

Brexit study demonstrates importance of EU for UK robotic surgery research

by [Laura Gallagher](#)
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Collaborations with EU researchers and institutions have been critical to the UK's success in robotic surgery research and innovation.

This is according to a new study which examines the UK's global research collaboration network and models how the UK might compensate for any loss of EU collaborations after Brexit.

Robotics has been touted as one of the technologies that is key to UK future growth. A [new analysis](#), led by Imperial College London, shows that international collaboration is key to success in robotic surgery and that the EU is the UK's largest partner. According to the study, published today in *BMJ Open*, the UK is currently third in the world in robotic surgery innovation, with the US in first place and Italy in second.

Our research shows that in the field of robotic surgery research, replacing EU partners with top US collaborators might maintain or even improve the UK's position. Unfortunately, in the short term this could be difficult and costly.

– **George Garas**
Study author

is likely to undermine the UK's status as a global leader in science and innovation. We need to understand what the impact of losing the existing valuable EU links would be so as to tactically plan the UK's research and innovation strategy after Brexit.

“Our research shows that in the field of robotic surgery research, replacing EU partners with top US collaborators might maintain or even improve the UK's position. Unfortunately, in the short term this could be difficult and costly. UK institutions may be less attractive to top US institutions if they are no longer well connected to the EU. Our simulations do not take into account the knock-on impact of losing EU funding and EU staff, both of which are likely outcomes of Brexit.”

The researchers found leveraging collaborations with Asian countries (including China, India and South Korea) would be less

The study authors argue the best outcome for the UK and EU would be for the research partnership between the two to continue. Their simulations suggest if this is not possible, the UK's best option would be to replace EU collaborators with partners in the US. However, under this scenario the UK's research impact would ultimately suffer unless its new US partners were the top-performing ones in the field.

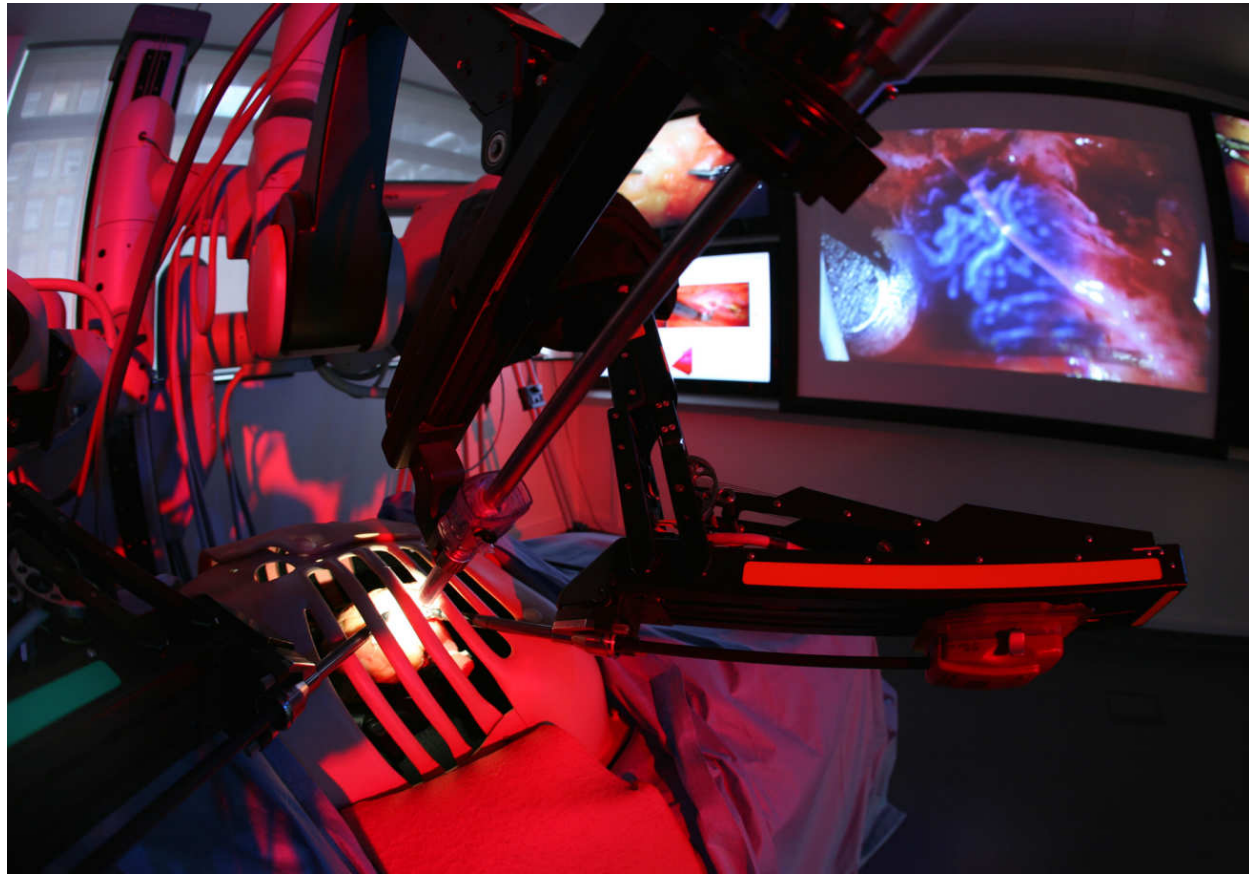
Dr George Garas, lead author of the study from the Department of Surgery and Cancer at Imperial College London, said: “There is a consensus within the scientific and healthcare communities that Brexit

advantageous than partnering with the US. They also found that replacing UK-EU collaborations with collaborations with countries outside the US and Asia would mostly result in a substantial drop in the UK's performance.

Robots and robotic medical devices are increasingly used in operations to help surgeons to operate more precisely and use less invasive techniques.

The new study involved using complex mathematical modelling to map global collaborations in robotic surgery research, over a 19-year period between 1988 and 2017, based on the academic papers on robotic surgery published during this period. Analysis showed that the highest-performing academic articles in terms of citations and innovation were those involving international collaboration, and that the EU constitutes the UK's largest research collaboration partner.

The researchers ranked different countries for research impact and innovation in robotic surgery. The UK ranked 3rd for innovation and 6th for research impact, with the US top in both.



The Da Vinci robot, used to assist with keyhole surgery

A country's innovation index was measured by looking at factors such as what stage its robotic surgery developments had reached – for example whether something was at a prototyping stage, or a novel robotic medical device was already in use in hospitals. The team used citation data to analyse the research impact of individual countries.

The authors also analysed the structure of the networks involved and which types of networks resulted in the most successful research. They then simulated severing UK-EU27 collaborations and replacing these with different geographical clusters, to see how the UK's performance would change.

The research was a collaboration between academics from Imperial's Department of Surgery and Cancer, the Institute of Global Health Innovation's Big Data and Analytical Unit and researchers at Queen Mary University of London.

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Paper reference: [“Evaluating the implications of Brexit for research collaboration and policy: a network analysis and simulation study”](#), *BMJ Open*, 11 September 2019, doi: 10.1136/bmjopen-2018-025025

George Garas, Isabella Cingolani, Vanash M Patel, Pietro Panzarasa, Ara Darzi, Thanos Athanasiou.

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