



Industry-academia alliances to discover new drugs for cancer

A scientist at CRT Discovery Laboratories analyses a sample

Dr Hamish Ryder, Director of Drug Discovery for Cancer Research Technology Discovery Laboratories (CRT-DL), discusses the importance of industry-academia alliances in discovering new drugs for cancer.

CRT-DL is a small molecule drug discovery organisation comprising some 70 scientists, the majority of whom have previous pharmaceutical or biotech industry experience.

We are located at the Babraham Research Campus in Cambridge and have recently moved our London group to LBIC, in prime position to interact with the Francis Crick Institute, where a number of our collaborating Principal Investigators will be based.

We are part of CRT which in turn is a for-profit subsidiary of Cancer Research UK. CRUK is the world's largest charitable funder of cancer research, with an annual spend in excess of £350 million. CRT 'profits' are gift-aided back to the parent charity to fund further research.

It is a time of exciting progress in the understanding of cancer, even if this understanding underscores the complexity of tumour heterogeneity and resistance. At the same time great progress in the development of new therapies is being reported, particularly in the field of immunoncology, although there is again here much to learn about why some patients respond and others do not.

Unmet need remains high across many cancer types, and the incentive has never...

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WELCOME

The past six months have been very busy at LBIC, and we are delighted to feature many of our new clients in this issue. Cancer Research Technology, RespiVert and Fabrican have all set up their facilities now and are doing fascinating work in drug discovery, pulmonary diseases and spray-on fabrics, respectively.

MedCity has celebrated its first birthday at LBIC – on page 7 we hear about their progress promoting the UK life science industry.

We also have an update from the newly-launched Bio-Analysis Centre, which has already been making a big impact on clients.

Page 5 features some of the latest exciting developments in Synthetic Biology, a rapidly growing area of bioscience.

L. Gatty

Lucy Garnsworthy, Editor

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Source reagents by protein, inventor or institute. Find a supplier and view publications citing use



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Client News Round-up

Vasgen receives grant for US patent and advances R&D operations

Vasgen has been issued a notice of allowance for the US patent entitled 'ADAM15 Antibodies and Immunogenic Peptides'. Vasgen is developing a monoclonal antibody therapy targeting ADAM15 for the treatment of ocular neovascular diseases, such as wet age-related macular degeneration and potentially several aggressive cancers. The company has recently embarked upon an Innovate UK Biomedical Catalyst-funded project, in collaboration with the UCL Institute of Ophthalmology, to evaluate early-stage therapeutic candidates.



Aglaris Facer 1.0

Aglaris prototype to scale-up cell culture processes

Aglaris Cell has finished its first non-commercial prototype of Aglaris Facer 1.0. This prototype will be used to scale-up all the cell culture processes developed in the laboratory and perform all the validations needed for CE and GMP. The prototype has been designed and manufactured under the strictest standards of quality and ergonomics.

Riverbank IT Management ranked as one of the top IT service companies in Europe

Riverbank IT Management has been ranked as the 37th best Managed Service Provider (MSP) in Europe on Penton Technology's eighth annual MSPmentor 501 Global Edition. The list and report identify the world's top 501 MSPs. MSPmentor gathers information for its annual rankings through the participation of managed service providers and IT service providers in an annual survey. Rankings are based on Penton Technology's unique criteria for MSPs, such as annual recurring revenues and total revenues.

Vaxin acquires Immune Targeting Systems

US clinical stage vaccine development company Vaxin Inc. has entered into a definitive agreement to acquire novel T-cell vaccines company Immune Targeting Systems (ITS) Ltd. to advance its leadership in developing vaccines for public health and biodefense needs. The combined company (known as Vaxin Inc.) will have multiple clinical-stage assets, including seasonal 'flu programme NasoVAX, a hepatitis B therapeutic vaccine, and AdVAV, an intranasally administered anthrax vaccine. Additional pre-clinical programmes include a programme in cancer vaccines and several early-stage animal health vaccines.



LBIC welcomes these companies who have joined the Centre over the past six months:

- Alkol Biotech
- Cancer Research Technology
- Brain e-Games
- Innoveas International
- MedCity
- Pharmamedic Consultancy
- RespiVert
- UCL Quantum Foundations Group
- Yaqrit

Continued from front page

been greater to bridge the gap between cutting-edge academic research and organisations with the wherewithal to develop and rapidly bring new agents to patients.

As part of CRUK's broader translational strategy, CRT-DL has an exclusive focus on establishing and prosecuting biologically-themed multi-project alliances with industry. We share CRUK's ambition to beat cancer sooner, and our alliance model is fully aligned to making this a reality. We seek to bring together the best minds in basic and clinical cancer research, the rigour and drive of pharmaceutical and biotech companies, and our in-house drug discovery and alliance management capabilities to deliver breakthrough medicines for patients.

Each alliance is focused within a defined area of cancer biology, and has the aim of delivering a portfolio of drug discovery

projects that have compelling biological rationale and a clear understanding of which patients may benefit in the clinic. The themed approach allows clear delineation of alliance scope, innovative and focused ways to engage with the academic community and the efficient triage and prosecution of multiple drug discovery targets.

We have pioneered, developed and refined our approach by establishing



successful alliances with AstraZeneca in the area of cancer metabolism, Teva Pharmaceuticals in DNA damage response and Forma Therapeutics in deubiquitinase inhibitors.

Key principles to establish a successful alliance with CRT-DL include:

- Strength of the underlying science
- Involvement of a KOL group of world-class researchers funded by CRUK
- Early engagement of KOLs through funding and research tool access
- Early engagement of industry partners to help shape the alliance strategy
- Complementarity in skills and capabilities across all alliance partners
- Flexibility and transparency

We explore new theme areas on an ongoing basis and welcome interactions and input from both the academic community and potential industry partners as we plot the next assault on cancer. Areas we are currently thinking about, but are by no means limited to, include immuno-oncology, epigenetics and protein translation.

Oncology at the RVC

At the Royal Veterinary College (RVC), researchers study cancers in veterinary patients that can also be used as models for human cancer, working alongside clinical scientists and pathologists at veterinary and medical schools.

The RVC Comparative Physiology and Medicine research programme investigates diseases suffered by domestic pets and other animals that also occur in humans. The results of these projects can be used to develop treatments for animals and humans.

The Immune Regulation and Cancer group seeks to understand regulatory mechanisms that maintain immune tolerance and how failure of these mechanisms lead to autoimmune, inflammatory and neoplastic disease. A key focus is regulatory T cell (Treg) biology.

Professor Oliver Garden leads the Oncology Special Interest Group (OncoSIG)



Professor Oliver Garden and Dr Dammy Pinheiro in the lab

at the RVC, and has recently been awarded a grant by Petplan Charitable Trust to work on immune privilege in canine B cell lymphoma (BCL).

Professor Garden explains: "Cancer of the lymph nodes is a leading cause of

death in dogs. We propose to extend our previous work on canine BCL by defining suppressive cells in the cancerous lymph nodes that block the immune system's efforts to inhibit or kill the cancer.

Knowledge of the impact of these cells on the course of the cancer will not only help us to predict outcome in individual cases, but will also provide new targets for future treatments."

OncoSIG integrates the expertise of all researchers at the RVC and LBIC with an interest in cancer, including clinicians, clinician scientists and basic scientists from across the various RVC campuses. OncoSIG scientists enjoy a vibrant programme of monthly meetings and seminars, in which recent research, group developments and notable journal articles are discussed.

RespiVert

Joel Dudley interviews Dr Anne Brindley, VP and managing director of RespiVert, about the company's trajectory and focus.

When and how was RespiVert established?

RespiVert Ltd was established in 2007 as a start-up company, by Drs Garth Rapeport and Pete Strong (both ex-GlaxoSmithKline), with the scientific backing of Prof Peter Barnes of the National Heart and Lung Institute, Imperial College, London.

The company was venture capital (VC) funded, with a key investor being Imperial Innovations – the VC arm of Imperial College. RespiVert based itself at the Imperial Incubator in South Kensington. RespiVert was then acquired by Janssen Biotech, Inc. (formerly known as Centocor Ortho Biotech, Inc.) in May 2010, one of the Janssen Pharmaceutical Companies of Johnson & Johnson.

Why does RespiVert choose to focus on products for pulmonary diseases?

RespiVert focuses on discovering and developing new medicines for pulmonary diseases, including chronic obstructive pulmonary disease (COPD) and severe asthma. We focus on treatments to be inhaled directly into the lungs, where the diseases are located, to maximise the chance of achieving a benefit while minimising potential side effects.

RespiVert focuses on these diseases because of the high unmet medical need – COPD is the third leading cause of death worldwide, with high rates of smoking, exposure to pollution and an ageing population all contributing to the growing worldwide prevalence. Asthma affects approximately 300 million people worldwide (4–5% of the world's population), causing a large socioeconomic burden. Approximately 5–10% of asthmatics have moderate to severe disease that is poorly controlled, despite treatment with currently available therapies.

What are the company's key achievements so far?

RespiVert has discovered and taken three new compounds into early clinical testing thus far, and continues its innovative focus on discovery and development work to improve upon current therapies for pulmonary disease.

How did the acquisition by Janssen Biotech alter how RespiVert works and what it can achieve?

The acquisition by Janssen Biotech allowed further investment in the discovery and



Members of the RespiVert team in their new space

development programmes that were ongoing, new programmes to be initiated and an expansion of the skills within RespiVert. Furthermore, it has enabled access to resources and expertise within the global organisation to support ongoing discovery and development programmes.

What attracted you to move to LBIC?

Prior to the move to LBIC, RespiVert was located at both the Imperial Incubator in South Kensington and at the J&J Innovation Centre off Oxford Street. The move to LBIC has enabled the whole RespiVert team to be located together in one site. LBIC is one of the few sites in London where office and serviced laboratory space is available.

What are the advantages of being based in London at this point in time for a drug discovery and development company?

The central London location, close to good transport links, makes LBIC a great site. The location is central to the "Golden Triangle" of life sciences research and biotech innovation in the UK, encompassing London, Oxford and Cambridge. This facilitates collaboration with numerous high-quality academic and industrial groups. In particular, the proximity to the Crick Institute and facilities of the RVC are useful.

In addition, the location facilitates recruitment from a wide talent pool across southern and eastern England, and is convenient for employees who can come

into central London from all directions. In a small group like RespiVert, the staff are key to its success; therefore, there is a need to be in a convenient location to attract and retain the talent needed to advance science.

Looking to the future, what progress do you anticipate RespiVert making over the next couple of years?

Ultimately, we hope to advance innovative medicines for pulmonary disease and deliver a therapeutic solution to the market to help those patients in need of new options. That's what we are about and will remain focused on, and we are excited to progress our efforts here at LBIC.

AL COSTA, ALKOL BIOTECH

Alkol Biotech is a research company focused on the development of new plant varieties adapted to the needs of specific biofuel markets. The company adapts plant varieties to grow in colder and drier climates, offering better resistance to pests and diseases and higher productivities. This allows the development of healthy biofuel markets in countries that otherwise have to import biomass in order to produce biofuels sustainably. Europe has set a goal that by 2020, 94% of all the ethanol mixed in gasoline has to come from cellulose instead of sugar. However, a similar goal was also attempted in the US and proved a failure,

due to the lack of high-yielding cellulose feedstocks.

Sugarcane bagasse is widely considered as the best source for cellulose, but is currently only grown in Spain. However, Alkol has developed a hybrid called "EUenergyCane" which is able to withstand colder temperatures, and thus can be grown in colder regions, including the UK.

The hybrid was developed in the company's fields in the city of Motril in Spain, where Alkol is also creating what will be Europe's first sugarcane and tropical species breeding lab. To that end, it created a consortium with the city council and

leading universities in Europe and the USA.

Developing the EUenergyCane variety is a continuous improvement process which, in this next phase, will use genomics techniques to find relevant markers related to stress and cellulose production. To this end, being part of LBIC opened many doors to high-end, cost-effective mapping techniques which the company expects will drastically cut expenses and development time. The EUenergyCane will be a solution for the food x fuel crisis in Europe and the company plans to become the leader in plant genomics focused exclusively on the biofuels market.

Glowing plants, DNA synthesis and a language for biology

The growth of Synthetic Biology

LUCY GARNSWORTHY, LBIC

Synthetic biology has been identified as one of the UK's 'Eight great technologies' by the Department for Business, Innovation and Skills and the market was valued at US\$2.7 billion globally in 2013, predicted to reach US\$11.8 billion by 2018.

Synthetic biology incorporates elements of engineering, technology and even design to create new products or processes with a biological application. The third annual SynBioBeta London conference took place in April, showcasing recent advances in this rapidly-growing field. Companies presented recent innovations from a range of sectors including automation, healthcare, food and agriculture.

June 2013 saw the backing of the first crowd-funded synthetic biology project, Glowing Plant, which uses custom DNA sequences to produce a glow-in-the-dark

plant. Although VCs and angel investors generally advise caution regarding crowd-funding, Glowing Plant raised US\$484,000 (via Kickstarter) and will be shipping to its first US consumers later this year.

At SynBioBeta 2015, Glowing Plant announced the launch of TAXA, a new platform built from their existing product infrastructure that allows the development of novel consumer plants "without stepping into a lab". The nature of TAXA also means that the product is free from any regulatory approval process within the USA, thus reducing time and cost involved in users bringing a product to market and allowing for a more fluid product development strategy.

Another notable synthetic biology company is Twist Bioscience, which has a proprietary DNA synthesis process utilising a 10,000-well silicon platform – a step away from the traditional 96-well plastic plates, thereby enabling rapid, cost-effective

synthetic gene production. Twist has raised US\$40.2 million in 10 months, including a US\$5.1 million DARPA contract.

LBIC client Synthace, who in February 2015 closed a £2.2 million funding round, also presented their latest developments at SynBioBeta, notably the release of Antha, a high-level language for biology that allows users to create rapid, reproducible workflows using individually testable and reusable 'Antha Elements'.

New identity for microbiome group

ANDREA DINGEMANS, JANSSEN PREVENTION CENTER

You may have noticed that the name Crucell Vaccine Institute has disappeared from LBIC and been replaced by Janssen Prevention Center. The change reflects the creation of a new research group within the Janssen Pharmaceutical Companies of Johnson & Johnson.

Launched at the start of 2015, the Janssen Prevention Center (JPC) has been created to drive ground-breaking research into disease prevention in major areas of unmet medical need. It focuses on chronic, non-communicable diseases that are becoming increasingly common as people live longer, such as Alzheimer's disease, heart disease, cancer and autoimmune conditions. Preventing these illnesses will be crucial for shaping a healthier future and ensuring the long-term sustainability of healthcare systems.

Approximately 120 employees have transitioned from the former Crucell Vaccine Institute (CVI) to JPC, which has its headquarters and laboratories in Leiden, the Netherlands, as well as labs in La Jolla (California, USA) and here at LBIC in London.

The UK lab was established within CVI last year to advance research into the microbiome – the diverse population of bacteria living in and on the human body. There is growing evidence that the microbiome plays key roles in health and disease, raising new possibilities for therapeutic and preventive medicine.

"As part of JPC, we will focus on exploring the microbiome's relationship with non-communicable diseases, with a view to designing new concepts for their prevention," says Marcus Rauch, who now manages the London team on a daily basis.

The group's founder, Anthony Williamson, has been appointed to global positions within JPC, while retaining overall responsibility for the microbiome unit. He sees exciting times ahead as the London lab becomes fully operational. The team is currently focusing on industrialising microbiome research technology in preparation for working on cohort samples over the summer.



The resident Janssen Prevention Center team (from left to right): Nabeetha Nagalingam, Diana Munera, Kiana West, Brindha Lekshmisaran and Marcus Rauch

Bio-Analysis Centre providing valued service in LBIC

The Bio-Analysis Centre (B-AC) recently set up at LBIC has now successfully completed a number of projects for clients. Liquid chromatography-mass spectrometry (LC-MS) was used successfully to analyse eicosanoid samples for Dr David Bishop-Bailey of the RVC.

David commented: "It has been great to work with Dr Carolyn Hyde on this project. Cali's analytical expertise made this potentially difficult project extremely straightforward. We were quickly able to optimise an LC/MS/MS assay to quantify a

wide variety of lipids with great reproducibility and sensitivity, and measure these lipids in samples from human and cat urine. Having the facility in LBIC was fantastic as it made it possible to interact with Cali face-to-face on a regular basis, which really helped to expedite the work."

Another benefit to LBIC clients is the knowledge and resources of the B-AC. As an example, Immunoclin needed to analyse samples in their own lab using HPLC and B-AC was able to assist. Dr Dorothy Bray, Immunoclin's CEO, stated: "Owing to

regulatory constraints relating to our samples we were unable to send them to the Bio-Analysis Centre. Instead, with Cali's assistance, we have just set up our own HPLC system. It has been very helpful to access HPLC expertise, consumables and reagents from B-AC and shows the benefit to LBIC in having such a facility here."

If you have any analytical challenges that you would like to discuss with B-AC then please contact Cali on 020 7691 2064 or by email to cali@b-ac.co.uk

MedCity celebrates first birthday at LBIC

ABIGAIL SMITH, LONDON & PARTNERS

A year on from its launch, in April 2014, MedCity has celebrated its first birthday at LBIC, after moving in January this year to take advantage of the environment and being co-located with innovative companies. MedCity has galloped through a year of intense activity that has seen it develop new programmes to support entrepreneurs and industry, and promote the life sciences excellence of London and the greater south east of England internationally.

Unlocking greater investment for companies at all stages of development has been a key priority for MedCity. In October 2014 it launched 'Angels in MedCity', in collaboration with London Business Angels and Angels4LifeSciences. The scheme has so far held three investor workshops and three company pitching events, bringing

together more than 100 people to form the basis of a new and growing investor community.

MedCity is also partnering with the London Stock Exchange to raise awareness of the excellent investment opportunities that UK life sciences offer and to



encourage more companies to consider a London flotation, following the lead of Circassia, which raised £200 million in 2014, and recently the US biotech

Verseon – which chose to list on AIM rather than Nasdaq due to London's reputation for investors willing to take a long-term view.

MedCity and the LSE held the inaugural Future of Healthcare Investor Forum in January this year, which the partners intend will be an annual event. This complements

other work to promote the region internationally, including joining the Mayor of London's delegation to Boston and New York in February, and events and meetings with industry and investors.

Find news about MedCity's initiatives, programmes and

guides for entrepreneurs online at www.medcitylondon.com and subscribe to monthly updates. You can also follow MedCity on Twitter at @medcityHQ.

Fabrican's innovative Spray-on Fabric

DR. MANEL TORRES, WWW.FABRICANLTD.COM

Fabrican moved to LBIC in September 2014. The Fabrican team, drawn from backgrounds ranging from textile design to applied science, have exploited their expertise in colloid and polymer science, engineering and textiles to develop an instant spray-on coating.

Fabrican's patented Spray-on Fabric[®] enables designers to spray liquid material directly onto the body or create apparel using aerosol technology, industrial sprayers or 3D printing. Spray-on Fabric dries instantly on impact with any surface, including liquids, to create a fabric layer.

The technology consists of

short fibres bound together with polymers, and a solvent that delivers the fabric in liquid form, then evaporates when the spray reaches a surface. It can be used to make innovative garments that can be washed, re-worn and even integrated with diagnostic devices that can monitor the health of the wearer.

In the medical field

spray-on sterile bandages can be applied to burnt skin without applying any pressure, while drug-delivery patches can release medicines directly to the body at an optimal rate. Spray-on-Fabric can also be used to create lightweight, waterproof plaster casts and instant sterile structures to help to grow collagens or useful bacteria.

Fabrican hopes to further develop the product and utilise it in new and increasingly exciting applications.



LBIC: Where enterprise comes to succeed

The London BioScience Innovation Centre (LBIC) provides a focus for life sciences activity in the UK capital, offering laboratory, office and meeting room facilities of an exceptionally high standard and a professional front door that cannot fail to impress. LBIC also offers a popular Virtual Tenancy option for those companies who do not currently require on-site physical space.



Virtual client offer

Virtual tenancy at LBIC is an excellent choice for companies looking for a low-cost way to establish a presence in the UK capital. Virtual clients gain the advantage of a central London address and access to a community of life sciences professionals as well as a range of other benefits.

Client benefits

- Reception services
- Full business support package via the LBIC Business Support Network
- Regular invitations to events, training and seminars
- Complimentary 12 months' One Nucleus membership with access to its Purchasing Scheme
- Presence in LBIC marketing and communications
- Access to Royal Veterinary College services and equipment, including contract research, diagnostics and imaging
- LBIC's hot desking facility means you can rent a permanent desk in a shared office, or simply pay by the hour as needed

Meeting rooms and conference facilities

LBIC offers a number of meeting rooms and conference facilities for client use or occasional hire by non-resident companies. Catering can be provided upon request.

Contact us at lbic@rvc.ac.uk or
Tel: +44 (0) 20 7691 1122 to see
how we can help.

Contact us

LBIC has been supporting life sciences companies since 2001. Today we host more than 50 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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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



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