The UK has a long and proud history of world-leading scientific discovery and innovation, and in an increasingly competitive and technologically advanced world, our talented and industrious scientists continue to punch way above their weight in terms of scientific publications and their international impact. Indeed, a recent UNESCO Science report (Towards 2030) reveals that despite having only 0.9 per cent of the world's population and 3.3 per cent of its scientific researchers, we generate 6.9 per cent of global scientific publications and 15.1 per cent of the world's most highly-cited scientific papers.

In this article, I would like to set out why I believe the UK science community will continue to outperform in the event that the British electorate decide that our future lies outside of the EU project.

EU funding for UK science
The simple truth is that the EU supports just 3 per cent of UK research and development activity, as was revealed by a recent Royal Society report – The role of the EU in funding UK research (Dec 2015). OECD figures for 2014 also show that 97 per cent of European R&D occurs outside of EU funded research networks. Many pro-EU commentators must therefore have little faith in our science community if they believe that a 3 per cent drop in R&D funding (our own money of course) would constitute a disaster for UK science.

Our future relationship with EU science
Given that EU science networks account for such a small proportion of European science, it seems wholly implausible that a 'leave' vote would lead to scientific isolation, as some doomsayers predict. The fact that the USA is our most important scientific partner must surely prove that international collaboration does not require political union. Our involvement in high-profile intergovernmental projects such as CERN, EMBL and the European Space Agency is assured, and is testament to the reality that our involvement in European science would continue. Of course, if the terms were acceptable, then there is no logical reason why the UK could not participate in the EU’s European Research Area (ERA) as an associate member, on the same pay-in basis that 14 non-EU countries have agreed to.

Academic freedom of movement
As scientists, we fully recognise the importance of researchers and academics being able to travel between countries for the purposes of research and collaboration. However, we refute the suggestion that such movement is in any way contingent on being part of a political union. Indeed, research by Franzoni, Scellato et al. (2012) revealed that independent countries with strict immigration controls such as Australia, Canada and the USA recruit a greater percentage of foreign researchers than the UK, France and Germany. The research also reveals that the primary destination for UK-trained scientists is not the EU, but is the USA, Australia and Canada – none of which we have a free movement agreement with. For EU supporters to suggest that the UK would struggle to recruit scientists as an independent nation is countered by hard evidence to the contrary.

Part of a political union?
At the end of the day, the impact on UK science is but a small part of a much wider debate surrounding this referendum. This is a debate that goes to the very heart of who we are, and who we want to be governed by. It is therefore essential to remind ourselves that the forthcoming referendum is not a vote on our membership of a science club; it’s a vote on whether we wish to remain part of a political union with science aspects that has openly declared its federalist ambitions.

http://scientistsforbritain.uk/wordpress/
The EU produces over a third of the world's scientific output and 34 per cent more than the US. More importantly, that gap has grown by 4 per cent over the last six years (UNESCO, 2015). Collectively, we produce more researchers than China or the US and we have overtaken the US as the home of 'big science'. More than a collection of countries on a continent, the EU is an extraordinary hub of science, sharing policy-making mechanisms, funds to build multi-way collaborations, and a freedom of movement agreement which allows anyone within the EU to hire anyone else in the EU without visa hurdles.

Multinational dream teams
The EU puts 8 per cent of its budget into Horizon 2020 (£80bn from 2014-2020), invests 5 per cent further in programmes such as Copernicus, Galileo, COSME, Erasmus+ and puts 34 per cent of its budget into regional funds to develop competitiveness across the EU. It's a smart team investment making the EU budget increasingly an R&I budget. And it works. UK labs can put together multinational dream teams applying together for funds from a single pot. International scientific papers have 40-50 per cent more impact than domestic-only research and 62 per cent of the UK's research outputs are now international collaborations. The US is on 39.6 per cent. According to a 2013 Government report, it is the UK's increasing internationalisation that has recently put us ahead of the US for science productivity.

Investment in science
EU funds now make up 17 per cent of the total science grants in UK universities and 73 per cent of the increase in that funding from 2007-14. This surge is because the EU science investment nearly tripled over a decade whilst our national funding stagnated at the bottom of the G8. Those advocating a Brexit often claim pulling the plug on the EU will necessarily cause a larger economic drop, leaving HM Treasury with much less money overall. Science funding is usually a low priority in times of crisis.

In the policy driving seat
But it’s not just the funding levels; it’s our science policy, participation and access to people. We are currently in the driving seat of this extraordinary research hub, setting its policy direction and leading a lion’s share of its projects. Stepping away from the EU necessarily gives up our policy driving seat. Those advocating Brexit like to inform us that, nevertheless, we can still participate fully on the EU science programme. This is not our entitlement. Full membership for the UK post-Brexit is, bluntly, not in the interests of the remaining counties. As with Switzerland, we would likely be offered a partial association model. Finally, our freedom of movement arrangement is vital for our small innovative businesses which benefit from visa-free hiring from the EU talent pool.

The EU has an extraordinary future in science. Over 100 UK university vice-chancellors have backed remaining in the EU and a recent poll by Nature showed 83 per cent of UK scientists say they will vote to remain.

http://scientistsforeu.uk/