Research Councils UK (RCUK) is a 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 societies and economies. Together we invest more than £3 billion in research each year, covering all disciplines and sectors. The Research Councils are partner organisations of the Department for Business, Energy and Industrial Strategy (BEIS).

This response is made on behalf of the seven Research Councils and represents their independent views. It represents them both as employers, and as the UK’s statutory bodies with responsibility for funding research.

The MAC’s commission comes in a context of not only Brexit, but also a major government investment in a new industrial strategy which places research and development (R&D) at its heart. Our work is an essential part of delivering and commercialising research in the UK. R&D and human capital are drivers of productivity. A wide range of industries, from manufacturing and agriculture to digital technology rely on research to innovate, grow, and create high-value jobs. Nurturing a strong research base is also vital for preparing the nation for future challenges from climate change, food security and future cities, to antimicrobial resistance, national security and meeting the needs of an ageing population.

There are several reasons why research continues to need access to global talent. We summarise these below and note the particular vulnerabilities when looking at EU migration patterns.

- Competitiveness and productivity
  The global scientific community is continuously developing new techniques. Attracting talented international scientists and technical specialists to the UK is required to keep the pace and respond to new opportunities. In turn, these recruits contribute to the capacity building in the UK for the research and innovation sector. Although it is not yet understood how this process works in detail there is evidence that researcher mobility results in higher impact and research productivity.

- Mobility resulting from international funding agreements
  In research, mobility is not solely driven by employers seeking to recruit the best person at the most appropriate price. Collaboration also has a significant influence on migration patterns. This may be driven by individual researchers, government strategy, or as part of significant international programmes.

- A culture of global research excellence
  We know that non-UK researchers often spend an early part of their career in the UK and believe that UK-based researchers often spend time overseas. The exposure of ‘early career’ researchers to global excellence shapes the culture in research organisations. Researchers benefit from having established an international network of collaborators, mentors and peers.

1 http://www.rcuk.ac.uk/
3 From April 2018, the seven research councils, together with Innovate UK and Research England, will form a new body called UK Research and Innovation (UKRI).
• **Skills shortage**
  We set out our contribution to the identification of and intervention in skills shortages in this document. This is part of a long-term investment and does not provide a quick solution. We note in particular the skill shortage in technical professional groups (below PhD-level) where the EU currently supplies a significant number of the staff. Without these staff the work of more senior researchers is likely to be inhibited.

**Immigration system requirements**

5. We support calls to exempt EU researchers already working in the UK from immigration controls6.

6. Our engagement with the sector indicates that in the long-term, companies, universities, charities and research institutes alike see the implementation of an immigration system that enables the recruitment, retention or engagement of skilled international talent, irrespective of nationality, as an essential pillar of securing a positive outcome for science and research.

7. To maintain the UK’s excellent research base and meet the objectives set out in the government’s industrial strategy green paper, the UK’s immigration system should support the retention, access and movement of those who lead, undertake and support research. This includes:

- Highly skilled people – e.g. researchers, engineers, academics, business founders. Characteristics include PhD level roles or Chartered Engineer status.
- Specialist technicians – e.g. data analysts, cell culture specialists, artificial intelligence experts.
- Students – including undergraduate, postgraduate taught and PhD students.
- Dependents of these individuals.

8. The following types of movement are essential to research and innovation in the UK:

- Long-term migration with routes to residency
  - Recruitment to advertised posts - initiated by the employer - the strongest candidate is selected, irrespective of nationality.
  - Relocation of research and innovation talent to the UK - initiated by the individual; e.g. named holders of research grants or recognised fellowships, investors, business founders, those with skills in short supply.
  - Long-term intercompany transfers (ICTs).

- Temporary migration after which the individual will return to their home country:
  - Short visits (up to 6 months); e.g. visit a collaborator, give a lecture, sit on an interview panel.

- Temporary work (1-2 years); e.g. secondments, placements, training, co-location for collaboration, use of a UK-based facility, staff exchange, addressing an urgent research issue (e.g. disease outbreak), ICT.

- Formal study in approved education establishments with options for remaining in the UK.

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9. As explained below, to support science and innovation any immigration system should provide:

- Simple and proportionate administrative principles and processes for individuals and employers
- Clear guidance on eligibility and use of the system
- Minimal bureaucracy and cost, with efficient and reliable processing of applications
- Reliable and transparent reporting of migrant numbers and characteristics

Value of science and innovation

10. The impact of research is very often realised through the combination of a range of public and private investments over time and across multiple disciplines. We note:

- Every £1 invested by the government in the UK research base leads to an estimated lifetime return to the UK economy of around £7.20.
- In 2015/16 the government invested £5.86bn through the science budget, leading to a lifetime net present value of £42bn additional GDP for the UK economy.
- In 2013 the R&D-intensive aerospace and pharmaceutical industries generated a trade surplus of more than £5bn and £3bn respectively.
- The higher education sector generated more than £73bn of output and contributed 2.8% of UK GDP in 2011/12.
- The UK digital sector employs 1.6m people, is growing at 25% per year and contributes 10.4% of GDP. TechCity cite timely access to global talent is identified as key to supporting this growth.

11. A report on the comparative international performance of the UK research base commissioned by the Department for Business, Innovation and Skills (BIS) found that the UK continues to hold its place as a global leader in research. The UK accounts for 9.9% of paper downloads, 10.7% of citations and 15.2% of the world’s most highly-cited articles. The UK’s share of citations from patents to journal articles is 10.7%. In terms of field-weighted citation impact, the UK continues to rank number one amongst comparator countries.

12. Research can also have a concentrated local impact, for example the Cambridge Biomedical Campus. The campus combines world-class biomedical research, patient care and education on a single site. Now undergoing a major expansion that includes the co-location of companies alongside the existing 12,000-strong community of healthcare professionals and research scientists, the campus is on track to become one of the leading biomedical centres in the world by 2020.

EEA migration trends

13. Research is international and intrinsically collaborative. Scientific breakthroughs are not developed in isolation so easy movement of researchers, innovators and specialist technicians...
gives the UK a competitive advantage by opening up access to skills and international networks.

14. An internationally diverse workforce adds to the UK’s culture of global research excellence. From the earliest stages of training, students and researchers are exposed to the highest standards and the widest networks. This is associated with high levels of attainment and prestigious onward career destinations.

15. We note that:

- International movement is a feature of researchers’ careers. 72% of UK-based researchers spent time at non-UK institutions between 1996 and 2015.

- 27.7% of academic staff at universities are from outside the UK – 31,600 from other EU nations and 23,000 non-EU nations.

- The highest share of international academics are in engineering and technology (40%) and biological, mathematical and physical sciences (37%).

16. The labour market for academia works differently than from other markets. Mobility in research is often not driven by employers straightforwardly seeking to recruit the best person at the most appropriate price. Some of the differences are highlighted below.

17. First, funding decisions often precede employment decisions. Funding applications include the name of a principal investigator, often one or several co-investigators, and other researchers and experts who may not yet be employed by the organisation but who are named on the grant application. Non-UK EU nationals make up 11.8% of all Research Council funded principal investigators in the five years 2011/12 to 2015/16 and approximately 18% of new Research Council funded PhD students over the same period (24% non-UK nationals altogether).

18. Similarly, in the case of fellowships, an individual researcher is awarded funding to be deployed at a UK higher education or research institute and then takes on employment duties.

19. Second, researcher-led collaboration frequently results in mobility. In turn this may be driven by co-funding agreements with international partners (including lead agency agreements), international co-investigators policy and ‘the money follows cooperation’ rules.

20. Examples of UK-driven strategic internationally-focused funding activities which support researcher mobility include:

   a. The Newton Fund: an initiative intended to strengthen research and innovation partnerships between the UK and emerging knowledge economies.

   b. The Global Challenges Research Fund (GCRF) is a five year £1.5Bn fund and a key component in the delivery of the UK Aid Strategy.

21. Examples of international multilateral agreements supporting migration into and out of the UK (which are by no means exclusively the result of EU processes) include:

   a. Large scientific facilities programmes that the UK actively participates in, e.g.

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14 Includes UK and non-UK nationals - only published researchers from academia and industry were analysed
16 Staff by geographic region of nationality, HESA 2014/15
17 Nationality academic staff by cost centre group, HESA 2014/15
18 For information on how Research Council funding decisions are made, see: www.rcuk.ac.uk/funding/eligibilityforrcs
19 http://www.rcuk.ac.uk/international/funding/moneyfollowsresearcher/
i. CERN, in France and Switzerland, the world’s leading laboratory for particle physics.

ii. The Isaac Newton Group of Telescopes within the Canary Islands, undertaking world-class astronomical research.

iii. The European Synchrotron Radiation Facility (ESRF) in Grenoble, France, where UK scientists currently receive approximately 18% of the available ‘beam time’.

b. **The European Research Council (ERC)** is part of the excellence pillar of the EU’s Horizon 2020 programme, offering significant research funds to individuals at different career stages. The funding can include the applicant’s own salary and is sometimes therefore seen as a fellowship scheme. The UK is the main beneficiary of ERC funding, receiving the highest number of awards across all schemes and disciplines.

c. **The Human Frontier Science Program (HFSP)** is a program of funding for frontier research in the life sciences, supporting many early career researchers through fellowships. The HFSP supports novel, innovative and interdisciplinary basic research focused on the complex mechanisms of living organisms. The members of the HFSP, the so-called Management Supporting Parties (MSPs) are Australia, Canada, France, Germany, India, Italy, Japan, Republic of Korea, Norway, New Zealand, Singapore, Switzerland the United Kingdom, the United States of America and the European Union.

d. **European Molecular Biology Organisation (EMBO)**. EMBO Fellowships support postdoctoral and predoctoral research experience in laboratories in Europe and around the world. EMBO is an organization of more than 1700 leading researchers that promotes excellence in the life sciences. The major goals of the organisation are to support talented researchers at all stages of their careers, stimulate the exchange of scientific information, and help build a European research environment where scientists can achieve their best work. EMBO programmes and activities are funded by the European Molecular Biology Conference (EMBC) which comprises of 29 member states.

22. The UK has also been a highly successful beneficiary of the EU’s Marie Skłodowska-Curie Actions, as explained in the box below.


23. A number of Research Councils also employ researchers and associated staff at research institutes of international renown. These institutes were asked to provide an assessment of the impact of the EU referendum on their workforce. Two examples are below:

Response from the Science & Technology Facilities Council (STFC)
The highest identifiable impact of the EU referendum is on current staff and recruitment.

STFC employs around 2,100 people. Roughly 10% of STFC’s current employees come from non-UK EU or EEA countries, 26% of them are employed on fixed term contracts.

Many staff from non-UK EU or EEA countries work in areas where there is strong competition for scarce skills or in front line jobs delivering our science programme:
- ~45% of the total of non-UK EU or EEA nationals are employed as scientists;
- Of STFC engineering and technology related roles ~95% are from the EU;
- ~10% are students/graduate trainees;
- ~5% work within business support.

Departmentally:
- ~25% non-UK EU or EEA nationals in particle physics;
- ~15% in scientific computing including Hartree;
- ~15% in central laser facilities;
- ~10% in the Accelerator Science and Technology Centre;
- ~10% in ISIS, the UK’s Neutron and Muon Source
- ~10% technology.

There is a natural concern that we may not be able to retain or attract sufficient staff to deliver our programme in future.

In addition to working in a wide variety of technical and non-technical roles, non-UK EU/EAA nationals are employed across all pay bands. Though the majority earn salaries in excess of £30k per annum (nationally agreed salary ranges, in negotiation with trade unions and subject to public sector pay restraint), ~15% earn less than this.

Length of service varies: of our non-UK EU/EAA staff ~35% have been employed by STFC for 6 or more years, and ~50% have only been employed for 1 year or less (based on 2016 data).

Response from the Medical Research Council (MRC)
MRC’s three institutes (Laboratory for Molecular Biology, London Institute of Medical Science and Harwell) employ around 950 staff. Of these approximately 400 work in front line scientific roles with a further ~500 in professional and technical roles directly related to the scientific work undertaken.

MRC Science roles are predominantly filled by PhD qualified researchers, and non-EU candidates qualify for work permits. Most roles fall within SOC code 2112, a smaller portion

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22 STFC pay bands are available at: [www.stfc.ac.uk/files/pay-and-grading-system](http://www.stfc.ac.uk/files/pay-and-grading-system)
matching SOC 2119 more closely. Professional roles tend to be filled by highly skilled individuals as well with the majority holding at least NVQ6 or above qualifications (or equivalent). These may include bio-informaticians, engineers, imaging specialists, and experts in large scientific equipment (such as cryo-electron microscopy). The majority of technical roles require NVQ4 or above and may require specialist, niche expertise in animal experimentation, laboratory maintenance and management of scientific estate.

Of our scientific workforce, 39% hold EU nationality compared to 38% of UK nationality and non-EU workers making up the remaining 23%. Professional and technical roles are mostly filled by UK nationals (80%), followed by EU nationals (15%) and non-EU nationals (5%). It should be noted that a large number of EU nationals fill positions in bio-informatics.

The overwhelming majority (115 members of staff, 75%) of MRC’s EU scientific staff are employed as Early Career Researchers. These are qualified to NVQ level 8 and have a starting salary of £30k (nationally agreed with our trade unions, subject to public sector pay restraint). Most of these researchers will be employed on fixed term, often non-renewable contracts as so-called postdocs. In medical research in particular, the postdoctoral period is seen as transitional towards researchers establishing an independent research interest and associated team. Of all postdocs in MRC institutes UK nationals are in the minority (20%; EU 42% and non-EU 38%). This is not uncommon in science and to our knowledge does not mean that UK nationals are less competitive for our prestigious roles. Our expectation is that UK postdocs are elsewhere in the world increasing their network and conducting science at other competitive labs. Global mobility is a routine feature of the early researcher career and known to correlate positively to research impact and output. In recent years, this has become known as ‘brain circulation’ as researchers tend to settle down in their country of origin in later career stages.23 The breakdown of nationalities at the more senior end of the career spectrum, where contracts are typically open-ended, is distinctly different with UK nationals representing 53% of the cohort, EU workers 37% and non-EU workers 10%.

24. Since the EU referendum in 2016 a small number of grant holders have terminated their work early citing Brexit as a reason. Such instances have been reported to the BEIS central reporting system. Few employees have left the Research Councils citing the referendum result as their reason for departure. Employees tell us that they are waiting to see the result of ongoing negotiations between the UK and the EU before they make decisions on their future.

This case study illustrates the effects of an EU national leaving their research position citing Brexit as a reason.

**VivaMOS**

VivaMOS was started by an employee (EU national) of the Science and Technology Facilities Council as a spin-out company, based in Southampton. In addition to starting the company, while at STFC he co-authored over 100 papers on solid-state detectors, low-noise, microelectronics and Complementary metal–oxide–semiconductor (CMOS) image sensors in international journals as well as filing 8 patents on CMOS image sensors. He left STFC and VivaMOS in 2016 and moved to Spain, citing Brexit as one of the reasons behind his decision to leave.

VivaMOS specialises in the development and fabrication of high-end large-area CMOS image sensors. The company was setup in 2014 with the aim of commercialising the highly sought-after Lassena® image sensor. The Lassena® wafer-scale CMOS sensor offers a unique combination of high-speed, high-resolution, and low-noise performance, as well as being buttable on 3 sides, enabling the introduction of large Flat Panel Detectors for a wide range of X-ray applications. VivaMOS have grown to 8 employees having hired a team to manage the product cycle from development to production. They have ramped-up to full production on their initial product and sales revenue has already passed £1.5m.

The founder is now no longer involved in the company and given his previous track record he will continue to have a substantial research impact, and that any resulting economic impact will now be felt elsewhere.

**Outputs and impact**

25. Global mobility is positively associated with higher research impact and productivity.\(^{24}\)

26. The following case studies provide examples of highly successful EU nationals based in the UK who have grown their field of science, foreign investment into the UK and local job opportunity.

**Dr Lydia Teboul**
Dr Lydia Teboul (EU national) is head of Molecular and Cellular Biology at the Medical Research Council's Harwell Institute. Over the last three years, Dr Teboul has established and pioneered new technologies in the field of genome editing, specifically in animal models. The UK needs to rapidly grow expertise in this new and exciting field which promises to make significant advances in patient treatment. Dr Teboul has played a leading role in this effort to build UK capacity and capability.

Dr Teboul's team has grown in recent years from three to twelve individuals (two EU nationals, ten UK nationals) of molecular biologists and experts in imaging techniques. Under her guidance, MRC Harwell has been able to take on a globally leading role, securing an additional £800k per year from a range of international funding organisations.

**Dr Jan Löwe**
Dr Jan Löwe (EU national) is the international leader in the structural biology of the bacterial cytoskeleton. He is based that the MRC's Laboratory for Molecular Biology, where he leads his research group, is joint head of the larger Division of Structural Biology and is deputy director of the Laboratory.

All domains of life have a cytoskeleton – a complex network of fibres and tubes inside a cell. A cytoskeleton is made up of similar proteins across many organisms, but their structure, function and dynamic behaviour can be different. Prior to Dr Löwe's work, bacteria were believed to lack an organised cytoskeleton. To understand these systems and their mechanisms in bacteria, Dr Löwe’s research group utilise an impressive combination of specialised high-resolution cellular and structural biology techniques to gain insight about the whole cells, as well as at the level of molecules and atoms. By improving our understanding of how bacteria function, research like this can help determine how bacterial infections occur, and ultimately has the potential to identify new drug targets and support drug development. Antimicrobial resistance is an ever-increasing global health problem, emphasising the need for new antibiotics and methods to prevent drug resistance.

Dr Löwe’s group consists of around 15 members of staff of which more than two thirds are foreign nationals. A third of group members occupy postdoctoral, fixed term, non-renewable positions. The Division is made up of around 80 individuals, and approximately a third are employed on fixed term postdoctoral contracts (and 20% of these postdocs are UK nationals). The Division requires significant technical expertise (below PhD level) to support its work and EU nationals make up half of this workforce.

Dr Löwe’s group collaborates with groups inside the LMB, led by colleagues from a range of nationalities. It has formal collaborations with external research groups of high standing, in the UK and the rest of the world in equal measure. These collaborations expose group members,

and particularly early career researchers and PhD students, to the very latest thinking and technologies that are available.

**Professor Irene Miguel-Aliaga**
Professor Irene Miguel-Aliaga (EU national) leads the Gut Signalling and Metabolism group at the MRC London Institute of Medical Sciences (LMS), and is Chair of the Genes and Metabolism Section. She began her career studying for a doctorate at Oxford, moving to work in laboratories at Harvard and then in Sweden before returning to the UK.

Irene’s work focuses on understanding the mechanisms by which organs, in particular the gastrointestinal tract, sense and respond to change. Using Drosophila fruit flies as a model for human disease, Prof. Miguel-Aliaga’s work has shed light on why we do not eat for two during pregnancy and why diseases such as cancer preferentially affect males or females. This work has resulted in high impact publications, has attracted significant funding from EMBO, Wellcome and the ERC amongst others (in excess of £400K per annum over the last 5 years), and has been highlighted by mainstream newspapers or radio broadcasters such as the BBC. In 2015 the Journal of Cell Science elected her ‘Cell Scientist to Watch’, and this year she was elected to EMBO. Irene’s laboratory is currently training an international research team of 14 people, some of whom have brought their own external funding sources to the UK.

Irene has used her skills in genetics, molecular biology and neurobiology to make substantial contributions to the field, particularly in understanding the interdependence of gut and brain in homeostasis and the relay circuits that underpin metabolism in whole animals. This is an emerging area and could be viewed as a frontier upon which a more detailed understanding of nutrition, and its impact for development and ageing, rests.

27. A large number of early career researchers are non-UK nationals and are typically on non-renewable, relatively short term contracts. Tracking this group has significant methodological challenges that have not yet been successfully overcome although funders and employers alike realise the contributions of this large group of staff. In general, we expect the early career researchers we directly support to secure impressive positions here in the UK or elsewhere where they can apply their scientific knowledge and skill to best effect, be that in academia, industry or policy. We also hope they continue to collaborate with their former supervisors, mentors and peers.

**Next destinations of PhD students - MRC Laboratory for Molecular Biology (LMB)**
Approximately 75% of LMB students move to postdoctoral positions in academia after completing their PhD. A further 10% moved to scientific positions in industry or positions in which their scientific knowledge is essential, such as patent law. A further ~5% go on to further professional training, for example in medicine and 7% move to non-scientific positions, for example the civil service or consulting. Others were not immediately employed after leaving the Lab, often for personal reasons.

Just over half of students graduating from LMB remain in the UK. The bulk of the remaining students go to EU countries or the USA.

**Recruitment practices**
28. The Research Councils, in their role as employer, operate a standard, competitive recruitment process focussed on determining an individual’s suitability for the role and are conducted in
line with Home Office immigration rules. We can supply recruitment policies for a number of the Research Councils on request.

29. When recruiting to PhD-level roles we are at liberty to recruit the best candidate for the role irrespective of nationality25.

30. Senior scientific appointments are made following a presentation of candidates’ scientific vision and ambition (assessed for ‘fit’ with the Institute strategy) and obtaining independent, international scientific advice on this proposal (‘peer review’), in addition to a panel interview.

31. Applicants in general may be required to undergo an aptitude test (e.g. to test molecular and cell biology skills) but again this is not differentiated by nationality. In rare cases of urgency we may approach agency workers – typically this applies to high turnover roles in animal care and husbandry (NVQ4 or below). Very infrequently recruitment agencies may be used when searching for senior candidates who would qualify for Tier 1 positions.

32. Under the current immigration rules for non-EU workers, many technologist roles do not meet the requirements to be awarded a visa. Applying these rules to non-UK EU workers as well is likely to inhibit UK research. A recent report from the Russell Group26 shows the composition of the technical workforce in research intensive universities, highlighting that the skill level of technologists employed by universities is higher than the existing Standard Occupational Classification (SOC) codes would suggest. The report further shows how particular disciplines might be affected by any restrictions on EU workers access to the UK labour market with clinical medicine particularly affected.

33. If elements of the current immigration system for non-EU workers were to be applied to EU workers we foresee issues of speed and agility. The Resident Labour Market Test (RLMT) in the Tier 2 policy prohibits rapid recruitment, placing additional costs and timescale pressures on employers. In our view, which we have expressed in a number of earlier consultations27, the RLMT requirements should be updated to reflect modern recruitment methods in the UK. Should there be a move to an RLMT for EEA nationals we fear an unwieldy, slow recruitment process at the expense of securing both UK and international talent who would start to look for work opportunity elsewhere. We suggest a full review is required to make the process adaptable and relevant to modern recruitment processes.

34.

Response from MRC on recruitment practices and trends
MRC scientific vacancies attract significant numbers of international applicants commensurate with the international status and reputation of our institutes. In addition to routine turnover, MRC institutes recruit on a somewhat cyclical basis, as their funding is reviewed every 5 years. Year on year comparisons may therefore be slightly misleading.

The total number of applicants has remained relatively steady over the last four years, totalling approximately 6,800 per year. Over 4,000 apply for scientific roles and on average over 40% of applicants for these roles are of non-EU nationality, compared to ~30% EU and ~25% UK. UK applicants therefore make up the smallest portion of application. Conversely, UK nationals are most successful securing MRC science roles compared to EU and non-EU nationals. Success rates for other MRC roles also show UK nationals are more successful than applicants from other nationalities.

We have not investigated the reasons for this difference in any detail. It would suggest that MRC institutes apply rigorous recruitment processes which perhaps favour those with existing

25 However current immigration rules state that below PhD-level the appointable candidates from the UK or EU have preference.
UK knowledge including awareness of the UK research and innovation sector, funding systems and ways of operating. It is unlikely that language barriers are a reason for suppressed success rates of foreign nationals as English remains the *lingua franca* of the scientific world.

We have noted that the numbers of non-EU applicants to science roles is on target to be slightly lower than last year (140 per month in 2017 vs 165 in 2016). This is not giving us immediate cause for concern and we will continue to monitor the data. Overall data does not show particularly fragile professions/subjects but anecdotally, we hear of fewer EU applicants with specific technical skill sets from Spain and Poland which we continue to monitor.

**Training and skills**

35. The Research Councils have a statutory role in training future research leaders across a range of disciplines. In 2015/16 RCUK invested almost £430 million in postgraduate training. We work with universities, centres and institutes to:

- Train and develop the next generation of research leaders and technical specialists
- Support excellent individuals at critical points of their careers
- Help address research skills priorities

36. While the majority of Research Council funding for skills and capacity development is targeted at doctoral and post-doctoral level, our interventions are also made at other levels where skills needs or shortages are identified.

37. The Research Councils regularly\(^{28}\) assess skills shortages. Generally, we expect the need for higher skills at the postgraduate level in the UK to increase. We also note that 75% of roles on the Home Office’s Shortage Occupation List are in STEM\(^{29}\) and among engineering, science, and hi-tech firms, nearly half (44%) report difficulties in finding experienced recruits with the right STEM skills, particularly high-level STEM skills.\(^{30}\)

38. Postgraduate fellowships hosted by UK research organisations are open to applicants worldwide and once awarded non-EU fellows typically qualify for accelerated access to the Tier 1 Exceptional Promise scheme as operated by the UK’s National Academies. Overall, approximately 32% of Research Council fellowship holders do not hold UK nationality; for some Research Councils this is closer to 50%.

39. At any given time we are supporting approximately 17,000 PhD students in the UK. In the five years from 2011/12 to 2015/16 approximately 18% of Research Council-funded new PhD students are non-UK EU nationals (24% non-UK nationals altogether). Students’ eligibility for funding is not based on nationality but on residency. Many of them meet the so-called residence requirements\(^{31}\), suggesting that they have completed their undergraduate studies in the UK. A small number of studentships, targeted at shortage or vulnerable skills areas may attract full-funding to applicants of all nationalities, at the discretion of the Research Councils.

40. The distribution of EU students funded by RCUK varies by discipline. Clinical medicine and biosciences account for the majority but proportionally fields such as economics are more affected. Skills in advanced quantitative methods is a vulnerable area, shared by many disciplines.\(^{32}\)

41. Research Councils are actively involved in the development of technologists (below PhD level). Examples of where we have taken an active role in responding to significant technical skills shortage include:

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\(^{28}\) For an overview, see our submission to the House of Commons Science and Technology Committee’s ‘Closing the STEM skills gap’ inquiry [http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/closing-the-stem-skills-gap/written/45944.html](http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/closing-the-stem-skills-gap/written/45944.html) and also here [https://www.mrc.ac.uk/documents/pdf/review-of-vulnerable-skills-and-capabilities/](https://www.mrc.ac.uk/documents/pdf/review-of-vulnerable-skills-and-capabilities/)


a. STFC’s apprenticeship programme\textsuperscript{33} which attracts up to 30 new recruits each year. Between 75\% and 90\% of these trainees secure open-ended employment with STFC at the end of their apprenticeship.

b. MRC has developed two new standardised apprenticeships in animal technology\textsuperscript{34} as part of the government’s Trailblazer programme. It is also in discussion with industry partners about an apprenticeship in bio-informatics (level 7).

c. Support for Science Council’s programme for recognition of technical experts\textsuperscript{35}

d. BBSRC programme of work on the ‘non-faculty’ workforce.\textsuperscript{36}

e. RCUK has set out a Statement of Expectation on Technology and Skills Specialists, which include an obligation for research organisations to establish clear career structures, access to specialist training and travel budgets for the development of cutting edge skills.\textsuperscript{37}

Further information
The Research Councils are able to provide some further information upon request. If this would be helpful, please contact:

Linda Holliday, Director of Capacity and Skills
Email: Linda.holliday@headoffice.mrc.ac.uk or tel: 01793 416215

or

Stephen Longson, Immigration Manager
Email: Stephen.Longson@uksbs.co.uk or tel: 01793 867937

Research Councils UK
October 2017

\textsuperscript{33} http://www.stfc.ac.uk/about-us/work-with-us/apprentice-training-scheme/

\textsuperscript{34} https://www.har.mrc.ac.uk/news-events/news-archive/mrc-harwell-%E2%80%98trailblazer%E2%80%99-apprenticeships

\textsuperscript{35} http://sciencecouncil.org/employers/technician-commitment/

\textsuperscript{36} http://www.nature.com/nature/journal/v540/n7632/full/540199c.html

\textsuperscript{37} http://www.rcuk.ac.uk/documents/documents/statement-of-expectation-on-support-for-technology-pdf/