scienceisvital.org.uk

Rt Hon Joseph Johnson
Minister of State for Universities and Science
Department for Business, Innovation and Skills
1 Victoria Street
London SW1H 0ET

Open Letter mirrored on our website

Friday 5 June 2015

Dear Mr Johnson,

Many congratulations on your appointment as the new Minister for Universities and Science.

We are writing to you on behalf of Science is Vital, the grassroots organisation concerned about scientific research in the UK (scienceisvital.org.uk). Science is Vital is the voice of about 35,000 scientists and supporters of science, and is active in forging links between the public, scientists, policymakers and politicians. We believe that science is vital for the UK economy, and our aim is to ensure public investment in science, and to promote policies that will support an environment in which research can flourish.

We are concerned that the Conservative manifesto did not contain any specific commitment to the science resource budget, and that the managed decline in funding under the cash ring-fence established in the last parliament appears set to continue. Under this settlement, the science budget has decreased by around 15% in real terms since 2010, and the effects are already being felt. In 2013, in a report prepared at the request of David Willetts, Science is Vital found that 85% of scientists we questioned were worried about funding, and over half reported a drop in grant success rates since 2010 (report presented to BIS, 17 June 2013 – bit.ly/1GUWei3). This erosion of the science budget also risks decreasing the UK's international scientific standing: our spending as a percentage of GDP recently dipped below 0.5% of GDP (see bit.ly/1BFWfjN) and remains below the EU-28 average, which is increasing in real terms even as ours falls.

We applaud the manifesto commitment to maintain capital funding for scientific infrastructure for the period 2016-2021, but creating and maintaining facilities with insufficient funding to operate them at full capacity (as is the current situation with the ISIS neutron and muon source in Oxfordshire) is far from optimal. Without a healthy and sustained core budget, UK scientists will find it difficult to sustain the

vitality of British science, which is essential for the discoveries and development work that will help the country to face future challenges in climate change, energy and food supply.

You will no doubt be aware that the UK research base regularly punches above its weight in terms of output. With just 3% of global research spending, the UK produces nearly 16% of the world's most highly-cited articles. The most eye-catching recent examples include the discovery in 2007 of a new form of carbon – graphene – by Geim and Novoselov at the University of Manchester, and the long-anticipated discovery of the Higgs boson at CERN in 2012.

Many other results from UK research don't always hit the headlines or win Nobel prizes, but nevertheless make important contributions to the body of scientific knowledge, often providing the essential seed-corn for new innovations. We asked our supporters to flag up some recent highlights to illustrate the tremendous breadth and depth of UK science. Here are a few examples:

- A team at the Medical Research Council Laboratory of Molecular Biology in Cambridge has made a breakthrough in cryo-electron microscopy which will now enable scientists using this technique to visualise the molecular details of life at atomic resolution. This makes it a hugely powerful tool in our increasingly urgent quest to develop new antibiotics
  Scheres (2012) *J. Struct. Biol.* **180**, 519–530. bit.ly/1dHMSuP

- An international research team in a Google subsidiary based in London that collaborates with UK academic scientists has made deep new insights into learning behaviour, which has implications for how computers and robots can be designed to learn as we do
  Mnih *et al.* (2015) *Nature* **518**, 529–533. bit.ly/1GTu9Yx

- Using apparatus that they built themselves, teams of researchers at the universities of Warwick and Liverpool have worked out exciting new details of how cells take up material from the outside world – a process fundamental to cell health that goes wrong in diseases such as Alzheimer's
  Kaur *et al.* (2014) *eLife* **3,** e00829. bit.ly/1QkOmqH

- Researchers at University College London (UCL), as part of an international collaboration, have designed a novel technology called SureSelect that can rapidly fingerprint tuberculosis directly from patient samples in a matter of days – instead of the months required now. This will help stamp out the rising tide of antibiotic resistant TB in this country
  Brown *et al.* (2015) *J. Clin. Microbiol.* Accepted manuscript (13 May). http://bit.ly/1JkY103

- A team at the University of Oxford have analysed the genetic signatures of Britons, and were able to map the fine details of ancient migration patterns – using genetics to confirm historical accounts
  Leslie *et al.* (2015) *Nature* **519**, 309–314. bit.ly/1QkO2bD

- Researchers at the MRC Laboratory of Molecular Biology have challenged current theories of the chemical origins of life by showing that precursors of the components of RNA, protein and fat molecules may have arisen simultaneously from simpler chemicals available in the primordial soup
  Patel *et al.* (2015) *Nat. Chem.* **7**, 301–307. bit.ly/1dHM0Gy

- Physicists from Edinburgh, Durham and UCL reported observations of the collisions of 72 distant galaxies, providing striking new evidence for the existence of dark matter, the mysterious substance that is reckoned to constitute most of the mass of the universe
  Harvey *et al.* (2015) *Science* **347**, 1462-1465. bit.ly/1M5cDAv

To keep our great scientific work thriving, Science is Vital believes that the UK should set a goal of investing 0.8% of GDP in public-funded research and development, in line with the G8 average. This aspiration was set out in a letter to the *Telegraph* signed by 50 of Britain's best-known and most distinguished scientists (see bit.ly/1Jqw9Ib), including Lord Martin Rees, Professor Brian Cox, Sir Paul Nurse, Professor Stephen Hawking, and many Nobel laureates and Fellows of the Royal Society.

Over the past five years we have worked with our members and the wider science community to develop and understanding the effects of under-funding and immigration policies on the health of the UK science base. We would like to share with you how our large and politically active community feels about these subjects, particularly now that the ring-fence looks set to continue. We have had a very productive relationship with BIS and we would very much like to continue that with you.

Please let us know when might be a convenient time to meet with me and a few of my colleagues.

Yours sincerely,

Dr Jennifer Rohn
Chair, Science is Vital

Prof Stephen Curry
Vice-chair

Dr Andrew Steele
Vice-chair