



The network
for life science
executive leaders

FORMERLY KNOWN AS
biotechandmoney
bringing deals to life

LSX INVESTOR PERCEPTION SURVEY 2019

TRENDS AND TRUTHS IN LIFE SCIENCES INVESTMENT

CONTENTS

- 3** Key findings
- 4** Respondents' profiles and preferences
- 6** Areas of opportunity
Respondents identify the life science sub-sectors, therapeutic areas, and geographical markets that they believe provide the greatest investment prospects. With commentary and insights from Daniel O'Mahony, Partner at Seroba Life Sciences, John Cassidy, Investment Associate at Arix Bioscience plc, Tara Raveendran, Healthcare Analyst at Shore Capital, and Robert James, Managing Partner at Sixth Element Capital.
- 12** IP, regulation and compliance
Investors share their views on the UK's decision to exit the EU, and their expectations of how this will impact their investment strategies and the industry more broadly. The survey also examines the sway that IP and other factors have over respondents' investment decisions. With commentary and insights from Tim Sarson, Partner and Brexit Lead for Life Sciences at KPMG, and Simon Turner, Managing Partner at Alacrita.
- 16** Talent and executive strategy
We explore the qualities that investors look for in a life science company's management team and find out whether their opinion of executives' pitching skills has improved over the last year. With commentary and insights from Dr Christoph Kausch, Founding Partner and CEO at MTIP, and Karolina Zapadka, Business Acceleration Manager at Accelerate@Babraham.
- 20** Portfolio support
The survey uncovers how hands on investors like to be with their portfolio companies and examines the support mechanisms they provide, from access to their networks to facilitating engagement with service providers. With commentary and insights from Stephan Christgau, Senior Partner at Novo Seeds.
- 22** Emerging technologies
Survey respondents consider the potential of emerging technologies in the healthcare industry, as well as revealing whether they are investing or intend to invest in companies utilising these technologies. With commentary and insights from Helen Disney, Founder and CEO at Unblocked Events, and Jason C. Foster, Managing Director at Health Equity Consulting.
- 26** Acknowledgements

Published by LSX, formerly Biotech and Money, in February 2019

Designed by **Nitty Gritty Creative**

Stock images via **Adobe Stock**

Cover © **monsitj**

EDITOR'S COMMENT



Now in its third year, the *Investor Perception Survey* tracks the views of the investment community in order to identify evolving trends across the life sciences investment ecosystem. This ranges from investors' sub-sector performance expectations to

the therapeutic areas attracting their interest. We also examine the impact of external events and political upheavals on respondents' investment strategies, such as the UK's planned departure from the EU and the uncertainty trailing in this decision's wake.

The survey has the dual purpose of aiding life sciences companies in better understanding the current thinking and preferred ways of working among their potential funding partners. This year, we dive deeper into the key criteria investors weigh up when making investment decisions, the attributes they feel make for a stand-out management team, and the support mechanisms they provide to help portfolio companies grow.

As digital health innovations continue to make their presence felt in the sector, we also turn our attention to emerging technologies. Where do investors see the greatest opportunities in applying advanced technologies to healthcare? What proportion of them are already active in this area? What factors would increase the likelihood of them investing in the future?

These questions and more are covered over the course of the report, alongside unique insights from a range of investors, analysts, and industry experts.

We hope you find the report useful and welcome your comments on the topics it explores.

LSX would like to thank all of those who took part in the survey and contributed to this year's report.

Louise Fordham, Editor at **LSX**, formerly Biotech and Money
#LSXinsights

KEY FINDINGS

This survey, which ran between October 2018 and November 2018, received a total of 84 responses. Telephone interviews were conducted with 18 experienced life science and healthcare investors, including angel, family office, venture capital and corporate venture capital investors in Europe and North America. Responses to the online survey were anonymous, and insights gleaned from the phone interviews have also been reported anonymously to allow for greater candour. One third (33%) of respondents are founders or managing partners of investment firms, and a further 48% are senior associate level or above.

59%

of respondents expect biotech to be the best-performing life science sub-sector over the next 12 months



49%

of respondents prefer to be 'very' or 'extremely' hands on with portfolio companies



77%

of respondents expect Brexit to have a significant negative impact on recruiting and retaining talent in UK life sciences



54%

of respondents list robust intellectual property among their top three investment criteria



76%

of respondents believe access to their network to be the most-valued support mechanism they offer to portfolio companies, aside from funding



61%

of respondents look for life science management teams with a well thought-through development strategy



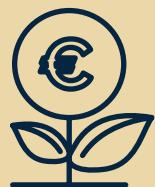
50%

of respondents help portfolio companies to engage with contract research organisations



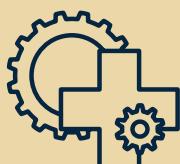
44%

of respondents rank oncology as the therapeutic area offering the best investment opportunity



37%

of respondents believe that advances in technology will have the most benefit on patient engagement, monitoring, and management



77%

of respondents think that of the life science management teams they see, 50% or less present well to them



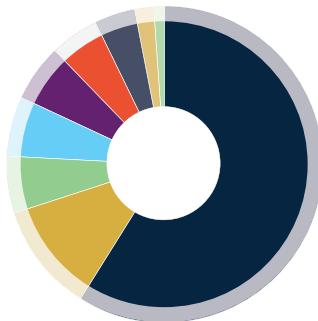
RESPONDENTS' PROFILES AND PREFERENCES

Due to rounding, percentages may not add up to 100.

FIGURE 1

The type of money respondents are running

Sample: All respondents (84)

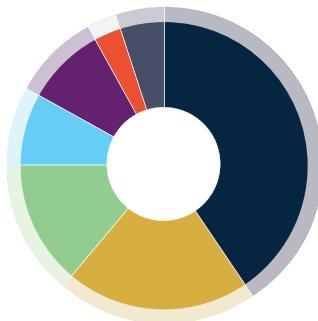


- Venture capital - **59%**
- Angel - **11%**
- Corporate venture capital - **6%**
- Institutional - **6%**
- High net worth - **6%**
- Family office/private wealth - **5%**
- Private equity - **4%**
- Government organisation/sovereign wealth fund - **2%**
- Large biotech/pharma - **1%**

FIGURE 2

The estimated total current value of assets under respondents' direct control

Sample: All respondents (80)



- \$100m or below - **41%**
- \$100m-\$250m - **21%**
- \$250m-\$500m - **14%**
- \$0.5bn-\$1bn - **8%**
- \$1bn-\$2.5bn - **9%**
- \$2.5bn-\$7.5bn - **0%**
- \$7.5bn+ - **3%**
- No funds under direct control - **5%**

FIGURE 3

The region where respondents are primarily based

Sample: All respondents (84)

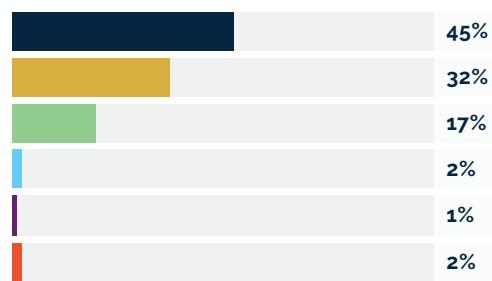


FIGURE 4

The region(s) respondents specialise in

Sample: All respondents (84)

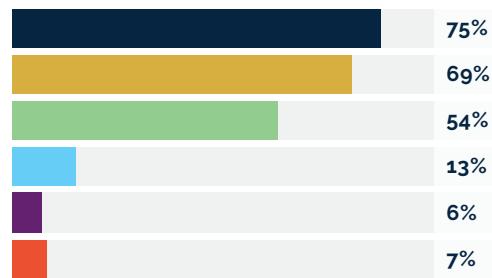
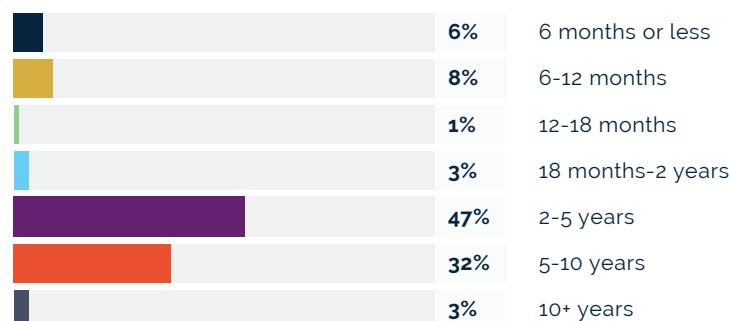


FIGURE 5

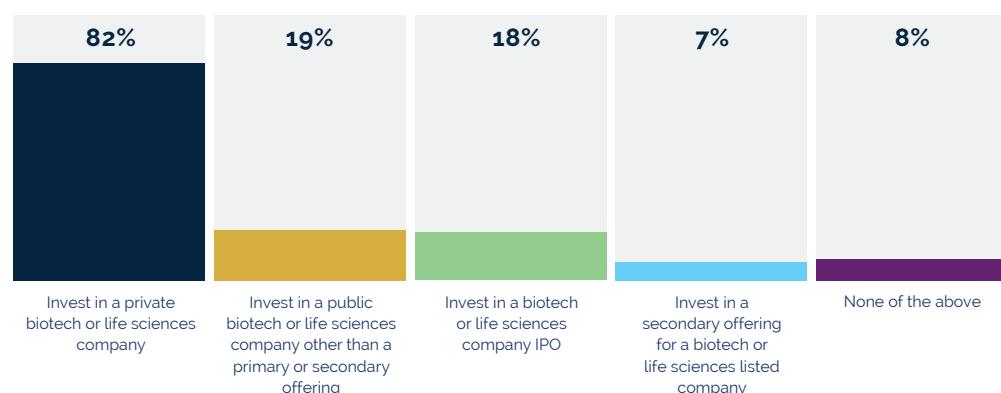
Respondents' current investment time horizon

Sample: All respondents (77)

**FIGURE 6**

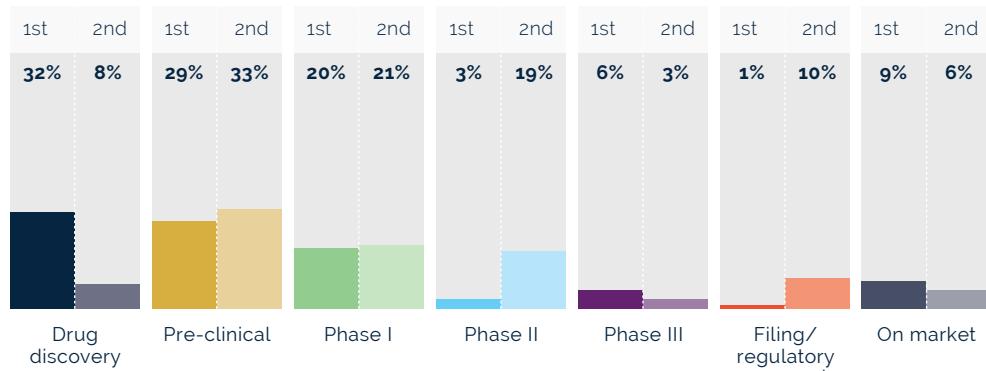
The investments made by respondents over the past 12 months

Sample: Biotech respondents (84)

**FIGURE 7**

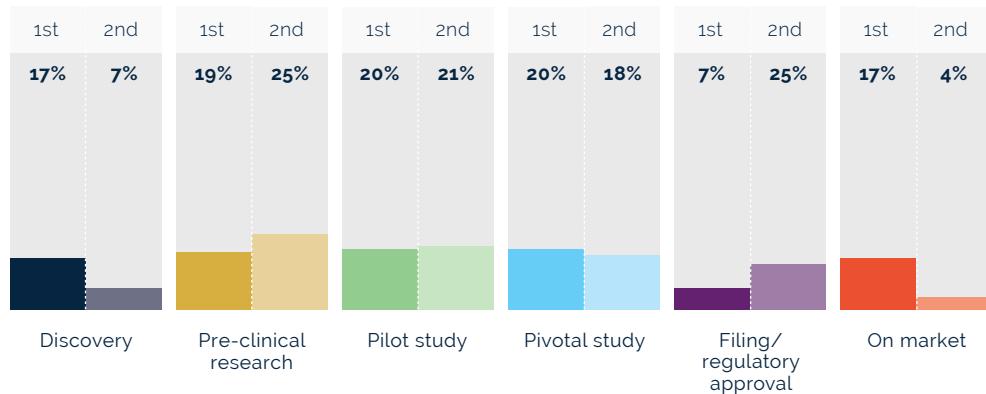
The product development phase at which respondents are most likely to invest in a biotech company (ranked by first and second choice)

Sample: Respondents that invest in biotech companies (66)

**FIGURE 8**

The product development phase at which respondents are most likely to invest in a medtech, medical devices or digital health company (ranked by first and second choice)

Sample: Respondents that invest in medtech, medical devices or digital health companies (59)



AREAS OF OPPORTUNITY

More than half (59%) of respondents to this year's *Investor Perception Survey* expect biotech to outperform other life science sub-sectors over the coming year, up from 57% in 2018 and 51% in 2017. It also racks up a 37 percentage point lead among the sub-sectors respondents feel offer the best investment opportunity. A number of factors have helped to sustain investment in therapeutics start-ups and support biotech sector growth, including pharma's increasing tendency to leverage externally-sourced innovation. The US Food and Drug Administration (FDA) has also ramped up its efforts and rhetoric around improving the efficiency of drug development programmes and accelerating the regulatory approval pathway for

products. There were 59 novel drug approvals in the US in 2018, compared to 46 in 2017 and 22 in 2016. A North American investor, who took part in a phone interview for this survey, said: "Ever since the new FDA Commissioner, Scott Gottlieb, took over, we've seen a very 'friendly' FDA when it comes to helping companies get drugs approved. I certainly think that's going to help drive the therapeutics side, perhaps more so than other [sub-sectors]."

FIGURE 9

The life science sub-sector that respondents believe will perform best over the next 12 months

Sample: All respondents (82)

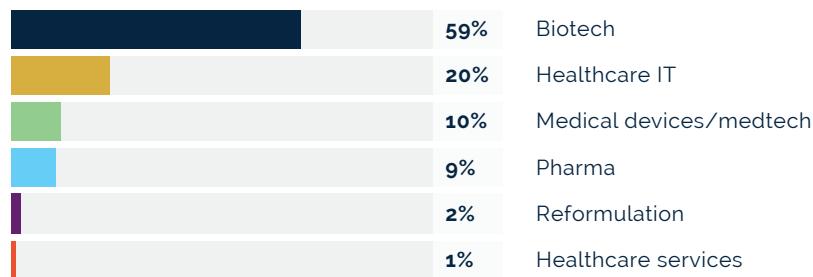
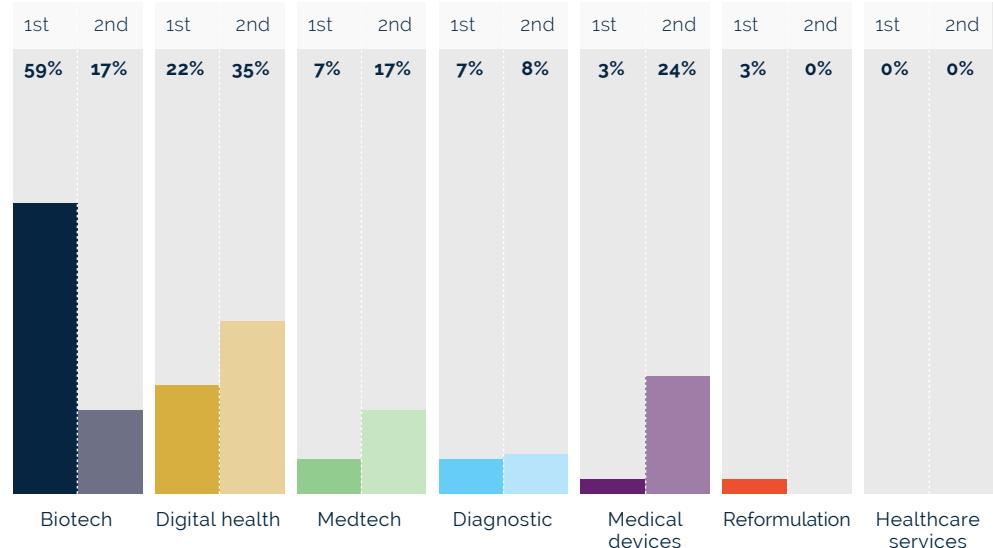


FIGURE 10

The life science sub-sectors that respondents feel offer the best investment opportunity (ranked by first and second choice)

Sample: All respondents (74)



Mixed picture for medtech and devices

Performance expectations for medtech and medical devices have dropped from 18% in 2018 to 10% in 2019. This year, 7% and 3% of respondents rank medtech and medical devices, respectively, as the area offering the greatest investment opportunity. This compares to 12% and 8% in 2018. Yet, it is worth noting that there has been an increase in the proportion of respondents who feel that these sub-sectors offer the second biggest investment opportunity. Almost a quarter (24%) of respondents rank medical devices as the second greatest investment opportunity, up from 18% last year, and 17% now place medtech second versus 10% in 2018.

In some cases, biotech's venture capital gain seems to have been medical technology's loss. "The most currently undervalued sector is the medtech sector. So many funds have, for various reasons, stopped or reduced their appetite for medtech and more money now goes into biotech," stated a European VC whose portfolio spans medtech, biotech, and digital health. Nevertheless, the interviewee is cautiously optimistic about the prospect of a revival: "I don't know if that will happen in the next 12 months, but I think there is the potential for some positive surprises and some relatively large exit transactions. There are a number of far-advanced companies that are addressing large markets."

Confidence in digital health on the up

One fifth (20%) of respondents think that healthcare IT will deliver the best performance over 2019, rising from 9% in 2018. The proportion that feel digital health offers the greatest investment opportunity has also improved year on year, with 22% and 35% ranking it as their first and second choice, compared to a respective 16% and 22% in 2018. "I think a lot of people are starting to see the opportunity in healthtech and realise that the healthcare market is one of the last markets to be disrupted by technology," noted an investor active in this space. "We're starting to see quite a lot of traction for digital health technologies among B2B customers, like pharma, medical device companies, equipment providers, health insurers, and hospital systems. These larger providers are starting to adopt technology at scale."

However, some interviewees were concerned that an increased flow of tech-focused venture capital into digital health may mean that companies will not benefit from the specialist knowledge of healthcare investors. One life sciences VC said: "We see a lot of interest from IT investors in healthcare IT, but these investors are not necessarily going into the right projects so there might be some disappointments from that down the line."



VIEWPOINT

Daniel O'Mahony,
Partner at
Seroba Life Sciences

One of the major challenges facing medical device companies today is how far do companies need to develop and finance a new/innovative medical device before an M&A opportunity may become realistic. This impacts the journey time from start-up to exits, as well as quantum of funds that a medtech company needs to raise as it plans for success and value inflection.

The current trend suggests that a medical device company needs FDA approval as well as evidence of product commercialisation or early revenue ramp with good reimbursement codes in place in the USA prior to exit. It also seems to suggest that large strategic medtech companies place greater value on revenue generated in the USA vs Europe. Having good reimbursement codes in place for new innovations in medtech with CMS coverage is also an important criterion that investors take into consideration when investing in innovative medtech technologies.

The net impact of these developments is that traditional life science VCs are investing at later stages of development – namely post design freeze or indeed post first-in-human clinical trial stages. Single-asset, pre-revenue medtech companies will struggle to secure IPO investment, with IPO trends favouring revenue-generating companies, preferably with multiple assets/product offerings. The ongoing consolidation in the medtech sector also means there are fewer and fewer M&A acquirers today.

Collectively, these developments have had, and continue to have, a downward impact on VC investment into the medtech sector, with valuations also impacted. Five years ago, many of the life science VCs had a 50-50 allocation between medtech and biotech investments. Today that trend is 70-30, 90-10 or 100-0 balance in favour of biotech vs medtech investments. In this environment, the future development and growth of single-asset, early-stage medtech companies (on a journey to FDA approval) may require new business models on investment/partnerships/alliances/cooperation/shared resources/owning the patient journey in the continuum of patient care in order to attract investment for product development and launches into the US market, be it from private equity, IPO or traditional life sciences VC sources. With these trends, coupled with the uncertainties around EU Medical Device Regulation (MDR), the European (vs US) patient may be starved of new medtech innovations - a reversal of what occurred circa 10 years ago as new devices such as TAVR devices were launched into Europe well ahead of the USA market.

Note: This is an abridged column. Read the full-length piece on www.lsyleaders.com for more on the impact of MDR and emerging investment areas



VIEWPOINT

John Cassidy,
Investment Associate at
Arix Bioscience plc

For private biotechs developing innovative therapeutics there has hardly been a better time to raise cash than 2018, which saw more than \$14.2 billion of venture capital (VC) invested in the sector, beating the previous record of \$11.5 billion¹ in 2017. The flood of cash has been driven both by existing specialist biotech investors raising larger funds, as well as greater participation in the space by generalist investors, reflecting the positive sentiment towards biotech that has been built by high-profile scientific and clinical advances as well as impressive commercial and financial success for VC-backed biotechs.

This surge of capital has coincided with increasing uncertainty over how medical innovation will be valued and paid for by healthcare payers. This is especially true in the US, where resistance to high drug pricing is building and impacting revenue expectations for large biopharma. This puts pressure on large biopharma to maintain a pipeline of differentiated products that address major needs, a challenge that they look to solve by turning to external sources of innovation. Thus, macro factors squeezing large biopharma continue to offer opportunities to biotechs developing novel therapies. Biotechs developing therapies in crowded spaces (e.g. immunotherapy), without clear differentiation from other pipeline assets (e.g. similar mechanism, "me-better") may struggle to find a buyer despite the potentially lower technical risk.

The challenge for VCs is to deploy larger funds efficiently without letting standards slip, which results in more competition for the best opportunities regardless of geography. Although the total investment in the sector is at record highs, the number of deals completed in 2018 was lower than in recent years (2018: 706 vs 2015-17: 707-891), suggesting that VCs are focusing on fewer, larger investments. This is driven by a desire to take larger stakes in the most compelling opportunities. This results in a growing divide between "haves" and "have-nots" in the biotech world, where the top tier of companies that have both teams with track records of executing R&D programmes and successful exits, and the combination of high-quality differentiated technologies are able to raise upsized VC rounds at high pre-money valuations, while others may struggle to secure funding.

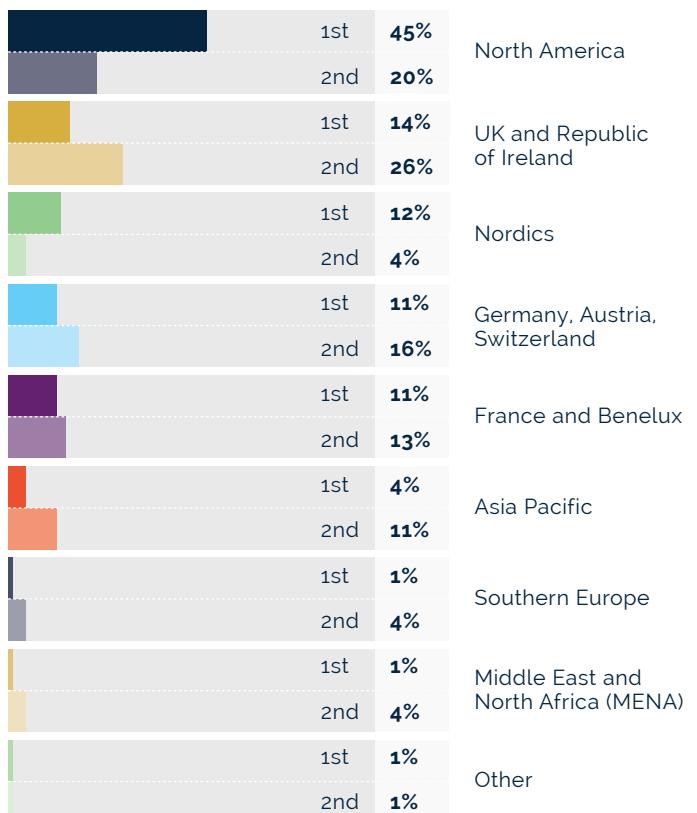
Although many investors consider the US biotech hubs (Boston and Bay Area) as the source of the best ideas, there is a growing willingness to travel further to source innovation. This creates opportunities for European biotechs who are increasingly able to find support from international investors as well as those closer to home.

¹ Source: PitchBook, 6 January 2019

FIGURE 11

The geographical markets where respondents are seeing the greatest investment opportunity (ranked by first and second choice)

Sample: All respondents (76)



UK slips down in investors' estimations

When it comes to the geographical markets where respondents are seeing the greatest investment opportunities, the UK and Republic of Ireland stand out among European regions with 14% of respondents selecting them as their first choice and 26% as their second choice, but their lead has reduced significantly. For first choice, the UK and Ireland are just two percentage points ahead of the next region in Europe (the Nordics with 12%) compared to seven percentage points in 2018 (27% versus Germany, Austria and Switzerland's 20%). The UK may be beginning to feel the chill from its impending exit from the EU which, at the time of writing, is still scheduled to occur on 29 March 2019. Indeed, the proportion of respondents who view France and Benelux as the region offering the best opportunity has increased from 8% in 2018 to 11% this year – the Netherlands will of course welcome the European Medicines Agency (EMA) to Amsterdam when it departs its current home in London.

North America retains its crown

Unsurprisingly, the majority of respondents (45%) view North America as the most fertile ground for investment. Several investors interviewed for this survey lamented the lower risk appetite and availability of capital in Europe when compared to the US. Some suggested a greater tolerance for failure and more active promotion of European success stories could help to even the playing field. "We need to make sure people know what we are doing," said one European VC interviewee. "Right now, I don't think we communicate enough about all of the successes we have here. We need to rebalance that and also make sure companies are speaking to US investors at all stages of their development." Other recommendations included building management teams that have experience on both sides of the Atlantic to help navigate development across global markets, as well as calls for policy measures that encourage investment in public life sciences companies listed on European exchanges.

However, the investment environment in Europe is far from doom and gloom. As one VC investor noted: "The good news is that there is quite a lot of capital now in certain countries in Europe, and I expect that the gap [with the US] is going to narrow going forward." A number of European VC firms have raised new funds over the last 12 months, such as Forbion's €360 million Forbion IV fund, Sofinnova's €275 million Crossover I fund, and the €345 million BioDiscovery 5 fund managed by Andera Partners, formerly EdRIP.

Anticipating cooling markets

Regions outside of US life science hotspots can also provide welcome relief from high valuations. "We will be taking a closer look at technologies and companies outside of [Boston and San Francisco] because we think there is far more value there and the science is just as good, if not better in some cases," said an interviewee from a North American fund.

For companies looking to go public, the US, namely Nasdaq, continues to be the main draw for life sciences companies. According to the [PwC US Capital Markets Watch](#), there were 20 pharma and life science US IPOs in 3Q18, raising \$3.3 billion. This is a substantial increase on 3Q17 when 11 IPOs raised \$1.1 billion. However, after a particularly hot IPO market in 2018, there are signs of a cooldown. "I think the IPO window will maybe not close, but certainly start narrowing in 2019," stated one investor.

Yet, overall, interviewees were upbeat about the outlook for the sector. As one VC said: "We see so many great opportunities every day. I've been in this industry for over 20 years and I can hardly think of a time when we had so much innovation or were as close to major breakthroughs as we are today."



VIEWPOINT

Tara Raveendran,
Healthcare Analyst at
Shore Capital

How quickly tides can turn – heading into December, 2018 was set to be another good year for biotech, with indices reaching all-time highs in August and the IPO window seemingly wide open. While the last quarter was more tempestuous, the downward spiral accelerated with dramatic effect into year-end. Roll on Christmas and with it all the remaining optimism seems to have evaporated. December saw indices, not just biotech, plummet, with newly-financed public biotech companies also wrapped up in the carnage. Both the S&P 500 and DJIA were down around 9% in December, with the Nasdaq Biotech Index down c.16% over December to Christmas Eve, although eventually recovering somewhat to end the month down in line with the market.

Taking a step back, the biotech IPO market in 2018 was nothing short of impressive, with 60 new offerings on US exchanges, which includes the \$604 million raised by biotech unicorn Moderna in early December – the largest biotech IPO ever. Perhaps however, the writing was on the wall, with the stock struggling on its first day of trading and ending the day c.20% lower than its IPO price. That wobble in biotech seemed to be just a prelude of what was to come. It is also notable that two of the other larger US IPOs of 2018 – Allogene (\$373 million) and Rubius (\$277 million), were also for companies with a product yet to reach the market. Some might argue that actually these were signs that the market perhaps got ahead of itself.

On the plus side – despite increased investor caution, against a backdrop of potential rising US rates and slowing China growth, the fundamentals for biotech remain strong. Innovation is in demand and abundant - RNA therapeutics that can access previously undruggable targets, potentially curative cell and gene therapies, and novel gene editing platforms are rapidly advancing into and through the clinic. Historically valuations have proved too much of a barrier to acquirers, but the recent market rout may just prove the catalyst – as demonstrated by the first deal of 2019 with Bristol Myers' \$74 billion acquisition of the troubled biotech bellwether Celgene. Here in the UK, the acquisition of two stalwarts of the sector – Shire's \$62 billion acquisition by Takeda and BTG's \$4 billion acquisition by Boston Scientific – demonstrates the increasing attractiveness of UK healthcare assets to international acquirers. So, while investor enthusiasm may be more tempered, and capital markets more selective, we see an improving M&A environment for high-quality small and mid-cap biotechs, both private and public.

FIGURE 12

The therapeutic areas that respondents feel offer the best investment opportunity (ranked by first and second choice)

Sample: All respondents (73)



Oncology is still number one

Oncology remains the clear frontrunner among the therapeutic areas respondents believe offer the best investment opportunities. More than two fifths (44%) of respondents rank it in first place, an increase of seven percentage points on 2018. However, with the continued heat comes the continued challenge of identifying the companies and technologies that stand out from the crowd. "It's not an area that's overheated in terms of patient need, there is still huge patient need. But for an investor to work out what to invest in in this space can be quite hard," said one early-stage VC interviewee.

CNS has slipped below autoimmune/immunology to third place this year, with 8% of respondents selecting it as the area offering the greatest investment opportunity compared to 17% in 2018. In January 2018, Pfizer hit the headlines over its decision to halt its neuroscience discovery and early development efforts in favour of a venture capital strategy. Six months later, it committed \$600 million to investment activities through Pfizer Ventures, with 25% of this earmarked for early-stage neuroscience companies.

Cell and gene therapies hold investors' interest

As in 2018, opportunities in cell and gene therapies carry on capturing the attention of investors interviewed for the survey. This has been buoyed by some notable deals and finance raises over the last 12 months, such as Allogene Therapeutics' \$372.6 million IPO, the \$8.7 billion acquisition of AveXis by Novartis, and NHS England's green light for Novartis' CAR-T cell therapy, Kymriah, for children and young people with B cell acute lymphoblastic leukaemia (ALL) that is refractory, in relapse post-transplant or in second or later relapse. The latter was followed by NHS England's deal with Gilead Sciences to provide adult patients whose large cell lymphoma has returned or has stopped responding to previous treatment with access to Yescarta via the Cancer Drugs Fund. According to the Alliance for Regenerative Medicine's [Q3 2018 Data Report](#), published in November 2018, companies active in gene and cell therapies and other regenerative medicines raised more than \$10.7 billion globally in 1Q18-3Q18, up 40% year on year. The report also found that 1,003 clinical trials were being conducted at the end of 3Q18, 573 of which were in oncology.

Many yet to see investment opportunity in AMR

Although anti-infectives does not seem to be an attractive investment area at present – just 4% of respondents rank it as their first choice and 3% as their second choice – some of the investors interviewed expressed unease about the lack of capital for innovations that address the significant challenge posed by antimicrobial resistance (AMR). "I would like to see a resurgence in research activity for antibiotics," said a UK-based VC investor. "If we don't see that, it will be self-harming when you consider the risks." Steps are being taken at an industry and policy level. In February 2018, Novo Holdings launched the \$165 million Replenishing and Enabling the Pipeline for Anti-Infective Resistance (REPAIR) Impact Fund, commissioned by the Novo Nordisk Foundation. The fund was set up to invest in companies involved in the discovery and early-stage development of therapies to tackle AMR. Elsewhere, the FDA's Scott Gottlieb has mooted an alternative reimbursement model for some new antimicrobial drugs in order to incentivise drug development. The suggested model would involve healthcare institutions paying a fixed licensing fee for access to the drug, which would allow them to provide a certain number of doses per year. It remains to be seen whether proposed AMR incentives will help to pique the interest of the wider investor community going forward.



VIEWPOINT

Robert James,
Managing Partner at
Sixth Element Capital

Established in 2012, the CRT Pioneer Fund (CPF), managed by Sixth Element Capital, was set up to bridge the investment gap between cancer drug discovery and early clinical development. It was set up as a collaborative and novel financing solution, designed to fund and manage innovative science in order to bring new therapeutic products more rapidly to the point where they could be commercialised. A specialist oncology fund, the principal objective of CPF was to create an asset-centric fund investing in early-stage assets and funding them through discovery to clinical trials before exiting. The fund was specifically designed with a focus on moving forward projects that had arisen from Cancer Research UK's investment in drug discovery.

A key element of CPF's strategy has been accepting the risks associated with investing in single assets. It has managed the risk in each project through diversification at the level of the entire fund. This has enabled an investment process that is very rigorous and focussed on the technical and financial challenges associated with an individual drug discovery project, rather than developing platform technologies.

Another key investment principle is to focus investments on world-class research institutions as the source of projects and invest into these institutions to advance projects, rather than seek to spin projects out into new companies. This not only keeps investments focussed, but it means that the experts who have discovered the programme are highly engaged in progressing the asset.

The £70 million CPF currently has a portfolio of 11 investments. Of these, CHK1 and MPS1, which both originated from The Institute of Cancer Research, London, successfully entered partnership agreements with high-quality partners, and serve as excellent exemplars of the investment model. For example, CHK1 was at candidate stage when CPF made its first investment in 2013, with the aim of advancing the asset into Phase I clinical trials, working with Cancer Research UK. CHK1 has since partnered with Sierra Oncology, entering a licence agreement whereby Sierra Oncology will pay an aggregate amount of up to \$321.5 million upon achievement of certain development, regulatory and commercial milestones, as well as high single to low double-digit royalties on net sales. CHK1 is now in extensive Phase II evaluation.

This investment model has proved to be a highly effective mechanism to invest in early-stage assets in a way that not only advances the science but also could lead to significant returns to investors.

IP, REGULATION AND COMPLIANCE

Brexit affecting over a quarter of respondents' investment strategies

Three in 10 (30%) respondents report that while the UK's decision to exit the EU is not currently impacting their investment strategy, they expect it to in the future, down from 38% in 2018. A further 40% do not expect it to have any effect on their investment strategy either now or moving forward, a slight improvement on the 38% of respondents who said the same in the *Investor Perception Survey 2018*, published last February. Although these findings seem positive, it is important to consider them in light of the following factors. First, not all respondents to the survey invest in the UK (69% specialise in the UK and Republic of Ireland), and other local funds will only invest in UK companies. Second, while fewer respondents expect Brexit to impact their investment strategies in the future, a higher proportion now say that it is already leading them to place a greater focus on opportunities outside of the UK (27% in 2019 versus 20% in 2018).

FIGURE 13

How Brexit is impacting respondents' investment decisions

Sample: All respondents (77)

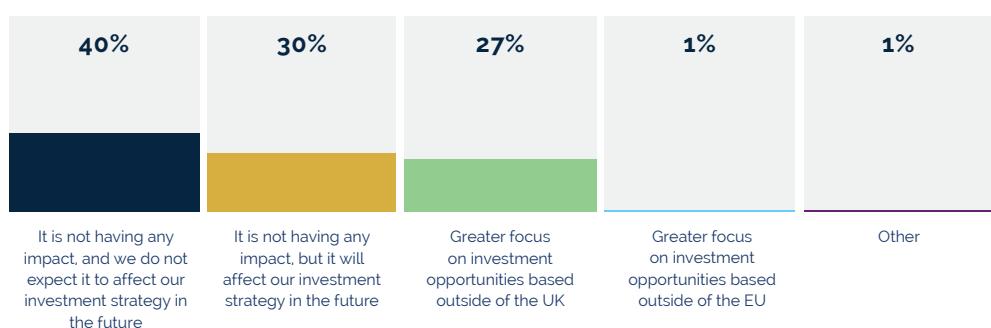
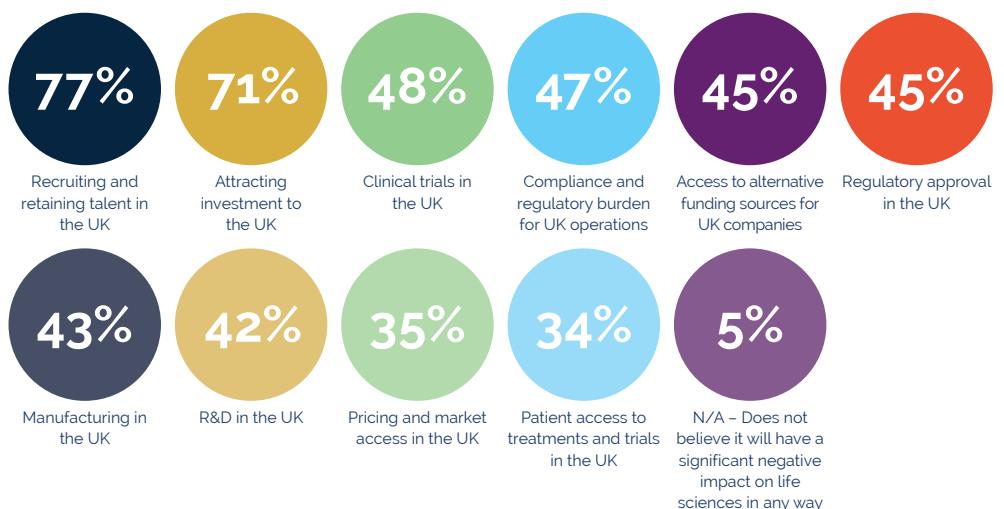


FIGURE 14

The areas upon which respondents believe Brexit will have a significant negative impact

Sample: All respondents (77)



Third, it should be borne in mind that this survey was open to responses in October-November 2018. This period saw UK Chancellor Philip Hammond deliver the Autumn Budget on 29 October, during which he confirmed that £200 million would be made available to the British Business Bank to replace access to the European Investment Fund (EIF). The Budget also reiterated ongoing efforts to support pension fund investment in patient capital. The Withdrawal Agreement was published on 14 November, followed by a Political Declaration on 25 November, which sets out the framework for the future relationship between the UK and EU. The latter noted 'the United Kingdom's intention to explore options for a future relationship with the European Investment Bank (EIB) Group' and that the possibility of cooperation between UK authorities and EU agencies, such as the European Medicines Agency (EMA), would be explored.

UK MPs were due to vote on the Withdrawal Agreement on 11 December (after this survey closed), but Prime Minister Theresa May postponed the vote and subsequently found herself facing a vote of no confidence. May survived the no confidence vote and rescheduled Parliament's vote on the Withdrawal Agreement for the week of 14 January 2019, with the UK government stepping up preparations for a no-deal Brexit and the European Commission starting to implement its no-deal Contingency Action Plan. At the time of writing, the UK is still due to leave the EU on 29 March 2019, although the manner in which that exit

will occur remains unclear. To borrow a term that recently put EU Commission President Jean-Claude Juncker in hot water – for the moment the Brexit scenario can, at best, be described as “nébuleux”.

Concerns about capital

More than two thirds (71%) of respondents believe that Brexit will have a significant negative impact on attracting investment into UK life sciences. “It affects the attractiveness of the UK as a place to invest and UK businesses as a thing to invest in. Full stop,” stated one UK-based VC interviewee. As many European VC funds are backed by the EIF, and thus required to invest a substantial proportion of the fund into opportunities in the EU, the pool of venture capital available to UK companies is expected to shrink. “The main impact for us is that once Brexit has happened, the UK will of course not be regarded as part of the EU anymore, and we have limitations on investment outside of the EU,” noted a European VC. “That’s a big problem for companies in the UK because it reduces the universe of investors they can talk to.” An interviewee from a non EIF-backed fund did note that for them and similar funds, this would mean less competition for the best investment opportunities, although UK companies seeking capital may be less inclined to see this as a positive.

Talent jitters and the impact on innovation

Of greatest concern to respondents is the UK’s ability to recruit and retain talent (77%). According to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), published in September 2018, talent attraction and retention is also among senior life science executives’ top Brexit worries (49%), second only to attracting investment to the UK (62%).

Some of the investors interviewed for this survey had first- or second-hand accounts of rising recruitment and retention challenges, from academic researchers to company management teams. A UK-based investor said: “We’re already hearing from our CEOs that this uncertainty is not helpful in attracting talent to the UK. People don’t want to move here as much, and then over here they are uncertain about their future and more open to relocating to their countries of origin. It’s creating an unstable base.” Another VC added: “It is one thing to develop great science, and the UK obviously has that, but to make it a real success you need the best people at all levels. I know a lot of academics that are leaving [the UK], so we will have to see whether in the long term the environment continues to be innovative and entrepreneurial at an academic level.”

Given the strength of the UK’s life sciences industry, particularly world-renowned hubs such as the ‘Golden Triangle’ of Cambridge, Oxford and London, others expressed greater optimism for the sector’s future, albeit tempered with hopes for a high degree of alignment and collaboration between the UK and EU post Brexit. “The UK funds a lot of very good healthcare companies and there’s a good amount of deal flow coming out of the UK. It’s a mature ecosystem with very innovative companies. However, how easy it will be to invest in those companies going forward, we just don’t know yet,” said one VC. “We are very open to continuing to invest in the UK and keeping it on our radar, but we will have to wait and see what happens.”



VIEWPOINT

Tim Sarson,
Partner and Brexit Lead for
Life Sciences at **KPMG**

Writing at the start of January 2019, KPMG’s Tim Sarson provides his take on Brexit’s impact on life sciences:

It’s 2019, and the Brexit merry-go-round continues. It’s in our faces every day, but to many, there’s still an unreal air to the whole thing. Meanwhile, the clock keeps ticking.

At least in theory the life sciences industry is taking the challenge deadly seriously. Life sciences companies and public sector bodies have been swimming in mitigation plans and Brexit taskforces since late 2017. Today, the sector is better prepared as a whole, certainly at the large company end of the scale, than most others. Businesses have mapped and interrogated their supply chains, paid much needed attention to their EU workforce and core suppliers, and executed on regulatory and stock building plans.

Good news if you work in life sciences, but less reassuring if you’re also interested in non-medicinal things like fresh food and Easter holidays.

So why do recent opinion surveys show a sharp increase in public concern about medicine shortages?¹ Because they’ve seen it covered in the press, and they know that health and the NHS are top priorities for Britain. Do they really lie awake at night worrying about what might happen if the UK tears itself out of a decades-long process of integration with no agreement on a way forward? Speaking for myself, I suspect not. Just as before the referendum my head says prepare for no deal, but my heart still says it’ll all be fine.

Will it all be fine in the case of no deal? No: a no-deal Brexit will put immense strain on most medicine and equipment supply chains. There will be some unavoidable shortages, and some surprises from mid and smaller-size companies that are more critical than we might imagine. The multinationals will, over time, pull investment from the UK and delay existing investment programmes. Resources and effort will be diverted into unproductive activity because of Brexit. Time and money will be wasted on an avoidable crisis.

So far as long as no deal remains a possibility, drug manufacturers and their partners throughout the supply chain must continue to do their best to mitigate the worst effects, and hope the rest of the economy does likewise.

¹ Source: A survey commissioned by KPMG and carried out by Hanbury Strategy, a member of the British Polling Council. 4,015 adults were polled online between 31 October and 5 November 2018.

IP ranks highly on investors' wish lists

In the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), 81% of senior leader respondents recognise intellectual property (IP) as being very important to their companies and 17% consider it to be moderately important. This year's survey of investors confirms the significance companies place on IP from a financing standpoint – 85% of investor respondents say that IP is a 'very important' factor in their investment decisions, and a further 12% view it as 'moderately' important. More than half (54%) of respondents rank it among their top three criteria when deciding whether to invest in a life sciences company.

As one would expect, however, respondents place most weight on the technology itself, with 73% citing innovative technologies that address unmet need among the key elements they look for in an investment opportunity. "They have to be very innovative and exciting and have the potential to advance current standards of care and therapies in a meaningful way," said one VC interviewee. "Meaningful is important here because pricing and reimbursement is a real concern, so you have to really believe in a therapy making a significant difference to care so that it can attract good reimbursement." Potential market size and reimbursement are crucial components in the success of companies across the life sciences industry, as well as the investors that back them. As a healthtech investor stated: "You want a willingness to pay from somewhere in the market. You don't want companies to have that solution-in-search-of-a-problem challenge that many have."

FIGURE 15

How important intellectual property (IP) protection is in respondents' investment decisions

Sample: All respondents (69)

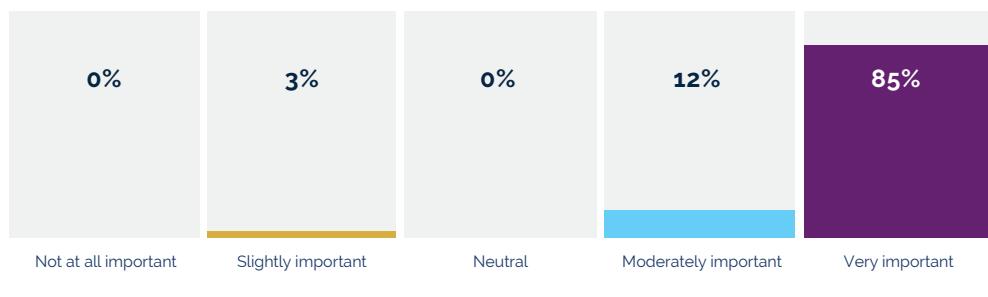
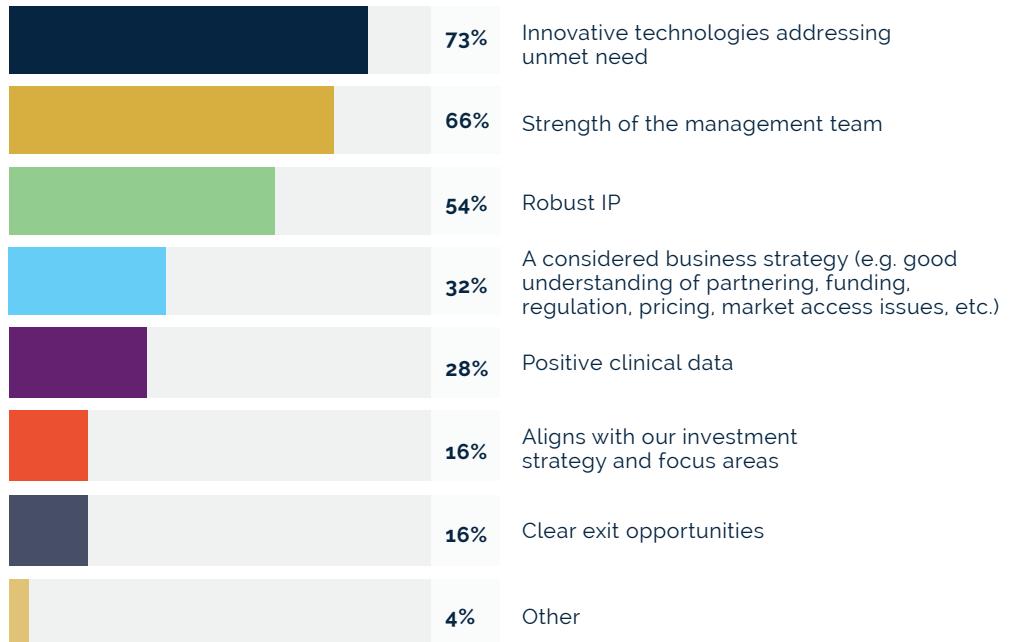


FIGURE 16

The top three criteria in respondents' investment decisions

Sample: All respondents (79)



Around one third (32%) of respondents look for a well-considered strategy that takes into account issues such as market access, financing, and business development. A number of investors interviewed, particularly those focused on earlier-stage opportunities, also stressed the need for a reasonable valuation. This, alongside an appropriate development plan, can set a company in good stead to create value to provide a return to early investors, while not being so high as to put off potential new investors from participating in later funding rounds.

"What we typically consider are how many financing rounds [a company] will need to have, whether each financing round is attractive enough to onboard new investors, and whether it's attractive in terms of the ultimate, end-goal valuation," said one early-stage VC investor. "An investor's focus is not on maximising the first financing round valuation. We see it as a process, and for each financing round there need to be sufficient value inflection points to justify an increase."

No unmet need or innovation, no dice

The *Investor Perception Survey 2018* found that the strength of a company's management team was a deciding factor in the investment decisions of 80% of respondents. It also maintains a prominent place among this year's respondents' investment criteria, coming second only to innovative technologies. "We look for a management team that is experienced," said a European VC. "Not everyone has to have all of the potential experience required, but there need to be a few good people there who we can really feel confident to back. The rest of the team can grow and build from there."

But there is a reason why the strength of the management team trails behind innovative technologies addressing unmet need, at 66% versus 73%. "The management team is important, but what is most important is the technology and the validity of the technology. Even if you have good people, if you have the wrong product and the wrong technology, you can't get anywhere," noted an investor with a portfolio spanning Europe and the US. This sentiment was echoed by others: "If the science and future need for that asset aren't there, then no matter how great the management team is, we will walk away."

"EVEN IF YOU HAVE GOOD PEOPLE, IF YOU HAVE THE WRONG PRODUCT AND THE WRONG TECHNOLOGY, YOU CAN'T GET ANYWHERE."



VIEWPOINT

Simon Turner,
Managing Partner at
Alacrita

This year's *Investor Perception Survey* predictably confirms the continuing importance to VC investors of effective IP protection, alongside technology and management. More noteworthy is the result that as much as 15% of respondents did not believe IP protection to be very important, and while 73% cited innovative technology as one of their top three investment criteria, only 54% cited effective IP protection in one of these positions.

This may reflect an increase in investable technology propositions, such as bioinformatics-based plays, where conventional IP protection through patents is either ineffective or impossible. In this case, silence may be the best policy, at least while the technology develops. Over recent years we have seen many examples of biotech companies emerge from 'stealth mode' with a mature technology platform, a pipeline of early-stage product candidates and an eight-figure \$ sum of funding to advance those products through early clinical trials.

Such secrecy is all the more understandable in contemporary science where few research institutes remain ahead of the field for very long. Technology Transfer Offices face an agonising dilemma over whether – and when – to protect innovations. File patents too early and lose prospects of a broad filing due to incomplete understanding of the science, and its potential, and inadequate exemplification, or file late and risk ceding priority to competition.

September 2018 saw final victory in the US Court of Appeals for the Broad Institute in its patent battle with Berkeley over the rights to CRISPR-Cas9 gene editing, concluding a three-year interference dispute. However, the uncertainty over IP ownership did not dissuade investors from investing an aggregate c. \$500 million in the four licensee companies at the centre of the dispute. This, and other situations like it, would appear at first glance to stand at odds with the importance attached to IP protection. It seems, though, that investors were taking a calculated risk that a favourable outcome would see their investees in control of the platform, but even in an unfavourable outcome would have enough bargaining power to gain access rights while developing their platforms further and advancing a pipeline. It also highlights the fact that the more important IP is in the product rather than the platform.

TALENT AND EXECUTIVE STRATEGY

This year's survey shows an improvement in respondents' opinions of life science management teams' pitching skills. In the [Investor Perception Survey 2018](#), 85% of respondents felt that 50% or less of the teams they saw each year presented well to them. Now, 77% of respondents believe this to be the case. Yet these figures are still not where investors, nor presumably life sciences companies, would hope them to be. Communicating the investment case and company story is an area that some life sciences companies have admitted to struggling with – 35% of respondents to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), published in September 2018, list it among the top three hurdles they face when trying to secure financing.

FIGURE 17

The proportion of life science companies approaching respondents that have a good understanding of their investment criteria and focus areas

Sample: All respondents (73)

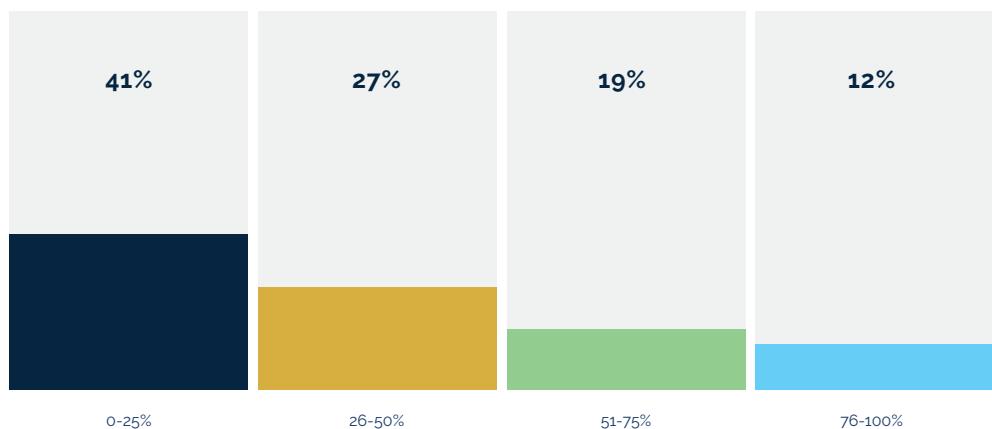
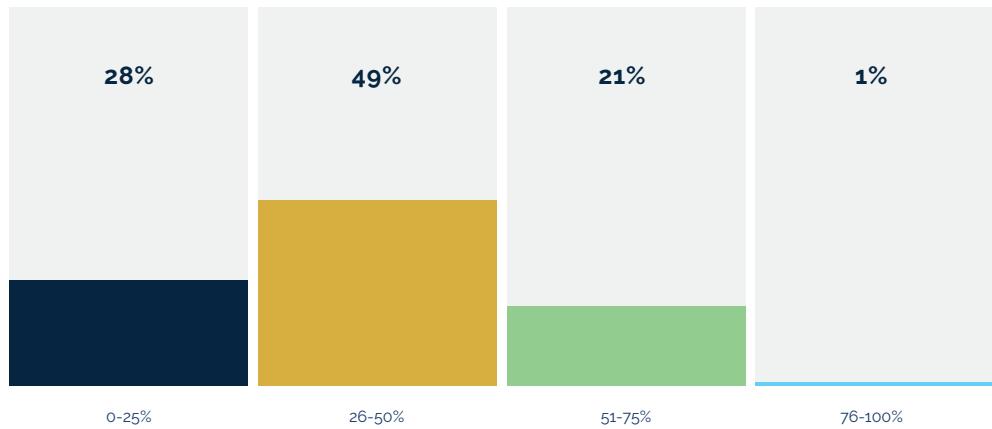


FIGURE 18

The proportion of life science company management teams that respondents feel present well (of those they see each year)

Sample: All respondents (71)



Pitching 101: Convey the key messages

Among the recommendations most frequently mentioned by the investors who took part in telephone interviews for this survey were for presenting companies to focus on the essential message they want to get across, to articulate that message clearly and concisely, and to have the data available to back that up. "It's important your message is understood at the first meeting," stressed one VC interviewee. "Too often we come away from a meeting and we really have to think hard about what was trying to be conveyed or there are key bits of data missing and we have to follow up." This means avoiding generalisations and instead zooming in on what makes your technology unique, what problem it addresses, and why your company has the potential to succeed. "It's all about narrative. You're trying to sell one message for your particular company, which usually does one particular thing," said a UK-based investor. "Trying to make a general narrative of what the industry does or what is going on in biotech is deeply uninteresting. You have one thing to tell, so tell it, tell it, and tell it again."

Developing a polished but transparent pitch

The investors interviewed expressed a preference for 5-15 slides per company pitch, which would also include a considered and realistic development plan and demonstrate an understanding of the commercial opportunities. There are external resources companies can turn to in order to enhance the quality of their slide decks, and initiatives such as mentoring, incubator and accelerator schemes that can help them refine their proposition. An interviewee who invests in healthtech said: "Part of the problem is that a lot of the teams putting healthtech ventures together are clinical or technical, they aren't necessarily 'business people'. But there's a whole swathe of organisations and others that are trying to support these companies."

At the same time, when it comes to pitching, it remains important that style does not eclipse substance. "It's nice to see a little bit of honesty about where [a company] has got to and where it is going next, and an awareness of how hard the task might be," stated an early-stage investor. As another VC pointed out: "You can always add experienced people to a company later who can deliver the perfect pitch, but for the initial selection of the investment opportunity I think you need to have honest people, not streamlined people."

"YOU HAVE ONE THING TO TELL, SO TELL IT, TELL IT, AND TELL IT AGAIN."



VIEWPOINT

Dr Christoph Kausch,
Founding Partner and CEO
at **MTIP**

Pitching a venture capital fund is not an easy exercise for many entrepreneurs because you may never get a second chance to make a good first impression!

When you are starting a presentation about your company, focus on setting the scene by describing the current environment with its related challenges and pain points. Then present the unmet medical need, which must be clearly identified in order to demonstrate how you are solving the issue and why your product is better than its competitors.

Entrepreneurs must be able to present the value their company is adding to stakeholders because healthcare is a value-based market where only 'must-have' solutions can survive and because insurance will never pay for 'nice-to-have products'. The general constraint on healthcare spending continues to accentuate this fact.

The goal is to show that your solution has a competitive advantage and you are able to secure it with key assets such as (clinical) validation data, patents, a proprietary data set to train your machine learning or an existing customer network. These kinds of assets add a lot of value to your company because they de-risk the investment in the investor's eyes.

A good value proposition with a sizeable cash amount is not equal to success without cornerstones demonstrating a feasible plan and the right capabilities to execute the vision. Your roadmap should include value inflection points, usually defined by target milestones, their related activities, and how the money raised is allocated over time.

This planning exercise is important and often underestimated by companies, but it provides clarity for an investor about the management's view. The team must demonstrate technical knowledge and expertise, but also sales and marketing skills.

Exit scenarios need to be addressed with potential future buyers and timelines because most venture capital funds are closed-ended (normally 8-10 years lifespan), which means they need to be liquidated in a certain timeframe. Keep in mind that exit triggers the venture capitalist's strategy!

The first interaction between an entrepreneur and an investor will start at two different sides of the table but might end up side by side, in the same boat. At the end of the journey, transparency, honesty, and open communication are essential for rowing faster together.

Investors' verdict on management skills improves

Over one third (36%) of respondents consider just 0-25% of the life sciences teams they see each year to be effective managers, a more favourable outcome than the 59% of respondents who shared this view in 2018. That only 20% of this year's respondents believe more than half of the teams they see to be effective is partly a reflection of the early stage at which a significant number of them invest. Many of these investors will help teams to gain or access the skills they may lack, if the teams already possess some of the qualities they are seeking or if they have the potential to develop these qualities.

FIGURE 19

The proportion of life science company management teams that respondents consider to be effective managers (of those they see each year)

Sample: All respondents (69)

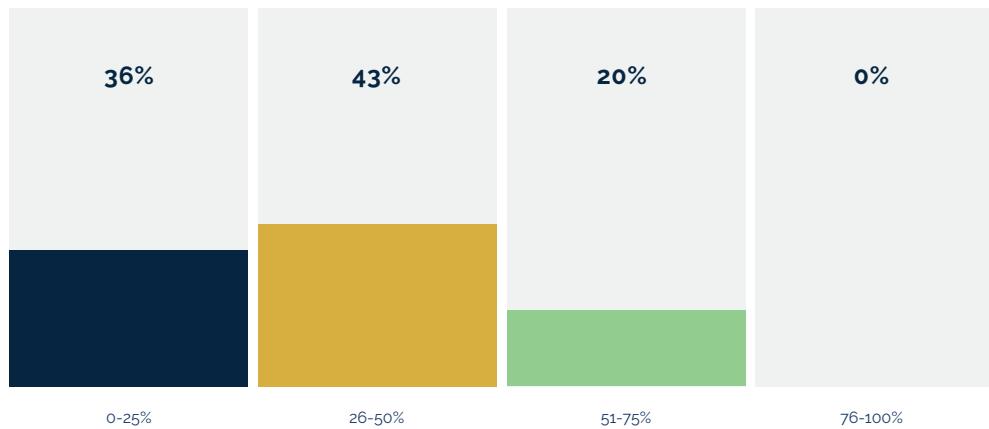
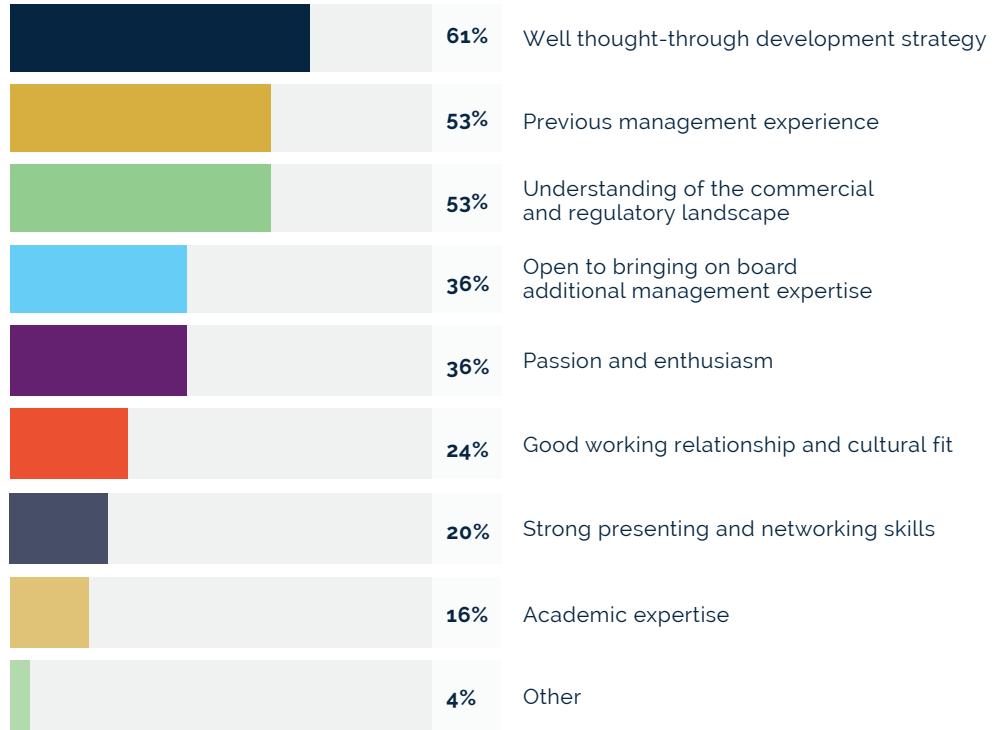


FIGURE 20

The top three qualities respondents look for in a life science company's management team

Sample: All respondents (76)



A well-rounded understanding and skillset are sought after

Among the top qualities respondents look for are a well-thought through development strategy (61%), previous experience (53%), and understanding of the commercial and regulatory landscape (53%). "Typically, we like to see domain expertise and for at least one member of the team to have experience in the sector and really understand it," stated a UK VC. "Previous start-up experience helps a lot too, and we now see that more than we used to."

Respondents also value a team's willingness to bring on board additional expertise, with 36% including this among their top three most sought-after attributes. This might include the appointment of senior personnel who could complement the existing team's knowledge and capabilities with more extensive commercial, regulatory, medical or business experience, for example. This expansion of skillsets can play a vital role in driving companies forward as they grow and mature.

Yet, according to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), 48% of respondents find senior management roles the most difficult to recruit for, and 42% of respondents list a lack of financial resources to offer a competitive pay and benefits package among the biggest barriers they encounter when attracting and retaining talent. For those with limited resources, advisory board members can offer an advantageous alternative. As one interviewee pointed out: "A small company cannot often afford big corporate profiles in house, but if they can find the right people and maybe offer some stock options, then they could put together a very high-profile advisory board. Start-ups tend to underestimate just how much value can come from here."

A further 36% of investor respondents rank passion and enthusiasm among the qualities they seek in life science company managers or, as one interviewee put it, "perseverance and realistic optimism." While relevant to all stages of development, these attributes are especially pertinent to start-ups. "What all entrepreneurs need to have in a start-up is entrepreneurial spirit. As a founder, a lot of people will tell you 'no, that doesn't work, go in this direction'. You need to have the stamina to push things through and a can-do mentality," said a European VC.



VIEWPOINT

Karolina Zapadka, Business Acceleration Manager at [Accelerate@Babraham](#)

The Babraham Research Campus is considered to be one of the UK's leading campuses to support start-up and scale-up bioscience enterprise and is distinct in its co-location of over 60 bioscience companies with the Babraham Institute. World-class research and business come together to promote innovation and strengthen links between academia and the commercial world. To date, over £1.2 billion has been invested in life science companies located here.

In January 2018 we launched Accelerate@Babraham - an initiative designed to support life science ventures at the very earliest stages of development - giving them access to laboratory and office space alongside supporting programmes of business, science, finance and entrepreneurial mentoring. As part of this new initiative, we ran the first Accelerate@Babraham start-up competition in July - awarding five young life science ventures the opportunity to participate in the Accelerate@Babraham programme, along with non-dilutive funding (£20,000 each). The winners cover a broad life science spectrum, including therapeutics, medical devices, diagnostics, process development, digital health, machine learning and AI.

A primary objective for us in delivering the programme was to not only enable our entrepreneurs to access lab space and equipment they might ordinarily not have been able to access, but to also equip them with the wider commercial skills and knowledge they would need to succeed. Giving them access to our extensive life sciences network and introducing high-potential investors was key, but we also went a step further - matching each venture with expert mentors that had specific and personal experience within relevant fields.

Our workshop sessions focused on the steps required to effectively develop a more commercial approach to the development and communication of their ventures. For example, how to refine the investor pitch; company structure; and the importance of strategy – laying the foundations for a sustainable business model rather than being pressured to go out and raise the next round.

Success for us is assisting these young ventures across every aspect of their business during their time with us – it's not all about the science. Commercial know-how and being able to confidently communicate propositions to stakeholders, potential collaborators and in some cases, patients, is just as key. The result, we hope, will be the creation of new therapies, businesses, jobs and eventually new UK-bred big life science companies that will maximise the impact of UK life science, in addition to improving world health.

The Accelerate@Babraham activities have had strategic support from a number of organisations including AstraZeneca, MedImmune, Rxcelerate, One Nucleus, Lilly, SVB and Taylor Vinters.

Note: This is an abridged column. Read the full-length piece on [www.lsxleaders.com](#)

PORTFOLIO SUPPORT

Almost half (49%) of respondents like to take a 'very' or 'extremely' hands-on approach with the companies in their portfolio, with a further 38% preferring to be 'moderately' hands on. Given that a significant proportion of respondents are VCs focusing on early-stage companies, some of which will also be involved in company creation, their desired level of input is perhaps unsurprising. Beyond financial backing, many investors will look to support portfolio companies in a variety of ways, such as offering strategic direction. As an interviewee from a leading European VC firm noted: "We advise our portfolio companies on development strategies and, of course, we challenge them. Have they thought everything through? Have they determined the ultimate positioning for their product?"

FIGURE 21

How hands on respondents like to be with portfolio companies

Sample: All respondents (74)

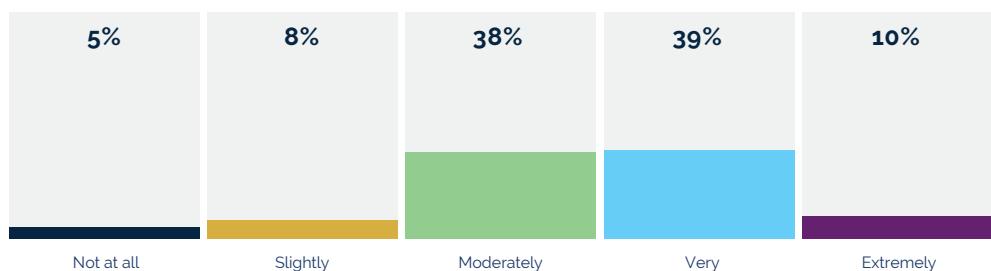


FIGURE 22

The top three support mechanisms respondents offer to portfolio companies, aside from funding, that they believe to be most valued

Sample: All respondents (80)

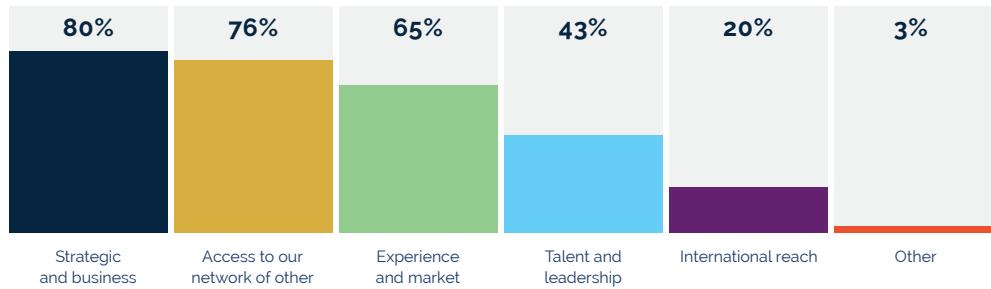
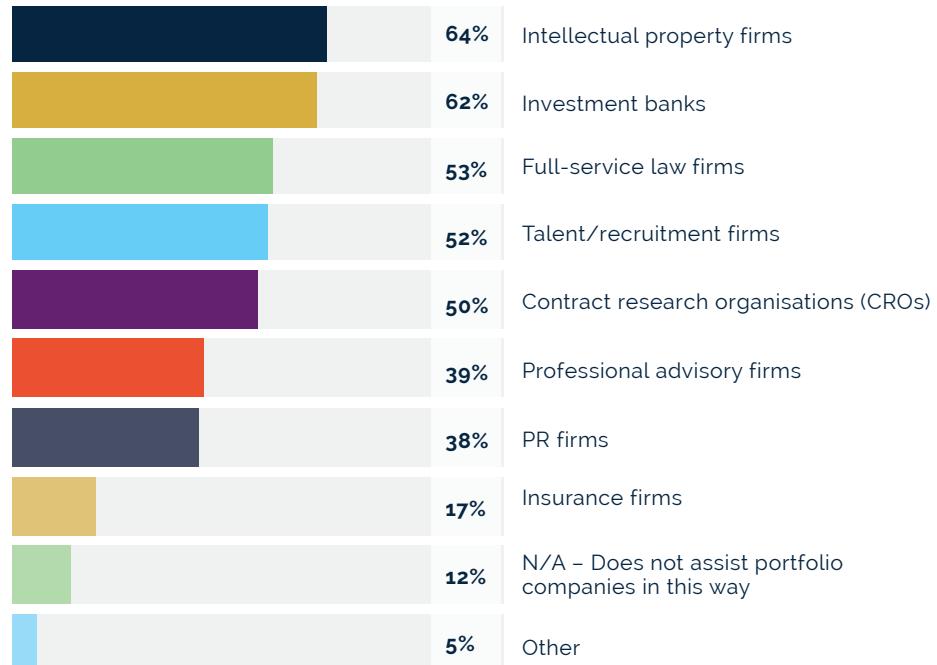


FIGURE 23

The service providers that respondents help portfolio companies to engage with

Sample: All respondents (66)



In addition to assisting companies in honing their commercial, business, and product development plans, some firms also guide less-experienced management teams through the operational aspects of running a company. "If it's a first-time CEO, we make sure that we help them think through some of the key day-to-day issues that come along, and how these can best be handled. We can be another voice for them to brainstorm with," said another VC investor. Companies who either do not require or whose investors are not in a position to provide assistance on such a granular level, can still reap the benefits of an investor's experience. "After 20 years in venture capital, managing several funds, and having some failures and some successes, there is a lot we can share with a company," pointed out an investor who backs start-ups and SMEs.

Leveraging highly-valued networks

According to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), published in September 2018, aside from funding, senior life science executive respondents place most value on access to investors' networks (85%), strategic and business development support (63%), and experience and market knowledge (51%). Although these three also come out on top among investor respondents' perception of the support mechanisms investee companies most value (at 76%, 80%, and 65%, respectively), the survey results suggest a slight underestimation of just how much companies appreciate being able to tap in to an extended network of potential investors and partners. With two fifths (42%) of respondents in the [LSX C-Suite Challenges in Life Sciences Survey](#) citing access to potential investors as a key obstacle to securing financing, and 78% reporting that identifying relevant investors is a major challenge, the importance they attach to help from existing investors in this area moves more sharply into focus.

Building up expertise and industry connections

Beyond their network of contacts in the investment community, investors can also enable knowledge-sharing between their portfolio companies, open doors to potential partners, prospective employees and advisors, and facilitate connections with consultants and service providers. Indeed, 50% or more help their portfolio companies to engage with intellectual property firms, investment banks, full-service law firms, talent and recruitment firms, and CROs as needed.

While a large proportion of respondents are actively involved in the development of their investee companies, which will often also see them take up a board position, the emphasis generally lies on helping to deliver the building blocks and guidance required to empower a company to succeed. "You cannot micromanage from board level," warned one interviewee. "You want to make sure you're supportive of the management, but that the management is coming up with the goods itself and pushing the company in the right direction."



VIEWPOINT

Stephan Christgau,
Senior Partner at
[Novo Seeds](#)

There is an abundance of promising scientific research that has the potential to deliver innovative therapies and better treatment for patients, but in Europe the road from academia to commercialisation remains challenging. Many incubators, technology transfer organisations and regional seed investors provide funding and support for aspiring entrepreneurs, however, this early part of the ecosystem remains fragile. A disconnect often exists between many locally-focused seed investors and international venture funds that have grown in size over the last few years, and thus look for investment opportunities where teams, development plans and assets are developed to a mature stage and where larger financing rounds are enabled.

Since Novo Seeds' inception in 2007, our investment strategy has enabled us to create and build biotech companies to a stage where they can attract the large financing rounds needed to bring them to real inflection points. On behalf of the Novo Nordisk Foundation, we administer pre-seed grants of up to approximately €500,000 to early academic projects that are too early for investment, but where we see potential. With the pre-seed grant, projects can perform key proof-of-concept experiments as well as fund completion of initial development plans.

Novo Seeds have built a team of repeat entrepreneurs, anchored in our entrepreneur-in-residence programme, BiOrigin. The team work with founders to build the necessary internal functions as interim management. Importantly, we have the possibility to invest in very early companies making them "Series A ready" and we have the capability to fund the companies through all stages from these very early seed rounds, all the way to an exit. We place a high emphasis on syndication; it spreads the risk; our fellow venture funds bring additional valuable networks and competencies and, importantly, having a clear goal to add investors ensures that we work to build companies on par with the best to attract international capital. Good examples of companies we have built and funded include NMD Pharma, which completed a €38 million Series A in March 2018, and Galecto Biotech, which completed a €79 million Series C round in October 2018. Both of these companies started as pre-seed projects, and we worked with the founders since the very inception to assist in building a strong investor syndicate, attract the relevant talent to boards and advisor panels, and to support the companies' strategic direction.

EMERGING TECHNOLOGIES

More than one third (37%) of investor respondents expect emerging technologies to have the most beneficial impact on patient engagement, monitoring and management, while 27% and 20%, respectively, predict that new tech advances will have the greatest potential in drug discovery and R&D. This is broadly in line with the views of life sciences executives: 30% of respondents to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), published in September 2018, believe the most benefit will occur in patient engagement, 25% in R&D, and 21% in drug discovery. C-Suite respondents expect artificial intelligence (AI) and machine learning (ML) to have the most far-reaching impact on the sector by a significant margin (52%), as do respondents to this year's *Investor Perception Survey* (68%).

AI and machine learning singled out for potential breadth

According to data from [Rock Health](#), released in February 2018, \$2.7 billion of venture capital was invested into healthcare companies utilising AI and ML in 2011-2017 in the US alone. Over this period, the top five areas that received the most US venture capital funding were: research and development catalysts, including drug discovery and clinical trial management (\$650.1 million); population health management (\$523.8 million); clinical workflow (\$514.8 million); health benefits administration (\$496.5 million); diagnosis of disease (\$330.4 million).

FIGURE 24

Where respondents believe advances in technology will have the most benefit in the life sciences sector

Sample: All respondents (75)

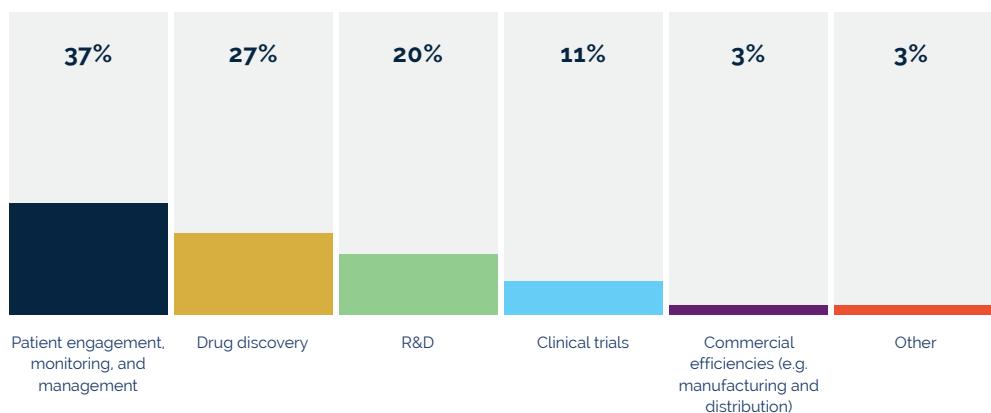
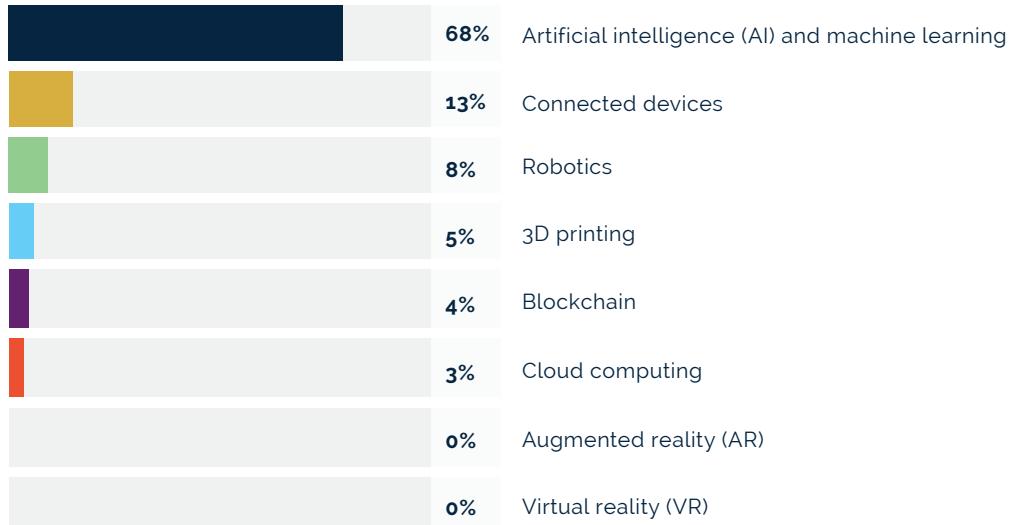


FIGURE 25

The technology respondents believe will have the most far-reaching impact on healthcare

Sample: All respondents (77)



AI and ML have the potential to enhance a range of processes and augment human expertise across the healthcare industry, from clinical trial enrolment and medication adherence to medical imaging. This may be why respondents currently envision their impact as being far greater than those of other emerging technologies. "We're starting to see products that leverage AI and deliver real value. For things like blockchain and augmented reality, it's looking like most of their applications are fairly niche, whereas AI has the potential to touch pretty much every element [in healthcare]," noted a digital health VC interviewee. A number of investors interviewed for the survey agreed that while deep tech and emerging technologies other than AI and ML could have a notable impact on the sector, this was more likely to be confined to particular areas. As one CVC investor said: "Blockchain could be disruptive, but more in terms of the distribution of information or something like genomic profiling. It's an enabling technology, not necessarily a change driver."

Governments and regional authorities have ramped up efforts to create environments that encourage AI innovation and give them a competitive edge. The EU Commission, for example, has worked with EU Member States to develop a co-ordinated plan for 'AI made in Europe'. This will see the Commission invest €1.5 billion by 2020, followed by a proposed €7 billion in 2021-2027 through Horizon Europe and the Digital Europe Programme in AI. The plan aims to foster public-private partnerships and deliver start-up and scale-up funding support for companies utilising AI. In the UK, initiatives include the establishment of five centres of excellence in digital pathology and medical imaging, building on advances in AI, based in Leeds, Oxford, Coventry, Glasgow and London. Elsewhere, the UK's Medicines and Healthcare products Regulatory Agency (MHRA) has secured funding to set up a proof-of-concept pilot scheme with NHS Digital to develop synthetic datasets in order to validate algorithms, including AI algorithms for medical devices. Across the Atlantic, the FDA is looking to measures such as its digital health software pre-certification pilot program to ensure regulatory models are fit for purpose.

Seeing past the hype

Although more than two thirds of respondents believe AI and ML will have the most far-reaching impact on healthcare, concerns about hype remain, with several of the investors interviewed seeing AI as a buzzword that is often overused or incorrectly applied. "I think there are going to be some interesting investment opportunities in artificial intelligence, but you have to be more diligent in separating the hype from actual potential," stated a UK-based VC investor. Of course, for AI, ML and all emerging technologies applied to healthcare, the focus is not on the technology itself but on how it can benefit patients. As a CVC interviewee said: "We need to prove that these things improve patient outcomes. That's ultimately the goal. That's why we do all this."



VIEWPOINT

Helen Disney,
Founder and CEO at
[Unblocked Events](#)

What do the life sciences have to do with blockchain? The word tends to still be associated in most people's minds with financial technology or with its origins in bitcoin.

Yet many industries outside of finance, including the life sciences, are now investigating blockchain and Distributed Ledger Technology (DLT) because they could help us solve business problems that were previously hard to fix. According to a June 2017 [survey](#) of senior pharmaceutical and life science leaders conducted by the Pistoia Alliance, interest in blockchain is high – with 83% expecting it to be adopted in the next few years.

A blockchain or distributed ledger is a way of securely keeping track of all the transactions happening on a decentralised network. Participants all have access to an identical, shared history of events that cannot subsequently be changed – like a global shared diary that everyone can read but no one can tamper with.

This means, for example, that we can share confidential details such as healthcare data records securely and quickly. We can also make complex global supply chains more secure and more transparent. And we can use it to track and monitor the progress of clinical trials or gather and process reams of healthcare data coming from new sources, such as whole genome sequencing data. Now the connection between blockchain and life sciences starts to become more tangible.

Blockchain could help to reduce lengthy drug development times by encouraging collaboration between companies whilst protecting ownership of their intellectual property and ensuring each stakeholder receives their share of the dividends. It could also help to speed up research by potentially allowing researchers to publish their findings securely in real time. DLT combined with other technologies, like AI, could help create "data lakes", delivering new insights into rare diseases.

By creating a personalised healthcare 'wallet' which could be stored in a laptop or mobile phone, DLT can also empower patients to take control of their own records. The health data is anonymised and secure but the patient has full control over who accesses what by using private keys to unlock some, or all, of their data as they see fit. Patients might be willing to sell that valuable health data to pharmaceutical companies – or donate it to scientists – to speed up discovery of new treatments whilst preserving their anonymity.

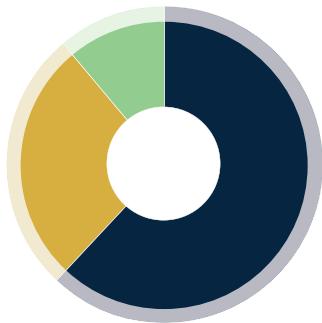
Blockchain in healthcare is still a niche topic but the current view from many industry experts is that finding niches is actually the key to future competitive success in drug discovery so the consequences of blockchain in life sciences could be profound.

At present, around two thirds (62%) of respondents invest in companies that utilise emerging technologies, and a further 27% intend to do so in the future. Those investors interviewed for the survey who do not yet invest in firms that use these technologies indicated that they would require additional expertise in order to begin doing so. When discussing AI, one European VC investor said: "I think it will have a very significant impact on the sector but we are not investing in this area right now because we don't have sufficient expertise within the team to evaluate these opportunities." Almost a third (31%) of respondents cite access to in-house or external expertise among the factors likely to increase investment in emerging technologies, while 35% feel that greater familiarity with the specific challenges and opportunities facing companies employing this kind of tech would help.

FIGURE 26

The proportion of respondents that currently invest in healthcare companies that utilise emerging technologies

Sample: All respondents (71)

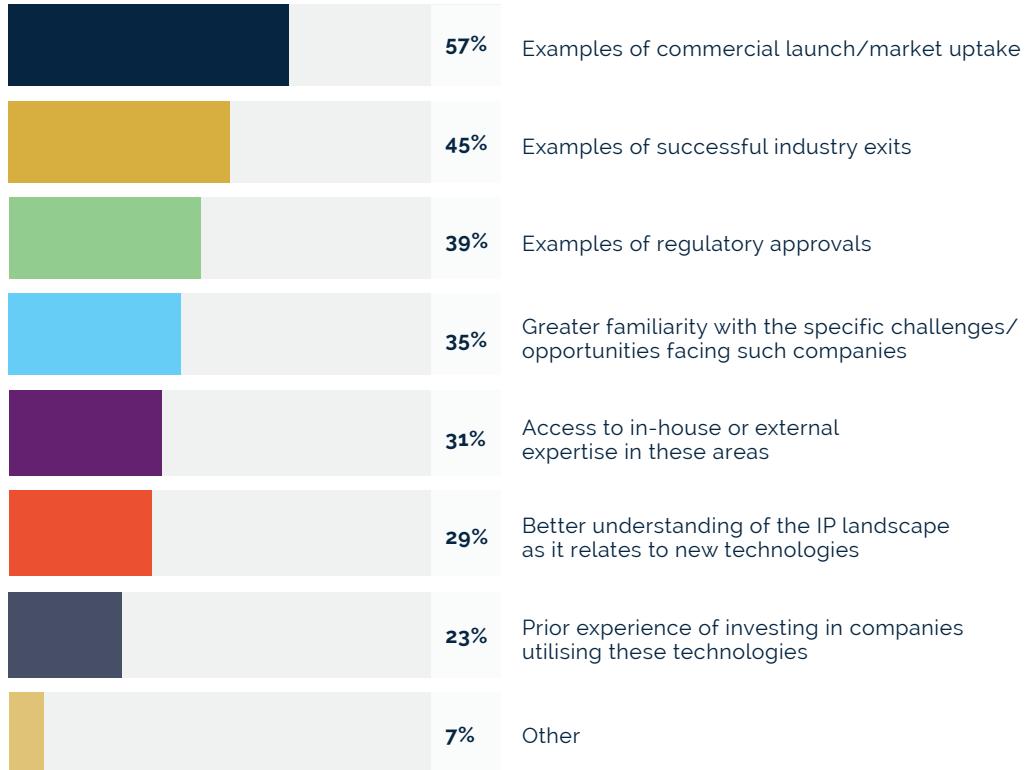


- Yes, we currently invest in companies utilising emerging technologies - **62%**
- No, but we plan to invest in these companies in the future - **27%**
- No, and we do not intend to invest in these companies in the future - **11%**

FIGURE 27

The factors respondents believe would affect the likelihood of firms investing in companies utilising emerging technologies

Sample: All respondents (75)



For others, it is a case of waiting to see what a typical exit in this space looks like and gaining a clearer picture of regulatory and marketing approval pathways, both of which should come with time and the maturation of the market. "I think in the longer run more exits will be important," stated a UK VC interviewee. "In the more immediate term, with AI in drug discovery for example, seeing some of those products that have had an artificial intelligence component in the development process getting further along the pipeline [would help]."

Looking towards commercial success

It is examples of commercial uptake that the majority (57%) of respondents see as the tipping point for investment in companies developing products powered by advanced technologies. "Commercial traction of these types of technologies really sets the field forward, that will be the thing that does it," stressed an interviewee from a European CVC firm.

Yet there are often myriad obstacles to navigate in order to successfully develop and launch a commercially-viable product. For emerging technology companies, challenges such as route to market, adoption, pricing and reimbursement, may be exacerbated. According to the [LSX C-Suite Challenges in Life Sciences Survey 2018](#), life science executive respondents view payer buy in (26%) and regulatory approval (28%) as the two main barriers to the advance of emerging technologies in healthcare. Such hurdles have also not gone unnoticed by investors. "At the moment, one of the biggest problems seems to be integrating technologies into healthcare systems," said one VC interviewee. "We need to see clearer pathways for technology integration. I think that will lead to more investment, and to bigger exits, and the like."

"AT THE MOMENT, ONE OF THE BIGGEST PROBLEMS SEEMS TO BE INTEGRATING TECHNOLOGIES INTO HEALTHCARE SYSTEMS. WE NEED TO SEE CLEARER PATHWAYS FOR TECHNOLOGY INTEGRATION."



VIEWPOINT

Jason C. Foster,
Managing Director at
Health Equity Consulting

As the saying goes, "Data doesn't lie...", except sometimes it does mislead. The data is clear that 2018 saw the largest amount of investment in healthtech ever with \$6.8 billion being invested through 3Q18, compared to \$5.7 billion for all of 2017. Fantastic you say! However, the other half of the story, which isn't so great, is that the number of deals declined (to 290 from 357) so the average deal size increased by 43% from \$16.4 million to \$23.6 million in 2018. So what gives? Despite the record amounts of dry powder venture capital funds have raised, institutional investors are taking bigger bets in fewer, later-stage deals that carry less risk, which is driving up valuations on later-stage companies and putting companies in need of early-stage funding under even more pressure.

Some recommendations for healthtech companies in light of this:

1. Bootstrap with your own funds/friends' and family funds for as long as you can and raise EIS/SEIS later in your lifecycle.
2. Manage your cash burn very carefully – don't invest too far ahead of revenue and when you do invest, invest in revenue-generating activities not fixed costs (i.e. headcount) which is hard to get away from.
3. Don't start with the NHS or B2C – "Death by pilot" in the NHS is a very real thing and B2C is hard and expensive. Find a B2B model that works to sell to pharma, medical device, health insurers, hospitals or OEMs or try to sell to large providers who already have NHS contracts.
4. Join a good healthcare-focused accelerator – they often support with services, mentors, connections to customers, and cash.
5. Get grants – Innovate UK is doing a ton of work to support healthtech start-ups, as are Horizon 2020, Wellcome Trust, Prince's Trust, etc.
6. Find a specialist fund or family office to support you – there are some family offices/funds out there (like ours) who specialise in funding healthtech between Seed and Series A.
7. Be careful with crowdfunding except under certain circumstances (i.e. B2C pre-sales) as it can hurt your chances of getting investment later.

Note: This is an abridged column. Read the full-length piece on [www.lsyleaders.com](#) for more insights from Jason C. Foster, an advisor and investor in healthtech companies and a mentor to healthtech start-ups

References:

- <https://www.mobihealthnews.com/content/72-digital-health-funding-deals-q3-2018>
- <https://www.mobihealthnews.com/content/rock-health-2018s-digital-health-funding-has-already-outpaced-2017>
- <https://rockhealth.com/reports/q3-2018-an-entrepreneurs-market-leads-to-digital-healths-biggest-quarter-yet/>

ACKNOWLEDGEMENTS

LSX would like to thank all of those who participated in the online survey and who kindly gave their time to take part in telephone interviews.

We would like to give special thanks to those who contributed their valued insights to this year's report: Daniel O'Mahony, Partner at Seroba Life Sciences; John Cassidy, Investment Associate at Arix Bioscience plc; Tara Raveendran, Healthcare Analyst at Shore Capital; Robert James, Managing Partner at Sixth Element Capital; Tim Sarson, Partner and Brexit Lead for Life Sciences at KPMG; Simon Turner, Managing Partner at Alacrita; Dr Christoph Kausch, Founding Partner and CEO at MTIP; Karolina Zapadka, Business Acceleration Manager at Accelerate@Babraham; Stephan Christgau, Senior Partner at Novo Seeds; Helen Disney, Founder and CEO at Unblocked Events; Jason C. Foster, Managing Director at Health Equity Consulting.

Further thanks go to Optimum Strategic Communications for their support, as well as to the LSX Community Partners who helped to distribute the survey to their networks.



ABOUT US

LSX, formerly Biotech and Money, is an influential community of senior life science decision makers. We connect senior life science executives with access to the capital, intelligence, innovation, and partners they need to grow their businesses.

We achieve this through a programme of high-level conferences and networking events, via content that showcases and shares the expertise of investors, senior leaders and industry stakeholders, as well as through bespoke initiatives.

Find out more at www.lsxleaders.com.

CONTACT US

 info@lsxleaders.com

 **+44 (0) 203 637 5908**

 **Suite 132, Business Design Centre, 52 Upper Street, Islington, London, N1 0QH**



Disclaimer. (1) Introduction. This disclaimer governs the use of this report. (By using this report, you accept this disclaimer in full.) (2) No advice. The opinions expressed are those of the individual contributors and do not reflect the views of the sponsors, or publisher of this report. The report contains information about healthcare company investments, markets and trends. The information is not advice, and should not be treated as such. This document and the information herein does not constitute investment, legal, or tax advice and is not a solicitation to buy or sell securities, stocks or shares or intended to constitute any binding contractual arrangement or commitment to provide securities services. This document is for informational purposes only, it does not take into account any investor's particular investment objectives, strategies or tax and legal status, nor does it purport to be comprehensive or intended to replace the exercise of an investor's own careful independent review regarding any corresponding investment decision. (3) No representations or warranties. To the maximum extent permitted by applicable law and subject to section 5 below, we exclude all representations, warranties, undertakings and guarantees relating to the report. The information provided herein has been obtained from sources believed to be reliable at the time of publication, nonetheless, we cannot guarantee nor do we make any representation or warranty as to its accuracy and you should not place any reliance on said information. Without prejudice to the generality of the foregoing paragraph, we do not represent, warrant, undertake or guarantee: • that the information in the report is correct, accurate, complete or non-misleading; • that the use of guidance in the report will lead to any particular outcome or result; (4) Limitations and exclusions of liability. The limitations and exclusions of liability set out in this section and elsewhere in this disclaimer are subject to section 5 below; and govern all liabilities arising under the disclaimer or in relation to the report, including liabilities arising in contract, in tort (including negligence) and for breach of statutory duty. We will not be liable to you in respect of any losses arising out of any event or events beyond our reasonable control. We will not be liable to you in respect of any business losses, including without limitation loss of or damage to profits, income, revenue, use, production, anticipated savings, business, contracts, commercial opportunities or goodwill. We will not be liable to you in respect of any loss or corruption of any data, database or software. We will not be liable to you in respect of any special, indirect or consequential loss or damage. (5) Exceptions. Nothing in this disclaimer shall limit or exclude our liability for death or personal injury resulting from negligence; limit or exclude our liability for fraud or fraudulent misrepresentation; limit any of our liabilities in any way that is not permitted under applicable law; or exclude any of our liabilities that may not be excluded under applicable law. (6) Severability. If a section of this disclaimer is determined by any court or other competent authority to be unlawful and/or unenforceable, the other sections of this disclaimer continue in effect. If any unlawful and/or unenforceable section would be lawful or enforceable if part of it were deleted, that part will be deemed to be deleted, and the rest of the section will continue in effect. (7) Law and jurisdiction. This disclaimer will be governed by and construed in accordance with English law, and any disputes relating to this disclaimer will be subject to the exclusive jurisdiction of the courts of England and Wales. (8) Our details. In this disclaimer, "we" means (and "us" and "our" refer to) LSX Limited a company registered in England and Wales under registration number 8982745.



**Suite 132 | Business Design Centre 52
Upper Street | Islington
London N1 0QH**

www.lsxleaders.com