

9 September 2021

Rt Hon Rishi Sunak MP
HM Treasury
1 Horse Guards Road
London
SW1A 2HQ

Dear Chancellor

Spending Review 2021

Following the launch of the Spending Review (SR21), I am writing on behalf of the Royal Society of Biology to press for continued Government support for scientific research and skills across the UK. Our priorities include the following:

- We urge the Government to continue towards the R&D investment target of 2.4 per cent of GDP and to work actively with the community on ways to reach this.
- The climate and biodiversity crises need to be addressed, unleashing progress towards net zero and providing essential funding for adaptation.
- Biosecurity continues to need investment to reduce the deadly risks of anti-microbial resistance and the emergence of future pandemics.
- The Spending Review should include provisions to upskill the workforce, preparing for future needs for appropriately trained staff at all levels
- We support proposals for an Office for Science Education Professional Development, and for Government investment to develop subject-specific CPD for science teachers.

Biology for a changing world

The Royal Society of Biology (RSB) is a royal chartered professional body representing members and organisations across a wide range of specialisms. Our membership comprises over 17,000 biologists at all levels – including students, technicians, teachers, scientists in industry and high-impact academic researchers – as well as approximately 100 specialist member organisations with diverse expertise.¹ We use the terms 'life sciences', 'biology', 'biosciences', and 'biological sciences' interchangeably to describe all areas of the science of life, from molecules through whole organisms to ecosystems, and across all biological specialisms.

The biosciences played a vital role in protecting people and reopening economies around the world this year. We have all benefited from previous investment in research that put the UK at the forefront of COVID modelling, sequencing, clinical trials, treatment and vaccine development. Applications of biological research affect every aspect of daily life – from fuel to food, from pharmaceuticals to farming, from human health to the health of our environment. Working with peers across the sciences, maths, engineering and beyond, biologists are addressing the complex, interconnected challenges we face.

¹ A list of RSB Member Organisations is available on [our website](#).

Commitment and support for UK research and innovation

The Integrated Review² prioritises ‘sustaining strategic advantage through science and technology’. Investment is key to retaining our status as a science superpower, and leveraging co-investment from the private sector, yet as other countries continue to out-invest the UK, we risk losing our advantage. The economic benefits of science and research spending are well evidenced: UK Research & Innovation (UKRI) estimates that every £1 of public R&D investment generates around £7 of net benefit to the UK.³ Four years ago the Government committed to reaching 2.4 per cent of GDP investment in R&D by 2027, and to reach 3 per cent of GDP in the longer term.⁴ The 2.4 per cent target formed part of the 2019 Conservative Party Manifesto and the Spending Review 2020 outcome. The bioscience community welcomes the Government’s recognition of the value of research. We strongly support the 2.4 per cent target and urge the Government to engage actively with the community about how it intends to reach it.

The RSB supports the Government’s ambition to capture more of the economic and social benefits from UK science. Innovation is key to this and a healthy environment for innovation is key to attracting private investment in new and expanding technologies, particularly in the biosciences. Innovate UK attracts private investment in new technologies, driving innovation, particularly in the biosciences. For example, ensuring Innovate UK is properly funded will provide support to SMEs to develop research, manufacturing capabilities and jobs. Within Innovate UK, the Biomedical Catalyst provides early-stage funding for researchers and businesses to develop scientific ideas into therapies. The Government recognised the value of the Biomedical Catalyst in its Plan for Growth, and provided funding for the competition in 2021. However, the scheme remains oversubscribed and unable to fund all the projects it approves. We urge the Government to commit to increased, long-term funding for the Biomedical Catalyst, to derive maximum value from its proven success.

Establishing two ‘What Works Centres’ was a key recommendation of the National Food Strategy, to improve the sustainability and health impact of farming and diets.⁵ We encourage the Government to provide endowments that will enable the centres to pursue a scientific, evidence based strategy. The ‘What Works Centre for Agriculture and Horticulture’ will bring together evidence from academic research, near-market research and farmer experience to assess what works in farming – critical if the industry is to meet very challenging targets for net zero and the 25 Year Environment Plan.

Investment to generate greater value from research is vital, but a focus on near-term impact must not come at a cost to the discovery research in which the UK excels, and which can deliver extraordinary future opportunities over the longer-term. An appropriate balance of applied, translational and discovery research is necessary, and should be reflected in the allocation and duration of public funding.

Universities have been hit hard by the COVID-19 pandemic and EU exit, with a loss of international students and the income they provide, unprecedented levels of deferrals creating uncertainty over domestic student numbers, effects on student mental health and wellbeing, and the need to invest in online teaching. Meanwhile, HEIs are acting and investing to drive improvements including towards carbon neutrality. In addition to their research activities, universities are key to improving social mobility, widening participation, and providing knowledge exchange to enable ‘levelling up’;

² HM Government, 2021. [Global Britain in a competitive age: the integrated review of security, defence, development and foreign policy.](#)

³ House of Commons Science and Technology Committee, 2019. [Balance and effectiveness of research and innovation spending.](#)

⁴ HM Government, 2017. [Industrial Strategy: Building a Britain fit for the future.](#)

⁵ National Food Strategy, 2021. [The Plan.](#)

many are currently struggling to fulfil all of these aspirations. If HEIs are to fully contribute in each of these priority areas, funding deficits must be addressed in salaries, infrastructure development, student-related income, research funding opportunities, and research funding lost through cuts to international development budgets.

We welcomed the Government's decision to associate with Horizon Europe, which can continue the close partnerships that accelerate research and innovation. Assurances are now needed that participation for the full seven-year programme will be funded in addition to other science budgets, ensuring that UK researchers can engage in meaningful long-term projects and be able to make full advantage/create maximum benefit from the opportunities on offer through it.

Priority for environmental issues

The climate crisis puts the world in peril and requires bold, urgent policy action. All hope of stabilising global temperatures rests on whether we make immediate, rapid and large-scale reductions in greenhouse gas emissions. Without such action, the IPCC warns that limiting warming to 1.5°C or even 2°C will be beyond reach.⁶ It is vital the Spending Review reflect the scale and urgency of this crisis. It must include appropriate commitment for the forthcoming Net Zero Strategy, climate adaptation in the UK, and the climate finance goals negotiated in the Paris Agreement. Support from the public sector is crucial to a net zero future, and pandemic recovery plans must align with green goals – a matter that scientists could work with Government to evaluate. The costs of failure to protect our climate will far outweigh the costs of acting now.

The biodiversity crisis is inextricably linked with the climate crisis. Both require urgent and immediate action, and rational decision-making must address both together. The Dasgupta Review on the economics of biodiversity highlights the opportunities of wise, connected policymaking, and the dangers of working in siloes.⁷ Habitat protection and restoration are key in adapting and providing resilience to our changing climate. Nature-based solutions can help to tackle climate change while enhancing nature and improving human wellbeing.⁸ For example, restoration of peatlands, seagrasses, saltmarshes, forests and other ecosystems will both sequester carbon and increase biodiversity.

The devastation caused by the COVID-19 pandemic shows the importance of efforts to prevent, detect, report and respond to health threats. The risks of pandemic diseases are increased by contact between humans and wildlife through deforestation, the wildlife trade and the degradation of natural habitats. This year's meeting of G7 health ministers agreed that a One Health approach is needed, recognising links between the health of humans, animals, plants and the environment.⁹ They further agreed on the need to mitigate, minimise and contain the risk of anti-microbial resistance (AMR). We welcome these developments, and note COVID-19 has exacerbated AMR, while research on this issue has been set back by cuts to the UK's Official Development Assistance (ODA), as with many important areas.^{10,11} Investing in solutions-focussed AMR research now will avoid incurring future costs.¹² At the upcoming meeting of the G20 leaders, we urge for a

⁶ IPCC, 2021. [Sixth Assessment Report](#).

⁷ Dasgupta, (2021). [The Economics of Biodiversity: The Dasgupta Review](#).

⁸ British Ecological Society, 2021. [Nature-based Solutions](#).

⁹ DHSC, 2021. [G7 Health Ministers' Meeting, communique, Oxford, 4 June, 2021](#).

¹⁰ SfAM, 2021. [AMR case study: the impact of COVID-19](#).

¹¹ UKRI, 2021. [UKRI required to review Official Development Assistance funding](#).

¹² SfAM, 2021. [Supporting microbiology to prevent the next global catastrophe](#).

commitment to be made to investment in global solutions to reduce the chance and impact of future pandemics.

Skills and levelling up across the UK

A workforce equipped with skills and knowledge is absolutely critical to the Government's scientific ambitions and in levelling-up all parts of the UK. The Spending Review should include provisions to upskill the workforce, addressing skills gaps and preparing for future needs in strategic areas, which will include low-carbon and sustainability skills needed for a successful transition to net-zero. Crucially, we must reach net zero by making smart policy choices across every sector that are net beneficial for nature. Knowledge of the living world is essential to how we mitigate and adapt successfully and sustainably, including how we identify opportunities and recognise any potential risks from specific carbon-reducing initiatives to the biosphere or health.

Training and skills development will require resources. RSB accreditation recognises and supports the development of skills and education in the biosciences, ensuring graduates acquire knowledge and skill sets that make them highly employable. The RSB also promotes CPD through its professional registers, aiming to drive up skills and professional standards across the workforce, including workers in technical, academic, and industry roles. The RSB, along with other learned societies, academies and membership organisations, could contribute to addressing particular skills shortages, through assessing areas for development in curricula and training.

Driving excellence in science teaching

The RSB aims to raise the professional status of primary and secondary teachers in the sciences, and improve retention of subject-specialist teachers. The *Subjects Matter* report from the Institute of Physics (IOP) describes the problems in our education system, including unequal access to high quality teaching, high teacher attrition rates, and recruitment shortages in the sciences.¹³

Ensuring every student has a subject-specific teacher throughout their schooling increases progression into post-16 qualifications and beyond. We therefore support proposals put forward by the IOP and the Royal Society to drive excellence in science teaching. These proposals include establishing an Office for Science Education Professional Development, and investing £87m over three years in subject-specific Continuing Professional Development (CPD) for teachers in the sciences.

The RSB strongly recommends funding for subject-specific CPD in the sciences. We could support this work through identifying gaps in provision and contributing to standards and frameworks. Much investment is made in CPD for biology specialists teaching out-of-field in chemistry or physics. This is important to ensure teachers develop subject knowledge in the range of disciplines they are deployed to teach, however we should be aiming to support biology teachers to also develop in-field subject knowledge and subject pedagogical content knowledge through high quality, accredited, subject-specific CPD, and ensure as many students as possible are taught by in-field subject experts for all three sciences.

¹³ Institute of Physics, 2020. [Subjects Matter](#).

As we take steps towards recovery from a devastating pandemic, we encourage the Government to set out a bold and forward-looking vision in the Spending Review that supports an integrated approach to research, skills development and the related policy framework across Government departments and agencies, building on the Innovation and Skills ambitions already outlined this summer. In this year of global leadership, the UK has the opportunity to demonstrate our ambition to create a cleaner, fairer and healthier world with opportunities for all, which science and research can help to deliver.

Yours sincerely,



Dr Mark Downs CSci FRSB

Chief Executive

CC:

The Rt Hon Steve Barclay MP (Chief Secretary to the Treasury)