Summary of key points

UK research and innovation are global. RCUK works across the world and will continue to develop its strong international links, but EU interaction forms a significant part of the international collaboration landscape and the risks posed by losing it are real.

- We must remain open and welcoming to research talent, underpinned by continued easy movement of global research labour. The contribution made by non-UK nationals to the UK research base is integral to our world-leading position.

- Continued access to at least current levels of research funding and mechanisms for international collaboration, including schemes accessed through the EU, are critical to the UK’s continuing place as a world leader in research and innovation.

- Continued access to and sustainable financial support for world-class infrastructure and facilities are essential for UK research.

- It is crucial that a future model of engagement with the EU enables the UK to continue to engage proactively in strategy development and decision-making. The UK has had a strong voice in EU research strategy and policy, benefitting both the UK and research across Europe.

- It is imperative that issues, risks and opportunities related to UK research and innovation are fully considered in negotiation of a new relationship between the UK and EU.

- The need for continuing clarification and effective negotiation is urgent. Reliably determining any impacts on research of short-term uncertainty and the UK’s new relationship with the EU is crucial, but will take time.

1. **Research Councils UK (RCUK)** is the strategic partnership of the UK’s seven Research Councils. Our collective ambition is to ensure the UK remains the best place in the world to do research, innovate and grow business for the benefit of society and the economy. Together, we invest £3 billion in research each year, covering all disciplines and sectors. This response is made on behalf of the seven Research Councils and represents their independent views.

2. **RCUK continues to work closely with colleagues in government and the wider sector to ensure an effective and joined up approach to the implications of leaving the EU.** This written submission reflects the interests of UK research as a whole, but focuses on evidence linked to the Research Councils directly. It supports the oral evidence given to the Committee by Professor Philip Nelson, Chair of RCUK Strategic Executive, in July 2016.

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1. [www.rcuk.ac.uk](http://www.rcuk.ac.uk)
2. [www.ahrc.ac.uk](http://www.ahrc.ac.uk); [www.bbsrc.ac.uk](http://www.bbsrc.ac.uk); [www.epsrc.ac.uk](http://www.epsrc.ac.uk); [www.esrc.ac.uk](http://www.esrc.ac.uk); [www.mrc.ac.uk](http://www.mrc.ac.uk); [www.nerc.ac.uk](http://www.nerc.ac.uk); [www.stfc.ac.uk](http://www.stfc.ac.uk)
Introduction

3. UK research and innovation is global. RCUK works across the world and will continue to develop its strong international links, but EU interaction forms a significant part of the international collaboration landscape. The risks posed by losing EU engagement are real and must be key considerations in negotiation of the UK’s future EU relationship.

4. The UK is a global science and research nation and its research base is a national asset.

5. RCUK’s ambition - that the UK remains one of the best places in the world to do research, innovate and grow business - can only be realised if the UK remains open to the best international researchers and technical specialists. In a competitive international market, the UK research sector relies on being able to engage with the brightest minds, the best organisations and the leading facilities wherever they are placed in the world.

6. RCUK has strong bilateral and multilateral links with research funders across the world and an authoritative voice in international research strategy development. We will continue to explore and invest in opportunities for international collaboration which align with the priorities of UK research, taking full advantage of any new opportunities which arise. Engagement with European researchers and associated professionals, institutions and funding programmes is a crucial part of the international collaboration landscape – in monetary terms and beyond – and our strong position within Europe is a key contributor to the UK’s leading global research role.

7. The risks posed by leaving the EU are therefore real and it is imperative that UK research and innovation are key considerations in negotiation of a new relationship between the UK and EU. Key issues around people and mobility, funding and collaboration, infrastructure and facilities and influence and legislation are outlined below, but their interdependencies should be appreciated: the best people will not come without funding, and excellence-based funding will not be won without the best people. Some uncertainty is inevitable, but the research and innovation system will be damaged by any perception that the UK is not fully open for business.

People and mobility

8. The contribution made by non-UK nationals to UK research and innovation is integral to our world-leading position: we must remain open and welcoming to research talent, underpinned by continued easy movement of global research talent.

9. The UK has achieved its high standing in global research by attracting, training and investing in the best minds and skills in students, researchers and professional and technical experts. International mobility and collaboration are intimately linked and the UK is a focal point for both, occupying a central position in the global network of collaborative partnerships and benefitting from the greater citation impact of internationally collaborative research. RCUK regards the continued easy movement of global research talent into and

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3 For example through our overseas teams [in China, USA & India], the UK Research Office [in Brussels] and participation in international fora such as Science Europe, ESFRI and the Global Research Council
4 For example through the Newton Fund and Global Challenges Research Fund.
5 International Comparative Performance of the UK Research Base (2013)
out of the UK as critical to maintaining and strengthening our world leading research position.

10. We place great value on the contribution that non-UK nationals make to delivering Research Council-funded research and across the research system. EU nationals are key contributors, making up 11.8% of all Research Council-funded applicants in the five years 2011/12 to 2015/16 (rising steadily from 10.1% to 13.1% across the years) and 18.8% of Research Council-funded new PhD students over the same period (again rising steadily from 15.0% to 21.1%). EU nationals make up 11.5% of the current Research Council workforce, approximately 85% of whom are directly involved with or support research in our Units and Institutes.

11. We have welcomed assurances that there are no immediate changes to the circumstances of British Citizens living in the EU or European citizens living in the UK and are facilitating the provision of clear and consistent information through the UK Research Office in Brussels (UKRO). However, careers, recruitment and international collaborations are planned over time periods significantly longer than the UK will remain a member of the EU. There is therefore a significant risk that, in a climate of uncertainty, the talented students, researchers and technical specialists required for UK research to continue to be a world leader will leave or not come to UK.

12. It is vital that the long-term position of non-UK EU nationals is clarified as soon as possible to provide reassurance and prevent “brain-drain”. Future arrangements must enable RCUK and the UK research system to continue attracting and retaining the best from across the world, and ensure that UK and international research talent can continue to benefit from mobility into and out of the UK.

**Funding and collaboration**

13. Continued access to at least current levels of research funding and mechanisms for international collaboration, including schemes accessed through the EU, are critical to the UK’s continuing place as a world leader in research and innovation. Replicating EU support for international collaboration and mobility at a national level would place an immense burden on existing UK funding systems.

14. UK research is world-leading and has, as a result, been particularly successful in winning EU funding. The UK received more than €7bn through the 2007-13 EU Research and Innovation programme, and has already received more than €1.8bn under the current programme, Horizon 2020. This represents 15.5% of total H2020 funding allocated so far and is set in the context of a UK Government science and research resource budget of £4.7bn for 2016/17. Particular success has been through the European Research Council (ERC) and Marie Sklodowska Curie Actions (MSCA) schemes, under which the UK has received the highest share of all participating countries. The Research Councils actively engage in EU programmes at all levels (see box), for example supporting UK involvement in all ten JPIs and around twenty ERA-Nets and CSAs) – playing a leadership role in several.

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6 See Higher Education Funding Council for England (HEFCE) submission for more detailed information on the contribution of EU nationals across the UK research system as a whole

7 Based on Principal Investigators and Co-Investigators on Research Council grant applications

8 Provided by the then Prime Minister shortly after referendum result

9 Framework Programme 7

10 UK participation in Horizon 2020 and Framework Programme 7 (April 2016)

11 The allocation of science and research funding 2016/17 to 2019/20 (March 2016)
15. Crucially, such EU programmes are complementary to national schemes in terms of mechanism as well as funding. They support international collaboration (with both EU and non-EU countries) and contribute significantly to the UK’s diverse and robust research landscape across career stages. For example, ERC schemes provide scale and flexibility of funding whilst MSCA programmes support mobility of students and researchers - enabling UK nationals to work in other participating countries and attracting those from other countries to the UK. JPIs, ERA-Nets and CSAs foster and support international collaboration at a strategic and research level, reducing fragmentation and adding value to national investment. The future relationship between the UK and EU will determine the long term nature of UK and RCUK engagement with these schemes.

16. UK participation in collaborative programmes can also make an important contribution to larger scale and longer term impact, linking the UK research base to European businesses and policy makers and increasing potential for research translation at a European level. Overall, replicating the diversity of EU support for multinational collaboration and international mobility at a national level would place an immense and unsustainable burden on existing UK funding systems.

17. Any restriction or reduction in access to EU programmes would therefore, if not fully compensated elsewhere in terms of funding value and mechanism, represent a significant risk to the excellence of UK research. This risk lies across the research base as a whole, but is particularly acute in those disciplines and institutions which receive the highest proportion of their funding through EU programmes. Annex 1 provides information on disciplines which receive the highest proportion of their total research income from these sources, as well as those which receive the greatest value12.

18. RCUK welcomes the statement made on 13 August by HM Treasury on continuity of funding for UK applicants to Horizon 202013, which provides reassurance for those applicants and their European partners. The confirmation that HM Treasury will underwrite the payment of awards where applications are submitted while the UK remains a member of the EU, even when specific projects continue beyond the UK’s departure from the EU, will allow consortia to bid with confidence. Future models for longer-term engagement must ensure that RCUK and UK researchers can continue to play a leading role in international research collaborations, and that there is no reduction in overall levels of research funding.

**Joint Programming Initiatives (JPIs)** pool and align national research efforts to more effectively tackle common European challenges, many of which have a wider global impact. There are ten JPIs in key areas such as *neurodegenerative disease, cultural heritage, antimicrobial resistance* and *climate change*.

**European Research Area Networks (ERA-NETs)** strengthen co-ordination of national and regional research programmes by providing a framework to develop joint activities and support joint calls for transnational proposals. The Research Councils support UK involvement in around twenty such platforms, aligning with areas of key national interest such as *diet and health, synthetic biology* and *urban futures* and often receiving additional EU funding for particular activities.

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12 See Higher Education Funding Council for England (HEFCE) submission for more detailed information on EU funding to regions and institutions

Coordination and Support Actions (CSAs) support coordination and networking – including workshops, development of collaborative activities and knowledge exchange - particularly where relationships are new and emerging.

Infrastructure and facilities

19. Continued access to and sustainable financial support for world-class infrastructure and facilities are essential for UK research.

20. The UK’s world-leading research infrastructure and facilities are a key factor in attracting the most talented researchers and multinational R&D companies. Maintaining access to a full range of research facilities, both those in the UK and internationally, is vital for the UK to remain a leading centre of research excellence. RCUK will continue to work to ensure that our researchers have access to leading research infrastructure and facilities wherever they are located, as well as promoting those within the UK.

21. The UK and RCUK participate in a range of European and international infrastructures which are not part of EU institutions, but are also heavily engaged with research infrastructures that receive EU funding (see box for example).

The European life science infrastructure for biological information (ELIXIR) is an intergovernmental organisation, led by the UK, with nodes across member countries and a central hub in Hinxton, Cambridge. ELIXIR orchestrates the collection, quality control and archiving of large amounts of biological data produced by life science experiments – making them available to researchers in participating countries and beyond.

UK participation is funded by BBSRC, MRC and NERC. The ELIXIR Hub coordinates two large H2020 Research Infrastructure projects since 2015, at a value of over €35m, with the UK receiving the largest share, and building on previous €10m EC funding (2012-15).

22. UK institutions are involved in 78 of the 100 projects funded so far under the H2020 Research Infrastructures Programme, building on €273 million funding to the UK under the previous FP7 Programme. The strength and vitality of UK research infrastructures, together with the multinational infrastructures in which it has a stake, have also benefitted greatly from the exchange of ideas and technical expertise through many EU-funded networks and Joint Research Activity projects supported by the EU.

23. While HM Treasury’s recent statement provides reassurance for those participating, or planning to participate, in projects funded through the Horizon 2020 Research Infrastructures Programme, clarity and reassurance about the future terms of UK engagement is urgently needed in other areas. A particular concern is the continued ability of the UK to host, join and vote in European Research Infrastructure Consortia (ERICs), a legal entity model which facilitates the establishment and operation of large European research infrastructures among EU Member States and Associated Countries. The UK hosts one ERIC (see box) and participates in seven established ERICs - as well as a

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14 For example CERN and the European Southern Observatory (ESO)
15 For example the Square Kilometre Array (SKA) and T2K neutrino experiment
16 Framework Programme 7: the EU Research and Innovation funding programme 2007-13
17 For example the Integrated Carbon Observation System
further seven infrastructures in the process of applying for ERIC status\textsuperscript{18}. UK involvement and leadership will be affected by the membership and voting status afforded by our future relationship with the EU.

**European Social Survey (ESS):** headquartered at City University, the ESS provides rigorous cross-national data on social attitudes and behaviour. It has 16 member countries and serves a large and growing international social science and policy community (more 94,000 registered users from across the world). UK participation in the ESS is funded by ESRC.

The ESS has received just over €26m in EU grants since 2001, with the UK receiving the largest share. The ESS HQ also coordinates two H2020 Research Infrastructures projects with a collective total of €10.5m. Again, the UK receives the largest share. Leaving the EU could mean that the UK, while still participating in the ESS, would lose leadership and voting rights.

**Influence and legislation**

24. **The UK has had a strong voice in EU research strategy and policy, benefitting both the UK and research across Europe.** It is imperative that a future model of engagement with the EU enables the UK to continue to engage proactively in strategy development and decision-making.

25. RCUK makes, and will continue to make, an authoritative contribution to international research strategy and policy development through our membership and participation in a range of international fora\textsuperscript{19}. However, EU programmes and co-ordination bodies\textsuperscript{20} play an important role in influencing, maintaining and building strategic relationships. Participation puts RCUK and UK researchers in a position to influence both the direction of specific programmes and broader research strategy (see box for example) in a direction which reflects the strengths and needs of UK-based research to the mutual benefit of all participants.

The **European Strategy Forum on Research Infrastructures (ESFRI) 2016 Roadmap** was developed with significant UK input and leadership. Proactive membership enhances the UK’s reputation, positioning and influence, as well as the successful leveraging of EC funding. Research Infrastructures that appear on the Roadmap are of highest strategic importance and qualify to apply for EU funding. This EU funding is also a means to leverage Member State support and capital investments at a national level.

The UK’s ability to influence and leverage EU funding through ESFRI will depend upon the future model of engagement: at present, EU Member States and those countries **Associated** to Horizon 2020, but not third countries, are able to participate.

\textsuperscript{18} For example the European Carbon Dioxide Capture and Storage Laboratory Infrastructure; Extreme Light Infrastructure

\textsuperscript{19} For example Science Europe; the Global Research Council; OECD Global Science Forum

\textsuperscript{20} For example Research Council advice to Ministries on Horizon 2020 Programme Committees
26. The UK and RCUK has also had a strong and positive voice in the development of much EU legislation and regulation relevant to research, innovation and technology. This influence has had a positive impact on the conduct of research – for example promoting high and consistent standards of animal welfare in research\textsuperscript{21} and updating data privacy laws across the EU\textsuperscript{22}. More generally, the implications of leaving the EU on the status of legislation relevant to research will need to be carefully considered as negotiations progress. In many cases\textsuperscript{23}, it is likely that the continuation of collaborative research would require the UK to adhere to EU standards and implement new regulations at national level.

CONCLUSION: Negotiation and Monitoring

27. It is imperative that issues, risks and opportunities related to UK research and innovation are fully considered in negotiation of a new relationship between the UK and EU. RCUK continues to work closely with colleagues in government to ensure that research and innovation are well-placed in these negotiations.

28. Reliably determining any impacts of short-term uncertainty and the UK’s new relationship with the EU on research is crucial, but will be challenging and will become apparent over time. There are a range of indicators from a range of sources (e.g. HESA\textsuperscript{24}, European Commission\textsuperscript{25}) which can be harnessed and it will be important for stakeholders to work together for effective monitoring. RCUK will work with BEIS and the wider community to determine the most appropriate ways to benchmark and monitor the role of EU funding and EU research talent across the UK research system.

29. The delay between application and funding initiation – and the frequency with which databases are updated – means that there is likely to be a 12-18 month lag in any trends in European application, funding, or expenditure levels becoming evident. Research Councils may see an increase in application rates to their national schemes in a shorter time-frame.

30. However, the continuing clarification and negotiation needed to mitigate the significant risks to UK research and innovation must take place in a shorter and urgent time-frame.

\textsuperscript{21} Alternatives to Animals directive, which came into force in 2010
\textsuperscript{22} General Data Protection Regulation
\textsuperscript{23} for example EU Clinical Trials and General Data Protection Regulation - both of which are expected to come into force in 2018
\textsuperscript{24} The Higher Education Statistics Authority collects national data on research expenditure and students on an annual basis
\textsuperscript{25} The European Commission E-corda Database provides a snapshot, updated three times per year, of funding from and applications to Framework Programmes and H2020
ANNEX 1: Discipline-specific EU funding

Over the three year period from 2012-13 to 2014-15 EU Government Bodies provided 13% of all the research grants and contracts income to UK universities (as reported to HESA). Over this three year period, the ten disciplines (based on HESA Cost Centres) that had the highest proportion of their total research income from the funder type “EU Government bodies” were as follows:

<table>
<thead>
<tr>
<th>HESA Cost Centre</th>
<th>Proportion of research income from EU Government Bodies (2012/13-14/15)</th>
<th>Total income from EU Government Bodies (2012/13-14/15) £000’s</th>
<th>Total income from all EU funding sources (2012/13-14/15) £000’s</th>
<th>Proportion of research income from all EU sources (2012/13-14/15)</th>
<th>Total amount from all sources (2012/13-14/15) £000’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>126 Archaeology</td>
<td>34.8%</td>
<td>£21,492</td>
<td>21,863</td>
<td>35.4%</td>
<td>£61,737</td>
</tr>
<tr>
<td>121 IT, systems sciences &amp; computer software engineering</td>
<td>30.9%</td>
<td>£136,424</td>
<td>141,584</td>
<td>32.1%</td>
<td>£441,693</td>
</tr>
<tr>
<td>140 Classics</td>
<td>30.1%</td>
<td>£3,603</td>
<td>3,874</td>
<td>32.3%</td>
<td>£11,984</td>
</tr>
<tr>
<td>130 Law</td>
<td>24.7%</td>
<td>£13,477</td>
<td>15,253</td>
<td>28.0%</td>
<td>£54,559</td>
</tr>
<tr>
<td>141 Philosophy</td>
<td>24.2%</td>
<td>£6,295</td>
<td>6,571</td>
<td>25.3%</td>
<td>£25,981</td>
</tr>
<tr>
<td>145 Media studies</td>
<td>23.1%</td>
<td>£5,233</td>
<td>5,696</td>
<td>25.2%</td>
<td>£22,630</td>
</tr>
<tr>
<td>127 Anthropology &amp; development studies</td>
<td>22.7%</td>
<td>£17,113</td>
<td>18,301</td>
<td>24.3%</td>
<td>£75,225</td>
</tr>
<tr>
<td>128 Politics &amp; international studies</td>
<td>21.6%</td>
<td>£21,666</td>
<td>24,550</td>
<td>24.4%</td>
<td>£100,515</td>
</tr>
<tr>
<td>113 Chemistry</td>
<td>21.5%</td>
<td>£142,150</td>
<td>154,751</td>
<td>23.5%</td>
<td>£659,685</td>
</tr>
<tr>
<td>119 Electrical, electronic &amp; computer</td>
<td>21.2%</td>
<td>£114,403</td>
<td>125,427</td>
<td>23.3%</td>
<td>£538,961</td>
</tr>
</tbody>
</table>

26 Figures taken from HEIDI HESA finance returns: Table 5b; Research grants & contracts – breakdown of income by cost centre, Academic Departments 101-145 for the three years 2012/13-2014/15
27 All EU funding sources taken as: EU Government bodies, EU based charities, EU industry, commerce & public corporations, and EU other from HESA finance table 5b
The top ten HESA Cost Centres by value of EU contribution were:

<table>
<thead>
<tr>
<th>HESA Cost Centre</th>
<th>Total income from EU Government Bodies (2012/13-14/15) £00’s</th>
<th>Proportion of research income from EU Government Bodies (2012/13-14/15)</th>
<th>Total income from all EU funding sources (2012/13-14/15) £00’s</th>
<th>Proportion of research income from all EU source (2012/13-14/15) £00’s</th>
<th>Total amount from all sources (2012/13-14/15) £00’s</th>
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</table>


<table>
<thead>
<tr>
<th>Field of Study</th>
<th>First Year 2019/20 (£)</th>
<th>% Change First Year 2019/20</th>
<th>First Year 2018/19 (£)</th>
<th>% Change First Year 2018/19</th>
<th>Total First Year 2019/20 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 Clinical Medicine</td>
<td>£323,956</td>
<td>6.2%</td>
<td>£425,881</td>
<td>8.1%</td>
<td>£5,258,380</td>
</tr>
<tr>
<td>112 Biosciences</td>
<td>£252,450</td>
<td>13.1%</td>
<td>£284,456</td>
<td>14.8%</td>
<td>£1,926,679</td>
</tr>
<tr>
<td>114 Physics</td>
<td>£143,306</td>
<td>15.9%</td>
<td>£151,802</td>
<td>16.9%</td>
<td>£898,849</td>
</tr>
<tr>
<td>113 Chemistry</td>
<td>£142,150</td>
<td>21.5%</td>
<td>£154,751</td>
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<td>119 Electrical, electronic &amp; computer engineering</td>
<td>£114,403</td>
<td>21.2%</td>
<td>£125,427</td>
<td>23.3%</td>
<td>£538,961</td>
</tr>
<tr>
<td>120 Mechanical, aero &amp; production engineering</td>
<td>£105,678</td>
<td>15.3%</td>
<td>£124,843</td>
<td>18.1%</td>
<td>£688,649</td>
</tr>
<tr>
<td>111 Earth, marine &amp; environmental sciences</td>
<td>£96,343</td>
<td>18.3%</td>
<td>£112,825</td>
<td>21.5%</td>
<td>£525,031</td>
</tr>
<tr>
<td>115 General engineering</td>
<td>£80,994</td>
<td>17.5%</td>
<td>£89,119</td>
<td>19.3%</td>
<td>£461,690</td>
</tr>
<tr>
<td>122 Mathematics</td>
<td>£51,842</td>
<td>18.4%</td>
<td>£56,079</td>
<td>19.9%</td>
<td>£281,725</td>
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</table>