Leaving the EU: implications and opportunities for science and research

A response from the Royal Society of Chemistry to the House of Commons Select Committee on Science and Technology.

We have drawn upon evidence from our submission to the House of Lords inquiry into the *Relationship between EU Membership and the Effectiveness of Science, Research and Innovation in the UK* in this response.[1] We have also gathered evidence from the chemical sciences community to illustrate the implications and opportunities that have been identified so far as a result of the outcome of the EU referendum. It is still too early to understand or ascertain the full range of implications that leaving the EU will have for science and research and we will continue to work with our members and wider community to identify and respond to these as they become apparent.
July 2016

Summary

We have identified three main areas that represent both priorities for science and research, as well as areas where changes are already being observed by the scientific community. These are:

- Funding;
- Mobility and collaboration;
- Regulation and scientific advice.

We examine each area in more detail below, citing examples of some of the challenges and opportunities identified by the chemical sciences community. For each of these areas, further analysis of the potential changes and options for UK science outside the EU is needed and will depend heavily upon future negotiations and subsequent decisions that relate to the exact terms of the UK's exit from the EU.

1. Funding

EU research funding programmes represent an important funding stream for UK science and a proven and successful mechanism for UK universities and companies to conceive, lead and participate in collaborative pan-European projects. **The government must ensure that overall levels of UK science funding are maintained.**

Since the result of the referendum, researchers across the scientific community, including those working in the chemical sciences, have expressed concerns regarding the uncertainty of the UK's future access to EU research funding programmes and collaborative opportunities.

For UK chemistry departments, funding from the EU represents a significant source of income. Key data are:

- UK chemistry departments received over £48 million or 22.4% of their funding from EU government bodies[2] in 2013/2014, up from 16.8% in 2011/12.
- The proportion of funding that UK chemistry departments received from UK research councils decreased from 55.4 % to 50.9% between 2011/12 and 2013/14.[3]

We have been informed by our community of instances where UK researchers are being discouraged from participating in future joint EU research bids, due to the uncertainty around future eligibility of UK scientists for EU research funding. Researchers have highlighted how uncertainty about future eligibility is hampering preparation of applications for long-term funding, e.g. 5-year Advanced, Starter and Consolidator awards from the European Research Council (ERC), which UK universities, to date, have been very successful in securing.

In addition to the direct impact on the level of funding that UK universities receive from EU research programmes (see above), many chemists from whom we have heard are equally concerned at the impacts with respect to reduced international collaboration, access to networks, sharing of knowledge, movement of researchers and students, and the knock-on effects for the UK's performance in science and innovation.

Chemistry specific examples include:

- Some researchers specifically mentioned being advised to withdraw from applications for Innovative Training Networks (ITNs, a Marie Skłodowska-Curie action), which bring together universities, research centres and companies to train cohorts of PhD students within an international network.
- Instances where scientists in UK universities have been advised by partners from universities in other EU countries to not participate in EU funding bids.
- A UK university being deprioritised as a partner in an EU funding bid by a large industry partner in the same consortium.

Alongside these specific instances that have been reported to us, our community is voicing a strong broader perception, seen across science, that UK researchers are being dropped or no longer being invited to participate in future funding consortia.

We have also received specific examples about changes following the referendum from members of our community who collaborate with or work in small and large companies:

- The initial decline in the value of sterling has brought opportunities for one small company that exports services, but has increased the costs of importing and reduced profit margins for another company that is a distributor.
- In one small company, a recent 3-month secondment of a researcher from a mainland EU university via a Marie Skłodowska-Curie Research and Innovation Staff Exchange has resulted in advances that will help to boost future sales for their business. They expressed the view that the uncertainty around future access to such funding and the broader networks with which they link is a concern for their company.
- A small UK chemical equipment supplier has abandoned plans to expand into Europe, causing some loss of initial investments and is now examining expansion into the Americas instead.
- An academic in receipt of a KTP grant looks set to lose part of this award as the company with which they were working on this project has imposed a recruitment freeze as a direct result of the EU referendum. If the company is no longer be able to offer the research post funded by the KTP grant, part of the 2-year grant will be forfeited.

2. Mobility and Collaboration

The mobility of researchers and students to and from the UK is essential for UK science to advance through international collaboration.

To maintain its world-leading performance in science and innovation, the UK needs access to the best knowledge, ideas and people. The UK needs to attract the best researchers from all over the world and researchers based in the UK need to collaborate internationally. Conditions are needed that encourage the best international researchers to establish their careers in the UK, attract talented international students to study, train and work here, as well as allowing easy access for scientists at all career stages and of different nationalities to undertake international visits to collaborate or present their research as part of the global scientific community.

The most recent data from the Higher Education Statistics Authority indicates that in UK chemistry departments:

- 20% of staff are non-UK EU nationals
- 13% are non-EU nationals.[4]

These statistics include permanent appointments as well as contract staff, e.g. postdoctoral researchers.

We have already been informed of instances where talented chemistry researchers based overseas are declining offers of employment in the UK as a direct response to the referendum vote, and where non-UK nationals based in the UK are considering leaving. The examples that were shared with us were diverse and included:

- A German early-career researcher currently based in the EU has declined a permanent position in a UK university;
- A UK national working in the USA has chosen not return to the UK to take up the offer of a position as a professor in a UK university;
- A UK national has declined a fellowship position in the UK, in favour of staying in a postdoctoral research position in France;
- EU students declining to commence their PhD studies in the UK due to the uncertainty in the status of UK access to EU funding and the status of EU nationals in the UK more broadly.

These examples illustrate the complex nature of effects that the result of the EU referendum is having and may continue to have on researcher mobility. Changes in researcher mobility are likely to affect not just the UK's ability to attract leading EU researchers, but also the global flow of talented researchers - at all career stages - to and from the UK.

It is also important to note that the issues around mobility of scientists and students are related to the issue of funding discussed in section 1 because EU funding schemes, ranging from grants to networks to public-private partnerships, are also mechanisms that provide access to international partners for mutually beneficial collaboration.

We have also received comments showing that the current uncertainty about the status of EU nationals in the UK, and of UK nationals working in EU countries, is impacting morale and motivation in universities and companies.

3. Regulation and Scientific Advice

Regulations and directives currently set by the EU and implemented in the UK both apply to and rely on the chemical sciences. Decisions will need to be made as to whether these should still be in effect in the UK. These decisions should take into consideration the potential impacts of different options on the UK in a global context.

Considerable effort and scientific expertise will need to be invested in determining the best options for the UK's future regulatory environment. Our analysis shows that there are over 300 chemistry-relevant regulations and directives relevant to UK industry and the UK chemical sciences community, broken down into:

- Over 100 regulations and directives that govern the manufacture, use and distribution of chemicals, human and veterinary medicines and many types of other products e.g. consumer goods, electronics, paints and agrichemicals.
- Regulations that require chemical sciences expertise in their development and enforcement e.g. directives and regulations relating to food, water, environment, energy and broader research practices. Specific examples are the *EU Water Framework Directive* and the *EU Ambient Air Quality Directive*.

This analysis only covers regulations and directives; it does not include documented legislative decisions, guidance or recommendations.

Furthermore, the UK's adherence to some international agreements is currently enforced through the UK's membership of the EU. For example:

- The UN *Globally Harmonised System of Classification and Labelling of Chemicals* is currently implemented through the UK's adherence to the *EU Regulation on the Classification, Labelling and Packaging of substances and mixtures (CLP)*.
- Other international chemical conventions that are embodied in EU regulation to which the UK adheres include the *Stockholm Convention on Persistent Organic Pollutants* and the *Minimata Convention on Mercury*.

In analysing options for the different regulatory frameworks in the global context it will be crucial to understand how EU regulation influences global regulatory harmonisation and trade. For chemicals a key EU regulation is *Registration, Evaluation, Authorisation of Chemicals (REACH)* and its annexes. In recent years, there have been signs of a global trend towards development of what are known as 'REACH-like' regulations in other countries, for example:

- An act on the registration and evaluation of chemicals, known as Korea-REACH, has been in force in South Korea since 2015. Whilst legislatively distinct from REACH in the EU, Korea-REACH does have similar principles, including the registration of chemicals and evaluating the hazards and risks of chemicals in different products and applications.
- While the United States has its own approach to chemicals regulation, elements of the changes to the US *Toxic Substances Control Act (TSCA)* signed into law in June 2016 can be interpreted as bringing TSCA closer in its outlook to the EU approach to regulating chemicals.[5] These include a new mandatory requirement for the US Environmental Protection Agency (EPA) to evaluate the risks of existing chemicals and the development of a process for identifying high and low priority chemicals substances for assessment.

Whilst these examples do not represent an exact transposition of the REACH legislation globally, they do indicate a shift towards the spirit of the EU's REACH regulation, giving some indication of the EU's wider influence on some aspects of global regulation.

Consideration will be needed to ensure that any future framework includes high quality, unambiguous, practicable regulations that can provide clarity for UK business and science, allowing them to excel in the international community, whilst affording the levels of protection for human health and the environment that are expected by society.

We will need to understand how changes to our relationship with the EU will affect the UK's ability to be involved in providing scientific evidence and advice, in developing regulation and also in being involved in research programmes such as those developing new chemicals testing methods and risk assessment approaches that underpin regulation. Mechanisms for the input of scientific advice to the European Commission are complex and vary according to specific structures and the broader relationship a country has with the EU.

Examples of how the UK currently inputs scientific evidence and advice include:

- UK scientists provide scientific advice to European Commission Directorates General via many different agencies (e.g. ECHA, EFSA, EMA, EEA) and their Committees.
- The UK has extensive collaboration with the European Commission Joint Research Centre, which generates guidance and evidence to inform regulation.[6]

Considering potential alternative arrangements, there are differences in how Norway, Switzerland and the USA interact with the regulatory and scientific advisory mechanisms in the EU. For example:

- The USA, Norway and Switzerland are all permitted to appoint accredited stakeholder organisations to European Chemicals Agency (ECHA) accredited stakeholders database.
- For the European Food Standards Agency (EFSA) Advisory Forum, Norway and Switzerland have a different status to one another. Switzerland, alongside EU candidate countries has observer status on EFSA's Advisory Forum. Norway is a full member, meaning that 'competent authorities' in the country can carry out research commissioned by EFSA that will inform decisions on EU food safety measures.

It will be important to look at the full range of scientific advice mechanisms and routes in detail to understand whether and how the UK science community can best continue to provide scientific evidence and advice as part of a global community.

Contact

The Royal Society of Chemistry would be happy to discuss any of the issues raised in our response in more detail. Any questions should be directed to Dr Mindy Dulai, dulaim@rsc.org, 01223 432674.

About us

With over 50,000 members and a knowledge business that spans the globe, the Royal Society of Chemistry is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world.

A not-for-profit organisation with a heritage that spans 170 years, we invest in educating future generations of scientists, we raise and maintain standards and work with industry and academia to promote collaboration and innovation. We advise governments on policy and we promote the talent, information and ideas that lead to great advances in science.

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[1] - Royal Society of Chemistry response to the House of Lords Science and Technology Select Committee inquiry into *The Relationship Between EU Membership and the Effectiveness of Science, Research and Innovation* in the UK, November 2015.
[2] - Funding from EU Government bodies defined by HESA as *'all research grants and contracts income from all government bodies operating in the EU, which includes the European Commission but excludes bodies in the UK', https://www.hesa.ac.uk/component/content/article?id=1317*
[3] - Source data: HESA finance records (http://www.hesa.ac.uk)
[4] - Source data: HESA student and staff records (http://www.hesa.ac.uk)
[5] - https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/frank-r-lautenberg-chemical-safety-21st-century-act
[6] - https://ec.europa.eu/jrc/sites/default/files/jrc_country_leaflet_uk_en.pdf

