QMB Innovation Centre
QUEEN MARY BIOENTERPRISES

Discovery

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NEWS, VIEWS AND EVENTS AT QMB

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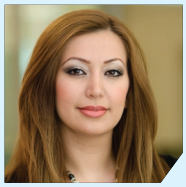
2014 IS SHAPING UP TO BE A BUSY YEAR

2014 is shaping up to be a busy year for our colleagues at Queen Mary Innovation (QMI), the technology transfer arm of Queen Mary University of London (QMUL).

EDITOR'S WELCOME



Welcome to the latest issue of QMB's newsletter, where you can read about the latest news from QMB and its clients.

It's been a busy year for both QMB and the life sciences sector. While the life sciences sector has been dominated by the planned development of MedCity and, of course, the now rejected, takeover of Astra Zeneca by Pfizer, we have had some significant news from our clients.

The year started off with the big news of the acquisition of the Queen Mary University of London spinout, Activiomics, by Retroscreen Virology Limited (RVL) in a £4m all-share deal. The move is part of RVL's plan to build a discovery arm, enabling the development of new therapies. We went to RVL's investor presentation to hear from Kym Denny, RVL's Chief Executive, on the day the Company announced the start of its first ever asthma study into developing a safe, reproducible and clinically relevant asthma human challenge model.

We also have news from BioMoti which has won a series of grants from the Medical Research Council and the Biological Sciences Research Council, while MediWise has welcomed a new Managing Director and won an award from the Technology Strategy Board.

These stories and more are covered in further detail in this issue of the newsletter. For more updates on the latest news from QMB, including a new blog on emerging issues in the life sciences sector from QMB's Dr Ramsay Richmond, please visit our website.

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February saw yet another QMI portfolio company, Actual Experience (AE), list on the Alternative Investment Market (AIM), notching up a market value of £56m since its launch. Based in Bath, AE is an analytics company specialising in the management of corporate digital supply chains. Founded by Professor Jonathan Pitts and Dave Page in 2009, with the financial backing of the IP Group and Angel Investors, QMI helped the founders, pre-incorporation, to develop the business plan and raise early stage finance.

QMI's Adam Daykin, Head of Technology Transfer, Technology & Engineering, said:

"We are delighted that another QMI company has made the successful transition to listing on the AIM stock market. As companies develop their technology and grow their customer base, the next logical step is to go for a public listing. That's not the case with all companies but for AE it was the right move and we believe that, with their product and strong management team, the Company will go from strength to strength."

In April, researchers at QMUL announced a new method for fabricating a material that has the potential to revolutionise the telecommunications industry by improving the effectiveness of fibre optic technology. The research has received a proof-of-concept grant to develop the technology and early stage discussions are currently taking place with QMI to potentially create a new spin out.

Dr Graeme Brown, Director of QMI, said:

"We made an excellent start to the year with the flotation of a portfolio company and new technologies coming through, which gives us a great platform for new spinout creations. With more developments in the pipeline, we expect 2014 to be an excellent year for QMI."

EXCITING TIMES AHEAD FOR MEDIWISE

MediWise, a QMB tenant specialising in the development of wireless, implantable and wearable medical devices, has appointed Matthew Khoory as Managing Director.

Matthew is a healthcare professional who spent more than 10 years at GE Healthcare, holding roles in business development, risk management, finance and business analysis, where he developed novel solutions for public and private health systems globally.

MediWise has developed a series of prototypes for wireless medical devices including a non-invasive blood glucose monitor and a radio wave imaging system that has applications in detecting early stage cancer. Matthew's appointment comes as the company begins a fundraising programme to secure the capital to commercialise its advanced technology.

Award Winning

The company is also celebrating winning a series of awards, including two from the Technology Strategy Board (TSB) totalling £350k. These awards were won under highly competitive conditions, to further the development of MediWise's wearable glucose monitor and its radio wave imaging system prototypes.

The Company also won the fourth edition of the Building Global Innovators Competition in Lisbon with the accompanying prize of €100k, for the development of GlucoWise™, an affordable non-invasive glucose-sensing device that allows diabetics to monitor their blood sugar accurately and continuously. This prize was on top of the €100k won from the previous round of the competition, with the opportunity for the amount to be doubled in the next three to five years if they achieve certain milestones over the next 18 months.

glucowise

mediwise
MEDICAL WIRELESS SENSING

RETROSCREEN UNVEILS NEW HVIVO PLATFORM FOR ASTHMA AND COPD

Retroscreen Virology Limited (RVL) recently hosted an investor event at Queen Mary BioEnterprises Innovation Centre, giving institutional investors a chance to hear how the Company will use its new hVIVO platform for research and development, particularly in cases of asthma and Chronic Obstructive Pulmonary Disease (COPD), to address key bottlenecks in the industry.

The event coincided with Retroscreen announcing the start of its first ever asthma study into developing a safe, reproducible and clinically relevant asthma human challenge model. The Company plans to launch the model as the first commercially available viral challenge model for the study of asthma, third party asthma and antiviral therapies in asthmatic subjects. The model will also provide Retroscreen with its first samples to be obtained from subjects during the course of an asthma exacerbation using its hVIVO platform.

Over 40 attendees gathered in the auditorium at QMB to hear Kym Denny, RVL's Chief Executive; Tony Lockett, Chief Medical Officer, and Chris Poll, Vice President of Research & Development, Operations, talk about how Retroscreen will use human models of disease in healthy volunteers to study new drugs while investigating disease in a safe, controlled environment. The presentation team also included Neil Torbett, Director, Research & Development, Proteomics; Lars Branden, Senior Director Research & Development, Informatics; and Paul Whittaker, Head of Biomarkers.

Retroscreen has developed hVIVO to address a fundamental problem in the drug discovery process, to understand why so many drugs – around 80% – fail in Phase II trials. Kym cited asthma, a disease which kills 25,000 people in Europe every year, as an example. In the last 30 years, just four drugs from two new classes have been released, representing a poor return on the billions of pounds that have been invested over the years, said Kym.

While asthma isn't a single disease, Kym said some of the major reasons for the high failure rate include misleading or inaccurate information recorded in Phase II trials and ineffective programmes that do not provide enough information for moving on to Phase III. The high rate of failure in these late phase trials puts an incredible strain on the pharmaceutical industry, causing costs to rise.

One of the biggest issues in drug discovery is the mode of testing. Animal models of disease are often unrepresentative of human biological processes, and the snapshots of cellular data available in human tissue cannot lead to a true understanding of disease progression given the uncontrolled nature of their collection - these lead to very low drug development success rates and very high costs.

RETROSCREEN VIROLOGY'S INVESTOR EVENT AT QMB

"The hVIVO platform can be used to gain a much more detailed understanding of human illness by studying all stages of the disease lifecycle in humans, not in laboratory models."

said Kym, who spoke to QMB on the side-lines of the investor event.

Retroscreen's hVIVO human challenge models of disease, or HCM, uses challenge agents, such as respiratory viruses, to elicit common self-limiting diseases such as flu, cold (Human Rhinovirus, or HRV) and Respiratory Syncytial Virus, or RSV, in otherwise healthy volunteers. By watching the entire disease lifecycle as subjects move from healthy to sick and recover back to healthy again, the Company hopes to obtain high-quality, longitudinal data from the before, during and after phases of disease. These models can be used to study the efficacy of new therapies such as antiviral drugs and vaccines and also to study the target disease itself.

Using hVIVO, Retroscreen aims to create a true snapshot of a disease by analysing biomarkers to get a better understanding of the dynamics about how new drugs work. Retroscreen's hVIVO model will address these issues by taking multiple samples of several types of human tissue before, during, and after an infection, essentially making the patients their own control. Biopharmaceutical customers already take advantage of these benefits in flu and RSV trials and, with the start of an asthma study, Retroscreen expects to develop a commercialisable asthma service too.

"We believe that hVIVO has the power to overcome key industry bottlenecks to deliver new innovative therapies and better diagnostics to market in an accelerated timeframe. We have proven that by carefully selecting human volunteers and monitoring them throughout a disease episode under tightly controlled medical quarantine conditions, we can demonstrate proof of concept for a new investigational drug in a much shorter timeframe, in 9-12 months, in fewer subjects than traditional methods. Crucially, this means before the need to invest in large, expensive field-based pivotal studies."

Kym Denny, RVL's Chief Executive

RETROSCREEN VIROLOGY'S INVESTOR EVENT AT QMB

Beyond asthma, the next stage of its development is to broaden its capability into new disease areas such as COPD. Retroscreen is currently developing controlled human challenge models of these airways diseases, exploiting the fact that exacerbations are caused by respiratory viral infections. Pilot studies in COPD are scheduled to commence in the first half of 2015. If successful, these models will not only allow new therapies to be tested more effectively, but by analysing samples from its asthma airways disease model, it hopes to solve the puzzle of the diseases themselves.

"Retroscreen is expanding the application of its hVIVO platform into new disease areas with high, unmet needs. Asthma represents a major opportunity for Retroscreen not only to expand its service offering, but also to gain important insights into a disease that affects millions of people around the world."

Kym Denny, RVL's Chief Executive

A major part of Retroscreen's data recovery and analysis comes from its proteomic capability and its ability to unlock information at the molecular level. Through conducting trials, collecting data, and using bioinformatics - for linking proteomic, genomic and clinical data – the Company has also geared itself up for biomarker discovery. Kym believes this should ultimately lead to new diagnostics and therapeutic products, as well as better understanding of patient stratification, which could enable more informed treatment choice."With a better understanding of patient stratification, more precise and more relevant solutions can be found," said Kym Denny, RVL's Chief Executive

Together with Retroscreen's proprietary technology, a key component in this capability is Activiomics, a QMB virtual tenant and formerly a privately owned company spun out of Barts and the London Medical School, part of Queen Mary University of London, which Retroscreen acquired in March 2014 for £4m.

Activiomics' core technology is TIQUAS (Targeted Quantification of Cell Signalling) which is an advanced, mass-spectrometry technology platform that allows the identification and quantification of the global phosphorylation status of cells and tissues, providing a direct read-out of the biological processes that underpin disease progression as well as responses to drug administration. TIQUAS has broad application in the area of biomarker and drug discovery as the cross-comparison of treated samples enables biomarker discovery and/or drug profiling.

Retroscreen was the first anchor tenant at QMB, moving into a £2m purpose built facility on the entire second floor in 2011, before also taking up residence on the third floor in 2013. The Company has now established itself as a world leader in this field through the provision of clinical services to third-party study sponsors. To date, it has conducted 35 clinical studies involving more than 1,600 volunteers for a range of leading industry, governmental and academic clients.

"Having such a facility as this in London has been a key success factor for Retroscreen. We have a state of the art quarantine unit, plus laboratories and office facilities all under one roof. This makes collaboration and coordination across medical, clinical, R&D and planning functions easy and highly productive. It is also an accessible hub for our volunteers who are at the heart of our work."

Kym Denny, RVL's Chief Executive

RETROSCREEN VIROLOGY
CONQUERING VIRAL DISEASE

DOUBLE SUCCESS FOR BIOMOTI

BioMoti is enjoying a double win after securing two grants, one from the Medical Research Council (MRC) and the other from the Biotechnology and Biological Sciences Research Council (BBSRC).

The MRC grant is a CASE Studentship in collaboration with Professor Kenneth Linton at Queen Mary University of London. The grant will support a PhD student to study the basic cellular and molecular biology mechanisms underpinning 'targeting cancer cells with CD95R-coated nanoparticles'. Targeted delivery is a promising approach for therapeutic development with the recent clinical trial successes and market launch of Adcetris® by Seattle Genetics and Kadcyla® by Roche, highlighting the paradigm shift in the case of antibody-drug conjugates.

BioMoti also received part of a £100k grant from the BBSRC which will be used to support Queen Mary's life sciences researchers through industry placements, provide a new Discipline-Bridging Fund to support interdisciplinary projects and collaborative activities, and an online resource to share research tools such as data sets and software.

"We are delighted with our awards. The MRC award represents the first funded collaborative venture between BioMoti and Professor Linton's laboratory, based on our mutual scientific interests. The complementary expertise in membrane protein biology and bioengineered drug delivery platforms brought by both partners will ensure exciting science is explored and developed in the crucial multidisciplinary area of targeted therapeutics delivery."

Dr Davidson Ateh, CEO of BioMoti.

BioMoti

RETROSCREEN ACQUIRES ACTIVIOMICS IN A DEAL WORTH £4M

Activiomics, a virtual tenant at QMB, was bought by Retroscreen Virology Group in March in a £4m all-share deal, part of a strategic commitment by Retroscreen to build its protein identification and data analytical capabilities.

Together with Retroscreen's proprietary technology, the Activiomics acquisition will enhance Retroscreen's ability to build robust and accessible bio-scientific databases which can be applied across a wide range of products and services in the quest to stratify disease. The technology will lead to a more tailored approach to patient therapy through the identification of biomarkers, leading to the development of new therapies and diagnostics.

Neil Torbett, formerly Chief Operations Officer at Activiomics, has been appointed as Director for Research & Development in Proteomics at Retroscreen.

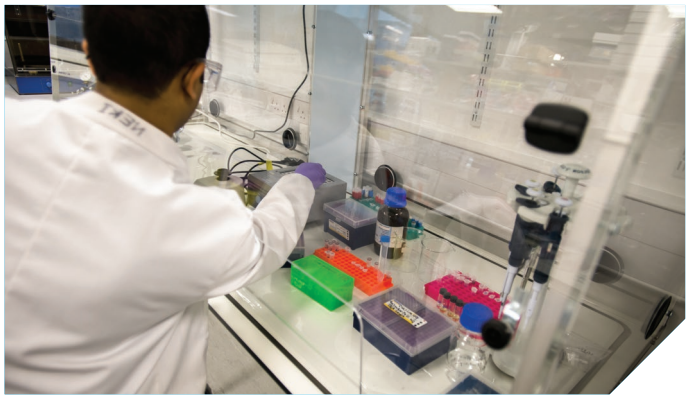
Kym Denny, Retroscreen's Chief Executive, said:

"The Activiomics acquisition compliments the work we already do in this exciting area of research."

activiomics

SPIROGEN AND ADC THERAPEUTICS DEAL IS GREAT NEWS FOR LONDON

Now the dust has settled on AstraZeneca's push into the antibody-drug conjugates (ADCs) market through its acquisition of Spirogen and a licensing deal with ADC Therapeutics, it's a good time to reflect on the deal and look at what it says about London.



AstraZeneca's MedImmune unit has bought Spirogen, a biotechnology company spun-out of UCL by UCL Business in 2001, for $200m, effectively bolting the biotech company's ADC generation platform onto its own oncology R&D portfolio - with another $240m in the offing if certain pre-clinical candidates at Spirogen meet development targets.

The deal shows the underlying strength of British bioscience and the strength of drug discovery chemistry in London. Oncology is a core therapy area for AstraZeneca spanning both small molecule and biologics research and development. MedImmune is developing a comprehensive portfolio with an emphasis on two key areas in oncology development: antibody-drug conjugates and immune-mediated cancer therapy, which aims to harness the power of the patient's own immune system to fight cancer. Together, immune-mediated cancer therapies and antibody-drug conjugates have the potential to treat cancer in a way that current therapies are unable to do.

The Spirogen deal reflects the dynamism in the capital today which, for the last 10 years, has been trying to diversify away from the traditional hubs of banking and finance, to new and growing firms that are emerging as an engine of growth for the whole country.

In London we have cohorts of highly trained people who want to be scientists. ADCT and Spirogen operate in an intensely congested urban environment where the need for good physical infrastructure is essential. Fortunately, the London government has invested in infrastructure, where new infrastructure projects such as Crossrail will open up large areas of London, but it is even more the case with digital connectivity, where again London can offer a real advantage.

London is also one of the best places in the world to do business, not least because it allows entrepreneurship to thrive. That these companies have been able to hold onto their scientists is testament to the strength of the London economy, which, even for SMEs, is international in its outlook, rather than simply serving a local market.

Medical research in London is world class; it's up there with Boston, San Francisco and San Diego. But foreign companies who want to come in just can't find space, irrespective of rent, and that's a travesty.

Senior scientists want to live and work in London and it proves that we can compete with the likes of Zurich, Basel, Boston and San Diego which, if we're being brutally honest, are more picturesque and benefit from a better climate to live and work in. London's amenities and culture are trumping smaller, more attractive, foreign cities. It's also a great vote of confidence in London's education system in that it can produce scientific talent that can sustain these companies.

With London so highly congested, space is at a premium. One science company recently got evicted from its premises to make way for residential developments, simply because residential is seen more lucrative. But that's a short-term view; scientists, technicians, engineers and computer people bring long-term revenues and economic benefits. The central issue is London has amazing assets but suffers from bottlenecks, which could be solved by spending a relatively small amount of money.

The Spirogen deal gives us the evidence to suggest that London has all the characteristics that could see more bioscience companies coming to London in the future, but we won't be able to sustain this success unless we do more relieve the pent up demand for space.

Spirogen

SECTOR ROUND-UP

While IPOs didn't necessarily disappear during the global economic downturn, corporate activity certainly stalled as investor appetite dried up, irrespective of the intellectual property or ground breaking innovation on offer.

Indeed, Retroscreen Virology was one of the few life sciences IPOs in 2013, which is testament to the company's innovative vision and business offering. Today, IPOs are firmly back on the menu, both at home and abroad, indicating the worst is over for the global economy.

Horizon, a UK based diagnostics company listed this year on AIM and the company now has a market cap of £112m, while across the pond, the US has seen a number of IPOs from the likes of Versatis, Akebia Therapeutics, InterMune, and Sangamo BioSciences, all raising over £100m through IPOs. The IP Group, an organisation closely linked to QMB and a backer of companies like Retroscreen Virology, has also said it is considering a flotation, while Allied Minds, a VC company similar to the IP Group, but US-centric in its investments, is also planning a London IPO.

One of the biggest challenges facing the life sciences industry is how to productively turn innovation into commercial success. QMB and QMI have been at the forefront of putting London on the map as a life sciences hub, promoting innovation and helping to bring new products and services to market.

London's transformation from being a city exceptionally dedicated to financial services will take a while to bear fruit, but there's no doubt this is a persistent, if background, imperative for local and central government.

This year saw the launch of MedCity, a partnership between UCLPartners, King's Health Partners, Imperial College AHSC and the Greater London Authority, to establish London and the greater South East as a world-leading cluster for life sciences. MedCity will be funded with £2.92m from the Higher Education Funding Council for England, and a further £1.2m from the Mayor of London's office.

Boris Johnson, the Mayor of London, said:

"Together with Oxford and Cambridge we form a 'golden triangle' of scientific innovation… MedCity will span everything from research to clinical trials to manufacturing, across biotech, med-tech and health-tech."

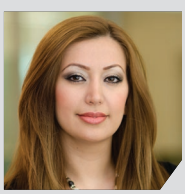
Elsewhere, the med-tech sector has had a bumpy ride so far this year, with big names such as Medtronic suffering and Bayer HealthCare has announced it is casting off its interventional device unit and selling it to Boston Scientific for an agreed $415m in cash.

While MedCity may be a great example of collaboration in the life sciences sector, the M&A activity surrounding Pfizer and Astra Zeneca indicates there's more intensive competition between the big pharma companies to acquire attractive (and pipeline filling) drug portfolios. Despite Astra Zeneca's rejection of Pfizer's £65 billion takeover offer, the market may see a new wave of consolidation among the big pharmaceutical companies.

It remains to be seen if Astra Zeneca's investors will let the opportunity go, particularly as the market's interest has now been piqued. It will be interesting to see if another proposal emerges at some point in the future once the cool-down period has ended. While there are serious domestic issues to consider, the need to realise shareholder value is often at odds with protecting the strategic national interest through preserving the stickiness of the associated science jobs. I wonder if any senior planner has ever calculated the lifetime cost to the nation if a mid-career drug discovery chemist is forced by post-acquisition exigencies to change profession. This debate will be one litmus test for the free-market nature of Conservative government.

Dr Ramsay Richmond

Please contact our management team with any feedback or news story ideas:



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