

LOOKING UP IN A DOWN MARKET: CAMBRIDGE, OXFORD, AND LONDON

The science job market in the London–Oxford–Cambridge triangle, after 10 years of rising public investment in the United Kingdom’s science base, has never been stronger. But the shockwaves of the financial crisis are undermining the biotech industry and pharma restructuring is hitting R&D, while academia is refocusing research with a translational bent. **By Nuala Moran**

Like the curate’s egg, the scene for science jobs and recruitment in the London–Oxford–Cambridge triangle is good in parts—the good being those areas that, as yet, have escaped the fallout from the financial catastrophe and the restructuring of the pharmaceutical industry; the bad being those that have not.

To take the prime example of a bad part, the United Kingdom’s biotechnology sector, based in the triangle, has been hard hit by the seizure in the capital markets. In a survey of 295 companies carried out by the UK BioIndustry Association in March, 78 percent said they had found it more difficult to raise cash in the previous 12 months. More than a third of companies trying to raise equity financing failed to do so, while a further 47 percent were not able to obtain all the financing they required.

With fewer products in the pipeline and sources of funding drying up, some biotechs are shutting their doors. Others are cutting back to conserve cash and try to hang on until the financing position improves. Companies in the region that have announced staff cuts include Oxford-based Summit Corporation, a zebrafish genomics specialist; Alizyme of Cambridge, which is developing treatments for gastrointestinal diseases; and Silence Therapeutics of London, an siRNA company.

Meanwhile, the pharmaceutical industry worldwide is undergoing the most thorough restructuring and consolidation in its history. While many of the pharma job cuts of the past two years have involved sales and marketing divisions, the UK’s previously strong position in pharmaceutical R&D and manufacturing has left it especially exposed to these shifts.

To cite two examples, GlaxoSmithKline, the largest UK-based pharmaceutical company, has announced the closure of three UK R&D sites in the past two years. And with Pfizer and Wyeth accounting for over 6,000 jobs in the UK, employees are braced for the job losses that will likely flow from their recent merger.

Accompanying these macroeconomic factors, changes such as the push to interdisciplinary and translational research, as well as the addition of innovation and technology transfer to the research and teaching remits of universities, are changing the nature and practice of academic research and of science-related jobs.

The Fallout from Pharma

David Rees, senior vice president of medicinal chemistry at Astex Therapeutics, a fragment-based drug discovery specialist based in Cambridge, keeps a keen eye on the recruitment market in the city. Medicinal chemistry has *continued* »



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“Pharma wants people who are adaptable, and are prepared to collaborate and interact with the public and private sectors.”



long been a specialty where skills are in short supply, but speaking in March, Rees said there are far fewer job vacancies than 12 months ago. “There are many more people looking for jobs because of downsizing in pharma.”

Whereas Astex and its biotech peers would previously have taken doctoral students straight from university, “It is now possible to recruit people from pharma with lots of experience in chemistry,” says Rees.

As a consequence, some salaries are falling. “Astex is maintaining salary levels—which have always been competitive with pharma—but contract research organizations (CROs) are paying less.” Some CROs are employing staff on short-term contracts to work on specific projects.

A curious factor is a shift in the perception of risk. Whereas scientists in big pharma previously expected to have secure jobs for life, Rees believes they now have no greater sense of job security than those in biotech.

“There still aren’t many unemployed chemists, but people do accept the need to change company more often, and they may need to look at a move as a way to reinvigorate their skill set,” advises Rees.

The CEO of another development-stage Cambridge biotech, **Tim Brears** of Xention, a discovery company specializing in ion channels, agrees that the recruitment market in the city suddenly has a very different feel. “We always expect quite a few applications when we advertise, but since the pharma downsizing began we are getting deluged.”

Pharma Changing Its Requirements

The restructuring of the pharmaceutical industry may be happening under the cover of the global financial crisis, but it was sparked by factors that are particular to the sector. These include patent expirations, the rise of competition from generics, a downward pressure on drug prices, increasing scrutiny from regulators and health technology assessment bodies, pressure to move research offshore, and the crisis in R&D productivity.

Ann Gales, a partner at the high-level recruitment consultancy Heidrick and Struggles in London, advises that these pressures are reflected in the kinds of people pharma now wants to recruit.

“Requirements are changing in response to the environment. Pharma wants people who are adaptable, and are prepared to collaborate and interact with the public and private sectors,” says Gales.

There is no less focus on scientific expertise. “Science is still the key strength, but on the more commercial end of the business there is a need for people who can engage with the payers and are comfortable in dealings with regulators, health technology assessment bodies such as NICE [the UK’s National Institute for Health and Clinical Excellence], clinicians, and patient groups.”

Meanwhile, for those embarking on a career in the industry, a first degree in science leaves a wide number of career avenues open. But there is no doubt that scientists now need to offer commercial skills as well. “As the two sides of pharmaceutical companies get closer together, staff need to work in multifunctional teams, both internally and externally,” says Gales.

Public Investment Continues to Create Jobs

After 10 years of rising public funding, the UK’s science base has never been stronger. One manifestation of this investment is the Diamond Light Source near Oxford, the largest science facility to be built in the UK in the past 40 years. The synchrotron opened just over two years ago and is still in the process of building up its operations. Professor **Trevor Rayment**, physical sciences director, says 161 staff are employed in physical sciences; at the full capacity of 15 beam lines, this will rise to between 400 and 500.

Most recruits are academics, but there is a need for hybrid skills. “You have to be capable of handling a big machine, and need to enjoy troubleshooting and getting it to work well. And although our scientists have their own projects, the emphasis is on providing a service to our users,” says Rayment.

While public spending on science is at an all-time high, this has been justified as an investment in the knowledge economy. Inevitably, this has repercussions in terms of the pressures universities are coming under to adopt a more commercial focus in their research, professionalize technology transfer, and collaborate with industry.

Universities such as Oxford, Cambridge, University College London (UCL), and Imperial College pride themselves on their commercial edge, and as a movement it is becoming hard for academic researchers to resist, as several recent initiatives highlight.

For instance, beyond generalist technology transfer, the Biotechnology and Biological Sciences Research Council (BBSRC) is now funding Innovation and Knowledge Centres to promote early commercialization of research in specific fields. An example is Cambridge University’s center specializing in manufacturing technologies for photonics and electronics. This combines research with business development, market analysis, and commercialization skills.

Another scheme is bringing industrial “moles” into the heart of academe through Industrial Impact Fellowships. Researchers from industry join existing projects and programs with a brief to support translation of research. Science Minister Paul Drayson says, “Fellows of this scheme will get to share their experience, skills, and contacts directly with researchers—which is essential to bring innovations from research to market rapidly.” **continued »**

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Focus on Cambridge/Oxford/London

By importing skills from outside, this program is attempting to make up for the perceived deficit of entrepreneurial skills and business knowledge inside universities. But universities are also offering courses in entrepreneurship to their researchers. A leading example is Imperial College's Entrepreneurship Hub, which teaches all science and technology undergraduates entrepreneurship skills and provides training for faculty and researchers in venture creation.

The Push to Translational Research

In medicine in particular, there is a push to create a translational research chain from laboratory bench, through drug discovery and development, and into the clinic. This new direction is prompting the major reorganization of the leading medical schools and teaching hospitals at Imperial College, UCL, and Cambridge, among others. The aim is to create American-style academic health science centers, such as that at Harvard, that integrate research, education, and clinical care.

Alongside this large-scale restructuring are programs to fill in

the gaps in the translational research chain. For example, Imperial College and King's College London recently won funding for an Integrative Mammalian Biology program, in which researchers will be trained in the use of computer models of human physiology to replace the use of animals in experiments.

One step that exemplifies how the pressure to translate research through to the market is forcing the pace of multidisciplinary research is the formation in April of the Center for Stem Cells and Regenerative Medicine at UCL. The list of specialties that will be brought together is deep and broad: beyond a swathe of biological sciences, they include physical scientists, chemists, mathematicians, engineers, and material scientists from 130 research groups in several faculties, hospitals, and research institutes.

Professor **Claudio Stern**, chair of the center's steering committee, says UCL has many scientists in the field of stem cells, but they were working in relative isolation from each other. "The enhanced communication will greatly improve the flow of information between basic and clinical scientists that is absolutely crucial for this field to move forward." *continued »*



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London

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Featured Participants

Alizyme
www.alizyme.com

Astex Therapeutics
www.astex-therapeutics.com

Biotechnology and Biological Sciences Research Council
www.bbsrc.ac.uk

Bluewater Bio
www.bluewater.bio.com

Cambridge University
www.cam.ac.uk

Cancer Research UK
www.cancerresearchuk.org

Diamond Light Source
www.diamond.ac.uk

GlaxoSmithKline
www.gsk.com

Heidrick and Struggles
www.heidrick.com

Imperial College
www.imperial.ac.uk

King's College London
www.kcl.ac.uk

National Institute for Health and Clinical Excellence
www.nice.org.uk

Oxford University
www.ox.ac.uk

Pfizer
www.pfizer.com

Silence Therapeutics
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Summit Corporation
www.summitplc.com

TMO Renewables
www.tmo-group.com

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“We’ve been recruiting over the past two years, and when I look at our ranks, about one-third of staff are from the pharmaceutical sector.”
—Hamish Curran



Cleantech: A New Source of Science Jobs

The sudden contraction in some parts of the science jobs market may undermine existing career plans of those in pharma and biotech and require a rethink by new graduates trying to get on the first rung of the ladder. But avenues are opening up elsewhere. The UK’s emerging cleantech sector holds prospects for people with pharmaceutical experience, according to **Hamish Curran** CEO of TMO Renewables, a cellulosic biofuels specialist. “We’ve been recruiting over the past two years, and when I look at our ranks, about one-third of staff are from the pharmaceutical sector.”

The immediate payoff was a commercialization deal in age-related macular degeneration in which Pfizer became the first big pharma company to make a move into the use of embryonic stem cells as the basis for a tissue regeneration therapy.

The Triple Whammy: Multidisciplinarity, Translation, Commercialization

So how are these huge shifts in the research firmament—multidisciplinarity, translational research, and commercialization—affecting one of the largest funders of basic biomedical science in the country, Cancer Research UK?

“We are not turning away from basic research—that is still at the core of what we do,” says **Simon Vincent**, the charity’s head of personal awards. However, he adds, “The nature of basic science is changing, and this is influencing the kind of people we are looking to recruit.”

In particular, the charity is moving up the development pathway, and has begun to establish drug discovery and development capabilities. “This means we are recruiting more synthetic chemists, for example,” says Vincent.

Indeed, in this move to secure the foundations of drug development, CRUK has needed to bridge several skills gaps. An example is bioinformatics, a specialty in which it has set up groups in Cambridge and London. “This is a reflection of the impact of genomics on the way we do basic biology,” Vincent says.

In November 2008 CRUK announced its GBP1.5 billion science strategy for 2009–2014, under which it will establish 20 centers of excellence linking research, patient care, public engagement, and prevention. “We are putting more emphasis on translation—that is our clear objective. We will only work with universities to establish a center if there is a commitment from academic groups and clinical departments to get involved,” explains Vincent.

The centers will not require new specializations, but Vincent says there will be a need to cultivate researchers who are capable of seeing patients in the clinic and then applying their observations in the lab.

Speaking in March, Vincent said CRUK was actively recruiting, and there was no sign as yet of an increase in applications as a result of fallout from the pharma and biotech sector.

However, as a charity, CRUK is seeing a fall in donations as the economy contracts, Vincent says. “It has had an impact; we are expecting a 4 percent fall this year. But we are not cutting programs.”

The company was founded in 2002 to develop second generation biofuels and is currently testing its first demonstration plant. Curran, himself a veteran of the oil industry, advises that cleantech projects require a new mix of skills. “There has to be a marriage between engineering and biology to build a bioprocess plant that can operate 24 hours a day.”

Similarly, sustaining microbial populations is central to the R&D activity of Bluewater Bio, a wastewater treatment specialist. The London-based company is in the process of optimizing technology discovered in South Korea for removing organic material from wastewater, to suit environmental conditions and wastewater standards in the UK and elsewhere in Europe. “We have a formula, but we need to understand more about the effects of changing the operating parameters on the process,” says **Garry Hoyland**, technical director.

There is increasing public investment in the field, too. A notable example is the GBP27 million Sustainable Bioenergy Centre set up with the aim of replacing petrol with biofuels. In another initiative the BBSRC has joined with 10 companies to develop the technologies required to replace petrochemicals through biorefining.

Potential recruits should be aware that cleantech is opening up a new interface between disciplines, says **Tim Barnes**, executive director of UCL Advances, the technology transfer and commercialization arm of University College London. This is reflected in the kinds of expertise that employers of science graduates are looking for. “Just look at the problems we are trying to solve: developing a hydrogen-powered car covers a range of different disciplines—many aspects of which aren’t really to do with engineering,” says Barnes. Those interested in working in the field need to demonstrate they can network and operate across disciplinary barriers.

Traditionally 25 percent of the UCL’s numerate graduates have gone to work in the City of London’s financial services sector, a market that has dried up overnight. “Science graduates at any level are finding it tough to get jobs,” says Barnes who advises that one tack is to complete another course.

The university is helping by offering discounts on fees for its postgraduate courses. As well as increasing skills levels, it hopes that the best students will be attracted into research.

This would be at least one positive outcome of the current financial crisis.

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