

Report: The Impact of EU Membership on UK Molecular bioscience research

The Biochemical Society promotes the future of molecular biosciences: facilitating the sharing of expertise, supporting the advancement of biochemistry and molecular biology, and raising awareness of their importance in addressing societal grand challenges.

Our Policy programme aims to promote the importance of our discipline and through this the broader life sciences. We work in partnership with the Royal Society of Biology and others to engage our members with key science and education policy issues and ensure that their views are channelled to the appropriate policy-makers.

A. Introduction

The recent referendum on the UK's membership of the EU has had significant implications for the molecular bioscience community, with key considerations ranging from funding to free movement of labour and potential for collaboration. In order to help inform the Biochemical Society's policy activities in this area, an online survey was carried out in February 2016 to capture the views and experiences on this important issue of researchers working in molecular bioscience.

This report provides a summary of the findings from this survey.

B. Questionnaire design

In order to collect the views and experiences of those working in molecular bioscience, an online questionnaire was created covering all career stages, nationalities and countries of work. Both Biochemical Society members and non-members were invited to contribute. The questionnaire was promoted through emails to the membership, emails specifically to members of the Biochemical Society Industry Advisory Panel, social media and on the Biochemical Society website. Additionally, those contacted were encouraged to share the questionnaire within their networks where appropriate.

The questionnaire contained 16 questions (with a mixture of open and closed questions) and was designed to draw out the views of our community on UK staying in or leaving the EU. 376 individuals responded to the survey, of which 118 consented for their comments to be quoted alongside their name and institution/company. 90% of respondents identified themselves as members of the Biochemical Society.

Questions one to six were used to gather background information about the respondents (Figures 1-3). The remainder of the questions focused primarily on EU funding and on networking and collaboration. A copy of the survey questions is provided in Annex 1.

Which of the options best reflect your current position?

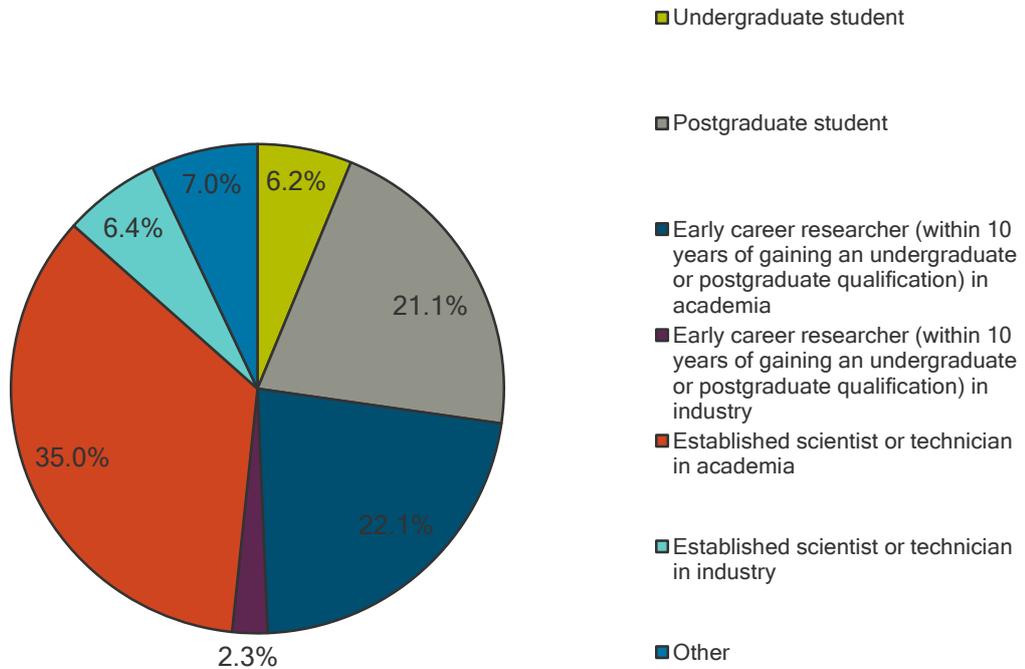


Figure 1. Diversity of different career stages that the survey respondents were representing (number in brackets indicates the number of responses).

Which of the following best describes you?

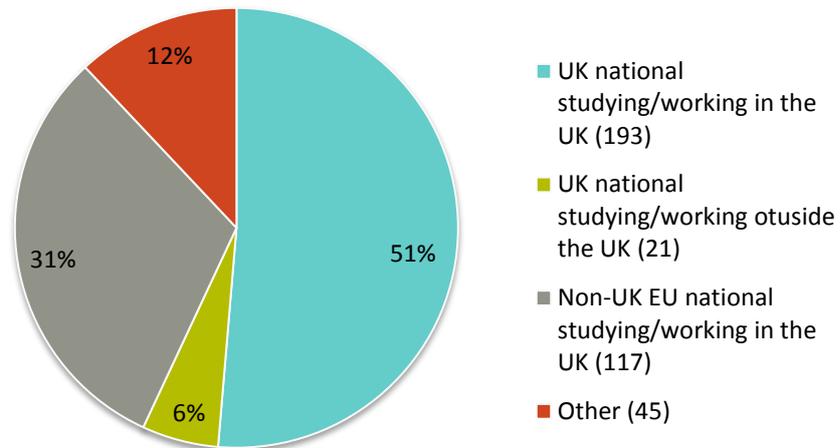


Figure 2. More than half of the survey responses were from UK nationals either studying or working in the UK (number in brackets indicates the number of responses).

Are you a member of the Biochemical Society?

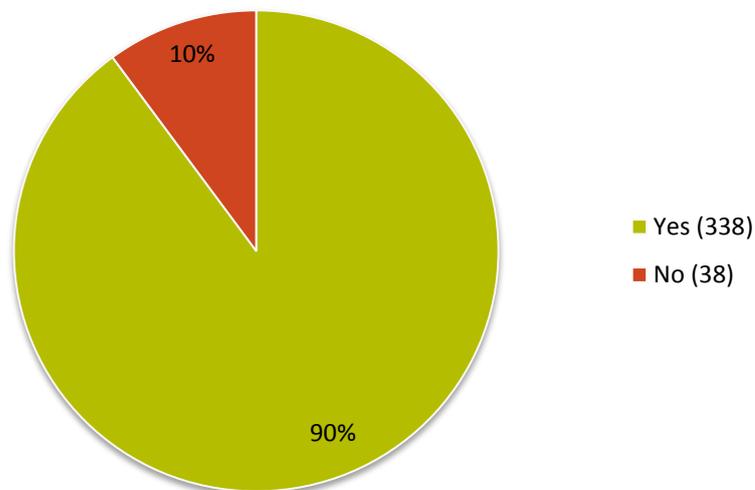


Figure 3. The majority (90%) of the respondents were members of the Biochemical Society (number in brackets indicates the number of responses).

C. Limitations of the data

The role of EU membership in UK molecular bioscience is highly complex. This survey was designed to capture high level views and experiences on some of the broader issues such

as funding and collaboration. However, it is clear that other issues are also highly relevant (e.g. regulation and legislation), which are beyond the scope of this report.

In drawing conclusions from the data, it is important to note that because the sample was self-selecting, the responses may not accurately reflect the views of all members of the molecular bioscience community. Also, respondents were not asked to provide information about their political affiliation and it is therefore possible that the results may have been influenced if a disproportionate number of responses came from members of one or more political parties. Finally, due to the limited number of options provided to answer the multiple choice questions in the survey, it is not always possible to draw firm conclusions on the findings.

D. Results

a. Overview of results

In general, respondents indicated that they believe UK molecular bioscience benefits from EU membership and were strongly supportive of the EU's role in UK molecular bioscience. 96% of the 376 complete responses agreed that "overall, current EU membership benefits UK molecular bioscience". This was largely consistent across all demographics (figure 8). Support for EU membership was also very high on issues such as EU funding, and networking and collaboration in the EU. Again, responses were broadly similar across all demographics covered by the analysis and responses to open-ended questions provided insight into the rationale behind these decisions.

Respondents were divided into the following categories based on their responses to questions 1 to 6. *Career stage*:

- undergraduate students (n=13)
- early career researchers (postgraduate students, early career researchers in academia and early career researchers in industry, n=166)
- established researchers (in academia and industry, n=175)
- other (n=22)

Nationality:

- respondents who are from the UK and work in the UK (n=193)
- respondents who are from the UK but work outside of the UK (n=21)
- respondents who are from the EU (not including the UK) and work in the UK (n=117)
- other (n=45)

Sector:

- respondents based in industry (early career researchers in industry and established researchers in industry, n=30)
- respondents based in academia (postgraduate students, early career researchers in academia and established researchers in academia, n=311)
- other (n=35)

b. Funding

Respondents were asked three questions on funding. Almost half (47%) of respondents indicated that they had been involved in an EU funded molecular bioscience project in the past ten years (Figure 4). This split was consistent among most groups considered in the analysis, although established researchers were more likely to have received EU funding than early career researchers (56% of established researchers had received EU funding compared to 41% for early career researchers). This difference may reflect the fact that established researchers are more likely to be aware of the full range of funding sources available or perhaps find the necessary collaborative partners with greater ease.

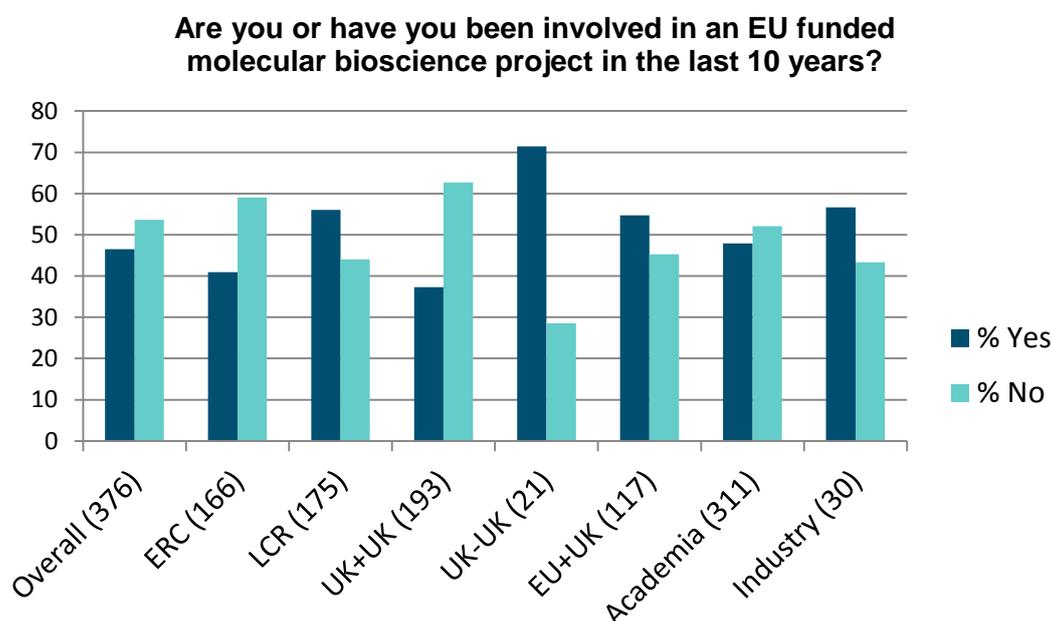


Figure 4. The proportion of respondents who have been involved in an EU funded molecular bioscience project in the last 10 years. 376 respondents answered this question, of which 166 were early career researchers (ECR), 175 – late career researchers / established scientists (LCR). 193 respondents identified themselves as UK nationals working/studying in the UK (UK+UK), 21 – UK nationals working outside the UK within the EU (UK-UK) and 117 – non-UK EU nationals working/studying in the UK (number in brackets indicates the number

of responses). Please note that not all categories are mutually exclusive, for example, a respondent can be an early career researcher (ECR) who is a UK national working in the UK (UK+UK) in industry.

UK nationals working outside the UK were more likely to have been involved in an EU funded project in the last 10 years (71% of UK nationals working outside of the UK had been involved in an EU funded project in the last 10 years, compared to 37% of UK nationals who work in the UK).

The questionnaire also asked respondents how relevant they thought EU funding was to their research (Figure 5). Despite the fact that slightly less than half of respondents had been involved in an EU funded project in the past ten years, 71%, still felt that EU funding is either “essential” or “very relevant” to their research, suggesting that people still value the funding provided by the EU whether or not they benefit directly. This rose to 85% for people who have been involved in an EU funded project and fell to 59% for those who had not. Although established researchers were more likely than early career researchers to be involved in an EU funded project (see above), early career researchers felt EU funding was more relevant than established researchers (76% in comparison to 67%), perhaps suggesting that they see this as a source of funding which they may be able to take advantage of later in their career. Similarly, despite the fact that respondents working in industry were more likely to be involved in an EU funded project than those in academia, industry respondents (57% against 48%), felt EU funding was less relevant. As with the previous question, it appears that UK nationals who work in the UK are less reliant on EU funding than UK nationals working outside the UK and non-UK EU nationals working in the UK.

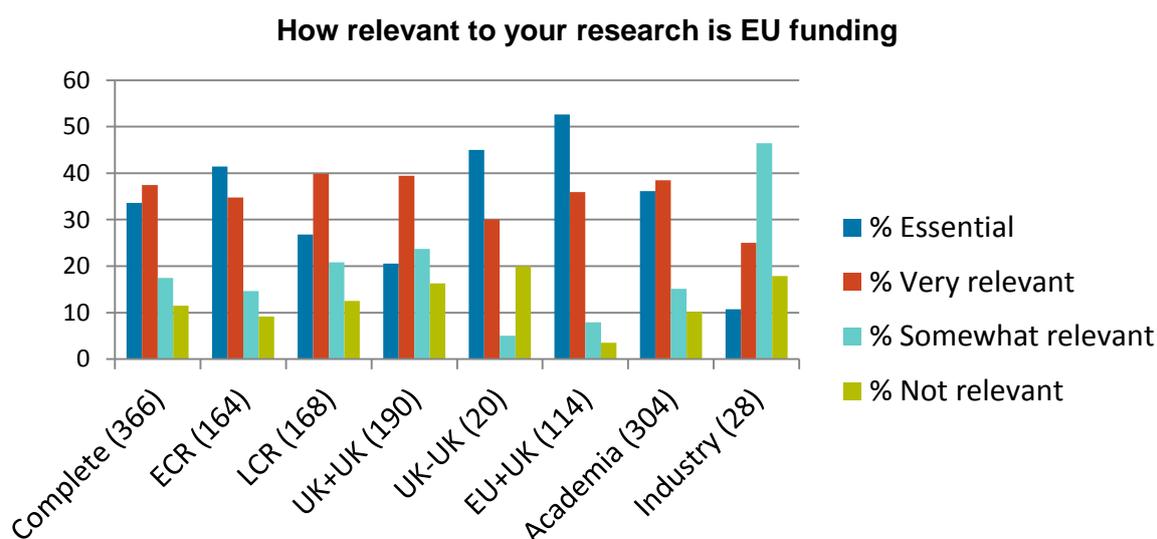


Figure 5. The relevance of EU funding to molecular bioscience research in the UK (number in brackets indicates the number of responses). See Figure 4 for abbreviations.

The final question on funding asked if respondents had applied for EU funding and if they found it more or less complicated when compared to applying for funds from UK only sources. Overall, more than half of respondents (53%) found it more complex, while 42% found it about the same in terms of complexity and 11% found it less complex.

Moreover, 70% of the established researchers said they found the application for EU funding more complex and 28% said they were roughly the same. However, this increased complexity did not appear to deter researchers from obtaining EU funding. Of the established researchers who said the application process for EU funding was more complex compared to the UK, 58% had still been involved in an EU funded project in the past 10 years and 71% said that EU funding was “essential” or “very relevant” to their research.

Based on these findings it appears that a large proportion of the respondents to the survey both value and depend upon EU funding for their work. Certainly the topic of research funding was raised frequently by respondents as part of the open ended questions, with many references to the fact that UK researchers receive a sizeable amount of funding from EU sources and with some referencing the fact that the UK is believed to be a net receiver of research and development funds from the EU. Several respondents expressed concern about how this funding shortfall would be replaced were the UK to leave the EU, with a senior lecturer at a UK university arguing that:

“There would be no advantage to UK molecular bioscience of leaving the EU - any redistribution of funding would be minimal (there is no commitment from Leave [campaign] to increase science spending as a proportion of GDP) and would not have the same impact as EU funding. The flood of highly talented and driven scientists would dry to a trickle and the UK would lose its privileged position in the international scientific community.”

Others argued that having greater autonomy over UK spending could be beneficial for UK researchers. A professor at a UK university suggested that if the UK were to leave the EU:

“The research funding would be much better spent within the UK. The process would be more efficient and fund researchers more on merit rather than on political grounds.”

c. Collaboration and networking

The questionnaire included several questions related to networking and collaboration. Respondents who had indicated that they had been involved in an EU funded project in the last 10 years were asked to specify which other EU countries had been involved. Collectively, there were at least two collaborative projects with every country in the EU.

Figure 6 and table 1 show that collaboration was heavily focused in Western Europe, with Germany, France, the Netherlands and Spain the four most common partners. This was not unexpected given the distribution of both the population in Europe and research and development funding.

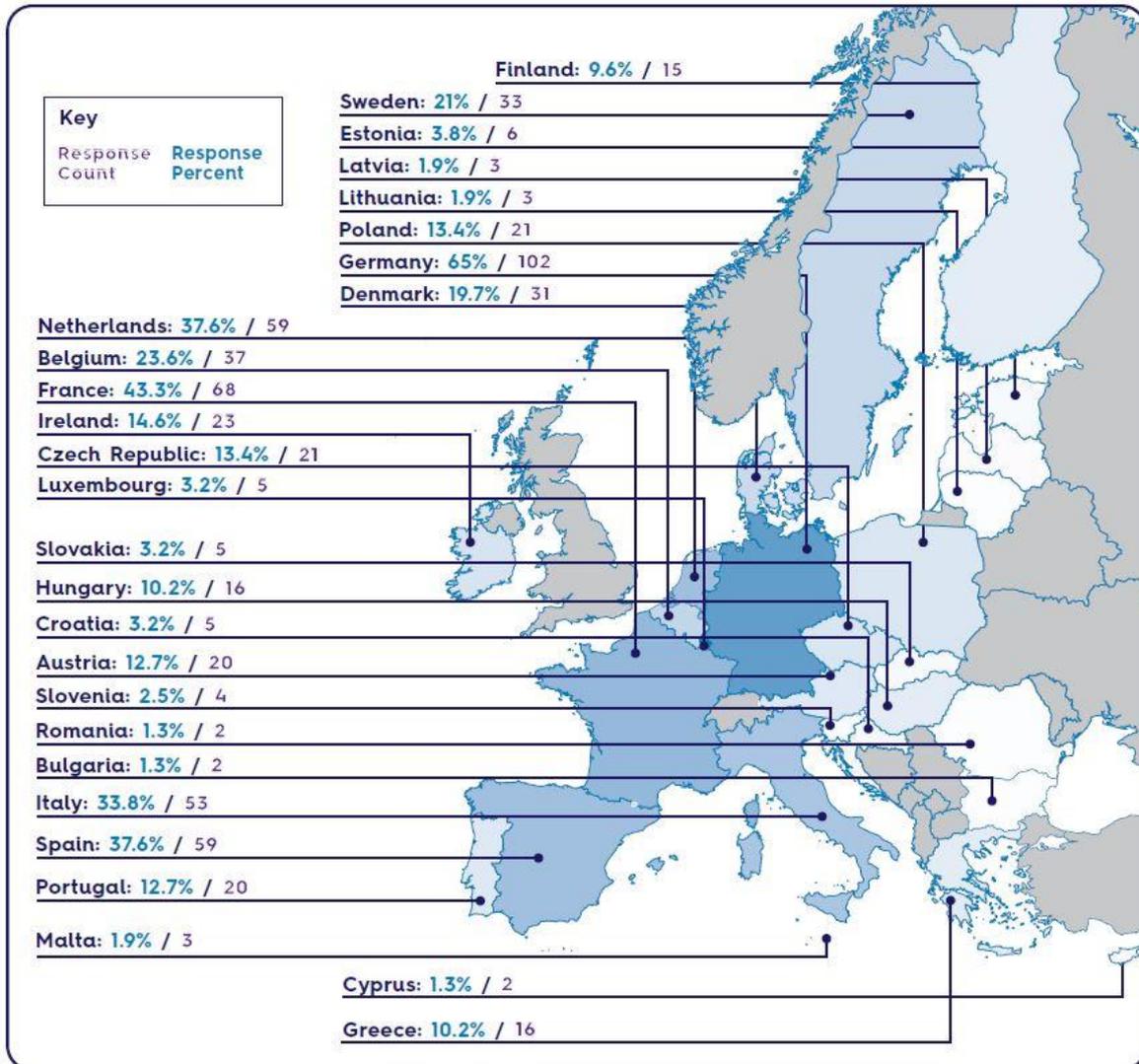


Figure 6. The countries respondents indicated as partners in scientific research.

Germany	102	Hungary	16
France	68	Finland	15
Netherlands	59	Estonia	6
Spain	59	Croatia	5
Italy	53	Luxembourg	5
Belgium	37	Slovakia	5
Sweden	33	Slovenia	4
Denmark	31	Latvia	3
Ireland	23	Lithuania	3
Czech Republic	21	Malta	3
Poland	21	Bulgaria	2
Austria	20	Cyprus	2
Portugal	20	Romania	2
Greece	16		

Table 1. The number of respondents who have collaborated with researchers from the countries within the EU.

Respondents were also asked how relevant networking with other researchers in the EU was to their research. Overall, 87% of respondents rated this as “essential” or “very relevant” to their research. The results were broadly consistent between all groups (Figure 7), with industry having the lowest proportion (83%) of respondents who felt networking with other researchers in the EU was “essential” or “very relevant” compared to 96% for non-EU nationals who work in the UK, the highest proportion for any group.

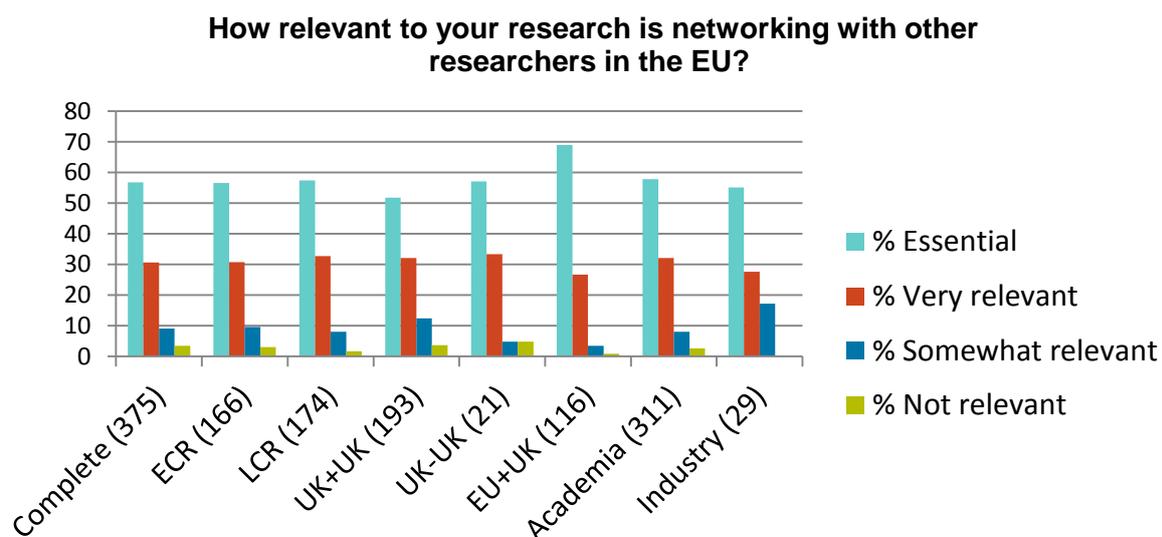


Figure 7. The importance of networking with other researchers in the EU to UK molecular bioscience research. See Figure 4 for abbreviations.

These findings were reinforced by the open questions later in the survey, with collaboration and networking being the issues most frequently commented upon by respondents. One respondent, a retired former employee at the European Commission, claimed, for example, that:

“[The EU] has changed and normalised cross-border scientific collaboration in Europe out of all recognition since I started my career.”

Another respondent, a research assistant based at a UK university, stated that:

“EU membership ensures collaborative work is fluid and funding is often available for travel and accommodation to access both collaborative researchers and infrastructure. This has been essential for several of my highest impact publications”

Many provided more general comments about how the opportunity to collaborate with many other scientists within the EU had furthered their work, including a senior member of staff at the Francis Crick Institute who said:

“My work has benefitted hugely from collaborations with EU countries outside the UK that has been fostered by EU funding. Open borders within the EU have enhanced my ability to recruit excellent scientists from across the EU, much improving the quality of researchers available to my lab compared with the EU alone.”

Despite these findings, it was however felt by many that these relationships would still be possible outside of the EU. Very few respondents suggested that these links would break down entirely outside of the EU, but most claimed that being part of the EU made collaboration and networking significantly easier, particularly in terms of enabling permit-free cross border lab visits. A researcher at the John Innes Centre gave this example:

“I went to work in France for 2 years with absolutely no trouble, but a colleague is having difficulties in getting a visa for a one month exchange visit to China.”

From a publishing perspective, the questionnaire asked respondents to indicate what proportion of papers they had published in the past five years which had been co-authored by non-UK EU based scientists. Of the 285 respondents who said this question was applicable to them, 35% had co-authored with non-UK EU based scientists on at least half of the papers they published in the past five years.

The exchange of students between research centres in different countries was also found to be important for several respondents. 18% of respondents said that they had been involved in an EU student exchange scheme such as Erasmus, often as a student or as a supervisor. This included students travelling to and from the UK as part of an exchange programme and

supervisors who had hosted several students from a variety of EU countries throughout their career.

With regards to free movement of labour more generally, several issues were highlighted by the open ended questions. One respondent, a Research Assistant based at a UK university, for example suggested that:

“[...] the UK is not self-sufficient [...] in terms of producing enough number of scientists, health professionals and other highly qualified work force to sustain their scientific, health and technological systems, so it has to import them. Should the UK leave the EU, the mobility restrictions will impair the recruitment of top scientists, engineers, health professionals and technologists, which in turn would jeopardize the economic development of the country: a dreadful perspective considering that the future long-term sustainability of developed economies will depend greatly on boosting science-based knowledge, research and technological advancements in an ever-increasing competitive world.”

Some established scientists, were keen to stress that they looked beyond the UK when attempting to recruit the best PhD students, postdocs and research assistants. Many suggested their output would suffer if they were limited in their choices. One respondent, a lecturer at a UK university, said:

“From a teaching point of view, EU membership makes it a lot easier for students to go abroad within the EU to study for an undergraduate or a postgraduate degree. Consequently, UK institutions benefit from excellent, self-motivated European students who want to study in the UK, and it is a lot easier for our own students to experience life abroad”

Early career researchers expressed interest in the free movement of people to study for a PhD and jobs in post-doctoral positions. One PhD student based at a UK university and originally from Greece, suggested that if, following a ‘Brexit’, EU students are charged international fees at UK institutions, they would be “discouraged to come study in the UK and ... choose other European countries such as Germany and France”. These less experienced researchers were also appreciative of EU funds which they believed were easier for early career researchers to win. A researcher at the Max Planck institute suggested that EU funds are “important for young scientists trying to establish their own labs” and without this funding source they “would find it hard to find funding to set up labs”.

d. Other issues

In addition to the issues already considered around funding, networking and collaboration, other issues were also highlighted by the survey, particularly by the open-ended questions. Many respondents took a broader look at the issue of EU membership and considered how

effective the UK could be outside of a larger research network such as the EU. It was argued by some respondents that only as part of a larger partnership would the UK be able to compete with populous countries with a vast pool of talent such as the USA and China. Others agreed that international collaboration was crucial but disagreed on which international partners UK researchers should focus their collaborations on. It was argued, the UK should embrace and seek out partnerships all across the world. Some commentators stressed that being part of the EU did not preclude collaboration with non-EU partners; it simply made it easier to collaborate within the EU.

For example, an associate professor at a UK university noted that:

“As it stands there is no block on interacting with researchers from outside the EU, and I have active collaborations with the US and Brazil which would not be put at threat if the UK were to stay in the EU.”

He added that

“Although the funding streams from the EU are of course important, for me the single most important aspect of our membership is the ease of exchange of ideas, students and researchers.”

The consensus however was that supporting collaboration is of utmost importance because, as one researcher involved in drug discovery said:

“On a “micro” level, the days of the vertically integrated institution are over and collaboration and co-creation are the only credible way forwards. On a “macro” country level, the same is true. Driving a separatist line is a worrying development in the wrong direction.”

“Science is an international ‘challenge’. It is essential that one works with the best people, wherever they are. The EU facilitates this.” added a researcher at the John Innes Centre.

While industry respondents had many of the same concerns as those in academia, there were some issues unique to industrial research and development, particularly the free trade agreement at the heart of the EU. While a few respondents stated that the EU market was not particularly important for their business, many felt the opposite. One respondent said that it represented a “significant proportion” of sales, another stated that by having access to the common market their “customer base is enormously extended”, and a third respondent said that when they launch products, “access to the European market will be vital to the success of the business”. In contrast, a few respondents identified ‘Brexit’ as a potential opportunity for the UK to renegotiate favourable trade deals with other markets.

The impact of EU-wide regulation was also raised by several industry-based respondents. In some cases this was considered restrictive and disjointed while others felt it helped to

maintain standards of quality and safety. Collaboration with EU-based partners and research funding from EU sources were highlighted as particularly important in industry as well as in academia. One business reported that it received “a significant amount of funding from EU research and development initiatives” while another claimed it relied upon these funds. As with academics, those working in industry identified the uncertainty surrounding the UK’s relationship with the EU moving forward as a cause for concern, citing fears of “harsher market conditions” with the EU and logistical problems such as distribution which require long-term planning.

While the vast majority of respondents were broadly supportive of the role of EU membership on UK molecular bioscience research, a small number of respondents said that they did not feel the result of the referendum would make a perceptible difference to the average researcher in the UK, at least not in the short term, as they believed UK researchers would continue to participate in EU research programmes. These individuals did not however identify any benefits of a ‘Brexit’ to UK molecular bioscience, with a retired former employee at the European Commission calling it an “unnecessary complication”. Outside of this minority, most people believed they, or at least the research community in the UK as a whole, would be affected were the UK to leave the EU, with one professor at Cancer Research UK claiming it would be “disastrous if [the UK was] not able to participate in EU programmes”. The uncertainty of what would happen in this eventuality was identified on many occasions as cause for concern.

Finally, respondents made repeated reference to the continuation of the excellent quality of science in the UK and were reluctant to support any measures which might endanger this world-leading research.

E. Conclusions

Overall, the vast majority of respondents to this survey (96%) felt that EU membership is of benefit to UK molecular bioscience (Figure 8). Based on the survey findings, the following findings appear to be of particular relevance to those working in molecular bioscience.

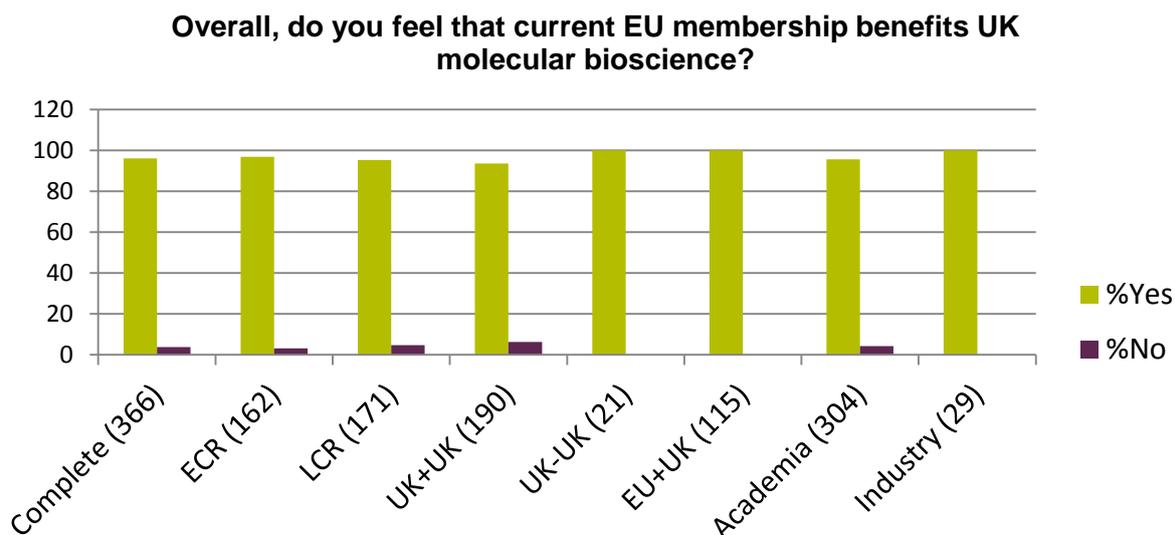


Figure 8. The impact of the current EU membership to UK molecular bioscience. See Figure 4 for abbreviations.

- Funding** – Almost half (47%) of respondents in this survey had been involved in an EU-funded project within the past 10 years, with established scientists more likely to have received funding than early career scientists. The majority of respondents (71%) felt that EU funding is essential or very relevant to their research; although a small number felt that having greater autonomy over UK spending could be beneficial for researchers. Just over half (53%) of respondents found the process of applying for EU funding to be more complex than applying for funding from UK sources, increasing to 70% of responses from established scientists.
- Collaboration and networking** – 87% of respondents to the survey felt that the ability to work collaboratively and network with other researchers in the EU was essential or very relevant to their research. This finding was broadly consistent between all groups. Very few respondents suggested that these links would break down entirely outside the EU, but most felt that both collaboration and networking were facilitated by being part of the EU. Free movement of labour was felt to be an important issue, not only in order to attract highly qualified scientists to the UK, but also for students wanting to study in the UK and UK students wanting to study and work abroad in the EU. Just under 20% of respondents had been involved in an EU student exchange scheme such as Erasmus, either as a student or supervisor.

- **Industry** – Issues of particular relevance to industry respondents included free trade and the impact of EU-wide regulation. The majority of industry respondents stated that access to the common market had extended their potential for trade, although a few respondents identified 'Brexit' as a potential opportunity for the UK to renegotiate favourable trade deals with other markets.

Annex 1 – Survey Questions

Impact of EU membership on UK molecular bioscience research

1. Name *

2. Email address *

3. Name of institution / employer *

4. Please choose the option which most closely reflects your current position: *

- Undergraduate student
- Postgraduate student
- Early career researcher (within 10 years of gaining an undergraduate or postgraduate qualification) in academia or industry
- Established scientist or technician in academia
- Established scientist or technician in industry
- Other

5. Are you a member of the Biochemical Society? *

YES/NO

6. Which of the following applies to you? *

- You are a non-UK EU national studying/working in the UK
- You are a UK national studying/working outside the UK
- You are a UK national studying/working in the UK
- Other

7. Are you or have you been involved in an EU funded science project in the last 10 years?

YES/NO

8. If so which other EU countries are/were involved in addition to the UK?

9. In which EU countries outside the UK (if any) have you studied? Please specify which countries and at what level (undergraduate, postgraduate etc). (*drop down menu*)

10. Have you ever participated in an EU student exchange scheme (e.g. Erasmus)? If yes, please specify what scheme and in which country. (*drop down menu*)

YES/NO

11. How relevant to your research is each of the following:

- Networking with other researchers in the EU

Essential / very relevant / somewhat relevant / not relevant

- EU funding

Essential / very relevant / somewhat relevant / not relevant

12. Approximately what percentage of your publications over the last 5 years were co-authored by EU-based scientists who are not based in the UK? If you have not published in the last 5 years, please select "not applicable".

0 - 25% / 25% - 50% / 50% - 75% / 75% -100% / not applicable

13. In your opinion, does EU membership encourage the spread of good scientific practice?

YES/NO

14. If you have ever applied for EU funding, how do you find the process in comparison to applying for funding from UK bodies? (e.g.UK Research Councils)

Highly complex / complex / fairly straightforward / straightforward

15. If you work in industry, how (if at all) does being in the EU impact your business? Does being part of the EU community affect your customer base?

16. Overall, do you feel that current EU membership benefits UK science? Please explain your reasons.

YES/NO

17. What do you feel would be the main advantages and disadvantages to the UK science if the UK were to leave the EU?

18. What do you feel would be the main advantages and disadvantages to the UK science if the UK were to stay in the EU?

- End of report -