

## Key priorities for the research base

Submission from the Physiological Society May 2013

### Summary

- The research base is a key contributor to economic growth and the nation's wellbeing.
- Long term, stable funding is needed to allow disciplines like physiology, which underpins medical advances, and the wider research base to grow and compete internationally.
- The government must maintain the current ring fence and look to increase funding.

### The Physiological Society

The Physiological Society brings together over 3,000 scientists from over 60 countries. Since its foundation in 1876, our members have made significant contributions to our knowledge of biological systems and the treatment of disease.

We promote physiology and support those working in the field by organising world-class scientific meetings and by publishing the latest developments in our three leading scientific journals, *The Journal of Physiology*, *Experimental Physiology* and *Physiological Reports*.

### The science and research base

The importance of the science and research base to the UK is widely acknowledged:

“Our world-class science and research base is inherently valuable, as well as critical to promoting economic growth. Investment in science and research creates new businesses and improves existing ones; brings highly skilled people into the job market; attracts international investment and improves public policy and services” David Willetts and Vince Cable.<sup>1</sup>

“A strong and competitive science and research base ... is vital for the UK to compete and thrive in the global race” David Cameron.<sup>2</sup> George Osborne also recognises the value of science, stating that technical change, driven by scientific and technical advances will determine our economic growth.<sup>3</sup>

### The impact of the research base

The research base has both direct and indirect impacts across the whole of society, through benefits to the economy, health, communications, travel and the arts to name but a few.

The link between research, innovation and economic growth in the UK is well established; in the period from 2000-08 over 60% of the UK's economic growth was the result of innovation.<sup>4</sup> This economic impact can be attributed to both the knowledge capital it generates and the human capital that it produces.

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<sup>1</sup> <http://www.bis.gov.uk/assets/BISCore/science/docs/A/10-1356-allocation-of-science-and-research-funding-2011-2015.pdf>

<sup>2</sup> <https://www.gov.uk/government/news/30-million-investment-in-health-research-centre-to-tackle-major-diseases>

<sup>3</sup> <https://www.gov.uk/government/speeches/speech-by-the-chancellor-of-the-exchequer-rt-hon-george-osborne-mp-to-the-royal-society>

<sup>4</sup> <http://www.nesta.org.uk/library/documents/PlanIwebv3.pdf>

It is recognised that the research base drives investment into the UK.<sup>5</sup> As highlighted by AstraZeneca's decision to invest £330 million in a new R&D centre and global headquarters in Cambridge. AstraZeneca cited the “easy access to scientific talent and excellent collaboration opportunities through renowned academic research institutions” as two of its reasons behind choosing Cambridge, ahead of other potential sites around the world.<sup>6</sup>

It also delivers significant advances in health. Studies in physiology continue to improve our understanding of biological systems and ability to treat disease.

Physiological research supported by the MRC and conducted by Sir Tim Hunt and Sir Paul Nurse on the key regulators of the cell cycle resulted in the award of a Nobel Prize and more importantly has advanced our understanding of cell cycle control defects and hence cancer.

### **Efficiency of the research base**

The UK's research base is already one of the most efficient in the world. In 2011 a report commissioned by BIS found that “while the UK spends far less in absolute terms on research than the US, China, Japan and Germany, recent trends indicate that it is becoming more efficient than all four in terms of output per unit spent.”<sup>7</sup> This was reinforced in a study by Thomson Reuters, “Its [the UK's] average research impact now surpasses that of the USA.”<sup>8</sup>

However, the UK should not continue to rely on the ability of the research base to pull the proverbial rabbit out of the hat. This same report also warns that while the UK currently remains a world leader in research, this position is far from guaranteed – “its [the UK] leadership position may be threatened by its declining share of researchers globally, and by its declining share of global spending on research.”

The long term risks of underfunding the research base should not be ignored. Much like the widely reported drug pipeline issues pharmaceutical companies face,<sup>9</sup> there are numerous examples of vulnerable research areas in countless disciplines that could take years to recover if funding streams dry up, a widely recognised example of this is *in vivo* physiology.<sup>10</sup>

### **Maximising leverage from private, charitable and international funders**

The proportion of the UK R&D funding from international investment and non-for profit sources was found to be 23% in 2010. This is a higher figure than other comparator countries and significantly higher than the G8 average of 4.4%.<sup>11</sup> The report attributed this mainly to the contribution of the Wellcome Trust, Cancer Research UK, the British Heart Foundation and other charity funders of biomedical research.

If the sector is to continue to be a world leader and attract inward investment from private, charitable and international funders, the government must continue to support the sector by putting long plans in place to support the research base.

The introduction of catapult centres and financial measures such as the Patent Box and the Biomedical Catalyst should increase the levels of research translation. In turn, this should

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<sup>5</sup> <http://www.cbi.org.uk/media/934670/making-the-uk-the-best-place-to-invest-report.pdf>

<sup>6</sup> <http://www.astrazeneca.com/Media/Press-releases/Article/18032013--astrazeneca-to-invest-research-centre-and-global-hq>

<sup>7</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32489/11-p123-international-comparative-performance-uk-research-base-2011.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32489/11-p123-international-comparative-performance-uk-research-base-2011.pdf)

<sup>8</sup> <http://sciencewatch.com/grr/united-kingdom>

<sup>9</sup> <http://www.forbes.com/sites/greatspeculations/2012/05/30/abbotts-pipeline-is-crucial-in-advance-of-2016-patent-cliff/>

<sup>10</sup> <http://www.abpi.org.uk/our-work/library/industry/Documents/skills-biomedical-research.pdf>

<sup>11</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32489/11-p123-international-comparative-performance-uk-research-base-2011.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32489/11-p123-international-comparative-performance-uk-research-base-2011.pdf)

leverage additional private funding and further develop the benefits of the research base to the UK economy.

### **Balance between resource and capital**

The ideal balance between resource and capital will vary discipline by discipline. The £650 million Francis Crick Institute, joint public / charity venture, will provide an incredible platform to advance physiology and other biomedical sciences. The Large Hadron Collider has provided particle physicists opportunities to further research that would not have been possible without the initial capital investment. However, a supply of high trained and highly skilled scientists will be required to achieve the maximum output from these capital investments. It should also be noted that in other research areas large scale capital investments will be of significantly lower value.

In SR10 while the resource budget was frozen, considerable cuts in the region of £1.7 billion were made to capital spending. In the period following SR10 additional capital commitments totalling ~£1.4 billion have been made.<sup>12</sup> While these additional investments have been warmly welcomed; providing funding by this method will not provide the stability that the sector requires to achieve its maximum potential. Considerable care should be taken when determining the balance between resource and capital, and the decision should be based on a solid, evidence based foundation.

### **Conclusion**

The UK clearly has a world leading research base, which is the envy of many a nation. Stable, long term support must be given to the sector. The government, as a minimum must maintain the current ring fence, and look to increase its science funding, as the USA, Germany and France have.<sup>13</sup> It is clear that the future economic growth and the health of the nation will suffer otherwise.

It is time for the government to deliver on the pledge that George Osborne made last November - "We have great science in Britain. We are backing it. And we will do more."<sup>14</sup>

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<sup>12</sup> <http://blog.sciencecampaign.org.uk/wp-content/uploads/2013/03/Public-Funding-of-UK-Science-and-Engineering-%E2%80%93-March-2013-update.pdf>

<sup>13</sup> [http://royalsociety.org/uploadedFiles/Royal\\_Society\\_Content/policy/publications/2011/4294977681.pdf](http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/publications/2011/4294977681.pdf)

<sup>14</sup> <https://www.gov.uk/government/speeches/speech-by-the-chancellor-of-the-exchequer-rt-hon-george-osborne-mp-to-the-royal-society>