

# Transition

UK Life Science  
Start-up report 2011

## Mobius Life Science Fund

Mobius is focused on making early-stage investments in businesses in the bio-pharma/medical technology and healthcare sector. It is run by a subsidiary of BioCity Nottingham Ltd, which operates one of the largest bioscience incubators in Europe, and so is not only ideally placed as a focus for new opportunities, but also extremely well networked within the sector enabling high quality support for the businesses it invests in.

Investments are normally made as a mixture of debt and equity, with the debt component coming from a collaboration between Mobius and Nottingham City Council, which is intent on doing its part to support one of the strongest and fastest growing sectors in the area.

Mobius is unusual as it invests a lot of time up front in helping to develop early-stage business propositions and then usually takes an active role on the board to further help the company succeed.

[www.mobiuslifesciences.com](http://www.mobiuslifesciences.com)

## BioCity Nottingham Ltd

BioCity Nottingham Ltd has developed and operates one of the largest bioscience incubators in Europe. Home to around 70 early-stage businesses it is a hot-bed of entrepreneurial activity in the sector. As well as providing very flexible laboratory and office facilities, BioCity is able to provide on-site a whole range of non-core, but vital services to businesses which would otherwise be costly and inefficient for them to develop in-house. This ensures that companies with BioCity have the maximum opportunity for success and investors see the most efficient use of their funds.

[www.biocity.co.uk](http://www.biocity.co.uk)

## About the author

Glenn Crocker has a first degree in Genetics and a D Phil in Immunology. He qualified as a chartered accountant with Ernst & Young and worked in the life science practice for a number of years, advising a range of businesses as well as editing and co-authoring a number of the firm's US, European and Global Life Science Reports. He became CEO of BioCity Nottingham in 2003, growing it to be one of the largest bioscience incubators in Europe. He was a founder of R5 Pharmaceuticals and Mobius Life Sciences Fund and sits on the board of both those companies along with a range of others.

## Acknowledgements

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# Summary

This is the second annual UK life science start-up report, which has been produced in order to gain some insight into what is happening with early stage companies in the sector. Where are they coming from? What fields are they in? What investment are they raising?

The 2011 analysis considers companies that were formed in the five year period to the end of 2010, which is rolled on one year from that used in the last report. This allows us to view changes over the years and tentatively suggest how these might relate to the wider ecosystem in which life science start-ups operate.

The overall picture is of an industry in transition with a changing base of businesses, a restructuring of the discovery landscape and an evolving funding ecosystem.

One of the first observations is that, overall, there has been a fall in new start activity between the two periods, although the numbers have held up in the East and South East of England. This is accompanied by a 12% drop in the total amount of investment made into the most recent class of emerging businesses compared to companies formed between 2005 and 2009. It's reasonable to assume that there may be a connection between these two

facts and further analysis shows that the biggest funding decline is in the sub-£500,000 investment category, which is the pond in which most of the start-ups fish. One contributor to this may be the reduction in public sector funding in recent years, which has fed through to investment funds. Over the past decade the proportion of early stage investment across all industries from public sector-backed investment funds increased from

20% to nearly 70% so turning off that tap is bound to have repercussions. This is a fact that government must recognise. If you encourage dependency on public funding and then simply stop the supply there are likely to be painful withdrawal symptoms; even smokers are able to use patches.

In what is becoming an increasingly common economic story, it may be the Chinese that come to the rescue of early



stage life science companies in the UK. Companies such as Crystec, from Bradford University and OxStent and VacMedix from Oxford have tapped in to the vast amounts of cash and other resources available by setting up camp in the country. It's not a straightforward process and usually involves giving away a large proportion of the future income from Chinese sales, but businesses must do what they have to in order to succeed and if the Chinese government will fund where the UK won't then who can blame them.

The reduced early stage funding in the UK combined with changes in the large pharmaceutical company R&D base means that service-based businesses feature increasingly strongly in the start-up landscape. Service based businesses usually have the advantage that they can generate cash early and so are less constrained by funding shortages and some are even bootstrapping using redundancy money arising from pharma site closures.

However, that doesn't mean the development of therapeutic products in the UK is becoming endangered as the number of Advanced Therapy and Therapeutic Protein companies actually increased, although there was a decline in small molecule-based start-ups. Moreover, the transformational £140 million fundraising by Imperial Innovations means it is well positioned to place some serious bets on therapeutic businesses, which indeed it has over the past couple of years, making it a leader in a diminishing coterie of large-scale investors in the sector.

But even Imperial's fire power can't overcome the fact that the old biotech discovery and development models don't work, certainly not in the UK, and so there is a growing trend for more discovery and early development work to be undertaken in the university research laboratories with pharmaceutical companies themselves, or teams with strong pharma experience, becoming embedded in the academic environment. This helps to ensure discoveries are taken forward with the industrial




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### The 2011 UK Life Science Start-up report inevitably focuses on the developments in the financing landscape

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rigour required by the pharma developers who will pick up the projects as they progress and gives further heart to the belief that drug discovery in the UK has a future.

Coincidentally, universities account for the vast majority of the fall in new start-ups in the current period compared to the previous five years. It appears that a well funded spin-out premier league of Oxford, Manchester and Imperial College is emerging and other universities will need to decide whether they want to play this game or take an alternative route, maybe buddying-up more with pharmaceutical companies.

The 2011 UK Life Science Start-up report inevitably focuses on the developments in the financing landscape. The cries from some that the UK life science industry suffers from a lack of investment have been a perennial feature of the sector for the past two decades, but there are indications that the wolf has finally arrived at the door. This report identifies some of the indicators of that further funding squeeze, but also shows how the sector is evolving to cope with the new ecosystem—hopefully indicating a positive, if different, future for the industry.

# Introduction

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When we released the 2010 UK Life Science Start-up report we did so with the aim of it being produced annually. Having committed to this I was then struck by the fear that there wouldn't be anything new to talk about in the subsequent year. In fact those fears were completely unfounded as the life science industry is in such a state of flux there are no end of topics to discuss.

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Last year we focussed on the academic research base, identifying a link between the level of research intensity in an institution and its spin-out activity. This was to be somewhat expected and of more interest was the link between the strength of the life science research base in a region and the total level of start-up activity in general i.e. not just university spin-outs. We know anecdotally that companies don't generally gather round universities for the technologies spilling out of them, which suggests the clustering effect is more likely due to the related talent pool that universities produce.

Talent is one of the key pillars of a successful life science business, alongside technology and infrastructure and, of course, finance. Indeed funding attracts talent and enables technology and infrastructure to be developed and so is fundamental. Given the turmoil in the financial markets it therefore seemed right to particularly focus on finance in the industry this year.

The methodology used to collect the data for analysis was identical to last year to ensure like-for-like comparison. The criteria for a company to be included were the same, namely, it needed to be research-based, not a consultancy businesses and not a subsidiary. The 2010 report gathered data on UK life science start-ups in the five year period 2005-2009 and we have now rolled this forward to cover the years 2006-2010. Five years was chosen because there is too little individual activity in a particular year to enable any conclusions to be drawn. In addition, companies are easier to find the older they are, as they are more likely to have done something resulting in a press release or to have made it onto a database.

Having a second set of data has enabled us to start to compare periods of activity and at least get a hint of potential emerging trends. However this comes with a strong caveat because of course two time points are not enough to definitively identify



longer term trends so at this stage we can only point-out differences and suggest what might be happening given the wider context of changes in the landscape of the industry.

In order to gather the data a vast array of databases have been trawled and websites searched, but inevitably the data cannot be absolutely complete. Still we are confident that it is sufficiently comprehensive to give a good picture of what is happening across the UK in the life science start-up arena and, because the same criteria and methodology was used as last year, the period-to-period comparisons should stand.

As well as looking at comparisons between time periods we have further analysed the data sets, in particular with regard to financing, to find out where investment is going geographically, by subsector, by source of company and a number of other factors. Looking at the scale of investment being made is also extremely important as this can identify emerging funding gaps which a government might want to address if it is interested in maintaining a pipeline of new start-ups to create the next generation of life science businesses in the UK. How it might address such gaps is of course another matter but we do offer a high level overview of some of the initiatives in the UK which may



have an impact on industry financing as well as comparing the situation in the US. In addition, we have just touched on the enormous topic of emerging opportunities in China for funding UK life science companies. This will no doubt be an area to which we will return in greater depth.

Finally, when presenting last year's report there was a lot of interest in what has happened to the companies since founding; which were successful and which failed and why. Success, of course, means different things to different people but for investors an exit is pretty high up the priority list so we have investigated which companies in our 2005-10 class reported an exit. We don't yet have complete data on other potential success criteria, such



as company growth and product development but hope to build that over time. Conversely, business failures can be clearly seen when a company is wound up at Companies House, but all start-up populations, no matter what the sector, are littered with the living dead businesses that are as good as finished but much more difficult to spot.

These further investigations and analyses will provide the foundation for future reports but in the meantime I hope you find this year's an interesting and informative read.

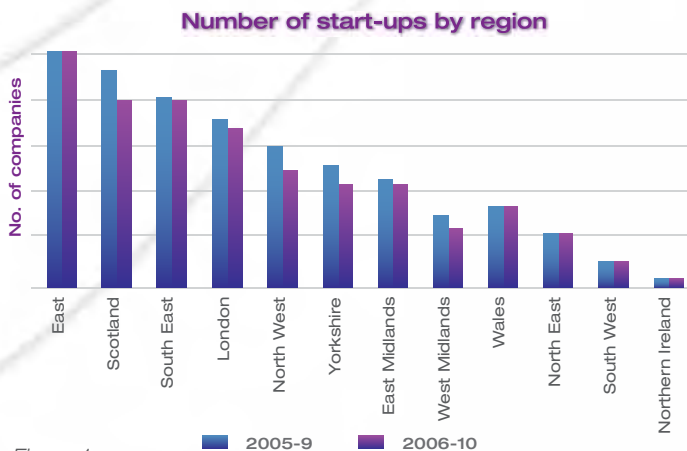
Glenn Crocker D Phil

# The Numbers

The general decline in economic activity over recent years is reflected in an overall fall in new start-up businesses in the life science sector in the 2006-2010 group compared to 2005-2009. A total of 290 new life science companies were formed in the later period compared to 315 in the five years to 2009.

Although only small, the fall is particularly sharp in Scotland, the North West of England and Yorkshire whereas new-start activity has remained fairly consistent across the rest of the UK. It is clearly too early to determine whether this is a blip or a trend, but the decline in activity could be impacted by the fall in public funding for business which was already starting to take effect in 2009 as the squeeze on public finances began and accelerated in 2010 with the change of UK government and consequent changes in spending policy. If true then the effects in 2011 and 2012 are likely to be more dramatic.

A total of 8.2% of the companies that started in 2005-2009 formally ceased trading in 2010. This compares to an average failure rate for start-ups generally of between 20 and 40% across the UK in the first few years from foundation. On this basis it looks like life science start-ups are more robust and sustainable than the average. Intuitively, this is likely to be the case given the provenance of life science businesses compared to start-ups as a whole. The hurdles that need to be overcome to start a life science business are generally greater than in other sectors, especially where intellectual property is



involved as is commonly the case. Moreover, many life science start-ups will have been subject to investor scrutiny before they even make it off the starting block, which helps to sort at least some of the wheat from the chaff. For a government looking to develop the UK economy therefore, it's easy to see why investing in a sector with high start-up hurdles like the life sciences is the right thing to do. The challenge is to make sure that initial start-up hurdle is kept low enough to ensure good opportunities take off, but not so artificially low that money and effort is frittered away on a rash of no-hopers that fizzle out in short order. There is a concern that maybe the initial start up hurdle is rising too high.

### Sectors

Around two thirds of life science start-ups are in the specialist services and med-tech sub sectors. The predominance of specialist services businesses may be a consequence of the transition the industry is going through with a trend towards outsourcing as large pharma companies withdraw from non-differentiating activities and virtual biotech business models become the norm. The financing needs of service companies will also impact on the level of start-up activity. Service-based companies can often set off with minimal investment; for example, only 20% of the service-based start-ups announced that they had received venture investment against around half of the advanced therapy companies. The remainder of the advanced therapy companies will no doubt have at least obtained grant funding, be in the process of seeking investment or will have kept quiet about any investment they have received.

Despite the greater requirement for investment, the number of advanced therapy-based businesses created bucked the downward trend, whereas small molecule companies which similarly require greater levels of investment to start out showed




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The challenge is to make sure that initial start-up hurdle is kept low enough to ensure good opportunities take off . . .

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the most noticeable decline. Investor sentiment may be a significant factor in this trend; as the number of discovery and development casualties in the sector has mounted, all but a hard core of specialist investors have shied away from the all-or-nothing approach offered by many discovery plays.

What may be the beginning of a trend in the opposite direction is the increase in ICT/e-health based companies. Although only from a low base, a positive trend would replicate that in the US, where novel accelerator programmes such as RockHealth and Healthbox have increased the focus on this sub-sector of the industry.

# The Numbers

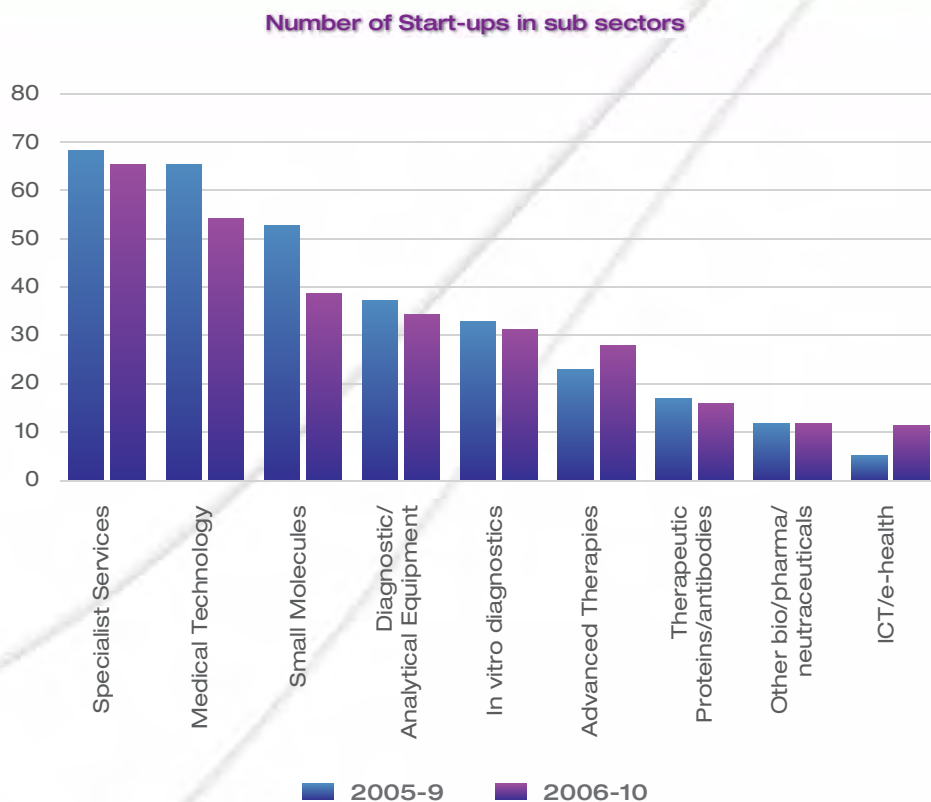


Figure 2

Companies developing therapeutic products (small molecule; antibody; therapeutic protein; vaccines) are disproportionately represented in London and the East and South East of England, again most likely a result of a combination of the availability of capital and the strength of the research base. Meanwhile, specialist service companies are more prominent in Scotland, the West Midlands and the East of England.

## Universities

Four fifths of the decline in the number of start-ups can be accounted for by a drop in university spin-outs. The number of these fell from 135 to 115 (15%) whereas the number of non-university start-ups fell by just 3%. There has been a general trend away from spinning-out university technologies into companies towards a preference for licensing. Moreover, there has been an increasing formalisation of technology commercialisation in universities resulting in greater control and higher hurdles to be overcome before a spin-out can be created. This in theory should result in fewer, higher

Having significant resources also attracts good quality people, another key requirement for success. In addition, these universities already have in place the third pillar; namely a high quality research base

quality businesses being formed. As yet we have no evidence as to whether this is being achieved.

Of the three universities that lead the field in spin-out activity, two, Imperial and Manchester, have created substantial investment funds over recent years. Manchester completed its £32 million UMIP Premier Fund in 2008 and at the end of 2010 Imperial Innovations changed the game completely when it added £140 million to its investment fund coffers. In doing so, the fund also broadened its remit to include Oxford, Cambridge and University College, London.

Unless other universities can join the Imperial or Manchester clubs or follow their lead, as has been mooted in Scotland, it seems likely a two-tier structure will emerge with the well-resourced group of Imperial, Oxford, Cambridge, UCL and Manchester forming a start-up premier league. Of course, simply having a lot of money doesn't automatically mean that a lot of high quality businesses will spring forth, but it certainly overcomes one of the main barriers. Having significant resources also attracts good quality people, another key requirement for success. In addition, these universities already have in place the third pillar; namely a high quality research base.

**Concentrations of sector activity -% total UK activity**

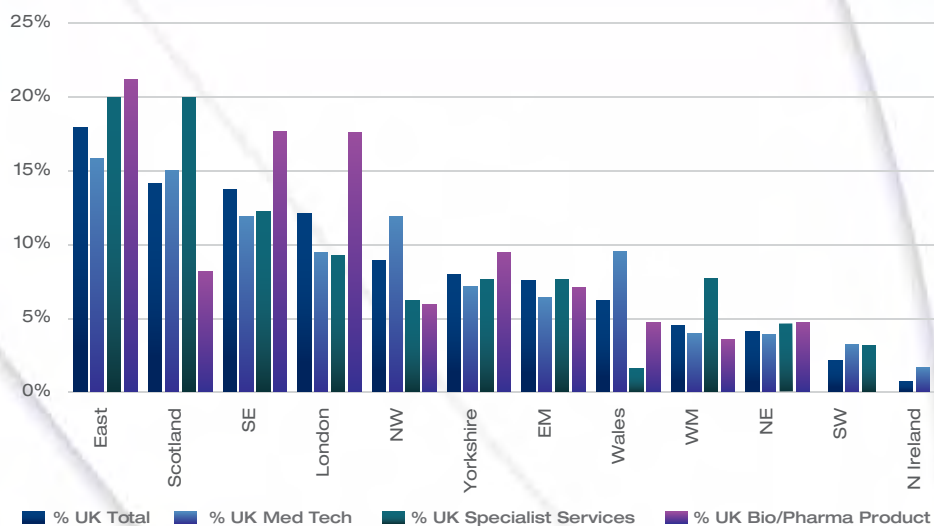


Figure 3



	Start-up Source		
	University	Non-University	Total
2005-9	135	180	315
2006-10	115	175	290
Change	-20	-5	-25
% Total change	80%	20%	100%

Table 1

# The Numbers

One might imagine that, given the universities position as hot-beds of innovation they might provide a disproportionate amount of the companies developing therapeutic products, but this appears not to be the case. The proportion of spin-outs in the therapeutic products area from universities is roughly the same as the proportion of university start-ups in total. However, further analysis of the therapeutic products category reveals

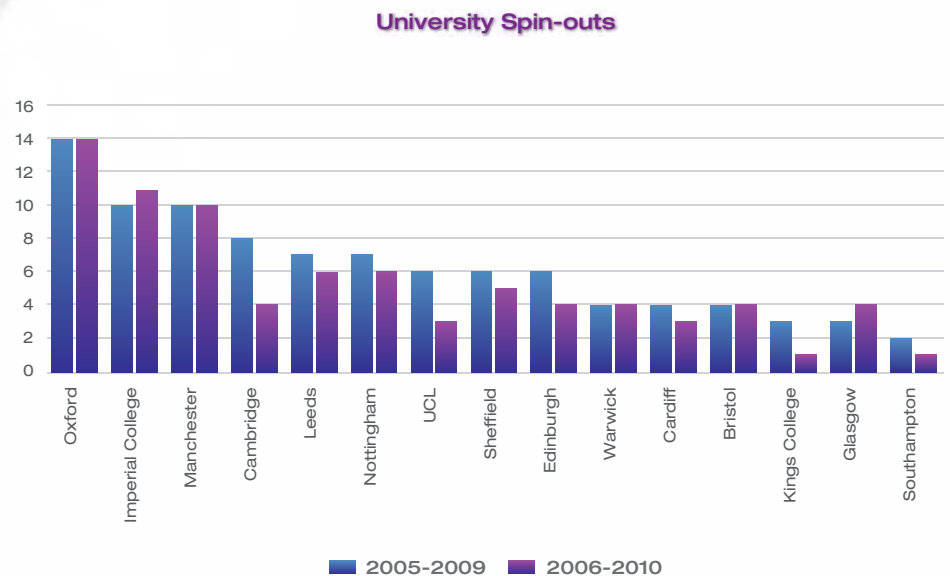
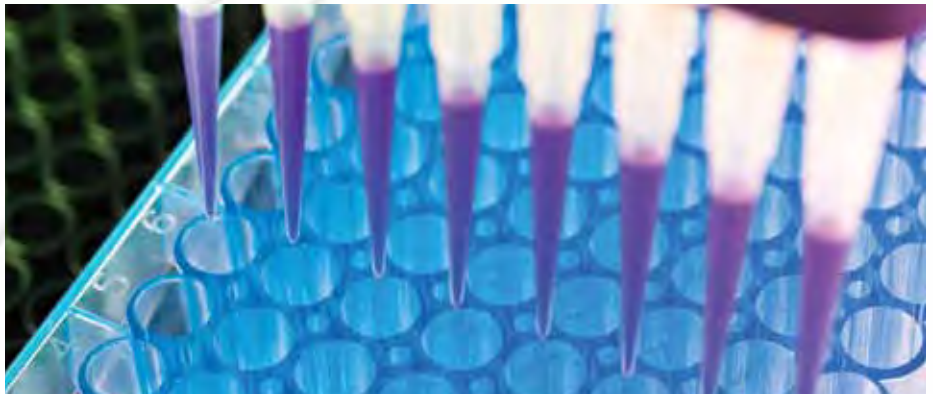


Figure 4



that companies developing therapeutics based on Advanced Therapies are somewhat more likely to come from a university source.

Many of the university spin-outs find their way into bioincubators and, as such, these organisations continue to provide the highest

concentrations of early stage life science companies, with almost half of all life science start ups located in a UK bioincubator or biopark.

### Source of companies

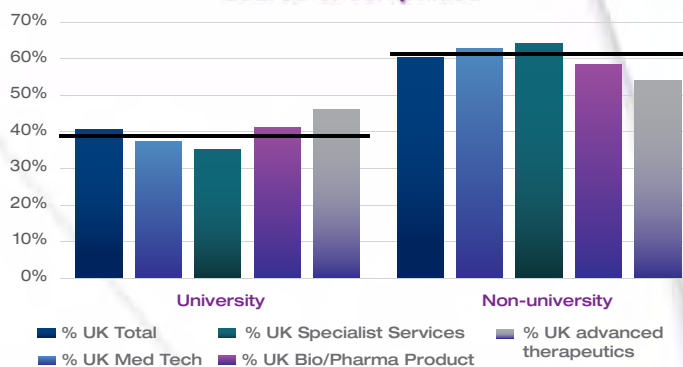


Figure 5

### Start-up population based in bioincubators

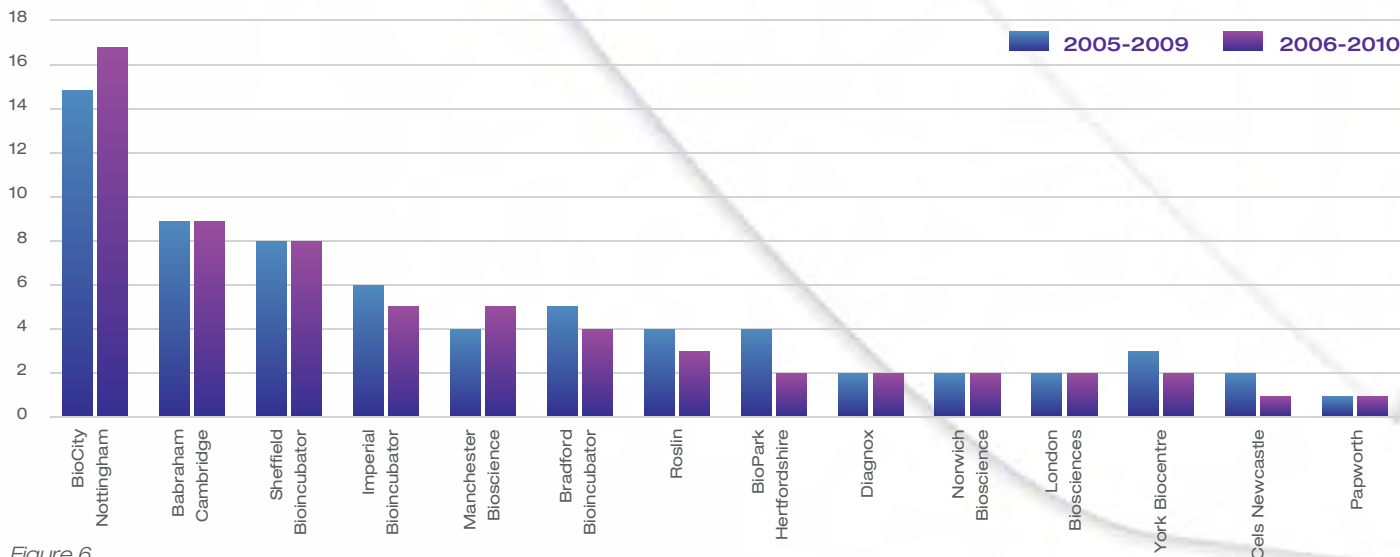


Figure 6

# Finance

The total amount of investment raised by life science start-ups in the 2006-2010 period was £329 million, a decline of £43 million or 12% on the £372 million raised in the five year period ended 2009.

The largest fall in activity was seen in the number of companies receiving investment in the sub-£500k range.

This may partially reflect the winding down over recent years of some of the public sector-backed funds such as the Regional Venture Capital Funds which mostly operated at the sub £500,000 investment level.

According to a report by NESTA, over the past decade public sector-backed funds constituted an increasing proportion of early stage investments in the UK<sup>1</sup>, reaching almost 70% in 2008, the year when most of the Regional Venture Capital Funds made their last investments.

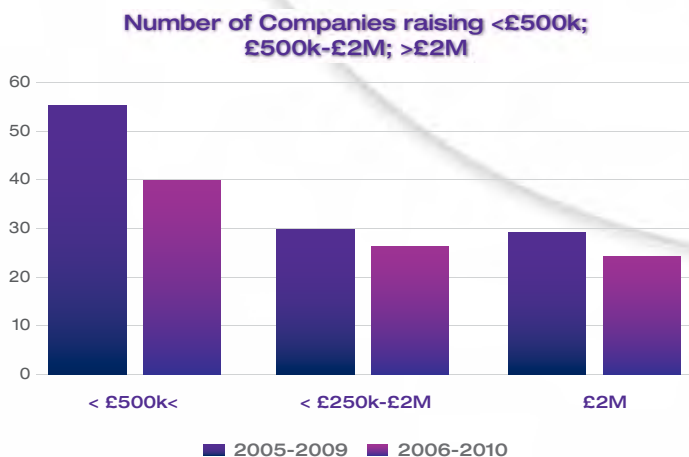


Figure 7

**Publicly backed investments as a % of all early stage deals (source: NESTA)**

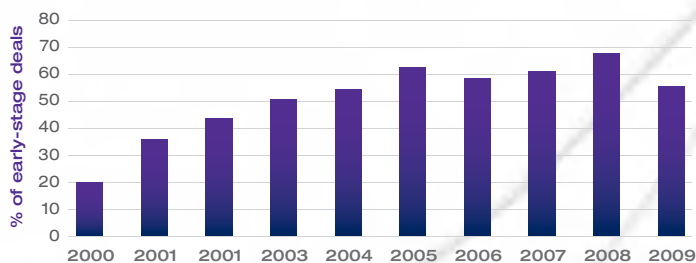


Figure 8

It's not easy to determine whether the private funds retrenched from early stage investing over the past decade because the public sector stepped in (enabling them to move upscale) or the public sector picked up slack left by private funds as they fled from the early stage market. What is clear is that there will be no rapid return to the situation of ten years ago and if, as a result of public spending cuts, the public sector investment into early stage businesses disappears it will leave a huge hole that could have a massive impact on the development of the next generation of life science businesses.

Approximately 31% of the companies formed in the 2006-10 period reported they had secured investment compared to 36% in the period to 2009. Although Yorkshire and Scotland remained the regions where the highest proportion of start-ups

<sup>1</sup>Venture Capital: Now and after the dot-com crash- NESTA

Regional Venture Capital Fund	Fund Size £M	Date closed/closing
North East Growth Fund	20	2013
East Midland RVCF	30	2008
North West Equity Fund	35	2008
London Capital Fund	50	2011
Yorkshire & Humber EF	25	2008
South East	30	2008
Advantage Growth Fund (WM)	17	-
South West RVCF	25	2012

Table 2: Regional Venture Capital Funds

received investment, there were falls across the board.

As previously reported, investment in life science start-ups remains concentrated in the bottom right hand corner of the UK map, with companies in London, the South East and East of England obtaining 74% of the total investment in the UK sector.

Moreover, over 40% of the total funding raised by the start-ups is concentrated in just 8 companies. The larger scale investments that have been seen over recent years are clearly a welcome development and go a small way to countering the criticism that UK life science companies are starved of



# Finance

investment. However, the question left begging is whether, over the past five years, there were really only a handful of life science companies formed in the UK that were suitable for investment over £5 million (which itself is hardly a stellar hurdle). Of course we don't yet have the full picture because, given time, some companies formed in the past year or so will also go on to enter the £5 million plus club, but the overall situation is unlikely to change significantly as a result.

The list of some of the largest start-up investments also highlights the prominence of just a small group of investors in the sector, with Imperial Innovations, MVM, SV Life Sciences or Novo AS between them involved in all the leading transactions.

The data also shows that university spin-outs are more likely to have obtained investment than non-university start-ups, but the average amount they raise is a little over half that of their non-university counterparts. This is despite the fact that Imperial and Manchester spin-outs constitute half the list of leading investments, further emphasising just how small-scale the investments in other university spin-outs must be. Indeed, a large proportion of university spin-outs (around 50% of those that gained investment) raised less than £500k.

**Percentage of life science start-ups receiving investment**

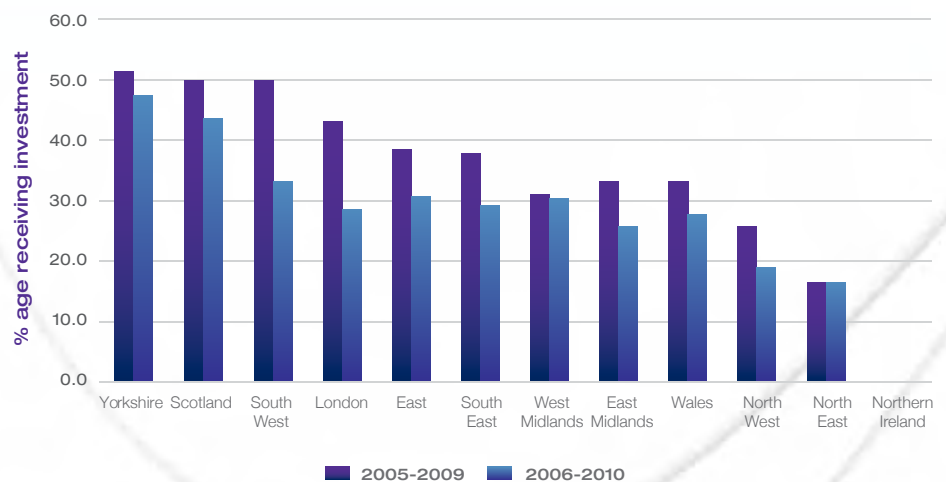


Figure 9

**Investment across the UK (£M)**

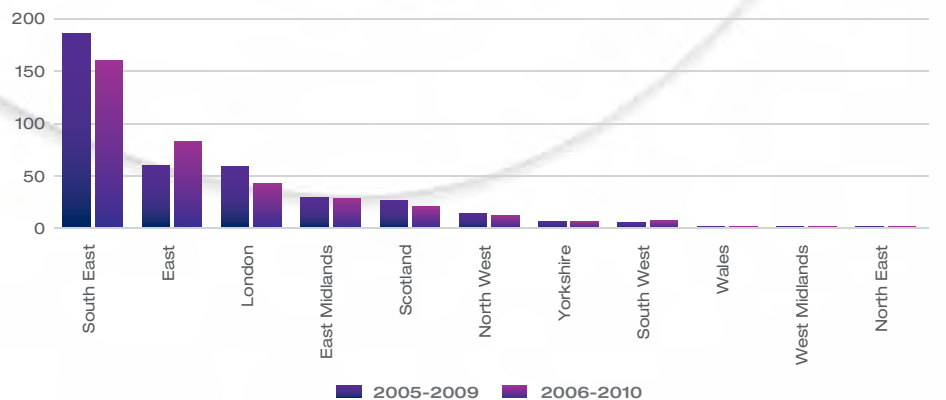


Figure 10

Company	Location	Amt raised 2006-2010 (£M)	University	Investors	Status
Circassia Pharma	South East (Oxford)	30.0	Imperial College London	Imperial Innovations, Invesco, Landsdown	ongoing
Vantia Therapeutics	South East (Southampton)	37.7	none	MVM, SV Life Sciences, Novo A/S, Ferring Pharma	ongoing
Convergence Pharmaceuticals	East (Babraham)	22.4	none	Apposite, SV Life Sciences, New Leaf Ventures	ongoing
Heptares Therapeutics	East (BioPark Herts)	21.3	none - MRC LMB	MVM, Novartis, Clarus, Takeda	ongoing
Serentis	London	20.3	none	MVM, Apposite, Novo A/S	Placed into liquidation 2010
Respivert	London	13.0	Imperial College London	Imperial Innovations, SV Life Sciences, Advent	Acquired by Centocor
Myconostica	North West (Manchester)	11.6	University of Manchester	UMIP Premier Fund, Kreos Capital	Acquired by Lab 21
Myotech/Psioxus	London	5.6	Imperial College London	Imperial Innovations, Invesco, Mercia Seed Fund	Myotec merged with Hybrid Biosystems
<b>Total</b>		<b>131.87</b>			

Table 3: Top Life Science start-up investments

Source of start-up	Total number of start-ups	% obtaining investment	Average investment/company (£M)
University	115	38%	2.5
Non-University	175	27%	4.3

Table 4: Investment in university and non-university start ups



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**Investment in Subsectors - Number of companies**

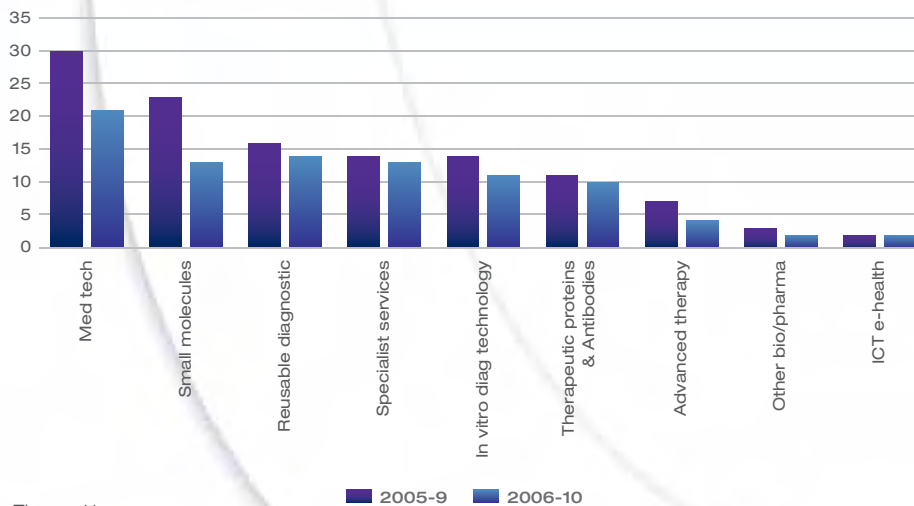


Figure 11

The number of investments in both med tech and small molecule-focused companies fell but the average amount invested in each small molecule based company increased substantially, by 60% to £9.3 million, continuing a recent trend in certain sub sectors, towards bigger plays in fewer businesses.

This has been identified as a trend in the US across the industry as a whole, not just in start-ups as reported by a recent Money Tree report from PwC and the NVCA where, in the first quarter of 2011, venture investment in life sciences was up 16% to \$1.4 billion but deal volume was down 9%.

2006 was clearly a good year for life science start-ups as not only did this group obtain substantially more early investment than other years, they also constitute most of the exit class to date

However, the increased investment per company doesn't compensate for an overall reduction in investment, highlighted by the amount companies have raised in the first four years from inception. Over that period, companies formed in 2007 have raised around half the amount of companies formed a year earlier.

In 2010 we also started to see some exits for investors in companies formed in the 2005-9 period. One of the most notable transactions was Respivert, spun out from Imperial in 2006 and acquired by Centocor (J&J) for approximately £70 million. 2006 was clearly a good year for life science start-ups as not only did this group obtain substantially more early investment than other years, they also constitute most of the exit class to date. Three of the transactions involved service/diagnostics companies and two were therapeutic-based.

**Investment raised in first 4 years (£M)**



Figure 12

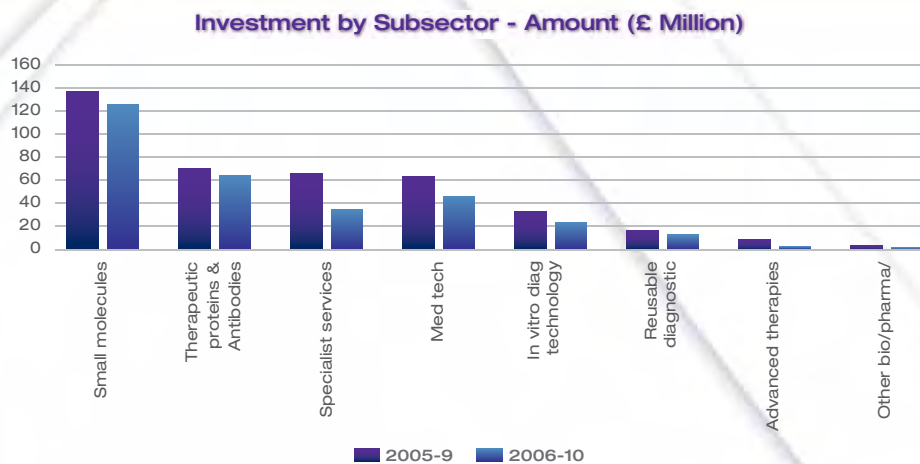
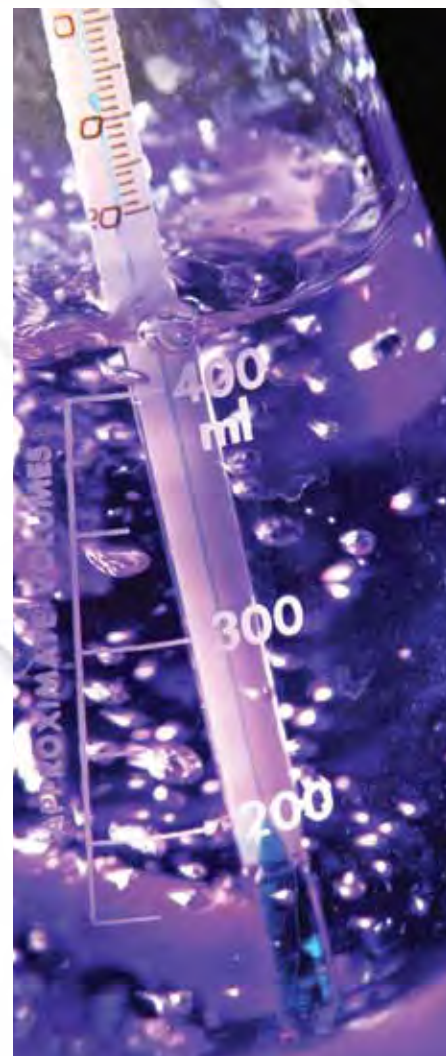


Figure 13

Company	Year formed	Location	Source	Acquired by/ merged with
Respivert	2006	Imperial College Incubator, London	Imperial College	Centocor (J&J)
Myconostica	2006	Manchester Bioincubator	Manchester University	Lab 21
D3 Technologies	2007	Glasgow	Strathclyde University	Renishaw Group
R5 Pharma	2006	BioCity Nottingham	BioCity	Aesica
Myotec	2006	London	Imperial College	Hybrid Biosystems

Table 5: Exits and M&A



# Finance

## Pharma steps in

One of the most obvious ways for pharma companies to address the shortfall of R&D productivity is to go straight to one of the sources, namely university research groups. These relationships have existed for decades, but over the past few years there has been a flurry of collaborative research deals signed between the major pharma players and leading university research groups. In the UK this has included the University of Manchester's joint deal with GSK and Astra Zeneca to create the new Manchester Collaborative Centre for Inflammation Research, funded by a £10 million contribution from the two companies.

GSK also recently signed a deal with Edinburgh University in the field of acute pancreatitis that, on the face of it, has a lot of similarities with the sort of deal the pharma giant might strike with a small biotech, including up-front payments, milestones and royalties. This appears to be more than a collaborative research grant. Other deals include University College London's agreement with Astra Zeneca in the field of stem cells and University of Nottingham's multi-million pound collaboration with Ortho Biotech (Johnson & Johnson) to create an ex-vivo cancer pharmacology centre.

These deals make increasing sense for both sides: As public funding of universities is squeezed industrial paymasters become ever more important, while for the pharma companies, this is a very cost effective way of expanding their research base. Moreover, it's a variable cost which can be turned off relatively easily with very little publicity- as opposed to closing down a research site.

Of course, this approach is not without its challenges. The difference in cultures is undeniable and the industry is full of anecdotes on the challenges of dealing with universities, whereas university administrators and academics will tell of the

frustrations of working with large pharma companies. Moreover, the whole area of intellectual property is fraught with pitfalls, especially where, as is often the case, research council or charity funding has also been involved.

It also needs to be recognised that somebody who works in the academic environment has often taken a conscious decision not to work in industry. There will be a line beyond which the academic researcher may start to wonder whether he is actually working for big pharma but without the financial benefits.





### So what might this mean for the creation of new start-ups?

Although the possibility of university/ pharma spin-outs coming from these collaborations can't be ruled out, it is more likely that commercial opportunities will be picked up by the partner companies and developed in-house. The trend over the coming years will be for universities to increasingly position themselves as research engines for the pharmaceutical industry, but there are only a limited number of truly world class research groups in a position to enter into pharma deals with the result that we could see a new gold rush, with ever higher valued deals announced in coming years.



### The trend over the coming years will be for universities to increasingly position themselves as research engines for the pharmaceutical industry

Clearly, pharma companies will never lock down the entire academic life science research base so there are still likely to be opportunities for novel technologies to emerge into spin-outs but, combined with lower investment levels, the increasing move by pharma into research deals with universities provides another downward force on spin-out activity in future.

Countering this is the spin-off activity from pharma companies themselves, which tends to create fully-formed discovery and development companies. Recent examples include Convergence Pharmaceuticals, which emerged from GSK in 2010 to develop a portfolio of analgesics and Vantia, which span-out from Ferring in 2008 with a library of small molecule drug candidates.

# Finance

## Pharma steps up

Aside from involvement at the early discovery phase through academic collaboration, the other clear way for pharma companies to access early stage opportunities is by investing in the businesses that are developing them. This is generally undertaken on an arm's length basis through a corporate venture fund, although the pharma parent's strategic priorities inform investment decisions. Corporate venturing in the life sciences is nothing new - Johnson



& Johnson Development Capital was founded in the 1970's and SROne, GSK's investment vehicle, has been around for over 25 years - but there has been a rush of new funds created over the past few years.

### Recent developments include:

- Novartis Option Fund- created in 2007. The fund makes seed investments and takes an option on the pipeline;
- RedScript Ventures - created by Johnson & Johnson in 2010 to seed opportunities of strategic interest to J&J;
- Boehringer Ingelheim - a €100 million fund founded in 2010
- BASF Ventures - created in 2011
- Merck - new \$250 million pot to invest strategically in Limited Partner funds

The funds operate in a myriad of ways and with different goals, but what is clear is that some at least are stepping into the early stage space, often with creative deals.

It's worth noting, however, that the £329 million of investment raised by the UK's life science start-ups over a five year period averages at approximately £66 million per annum which equates

to around 1% of Roche's annual R&D budget. Of course we can only record investments where they are publicly announced by the businesses so our £66 million a year may be a slight understatement, but it would be unlikely to affect the fact that for just 1% of its annual R&D budget Roche could own a stake in every single UK life science company that raised investment.

Naturally there would be a large number of companies in that group that would be of no interest to Roche, but it would be interesting to understand how the return on £66 million spent in that way would compare to £66million spent on internal R&D.

## Pharma steps back

The third way that pharma companies are gaining a view on opportunities coming through is through the establishment of incubator facilities. GSK's Stevenage bioincubator, due to open in early 2012, offers around 4,750 m<sup>2</sup> of laboratories and offices full square in front of the main GSK building on the campus. The £38 million project is largely public sector funded and represents a significant commitment to the industry. Meanwhile Johnson & Johnson recently announced plans to convert part of its La Jolla Research Centre into a bioincubator.

The theory behind these developments is that, aside from making use of redundant space and tapping into government funding, the close proximity between biotech and pharma will be mutually beneficial, giving pharma access to new developments and the biotech company access to the sophisticated infrastructure of the large pharma. It is still too early to say whether this model will work, but pharma's involvement in incubation is an obvious development, so we can expect to see more of it in the coming years.



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# The wider perspective

Every significant economy sites life sciences as being key to its future industrial success but government policies to support the industry vary widely. It is not clear that the UK government yet fully understands the seismic changes in the global pharmaceutical and biotech landscape and that tinkering around at the edges will not be enough to avoid the UK life science industry from being sidelined.



The UK government has tended not to develop policies specifically directed at the life science sector but there have been interventions that should benefit the industry. For example, in an attempt to encourage business angels to step in to meet the early stage company finance needs, the amount of tax relief an individual investor can claim under the Enterprise Investment Scheme was increased recently to 30% and there is a discussion about raising that further to 50% relief. This would certainly make angel investing more attractive and anecdotally even the 30% tax relief means that investors are prepared to put more into a business. Meanwhile, the government is also considering a business angel match fund although it remains to be seen whether it will be structured in a way so as to make it useful.

The majority of government grants accessible to UK life science companies are administered by the Technology

Strategy Board. The Grant for Research and Development was previously administered by the regional development agencies and there was a fear that centralising administration of these would make them harder to access but so far there seems to have been no negative impact. This funding can provide up to £250,000 towards research costs and has proven an extremely valuable uplift for early stage businesses.

But while initiatives directed specifically at the life science sector in the UK are few and far between, the United States has been busy bolstering its industry with a number of targeted measures. The Life Science Jobs and Investment Act was passed during the summer of 2011, bringing with it increased tax credits for companies working in life sciences and enabling life science companies that operate overseas to repatriate up to \$150 million of foreign earnings provided they are used to create new employment. Further funding is delivered

to small US biotechs through the Therapeutic Discovery Project, which provides up to 50% reimbursement of costs of therapeutic product development. Significantly, this includes the cost of clinical trials which is the point at which many UK biotechs stumble because of the large upswing in the amount of cash required even for early stage trials.

These targeted initiatives in the US are on top of a range of both national and state-based incentives aimed at encouraging investment in technology businesses. Already many states offer a 50% tax credit on angel investing on top of their own specific programmes to support the sector, such as Massachusetts' \$1 billion ten year life science fund.

The activity in the UK and US pales into insignificance compared to the investment available to life sciences in China, which is already providing a new avenue to funding for UK-based life science start-ups. One example is Crystec, a University of Bradford spin-out formed in 2007 to use supercritical fluid

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### 30% tax relief means that investors are prepared to put more into a business

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technology to improve the performance of existing medicines. The company has established a base in Tianjin, China and, although the terms of the deal are not public, it is well known that the regions within China will compete to offer the best funding package to companies willing to set up a base there. At the moment funding is generally not allowed to leave China, but the offers available can still be very attractive to a small life science company if it is feasible to carry out some of its development work in China. The UK life science industry may still have a strong future, but perhaps it just won't be located in the UK anymore!



# Conclusions

The heady days in the late nineteen nineties when money flowed freely into life science start-ups and Cambridge Antibody Technology briefly entered the UK FTSE 100 seem like a world away.

Even then, some were starting to question the all-or-nothing model that turned biotech investing into the equivalent of playing roulette and this doubt has been strengthened as, one by one, the well known names of the fin de siècle have fallen over.

The old biotech product development model requiring hundreds of millions of pounds of investment rarely works, especially in the UK where stock market valuations cannot justify the scale of funding required. But that doesn't mean UK life science has no future. The past decade has seen the growing pains of a sector coping with massive structural changes but we may now just be starting to see its transition to a very different looking industry as the new generation of early stage businesses and product opportunities emerge.

Britain's economy is corner-stoned by the service sector and it's the service side of the life science industry that increasingly forms its backbone. If we include diagnostics and e-health businesses (arguably usually ultimately service-

based businesses) then around a half of all life science start-ups in our analysis are service based. This is an expanding proportion of the total and likely to continue on that trend, driven partly by the changes in the large pharmaceutical companies. Over the past year or so the UK has seen the closure of research sites operated by Pfizer, Astra Zeneca, Merck and GSK among others and this

direct experience of working closely with around a dozen start-ups arising from the Astra Zeneca Charnwood site closure and if these grow at the same rate as some of the leading specialist service businesses at BioCity Nottingham then the research jobs lost at the AZ site will be fully replaced within five years. Moreover, they will continue growing beyond that.

## The past decade has seen the growing pains of a sector coping with massive structural changes

has resulted in the release of groups that previously provided in-house research services to the large pharma companies. In some cases these groups have formed themselves into new businesses, often with contracts back into the pharma while at the same time offering their services across the industry.

There will no doubt be much wringing of hands over the fact that firstly, these companies are small and secondly they don't exploit the UK's intellectual property base. However, BioCity has





And while it is true that service businesses are often founded on skills and know-how rather than on patents the most successful service-based businesses tend to follow a trajectory which leads to the development or acquisition of proprietary technologies as they mature.

Of course businesses providing drug discovery services need drug discovery to be taking place in order to ply their wares and while there's no sign that life science start-ups focusing on drug discovery are about to become extinct in the UK, there is an emerging trend for the universities to pick up the discovery baton with a more commercial approach to the process. A prime example is Imperial College's Drug Discovery Centre, in which a team with strong industry experience has been embedded within the academic research base to take projects forward using methodologies and standards acceptable to large pharma. In other cases, individual pharma companies are connecting up with the research base directly to support the development of projects. This approach addresses a dilemma which has haunted the industry in the past: projects have often been spun out of universities too early and not sufficiently de-risked, but university research departments have usually not had the skills to undertake the necessary early development work with sufficient rigour to satisfy a pharma company.

Whether they are providing discovery and development services or progressing therapeutics or medical technologies, companies in the life science sector still require investment. The number of significant life science investors in the UK is diminishing such that the same names crop up in most of the larger investment rounds in early-stage businesses. This lack of depth in the investment community is of concern, but that's nothing compared to the rug that is currently being pulled out from under small-scale early stage investing. This is because public-sector backed investment funds came to dominate early-stage investment in the UK, which is all well and good until the flow of public funding for investment is suddenly turned off, potentially

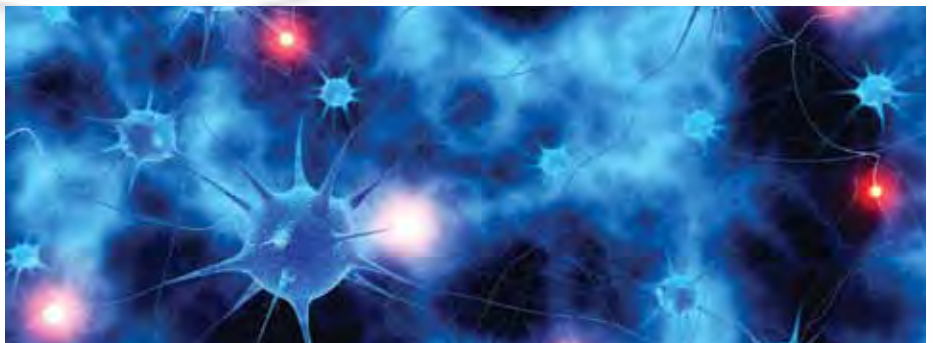
# Conclusions

leaving a massive hole. This is not the forum to debate the pros and cons of public sector backing for investment funds, but if the patient is to be weaned off this source of investment it is surely better to do it slowly.

The reduced levels of early stage funding coupled with changes in university approaches to spinning out companies appears to be feeding through to a fall in the total number of new life science businesses being created. It would be nice to think that the investment market operates with complete efficiency and as money becomes scarcer, so the quality of the pool of start-ups increases with every lifting of the investment hurdle. Unfortunately, we know this is highly unlikely to be the case and there is a real risk that great opportunities may not see the light of day.

So we may be looking toward a UK life science industry increasingly dominated by businesses providing discovery and development services with a lot of that discovery and early development being undertaken in a more commercial manner within our universities. Drug discovery and new

therapeutic businesses will still be created with a small number obtaining greater levels of investment from just a handful of specialist investors. For the rest of the reducing start-up population, finding investment looks likely to become even tougher unless there is any replacement of the rapidly disappearing early-stage funds. Whatever happens in this respect, Chinese investment is going to have an ever greater impact and it is likely we will see a flood of life sciences businesses eastwards to access the funding, market and clinical population. The UK Government will very soon need to decide whether it is comfortable with this or if it needs to provide an alternative.




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# Appendix 1

## Methodology

### Criteria for Inclusion

The criteria that needed to be met for inclusion in the study are:

- a. The company must be of an entrepreneurial nature, based in the UK and incorporated between 1st January 2006 and 31st December 2010.
- b. The company must be research or product focused, excluding consultants.
- c. The company must be sufficiently established, non operational entities that are companies in name only are excluded.
- d. Subsidiaries of other companies are also excluded.

### Data Sources

The company data that was used in this report was gathered from various sources, mainly from websites, databases and communications with academia.



The data sources that were searched were:

Source	Description
Companies House DVD- Rom Directory	Contains basic company details on over 2 million live companies registered in England, Scotland, Wales and Northern Ireland
Bioincubator Websites	• UK Bioincubation Forum
The BioIndustry Association	Is the trade association for innovative enterprises in the UK's bioscience sector
MedTrack	Biomedical Corporate Intelligence Database
UK Biotech Database	Provides a comprehensive overview on the life sciences industry in the UK
FAME Database	The UK and Irish financial company information and business intelligence Database
Regional Websites	Yorkshire and Humber Spin out Companies website, London Biotech Data and Scottish Enterprise
Universities	Websites and direct survey
Investment Websites	Various
Biotech Informa Database	A unique database of biotech companies and their suppliers
England's Regional Development Agency Websites	<ul style="list-style-type: none"> <li>• Advantage West Midlands</li> <li>• East Midlands Development Agency</li> <li>• East of England Development Agency</li> <li>• London Development Agency</li> <li>• Northwest Regional Development Agency</li> <li>• One North East</li> <li>• South East England Development agency</li> <li>• South West RDA</li> <li>• Yorkshire Forward</li> </ul>
European Medicine's Agency	List of SME's
Science technology and Business Park's website's	
Journals	Inc. Med-Nous, Nature Biotech
Companies House Direct Web Check Service	A searchable Company Names and Address Index

# Appendix 1



A range of websites and databases showing information on biotechnology and life science companies were reviewed. These included the UK Biotech database, the BioIndustry Association, Biotech Informa database and the MedTrack intelligence database. The FAME database was also searched and accessed from the British Library in London. Organisations

## The news archives of each development agency revealed many companies that had been funded or assisted by the agency

that provide specialist funding for companies involved within the life sciences sector uncovered more useful company data.

Regional sources of information were also checked, each Regional Development Agency was examined to find companies that the region had previously supported. Some of the websites also had a healthcare and life science section, which gave details on regional companies within the sector. The news archives of each development agency revealed many companies that had been funded or assisted by the agency. Another source was Scottish Enterprise.

Other company details were located through industry journals and news archives. A list of companies that have current SME status assigned by the European Medicines Agency provided yet more companies of use in the research.

All companies that were found from sources other than the Companies House database were then checked back on the Companies House Direct web check service to ensure that the companies were still in existence and the formation date was correct. As well as the data sources that have already

been listed there were other websites, databases and other company details that were searched that did not provide any profiles that fitted the criteria. Some of these sources included websites which were found by doing internet searches.

Once all the companies' names, formation dates and addresses etc were found and stored on the database, a search commenced to find out information on the investments that each company had received within the last 5 years. Detailed searches of each individual website began the search, the funding information was found on the news pages of the websites. If the companies had no funding details available on their websites, a search was conducted on an internet search engine. This search brought up a vast amount of funding details which were incorporated into the life science company database. The same type of search was completed to ensure all university spin out companies were identified.

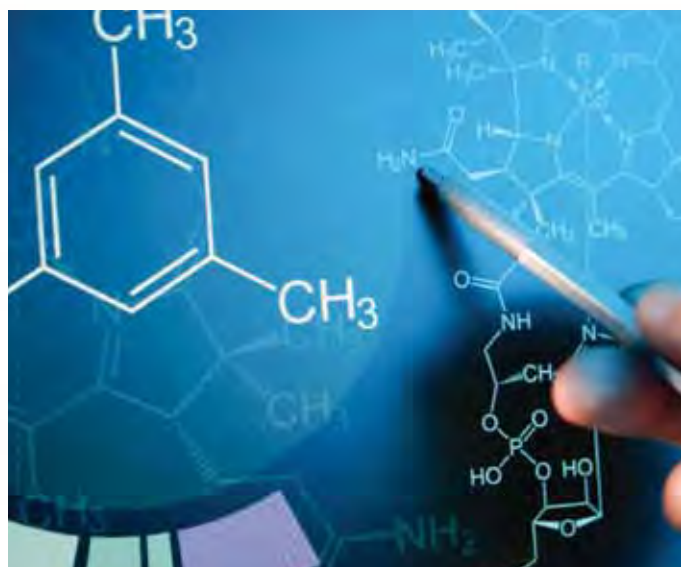
Finally, the companies were classified using the same criteria used for the UK.



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