

# What next for postdocs?

Postdoctoral researchers face substantial challenges and stresses that have been exacerbated by the COVID-19 pandemic. Positive action is needed from research institutions, funders and individual investigators to support postdocs and fortify the research endeavor.

In theory, a postdoctoral fellowship may sound like an ideal situation — a short-term, funded research position under the mentorship of an established investigator that offers the opportunity to learn new fields, expand and hone technical skills and develop one's own research ideas on the route to professional independence. However, the reality of the postdoc life is much harsher.

Even though, according to one survey, the majority of PhD graduates who undertook postdoctoral research did so aiming to secure a tenure-track faculty position<sup>1</sup>, a postdoc placement provides no such guarantee. Separate research indicates that even though the vast majority of research faculty have done postdoctoral work, the likelihood of securing a tenured or tenure-track position 10 years after obtaining a PhD was only 27.4% for PhDs awarded between 1980 and 2003 and dropped to 21% for those who graduated in 2001–2003 (ref. <sup>2</sup>). Although in recent years the industry has been absorbing a larger number of postdoctorally trained researchers<sup>2</sup>, many are left feeling professionally unmoored by their postdoctoral experience. A postdoc that would lead to an independent research position is in most cases synonymous with impactful first-author publications. As a result, securing postdoctoral funding and positions in prestigious institutes is very competitive, and the time constraints of fellowships and grants place high expectations and pressure to generate results in a limited amount of time. Those who would like to stay in academia but not as independent investigators have no clear career path, as their research experience rarely translates into more stable types of relevant employment, which leads many to abandon research.

Despite the time pressures that conducting research entails, the average postdoc lasts ~4 years (ref. <sup>2</sup>). Whether such positions can be considered 'short-term' is debatable, especially as for many people, their postdoc years coincide with major life decisions, including where to settle down and whether to start a family. Postdocs often struggle to reconcile professional and personal goals, a challenge that

is magnified by financial difficulties. Postdoc positions are not well paid, especially compared with positions in academia and industry<sup>2</sup>, and this includes large and expensive metropolitan areas. Although some universities and institutes provide subsidized accommodation and other benefits, such as childcare, this is not the norm. Instead, despite being an essential part of the research workforce, postdoctoral positions are not always formally recognized as employment but often fall into the 'trainee' category, a gray and precarious zone between being a student and being a full-time employee that affords fewer working rights and benefits. This is especially true in the USA, although countries with strong employment laws and social policies, such as the UK and members of the European Union, may provide better professional protection.

In addition, many PhD graduates are compelled to emigrate due to the limited postdoctoral research options in their home countries, or in search of higher quality training. The fact that their career prospects and important life decisions are tied to their immigrant status can be a source of constant anxiety, especially in recent times<sup>3</sup>.

Whittling down one of the most experienced, driven and productive group of researchers is a very counterproductive way to run the scientific enterprise. The inadequacy of the current system has been laid bare by the COVID-19 pandemic, which has magnified existing challenges and created substantial new ones. Lab closures forced researchers in many countries to stop all non-essential or non-COVID-19-related work, often for extended time periods, which meant that precious reagents and experiments had to be terminated at short notice and months of work were frequently lost. Although many labs have since re-opened, work is proceeding at a slower pace or with restrictions due to the implementation of necessary health and safety measures that include enhanced cleaning and disinfection procedures and working in a physically distanced manner or in shifts. The pandemic has also reduced the ability of many postdocs to work, due to increased family and caretaking responsibilities arising from school closures

and lack of childcare options, or because of the need to care for ailing relatives, something that unfortunately affects women more than men. Many postdocs are also facing their own health issues, whether caused by COVID-19 directly, or indirectly by its devastating impact on healthcare and by the exacerbation of mental health problems<sup>4</sup>.

Although some institutes and funders have offered support, such as by extending grant deadlines and postdoc salaries during lab closures, it is unclear how this financial burden will be borne, as these institutions are feeling the crunch of the ongoing major financial crisis<sup>5</sup>. Budget cuts are already signaling that the competition for funding will become even more vigorous. Those who do secure funds might have to extend their postdoc years beyond what they originally planned. Others might have to cut their postdoc short regardless of the stage of their project and look for professional opportunities elsewhere. Postdocs affected by border closures, travel bans and increasingly aggressive anti-immigration measures are particularly vulnerable in this context<sup>3</sup>.

The dire financial situation is also translating into broader hiring freezes, diminishing the career prospects of postdocs on the cusp of academic independence, who find themselves in a professional limbo, as they may need to leave their current positions without having the opportunity to test themselves in the academic job market. In cases in which interviewing and hiring continues, candidates' chances may be affected by traveling restrictions and the need to rapidly adapt to virtual job-hunting. The uneven global response to COVID-19, the uncertainty over how long the pandemic may last and the developing economic crisis set up the potential of a 'two-tiered' post-COVID-19 research landscape, in which the workforce of harder-hit regions will be at a financial and research disadvantage compared with countries that manage to control outbreaks more effectively and avoid lengthy lockdowns.

All the above add to the anxiety of postdocs about their future, as reflected in a recent worldwide survey conducted by *Nature*<sup>6</sup>. The majority of respondents

experienced more work-related anxiety and depression during the pandemic and felt impeded in their ability to work. They also felt more disconnected, as they found it more difficult to share their results or even discuss ideas with their supervisors. Competition for funding, lack of jobs and the economic impact of the pandemic featured high among the challenges postdocs identified for their career progression.

These feelings of uncertainty, anxiety and isolation are not unique to postdocs but are widespread across the workforce in 2020. However, postdocs are a vulnerable group that is particularly valuable for the scientific enterprise, and thus it is crucial to address their needs. It has been heartening to see many research institutes and individual investigators step up to the challenge. These efforts come across in the *Nature* survey<sup>6</sup>, with more than half of participants stating that they felt well supported by their PIs during the pandemic. However, it is rather concerning that one third of postdocs queried said they lacked the necessary support. This may reflect the fact that although some institutions rolled out well-coordinated, centralized plans and guidance to PIs for supporting lab personnel, in other places the response has been ad hoc and has depended largely on individual postdocs raising issues or individual PIs striving to support their teams. Moreover, the vast majority of

respondents noted that the duration of their postdoc had not changed, with only 10% reporting extensions to funding or postdoc contracts, which indicates that much work needs to be done to alleviate pressing stresses. Unfortunately, the financial problems of postdocs represent a Gordian knot, as even if universities, institutes and funders are willing to help, they currently face considerable economic challenges of their own.

Thus, it is important that postdocs themselves mobilize and be proactive. Nowadays, universities and research institutes typically have dedicated offices of postdoctoral affairs that can offer support and advice. In addition, there exist many independent postdoctoral associations, such as the [European Council of Doctoral Candidates and Junior Researchers](#), the [National Postdoctoral Association](#) in the US and the [UK Research Staff Association](#), that offer useful resources and fora through which postdocs can be heard. More formal representation can come in the form of postdoctoral unionization, a trend that has increased in the USA over the past decade, with the University of California postdoc union being the first to be established, in 2010, and that of Columbia University being the first to form at a private university, in 2018. A more informal but useful way to create support networks, build resilience, obtain advice and exchange information is to maximize digital connectivity through

virtual social groups, social media and networking at virtual conferences.

There are no easy solutions to the challenges that postdocs face. In looking for silver linings, perhaps for some postdocs who entered this arena as a perceived default next step after their PhD, this could be an opportunity to re-evaluate career options and seek different, more fulfilling and secure professional routes. For those dedicated to a research career, concerted efforts by all parties involved are needed to provide improvements in the short and longer term. For PIs, institutes and universities, this should be a wake-up call to come up with innovative solutions to ensure that the scientific enterprise avoids hemorrhaging talent in the form of bright but disillusioned postdocs. The dire times of the COVID-19 pandemic demand that stakeholders revisit the concept of postdoctoral training and act to support and protect early-career investigators — they are the future of research and their value cannot be underestimated. □

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