Royal Society of Biology

The Royal Society of Biology (RSB): representation to the UK Spending Review Part 2, 2025

Summary

Businesses in the UK life sciences industry contributed over £108.1 billion to the economy in 2021/22[1]. The life sciences workforce is crucial to sustainable management of our ecosystem services in the UK, worth a total asset value of around £1.8 trillion in 2022[2]. From cutting-edge research to transformative technological advancements, the life sciences sector's innovative solutions help to: improve people's health and protect the environment we rely on; develop climate-resilient food systems and clean, renewable energy sources; and educate and employ a diverse workforce across the nation.

The autumn announcement of a £20.4 billion budget allocation for 2025-2026 is extremely welcome to support research, development and innovation (RDI), including in the life sciences sector. As Government establishes its plans with this Spending Review, it is vital that these contain a long-term vision for investment in RDI. This support, delivered in consultation and collaboration with the sector, should ensure UK life sciences continue to advance societal wellbeing and sustainable economic growth, helping Government deliver on its missions.

For Government to maximise the benefit of the life sciences sector to the UK, we are calling for strategic, long-term investment in RDI, people and infrastructure, to:

1. **Unlock sustainable economic growth, building on the UK's existing strengths**
2. **Remove barriers to resilient job growth, addressing education and skills provision challenges**

[1] Office for Life Sciences (OLS), Bioscience and health technology sector statistics 2021 to 2022
NB: The economic impact of the life sciences sector measured within this resource is based on a narrow definition of life sciences, for example not including agriculture, and thus underestimates the true size of the economic contribution made by the sector.
[2] Office for National Statistics (ONS), UK natural capital accounts: 2024

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1. Unlock sustainable economic growth; building on the UK's existing strengths

Role of the life sciences

We welcome the identification of the life sciences as one of the eight growth-driving sectors in the Industrial Strategy. The life sciences encompass all areas of the science of life, from molecules to whole organisms and ecosystems – covering the breadth of the biosciences and bioeconomy, which contribute to society across health, food, security, the environment and beyond. The Department for Science, Innovation and Technology (DSIT) rightly noted the life sciences sector as a cornerstone for positioning UK leadership in science and innovation. However, delivering growth will require acknowledgement and support to the full breath of the bioeconomy. Life sciences outcomes provide vital contingency to address the most pressing global challenges that we currently face, such as the emergence and spread of infectious diseases, climate change and biodiversity loss[3]: **mitigating global challenges is of direct national security interest and economic benefit, through avoidance of planetary insolvency and societal destabilisation**[4]. One cross-disciplinary area of the biosciences, engineering biology, offers many exciting applications, which leverage bio-based solutions to help deliver across Government missions. A recent report by the House of Lords Science and Technology Committee[5] has called for public investment "at speed" to maximise its contribution to the UK economy and public services and avoid an exodus of capital and companies.

Unlocking growth

Productive RDI is at the heart of economic growth. **To deliver on the mission to achieve the highest sustained economic growth in the G7, Government must aim to make the UK a leading country in the G7 on strategic RDI investment.** Investment in RDI is supported by public opinion, with 70% of the population in favour of Government-funded research[6]. The COVID-19 pandemic highlighted how decades of prior discovery research enabled the development of

[3] RSB and Content With Purpose (CWP), 'Biology for a Better Tomorrow', 2024
[4] Institute and Faculty of Actuaries (IFoA), Planetary Solvency – finding our balance with nature, 2025
[5] House of Lords Science and Technology Committee, Don't fail to scale: seizing the opportunity of engineering biology, 2025
[6] Campaign for Science and Engineering (CaSE), Attitudes to taxpayer investment into RDI, 2022-2023

new vaccines at pace[7], taking pressure off the NHS[8]. **Sector-driven discovery research must be prioritised, alongside mission-led translational RDI, as the basis for solutions to known, and as-yet unknown, challenges**.

In addition to investing proportionately in discovery research, Government must use its mission-led support for translational RDI to **stimulate further private sector investment**. Every £1 of public RDI funding returns approximately £0.60-£1.10 of private RDI investment in the short term, and £3.09-£4.02 in the long term[9]. The Clinical Pharmacology Skills Alliance (CPSA) estimates that a £1 increase in Government spending on medical research is associated with a £0.83-£1.07 increase in private research spending[10]. For instance, clinical research activity conducted within the National Institute for Health and Care Research (NIHR) Clinical Research Network in 2016/17-18/19 helped generate a total of £2.7 billion of gross value added (GVA) and the creation of over 47,000 jobs. An NHS fit for the future is underpinned by investment in clinical research, providing better patient outcomes in the form of improved access to more efficient diagnostics and treatments, or preventative interventions that can help tackle health inequalities and the complex care needs of an ageing population.

Targeted, appropriate incentives are important to drive private investment as a direct engine to economic growth. However, **direct public investment must be equally as strategic**, to include targeted support for pillar components of the RDI ecosystem, where market forces can reduce the available contribution from private funding. Alongside discovery research, these pillar components may include skills, infrastructure, inter- and trans- national partnerships, and RDI for risk reduction.

Long-term funding cycles

In line with RSB's previous recommendations[11], Government has made the welcome commitment to provide stability and long-term certainty for "key RDI activities" through 10-year budgets. **For these long-term RDI funding cycles to deliver the best outcomes, they must be developed in collaboration with the RDI sector**. Their design and implementation will require consideration of various

[7] Excler JL et al. Factors, enablers and challenges for COVID-19 vaccine development, BMJ Glob Health, 2023
[8] Public Health England (PHE), COVID-19 vaccine surveillance report. 2021
[9] National Centre for Universities and Business (NCUB), Unlocking growth: The impact of public RDI spending on private sector investment in the UK, 2024
[10] Clinical Pharmacology Skills Alliance (CPSA) representation to the Spending Review 2021
[11] RSB, General election brief, 2024

parameters and criteria to identify the beneficiaries, strike the right balance between stability and flexibility, and set realistic timeframes on returns while also being mindful of reducing unnecessary bureaucracy[12].

Covering the full economic cost

Reaching maximum productivity and efficiency in teaching, training and RDI's contribution to economic and societal benefit (i.e. delivering across Government missions) depends on eliminating shortfall, and opportunity cost through cross-budget dependencies, by accurately measuring and appropriately funding the full economic cost (FEC) of research activities. Of course, efficiency and effectiveness in funding utilisation are also key. The shortfall in funding FEC of RDI is a long-term problem. For universities, the quality related (QR) block grant of strategic institutional research funding, even with cross-subsidy from international tuition fees, does not currently cover the FEC of research in many institutions, especially in light of other recent changes such as the national insurance increase – ongoing redundancies in universities may be evidence of this. In research institutes, the issue is compounded because they may lack additional teaching funding streams. Some UKRI research council-funded research institutions receive neither QR nor teaching funding. **Assessment of this complex picture requires holistic review, to increase end-to-end coverage of the costs of research activity.**

Universities are a crucial component of the UK RDI[13] landscape, with contributions ranging from the dissemination of knowledge and skills to the translation and commercialisation of their research activities via spin-out companies. Recent estimations have highlighted that every £1 of public money invested in the higher education sector generates £14 of economic benefit[14]. Additionally, publicly-backed bioscience spin-outs have contributed £5.2 billion to the economy between 1997 and 2021[15]. At a time when universities are facing significant financial pressures[16], **support in the short term, while long-term transformative reform is carried out, is vital to help them achieve financial sustainability** so that they are fit for purpose to continue delivery towards the Government's missions.

[12] CaSE, Long-term RDI funding, 2024
[13] CaSE, Universities: A crucial component of UK RDI, 2024
[14] London Economics, The economic impact of higher education, teaching, research and innovation, 2024
[15] UK Research and Innovation (UKRI) News: Publicly backed bioscience spin-outs make big impact on economy; and Biotechnology and Biological Sciences Research Council (BBSRC), Economic impact assessment of BBSRC attributable spin-outs, 2024
[16] Office for Students (OfS), Navigating financial challenges in higher education, 2024

Support at the regional level

The Chancellor's recent announcements about working with local leaders to build pipelines of investment and projects linked to regional growth priorities[17] is welcome. However, for these initiatives to be successful, **investments should also address regional disparities**. The South East continues to concentrate the highest share of both life sciences industry employment and turnover, accounting for 23% of total employment and 30% of total turnover in 2021/22. Appropriate funding to establish and maintain vital infrastructure that supports the innovation process from discovery to commercialisation, and initiatives that foster inter-regional collaborations, could help attract private investment to tackle these imbalances. Building on current regional strengths should include mapping and investment in future potential across the regions. The Royal Society of Biology is a member of CaSE, whose submission to the spending review covers further advice from the Science, Technology, Engineering and Mathematics (STEM) sector in this area.

2. Remove barriers to resilient job growth; addressing education and skills provision challenges

STEM skills gaps

Raising living standards in every part of the UK relies on breaking down the barriers to opportunity and building a thriving, scientifically-literate workforce. **The need for a skilled, digitally-enabled, flexible and dynamic workforce has never been greater; the growing skills gap and regional disparities must be addressed through strategic investment.** There were over 9 million people in STEM employment across all industries in 2023 and it is projected to grow by 4% by 2030[18]. The life sciences sector, as narrowly defined by the Office for Life Sciences (OLS), employs over 300,000 people[19], with the latest data showing an upward trend for both employment and revenue generated. The pharmaceutical industry alone contributed £8.7 billion to the total of business RDI performed in 2023, representing 17.4% of total contributions[20]. Labour market disruptions, including new technologies such as artificial intelligence (AI) represent opportunities to

[17] HM Treasury, Oxford-Cambridge Growth Corridor press release, 2025
[18] Department for Education (DfE), Supply of skills for jobs in science and technology, 2023
[19] OLS, Bioscience and health technology sector statistics 2021 to 2022
NB: The economic impact of the life sciences sector measured within this resource is based on a narrow definition of life sciences, for example not including agriculture, and thus underestimates the true size of the economic contribution made by the sector.
[20] ONS, Business enterprise research and development, UK: 2023

improve living standards through new professional occupations - but only if workers can keep pace with the skills and qualifications needed to attain these[21]. Currently, they do not: over a third (36%) of UK vacancies in 2022 were down to skills shortages[22]. The Science Industry Partnership projected that the life sciences sector will need to generate 133,000 jobs by 2030, to meet forecasted skills growth demands[23]. The STEM skills gap overall is widening, with over 173,000 unfilled STEM roles costing the economy £1.5bn annually[24].

Taking the example of AI, and in light of the AI Opportunities Action Plan[25], strategic Government support is necessary to resource the process of digitally enabling the workforce across sectors. However, **this must be delivered in conjunction with community consultation to be effective**, given that different parts of the life sciences sector, for example, have different approaches (and are at different stages in scoping and integration), with regard to AI. Thus, a one-size fits all approach to AI implementation (in terms of infrastructure, skills, etc.) is unlikely to work on the ground. The AI Action Plan priority first step, involving an updated, accurate assessment of the size of the relevant skills gap, is welcome.

By contrast, considering the existential threat of global challenges such as biodiversity loss and climate change, a report by the Chartered Institute of Ecology and Environmental Management (CIEEM) and Lantra[26] found that there is an unquantified capacity crisis and skills gap in the ecology sector, and "no robust attempt to quantify future demand for ecology skills as we scale-up climate change adaptation". Failure to assess and address skills gaps across the life sciences will prevent the UK delivering across Government missions, such as making Britain a clean energy superpower. It will prevent us delivering drivers of progress, such as reducing pressure on the NHS via preventative measures, or improving the efficiency and effectiveness of the planning system to achieve environmentally-sustainable development. Pervasive skills gaps will stymie our competitive edge and leading diplomatic role among other nations, in agreeing measures and delivering actions on the international stage, e.g. as part of the United Nations Framework

[21] National Foundation for Education Research (NFER), The Skills Imperative 2035
[22] Skills England, Driving growth and widening opportunities, 2024
[23] Science Industry Partnership, Life Sciences 2030 Skills Strategy
[24] STEM Learning, STEM Skills Indicator, 2018 and CaSE, The Skills Opportunity: Building a more innovative UK, 2023
[25] Department for Science, Innovation and Technology (DSIT), UK AI Opportunities Action Plan, 2025
[26] Chartered Institute of Ecology and Environmental Management (CIEEM), Vocational pathways into nature-based green jobs, 2023

Convention on Climate Change. If these skills gaps remain undefined and persist, opportunity cost and repercussions for the economy and societal wellbeing could be severe.

Need for specialist teachers

The skills gap and regional disparities must be addressed via strategic investment in education and training. A world-class STEM workforce requires world-class education and training: all students across primary, secondary and tertiary settings should be taught by specialist teachers with disciplinary expertise. **Government must invest in evidence-led subject-specific continuing professional development (CPD) for teachers throughout their careers**, and place disciplinary expertise at the heart of teacher recruitment and retention. The recent 47% reduction – of almost £4 million – in funding for CPD for science teachers, risks reducing the ability for teachers of science to upskill and develop as biology teachers, which in turn impacts the school-to-professional pipeline.

Investment in science education through investment in subject-specific training, retention and recruitment will provide better quality specialist teaching for more students. Feedback from teachers of the sciences[27] reveals trends of concern: reported understaffing across all three science subjects has increased since 2023; 40% of science teachers report understaffing of technicians – a vital resource for supporting school education; and teachers in areas of high socio-economic deprivation are more likely to report higher staff turnover and understaffing. Only 13% of biology teachers responding to the survey felt their professional development was sufficient, revealing further decline from responses in 2023 and 2022.

Better, more meaningful data collection on teacher specialism, recruitment and retention is needed at government level, broken down by subject for biology, chemistry and physics. The school workforce census is not reliable due to inconsistencies in the ways schools report to the census, timetable and recruit - resulting in unreliable data on teacher specialism, hours taught by subject, and teaching vacancies for biology and the sciences.

Upskilling, re-skilling and CPD

[27] Royal Society of Chemistry (RSC), Science Teaching Survey 2024

An accurate, national, cross-sector and landscape-wide assessment of key skills shortages is required, as exemplified above. This would provide a basis for employers, training providers, unions and other stakeholders to deploy efficient strategies to upskill and re-skill the workforce to address urgent needs. Such strategies should apply across career stages and include CPD schemes to retain and develop technical skills, as well as apprenticeships to upskill existing (as well as new) members of the workforce. **Skills England[28] should be appropriately resourced to deliver the audit and ensuing recommendations, and close involvement of the sector is imperative**.

The RSB and partner organisations across the STEM sector[29], are well-placed to assist in this endeavour. In 2025, the RSB aims to embark on a new scoping exercise, synthesising skills gaps across the life sciences. Additionally, the RSB promotes attraction and retention of a skilled workforce by providing training, CPD schemes and professional registration, and by supporting the Technician Commitment[30]. There is a crucial role for Government in supporting employers to facilitate and contribute to such schemes, as well as in funding them directly.

Attracting international talent

The skills gap and regional disparities must be addressed via strategic investment in appropriate immigration policy. Skills England reported[31] that specialist key occupations, such as laboratory technicians and biological scientists, may be affected by difficulty attracting international talent for more senior research positions. Isolating UK researchers and research institutions from the global community blocks this source of further skills and knowledge with which to further UK RDI. The UK must be as welcoming as possible to international scientists across the research workforce, and their families; the success of our science sector relies on the success of our international collaboration in science. **Government should take action to reduce upfront visa and immigration costs[32]**.

[28] Skills England information page
[29] RSC, Future workforce and educational pathways, 2025
[30] The Technician Commitment information page
[31] Skills England, Driving growth and widening opportunities, 2024
[32] CaSE, The Skills Opportunity: Building a more innovative UK, 2023

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About The Royal Society of Biology (RSB)

RSB is a learned society representing a diverse membership of individuals, learned societies and other organisations in the UK's life science sector. As a single unified voice for biology, we aspire to build a world that values its contribution to improving life for all by advising Government and influencing policy, advancing education and professional development, supporting our members, and engaging and encouraging public interest in the life sciences. Biological sciences underpin many essential aspects of society, from agriculture to the latest medical advances. They are central to addressing some of the most pressing global challenges that we are facing, such as climate change, biodiversity loss and the emergence and spread of infectious diseases. We have developed this submission in close collaboration with the RSB community and partners across STEM, aiming to reflect a consensus on key priorities for the sector to deliver its potential to benefit UK society and the economy. For further information or queries, please contact science.policy@rsb.org.uk or education.policy@rsb.org.uk