



Submission for Wellcome/Royal Society Future Partnership Project

Executive Summary

This response is written from the perspective of the members of the FENS Kavli Network of Excellence, a pan-European network of principal investigators in neuroscience [1].

- International collaboration is crucial in neuroscience
- The FENS Kavli Network is a successful model for investigator level collaboration

Summary recommendations:

- Continue to support research at the European level via H2020 and its successors
- Investigator networks like ours provide a relatively low cost way to enhance collaboration across Europe
- UK must redouble efforts to engage with the rest of European science
- Maintaining scientific mobility should be a key funding and political aim
- The support of the scientific community remaining in EU will be helpful for this agenda

Specific actions are highlighted in 13 numbered points through the rest of the document.

International Neuroscience

Neuroscience is a very active and highly interdisciplinary field straddling the biological, medical and physical sciences. Understanding the mechanistic basis of brain function is unsurprisingly considered a global basic research priority. In the western world, the rapidly increasing burden of neurodegenerative disease in an aging population and increased appreciation of the social and economic costs of mental health disorders, both clearly argue for increased investment in basic and clinical research.

Given this background, the huge complexity of the brain and the widespread agreement that progress will depend on leveraging a wide range of approaches and talents, it is unsurprising that large scale national and international efforts have been developing [2]. Examples include:

EU Human Brain Project
US BRAIN initiative
UK Dementia Research Institute
Japan Brain/MINDS
International Brain Initiative (early stage coordinating action)
Innovative Medicines Initiative (IMI)

Although these large top down initiatives have a unique role in delivering projects beyond the scope of individual laboratories and setting political and funding priorities, they are not the only levels of activity.

Q1 Elements that underpin successful partnerships

The FENS Kavli Network, a model for investigator led collaboration in Europe

Our organisation, the FENS Kavli Network of Excellence, represents another approach to promoting collaboration and building support for neuroscience. We are a network of 35 junior and mid-career neuroscientists representing most European countries. Established in 2014, through our joint efforts we aim to shape the future of neuroscience by putting young researchers in the driver's seat. We provide collaborative opportunities for young scientists, influence science policy, and facilitate the exchange between science and society. We are sponsored by the Kavli Foundation (key facilitators of some of the international projects mentioned above) and FENS, the Federation of European Neuroscience Societies (representing 24,000 European neuroscientists).

The network highlights in microcosm some of the features of the European research environment that are potentially imperilled by the impact of Brexit : 1) pan-European collaboration 2) the particular strength of UK research 3) the dependence on international mobility for both of these points. For example nine of 35 network members are based in the UK (or twice the 13% of the EU population living in the the UK). However, these 9 researchers come from 5 countries, and while 8 are European, only 3 are British.

Although the Network is only a few years old and not a formal collaborative body, it has provided opportunities for in person interaction and exchange, has led to active collaborations and enriched our science [3]. This model could be useful in other areas of science, particularly in the face of potential decreases in international/European scientific collaboration after Brexit.

Strong support for EU funding among Young Investigators

One of the recent actions of the FENS-Kavli network was a survey of about 300 European life sciences researchers. This underlined the support for European H2020 funding mechanisms and particularly the ERC as well as making specific suggestions for improvements [4]. It is worth emphasizing that pan-European funding mechanisms such as the ERC were very strongly supported by all participants, surpassing in preference national funding bodies and even research charities such as the Wellcome Trust. Highlighted features include the vital role in supplementing national research funding, especially in basic research, pan-European evaluation important for unbiased selection of the very best proposals, and in enabling excellent scientists to further their science in the most appropriate locations. Furthermore in a globally competitive research environment, they provide a highly visible European brand that is attractive to those considering a move to Europe.

The UK has been a net beneficiary of H2020 programmes. UK-based scientists have been consistently successful in ERC competitions. For example in the most recent ERC round (consolidator grant 2017), the UK received the largest number of grants (60/329 = 18%). However 34 of those grants were awarded to non-UK nationals.

Q2 Actions and priorities post Brexit

EU Funding Mechanisms - H2020 and its successors

- 1. The UK should retain membership of H2020 and its successors post-Brexit.**
- 2. If full membership is not possible then associate status (with or without a joint funding pot) would still be valuable for the UK and EU.**
- 3. There may be a place for smaller collaborative actions involving 2-4 investigators with tiered eligibility (more akin to HFSP grants) on a European scale.**

Non-EU Science Funding

Regardless of the success or otherwise of aims to retain a close relationship with H2020 after Brexit, there are other actions that could be taken on the European stage:

- 4. In the life sciences, EMBO is an important supporter of science across EU. Actions should be taken to strengthen EMBO fellowships and other scientific activities.**
- 5. UK should strengthen participation in international initiatives beyond Europe or that it previously participated in via EU institutions.**

Within the UK, positive funding actions could include:

- 6. If the UK fails to retain some form of H2020 membership, then it should reconstitute similar programmes at the national level (e.g. as Switzerland did for some programmes during its suspension).**
Retaining basic funding support like the ERC is critical since new national programmes tend to favour translational/clinical funding in the life sciences.
- 7. Maintaining/enhancing funding for UK-based PhD programmes that provide fees and stipend support students from the EU (and further afield).**
Wellcome programmes do this, but RCUK-funded programmes typically have strict residency requirements that mean most EU students cannot be given stipend support.

This last point is an example where a funding action could both counteract the negative impact of Brexit on mobility and take a positive step to welcome international scientists in training.

Other approaches to maintain EU-UK Engagement

Perception is very important, and it is critical that the UK redoubles its efforts to remain engaged and welcoming at the European level. There are opportunities to maintain engagement outside of standard funding for scientific projects.

Networks like ours provide low-cost, political boundary-free opportunities for scientific and intellectual exchange. The FENS-Kavli has also been active in policy and science/society engagement. Possible actions include:

- 8. Funding pan-European networks like ours in other scientific domains**
- 9. We feel that acting at the the level of junior mid career investigators with in person meetings is particularly effective. However there are many other models, some very inexpensive that can be helpful e.g. online communities based on a shared model organism or technique [5,6].**

Beyond science funding there are other important areas at a more political level:

- 10. Ensuring that the UK and EU maintain mobility for scientists at all levels (students, post-docs, senior scientists) will be critical for European science to flourish.**
- 11. Increasing mobility for non-EU scientists within the UK is one possible Brexit opportunity**

Q3 Factors affecting the ability to implement a shared vision on research and innovation

- 12. In spite of the overwhelming support for Remain among scientists in the 2016 referendum, there is a risk that Brexit may be seen as a self-inflicted wound that is solely for the UK to fix. The fact that the UK has consistently been a net scientific beneficiary may not be helpful in this regard.**
- 13. The rest of the Europe has a role to play. In particular scientific organisations in remaining EU states could lobby for a strong EU-UK scientific relationship post Brexit.**
- 14. It may be worth emphasising that the UK has a distinctive set of international collaborations that are likely to be of value to the whole of European science. For example it the number one European collaborator with the USA and Canada [7].**

Conclusion

The strength of British research is widely acknowledged to depend strongly on international researchers, especially those from the rest of Europe. However while some individual countries may benefit from a migration of talent after Brexit, we strongly submit that European science as a whole will be diminished if the UK and EU fail to take active steps to protect European science.

References

1. <http://www.fens.org/Outreach/FENS-Kavli-Network-of-Excellence/>
2. Underwood, E. (2016). NEUROSCIENCE. International brain projects proposed. *Science* 352, 277–278. Available at: <http://dx.doi.org/10.1126/science.352.6283.277>.
3. Poirazi, P., and Hall, B. (2017). The FENS-Kavli Network for Excellence in Neuroscience: Advancing science through collaboration and advocacy. *Synapse* 71. Available at: <http://dx.doi.org/10.1002/syn.21975>.
4. Poirazi, P. (2017). The perfect grant and how to get it. *Nature* 543, 151. Available at: <http://dx.doi.org/10.1038/543151a>.
5. <https://www.fly-jedi.org>
6. <https://worm-genie.eu>
7. UNESCO (2015). UNESCO science report: towards 2030 (UNESCO Publishing) Available at: <http://unesdoc.unesco.org/images/0023/002354/235406e.pdf>