



Making Biotech Great Again

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The instructions for writing this piece asked for “something about positive developments in the life science industry to counterbalance the doom and gloom in the world news in general”. But of course, every problem is but an opportunity, so in the spirit of helping Make Biotech Great Again (NB my late father’s name was Donald), here are two of the key problems/ opportunities (and positive developments) currently facing the industry.

Focus on Real Value

Lurid headlines about old products being repriced hundreds of times higher than previously (EpiPen in the USA or prednisolone tablets in the UK) speak to the political zeitgeist, especially under the Trump administration. Although a stain on

the landscape, these potential market abuses are essentially sideshows. The main act is the focus on the real clinical value of pharmaceuticals.

On the downside, there will be increasing opposition to paying >\$150,000 for incremental clinical value (e.g. a few weeks’

Continued on page 3.

WELCOME

It is my pleasure to welcome you to this issue of LBIC News. I continue to be impressed at the innovative ways in which our clients address real-world problems, and it’s no wonder that our guest writer Anthony Walker of Alacrita describes the life science sector climate as “sunny”.

Our featured client activities show some particularly bright spots: a vaccine that uses a mosquito’s own saliva to prevent human infection (Page 4), sustainable, protein-rich animal feed made from natural gas (Page 6) and even a spray-on instant sock that could treat fungal infections (Page 7).

I hope you enjoy this Summer issue and let us hope the life science forecast remains positive.

Lucy Garnsworthy, Editor

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on helix

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Translating UK scientific excellence into global therapeutic strategies

Keynote Addresses:

- Sharon Vosmek, Astia
- David Tapolczay, MRC Technology
- Pete Jackson, The AMR Centre
- Sara-Jane Dunn, Microsoft

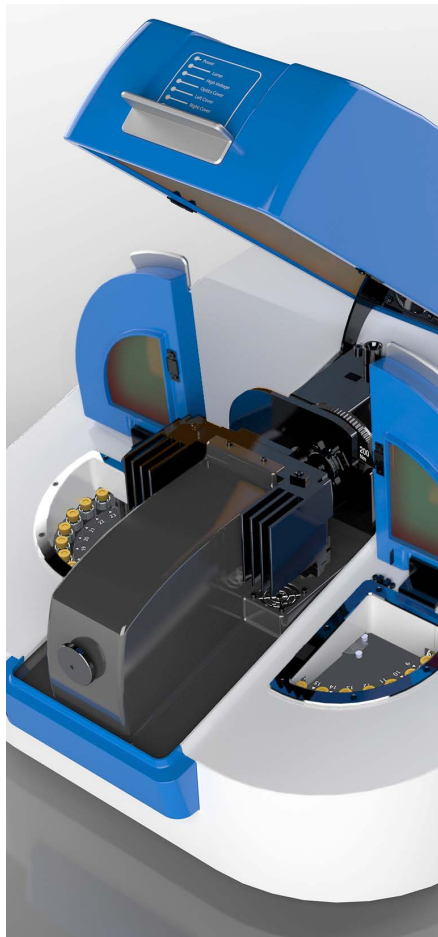
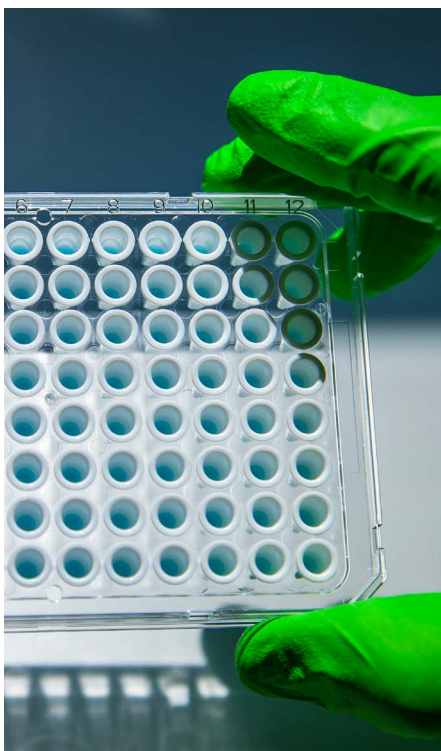
What to expect from the conference:

- Interactive Panel Debates
- 300 + Delegates
- 30 Exhibitors
- 1-2-1 Partnering

deltaDOT's software achieves FDA compliance

deltaDOT has updated its High Performance Capillary Electrophoresis (HPCE) technology to produce the improved HPCE-512 instrument. In addition to features such as optional sample cooling, the HPCE-512's instrument control and analysis software has now achieved compliance with the US Food and Drug Administration (FDA)'s Code of Federal Regulations (CFR) Part 11, covering electronic records. These require electronic records to be "trustworthy, reliable, and generally equivalent to paper records and handwritten signatures executed on paper."

deltaDOT's software meets CFR Part 11's stringent criteria, including prevention of unauthorised system access, maintenance of audit trails of user actions, generation of complete and protected data files and electronic signatures applied to data. deltaDOT's clients can confidently use the HPCE-512 instrument throughout their analysis, knowing all data can be properly validated.



deltaDOT's HPCE-512 instrument

PCR Biosystems improves PCR precision

PCR Biosystems' latest real-time PCR mixes, qPCR BIO SyGreen Blue Mix and qPCR BIO Probe Blue Mix, are designed to make it easier for researchers to set up their real-time PCR experiments. These easy-to-see mixes contain a non-reactive blue dye to improve reaction mix visibility without affecting PCR performance. The enhanced contrast between reaction mix and plastic enables greater pipetting precision and is particularly useful when loading small volume reactions. This new feature is combined with antibody-mediated hot start technology and advanced buffer chemistry to ensure maximum specificity and sensitivity for real-time PCR assays.

Visit www.pcrbio.com for further details including comprehensive competitor comparisons, or email andrea@pcrbio.com to order a free sample.

Domainex launches FragmentBuilder

Domainex recently launched its fragment screening service, FragmentBuilder, becoming the first CRO in the UK to offer MicroScale Thermophoresis (MST) as part of its services. FragmentBuilder's high-throughput technique quantifies molecular interactions and structural dynamics, to present binding affinity results within minutes. Advantages over alternative molecular interaction assay methods include a free choice of assay buffer systems, fast and flexible set-up with the potential for 400 measurements per hour, as well as a broad concentration range and small sample consumption.

Tecrea's Nanocin technology enters clinical testing in humans

Blueberry Therapeutics Ltd will use Tecrea's cell and tissue delivery nanotechnology, Nanocin™, in a Phase I/II proof of concept clinical trial in humans, which should validate Nanocin's suitability for clinical development projects.

Nanocin is a novel platform for non-toxic delivery of small molecules using nanoparticles, with the potential to improve efficacy of reagents, drugs and diagnostic probes.

Blueberry's study will test a Nanocin™-based nanomedicine for safety, local toleration, systemic and local pharmacokinetics as well as efficacy in the chronic and frequently recurrent conditions of onychomycosis and tinea pedis.

LBIC welcomes these new clients to the Centre:

- Braincures
- Calchan
- GammaDelta Therapeutics
- Health in Code
- InDNA Global
- PrepBioPharm

Continued from front page

extension of survival while suffering from a severely compromised quality of life). The corresponding upside is that breakthrough products that offer step changes in clinical efficacy will attract premium pricing and will be reimbursed. We have already seen a massive willingness to pay for curative therapies for Hepatitis C and for immunology agents that offer benefits in certain cancers where none existed before, and in the wake of filings for Kite's and Novartis's CAR T products, we should soon witness the birth of a new class of cell therapies, again with a transformative impact on the lives of cancer patients.

Golden Age of Life Sciences

Again, starting with the bad news, there is the perennial complaint about decreasing R&D productivity in the pharmaceutical industry coupled with a downturn in the FDA's rate of new drug approvals (albeit from a relative high the previous year). However, the news is far from all bad.

If you search the internet, you will find numerous papers hailing the 'golden age' of biology stretching back at least 60 years. But whether it is better than anything that will follow, today's life science research is at a high-water mark. The spectacular recent advances in gene therapy, cell therapy, genome editing, immuno-oncology, etc. have created a wealth of opportunities for savvy investors. It is particularly gratifying from a UK perspective to see so many large life science oriented investment

funds, many of which take a patient approach with the intention of building great companies (as opposed to just assets to sell): Syncona, Arix, Cambridge Innovation Capital, Oxford Sciences Innovation and Touchstone Innovations are some prime examples.

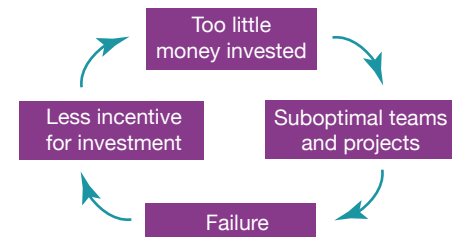
Among the '10 Breakthrough Technologies of 2017' showcased in the MIT Technology Review are three life science opportunities:

- Reversing paralysis using brain implants to restore the freedom of movement that spinal cord injuries take away
- Gene therapy 2.0: now that we have solved fundamental problems that were holding back cures for rare hereditary disorders, we'll see if the same approach can take on cancer, heart disease, and other common illnesses
- The Cell Atlas, a collaboration between the Sanger Institute, the Broad Institute and Mark Zuckerberg's Biohub, aiming to produce the first complete map of human cells that should comprehensively reveal what human bodies are made of and provide a sophisticated new model of biology that could speed the search for drugs.

There are dozens of other exciting technologies that are currently emerging, and space does not allow us to list more, but the overall climate in life sciences research remains sunny.

Recipe for Success

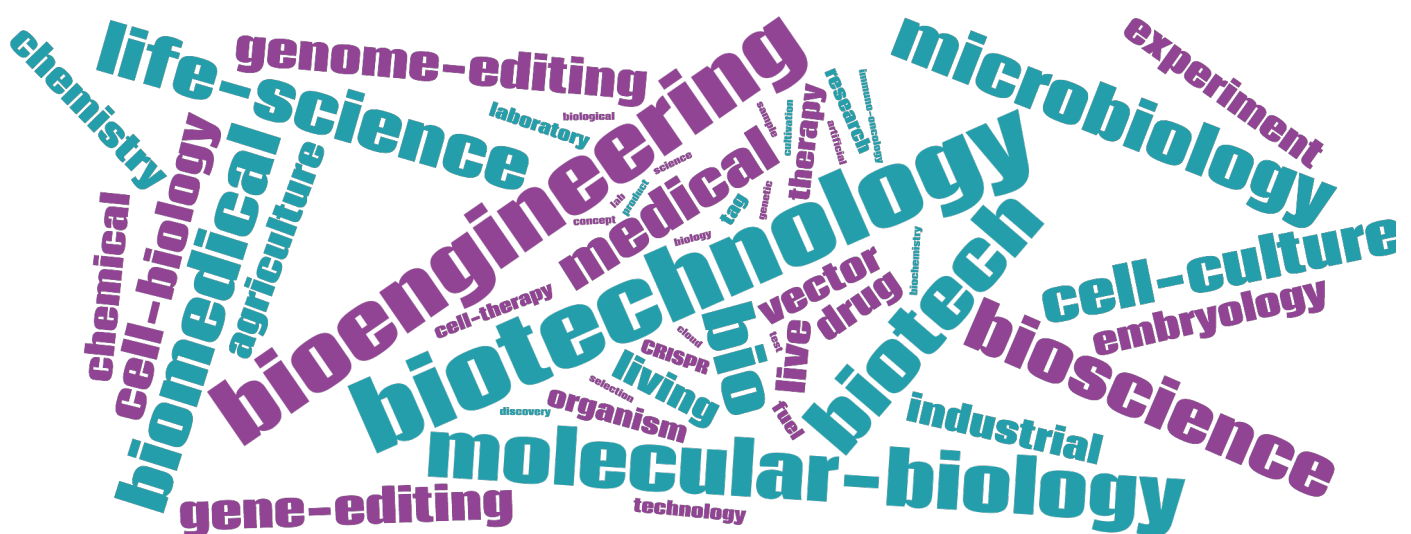
The pessimists have a hard time seeing beyond the trap that has beset biotech, especially in Britain, resulting from the vicious cycle:



For companies seeking capital, there are some golden rules that must be followed to maximise the chances of a successful financing round. Businesses need to be built around strong teams and compelling propositions that:

- Are well prepared for due diligence
- Have a commercial proposition, strongly supported (e.g. payer research)
- Have designed 'killer experiments' that reinforce value
- Contain sufficient IP, possibly from more than one source, that has been well-curated
- Have formulated robust development plans.

Provided these rules are followed, Alacritia's consulting practice on both sides of the Atlantic remains strongly optimistic about life sciences.



SEEK's mosquito-targeting vaccine reaches Phase I trials in USA

SEEK's investigational vaccine AGS-v, designed to trigger an immune response to mosquito saliva and thereby prevent infection, has reached Phase I clinical trials in the USA.

AGS-v contains four synthetic proteins from mosquito salivary glands. The proteins are designed to induce antibodies in a vaccinated individual and to cause a modified allergic response that can prevent infection when a person is bitten by a disease-carrying mosquito. The antibodies may also affect the biting mosquito, reducing the insect's reproductive ability or



*NIH Bethesda
Courtesy National Institutes of Health*

causing early death. Mosquito-borne diseases and infections cause over one million deaths per year worldwide.

The USA's National Institute of Allergy and Infectious Diseases (NIAID) is conducting the AGS-v trial at the National Institutes of Health (NIH) Clinical Center in



*Male Aedes Aegypti Mosquito
Courtesy NIAID*

Bethesda, Maryland. Around 60 healthy adult volunteers will participate in the double-blind study, separated into three groups to receive either two vaccine injections, one vaccine and one adjuvant injection, or two placebo injections. Study investigators will examine the volunteers and test their blood samples throughout the study to measure the levels of antibodies relating to the vaccine injections.

Following the injection stage, the volunteers will then have a controlled

exposure to non-infectious biting mosquitoes. Their blood will be tested for a response to the mosquito bites, while the mosquitoes themselves will be monitored for any changes in lifespan or fertility. Monitoring of the volunteers will continue for 10 months after the mosquito tests, to assess long-term effects, with the end of the study expected to be summer 2018.



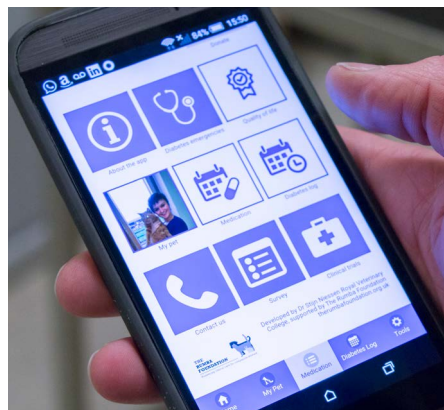
*Clinical trial participant at NIH
Courtesy National Institute of Allergy and Infectious Diseases*

exposure to non-infectious biting mosquitoes. Their blood will be tested for a response to the mosquito bites, while the mosquitoes themselves will be monitored for any changes in lifespan or fertility. Monitoring of the volunteers will continue for 10 months after the mosquito tests, to assess long-term effects, with the end of the study expected to be summer 2018.

RVC's revolutionary Pet Diabetes App

The Royal Veterinary College (RVC) has launched an app to improve diabetes management in animals and aid further research into the condition.

The free app, designed by Dr Stijn Niessen, a Senior Lecturer in Internal Medicine and pet diabetes expert at the RVC, allows pet owners to record key aspects of their pet's condition (such as weight, appetite and urination) as well as blood glucose measurements. Both owner and veterinarian can thereby have a clear clinical history before the animal is even seen at the clinic, so any treatment or controls can be amended in response to



the data from the app. The app also uploads data anonymously into a central database to improve research into pet diabetes. Over 2,000 users have downloaded the app since its launch in

summer 2016.

The app features various additional user-friendly capabilities, such as graphs to visualise important trends, a scientifically validated tool to calculate and monitor quality of life, and reminders including a prompt to rotate insulin injection sites to avoid inflammation.

The RVC developed the app with funding support from the Rumba Foundation, which supports pioneering clinical care for companion animals.

The RVC Pet Diabetes App is now available for free download onto smartphones and tablets, from Android (<http://bit.ly/1q3jCV5>) and iPhone App stores (<http://apple.co/203OoK2>).

LBIC's Virtual Client package

A flexible London biotech base

LBIC offers a 'virtual tenancy' for companies who need a London hub without the need for a permanent physical space on site.

Over two-thirds of LBIC's current virtual clients have been with us for more than three years, having found that the virtual option is all they need. Some of these have

their main operations elsewhere in the UK or abroad, so having a base in London is invaluable.

LBIC's experienced team has developed

the virtual package to suit the needs of life science companies of all sizes.

Introductory offer*

£600

for first six months



Benefits of an LBIC Virtual tenancy

- **A Central London address** less than 10 minutes' walk from the international transport links of St Pancras International station as well as the new Francis Crick Institute
- **Discounted client rates** on meeting rooms, catering and video conferencing facilities
- **A dedicated telephone line** answered in the client's name and redirected as needed
- **Post collection** and redirection
- **Courier bookings** at client rates
- **Access to RVC equipment** and facilities, including the stunning Lightwell café
- **One-year complimentary Gold membership of One Nucleus**, the international membership organisation for life science and healthcare companies
- **Visible profile within LBIC** and through our marketing and communications
- **Option to cancel at any time**, with just one month's notice period

The set-up process is quick and straightforward

Contact us at lbic@rvc.ac.uk or call +44 (0) 20 7691 1122 today to enquire about becoming a Virtual client.

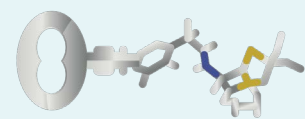
Additional charges may apply for certain services. A full list of charges can be supplied on request.

* Excludes VAT

Oppilotech secures funding to fight drug-resistant infections

Oppilotech has received funding for a six-month project to undertake early screening work, with an ultimate aim of developing the first new class of antibiotics to gain approval in over 25 years treating acute infections. Oppilotech's funding is from a new public-private partnership, the Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator, known as CARB-X.

CARB-X is a joint initiative by several US healthcare and research bodies to address the urgent threat of antibiotic-resistant bacteria, which kill 700,000 people a year worldwide. Funded by the Biomedical Advanced Research and Development Authority (BARDA) and the Wellcome Trust, CARB-X aims to invest up to \$450 million over five years to accelerate the preclinical discovery and development of at least 20 new antibacterial products, and progress at least two new products into human trials.



Oppilotech
UNLOCKING RESISTANCE

Ajay Mistry PhD, Founder/CEO of Oppilotech, said, "We are delighted to be one of the first portfolio companies selected by CARB-X. Our project was vetted by leading antibiotic experts on the CARB-X Advisory Board and is a reflection of the high-quality science we are pursuing to develop our pipeline of new anti-bacterials."



Commercial production underway on Unibio's sustainable animal feed

Henrik Busch-Larsen and HRH Prince Joachim at the new plant

HRH Prince Joachim of Denmark has opened Unibio's first production facility, based in the municipality of Kalundborg in Denmark, marking the company's next step in producing efficient, sustainable animal feed on a commercial scale.

HRH Prince Joachim said: "Like farming, science and research form an important part of our Danish identity...the traditional farming industry must face the future hand in hand with science and technology."

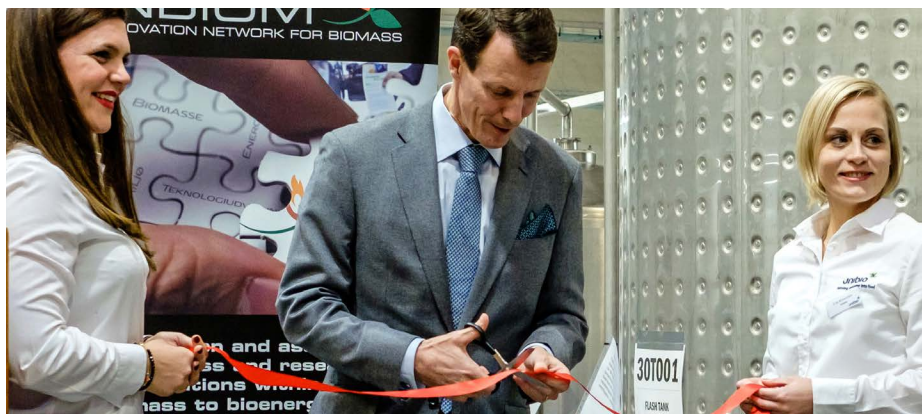
Unibio obtains a protein-rich animal feed called UniProtein from methane gas through a fermentation process using its patented U-Loop design, which was optimised shortly before the opening of the new plant. The U-Loop fermentor gives a high utilisation of the gas, which flows through the system with the other ingredients, creating much smaller bubbles than in traditional stirring methods, with approximately 30% energy saving.

UniProtein is 72.9% protein and has been approved by the EU as an animal feed supplement. Its long shelf life and

sustainable production process make it a very attractive option for feed suppliers: the initial year's output from the new plant has already been sold to Danish company Vestjylland Andel.

Henrik Busch-Larsen, CEO of Unibio, explained: "The crucial advantage of

UniProtein is that the technology is scalable and environmentally friendly compared with fishmeal and soy protein. We can produce natural protein in a plant using methane gas, and therefore the production of UniProtein is not limited by fishing quotas or the use of pesticides, and it is weather-independent. Unibio's technology thus provides animal feed producers access to a sustainable protein source of very high quality."



HRH Prince Joachim opens Unibio's new plant

Fabrican's Instant Socks

Fabrican has developed an instant sock from an aerosol can, offering a quick and convenient way to store and carry socks, with huge potential in healthcare and sport science as well as fashion.

Fabrican's formulation, based on a suspension of fibres, binders, solvents and a non-flammable propellant, can produce socks in either natural or synthetic fabric, including linen, wool, silk, nylon or polyester. This new way of dressing helps to create a perfect fit, and the seamless "second skin" sock helps to reduce friction from shoes and protects sensitive areas of the feet.

The 'Sterilised Sock' factor

Many sport, cosmetic, podiatrist and healthcare companies are showing interest in the new development for its varied applications.

Socks can incorporate antiseptics and anti-fungal agents to treat fungal infections of the toenails or feet and verruca treatments. Healthcare companies could utilise socks with anti-bacterial properties,



or natural deodorising ingredients such as tree tea oil or mint.

Chiropodists see benefits in the idea of embedding oils, tinctures and ointments for treating many foot conditions. Moisturisers

could be incorporated to allow healing and softening blisters and calluses on the feet. Scents could help disguise unpleasant odours. Fabrican's instant Spray-on fabric can also be tuned to create absorbent fabrics that would help with excessive sweating.

Fabrican claims that the instant sock prototype cleans your feet and provides a cooling, soothing effect when applied. Sports companies and consumers envisage easy-to-repair socks during sport, with extra padding added to high-friction areas. Fashion houses will be able to create any colour and quickly follow trends.

Please contact Fabrican for further information on the spray-on sock from an aerosol can.

www.fabricanltd.com

Introduction to...

Calchan

Calchan specialises in the early-stage development of oral small molecule treatments for pain and inflammation. Calchan's assets were originally spun out of GlaxoSmithKline (GSK).

Calchan's pipeline targets areas of clear unmet need: the lead drug candidate, a novel state-dependent calcium channel blocker, is a Phase I/II asset being developed for neuropathic pain indications. The company is also working on an apoptosis signal-regulating kinase 1 (ASK1) inhibitor, targeting pain and inflammation, which is currently at the preclinical stage.

Calchan received a £2.4 million government grant from Innovate UK to work with Galapagos on osteoarthritis research.

Calchan's team is led by CEO Brenda Reynolds, who has a successful track record of building UK-based companies, and CSO Zahid Ali who has extensive R&D leadership expertise, particularly in the pain and inflammation arena.

Calchan investors include Apposite Capital, New Leaf Venture Partners and SV Life Sciences as well as GlaxoSmithKline. www.calchan.co.uk

The logo for Calchan, featuring the word "Calchan" in a bold, blue, sans-serif font.

LBIC Clients by sector

4

Clean Tech 6.2%

Exploring alternative sources of fuel and animal feed, including algae and sugarcane waste.

17

Drug Discovery 26.2%

Seeking new treatments for health problems including cancer, HIV, influenza and multiple sclerosis.

13

Medical Diagnostics 20%

Technologies in development include point-of-care blood tests, early dementia detection and test for genetic diseases.

6

Medtech 9.2%

Products include a solution to preserve cells and tissue samples, a spray-on fabric and a mobile app to assist breast cancer patients.

10

Service Provider 15.4%

Specialist consultancy, IT, marketing and equipment services for the life science industry.

14

Analytical Services and Products 21.5%

Providing Radiocarbon dating, Contract Research, specialist software and platforms for laboratory processes and DNA sequencing.

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:

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Chief Executive

Janette Pickles
Operations Manager

Lucy Garnsworthy
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