

Written evidence submitted by British Society for Immunology

Introduction

- 1.1. The British Society for Immunology is the largest immunology society in Europe. We represent the interests of over 5000 immunologists working in academia, clinical medicine, and industry. Our main objective is to promote and support excellence in research, scholarship and clinical practice in immunology for the benefit of human and animal health.
- 1.2. Immunological science underpins many aspects of human health and the progression of disease. The application of immunological research extends across communicable disease and vaccination to the management and treatment of chronic diseases such as diabetes, asthma, allergies, and even cancer. It is also now becoming clear that immune responses are key to the development of many common disorders not traditionally viewed as immunologic, including metabolic, cardiovascular, and neurodegenerative conditions.
- 1.3. As a nation we are world leading in our immunological research and rank first for research in infection and immunology amongst our G7 partners.ⁱ Immunology therefore makes a vitally important contribution to the UK science base and the research of our members is of critical value to the overall health, wellbeing, and economic prosperity of the UK.

Summary

- 2.1. The UK continues to punch well above its weight in terms of scientific output and we remain a world-leading centre of scientific research. This is despite the fact that Government investment in science and research does not match that of other developed economies such as the US and Germany.
- 2.2. UK science welcomed the cash-terms protection of the science budget announced at the last spending review as this provided welcome stability for the Research Councils and higher education funding bodies when stress on the public finances was acute. However, this protection has translated into a real-terms decrease in the science budget of £1bn over the course of the last parliament.
- 2.3. The strain this has placed on the funders of research is now beginning to show. Since 2010/11 the value of grants and fellowships awarded by the MRC and BBSRC has been falling. For the Infection and Immunity Board at the MRC for example, the value of grants awarded has fallen by £12.6m since 2012/13.
- 2.4. Grants and fellowships are the lifeblood of scientific research and the downward trajectory in funding threatens the capacity for immunologists to sustain their contribution to the UK's scientific output. The BSI strongly believes that the Government should commit to a much needed programme of investment in the science budget. We believe that the upcoming Spending Review is the perfect opportunity for this and should set out this spending commitment such that the Government's ambition for science is able to match and support their vision for the UK's "long term economic plan".

International comparison

- 3.1. Science is a global endeavour and therefore any consideration of the science budget should be taken within the context of our relative standing amongst international competitors. This is important beyond reasons of national pride: we are in direct competition for personnel, resources, and funding from international bodies. The quality of our science – and by extension the science budget – is a fundamental determinant of our international competitiveness.
- 3.2. The UK has been able to punch well above its weight in terms of science output. We ranked top amongst the G7 countries for the quality of our research in infection and immunity between 2010 and 2014 as measured by the “impact” of research.ⁱ Furthermore, despite representing just 0.9% of the global population, 3.2% of global R&D expenditure, and 4.1% of the world’s researchers, we account for more than 9.5% of downloads, 11.6% of citations and 15.9% of the world’s most highly-cited articles.ⁱⁱ
- 3.3. This is despite total research and development (R&D) expenditure in the UK in 2013 equalling 1.63% of Gross Domestic Product (GDP).ⁱⁱⁱ This is below the EU-28 average of 2.01% and significantly lower than key international competitors such as the United States (2.81%), Japan (3.38%), Germany (2.85%), France (2.23%), and China (1.98%). The UK currently spends less on R&D by proportion of GDP than smaller European states such as Slovenia, Estonia, and the Czech Republic.^{iv}
- 3.4. The BSI remains concerned that failure to sustain real terms investment in science and research in line with our international competitors runs the risk of diminishing the UK’s standing as a global hub for world-class scientific research, including immunology. We strongly believe that rebalancing our investment in science relative to other advanced economies such as the United States and Germany should be a key strategic priority for the Government over the next spending period.

The reality of the existing budget

- 4.1. It is welcome that the budget for science and research was protected under the previous Government during a period of financial restraint. This ring-fencing allowed the Research Councils and higher education funding bodies to provide a degree of stability at a time of considerable economic uncertainty.
- 4.2. However, due to inflationary pressures, this cash-terms protection has translated into a real-terms decrease in the budget of £1 billion over the course of the last parliament. If spending on scientific research is to remain on the same trajectory over the course of this parliament UK science would be £2.3 billion poorer by 2020.^v
- 4.3. The Wakeham review set out a programme of efficiency savings that research funders must commit to over the spending period, with an overall target of £428 million in savings to be achieved over the course of 2011 to 2015.^{vi} Analysis by Universities UK shows that the research community is currently exceeding this target, with a cumulative £283m delivered against a target of £251m for the period up to 2013/14.^{vii}

- 4.4. Therefore, despite the extraordinary efforts of the research community to drive considerable economy savings in their budgets, the erosion of the science budget across the last parliament has not been significantly absorbed by the extent of the efficiency savings achieved.
- 4.5. In addition, while the 2010 spending review outlined cuts in the capital budget of 40%, subsequent commitments have “topped-up” the budget such that it is now in line with an above inflation rise towards the end of the spending review. This is welcome, though the ad-hoc nature of these announcements does not lend itself well to long-term planning for infrastructure and facility upgrades that are badly needed within some UK institutions.
- 4.6. The BSI remains concerned, however, that our ranking as a world-leading centre for scientific research and innovation is at risk due to the cash-terms decrease in the science budget. If there is no significant investment, or a continuation of cash-terms protection, we foresee significant challenges for immunology – and other areas of science – in maintaining the existing level of scientific output.

Impact on Research and Funding Councils

- 5.1. Our members rely on grants and fellowships from the Research Councils and higher education funding bodies in order to carry out ground-breaking immunological research. However, the capacity for immunologists to continue to make extraordinary contributions to these agendas is under threat. A progressively diminishing budget puts pressure on the research and funding councils, meaning less money for the grants and fellowships which are the lifeblood of research carried out by scientists up and down the country.
- 5.2. The pressure on research funders is evident when examining trends in the value of grants and fellowships awarded. For example, since 2012/13 the value of grant funding awarded by the Medical Research Council (MRC) has reduced every year for the last three years, from a high of just over £300m in 2012/13 to £243m for 2014/15. The total amount awarded to the Infections and Immunity Board during this time has fallen from £42.1m in 2012/13 to £29.5m for 2014/15.^{viii}
- 5.3. For research fellowships, the total value of awards from the MRC has decreased for the past four years running, from just over £50m in 2011/12 to £38.8m in 2014/15.^{viii}
- 5.4. The value of grants awarded by the Biotechnology and Biological Sciences Research Council shows a similar trend, with £408m worth of grants awarded in 2011/12^{ix} falling to £320m in 2014/15.^x
- 5.5. The BSI is concerned that cuts in funding will mean a failure to nurture young immunologists. Any reduction in funded posts limits career opportunities for young scientists and therefore results in a reduced capacity to develop the next generation of scientists, with knock on effects for scientific and economic output further down the line. It is important to note that by contracting back funding now we imperil the future of immunological research – not just that which is ongoing at present.
- 5.6. Moreover, budgetary restrictions are more likely to enforce a conservative approach by the Research Councils and higher education institutes, to the detriment of research that is not considered “core” or “priority”. Innovative and creative research, for which there is no

immediately obvious application, often forms the basis of profitable enterprise later on, or is the foundation of ground-breaking discovery.

5.7. Some detailed analysis to date of public funding for immunological research pertains specifically to infectious disease and vaccine research. It shows that public funding for this research accounted for £294m across 471 studies for the period 1997-2010. The paper highlights the global impact of this type of science, highlighting the benefits it brings in stimulating technological advancements and advancing the eradication of infectious disease. However, with acknowledgement to this importance, data on the provision or investment in immunological and infectious disease research is poor. Better mapping and evaluation of the distribution of research funding in this area, for example from data provided by the Research Councils, would be of significant benefit in informing future resource allocation.^{xi}

5.8. The BSI strongly believes that real-terms investment in the science budget is required to reverse the current trend before irreversible damage is done to the diversity and quality of the UK's research base. The current trajectory in value of grant and fellowship funding awarded by the Research Councils is extremely concerning, and seriously compromises the UK's ability to conduct fundamental research that is a critical underpinning of our attempts to better understand the problems, and likely solutions, to a diverse set of national and global priorities.

References

ⁱ [APPG on Global Health \(2015\). The UK's Contribution to Health Globally.](#)

ⁱⁱ [Department for Business, Innovation and Skills \(BIS\) \(2013\). International Comparative Performance of the UK Research Base](#)

ⁱⁱⁱ [Office for National Statistics \(2015\). UK Gross Domestic Expenditure on Research and Development, 2013](#)

^{iv} [Eurostat \(2015\). Gross domestic expenditure on R&D \(GERD\)](#)

^v [Campaign for Science and Engineering \(2015\).](#)

^{vi} [RCUK/UUK Task Group \(2010\). Financial Sustainability and Efficiency in Full Economic Costing of Research in UK Higher Education Institutions](#)

^{vii} [Universities UK \(2015\). Efficiency, effectiveness and value for money.](#)

^{viii} [Medical Research Council \(2015\). Annual Report.](#)

^{ix} [BBSRC \(2012\). Annual Report](#)

^x [BBSRC \(2015\). Annual Report](#)

^{xi} [Fitchett, JR *et al* \(2013\). Infectious disease research investments: Systematic analysis of immunology and vaccine research funding in the UK.](#)