UK BioIndustry Association

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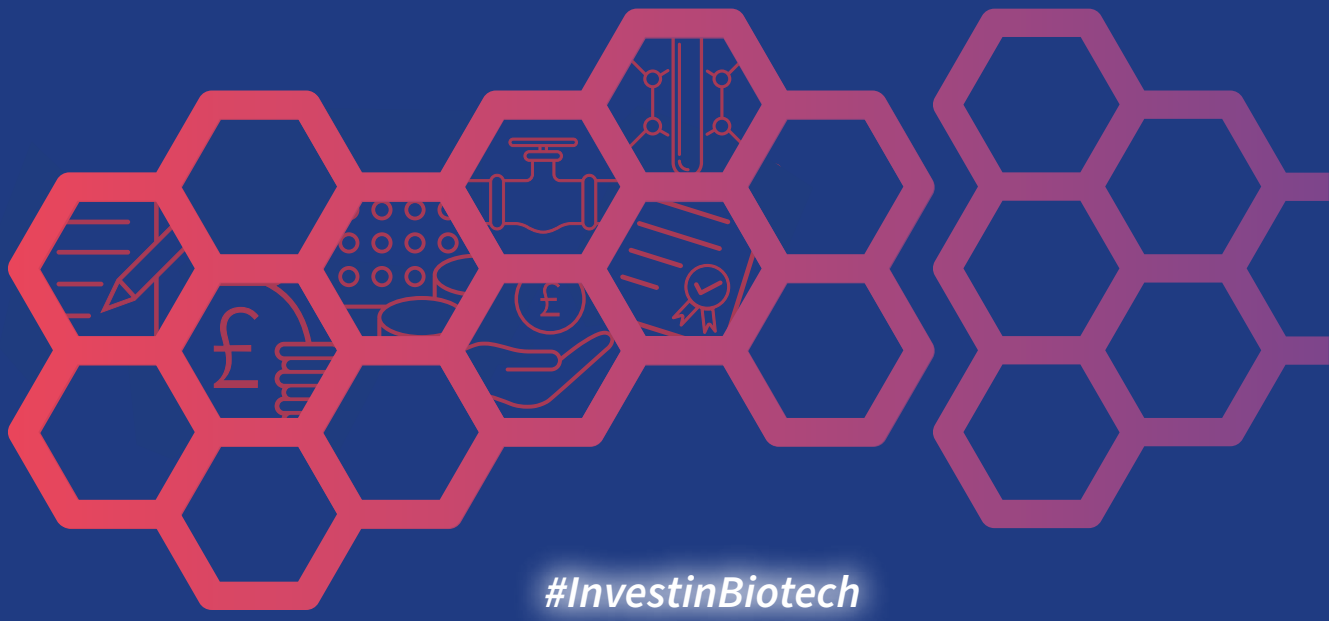

#InvestinBiotech

UK biotech financing | **2022**

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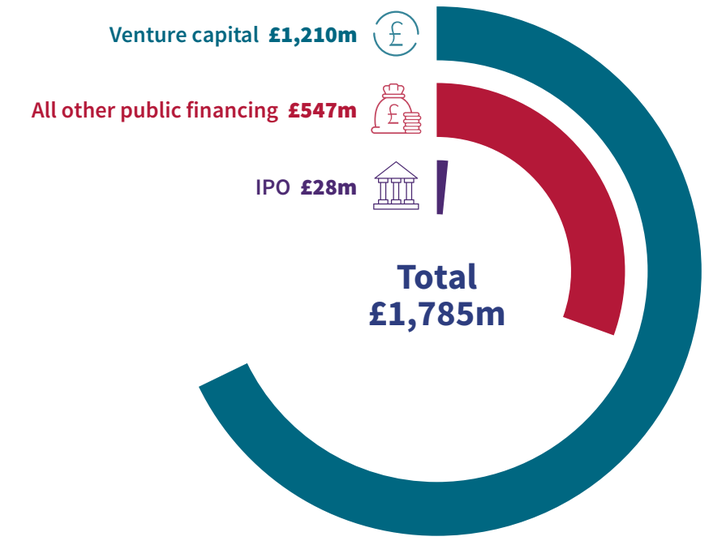
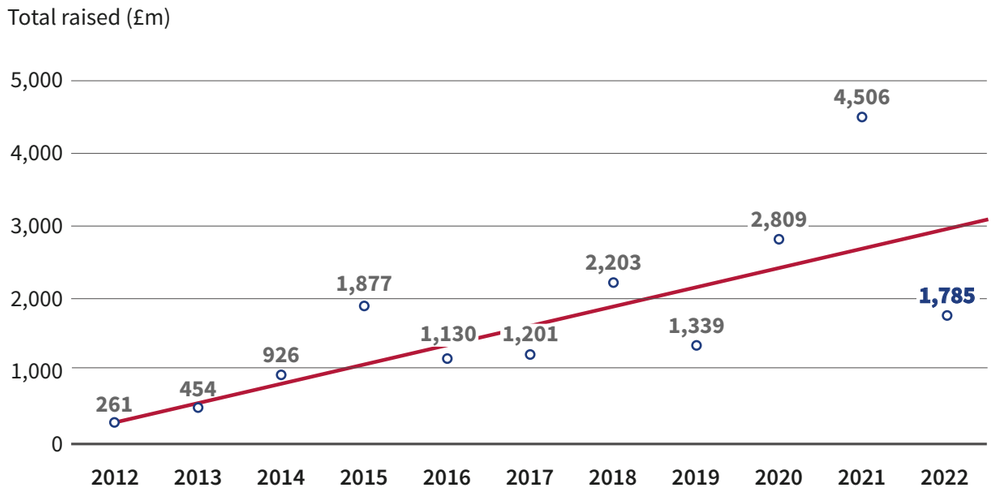


Long-term growth in UK biotech financing



Forewards

Steve Bates OBE
CEO, BIA

UK based life science companies are world leading in developing life changing medical innovation. This year's data shows they are much sought after by global pharmaceutical companies looking to acquire innovative pipelines and platforms, for which they are willing to pay significant premiums.

We are also seeing new forms of companies that are adding to the already very attractive UK offer. We have dubbed this emerging subsector techbio to reflect its place at the intersection of the artificial intelligence and digital revolution and the UK's existing and formidable drug discovery capability.

But, casting a shadow over this was the shuttering of global public markets – most crucially NASDAQ – leading to a world-wide fall in biotech investment in 2022. Critically, the UK and Europe do not currently have alternative investors able to scale life science companies to full potential.

This dependence on the US for risk capital at scale has been recognized by UK policy makers and 2022 saw some movement in developing policies, attitudes and networks to change this in UK financial, economic and investment community. This is best demonstrated by the appointment of our Chair, Dan Mahony, as the Life Sciences Investment Envoy. Do read his comment further on in this report.

The opportunity before us as NASDAQ sleeps is for London to awake to the growth opportunity on its doorstep. This means marrying the experts here in the UK who can spot, nurture and grow commercial opportunities with broader and deeper pools of capital – like UK pension funds – that need to diversify their investment base to deliver the growth our economy and aging population need.

Putting this virtuous circle together requires trust, risk taking and regulatory reform – but the goal is worth it and the rewards great, for citizens, companies and investors alike.

What cannot be overstressed in this pivotal year is the central importance of R&D tax credits in leveraging the private investment that drives the UK life science ecosystem. The halving of R&D tax relief for SMEs without details of what further support will be made available leaves the sword of Damocles hanging over the UK's start-ups and scale-ups. In a year when global markets are closed to biotech, it is vital that the UK does everything possible to attract investors and support its innovative companies.

The pandemic showed the societal and economic returns on investment in life sciences are huge. It also showed the return on cooperation between state and industry is equally large. The UK is and can continue to be the best place to start and grow a life sciences company, but only if we get the policy framework right and unlock the private investment our sector needs.

In the 12 months to November 30 2022, the global biotech sector saw a drop off in its fortunes. Having enjoyed record-breaking fundraising in 2020 and 2021, investor enthusiasm for the sector waned in 2022.

Mike Ward, Global Head of Thought Leadership for Life Sciences & Healthcare, Clarivate

Year-on-year, the NASDAQ Biotech index, which can be considered a proxy for the health of the sector, was down 9.56%. Much of this decline, however, was not a reflection on the R&D performance of biotech but was more in response to externalities such as rising interest rates, fears of recession and geopolitical shockwaves. Indeed, the NASDAQ Composite Index, which is a reflection of all innovative tech companies, including many that prospered during the early phases of the pandemic, slumped 29.8%.

Biotech's pandemic hangover is best illustrated by the fate of the companies that completed IPOs between 2020 and 2022. Since the start of 2020, of the 226 biotechs that completed IPOs on NASDAQ, 183 were trading at below their offer price, and 40 of this group saw their values drop by more than 90% since their debut. Although the performance of those completing IPOs in the 12 months to November 30 2022 were better with 75% trading higher.

Global biotech IPOs in 2022 were thin on the ground with only 31 completed raising £5.87 billion compared with 127 deals raising £19.09 in the 12 months earlier, which was the sector's record year. The total sums raised were the lowest since 2013 while the number of biotech IPOs was its lowest since 2012. Dearth of IPO activity was not restricted to biotech with only 173 IPOs being completed on NASDAQ in 2022 across all sectors, compared with 980 IPOs the year earlier.

With market valuations down and investors shying away from the sector, it is not surprising that global biotech firms struggled to raise new money via follow-on offerings, with a 42% decline on same period in 2021, and less than a third secured by sector in 2020. Nevertheless, while biotechs have struggled to attract finance from the public markets, VCs and private equity firms with life sciences mandates are still backing the sector even if blue chip generalist cross-over funds are currently avoiding the sector. Indeed, global VC financing activity in 2022 enjoyed its third best year. While just 32% lower than the 2021 record year, the sums raised by biotechs globally in 2022 totalled £19.33 billion.

Regulatory and political uncertainties – especially the Inflation Reduction Act and FTC warning that it would look more closely at pharma deals -- undermined the potential for M&A and biopartnering during 2022. Nevertheless, biotech innovation is still essential for pharma portfolios – 8 of the top 10 best selling drugs started life in biotechs – and the top 10 pharma companies are sitting on a cash pile of more than $140 billion that can be used to access to new assets such as Gilead Sciences £330 million acquisition of MiroBio's pipeline of immune checkpoint agonists and proprietary discovery platform, or emerging technologies such as the strategic collaboration between Sanofi and Exscientia to develop an AI-driven pipeline of precision-engineered medicines.

So while the global biotech sector's development slowed in 2022, the translation of ground-breaking science into benefits to patients continues at pace and the pivotal role they will have in the evolution of the pharma industry underpins a bright future.

Executive summary

The UK's innovative life sciences and biotech sector secured its fifth best fundraising year ever in 2022, with £1,785 million raised by UK-headquartered public and private companies across the year. While positive, this overall figure masks a mixed picture for the sector.

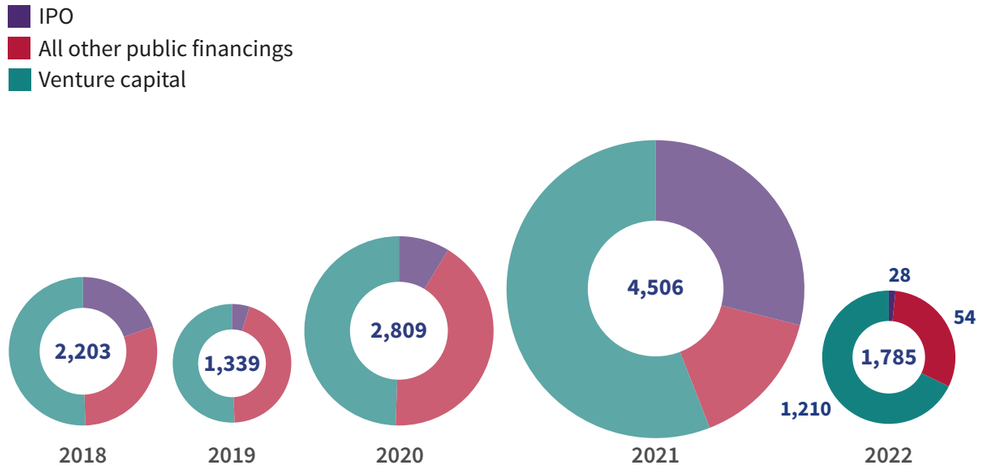
The public markets were particularly difficult, with investor appetite low, new launches were almost unseen. In fact, Initial Public Offerings (IPOs) raised just £28 million – the worst annual haul since 2012.

However, despite depressed share prices on both sides of the Atlantic, existing public companies with a positive story to tell were still able to raise capital despite the bear market. £547 million was raised by UK biotech companies in follow-ons in 2022, making it a very average year historically.

The venture markets saw much better action, achieving the third-best year on record with £1,210 million raised. Early-rounds, including seed, were relatively buoyant but later stage deals were thin on the ground and companies struggled to raise the larger deal sizes the UK sector has become more accustomed to in recent years. Nonetheless, the UK maintained its position as Europe's pre-eminent biotech sector, accounting for more than a third of the total venture capital (VC) raised across the continent.

Beyond equity capital, there was heightened M&A and licensing activity in 2022 as larger companies in particular looked to restock and strengthen their product pipelines with UK-sourced innovation. Some UK companies also came of age with their first successful pivotal trials and regulatory approvals.

Finance raised by UK-based biotech companies



Total raised (£m)

The dataset in this report covers the period from 1 December 2021 to 30 November 2022. It provides fundraising data based on the headquarters location of the company. Where fundraises weren't in pound sterling, the relevant exchange rate of the time was used. The data is provided by Clarivate Group and Bioworld, with additional data sourced from the London Stock Exchange and Pitchbook. Gross Domestic Product (GDP) figures are from 2021 provided by the World Bank.

Equity

The lifeblood of the sector, equity financing makes up the vast majority of funds supporting the UK's innovative life sciences and biotech sector. £1,785 million was raised in all forms of equity.

In November 2022, I was delighted to be appointed as the UK Government's Life Sciences Investment Envoy by the Business Secretary, Grant Shapps MP. My mission is to increase the availability of capital for our growing sector.

Dan Mahony, UK Government Life Sciences Investment Envoy

The UK's strength in life sciences is undisputed with UK companies attracting significant levels of foreign capital, especially from expert US investors who see the quality of our science. But to have a sustainable life sciences industry in the UK we must rebuild the domestic investment ecosystem. The goal is to ensure that there is a continuum of funding sources for companies from seed all the way to public markets. It is critical to have the right investor for the right stage of a company's development.

The Life Sciences Scale-Up Taskforce, led by the Government's Office for Life Sciences and the BIA, recommended not only the creation of the role to which I have been appointed but also the creation of a UK Scale-Up Partnership. This Partnership, which was modelled on the French Tibi Scheme, is designed to bring together Britain's institutional investors (including pension funds) with expert life science investors to marry capital with capability. Addressing the supply of scale-up capital will be my starting point as Envoy, but I am acutely aware that no part of the financing continuum is as healthy as it needs to be.

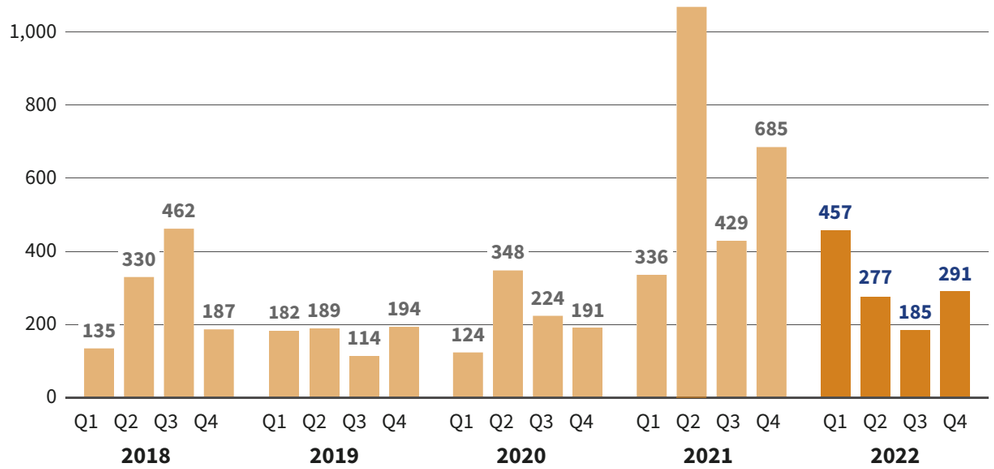
We have many of the elements required to deliver on the Government's commitment to make the UK a life sciences superpower including scientific expertise, innovative ideas and management talent. The missing piece is the supply of capital from our own domestic financial institutions driven by the confidence to invest in an industry where the UK has the potential to create a sustainable comparative advantage. Achieving this will be a challenge, but as Envoy I look forward to working with the UK Government to engage, educate and enthuse the investment community about the significant opportunities in UK life sciences.

Venture capital

VC has continued to flow into the sector in 2022, with foreign investors especially active and influential in the larger deals. A total of £1,210 million was raised throughout the year, the third best year recorded.

Off the back of a record-breaking 2021, when £2.5 billion was raised in VC, fundraising in 2022 got off to a strong start but then settled into more typical quarterly takings.

Total raised shown by quarter, for the past five years

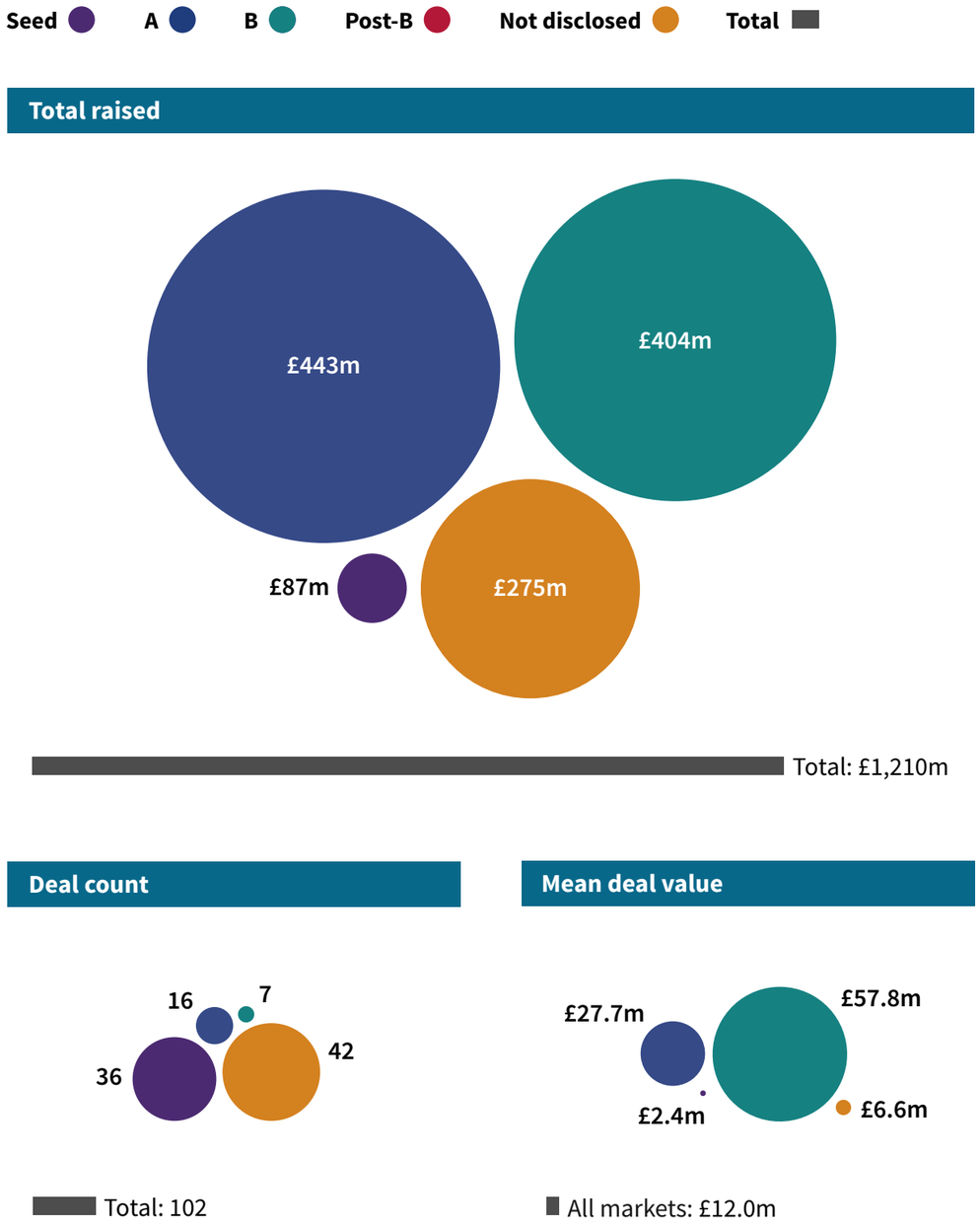


The majority of capital was raised in early-stage rounds, with no post-B deals reported. Although there was a lack of large later-stage deals, the mean Series A was 68% larger than that of 2021 (£16.4 million) and Series B deals were as healthy as that seen in the golden year of 2021, albeit there was fewer of them.

At the seed stage, 36 deals were recorded taking a total of £87 million, a historically healthy figure overall. With a mean seed deal of only £2.4 million, however, fledgling companies were not as well financed as in previous years.

The remaining deals where the series was not disclosed also had a much lower mean size compared to 2021 (£6.6 million vs £15.1 million), resulting in the overall mean deal size for 2022 being half that seen in 2021 (£12.0 million vs £23.3 million) and 2020 (£20.6 million).

UK biotech venture capital investment in 2022 by series



Top UK venture deals

Despite the high overall total taken in by the private UK biotech sector in 2022, individual companies struggled to secure the mega-deals the sector has started to enjoy in recent years.

Eight companies achieved funding rounds of over £100 million in 2021 and three in 2020. There were none of that scale in 2022.

MiroBio achieved the largest deal of the year with its £78.6 million raised in June, shortly before being acquired by Gilead in August. OMass Therapeutics and Ori Biotech also came very close to the top spot.

Top ten venture deals

Company	Date	Round	Amount £m
MiroBio	29/06/2022	B	78.6
OMass Therapeutics	28/04/2022	B	75.5
Ori Biotech	18/01/2022	B	74.5
bit.bio	30/12/2021	B	63.3
AviadoBio	02/12/2021	A	59.6
F2G	04/08/2022	ND	58.3
Pheon Therapeutics	14/03/2022	A	51.9
Microbiotica	07/03/2022	B	50.0
EyeBiotech	22/02/2022	A	48.4
Charm Therapeutics	09/06/2022	A	43.1

bit.bio combines the concepts of coding and biology to provide human cells for research, drug discovery and cell therapies, paving the way for a new generation of medicines.

Dr Mark Kotter, Founder and CEO, bit.bio

In 2021, bit.bio embarked on its Series B round, to accelerate revenue growth and launch a clinical pipeline. With our proprietary cell coding technology opti-ox™ we are in a unique position to unblock one of the major bottlenecks - access to scalable and consistent human cells.

Current funding conversations take place against an unprecedented set of disruptive global developments, but we are pleased to have attracted over $150 million from institutional and strategic investors since 2016. This funding will allow us to accelerate the discovery of novel cell types, grow revenue, and establish a clinical pipeline address-ing liver, metabolic and immunological conditions.

Following one of the largest biotech down-turns in decades, there are early signs of a market recovery. Investors are placing increased focus on revenue and clinical data. Headquartered in the UK, we are keen to further embed our own growth in this world-leading, thriving sector. We note the recommendations of the Council for Science and Technology to increase investment from domestic investors. There is huge potential in biotech and we hope that the UK will benefit from the rewards of innovation-led growth.

At the seed stage, despite the low average deal size, some companies secured impressive deals to kick-start their programmes. At the top was Constructive Bio, which raised £12.3 million of seed funding led by Cambridge UK-based Ahren Innovation Capital. The engineering biology company is pioneering approaches for building entirely synthetic genomes, turning living cells into sustainable bio factories to realise the sustainable materials and therapies of the future.

Top ten venture seed deals

Company	Date	Amount £m
Constructive Bio	15/08/2022	12.9
Epitopea	25/04/2022	10.7
Alethiomics	15/12/2021	6.0
Sania Therapeutics	23/03/2022	5.0
Bloomsbury Genetic Therapies	12/10/2022	5.0
Transine Therapeutics	31/05/2022	4.6
Cumulus Oncology	22/02/2022	4.1
Monument Therapeutics	15/12/2021	3.8
Imperagen	03/08/2022	3.2
NanoSyrinx	10/11/2022	3.1

Sixfold was founded to overcome the biggest bottleneck of RNA therapeutics: how to safely deliver strands of RNA to target tissue.

Dr George Foot, Founder and co-CEO, Sixfold Bioscience

Our Mergo® delivery system is inspired by the body's natural RNA shuttle mechanisms, which we engineer and screen using ML, high-throughput chemistry and single-cell sequencing readouts. Mergo® can repeatedly deliver RNA to target specific cells, including non-liver tissue. By reaching non-liver cells, we enable more patients to benefit from safer and more selective RNA therapies.

While the global economic climate has sent shockwaves through the early stage community, it's clear that COVID-19 has increased appetite for RNA-based medicine. Contrary to the 'what is RNA' environment when we founded Sixfold, pharma and Tier 1 investment firms are now investing heavily in RNA, and delivery in particular.

Capitalizing on this growing demand, in December 2021 we announced a second close of $2.2million contributing to a total $10.5 million seed round. Participation from a US investor base, including Cantos Ventures and Y Combinator, as well as non-dilutive funding from the Wellcome Trust (R3), Innovate UK and H2020 has been crucial to de-risking our Mergo® technology.

Sixfold is confident that our broad funding base and technology leadership mean that the company will continue to push what is possible with RNA.

VC investors

Oxford Science Enterprises and Scottish Enterprise were the most active investors in UK biotechs in 2022 by deal count, participating in five deals each. BIA Lifetime Achievement Award winner and founder of Abcam, Jonathan Milner, was the most active angel investor, with at least four disclosed investments.

UK biotech's attractiveness as a global investment location is clearly demonstrated by the fact that the top 24 financings all involved international investors. Within the top ten, eight deals were led by non-UK investors, largely from the US.

Of all the VC deals in 2022 identifying participating investors, 41% involved only UK-based investors, 40% attracted both UK and non-UK investors, while 19% had only international investors in the syndicate.

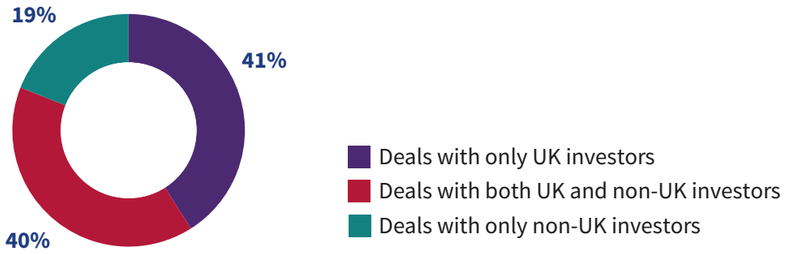
The most active non-UK investors in the UK biotech sector were the Dutch venture capital firm Forbion, the US's R42 Group, both involved in four deals, and Australia's Brandon Capital and Germany's BlueYard Capital, with three investments each.

The most active investors are unlikely to be equated to the biggest investors, as those involved in later-stage deals tend to make fewer investments but of greater value. It is not possible to determine the value of venture investments due to a lack of disclosures.

Top ten VC investors in UK companies by deal count and total invested

Investor name	HQ location	Deal count
Oxford Science Enterprises	UK	5
Scottish Enterprise	UK	5
Advent Life Sciences	UK	4
Forbion	The Netherlands	4
Jonathan Milner	UK	4
O2h Ventures	UK	4
Parkwalk Advisors	UK	4
R42 Group	USA	4
Brandon Capital	Australia	3
BlueYard Capital	Germany	3

UK biotech venture deals by investor location



The creation in 2022 of at least 16 new venture funds with a mandate to invest in the UK, totalling over £3.7 billion in capital to deploy, bodes well for the sector's financing in the coming years. Many of the funds are not purely focused on the UK, but within the top ten funds raised were three linked to the UK's world-leading universities.

Northern Gritstone, a new investment business focused on university spin-outs in the north of England, announced a first close of £215 million having seen strong interest from institutional investors, including UK pension funds. It joins the more established funds supporting spin-outs from Oxford and Cambridge.

Top ten new VC funds raised with mandate that allows investment in UK companies

Investor name	Fund name	Fund size (£m)	Date closed
LSP	LSP 7	832	11/02/2022
Frazier Life Sciences	Frazier Life Sciences XI	750	17/03/2022
Sofinnova Partners	Sofinnova Capital X	411	19/10/2022
Forbion	Forbion Growth Opportunities Fund II	371	09/06/2022
Catalio Capital Management	Catalio Nexus Fund III	305	03/05/2022
Oxford Science Enterprises	Oxford Science Enterprises	250	18/07/2022
Cambridge Innovation Capital	Cambridge Innovation Capital Fund II	225	26/04/2022
Northern Gritstone	Northern Gritstone	215	20/05/2022
Time BioVentures	Time BioVentures 1 LP	86	27/10/2022
Rapha Capital Management	Rapha Capital BioVentures Fund I	80	03/05/2022

Despite being home to some of the world's leading research institutes and universities, Europe has historically lagged with respect to research translation.

Dr Uzma Choudry, Investor, Octopus Ventures

This has evolved in the last 5-7 years as the European venture scene has matured and the appetite for investments in R&D heavy frontier tech has increased.

The gap between academia and entrepreneurship is starting to narrow, albeit slowly. We are now seeing more commercial acumen amongst European academics, who are on the learning curve of understanding what it takes to build and scale a start-up. There is also a lack of the 'hustle' mindset that we see in the American ecosystem, which will come as the biotech ecosystem matures and there are more successful European bred ventures – Abcam, Solexa, Exscientia, MiroBio, Ziylo and Ablynx.

One of the biggest hurdles for European biotech and deep tech ventures is the process of spinning-out IP and science from academic institutions. IP policies vary between institutions and are often not conducive to building ventures. Europe has had a lack of specialist fund managers in the TechBio space, however there is a new breed of emerging talent who are shaping the future of this industry and are primed to be future fund managers in this space. The appetite for European LPs to invest in such managers is yet to be seen, and this will be transformational to the budding TechBio scene in Europe. With US biotech investors increasingly building strategies to enter Europe, and with European TechBio growing, this is the right time to seek and back emerging talent in Europe.

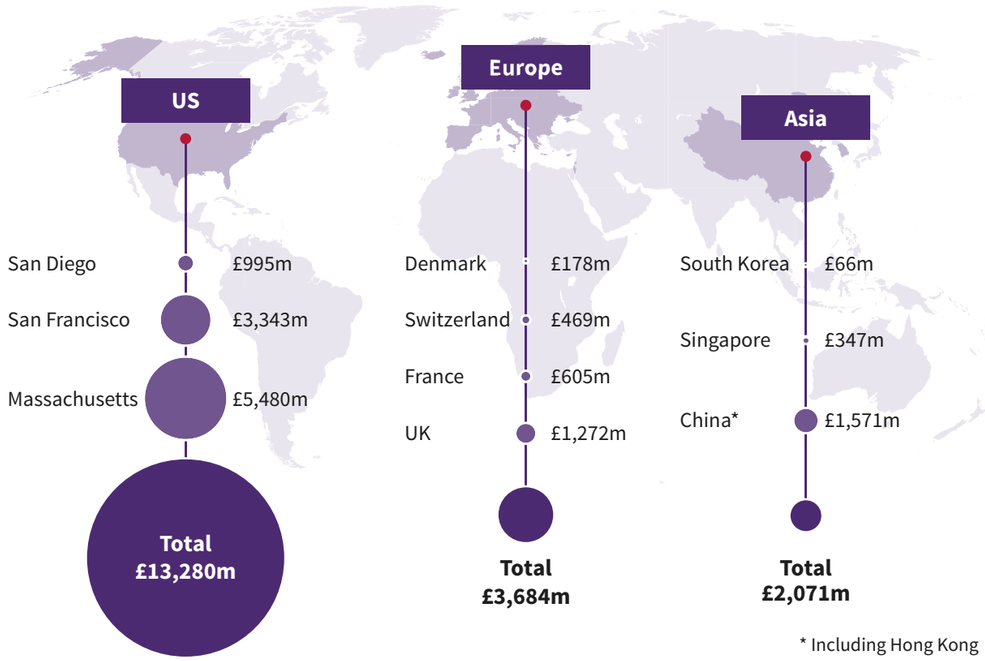
VC financing in Europe, US and Asia

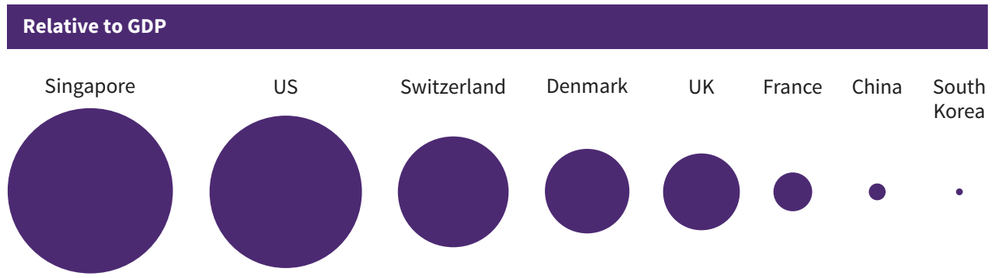
Global VC financing activity in 2022 enjoyed its third best year. While 32% lower than the 2021 record year, sums raised by biotechs globally totalled £19.3 billion.

Massachusetts still retains the top position, followed by the San Francisco bay area and China. The UK, which was the fourth most successful global cluster, maintained its pre-eminent position in Europe, while San Diego retained its top five position. Adjusting for GDP, Singapore places higher than the US for total VC raised, followed by the US and Switzerland. The UK places fifth by this measure.

The UK accounted for more than a third of the total VC raised by European companies and over half the total deals. However, the average UK deal size, at £12.4 million, was lower than the European average of £18.9 million and significantly lower than the US average of £49 million.

International VC financing





Public markets

UK IPOs

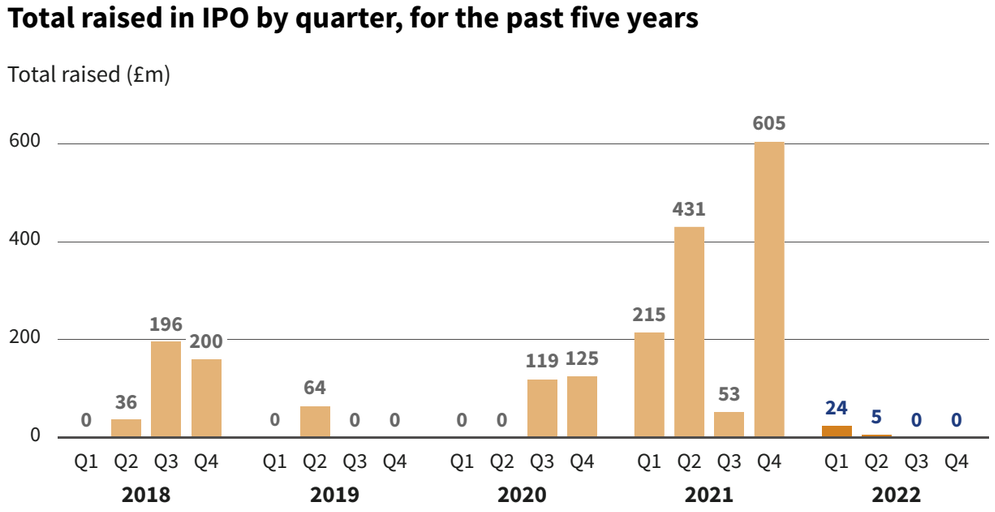
The UK suffered its worst year for Initial Public Offerings (IPOs) since 2012, with just £28 million raised, all in the first half of the year.

In the first quarter, Glasgow-based TC Biopharm, a clinical-stage biopharmaceutical company focused on developing novel immunotherapy products, listed on NASDAQ raising £13 million and life sciences tools company Aptamer Group launched on London's Alternative Investment Market (AIM), securing nearly £11 million.

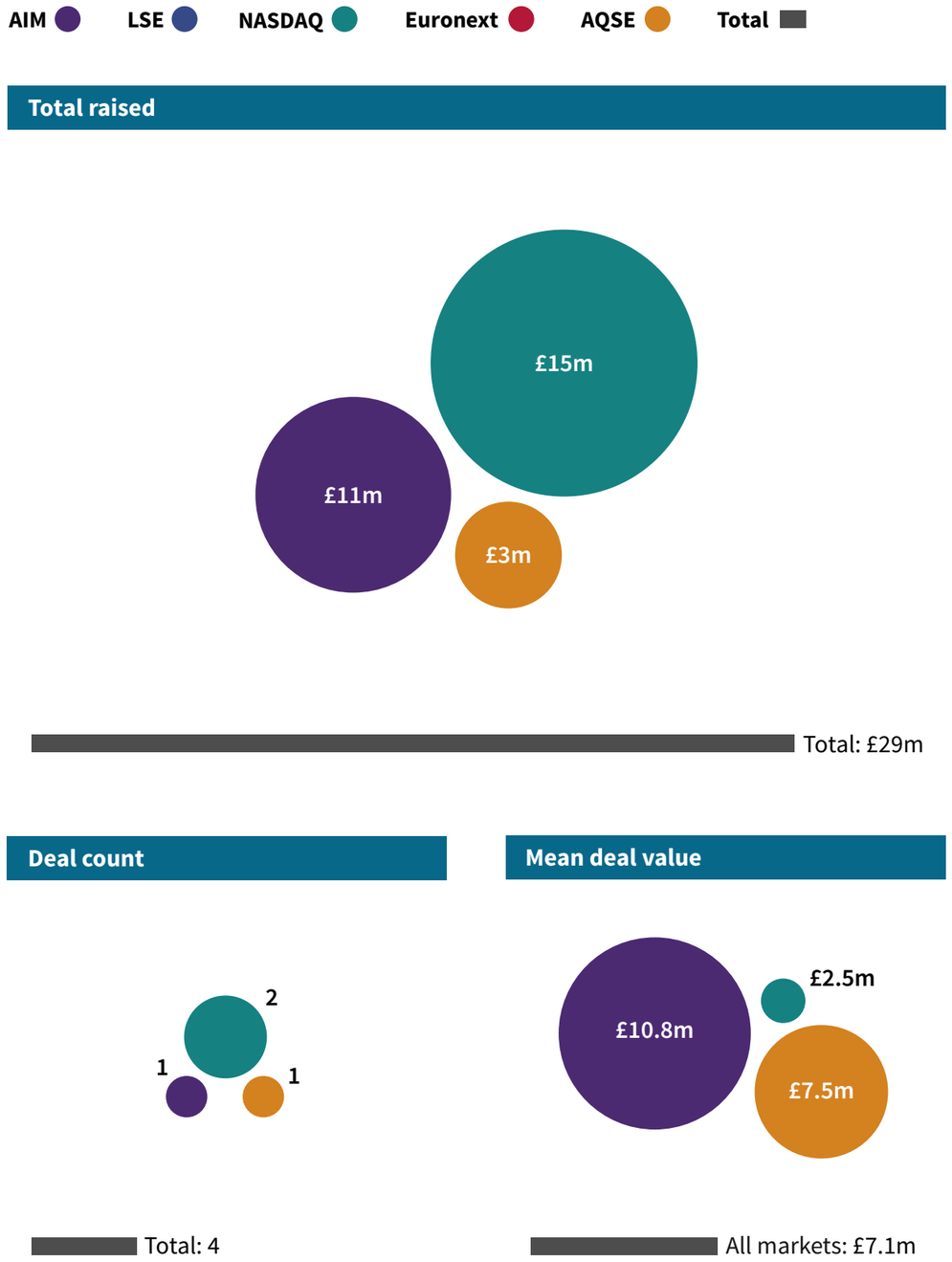
The second quarter saw even less raised. Okyo Pharma, which is developing a treatment for dry eye disease and was already listed on the London Stock Exchange, launched on NASDAQ raising £2 million, and ProBiotix Health launched on the London-based AQSE Growth Market, raising £2.5 million.

With the NASDAQ Biotech Index rallying and now in a better position than pre-pandemic, there may be light at the end of the tunnel for biotechs considering listing.

Total raised in IPO by quarter, for the past five years



UK IPOs in 2022 by market



UK biotech listings by market

Company	Date	Market	Amount (£m)
TC Biopharm Holdings	15/02/2022	NASDAQ	13
Aptamer Group	22/12/2021	AIM	10.8
ProBiotix Health	31/03/2022	AQSE	2.5
Okyo Pharma	11/05/2022	NASDAQ	2

Ariel White-Tsimikalis
Partner, Goodwin Procter LLP

After the Lord Hill Review highlighted that between 2015 and 2020 the London Stock Exchange attracted only 5% of IPOs globally, London has introduced unprecedented reforms in an effort to increase competitiveness and transition the make-up of the UK's listed company cohort to more 'companies of the future'.

Are these changes enough to displace Nasdaq as the home of biotech? The short answer is: no. The more nuanced answer is: Rome was not built in a day, and neither was Nasdaq.

London currently has the unique opportunity to attract mid-sized UK and European-based biotechs and other life sciences companies who are too big for a listing in mainland Europe but potentially too small for Nasdaq.

With sharpened regulatory and political focus on bringing more growth capital to the UK markets and more companies successfully using AIM as a stepping stone to Nasdaq and the Main Market, London needs to present itself as a viable alternative destination for biotechs. Whilst the UK listing regime changes implemented so far point in the right direction, more is needed to close the gap. Increasing UK institutional investor risk appetite for pre-revenue companies, making secondary capital raising cheaper and quicker, improving the quality of research coverage for biotechs and attracting more US investors into UK growth stocks to rival the depth of the US investment community remain challenges for London to overcome.

But it is not game over for London. The tortoise took a while, but did end up beating the hare.

IPOs in Europe, US and Asia

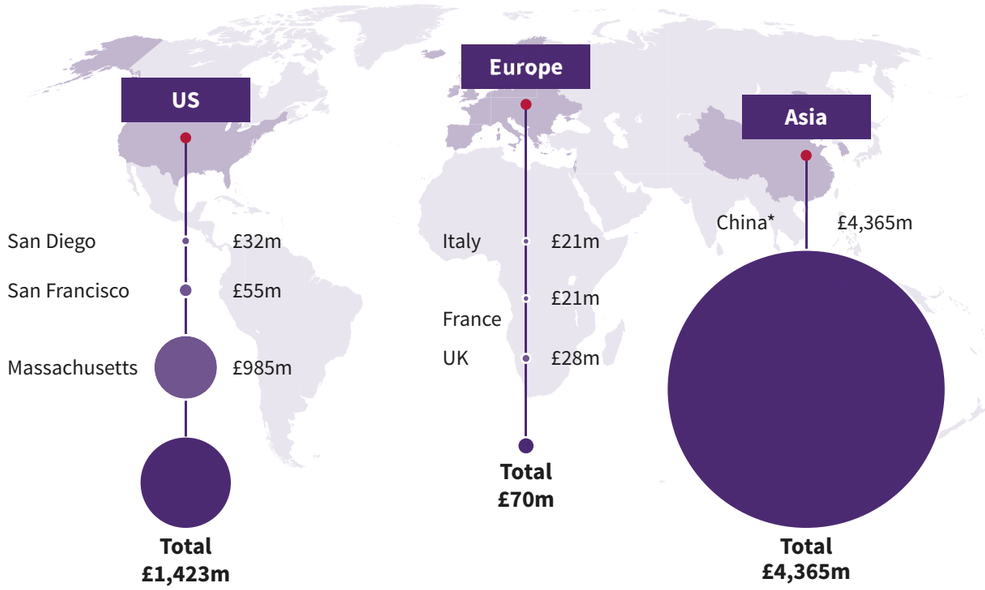
Biotech IPO activity globally was very much in line with the wider markets - depressed. In 2022, only 31 biotech IPOs were completed and the sums raised were 80% down on 2021, which was a record year for the sector. The total sums raised were the lowest since 2013.

Despite low IPO activity compared the historical standards, Massachusetts-based companies fared well compared to their US peers in other states. £985 million was raised by companies in the state, compared £87 million by Californian companies. The US sector combined raised £1.4 billion through IPOs in total, just 14% of that raised the year before.

With only £70 million raised by European-headquartered companies, the UK accounted for 41% of the continent's IPO capital raised. Italy and France were the only other countries to see any IPO activity, with one each and £42 million between them.

Only China bucked the trend, raising £4.4 billion in 2022, almost matching the £4.9 billion raised in 2021. As in previous years, the average Chinese IPO was significantly larger than that of US and European competitors.

International IPOs



Follow-on financing

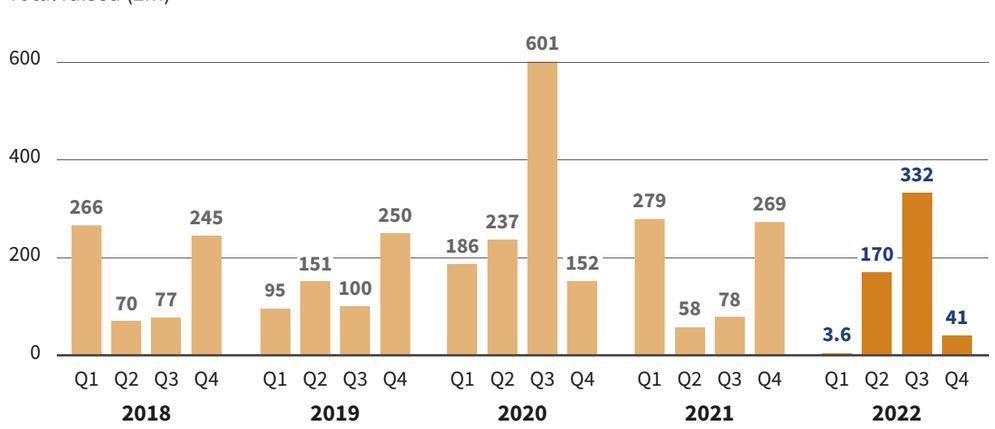
It was a turbulent year for listed UK biotechs, with many continuing to suffer sliding share prices from the bear market affecting all sectors that begun in 2021. This turbulence was reflected in the sums raised in each quarter, but the end-of-year total still hit a respectable £547 million.

While few companies secured fresh funds, those with positive stories to tell were able to raise sizable rounds.

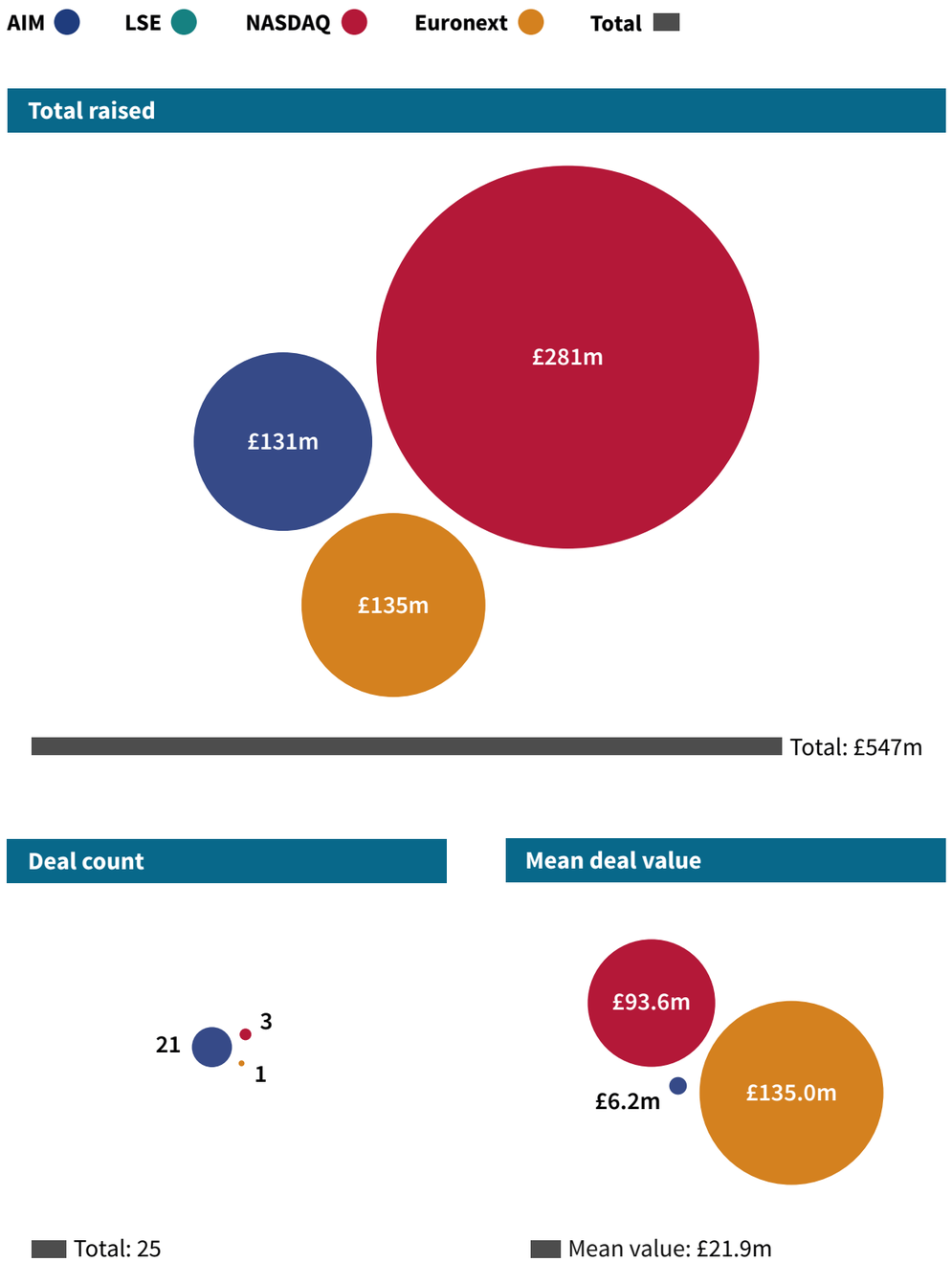
Verona Pharma raised £129.3 million following successful Phase III data, and Immunocore raised £120.7 million after the US regulator approved its T-Cell therapy for market. BenevolentAI raised £135 million following completion of its merger with Odyssey Acquisition on Euronext Amsterdam. The deal saw AstraZeneca take a stake in the company after the two agreed a partnership to use BenevolentAI's target generation platform to feed the pharmaceutical company's drug discovery portfolio.

UK companies were not alone. Since the start of 2020, 226 biotechs completed IPOs on NASDAQ. Of these, 183 were trading at below the offer price at the end of November 2022, with 40 seeing their values drop by more than 90% since debut. In addition, four of the 2020-2022 IPO cohort were acquired at values equal or less than the IPO price offering.

Total raised in follow-ons, shown by quarter in past five years



UK follow-on financing in 2020 by market



Dr Annelise Vuidepot
CTO and UK Site Head,
Immunocore

2022 has been incredibly successful for Immunocore. The Company became a fully integrated biotech, covering research to commercialization, as KIMMTRAK® (tebentafusp) became the first T Cell Receptor (TCR) immunotherapy and first bi-specific T cell engager to be approved for a solid tumour indication in February by the FDA, and to date in over 30 countries including the EU, Canada, Australia and the UK.

The product is also the only approved therapy for the treatment of HLA-A*02:01-positive adult patients with unresectable or metastatic uveal melanoma. KIMMTRAK validates the potential of our technology, being awarded the Prix Galien France and a SCRIP award in December, acknowledging our scientific excellence and innovative research.

We believe that the potential of TCR immunotherapy is vast, as they can target nearly the entire human proteome, and are committed to continuing our pioneering work to develop more therapies. We are funded through 2025, after a $140 million raise in July 2022 through a private investment in public equity. This will fund clinical trials with our product targeting PRAME, in multiple types of cancer, and with our candidates for HIV and HBV.

Our teams are working to identify new targets and develop the technology further to offer treatments that can radically transform the lives of patients living with cancer, infectious and autoimmune diseases.

UK follow-on financing deals

Company	Date	Market	Amount (£m)	Market cap post-raise (£m)
BenevolentAI	22/04/2022	Euronext	135	1,131
Verona Pharma	15/08/2022	NASDAQ	129	755
Immunocore	18/07/2022	NASDAQ	121	1,707
RedX Pharma	11/05/2022	AIM	34	214
Freeline Therapeutics	15/03/2022	NASDAQ	21	48
Angle plc	19/07/2022	AIM	20	189
E-Therapeutics	06/10/2022	AIM	14	109
Akari Therapeutics	12/09/2022	NASDAQ	11	45
Avacta Group	20/10/2022	AIM	7	269
Allergy Therapeutics	19/10/2022	AIM	7	118

Business deals

Beyond equity capital, mergers, acquisitions and licensing deals keep the sector moving. These deals raise funds that are either returned to investors or used for R&D programmes and to drive company growth. There was heightened deal activity in 2022 as larger companies in particular looked to restock and strengthen their product pipelines.

Mergers and acquisitions

With valuations down, acquisitions heated up in 2022 with UK companies involved in deals totalling more than £2.7 billion in estimated potential value.

The majority of targets were UK based but UK companies also represented a sizable proportion of the acquirers.

Vaccitech, the company with rights to the platform technology behind Oxford University's COVID-19 vaccine, Vaxzevria, acquired US-based Avidea Technologies for £28 million in cash and shares at the end of 2021. The deal brings complementary technology to the company and expands their product pipeline further in oncology, and into autoimmunity.

Novartis paid £587 million upfront for the UK cell and gene therapy company Gyroscope and could pay a further £514 million upon the achievement of milestones. Other notable deals involving target UK biotechs included Pfizer's acquisition of ReViral for an estimated £420 million, Gilead's acquisition of MiroBio for an estimated £350 million, and Abbvie's acquisition of DJS Antibodies for £229 million.

BenevolentAI was also acquired by the Odyssey special purpose acquisition company (SPAC) during this period in a deal that led to the former becoming the named company on Euronext Amsterdam.

Selected M&A deals involving UK biotech companies in 2022

Acquirer	HQ country	Target	HQ country	Deal date	Estimated value (£m)
Novartis	Switzerland	Gyroscope Therapeutics	UK	18/02/2022	1,101
Recordati	Italy	EUSA Pharma	UK	16/03/2022	594
Pfizer	USA	ReViral	UK	09/06/2022	420
Gilead Sciences	USA	MiroBio	UK	04/08/2022	350
Abbvie	USA	DJS Antibodies	UK	19/10/2022	229
Odyssey Acquisition	Luxembourg	BenevolentAI	UK	22/04/2022	191
Eagle Pharmaceuticals	USA	Acacia Pharma	UK	20/05/2022	83
Vaccitech	UK	Avidea Technologies	USA	10/12/2021	28
Arecor Therapeutics	UK	Tetris Pharma	UK	01/08/2022	6
Takeda Pharmaceutical	Japan	Adaptate Biotherapeutics	UK	10/01/2022	Not disclosed
Sandoz	Switzerland	Coalesce Product Development	UK	14/03/2022	Not disclosed
RIGImmune	USA	Subintro	UK	15/09/2022	Not disclosed
Beckley Psytech	UK	Eleusis Therapeutics	UK	29/11/2022	Not disclosed

MiroBio spun out of Oxford University in 2018, based on the research from two leading Oxford academics. The mission of MiroBio was to develop a new class of therapeutics – checkpoint agonist antibodies – to restore immune balance in autoimmune patients.

Dr Lynne Murray

VP - Head of UK Research organization and site lead for Oxford, Gilead

Supported by a strong group of international investors, who together invested just over £105 million to accelerate our R&D programmes, we have developed a proprietary discovery platform able to generate multiple checkpoint agonist candidates.

Agonist antibodies have historically been challenging to make, however with significant foundational research and in-house expertise, MiroBio has created a portfolio of molecules targeting numerous checkpoint receptors and our lead programme initiated clinical trials in the UK in mid-2022.

In August 2022, Gilead Sciences acquired MiroBio, within four years of being founded, for approximately £305 million. The acquisition will provide Gilead with MiroBio's proprietary discovery platform and entire portfolio of immune inhibitory receptor agonists.

The MiroBio Oxford site is the first non-US research site for Gilead, allowing close interactions with key academic and basic research groups. MiroBio had a number of UK and EU-based collaborations with industry and academia and I am hoping to continue building on these as we integrate into the Gilead family. I am delighted MiroBio has been acquired by Gilead, as we both share the same passion and commitment to deliver life-changing medicines for patients.

Licensing

UK biotechs formed partnership license deals with other companies worth an estimated potential total of over £9 billion in 2022, demonstrating the value of UK-originated science.

Oxford-based AI drug discovery company Exscientia and Sanofi establish strategic research collaboration to develop an AI-driven pipeline of up to 15 non-small molecule precision-engineered medicines across oncology and immunology. We estimate the deal to be worth a possible £3.9 billion in upfront and milestone payments and royalties.

In May, AstraZeneca entered into a licence agreement with RQ Bio for a portfolio of early-stage monoclonal antibodies targeted against COVID-19. The first entered clinical trials in December, less than a year after discovery.

BenevolentAI and AstraZeneca also expanded their existing partnership, doubling the number of disease areas being explored. The three-year expansion included an upfront payment, research funding, development milestone payments and tiered royalties on future revenues for the UK biotech.

Selected licensing deals involving UK biotech companies in 2022

Principal company	HQ country	Partner company	HQ country	Announcement/ start date	Estimated* value (£m)
Exscientia	UK	Sanofi	France	01/07/2022	3,900
Curve Therapeutics	UK	Merck Sharpe & Dohmme	USA	16/02/2022	1,252
Sosei Heptares	UK	Abbvie	USA	02/08/2022	1,054
Amphista Therapeutics	UK	Bristol-Myers Squibb	USA	04/05/2022	1,014
Amphista Therapeutics	UK	Merck	Germany	04/05/2022	783
Crescendo Biologics	UK	BioNTech	Germany	10/01/2022	582
Scancell	UK	Genmab	Denmark	24/10/2022	552

* total proceeds if all milestones are met and programmes are successful

Other finance

Non-dilutive grant funding and debt provides differentiated, albeit smaller, source of capital for innovative life science and biotech companies. A major advantage of both during down-years, such as 2022, are that funds available are often not correlated with the health of the equity capital markets.

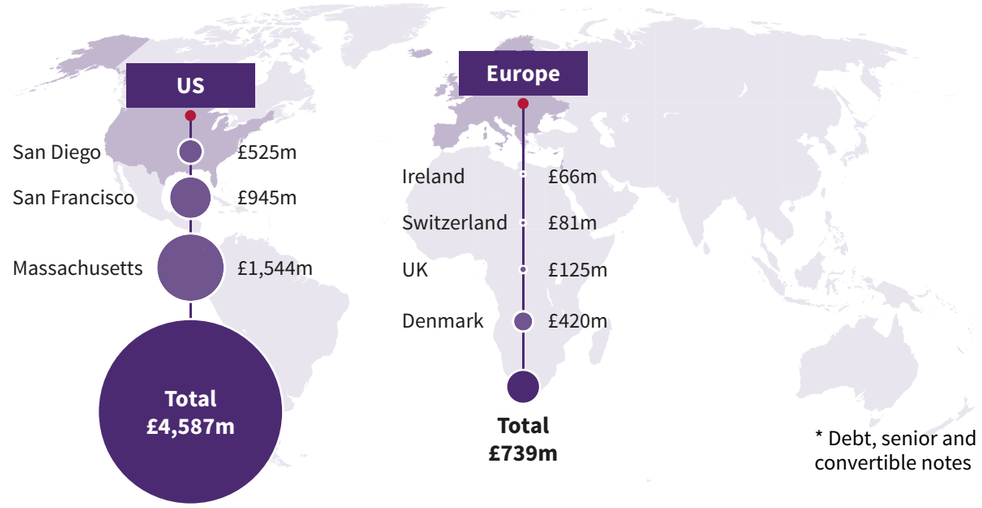
Debt

Much like we saw for equity, global debt financing fell significantly from 2021 levels.

£4.6 billion debt was provided to US companies in 2022, compared to £8.1 billion in 2021. Europe, however, saw a slight rise, from £604 million in 2021 to £739 million in 2022.

The US continues to account for the vast majority of the global total of debt raised by the sector and US average debt financings are twice the size of those seen in Europe (£75.2 million vs £36.9 million).

International comparison of total debt raised in current year



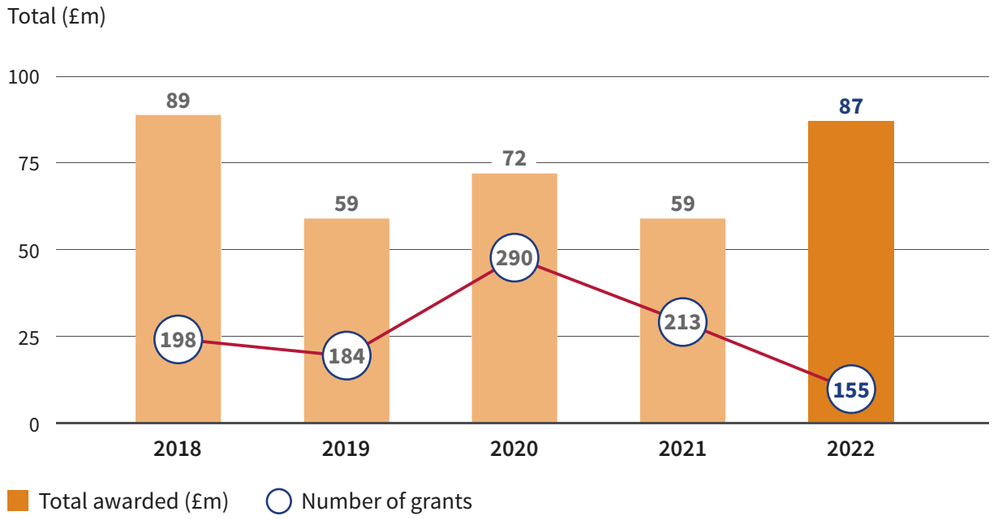
R&D grant funding

UK biotech companies won over £87m in grant funding in 2022, the vast majority of which came from Innovate UK.

The increase in grants available to the sector in 2022 is welcome but not significant enough to compensate for the fall in venture capital availability overall. However, it will be a lifeline for the companies that were successful in securing the grant funding.

The average grant value in 2022 was double that of 2021 (£564,000 vs £275,000) and significantly larger than that of previous years too, with the exception of 2018. The reason for this is not clear.

Grant funding to UK biotech businesses by year of award



Source: Beauhurst

NRG Therapeutics is a perfect example of venture, governmental and charitable organizations enabling the translation of innovative UK science into promising drug candidates. In total we have raised over £20 million with the majority received in 2022.

Neil Miller, CEO, NRG Therapeutics

We are applying groundbreaking science in the field of mitochondrial biology to develop disease-modifying treatments for neurodegenerative disorders. Our pipeline includes potential first-in-class brain-penetrant small molecule inhibitors of the mitochondrial permeability transition pore (mPTP) which have been shown to be neuroprotective in preclinical models of Parkinson's and ALS/MND. The unmet medical need is high, as these conditions are currently poorly treated, but so are the R&D challenges and investment risks.

Our founding investor, Parkinson's UK Virtual Biotech has a unique model and invests early where others won't. It has invested £2.5 million across three rounds, and participated in our £16 million series A. Its backing, alongside charitable grants including from The Michael J. Fox Foundation, funded early discovery studies that enabled us to attract international venture investment from Omega Funds and Brandon Capital. We have also benefited from a £2.68 million Biomedical Catalyst early-stage award to support our pre-clinical and IND-enabling studies, and an earlier Innovate UK EDGE grant which provided valuable scientific and commercial insights for ALS/MND.

R&D

With two of the top three universities for life sciences in the world and a vibrant entrepreneurial culture, it is no surprise that the UK punches above its weight in R&D activity and impact.

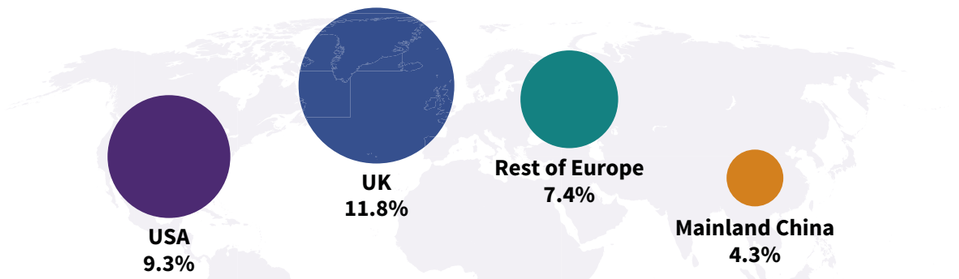
Patents

The UK displays a higher rate of pharmaceutical invention than our international comparators.

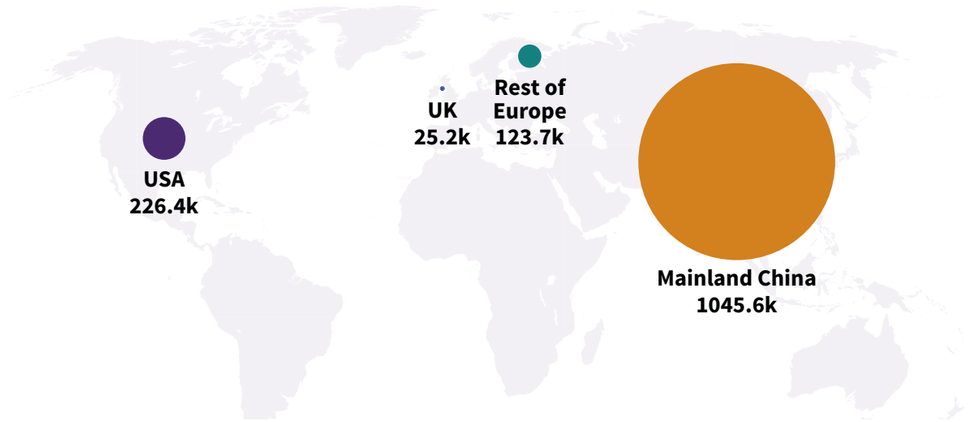
Although the overall number of patents published in the UK is lower than elsewhere, 11.8% of all patented inventions in the UK involve pharmaceutical content, compared to 9.3% in the US, 4.4% in China and 7.4% in the rest of Europe.

Clarivate has also calculated the invention strength, measured as the combined relative score of invention record across citation impact, patent grant and grant location, breadth of geographic filing and rarity of technology. Again, the UK comes top globally, concluding that the UK's position as a life sciences superpower is well founded.

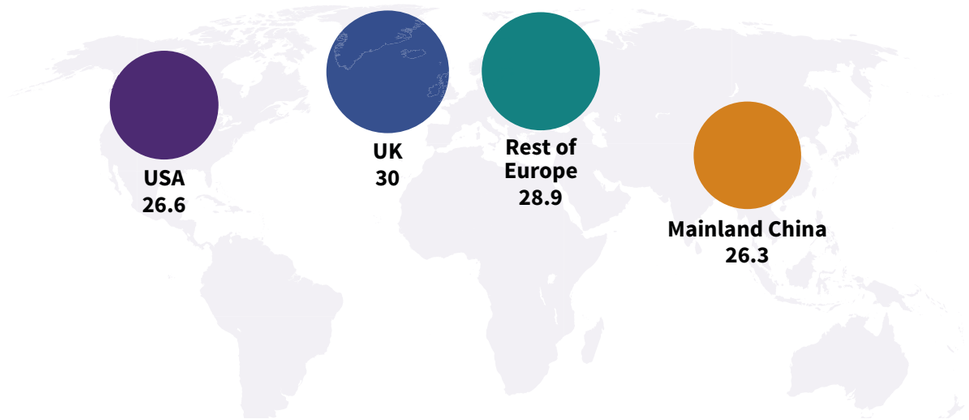
Proportion of inventions related to pharmaceuticals
% as totals for inventions published 2010-2021



Total inventions related to pharmaceuticals
Inventions published 2010-2021



Median invention strength, pharmaceutical inventions
Inventions published 2010-2021

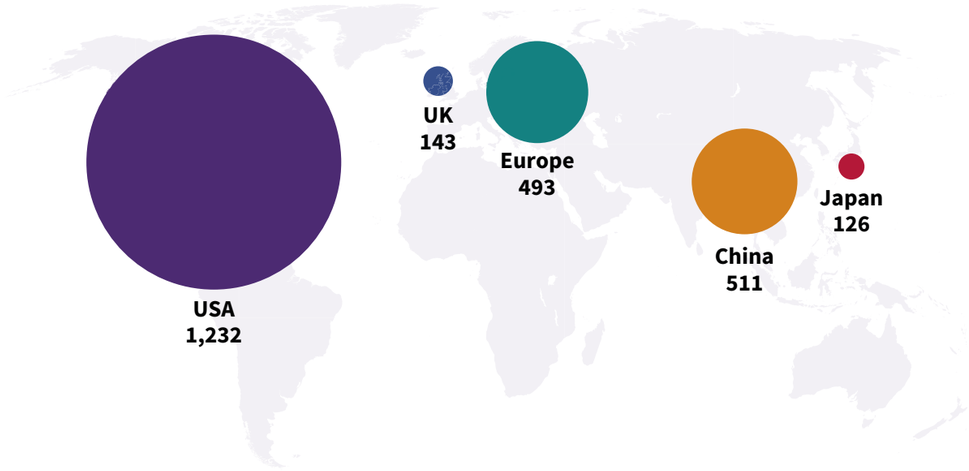


Clinical pipeline

The UK has 143 companies with products in clinical trials, accounting for almost a third of all clinical-stage companies in Europe.

The US has the largest number of clinical stage companies at 1,232, but its lead is perhaps not as large as might be expected given the disparity in investment. China has 511.

Companies with products in clinical development, by region



2022 was a year of outstanding progress for Verona Pharma. Our novel candidate, ensifentrine, delivered ground-breaking Phase 3 data in Chronic Obstructive Pulmonary Disease (COPD) enabling the company to secure $300 million in financing.

David Zaccardelli, President and CEO, Verona Pharma

The Phase 3 ENHANCE program demonstrated statistically significant and clinically meaningful improvements in lung function, symptoms, quality of life measures and the rate and risk of COPD exacerbations. Ensifentrine is the first novel compound in over a decade to address the ongoing needs of the more than 380 million patients suffering from COPD globally. Coupled with its favourable safety profile, we believe the inhaled PDE3 / PDE4 inhibitor will change the treatment paradigm for COPD.

Following these results, Verona secured $150 million in equity financing and a $150 million credit facility. The company will use the funds to support the continued development and commercial launch of ensifentrine in the US and Verona's efforts to partner ensifentrine worldwide.

I believe Verona has the potential to become a significant international biopharmaceutical company, demonstrating the potential of UK headquartered companies on the global stage.

About BIA

The BioIndustry Association (BIA) is the voice of the innovative life sciences and biotech industry, enabling and connecting the UK ecosystem so that businesses can start, grow and deliver world-changing innovation.

We are an award-winning trade association representing more than 500 member companies including:

- Start-ups, biotechnology and innovative life science companies
- Pharmaceutical and technological companies
- Universities, research centres, tech transfer offices, incubators and accelerators
- A wide range of life science service providers: investors, lawyers, IP consultants and IR agencies

Explore opportunities to influence, connect and save with the BIA
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