinical trial, which has been fast-tracked due to the designation of Zika as a Public Health Emergency of International Concern by the World Health Organisation (WHO). The technology targets mosquito saliva in a dual-action mechanism that aims to both prevent infection in humans and also reduce mosquito survival. If the Zika trial is successful, Imutex will address other mosquito-borne diseases, including malaria, dengue fever and West Nile fever.

Disruptive technology

Synthace and Microsoft partner to engineer biology

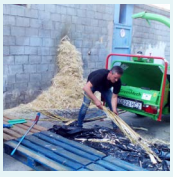
Synthace recently entered into a strategic partnership with Microsoft to use Azure cloud computing tools to further develop Antha, a high-level programming language and operating system for biology.

Antha assigns a description to every component of an experiment and the operating system then translates this for automated implementation, which makes procedures both traceable and reproducible.

"Biological experimentation is in crisis," said Sean Ward, Founder and CTO of Synthace. "Understanding complex systems is impossible if the underlying working practices are as highly variable and failure prone as they are today. Powerful advances in AI and deep learning are of little use without sufficient and structured experimental data to train them on, which is why Antha is bioscience's missing link."

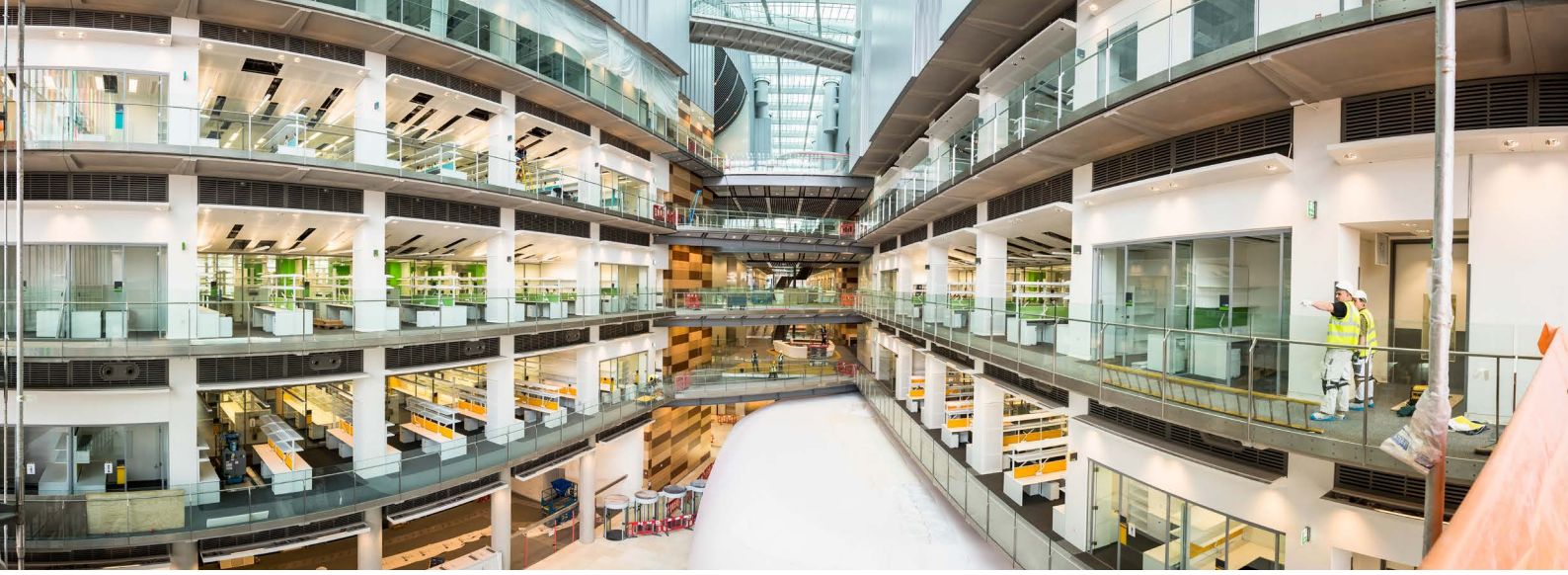
Energy

Alkol's EU-approved biofuel source



Sugarcane bagasse is a by-product of cane sugar production and can be used to produce cellulosic ethanol as biofuel. Alkol Biotech's proprietary EUnergyCane sugarcane grows in European territory and so clients in Europe can receive refrigerated sugarcane bagasse in two days, rather than the eight months experienced with shipments from elsewhere, due to delays caused by import procedures and customs. This means client production can progress much more quickly.

Alkol has already sold 500kg of EUnergyCane bagasse for scientific cellulosic ethanol technology testing to a leading European second-generation (2G) ethanol producer.



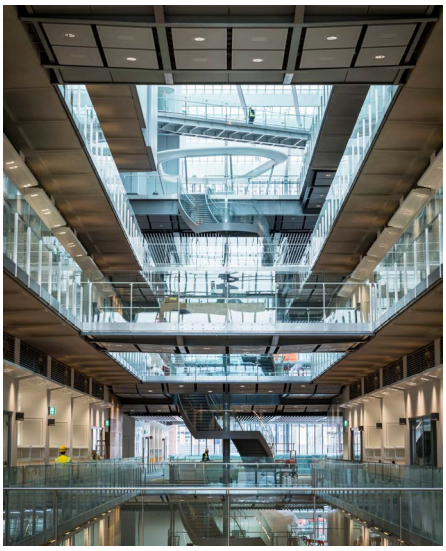
Francis Crick Institute 'coming to life'

The Francis Crick Institute update us on their latest developments.

On 1 April 2015, the Francis Crick Institute came to life: we transferred 1,200 staff from two institutes, the London Research Institute and the National Institute for Medical Research, to become official employees of the Crick.

One of the Crick's strategic priorities is to ensure that our discoveries are translated as quickly as possible into benefits for human health. We have already launched our first translation projects, including open science collaborations with GSK and AstraZeneca.

Our new building is more complex than the Shard and has more rooms than



Buckingham Palace, and it has required skilled architects, engineers and construction workers, in partnership with our own staff, to make the vision a reality.

The building has already won an award. We received the 2016 London First Investment in London's Future Award for "a visionary regeneration or development which reinforces London's competitiveness in the long term".

The finishing touches are being put to the building so that we can start to move in July.

Introduction to...

NALIA Systems

NALIA Systems provides custom biomarker arrays for screening samples from clinical trials and other biomedical research.

Their multi-biomarker panels test 10-20 protein markers simultaneously with the same sensitivity, discrimination and quantification as ELISA tests. This provides a huge increase in productivity and requires far less sample than running tests individually. NALIA recently completed work to design a bespoke panel to screen several markers for a pharmaceutical company and then ran the samples from the clinical trial.

NALIA is also developing a point-of-care platform for diagnosis of complex diseases by analysing multiple protein biomarkers simultaneously. The company received grant funding from Innovate UK and from the Horizon 2020 SME Instrument in 2015, which enabled them to demonstrate the capability to obtain results in under 20 minutes. NALIA Systems is now seeking funding to develop the prototypes and reduce the assay time further.

www.naliasystems.com

Bio-Analysis Centre

Bio-Analysis Centre

The Bio-Analysis Centre offers Triple-Quad Mass Spectrometry and advanced HPLC. With these instruments we can assist in identifying and quantitating a wide range of analytes through contract research. In addition to providing an analytical service, we also offer training on the HPLC and LCMS. Once training has been completed, clients will be able to use our equipment to run their own samples.

Meet the Manager

Dr Carolyn Hyde obtained her degree at University College, Cardiff and carried out her PhD at the School of Pharmacy, University of London, followed by a post-doctoral fellowship in Peptide Synthesis at the Laboratory of Molecular Biology, Cambridge. Carolyn's next position was at the Medical Research Council (MRC) Clinical Sciences Centre, helping to run a core facility making and analysing peptides and DNA. She was instrumental in getting Mass Spectrometry included in the service offering. From there she moved to UCL to run the Scientific Support Services where she helped researchers and biotech's solve their analytical challenges using Mass Spectrometry, HPLC, FPLC and SPR.

"I recently attended the week long LCMS training with the Bio-Analysis Centre. It was a highly intensive course covering all basic as well as advanced lab techniques essential for successful LCMS assays. The training was imparted by Cali supported by her team of highly trained, friendly and knowledgeable technicians. It was a privilege to be taught by someone with so much expertise in the field."

Kavin Abelak – UCL

HPLC

We use the Shimadzu Nexera XR HPLC system. These instruments have cooled autosamplers (for sample integrity) and Photo-Diode Array detectors, which can be used for compound analysis from small drug-like molecules to proteins. This instrument provides the optimal solution for a diverse range of applications.

"I would like to thank Cali and her team at the Bio-Analysis Centre for providing an excellent and prompt service, training and supervising two second year undergraduate students from the RVC to use Mass Spectrometry as part of their short research project to evaluate the potential immunomodulatory effects of C-type natriuretic peptide. Cali gave very clear advice before the project started, ensuring that the students prepared the correct samples and had the right controls for their analysis. Cali has provided a valuable learning experience for the students as well as enabling our group to obtain novel and reliable data, in a short space of time, using techniques that are not available in-house."

Dr Charlotte Lawson – RVC

Mass Spectrometry

We use a triple quadrupole mass spectrometer (Shimadzu LCMS-8040) with highly sensitive, reliable and fast results. We have extensive experience and knowledge in method development for new compounds along with excellent expertise in interpretation of results – providing a complete service for your analytical requirements.

Triple quadrupole mass spectrometer Shimadzu LCMS-8040

Training

In addition to providing analytical services, training on the Shimadzu Nexera XR HPLC and Shimadzu LCMS-8040 instruments is also available. The trainee will receive in-house certification, allowing them to use our equipment to run their own samples.

This cost-effective and competitively priced service gives the user more control over their research and allows them to work at their own pace. Although the user will be fully responsible for conducting their own work, there will always be a laboratory assistant available to help if needed. Unlike other companies providing a similar service, our training programme is usually one-to-one and offers a more practical experience, allowing the user to spend time becoming accustomed to the instrument.

Marcus Rauch of Janssen Prevention Center

We spoke with Marcus Rauch, Site Head and Principal Scientist at the Janssen Prevention Center London.

When and how was the Janssen Prevention Center established?

The Janssen Prevention Center was established at the start of 2015 by the Janssen Pharmaceutical Companies of Johnson & Johnson to explore new approaches to disease prevention. This global centre emerged out of the former Crucell Vaccine Institute (CVI), a vaccine discovery group within Janssen R&D.

Janssen's senior leadership recognised the need to drive innovation in the area of disease interception and prevention. CVI had delivered transformational concepts for preventing infectious diseases, especially influenza, and started exploring their potential application for the prevention of Alzheimer's disease and cancer. The Janssen Prevention Center was created to leverage this research expertise and take it further.

What is the group's focus, and why?

The Janssen Prevention Center focuses on the prevention of non-communicable diseases that come with age. These include many types of cancer, cardiovascular disease, metabolic disorders and neurodegenerative illnesses such as Alzheimer's disease.

This is an important area because of increasing life expectancy and aging populations worldwide. People are generally living longer today than their parents or grandparents, so they are spending more years suffering from chronic illnesses that tend to start after middle-age. Preventing these diseases is a top priority from both the human and socioeconomic perspectives.

The mission of the Janssen Prevention Center is to develop strategies to delay or better still prevent the onset of age-related illnesses, so that people can enjoy more years in good health. Our vision is to keep people healthy and vital for life.

What are the centre's key achievements so far?

First, I should explain that the Janssen Prevention Center consists of three groups, each with its own focus and expertise. Around 100 scientists and support staff work at our global headquarters in Leiden, the Netherlands; this is the main base for exploratory research into predictive biomarkers and preventive vaccines or oral drugs. Approximately 20 researchers are based in La Jolla, California, focusing especially on antibody discovery and analysis. Our small group in London is exploring possibilities for prevention in the emerging field of human microbiome research.

Substantial progress has been made in all these areas. Here in London, we've finished setting up research procedures and protocols, and have analysed the first samples.

At the global level, major achievements have been the development of an innovative strategy for advancing disease prevention, and establishment of the organisational structure and collaborations needed to support its implementation. Our approach to prevention starts with the search for biomarkers to measure health, predict the start of disease and guide further research into preventive interventions.

How closely do you work with the Janssen Prevention Center's groups overseas?

We work very closely with our colleagues in Leiden and there are weekly interactions with them because we are working on a similar project.

Anthony Williamson, our Head of Technology, oversees all three groups and so links the groups together.

How did you come to join the company?

My background is in microbiome research, and I met Anthony at a conference just as he was starting to set up the Crucell Vaccine Institute lab in London, so I applied and got the job.

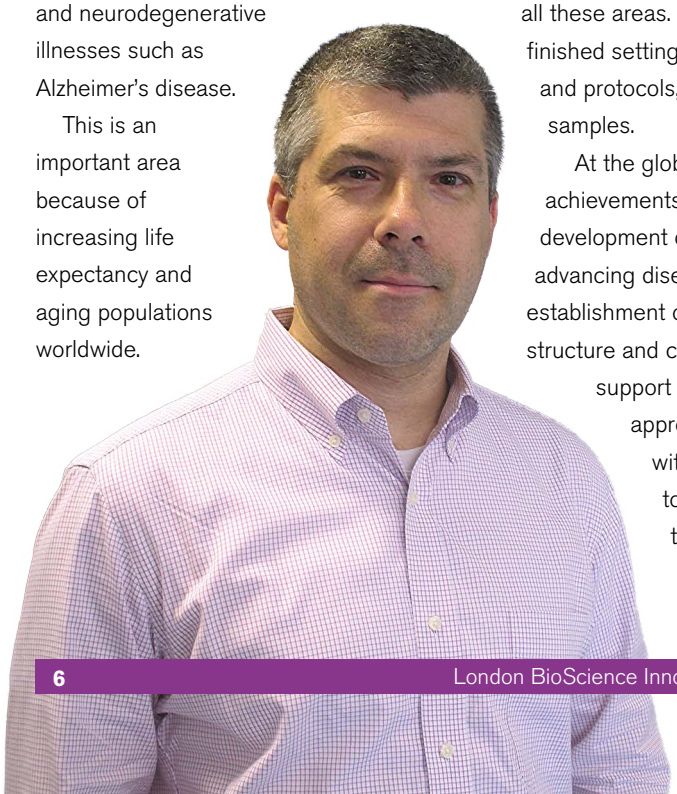
What are the advantages of being based in London?

It is a really central research hub, with lots of activities going on at UCL and Imperial, and of course there are many opportunities in Cambridge and Oxford. London is also ideally located for travel to the USA as well as within Europe.

Johnson and Johnson has its Innovation Centre here in London so that is ideal for us when we're negotiating contracts with external partners. That Innovation Centre acts as a transaction hub for us, with business development, finance and legal experts we can reach out to for help.

Looking to the future, what progress do you anticipate the Janssen Prevention Center making over the next few years?

With regards to the group here in London, I think we will set up additional programmes for different disease focus areas and become a leading partner within the company for microbiome research. We would really like to identify how we can modulate the microbiome in order to predict or prevent diseases.



Marcus Rauch, Janssen Prevention Center, London

Using your website to attract investment

DEBORAH COCKERILL, SCIAD COMMUNICATIONS

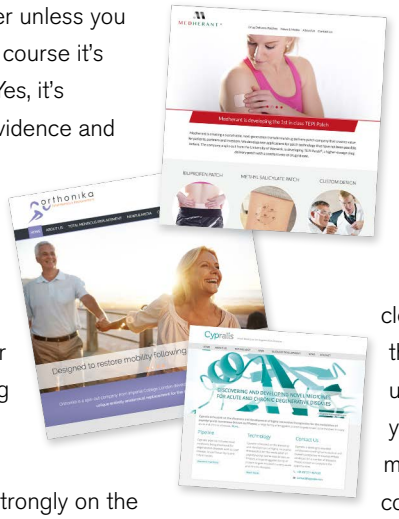
We've all been to those networking events where investors talk about what they look for when they make decisions about funding.

They usually list a common set of criteria to help them sort the wheat from the chaff. How much experience does the management team have? What is the benefit of the company's technology and what impact will it have? How good is the company's science? What's the business opportunity? What's the business model and is it expandable?

Not only is it important to answer these questions during that potentially vital conversation, it's also critical to communicate the same messages on your website and the rest of your marketing collateral. To make your company look 'fundable', you need to answer these questions clearly and it's your website where you need to start.

Don't start with the science

Science-driven companies, especially early-stage ones, often design their websites around their technology, going into great detail about their research. However, this is often highly complex and difficult to decipher unless you are a specialist and of course it's only part of the story. Yes, it's important to provide evidence and data but this can be presented accessibly as investors only need top-tier insight at this stage. You can save the detail for later when you're presenting to them.



We all know that most investors focus strongly on the experience of your management team. Business models can be changed, technology can be re-directed, but it's the team that will need to make it all happen. With a strong team well presented on your website and in your credentials you'll have a much higher chance of securing funding.

The third critical message is about commercialisation – how is your company going to make money for its investors – what's the business model? It's best to design the homepage of your website to explain your key messages prominently and concisely. Ensure that it's easy for all your stakeholders to read up on details about the market opportunities open to your company as well as the business model.

With a good website and clear messaging, investors will then find it much easier to understand the potential of your technology and will be more likely to take your company seriously as a potential opportunity.

Fabrican develops instant spider web


Fabrican instant spider web

Fabrican has created an 'aerosol loom' that instantly weaves a spider-like cobweb from an aerosol can. It uses both natural and synthetic fibres, with optional additives that impart stickiness or odour or even bacterial cellulose, an entirely organic green nanotechnology.

The instant spider web can be made in a variety of colours and textures, with diverse potential applications, from pest control, to home décor, to Wi-Fi signal booster. The spider web can be used to spray or repair a mosquito net, helping to prevent mosquito-borne illnesses, or to create a mesh to humanely capture insects. The web can even be sprayed around plants to impede slugs and snails.

Fabrican is working to integrate the latest technologies into its products, for example having micro-modems within the spider web spray, which can use signals from towers or satellites to supply Wi-Fi to rural and underdeveloped areas. Recent use of drones to deploy sprays for agricultural use or crowd control demonstrates the potential to similarly incorporate the Fabrican 3D spider web technology for further applications.

New Business Development Manager joins the Royal Veterinary College

RVC Business, the department of the Royal Veterinary College (RVC) responsible for all non-clinical commercial activity, welcomed Stuart Saigeman as Business Development Manager in February 2016.

Stuart has over 34 years' experience covering many areas of human, veterinary and ecological sciences both in the UK and New Zealand, working for universities, large pharmaceutical companies, and contract research organisations. His expertise and knowledge of the industry combined with sales experience will make him pivotal to the success of RVC Business.

Stuart has been familiarising himself with the Royal Veterinary College, which in March 2016 was ranked as the top vet school in the UK and Europe for the second consecutive year in the QS World University Rankings. The RVC's academic performance is boosted by a strong research portfolio.

Stuart has been meeting with LBIC clients to understand their research background, core values and their visions for the future. He will then identify how the RVC can aid these companies in achieving their research goals, leading to expansion of their core business areas.

Stuart said "*I love coming to work each day as there is always something new for me to learn or a person to meet, especially when they talk about their work or company they have set up. The enthusiasm and determination is extremely uplifting, especially since they have chosen to locate themselves at LBIC.*

"RVC Business provides a tremendous opportunity for bioveterinary and human healthcare companies to access the expertise, facilities and equipment at the RVC. I have also identified key areas where, given the opportunity, LBIC clients can harness more collaborative work with the RVC, but also with other clients within LBIC. Over the next five years, I see RVC Business growing – with hard work, determination and some entrepreneurship thrown in. Others might add "and some luck": I tend to think that you produce your own luck."

If you wish to meet Stuart for an informal chat over a coffee to discuss your work and how RVC Business might help, please contact him at ssaigeman@rvc.ac.uk

Would you like to feature in our newsletter?

If you would like to contribute to a future issue of LBIC News, contact **Lucy Garnsworthy** on **+44 (0) 20 7691 0982** or **email lgarnsworthy@rvc.ac.uk**

Contact us

LBIC has been supporting life sciences companies since 2001. Today we host more than 60 companies, ranging from entrepreneurial start-ups to more established UK companies and overseas subsidiaries from Europe, North America and Asia Pacific. The Centre is owned

and operated by the prestigious Royal Veterinary College, one of the independent Colleges of the University of London.

The Centre is a 10-minute walk from St Pancras International for Eurostar services and the site of The Francis Crick Institute.

Our management team comprises:

Dr Ken Larkin
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Deputy Director

Janette Pickles
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