

Microbiology Society written evidence to the House of Commons Science and Technology Committee Brexit science and innovation Summit inquiry

January 2018

Summary

1. **Need for clarity:** Microbiology Society members are concerned about the continued lack of clarity around what the UK's future science and innovation relationship with the EU will be in terms of mobility, collaboration, funding, infrastructure and regulation. UK and Irish members have given examples of this uncertainty impacting microbiology currently and in the future.
2. **People:** The Society recommends the Government swiftly clarifies future plans to ensure *and* promote mobility of scientific skills, talent and knowledge, across all career stages and sectors, between the UK, EU and other countries. There is an opportunity and need for the Government to be more positive in its messaging and actions, and to collaborate with the scientific community to demonstrate to scientists in the UK and internationally that the UK remains an attractive place to do science in the interim and post-Brexit.
3. **Funding and collaboration:** Our members require greater clarity about future relationships with EU science programmes and bodies, which support collaborative microbiology research and innovation, discovery science and career development. Members also need clarity about how any loss of access to these programmes will be replaced to maintain and build support for UK research and collaborations with the EU and other countries. Retaining links with EU scientific programmes and bodies is also important for tackling international challenges such as infectious diseases. There is an opportunity for the Government to not only match research investment the UK currently receives from the EU, but increase overall investment more rapidly to achieve ambitions set out in its Future Partnerships paper and Industrial Strategy.
4. **Infrastructure and resources:** Our members remain concerned about the impact of Brexit on access to important European microbiological research infrastructures and resources, such as culture collections and pathogen reference laboratories. The Government needs to ensure ease of access to scientific research resources and infrastructures is retained, and build domestic capacity where required to meet increased needs or address current gaps.

Introduction

5. The Microbiology Society is a membership charity for scientists interested in microbes, their effects and their practical uses. It is one of the largest microbiology societies in Europe with a worldwide membership of 4,700 people based in universities, industry, hospitals, research institutes and schools. Our members have a unique depth and breadth of knowledge about the discipline. The Society's role is to help unlock and harness the potential of that knowledge.
6. The Society welcomes the opportunity to inform the Select Committee's Brexit science and innovation Summit. Brexit is an extremely important issue for the Society and the microbiology community. As stated by the Society's Council¹: "*Part of the country's scientific*

¹ Science and the EU – Statement on Brexit from the Microbiology Society's Council (June 2016) Microbiology Society. <https://microbiologysociety.org/policy/science-and-the-eu.html>. Last accessed 24-01-2018.

strength comes from our continuing commitment to international partnerships. Scientific ideas do not respect national borders and, by definition, the global challenges that microbiology can help to address cannot be solved by any one country or bloc of nations. Throughout the world, the best laboratories are those that draw on and integrate diverse talents, ideas and backgrounds, welcoming researchers from all over the world. The Microbiology Society has always been an international organisation that values international partnerships. It is a UK and Ireland-based organisation, whose Irish Division has always encompassed scientists across the entire island of Ireland. Importantly, 93% of the authors in the Microbiology Society journals are from outside the UK, and its conferences have always included speakers and presenters from all parts of the world. Inevitably, many of the UK's scientific links are with our European neighbours, and the Society was a key driving force behind the establishment of the Federation of European Microbiology Societies. Our members have established valued and highly functional networks that have brought together researchers across the European Union. Many of our UK members have been funded via the European Research Council and Europe-wide training networks."

7. The Society welcomes and supports representations on Brexit previously made by the Science and Technology Committee and scientific organisations, including the Campaign for Science and Engineering and Royal Society of Biology, with whom we collaborate². Our evidence outlines specific outstanding issues and required actions raised by our members in response to this inquiry.

People

Mobility of scientific knowledge, skills and talent

8. **The Society supports the Science and Technology Committee's previous recommendation³ to improve the visa system and the support it provides for short-term visits, bringing ideas to the UK and facilitating collaborative research and technology transfer.** Some members suggest an expeditious STEM visa may be required to support the flow of talent across the science base, both from the EU and other countries.
9. **There is an opportunity for the Government to be more proactive in supporting the science community in demonstrating UK science remains open for business, for example by supporting bids to host high-profile international scientific conferences, and working with membership charities and professional bodies to communicate information and opportunities to our communities.** The Microbiology Society plays a key role connecting international microbiologists. The Society has removed all geographical boundaries from membership requirements, offering support and grants to microbiologists worldwide, to promote close global links for our community. Our Annual Conference attracts up to 2,000 microbiologists each year, with 12% attending from outside the UK in 2017. The Society has not seen a significant decrease in membership enrolment following the announcement of Brexit, but we are aware some overseas delegates have difficulties attending our events due to visa application delays; we are concerned these may increase with a potentially higher burden of applications to the Border Agency.
10. **It is vital the Government acts in the short- and long-term to maintain the attractiveness of the UK as a place to do science to UK researchers and those based in European and other countries through clearer and welcoming messaging.** Aligning with concerns raised previously

² Science and the EU. Microbiology Society. <https://microbiologysociety.org/policy/science-and-the-eu.html>
Last accessed 24-01-2018.

³ [Leaving the EU: Implications and opportunities for science and research](#)

by the Science and Technology Committee,⁴ our members are concerned about a ‘brain drain’ of microbiology skills and talent from the UK. Several members, from early career to senior scientists and nationals of the UK, EU and other countries, said they were considering or actively planning to leave the UK due to Brexit. Drivers include: concern about funding, job opportunities and the research environment being diminished, potential lack of job security and guarantees for dependants, and experience of increasingly negative attitudes towards migrants.

11. **Our members emphasise that policy concerning the mobility of scientists between the UK, EU and globally needs to consider skills and talent needs in the broadest sense, including principal investigators, early career researchers (e.g. undergraduates, postgraduates, and postdoctoral researchers), laboratory technicians and microbiologists working in industry and healthcare.** Members are concerned, for example, that postdoctoral researchers, an important asset to the UK’s research base, may fall through the gaps of a future immigration system if they are not appropriately regarded by the Home Office as having necessary skills and talent.

Early career researchers

12. It is important to better consult and inform early career researchers, and ensure access to EU support for career development is retained or replaced. Our Early Career Microbiologists’ Forum voiced concerns that loss of EU funding opportunities, including schemes supporting career development, could make it even more challenging to advance in an already competitive environment. For example, some members have benefited from access to EU funding, such as the Marie Skłodowska-Curie Actions which fosters career development and training of early career researchers, promoting interdisciplinary research and international collaboration. Since 2014, nearly 500 UK researchers have attracted over €500 million in funding involving 600 institutions.⁵ Members also emphasised the value of the ERASMUS study abroad programme.
13. **Current uncertainty and potential impacts of Brexit may already be dissuading some talented early career microbiologists from remaining in, or coming to, the UK** (see points 10 and 27). One early career member said: *“High-quality researchers, many of which the UK has invested in to educate, are already deciding on their positions for the next academic year. With the lack of clarity surrounding the future, I and several colleagues are already deciding or have decided to leave the UK.”*

Collaboration and funding

International collaboration

14. Maintaining and enhancing international collaboration with partners in Europe and elsewhere is important for microbiology. Our members emphasise the need to maintain connectivity to the European research partnerships to ensure the UK remains at the forefront of global science. Microbiological research is particularly multinational, depending on shared expertise across Europe and the world. For example, 64.6% of UK microbiology and immunology papers are co-authored with international collaborators, compared to just 48.6% for all UK science papers.⁶

⁴ [Leaving the EU: Implications and opportunities for science and research](#)

⁵ https://ec.europa.eu/research/mariecurieactions/funded-projects/horizon-2020-statistics_en

⁶ Elsevier B.V., 2018

EU Framework Programmes

15. **The Government's commitment to underwrite bids for H2020 projects submitted while the UK is a member of the EU is welcome. However, our members emphasise much uncertainty remains and that the Government needs to swiftly clarify what future UK–EU research funding partnerships will look like.** Members have told us that EU research programmes are an important source of funding for cutting edge microbiology across areas including health, agri-food, environment and industrial technology and, importantly, facilitate international research and innovation collaborations across both academia and industry. For example, The Society's 'Unlocking the Microbiome' report highlights that the European Commission's FP7 and Horizon 2020 research and innovation programmes have funded 535 microbiome research projects at a cost of €1.4 billion.⁷
16. **Members highlighted that pan-European research projects and consortia involving UK microbiologists are important for addressing international challenges, and UK desire to participate in future collaborations should be made clearer.** For example, a member highlighted the H2020 InfraVec2 project, which enables scientists working on insect vector-borne diseases to access samples and facilities across Europe, including labs in the UK - accelerating European insect vector biology research and targeting potential threats to human health and animal industries.⁸ Exclusion from future EU funding could be detrimental to this research, since the UK and Europe are world leaders in this field and continued collaboration is essential for maintaining our capacity and strength. Antimicrobial resistance is another global challenge requiring ongoing collaboration with the EU. The Innovative Medicines Initiative (IMI) is an EU H2020 academic and industry partnership, from which UK participants have received over €349 million to date, including DRIVE-AB, a joint initiative involving the UK and six European countries to stimulate development of new antibiotics.⁹
17. Some members said that while 'buy-in' funding streams, such as ERA-NET, allow access to some of the benefits of H2020, from personal experience they had found it much more challenging to form and maintain consortia within this framework, due to more complicated eligibility criteria and reliance on alignment between countries' review processes and priorities. Members also noted priorities for these large programmes are set many years ahead, so the UK may already be losing out on influencing future programmes it may still be involved in due to current uncertainty.

European Research Council Funding

18. **Government should ensure that support for longer-term discovery science support is considered in future arrangements.** Potential loss of European Research Council (ERC) funding is a specific concern to our members, due to its importance for funding blue skies research and to enable more ambitious, long-term research programmes to be nurtured. For those microbiologists not eligible for Wellcome Trust funding, ERC is the only source of longer-term funding, through five-year EU grants which operate for different career stages – starter, consolidator and advanced. Inability to apply for these, or a programme replicating this could significantly narrow the vision and ambition of the UK research base, reducing the competitiveness of the best UK researchers in comparison to those in the EU.

⁷ Microbiology Society Microbiome Policy Project. <https://microbiologysociety.org/policy/microbiome-policy-project.html> Last accessed 05-02-2018.

⁸ <https://infravec2.eu/>

⁹ <http://www.imi.europa.eu/projects-results/success-stories-projects/stimulating-development-new-antibiotics>

Ambitious future funding and partnerships

19. **Members indicated that they would prefer the UK maintain access to EU research programmes. If the UK does not continue to participate in EU programmes, members emphasised that increases in UK research funding were needed to at least match research funding the UK receives from the EU and replicate associated benefits.**
20. Brexit increases focus on opportunities to establish and strengthen other bilateral and multilateral partnerships. Some members welcomed recent UK funding (e.g. Newton Fund and Global Challenges Research Fund) aimed at supporting new collaborations with emerging economies on highly relevant topics such as communicable diseases and antimicrobial resistance. However, it was suggested these funding cycles are very fast-paced, sometimes making it difficult for researchers to assemble appropriate consortia and conduct the required administration. Dedicated, long-term and predictable funding streams, set up in consultation with the research community, are invaluable to the development of cutting edge, interconnected research programmes – a model to use with any new funding opportunities arising after Brexit.
21. **In the immediate term, the Government should be actively forging scientific links around the world and could strengthen dedicated functions (e.g. embassies, British Council, UK Science and Innovation Network) within the UK diplomatic missions to European countries and other countries around the world.** For example, in addition to existing large programmes cited above, seed money could also be provided for pilot projects to foster collaboration with other countries. The opportunity for including a research and development collaboration element to any future trade deals was also suggested.
22. The Government's commitment to increase the overall research funding base is welcome. However, as highlighted in our recent evidence to the House of Lords Science and Technology Committee's Life Science and Industrial Strategy inquiry,¹⁰ **in light of the risks posed by Brexit and the ambition of the Industrial Strategy to make the UK the best place to do science, we urge the Government to be ambitious and increase research investment more rapidly to remain competitive and avoid losses in activity, disruptions to collaborations and omission from new initiatives during the transitional period.**

European advisory and regulatory bodies

23. **The Government should, where possible, aim to retain as many cooperative links to EU scientific and regulatory bodies as possible, as well as developing stronger links to other non-EU European bodies such as EMBO.** The Government's Future Partnership Paper¹¹ highlights the importance of considering shared common challenges between the UK and the EU including infectious diseases of humans, animals and plants. Microbes do not respect borders, causing shared microbiological challenges and requiring common regulatory needs. It is therefore important the UK remains involved and engaged with bodies such as the European Food Standards Agency, European Centre for Disease Control and European Medicines Agency (EMA). The UK has also invested substantial financial and scientific input to these bodies. Members are concerned that it would be difficult to replicate their scale and effectiveness and that the UK's influence on science priorities, regulation and policies that may still affect UK science and innovation risks being diminished.
24. Microbiologists depend on being able to easily enquire about regulations, guidelines and standards for research. Members have expressed concern that losing access to EU agencies

¹⁰ <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee-lords/life-sciences-and-the-industrial-strategy/oral/77396.html>

¹¹ [Collaboration on science and innovation](#)

such as the EMA could impede research if UK agencies and departments are not better resourced to deal with a likely increase in enquiries and workload post-Brexit. **The Government needs to ensure any regulatory and scientific advisory capacity lost is strengthened domestically before Brexit.**

Collaboration between UK and Republic of Ireland microbiologists

25. The strong relationship between UK and Irish microbiology scientific communities illustrates potential impacts and needs concerning Brexit. Many of the Society's members are based in Northern Ireland and the Republic of Ireland, conducting collaborative research, and through the Society's Irish Division organising academic meetings. **Our members stress links between the UK and Republic of Ireland must remain strong to ensure bilateral scientific collaboration continues to thrive.**
26. Members are concerned about how funding programmes that foster research collaboration and partnerships between the Republic of Ireland, Northern Ireland and the wider UK may be affected by Brexit, for example, the long-running US–Ireland R&D Partnership Programme,¹² EU-funded consortia working on clinical and population disease studies, and the Ireland Wales EU Programme.¹³
27. Several universities in the Republic of Ireland offer four-year undergraduate microbiology programmes; graduates from these programmes are attractive to UK research groups as a source of talent and collaboration; UK microbiologists also study and work in the Republic of Ireland. A member who coordinates an Irish microbiology degree programme highlighted that several students had sought their advice as to whether they should undertake PhDs in the UK due to Brexit, and that greater clarity about the future relationship would enable them to answer in the affirmative.

Infrastructure and scientific resources

Reference laboratories and culture collections

28. The Government's Future Partnership Paper highlights the value of EU Reference Laboratories (EU RLs) for food and animal health for sharing information on disease risks between countries, regulation and standards and access to the best scientific expertise, and that future collaboration will need to be considered. European and national reference laboratories, as well as culture collections providing other microbial resources for research and industry, are of key importance for fundamental and applied microbiological research in the UK and vice versa. The huge diversity within the microbiological world means that culture collections are specialised and no one centre can provide comprehensive coverage of the key microbial groups necessary to advance microbiological research in relation to antimicrobial resistance (AMR), infectious diseases animals and plants, and public health. **It is of national bio-security importance to act to maintain and promote access and reciprocity of internationally available microbial strains and DNA collections, so the UK research community can continue to effectively study these global threats. Existing gaps in national microbial resources infrastructure¹⁴ mean the Government should also consider strengthening national capacity and support for research infrastructures that may be affected by Brexit.**

¹² <http://www.sfi.ie/funding/funding-calls/us-ireland-rd-partnership/>

¹³ <http://www.irelandwales.eu>

¹⁴ <https://microbiologysociety.org/uploads/assets/uploaded/19485bd1-f375-42dc-97ce5b15624adf36.pdf>

Import–export requirements

29. EU membership also simplifies the import–export of scientific research materials (e.g. live animals, human, animal and plant pathogens, CITES-listed samples and other biological resources) and use of DNA sequencing services. It is also not clear whether the Government is considering post-Brexit import–export requirements on the movement of scientific materials. **It is essential that appropriate agreements are put in place to prevent the import–export of scientific research materials being hindered on exiting the EU, which could disadvantage the UK research base.** For example, withdrawal from Euratom could hinder access to medical isotopes used for microbiological research purposes and diagnostics, as many of these isotopes are made in EU countries. Members also expressed concern about increased costs importing scientific equipment produced in the EU, impacting research budgets.