

COVID-19: the impact on molecular bioscience researchers

Summary

- In May 2020, the Biochemical Society conducted a survey of over 450 researchers in the molecular bioscience community to find out how the COVID-19 pandemic was impacting them and what they foresaw being the long-term impacts of the pandemic on them and their research.
- The majority of researchers were unable to access their laboratories and perform experimental work at the time of the survey. This is anticipated to result in a delay and a decrease in research output.
- At the time of this survey, respondents were able to complete only 47% of their usual work.
- The pandemic may have greatest impact on those at the early stages in their careers who are more reliant on new experimental data collection for career progression. 16% of respondents were concerned about career progression, with this increasing to 27% amongst Early Career Researchers (ECRs) and 9% of ECRs are considering moving away from research.
- There is a concern amongst researchers for the future funding landscape including challenges faced in relation to their specific grants.
- Researchers anticipate that social distancing measures will change both laboratory and teaching settings and that there will be an increase in the use of virtual technologies for teaching and meetings in future.

Who responded?

- A total of 469 people responded to the survey.
- 60% of respondents were based in the UK, with 40 % being outside of the UK.
- 54% of respondents were members of the Biochemical Society.
- 21 respondents (either ECRs or established scientists) were based in industry.

Undergraduate and Masters students	Postgraduate student	Early Career Researcher	Established Scientist	Other
5	65	111	247	20

Table 1 Career stage of survey respondents

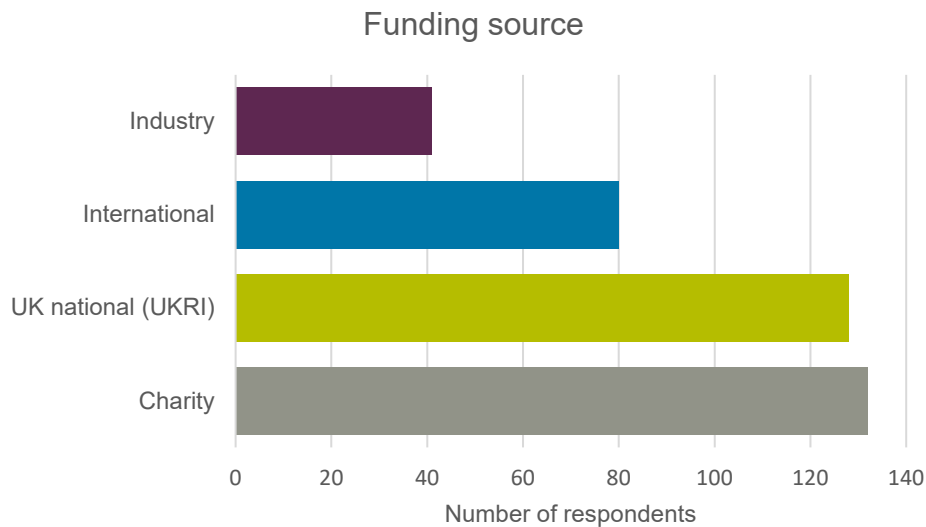


Figure 1 Funding source of survey respondents

A decrease in research output in the molecular biosciences

During immediate lockdowns placed in regions of many countries, **76% of researchers had no access to their laboratories**. Some laboratories were granted access for research related to the COVID-19 pandemic or essential maintenance of equipment or animal colonies. Many subsequent impacts on research and researchers (such as difficulties with researchers' specific grants or concern for career progression) can be linked to the lack of data collection during this time.

The lack of data collection and experimental work in the short-term is expected to be exacerbated by **a delay to restarting efficient research (17%)** (for example, due to the time necessary to rebuild cell cultures or animal colonies). Delays or difficulties in sourcing reagents and the implementation of social distancing measures in returning to the laboratory-based research were also referenced as factors likely to slow progress as researchers return to their laboratories.



Overall, the effects of regional or national lockdowns during the current crisis are anticipated to lead to a **delay or decrease in research output or slow progress in the medium-long term by 53% of survey respondents.**

Comments:

“As a plant scientist, I have not just lost the time while the lab was closed, but the time spent growing plants which are now too old to use and time I will need to spend re-growing plants when we return to the lab. This will reduce the amount of data I am able to produce within the next two remaining years of my PhD. It’s also likely that the return to bench-work will be phased. Our small and crowded lab will not be able to have the whole group working at once, which will again dramatically reduce research output.” – Postgraduate Researcher

“I anticipate that it will take 6-9 months to get the mouse colonies back up to pre-COVID levels ready for experiments and several weeks for cell cultures to be back up and running. Overall, I expect disruption to wet lab work for up to 12 months.” – Early Career Researcher

“Dramatically reduced research output because having to focus on designing and delivering online teaching rather than research.” – Established Scientist

“In the medium term, it will take time to have the lab up and running again. For example, we will need to start breeding the animals again and we will not be able to generate data for few months. The postdoc and research assistant working in the group are under short term contracts and their projects will finish without enough data for generating publications. Being a junior group leader, I cannot afford to extend their contracts.” - Established Scientist

Impact of pandemic will be most keen for Early Career Researchers

- Researchers were, on average, able to perform 47% of their usual work. Amongst postgraduate students and early career researchers, this decreased to 38% and 40% respectively.
- Whilst 16% of researchers described a concern for career progression in answer to either Q5 or Q7, this increased to 27% amongst ECRs.
- Almost half (47%) of the established scientists who mentioned concern for career progression in their responses did so on behalf of more junior colleagues (including ECRs and postgraduate students).
- 9% of ECRs are considering moving away from research as a career on a permanent basis.
- No researchers working in industry referenced concern for career progression.



Comments:

“Due to delays on experiments, my future publications will be delayed. My plan to submit a manuscript in 2020 is probably unrealistic as things stand. This year publication was paramount to apply for fellowships, therefore I will have to very likely postpone career progressions.” – Early Career Researcher

“As funders have informed us that they won’t know how much funding they can give out and what their priorities will be, I feel like the long-term effects of this are going to hit us very hard, especially early career scientists that NEED to demonstrate the ability to obtain funding.” – Early Career Researcher

“I am responsible for all lab members. All PhD students and post-docs will be adversely affected. The effects on future research will depend on the funding bodies and government in their responses to the situation.” – Established Scientist

“Progress on grant milestones will likely be delayed by several months. As it is unknown how long it will be before research can get back to the usual pace, it is hard to know what the longer-term impacts will be. I am particularly concerned about senior postdocs who are planning to write independent fellowships in the next year and whether there will be funding to support them. We could lose a LOT of excellent researchers.” – Established Scientist

“I think that a lot of early career scientist will leave academia due to a funding gap. Many already finishing grants no jobs available to apply for during the crisis.” – Early Career Researcher

Researchers are worried about funding

- Almost a fifth of researchers described an effect on their own grant funding (19%). Concerns included: not being able to meet key milestones on an existing grant, being uncertain of whether they would receive extensions to studentships or grants, inability to generate seed data for new grant applications.
- The impact on PhD studentships was linked to the stage of the project. Some students towards the end of their project are able to use this time to write theses with minimal impact, while those at the beginning of their project able to spend time writing literature reviews and planning future experiments. However, the survey responses indicate that the largest impact on those mid-way through their PhD project where they were amassing data efficiently at the time of lockdown.
- One fifth of respondents had concerns for the future funding landscape in the medium-long-term (21%). This was highest amongst those who list charity funding as a funding source (31%) compared to 22% receiving international funding, 17% UKRI funding and 15% industry funding.



Comments:

“The lockdown of the lab has meant work which would potentially be used for a publication will now be delayed. Long term I am concerned as I am in the final few months of my PhD and unsure if funding and future opportunities will be affected.” – Postgraduate Researcher

“Most vital - it will be stressful meeting the aims of awarded grants which may affect long term ability to get funding. University instability is an even greater worry now than it was before COVID. Other medium term - good: I hope I can manage to submit a paper or 2 in this time, although -bad: it is exams season and I am working in the lab on a COVID Ab test (rapid response grant) part time so I am working a lot. But new collaborations permitted by the COVID work and more online discussions with colleagues? Long term - huge worry about economic instability - research grants, higher ed, student ability to attend University, and Brexit com-pounding this.” – Established Scientist

“I worry about the long-term impact to available funding. I am trying to become independent at the moment and I worry the pot will be dry for a while.” – Early Career Researcher

“It will take a few months to get the lab back to normal once we are back, this will mean delay in publications (as right now we cannot address reviewers’ comments) and delay in applying for grant as we cannot generate preliminary data.” – Early Career Researcher

“Difficult to say for sure, but at least one grant funder is longer having a submission round this year due to Covid19. This was our first-choice funder for a grant.” – Established Scientist

Some changes to research will be permanent

- Many researchers foresee changes to working practices, particularly around travel and flexible working. This included 36% of respondents planning to continue some aspect of remote working on a permanent basis, an increase in online meetings (15%), generally travelling less for work (9%), teaching (8%) and conferences (6%).
- 15% of respondents believe there will be no permanent changes, with research eventually returning to how it was before.

Comments:

“I think virtual conferences will become more common. I might end up doing more non-lab work from home.” – Postgraduate Student

“Hopefully greater flexibility to work remotely (when writing papers/grant applications/data analysis). Raises questions about whether some conferences will choose to be run online in the future.” – Early Career Researcher



“Occasionally working from home, applying more automated analysis as I am spending some time on learning coding.” – Early Career Researcher

“More remote working. Better work-life balance. Positive impact on carbon emissions with fewer physical conferences and meetings, with more virtual meetings instead.” – Established Scientist

“I will certainly embrace online communication tools in the future. I may also elect to work from home one day per week, as I am finding the lack of interruptions allows extended periods of concentration.” – Established Scientist

“None. I am very much looking forward to returning to working full time on campus, and the return of face-to-face teaching!” – Established Scientist

Other effects of the pandemic indicated by respondents

Immediate impact:

- A minority of researchers (9%) directly referenced either having some data to analyse from home or the ability to continue with aspects of their research (e.g. in silico research).
- 4% of researchers have changed the focus of their work towards COVID-19 related research.
- Other answers include the following: a change in research focus, sometimes towards research related to SARS-CoV-2, issues with staffing (4%), difficulties working from home for example due to caring responsibilities (4%).

Medium-long-term impact (6-12 months):

- Answers included the following: concerns for staffing (7%), concern for education (6%), opportunities for new work (5%), difficulties with procurement of reagents or infrastructure (4%) and a limit to travel for meetings or conferences (4%).

Permanent changes to working life in the molecular biosciences:

- Other answers included: concern for education (5%).



Survey methodology

The results of the Biochemical Society survey “Impact of COVID-19 on researchers in the molecular biosciences” indicate some of the concerns of the community at the time of the survey (May 2020).

The survey had 469 respondents whose answers were included in the analysis. All responses were analysed anonymously. Free-type responses were manually categorised into themes based on the comments and views mentioned. These themes were then studied based on the number of respondents whose comments fitted into each category and the breakdown of those respondents according to their career stage, funding source and whether they were based in the UK or outside of the UK. The Biochemical Society defines “Early Career Researcher” as a researcher within ten years of completing a postgraduate qualification in the life sciences (not including career breaks).

Included below is a list of survey questions with the number of respondents and all response themes where relevant. All questions were optional and not all questions were answered by all respondents.

Q1. Please select the option which applies best to your career stage **(469 respondents)**.
(Undergraduate student, Masters student, Postgraduate student, ECR (academia), ECR (industry), established scientist (academia), established scientist (industry), other (please specify)).

Q2. What is your main source of funding? **(338 respondents)**
(UK national funding (UKRI), charity funding, international funding, industry, other (please specify)).

Q3. Do you work in the UK? **(467 respondents)**
(Yes, No, if no, please give the country you are based in).

Q4. What have been the short-term effects of COVID-19 on you research? (The immediate and current impacts of local or national lockdowns, other restrictions or changes due to COVID-19). **(430 respondents)**.

Theme	% of respondents	Theme	% of respondents
No lab access	76 %	Impact on mental health	3 %
Working from home	12 %	Pause on data collection non-lab based (e.g clinical research)	3 %
Decrease in productivity	9 %	Impact on collaboration	3 %
Some data to analyse or <i>in silico</i> research	9 %	None	2 %



Issues with grant funding	8 %	Procurement, reagents or facilities	2 %
Students unable to work	7 %	Issues with staff or recruitment	2 %
Animal research	6 %	Other	1 %
Teaching	5 %	Project deliverables at risk	1 %
Change in direction of work	4 %	Volunteered for COVID-19 efforts	1 %
Difficulties working at all (e.g. caring responsibilities)	4 %		

Table 2 Short-term impact of COVID-19: responses

Q5. What do you feel the medium- and long-term effects of COVID-19 will be on you research and research output? (Any anticipated impacts when research begins to restart or any challenges already encountered in returning to research as normal). **(400 respondents)**.

Delayed or lower outputs	39 %	Other comments	6 %
Funding – general landscape	21 %	None	5 %
Funding – specific grants	19 %	Opportunities for new work	5 %
Delay to restarting	17 %	Less travel for meetings or conferences	4 %
Social distancing measures in labs	15 %	Procurement of reagents or infrastructure	4 %
Slow progress	14 %	Mental health	3 %
Career progression	13 %	Unsure	3 %
Not meeting project deliverables	9 %	Difficulties with collaborations	2 %
Staffing issues (e.g. recruitment or furlough)	7 %	Caring responsibilities	1 %
Require time extension for a specific project	7 %	More intense workload on return	1 %
Impact on education	6 %		

Table 3 Medium-long-term impact of COVID-19: responses

Q6. Roughly what percentage of your usual work are you currently able to complete? **(467 respondents)**

Q7. What permanent changes to your working life do you foresee making following the lockdowns associated with COVID-19? **(360 respondents)**

Theme	% of respondents	Theme	% of respondents
More remote working	36 %	Increase to online conferences	6 %
More meetings online	15 %	Concern for career progression	6 %
None	15 %	Considering moving away from research	6 %
Less travel for work	9 %	Concern for education	5 %
Funding – general landscape	8 %	Change in research focus	3 %
Increase to online teaching	8 %	General increase to the use of online technologies	3 %
Social distancing measures	8 %	More intense workload	3 %
Unsure	8 %	Other	3 %

Table 4 Permanent changes to working life following COVID-19: responses

The Biochemical Society champions the molecular biosciences by identifying and acting on key science policy issues. For any enquiries regarding this survey or the work of our Policy Network, please email policy@biochemistry.org.