Brexit and research: goodbye EU money and colleagues?

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See also: **S Curry** (September 2016) and **F Colucci** (September 2016)

Frankly, I am not surprised by the British voters' decision to leave the EU. If you ask a nation or community "Do you want to control your own destiny or let pesky outsiders decide things for you?", there can be only one answer to this simplistic question. To understand the details of leaving and to consider the alternatives would require a thorough debate and not just sound bites. But many years of anti-EU propaganda and jingoism fused into a simple choice to the person on the street. In addition, Brussels is an easy target and it is political expediency to imply that this "foreign body" imposes its rules. Just as it is easy to "blame the committee" when some necessary but unpopular decisions are announced, "Europe" was the shield for introducing many decisions that help consumers, ensure better fiscal discipline or for collective approaches to climate change. Being Irish, I also saw many positive societal changes not just in my country, but all across the continent, thanks to the "outside body" in Brussels. And yet, the trend for the past few years has been to vote against the status quo. The Brexit vote, the Austrian presidential election, the rise of new right- and left-wing parties in Holland, France, Germany, Greece, Spain and the success of Donald Trump in the USA: the voters will no longer buy the same-old, same-old.

Now that the people have decided, and unless in the cold light of reality the new leaders of the UK choose to go back on that decision or acquiesce to a "light" version of Brexit, there will be severe consequences no matter how much British politicians try to convince their voters otherwise. The

supporters of the Leave campaign believe that Britain does not need to be part of a club the rules of which it did not like, and that it can thrive outside the EU. The question is whether that would be true for research.

There is no doubt that many universities, research institutes and scientists in the UK are top class and that research is well funded. The life sciences in particular are supported by two research councils and major charities such as the Wellcome Trust and Cancer Research UK. Of course, scientists never have as much funding as they have good ideas, but our colleagues in the UK are doing fairly well. Major pharmaceutical companies are based in the UK owing to the large pool of talented scientists—and because of the favourable tax offerings and because (say it quietly) it provides an English-speaking entry point to the EU market. Research in the UK benefits from great leaders and institutions, is well organised and productive, and demonstrates its social and economic impact.

Most of those factors will not change, so all is good then for a Brexited UK? It is hard to be sure how post-Brexit discussions will affect British science. In the extreme case, it means Britain slamming the door and becoming a EU-free country: no more complex applications and rules, no more signing time sheets, and all the other bureaucratic annoyances, but, also, no more money from the collective purse. That will mean a loss for many laboratories and researchers as the EU has become a major source of research funding for British scientists. The leading British laboratories did not partake much in the earlier Framework programmes, but, with time, UK scientists became enthusiastic and important

participants. It is estimated that 16% of the research funding for universities in the UK come from the EU purse. Similarly, the UK government first opposed the idea of an European Research Council (ERC), which scientists from all over Europe were lobbying for. The argument that more competition would raise the standards throughout the continent was not selling in the UK with its top-class research. However, the UK eventually came on board to support the creation of the ERC, presumably because Lord Sainsbury, then minister of research, realised that laboratories in the UK would be the major beneficiaries. Indeed, Britain has been the most successful country in attracting ERC funds since 2007: 636 grants were awarded compared to 441 grants in Germany, which ranks second place despite the fact that it has a larger population and invests more into research. This means 636 laboratories were able to hire the best postdocs and perform the most expensive, and hence most thorough experiments, while colleagues with less resources elsewhere fell behind. A 16% cut will hurt. Of course, the UK could increase its national funding by using money it once transferred to the EU, but that is an unlikely outcome.

But there is also the human dimension of no longer being part of the EU funding programmes, which are also about encouraging researchers to collaborate with colleagues they would not meet or appreciate in national-based funding systems. Through social engineering via the Framework programmes and the Marie Curie Fellowships that send young scientists all over the continent, very good research groups were discovered in Portugal, Greece, Spain, Poland or Estonia who produce exciting research and displayed great skills despite

local funding difficulties. Meetings, exchanges, and time spent together forged collaborations and personal relationships, and we all are the better for that. With a reversion to a UK-only research environment, this will be harder to organise and these links will be lost, together with the associated cultural enrichment and fun.

There will be another casualty: freedom of mobility and access to jobs that we have taken for granted. Basically, the national boundaries in Europe were good for football rivalry and to define where you paid your taxes, but otherwise moving from one laboratory to another was about a new job and life in a new culture. The UK and Ireland are not part of the Schengen agreement, which means that, coming from the continent, you have to show your passport at the border. But this is less restrictive than requiring a visa and work permission. Not only will the travelling researcher lose out, but so will British science that has benefited from this constant flow of talent. I live in Australia, which has a real problem in attracting researchers for anything other than a short period because of the difficulty of getting a Permanent Resident visa, which is a process full of uncertainties and potential major delays. It also requires a large amount of detailed information: try listing every trip to any country you have made during the past ten years with the exact dates of arrival and departure. Australia can proudly say that it has a higher percentage of immigrants than any other country. But it is much more difficult to relocate there than is the case within the EU. It dissuades those who have easier choices. It makes the country less attractive for the next career move.

And even benign visa controls can be tightened, which was evident in the USA in the aftermath of 9–11. The power of those who wield the visa stamp has the potential of becoming disruptive when applied too rigorously. The UK vote was sold by being hard on restricting entry and, in the extreme version of Brexit, it may follow this path unless they find an alternative to “we are gone and do not want to have anything to do with you” to manage the democratically decided decision.

The outcome would not be good for EU scientists either. Sure, they may have a better chance of getting EU funding without a major competitor, but I do not think that scientists would prefer this over the opportunity to collaborate or compete with the best. Without the great research output from the UK, the EU ministers might start to think that support at the communal level provides less return on investment. Or they might increase investment to show that EU research is thriving despite the departure of a very strong contributor. They may allow the UK to participate in some programs for some time, but they might change their minds. Recall how the rules of the NIH have shifted from relatively easy eligibility for international teams to barriers and difficulties in accessing those funds. Such decisions by politicians depend on factors that have nothing to do with research, and if you are not a member, you cannot vote or argue your position when changes are introduced.

Some mega projects in the EU could also be in jeopardy, but it is important to note that intergovernmental organisations such as EMBL, EMBO, CERN or HFSP predated

the EU and/or are funded and governed in a different manner. Nonetheless, EMBO or HFSP fellows might be less inclined to move to the UK and researchers from the UK might face extra hurdles in moving to Heidelberg or Helsinki.

All of this is speculation and might be a pessimistic spin on what might happen. But to avoid such a discussion is to fall into the same trap that has led to Brexit. It is time to think about how to minimise the fall out. Too many options are on the table for the UK government and the manner in which it will deliver the will of the people. There are too many choices for the leaders of the EU member states also, each hearing an echo of the referendum discussion in their own country. If the Brexit vote resulted in no loss of benefits for the UK, it will provide ammunition for the dissidents in their constituencies. I expect that politicians will ensure that the outcome shows the disadvantages of breaking up the relationship: a slammed door can be locked from the inside.

We have witnessed the power of the electorate. It cannot be ignored. We have to move on from wishful thinking that it will be business as usual and work to minimise the damage that could result, at least with regard to research. What happens in laboratories, wherever they are located, remains a global enterprise, and facilitating the continuation of that is necessary for the benefits to flow from research to mankind.

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