



Becoming a life sciences superpower

Recommendations for the 2021
Comprehensive Spending Review



September 2021

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Foreword



Steve Bates OBE
CEO, BIA

Since the outbreak of the COVID-19 pandemic, I have witnessed the UK's life sciences sector prove its world-leading credentials in response, from mobilising academics, government, and industry to quickly produce a vaccine against COVID-19, to carrying out an extensive genomic sequencing programme to track and monitor variants of concern.

For decades, we have had successive governments launch initiatives to build the life sciences ecosystem, establishing the foundations of the sector and the UK's position as an excellent location for biotech businesses, which in turn helped our sector to respond so effectively to the biggest global health crisis we have been faced with in a generation. From the Industrial Strategy and Life Sciences Sector Deals to the new 10-year Vision for Life Sciences and the target to increase investment in research and development (R&D) to 2.4% of GDP, the sector is primed to deliver on the Prime Minister's aim of making the UK a life sciences superpower.

Our pioneering sector already invests more in R&D than any other in the UK and is supported by a number of public initiatives to encourage this, including R&D tax credits and various programmes by Innovate UK like the Biomedical Catalyst competition. Such initiatives show government

confidence in the sector, which in turn boosts investor confidence: private investment in the sector has risen by 1,000% since 2012. With the sector in the spotlight after having played such an important role in fighting the pandemic, it is essential that we continue to get the backing from government to keep working on tackling diseases and improving health outcomes.

The Comprehensive Spending Review (CSR) is an excellent opportunity for the Government to review its support for our sector to ensure it is working effectively and efficiently to encourage ground-breaking biotech innovation and private investment to enable this. We hope this report helps policymakers to understand which initiatives add the most value to help make the UK a global life sciences hub.

As we begin our recovery from the economic turmoil caused by the pandemic, BIA members need the assurance of long-term funding for the initiatives that support their research and help them to commercialise their novel products. Through these initiatives, the Government can make the UK the best place in the world to start and grow a biotech company.

The BIA is on hand to support the Government to achieve this mission.

Executive summary

This report advocates for increased, long-term public investment in research and innovation, particularly in the life sciences sector, to accelerate the UK on its trajectory as a global leader in the field. This report sets out recommendations ahead of the Comprehensive Spending Review for policymakers to support innovative businesses, achieve the Prime Minister's aim of becoming a life sciences superpower, and ultimately, deliver health benefits for Britain – and the world – for generations to come.

The UK's world-leading life sciences sector has been put in the spotlight over the last 18 months for the crucial role it has played in developing an effective vaccine against COVID-19 and for the extensive genomic sequencing carried out to rapidly identify variants of concern, understand transmission and inform policy to slow its spread. Industry has only been able to respond so robustly and efficiently due to the continuous public investment in the life sciences ecosystem which has contributed to the building of a hugely successful sector.

The life sciences sector, recognised by successive governments for decades as a sector of the future, plays a huge part in contributing to the economy, creating highly skilled, levelling-up opportunities across all parts of the UK, and most importantly, delivering new treatments to patients and improving the health of the nation. The last 18 months have proved the need to continue to bolster the sector, to assess which public funding streams are most effective and to ensure they have adequate resource, as well as committing to policy changes to strengthen the life sciences funding ecosystem. By doing so, this will only help life sciences companies to continue to invest in R&D, of which the sector already invests more than any other sector and help to achieve the Government's target of the UK investing 2.4% of GDP in R&D by 2027. This investment, in turn, will continue to develop life-saving treatments and early diagnostic tools which could transform the prospects of patients and save lives.

Government target



UK invests 2.4% of GDP in R&D by 2027

In this report, the BIA makes four key recommendations to HM Treasury ahead of the 2021 Comprehensive Spending Review to achieve the aims and manifesto pledges of this Government, help life sciences business to scale and grow and deliver healthcare solutions for the public.

Recommendations



1 **Increase the budget of Innovate UK to continue to fund projects for the life sciences sector, supporting SMEs to establish long-term biotech research and manufacturing capabilities in the UK.**

Innovate UK funding is used to drive innovation and attract private investment in new technologies, particularly in the life sciences sector. Ensuring Innovate UK, a key driver of investment in R&D, is properly funded is essential for boosting investment in R&D and taking the UK closer to becoming a life sciences superpower.



2 **Commit to a long-term funding plan for the Biomedical Catalyst competition, increasing its annual budget to £100 million per year for the length of the Spending Review.**

The Biomedical Catalyst competition provides vital early-stage funding to help scale scientific ideas and products into therapies for patients. Its limited budget means it is unable to fund all the projects it approves, so committing to increased, long-term funding would help to get a plethora of pioneering life sciences projects off the ground, which may provide one of the key solutions to future health crises.



3 **Ensure the British Business Bank has the resources it needs to address the scale-up challenge and deliver cross-government support for the Life Sciences Scale-Up Taskforce.**

The Vision for Life Sciences identified poor access to finance as a barrier for companies looking to rapidly scale and a lack of UK institutional investors as a challenge to expanding and anchoring the UK sector. The British Business Bank is the Government's principal vehicle by which to address this and must be properly resourced to tackle the scale-up challenge. The Vision has also now established a Taskforce to look at what further measures could help – it will require cross-government support to succeed.



4 **Expand R&D tax incentives to cover data, cloud computing and capital expenditure to ensure the regime is internationally competitive and anchor long-term R&D activity in the UK.**

R&D tax credits play an integral part in fuelling economic growth through R&D and innovation, and so must remain up-to-date, competitive and well-targeted. Fine-tuning the scheme to introduce additional investment incentives and reflect how R&D is conducted in the 21st century would help to make the UK one of the best places in the world to start and grow a life sciences company.

Introduction

The UK is a global pioneer in life sciences, with the Prime Minister recently recognising it as a sector of strategic importance through the Vision for Life Sciences, the first sector for which a vision has been developed. A strong science base underpins the UK's growth in the sector, being home to three of the top ten universities in the world for life sciences – Oxford, Cambridge and University College London. With successive governments over decades supporting innovation and research through policy and regulation, this sector is a major contributor, not just to the UK economy, but also to the health and wellbeing of the nation.

Data from the Office for Life Sciences shows that in 2019, the sector employed over a quarter of a million people across the UK, generating a turnover of £81 billion.¹ These highly skilled jobs are spread out across the four nations, with two-thirds outside London and the South East.² Figures from 2019 show the growing sector is made up of 6,300 companies, over 80% of which are SMEs.³ In 2020 alone, the SME biotech sector raised a record £2.8 billion in equity finance, an increase of over 1,000% since 2012.⁴ Already in the first two quarters of 2021, a stellar £2.39 billion has been raised, with the hope that the recently published Vision for Life Sciences will propel the sector into a golden age.⁵

Start-ups and SMEs are the catalysts that will disrupt global markets and established companies, and as a result, drive economic growth. Investment in UK life sciences SMEs boomed in 2020, largely due to the spotlight on the sector and the success of its work tackling COVID-19.

The UK has long been developing an ecosystem that encourages innovation. In HM Treasury's Plan for Growth, unveiled in March 2021, innovation was identified as a key pillar in enabling the country to build back better after the economic turmoil caused by the pandemic. The life sciences sector is primed to support the agenda of boosting economic recovery and levelling up the country with its strong track record of rapid growth and the distribution of highly skilled jobs across the four nations. This has been clearly recognised by the Prime Minister, who has committed to making the UK a life sciences superpower and has set out the steps to achieve this goal in the Government's Innovation Strategy and Vision for Life Sciences. These proposals, alongside the Plan for Growth, will shape the way the Government will drive innovation to develop the life sciences ecosystem. The upcoming Comprehensive Spending Review is an opportunity for the Government to show where its priorities are for developing the sector and reaching this aim.

The UK life sciences sector in 2019



Generated an annual
turnover of **£81 billion**



6,300 companies,
80% of which are SMEs



Employed a **quarter of a million** people,
two-thirds of which are outside London and the South East

While the pandemic has shown that the sector is able to respond to the challenges it was presented with quickly and collaboratively through COVID-19 research, the development of vaccines and world-leading genomic surveillance, the ecosystem which underpinned this has only been able to thrive because of the continuous public investment in innovative businesses by successive governments, which generously paid dividends when the UK – and the world – needed it most.

Many countries across the world, including the EU, the United States and China, are committing considerable public investment to support their respective life sciences sectors, recognising that this is an industry of the future. This global race, with its serious competitors, may on the surface appear to be a challenge for the UK, but the UK already has a competitive edge in this field which it has proudly exhibited since the outbreak of the pandemic.

A key aspect of maintaining the UK's competitive edge, stimulating innovation and finding new technologies and therapies to improve our health and well-being is enabling increased spending on R&D. The Government is committed to ensuring the UK invests 2.4% of GDP in R&D by 2027, and 3% in the 'longer term' (including both public and private sector spending).⁶

Government to fund high-risk, high-reward research to transform lives

A new, Government-backed research funding agency which takes a different approach from UK Research & Innovation (UKRI) is a welcome addition to the R&D ecosystem. The Advanced Research and Invention Agency, currently being legislated for in Parliament, will operate as an independent UK scientific research agency, funding cutting-edge science and technology.

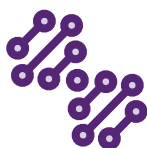
With a budget of £800 million over the course of this Parliament, it is hoped the agency will facilitate fast and flexible funding, accepting failure as an essential part of scientific discovery, for high-risk, high-reward research. This revolutionary approach to R&D is novel

for public investment, but not a new way of working in the UK life sciences sector, where government and business work in partnership to deliver health benefits to patients and grow the UK economy, attracting global companies impressed by the leading innovation.

The establishment of this agency shows the Government's dedication to putting the UK in a leading position to respond to pressing global challenges, removing bureaucracy to accelerate the development of future technologies that could transform lives. It must work along the full innovation pathway and utilise the UK's world-leading capabilities in academia and industry.

The life sciences sector invests more in R&D than any other sector in the UK. In 2019, the sector increased its expenditure on R&D by 6.9% to £4.8 billion, compared to the UK's total expenditure on R&D in 2018 of £37.1 billion. The sector employs 29,000 people in R&D-related roles, more than any other sector and equivalent to 11% of all people employed in R&D in 2019.⁷

The UK SME biotech sector in 2020



**Raised a record
£2.8 billion in
equity finance,
an increase of over
1,000% since 2012**

In order to sustain the growth in investment into R&D in the life sciences sector and meet the target of 2.4% of GDP more broadly, it is imperative that the Government uses the tools at its disposal to encourage companies to invest in R&D, as well as increasing public investment into R&D through UKRI and launching its own research projects.

The strong response by the sector to COVID-19 has shown just how advanced the UK is in terms of biotechnologies and genomic surveillance and has given a significant boost to the aim of becoming a life sciences superpower, which will include anchoring a significant advanced medicines manufacturing base. To capitalise on the world-leading successes over the last year and achieve this ambitious aim, the Government must ensure it is using all the tools at its disposal to strengthen the sector.

The BIA, as the trade body representing innovative large and small life sciences companies in the UK, has a unique understanding of biotech companies of all sizes and disciplines and what they need to produce a product or technology to improve the health of our nation. We have collected case studies from our members showing what works and how each essential form of government support plays a unique

and complementary role. Based on this analysis, this report outlines our key recommendations for the Government ahead of the upcoming Spending Review. There has never been a more important time for the Government to demonstrate its commitment to building a world-leading life sciences ecosystem for the protection and improvement of public health and as a catalyst for economic growth.

R&D in 2019



**Expenditure increased
by 6.9% to £4.8 billion**



**29,000 people employed
in R&D-related roles**

Recommendation 1: Increase Innovate UK's budget

Recommendation: Increase the budget of Innovate UK to continue to fund projects for the life sciences sector, supporting SMEs to establish long-term biotech research and manufacturing capabilities in the UK.

Increasing investment in R&D to discover key technologies and therapies to improve our lives and livelihoods is essential, and the Government's target to increase R&D spending to 2.4% of GDP by 2027 is laudable. One of the key mechanisms through which to reach this target and provide effective support for pioneering businesses is Innovate UK.

The UK's innovation agency provides grants intended to address market failures by supporting R&D that is too risky to be commercially viable for an SME. By de-risking pioneering technologies in the life sciences sector, Innovate UK plays a vital role in attracting much needed private investment, which can then help the UK meet its 2.4% target. In the first 12 years since its inception, Innovate UK generated up to £16 billion in Gross Value Added (GVA) for the UK economy and 70,000 jobs from investing £2.2 billion.⁸

Innovate UK



**Generated up to
£16 billion in GVA
for the UK economy**



**Created 70,000
jobs from investing
£2.2 billion**

Most public expenditure on R&D comes from the Department for Business, Energy and Industrial Strategy (BEIS), with the majority of BEIS funding for R&D then being allocated to UKRI. For the financial year 2021–2022, BEIS committed £11.35 billion to R&D, with £7.9 million to UKRI in total, and £907 million specifically for Innovate UK.⁹ However, a significant proportion of Innovate UK's budget is mandated by central government, meaning the agency has a smaller budget of its own than it appears.

Innovate UK is the only body under the UKRI umbrella which invests in businesses across British industries, whereas the other councils fund specific sectors. Despite this, Innovate UK runs several programmes in the life sciences sector which provide a vital source of funding for companies exploring new ways to improve health in the UK and across the world. The targeted, mission-focussed funding streams include the Catapult Centres and the Industrial Strategy Challenge Fund.

The Cell and Gene Therapy Catapult helps businesses translate early-stage research into commercially viable and investible therapies, helping to build a world-leading cell and gene therapy sector in the UK as a key part of a global industry. The Industrial Strategy Challenge Fund medicines manufacturing challenge has supported innovative ways to make traditional medicines, whilst developing entirely novel manufacturing processes needed for the newest novel therapies. Medicines manufacturing capability has been proven in the last year to be a vital

asset which the UK has not yet matured and as a result accelerated investment was required to scale-up the manufacture of vaccines needed to tackle the COVID-19 pandemic. By investing in medicines manufacturing, Innovate UK helps to speed up the availability of revolutionary new medicines for patients, and could prove to be a pivotal aspect of the UK's recovery from any future health emergency as well as generating export value.

Since its inception, Innovate UK has invested around £2.5 billion in British businesses,¹⁰ with most of its funding for life sciences going to SMEs. In this time, 89% of its grant funding awarded to life sciences companies has gone to SMEs, compared to just 44% across all sectors.¹¹ With the Government's commitment to making the UK a life sciences superpower and supporting life sciences SMEs, as set out in its Vision for Life Sciences, Innovate UK is a vital policy lever to help achieve this. The essential support it provides the vibrant, entrepreneurial, and scaling community of life sciences businesses in the UK enables it to be primed to deliver maximum benefit and growth for the UK.

To truly deliver on the Plan for Growth and boost the life sciences sector as set out in the Vision for Life Sciences, Innovate UK must receive an increase in its budget to reflect the success of its funding and to support its essential projects in the long term.

Supporting scale-up and manufacturing

Oxford Biomedica

Oxford Biomedica was founded in 1996 as a spin-out from the University of Oxford to develop gene therapy technology for diseases such as Parkinson's. Gene therapy offers potential solutions to a wide variety of diseases by targeting genetic causes but getting the treatment to where it is needed is challenging. Oxford Biomedica has perfected a technique for engineering viruses into vectors that can safely deliver gene therapy into target cells.

Oxford Biomedica has received Biomedical Catalyst grant funding to support development of a Parkinson's disease gene therapy and this is now being trialled in patients via a partnership with Sio Gene Therapies.

By 2012, Oxford Biomedica had invested in a production facility and was licensed for manufacturing. The following year, the company signed its first deal with Novartis to help produce a cutting-edge CAR-T therapy, a treatment where patients' immune cells are reprogrammed to help them fight cancer. In a subsequent deal, Oxford Biomedica became Novartis' approved vector manufacturer.

This was a period of significant growth for Oxford Biomedica, aided by a grant and loan from the Government's Advanced Manufacturing Supply Chain Initiative, resulting in more than 70 new highly skilled jobs and hundreds more via the company's partnerships.

In following years, an Innovate UK grant for collaborative R&D helped catalyse a unique partnership with Microsoft Research on the use of artificial intelligence and machine learning in life sciences. Innovate UK also contributed funding towards automating viral vector manufacture and analytics, enabling Oxford Biomedica to sustain growth into the future.



Oxford Biomedica's significant growth generated more than 70 new highly skilled jobs and hundreds more via the company's partnerships

Oxford Biomedica recently invested in a much larger manufacturing facility, with some early support from the Industrial Strategy Challenge Fund (ISCF). The expansion created hundreds of new highly skilled jobs in manufacturing and support areas that are needed to run the large Oxbox facility for manufacturing viral vectors. As a result, when COVID-19 took hold, Oxford Biomedica could join with AstraZeneca and the University of Oxford to produce an effective COVID-19 vaccine.



We moved heaven and earth to be able to utilise the ISCF grants scheme but doing so helped us to take some risk and raise the funding we needed to build our facility. Had we not done that, we wouldn't have been in a position to support the vaccine."

Dr James Miskin, Chief Technical Officer

Recommendation 2: Fund the Biomedical Catalyst competition in the long-term

Recommendation: Commit to a long-term funding plan for the Biomedical Catalyst competition, increasing its annual budget to £100 million per year for the length of the Spending Review.

The Biomedical Catalyst (BMC) competition, a sector-specific grant funding programme run by Innovate UK is a key source of early-stage funding for SMEs to help scale scientific ideas and products into therapies for patients, contributing significantly to both the health and the wealth of the nation.

Unlike other funding streams, the BMC funds ideas that companies have come up with themselves, regardless of what aspect of improving health they are aiming to target. This complements mission-based funding streams and provides a unique benefit to SMEs looking to fund their own ideas. It also targets the earliest phase of R&D, including translation of academic research, where there remains a funding gap.

The Biomedical Catalyst



Generates £4.72 in business value for money for every £1 invested



Leverages £5 of private investment for every £1 of public expenditure



Companies in receipt of the funding increased their R&D investment by 93%



Companies grew and created the equivalent of up to 330 jobs

In 2020–21



**211 out of 374
applications were
recommended
for funding, but only
18 organisations
were awarded grants**

Recent independent analysis from IPSOS Mori showed the Biomedical Catalyst, which has been operating with varied budgets for almost a decade, generates £4.72 in business value for money for every £1 invested. The programme leverages £5 of private investment for every £1 of public expenditure, vastly outperforming other public funding programmes which, on average, leverage £1.40 of private investment for every £1 of public investment.¹²

Companies in receipt of the funding increased their R&D investment by 93% and grew their companies in terms of employment by 11–15% over 3–5 years, creating the equivalent of up to 330 jobs.

In HM Treasury's Plan for Growth, the huge successes of the Biomedical Catalyst programme have been rightly recognised. Despite this, the scheme has received different levels of funding every year and its funding is only renewed on a year-on-year basis with no guarantee that it will run the following year. The scheme is massively oversubscribed, resulting in many companies that meet the success criteria not receiving funding. This obstructs opportunities for pioneering companies to grow and the UK economy to benefit, depriving people now and in the future of innovative treatments for diseases.

In 2020–21, out of the 374 applications received, 211 scored over 70% and were recommended for funding, but only 18 organisations were awarded grants due to budget constraints. Though a budget of £100 million would still not be able to fund all the applications made to the Biomedical Catalyst that were recommended for funding (total grant funding needed for this would have been over £250 million), it is evident that the current funding levels are vastly insufficient, particularly for a funding stream that provides such considerable returns.

The BIA has been proudly championing the Biomedical Catalyst for the leading role it plays in translating life sciences innovation into economic benefit for the nation. Continual funding for the competition from HM Treasury is welcome, but it is imperative that this is increased to £100 million and a multi-year commitment is secured to crowd in private investment to UK life sciences, validate early-stage firms with expert approval and increase employment in science-based jobs of the future.

To be able to properly capitalise on the benefits of the competition the annual budget for the Biomedical Catalyst competition should be increased to £100 million per year for the length of the Spending Review.

De-risking innovation at pace

Alchemab Therapeutics



Most medical research is based on understanding what is going wrong in the body and looking for drugs that could help put it right. Alchemab Therapeutics are taking a different approach – beginning with particular people who seem to fare better, even when they develop serious illnesses such as cancer or neurodegenerative disease.

For example, in Huntington's disease, patients typically experience early-onset progressive damage to nerve cells in the brain. It is usually a fatal disease and there is currently no cure. However, a minority of patients who inherit Huntington's remain well for longer than expected. Alchemab's approach is to compare these resilient people with typical patients and with healthy people. They are studying sets of antibodies – part of the body's protective immune response – that are unique to these unusual patients to see if they hold the key to treating other, more typical patients.

In 2021, Alchemab won an Innovate UK Biomedical Catalyst grant of £1.1 million to work with the Medicines Discovery Catapult on antibodies that may have a protective role in Huntington's disease. Together they are discovering how the antibodies interact with nerve cells and hope to develop new treatments to this devastating disease.

The company has also formed partnerships with biobanks and academic groups to help them collect samples from unusually resilient patients with other conditions that typically have a very poor prognosis, such as pancreatic cancer. They have recently partnered with AstraZeneca to aid in the development of new treatments for prostate cancer.

Alchemab has now raised £60 million in series A financing from a syndicate of international investors, one of the largest deals of its kind in Europe. As a result, the company is growing rapidly, increasing from no employees to more than 30 staff in only 18 months, with labs in Cambridge and offices in London.



In 2021, Alchemab won a Biomedical Catalyst grant of £1.1 billion and has raised £60 million in series A financing



From no employees to more than 30 staff in only 18 months



Ours is a very new way of working in drug discovery. The Biomedical Catalyst funding was so important because it allowed us to carry out some high-risk research on an extremely difficult disease. It also gave independent validation to our work and that was very helpful when it came to raising the capital we needed to grow and move our programme along."

Dr Olivia Cavlan, Head of Business

Nurturing new industry

Elasmogen



Elasmogen is part of a cluster of new biotech firms growing up alongside Aberdeen's legacy oil and gas industry. Founded in 2014, and with support from Innovation UK at critical points in its development, the company is creating better treatments for cancer and autoimmune diseases based on molecules called soloMERs.

SoloMERs are derived from proteins in shark blood that have similar abilities to human antibodies – they can recognise and bind to targets such as cancer cells, resulting in their destruction. Many researchers have created targeted drugs using human antibodies, but these are big in molecular terms, complicated and costly. SoloMERs, on the other hand, are smaller, meaning they can reach more parts of the body, such as solid tumours. They are also much simpler, making them easier to engineer.

In 2015 a feasibility grant enabled Elasmogen to partner with Queen's University Belfast to work on new cancer treatments. Unlike traditional chemotherapy that can have serious side effects throughout the body, these use soloMERs to target cancer cells and deliver tumour-destroying drugs. This collaboration with Queen's continues with a Knowledge Transfer Partnership-funded

post and a researcher funded by the Biotechnology and Biological Sciences Research Council.

Thanks to a £700,000 Biomedical Catalyst grant in 2017, Elasmogen has also been developing treatments for autoimmune diseases, including inflammatory bowel disease. Unlike other new antibody drugs that have to be injected into the body, these soloMER-based drugs will be in pill form.

In the same year, Elasmogen took part in an Innovate UK investment showcase that resulted in more than £3 million of Enterprise Investment Scheme funding from growth investor Deepbridge Capital. The relationship with Deepbridge Capital continues as Elasmogen works to secure series A funding of £15 million to take its first drug to the clinic.

Elasmogen also has an established partnership with drug development company Almac Discovery. Supported by an early-stage award from Innovate UK, they are developing a targeted chemotherapy drug for women with an aggressive form of breast cancer that should enter the clinic in early 2023.



In 2017, Elasmogen won a Biomedical Catalyst grant of £700,000, and secured series A funding of £15 million



Having support from Innovate UK to get to these key milestones in our development has enabled investors to see our potential. The Biomedical Catalyst funding has given me the fuel to go after series A funding, to grow the company, expand our pipeline and importantly our incredible team."

Dr Caroline Barelle, CEO and founder

Attracting investment

LUNAC Therapeutics



LUNAC Therapeutics was founded by Professor Helen Philippou and Dr Richard Foster as a spin-out company from the University of Leeds to develop a new type of anticoagulant drug.

Anticoagulants are prescribed to treat or prevent blood clots. For example, people with atrial fibrillation – an irregular heartbeat – may be offered anticoagulants to prevent blood clots forming in the brain. However, all existing anticoagulants increase the risk of bleeding, meaning there is tight balance between achieving optimal treatment for prevention of blood clots without incurring a bleed.

Professor Philippou and Dr Foster are taking a different approach by targeting a specific element in the body's complex blood clotting mechanism that makes it possible to stop dangerous blood clots, with minimal risk of bleeding. While developing this approach, Professor Philippou took part in an accelerator programme at life sciences campus Alderley Park, speaking to pharmaceutical companies and clinicians to better understand the unmet need in treating and preventing blood clots, in preparation for a spin out.

In 2018, LUNAC was founded and secured Biomedical Catalyst backing of £3.14 million the following year to develop a new anticoagulant drug in collaboration with the University of Leeds and the Medicines Discovery Catapult. Around the same time, LUNAC finalised a deal with life science venture capital firm Epidarex Capital and the University of Leeds for a further £2.65 million of investment. Epidarex Capital now sit on LUNAC's board, providing their business expertise alongside their financial support. Another £2.35 million of venture capital was secured in 2020.

The team at LUNAC continue to work on their anticoagulant drug, progressing through the laboratory and preparing for patient trials. Meanwhile, LUNAC recently won best start-up award from BioNow, the industry organisation for the North of England,

Founded in 2018, LUNAC secured Biomedical Catalyst backing of £3.14 million and almost £10 million in further investment

and are shortlisted finalists for the UK life sciences organisation OBN's best start-up biotech award. The company is also listed among JP Morgan's top 200 female-powered businesses in the UK.

In 2021, LUNAC announced a further £4.75 million in funding from existing investors and from the Northern Powerhouse Investment Fund and the Government's Future Fund.



We're getting bigger and have been able to bring on-board new staff, invest in regulatory and manufacturing preparation, and create the company structure needed to take a product to clinical development. This wouldn't have happened without the Biomedical Catalyst, which helped kick-start this part of our growth. Funding like this really helps prepare the company and attract the next set of investors."

Professor Philippou, Founder

Recommendation 3: Unlock UK-based institutional capital

Recommendation: Ensure the British Business Bank has the resources it needs to address the scale-up challenge and deliver cross-government support for the Life Sciences Scale-Up Taskforce.

Continuous support for the UK life sciences sector since 2012, when the Conservative-led Government published its first strategy for the sector, has resulted in a 1,000% increase in investment in the UK's innovative life sciences SMEs, with a record £2.8 billion raised by companies in 2020.¹³

The UK has attracted growing amounts of foreign venture and public market capital, particularly from the US, allowing companies to increasingly achieve large single funding rounds to finance intense R&D investment and business growth. This is a welcome change of pace for a sector that has historically been underfinanced. But, whilst we are the clear European life sciences leader, UK company fundraises are still being outpaced by the US and the Far East, where equity finance continues to be easier, faster and cheaper to access. Moreover, the lack of UK-based investors in larger funding rounds weakens the incentive for UK companies to remain and grow in the UK, meaning jobs and economic activity are lost and UK science is commercialised elsewhere.

If the Plan for Growth and Vision for Life Sciences are to achieve their ambitions, it must address this so innovative life sciences businesses can scale rapidly unconstrained by access to finance.

With the pandemic focusing UK investors' minds on the opportunities of our world-leading life sciences industry, the Government and the sector have a unique opportunity to harness the UK's status as a global finance hub to deliver on the Government's ambition to also make the UK a global life sciences hub.

The British Business Bank and its British Patient Capital subsidiary are powerful tools at the Government's disposal to crowd-in private investors and catalyse more UK-based venture capital funds. Its budget must remain under constant review and be responsive to the scale of the market failure behind the scale-up capital shortage.

The UK SME life sciences sector



**Since 2012,
1,000% increase
in investments**



**A record of
£2.8 billion raised
by companies in 2020**

The Life Sciences Scale-Up Taskforce, launched as part of the Vision for Life Sciences, will look at the barriers and solutions to allow large UK financial institutions, such as pension funds, to invest in the sector, as well as increasing the supply of scale-up capital from other sources. This will build on work already underway by HM Treasury, the Department for Work and Pensions and financial regulators as part of the productive finance agenda. The BIA urges cross-government support for the work of the Scale-Up Taskforce and quick implementation of its recommendations when it delivers later this year.

For the Life Sciences Scale-Up Taskforce to effectively address the issues with accessing scale-up capital, the British Business Bank needs to be adequately resourced to carry this out and the Government must look at the best way to implement its recommendations.

Creating confidence in UK manufacturing

FUJIFILM Diosynth Biotechnologies



New drugs developed in the lab need to be produced at scale and according to strict safety standards before they can be given to patients. Many treatments consist of very complex molecules that cannot be made through traditional chemical synthesis processes. Instead, they are developed and produced through biological systems: using bacteria, yeast, or mammal cells as tiny living factories and grown in sufficient numbers to produce treatments at scale.

FUJIFILM Diosynth Biotechnologies works with a diverse range of clients spanning university spinouts to global pharmaceutical companies, supporting them in the development of scalable and robust biomanufacturing processes that move treatments from the laboratory setting into the clinic. As demand for biomanufacturing has grown, the business has expanded.

The company's UK base is at Billingham in Teesside – an area known for its chemical and energy industries. Given the rapid growth the organisation has

experienced, the building that housed the 300 office staff and served as shopfront to visiting clients was soon outgrown. Anticipating this, the company bought a seven-acre plot adjacent to the site and in 2018 discussions to build a new head office and create a modern green campus began.

With Government support, both in the form of £2.6 million investment from the Tees Valley Combined Authority towards the cost of the build and local government support to gain planning permission to close a road that cut through the campus, the plan was agreed. Building began in 2020 and the modern and flexible head office will open in 2021.

This flexible approach is key to FUJIFILM Diosynth Biotechnologies' success as a contract development and manufacturing business. It means they are able to adapt to the changing demands of manufacturing pharmaceuticals. For example, this year, the company has been producing COVID-19 vaccines for Novavax for the UK Government.



FUJIFILM received £2.6 million worth of Government support, including investment from the Tees Valley Combined Authority, to build a new head office and create a modern green campus



The pandemic has shown us that offshoring all your manufacturing is quite a high-risk strategy. For us, the Government's assistance is a really important sign of their commitment to supporting and investing in UK manufacturing."

Paul Found, Chief Operating Officer

Producing better treatments sooner

Areacor Therapeutics

Founded in 2007, Areacor was built on the idea that many medicines are effective in treating patients, but they could work faster, be easier to use, and simplify patient care. For example, insulin for diabetes lowers levels of sugar in the blood, but once injected, there is a time lag when sugar levels can be too high. This leaves patients vulnerable to serious complications including heart attack or stroke. Areacor's lead proprietary product seeks to solve this challenge.

Arestat™, the company's proprietary formulation technology platform consists of a panel of pharmaceutical tools, each one enabling a combination of ingredients to enhance the properties of treatments and vaccines to overcome a specific challenge. Challenges could include drugs that are difficult to store so have to be kept at a specific temperature, or drugs that are difficult to concentrate, meaning they have to be given slowly via an intravenous infusion. Most pharmaceutical products have more than one issue to overcome and Areacor works with its partners to combine their enhanced version of the ingredients to address each challenge.

In 2012, Areacor won some of the first Biomedical Catalyst funding to develop a safe and easy to administer formulation of an immunotherapy treatment. The company has continued to develop improved formulations of specialist hospital treatments as well as new formulations of faster-acting insulin.



The Innovate UK funding enabled Areacor to recruit a team of more than 30 staff



Between 2018 and 2020, Areacor invested £11.2 million in research and development and received £1.8 million in R&D tax credits. To fund this investment, Areacor raised £6 million of new equity in 2018 which leveraged Innovate UK grants. In 2021, Areacor received a second Biomedical Catalyst grant of £2.8 million to support development of its fast-acting insulin in the next phase of patient trials. Areacor subsequently raised £20 million in an oversubscribed initial public offering.

The Innovate UK funding enabled the firm to recruit new clinical and product-design staff, creating a team of more than 30 staff, and it will expand further following the latest investment.



We want to recruit the best scientists and the Biomedical Catalyst grant helps with that because it showcases our technology and that our business is viable. When we were talking to investors, especially to the more generalist investors, the scientific and commercial validation that comes with the Biomedical Catalyst is a key factor. Crucially, the funding has enabled us to move forward at speed to advance our portfolio of better treatments for patients.”

Sarah Howell, Chief Executive

Recommendation 4: Expand R&D tax incentives

Recommendation: Expand R&D tax incentives to cover data, cloud computing and capital expenditure to ensure the regime is internationally competitive and to anchor long-term R&D activity in the UK.

The small and large business R&D Tax Credit schemes, which provide a minimal-bureaucracy system that rewards and amplifies companies' own investment in R&D, are often cited by BIA members as the most valuable form of innovation support. Continuing them and ensuring they function as intended is critical to maintaining the UK's attractive fiscal environment for R&D investment and achieving the Government's stated ambition to raise R&D investment to 2.4% of GDP by 2027 and make the UK the global hub for life sciences.

Tax expenditures such as R&D tax credits are an important part of the policy mix required to achieve these objectives. It is imperative that the Government ensures the incentive scheme can encourage R&D investment in the most effective way, that the UK's tax regime remains internationally competitive, and the UK continues to be a global destination for life sciences investment.

The two regimes, SME tax relief and R&D Expenditure Credit (RDEC), target different types of companies at different stages of the lifecycle, and work well together. While both schemes have the policy intention to increase R&D activity, they seek to achieve this in different ways because of the different challenges faced by SMEs

Oxford University study shows higher R&D tax relief incentivises more R&D spending

In 2008, SMEs were redefined from having 250 employees or less to 500 or less. With this change, companies with a headcount of between 250 and 500 became eligible for a more generous SME tax credit scheme. A study by the Saïd Business School at the University of Oxford found that when comparing the newly-classified SMEs on the more generous scheme to the companies

that continued to be classed as large, those now in receipt of a more generous R&D tax credit increased their R&D investment by 33%. The more generous R&D tax credit reduced the cost of doing R&D for the company by 22%, so the increase in R&D investment was due to being incentivised to invest more rather than a reallocation of funds.¹⁴

and large companies. Both schemes must remain relevant to how R&D is conducted in the 21st century if they wish to continue to incentivise investment.

The BIA recommends two key changes to the current schemes to reflect the nature of R&D investment. Firstly, the inclusion of data and cloud hosting, which is now seen as an essential input to R&D, and which the Government has agreed that there is a compelling case for its inclusion.

Secondly, the inclusion of capital expenditure in both regimes. The UK has historically offered the lowest incentives for R&D capital expenditure out of all the G7 countries,¹⁵ and the 100% tax relief that can be claimed at the year of acquisition of the asset is of little benefit to SMEs that are loss-making already.

By widening the scope of the R&D tax credit scheme to cover key features of present-day R&D activity, the Government can bring the schemes in line with current technology to make the UK more internationally competitive and encourage additional investment in R&D to unlock future innovation and economic activity.

Establishing a pioneering pharmaceutical company

GW Pharmaceuticals



GW Pharmaceuticals (GW), a Jazz company, is a global biopharmaceutical company that has established a world-leading position in cannabinoid science and medicine. GW's mission is to unlock the potential of the cannabis plant through rigorous scientific investigations and extensive clinical trials to improve the lives of seriously ill patients. GW's longstanding commitment to the UK was recognised in 2021 with the Queen's Award for Enterprise in Innovation, regarded as the highest official UK award for British business, for GW's ground-breaking work to harness cannabinoid science to create regulatory approved, world-first cannabis-based medicines.

In 1998, GW's founders, Dr Geoffrey Guy and Dr Brian Whittle took up the challenge of creating a tried and tested, regulatory approved modern medicine from the cannabis plant. Along with its physician-investigators, collaborating scientists, and patients, GW embarked on an ambitious and pioneering programme to investigate the therapeutic potential of cannabis, at a time when cannabis still carried a significant stigma and barriers to research were formidable. In the period between 2000 to 2017, GW was eligible for the UK Government's SME R&D tax relief scheme and took advantage of this to support investment into its world class R&D programmes, as well as state of the art manufacturing sites and research facilities. This support also allowed the company to focus on its product and corporate development.

To date, the company's continued dedication and investment into R&D and the facilities needed to bring cannabis-based medicines to the patients who need them, has resulted in the regulatory approval of two, world-first, and potentially life-changing treatments in a new frontier of medicine. This investment has enabled GW to conduct over 100 clinical trials involving over 8,000 patients globally.

These trials have allowed GW to achieve regulatory approvals in over 40 countries around the world, including in the US and EU, by demonstrating that complex botanically extracted cannabis-based medicines can be successfully routed through the pharmaceutical regulatory approval pathway.

More recently, GW has invested approximately £470 million in R&D and £114 million in manufacturing facilities in the UK in the last five years. GW continues to invest in its future, and once complete, the new building at its site in Kent is expected to be the largest GMP facility in the extraction of cannabis compounds anywhere in the world. This continuous investment in our manufacturing facilities provides GW with the scale to supply regulatory approved medicines to meet the growing needs of the patients for novel treatment options.



GW conducted 100 clinical trials involving over 8,000 patients globally



In the last five years, the company has invested £470 million in R&D and £114 million in manufacturing

Building UK manufacturing

eXmoor Pharma Concepts



Some of the most exciting new ideas in medical research are based on cell therapy or gene therapy, where patients are treated with beneficial cells or genes respectively. These have the potential to treat a wide variety of diseases including sight loss, haemophilia and cancer.

Producing experimental cell and gene therapies in the lab requires a high level of skill and specialist equipment. Translating these treatments to patients in the clinic and commercialising them means carrying that same technical challenge but on a far bigger scale.

Founded in 2004, eXmoor Pharma enables academics and biotech firms to negotiate this difficult stage in developing treatments. The company began operating as a small group of highly skilled consultants, advising on the processes and facilities needed for biomanufacturing and specialising in cell and gene therapies.

By 2016, eXmoor was looking to diversify and form a physical presence. The directors realised that the Government's R&D tax credit scheme provided a very strong incentive to reinvest profit into the business and grow by creating a physical lab space and employing more staff. And so, in 2017, eXmoor opened its own lab, initially employing four scientists. The company has continued to make use of the tax credit scheme, reinvesting more to expand

the business, and now employs a team of 24 scientists within a total of 40 people. eXmoor now currently spends over £900,000 on R&D per year which has resulted in a total tax benefit of over £1 million since they started making use of the tax credit scheme. This benefit has catalysed their expansion plans.

eXmoor's client list includes clinical partners, such as Guy's Hospital, academic organisations, such as King's College London, and biotech businesses. They have worked with MeiraGTx to turn a former Royal Mail sorting office in London into a new manufacturing facility for gene therapies, particularly to treat sight loss.

As a result of this initial expansion, partly funded by R&D tax credits, the firm has recently received £12 million from healthcare investors MVM Partners. This will enable eXmoor to grow further by creating a dedicated development and manufacturing facility near their current site in Bristol. This will have capacity to manufacture cell and gene therapies on the scale needed for early patient trials.



Ultimately what the R&D tax credits have enabled us to do is to help anchor manufacturing of cell and gene therapies in the UK. We don't want to see the amazing outputs from UK universities having to go elsewhere for manufacture, we want to retain skilled staff and facilities in the UK."

Dr Remy Martin, Business Development Manager



eXmoor spends over £900,000 on R&D per year which has resulted in a total tax benefit of over £1 million

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About the BIA

Established over 25 years ago at the infancy of biotechnology, the BioIndustry Association (BIA) is the trade association for innovative life sciences in the UK. Our goal is to secure the UK's position as a global hub and as the best location for innovative research and commercialisation, enabling our world-leading research base to deliver healthcare solutions that can truly make a difference to people's lives.

Our members include:

- 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

We promote an ecosystem that enables innovative life science companies to start and grow successfully and sustainably, and we do this through *Influence, Connect, and Save*.

Influence

The BIA represents the interests of its members to a broad section of stakeholders, from government and regulators, to patient groups and the media. We also work with organisations at an international level to ensure that UK biotech is represented on the global stage including Europabio, EFPIA and ICBA. BIA is the key thought leader for the sector – working across a wide range of related issues including policy, finance, science, regulatory, legal and talent.

Connect

The BIA provides many varied opportunities for life science leaders to connect with each other – to network, share and learn from experience, to access sector thought leadership and to take key issues forward. From the famed BIA Gala Dinner, to the CEO & Investor Forum, Women in Biotech networking evenings, quarterly committee meetings and our many regional events, to name but a few, the BIA provides access to a highly respected and diverse network. BIA also works to ensure that we provide opportunities and promotion for our members internationally – through panels and networking events at major events overseas, we are raising the profile of the UK as a global hub. We know that promoting what you do as an organisation is important, and we help organisations to raise their profile – at events and through our online presence and communications.

Save

For many of our emerging members (and a good number of well-established ones too) the BIA Business Solutions Scheme provides significant savings that are helping them to grow more cost-effectively. We believe this is the most competitive scheme of its kind in the UK.



For more information about the BIA, please contact info@bioindustry.org.

Connect

Online and in person with industry leaders

40+ events across the UK
760+ organisations
2,500+ delegates
5,000+ readership

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