THE ROYAL SOCIETY

30 November 2018

Submission to the Lords EU Home Affairs sub-committee inquiry into Brexit – EU students exchanges and funding for university research

Summary:

- **Science is an inherently international activity, and international collaboration is fundamental to conducting excellent scientific research. UK citizens and people around the world benefit from cutting-edge research and innovation happening here. These relationships are also a key source of 'soft power' for the UK's relationships around the world.**
- **Recognising the value or R&D to the UK, the UK government has made an ambitious commitment for 2.4% GDP investment into UK R&D by 2027 with a longer-term goal of 3%. To ensure that the UK is in a position to deliver this, UK research and innovation needs a deal that:**
    - **Keeps highly-skilled scientists working in the UK and ensures that international talented people still choose to come here and contribute to our globally competitive science**
    - **Keeps access to money and networks which support the UK to work with scientists around the world by ensuring that the UK remains in Horizon 2020 to its end and seeks full association with its successor, Horizon Europe**
    - **Maintains regulatory alignment that allows access to new medicines and new technologies**
- **As well as delivering a deal that supports research and innovation, the UK government should provide much needed confidence to the research and innovation community and those investing in UK R&D, by earmarking additional public funds in the upcoming Spending Review for association with Horizon Europe.**
- **"No-deal" is a bad deal for science. If we leave without a deal, it will impact on scientific research immediately and could take years to rebuild.**

Introduction:

1. The Royal Society welcomes the opportunity to submit evidence to the Committee's inquiry into Brexit – EU students exchanges and funding for university research. The Society is the National Academy of Science for the UK and the Commonwealth. It is a self-governing Fellowship of many of the world's most distinguished scientists working across a broad range of disciplines in academia and industry. The Society draws on the expertise of its Fellows and Foreign Members to provide independent and authoritative scientific advice to UK, European and international decision makers.

2. This submission focuses on access to the EU framework programmes – Horizon 2020 and its planned successor Horizon Europe – and the impact of a no deal scenario for research and innovation. It draws on a number of existing pieces of work including a Technopolis report into the role of EU funding in UK research and innovation commissioned by the four UK National

Academies[1], and a Royal Society factsheet highlighting the impact on scientific research is the UK leaves the EU without a deal[2].

Horizon 2020/Horizon Europe

3. The UK has been extremely successful in accessing EU framework programme funding for research and innovation to date, receiving an average of Euro 1.3 billion through Horizon 2020 between 2015-17[3]. It is important to recognise that this is not the only source of EU funding for research and innovation activities in the UK, the UK receives an additional Euro 0.2 billion per year on average through ESIF to support research and innovation activities[4]. Both sources of funding make an important contribution to the UK's research and innovation ecosystem and help provide a consistent policy and investment environment over time. Ensuring that this consistency is maintained as the UK leaves the EU will be vital for achieving the UK government's ambitious target for 2.4% of UK GDP to be invested into R&D by 2027, with a longer term goal of 3%.

4. The transition period as set out in the withdrawal deal published on 25 November would ensure that the UK could continue to participate fully in the Horizon 2020 programme to its end. The UK's participation in EU structural funds would also continue to the end of the current funding cycle from the EU budget. The commitments to ongoing rights for EU nationals to make Britain their home, to live, work and study until the end of the transition period and reciprocal rights for UK citizens elsewhere in the EU will also ensure that UK and EEA scientists can still move easily within the EU and UK in the course of their work. And the EU (Withdrawal) Act 2018 ensures that at the point of departure existing EU legislation will be transposed into UK law so there will be no immediate changes to regulation. However it does not provide certainty beyond the end of the transition period.

5. The terms by which countries can associate to Horizon Europe are still to be agreed. There are some promising indications that association, and a broader science and innovation accord, could be possible. In his report commissioned by the EU, *LAB-FAB-APP*[5], Pascal Lamy, former Director General of the World Trade Organisation observed that: "Whatever Brexit modalities are agreed between the UK and the EU by 2019, full and continued engagement with the UK within the post-2020 EU R&I programme remains an obvious win-win for the UK and the EU. The UK has one of the strongest science bases of all European countries. A positive cooperation model (e.g., based on mutual investment) should be established, so that the UK remains part of the European Research Area."

6. In the *Political Declaration setting out the framework for the future relationship between the European Union and the United Kingdom* published on 25 November[6], there is both a commitment to seeking UK participation in Union programmes in science and innovation and the

---

[1] Technopolis (2017) the role of EU funding in UK research and innovation commissioned by the four UK National Academies
[2] Royal Society (2018) "No-deal" is a bad deal for science https://royalsociety.org/~/media/policy/Publications/2018/royal-society-brexit-no-deal-factsheet.pdf
[3] Annual UK research funding from the EU calculated using the average Horizon 2020 funding received by the UK per year between 2015 – 2017. See https://royalsociety.org/~/media/policy/projects/ brexit-uk-science/references-and-workings-for-brexit-no-deal-factsheet.xlsx for the calculations on which this is based.
[4] Technopolis (2017) The role of EU funding in UK research and innovation – an analysis commissioned by the UK's National Academies – The Royal Society, British Academy, Academy of Medical Sciences and Royal Academy of Engineering
[5] European Commission (2017) *LAB-FAB-APP Investing in the European future we want*
[6] UK government (2018) *Political Declaration setting out the framework for the future relationship between the European Union and the United Kingdom* https://www.gov.uk/government/publications/withdrawal-agreement-and-political-declaration

European Research Infrastructures Consortiums as well as a declaration that suggests a wish to pursue a broader scientific relationship to "engage in dialogue and exchanges in areas of shared interest, with the view to identifying opportunities to cooperate, share best practice and expertise, and act together, including in areas such as culture, education, science and innovation".

7. We previously welcomed the Prime Minister's stated intention to seek "the option to fully associate ourselves with the excellence-based European science and innovation programmes – including the successor to Horizon 2020 and Euratom R&T"[7].

8. **The UK should seek an association agreement that enables access to all aspects of the EU's research and innovation programme, Horizon Europe, with full engagement and influence.** This will include the ability to influence and, through the offer of the UK's considerable expertise and leadership in science, to help shape the content and direction of the programme and its successors, consistent with the progressive and international vision articulated in the LAB-FAB-APP report. This would also include active support in the evaluation and peer review of the programmes.

9. Importantly, until Horizon Europe is finalised, association to the programme will not be possible, meaning that there will be a period of uncertainty for UK-based researchers and businesses over the UK's future funding environment. **While this uncertainty is inevitable, the UK government could ameliorate the damage that this may do to UK confidence and send a clear message of its intention to seek association by committing the public money in the upcoming Spending Review to buy into Horizon Europe once it is agreed.** Any delay in seeking association will impact on the ability of UK-based researchers to participate in the EU programme – both directly and as collaborators on multi-country applications.

10. Science is an inherently international activity and as well as seeking a close scientific relationship with the EU, the UK must also send a bold, positive message that the UK is one of the best places in the world to research and innovate. The Society's aim is to reinforce the importance of science to build partnerships between nations, promote international relations and science's role in culture and society. As the UK's National Academy of science, the Royal Society has considerable national and international scientific networks.
    - **Grants:** In 2017/18, the Society invested just over £73million in outstanding scientists, which included nearly 400 grants to specifically support international scientific collaboration and travel (this particular category represents an increase of 41% on the previous year). The Society's flagship University Research Fellowship (URF) scheme supports outstanding early career scientists to build an independent research career in the UK. In 2017-18, 49% of newly appointed URFs were non-UK nationals.
    - **Journals:** The Society publishes a wide range of scientific journals which each year publish thousands of articles, which are downloaded tens of millions of times, from and by leading scientists from all over the world. The vast majority of scientists who publish in Royal Society journals are based overseas (over 80%), and 94% of those accessing the research are based abroad.
    - **Scientific meetings:** In 2017/18, over half of the 643 leading scientists who were speakers, chairs and organisers of the 33 events held under the Society's prestigious scientific meetings programme were from outside the UK.

[7] Theresa May (2018) PM speech on science and modern Industrial Strategy: 21 May 2018 https://www.gov.uk/government/speeches/pm-speech-on-science-and-modern-industrial-strategy-21-may-2018

- **Multilateral networks:** In addition to the individual links of the Society's Fellows, the Royal Society is itself a member of a number of multilateral scientific networks. These include a network of the world's science academies and the newly established International Science Council, which draws its membership from national scientific organisations and international unions for scientists in specific disciplines.

11. The Royal Society's national and international scientific networks are an asset for the UK's relations with the rest of the world and a key source of 'soft power'[8]. The Society works closely with the Foreign and Commonwealth Office's Science and Innovation Network to support international scientific collaboration. The Society looks forward to the finalisation of the government's International Research and Innovation Strategy which it hopes will act as a means to bring greater coherence and cohesion to the international work of government and its many partners in the scientific community.

A no deal scenario

12. If the UK leaves the EU without a deal, the UK will immediately become a third party to Horizon 2020. It is helpful that the UK government has made a number of guarantees to ensure that, in the case of the UK leaving the EU without a deal, it would provide funding to enable UK-based researchers to continue to participate in some of these EU research funding streams. The Chancellor's clarification that money to cover projects agreed before the UK leaves the EU on 29 March 2019 will be additional money, i.e. not taken from money already earmarked for research and innovation is very helpful[9] **. It would be helpful to clarify that the further guarantees in the event of the UK leaving the EU without a deal[10] will also be covered from additional money and to explain how those guarantees will be monitored and safeguarded over time.**

13. However it is important to recognise that even with these guarantees, as a third country, the UK would not be able to participate in a number of schemes that together invest approximately half a billion pounds into UK R&D annually[11]. This includes the ability of UK-based researchers to access funding from the European Research Council or Marie Sklodowska-Curie Actions and the ability of UK-based SMEs to access SME Instrument funding. It could take years to develop alternatives, meaning that valuable research could be stopped in its tracks and the UK risks losing valuable people and projects. It is not just access to this funding that is important to UK R&D but also immigration policy that will impact on the ability of highly-skilled people to come and work here. **The UK must leave the EU with a deal that keeps highly-skilled scientists working in the UK, keeps access to money and networks that support the UK to work with scientists**

---

[8] https://royalsociety.org/~/media/policy/Publications/2013/rs-submission-to-soft-power-consultation-18092013.pdf

[9] Evidence to the Commons Treasury Committee by the Chancellor, Philip Hammond MP. 12 December 2016 Q314 http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/treasurycommittee/autumn-statement-2016/oral/44385.html

[10] Announced in a Treasury Written Ministerial Statement on 24 July 2018 HLWS897: "The Treasury is also guaranteeing funding in event of a no deal for UK organisations which bid directly to the European Commission so that they can continue competing for, and securing, funding until the end of 2020."

[11] The UK Government's guarantee announced on 24 July 2018 will cover the cost of UK participation in Horizon 2020 as a third country in the event of leaving the EU with no deal. As a third country, UK-based academics will not be able to access funding from the European Research Council or Marie Sklodowska-Curie Actions and UK-based SMEs will not be able to access SME Instrument funding. Over the period 2015-17, the UK received an annual average of Euro 601 million from these three funding streams. See https://royalsociety.org/~/media/policy/projects/ brexit-uk-science/references-and-workings-for-brexit-no-deal-factsheet.xlsx for the calculations on which this is based.

around the world, and maintains regulatory alignment that allows access to new medicines and technologies. Securing such a deal will be crucial to delivering the government's own commitment for 2.4% GDP investment into UK R&D by 2027, with a longer-term goal of 3%.[12]

14. It is also important to recognise that ongoing uncertainty sends a message internationally. The UK competes with other scientifically excellent nations to attract international talent and these people contribute to our excellent scientific workforce. 29% of academic researchers working in the UK are from overseas[13]. People with in-demand skills can choose where they live and work. Perceptions are therefore important. Uncertainty is already a concern to the health of UK research and innovation. To give an example drawing on the Society's activities, through the University Research Fellowships scheme, the Society invests c.£32 million a year and currently supports 317 individuals with approximately 40 new fellowships awarded each year. The fellowships are for five years with a renewal period of an additional three years, meaning that the Society's commitments already extend beyond the proposed transition period. For those researchers in receipt of these funds who are from overseas, they are currently facing uncertainty over the future immigration system. This uncertainty is also a consideration for potential candidates that could be recruited to the UK through this and other fellowship programmes.

15. Whatever future relationship is formed between the UK and EU, science will remain international. UK science has strong scientific relationships with communities around the world – from the formal networks previously mentioned, to the involvement of UK-based researchers in international scientific meetings and more informal day-to-day collaborations between teams and individuals.

    Case study: Scientific advances are made in collaboration
    Professor Richard Henderson FRS FMedSci received the Nobel Prize in Chemistry in 2017 for contributing to the development of cryo-electron microscopy, a method which both simplifies and improves the imaging of biomolecules that revolutionised biochemistry. Working in Cambridge in 1990, Richard used electron microscopy to produce the first image of a protein at atomic resolution. When combined with the work of Jacques Dubochet (University of Lausanne, Switzerland) and Joachim Frank (Columbia University, US), his breakthrough made the technology possible. Every nut and bolt of the electron microscope was then optimised over the years and the desired resolution was achieved in 2013[14].

16. The UK government will play an important role in supporting UK science tor remain a global scientific powerhouse and magnet for talent that can compete on the scale of other scientific superpowers, such as the USA and China. It must communicate clearly throughout the upcoming changes its intention to remain a nation with a global outlook that is open to the world and welcoming to talent, and take actions that support this.

For further information, contact Becky Purvis, Head of Public Affairs, becky.purvis@royalsociety.org

---

[12] BEIS (2017) *Industrial Strategy: building a Britain fit for the future*
[13] Higher Education Statistics Agency. 2017 Staff numbers and characteristics. See https://www.hesa.ac.uk/data-and-analysis/staff (accessed 14 March 2018). Figures include academic staff with functions in research, in teaching or neither. Numbers are rounded.
[14] Nobel Prize. 2017 The Nobel Prize in Chemistry 2017. See https://www.nobelprize.org/nobel_prizes/chemistry/laureates/2017/press.html (accessed 10 May 2018).