

OPINION

Gradually, then suddenly: the precarious position of UK preclinical neuroscience

The slow erosion of UK preclinical neuroscience means that it urgently needs support to secure its foundations.

A recurrent staple of news websites over the past decade has been dramatic pictures of sinkholes. These incongruous images usually feature an everyday scene – a suburban street, a football pitch – punctured by a large, gaping portal, swallowing up the surface world. They are undoubtedly strangely compelling. In part, this is because they challenge our sense of the foundational solidity of the ground around us, making us contemplate that processes out of sight, below the surface, might be slowly eroding the structures that keep things upright. Moreover, when a sinkhole collapse happens, it can be catastrophically sudden and without warning. As the author Dave Eggers writes in his children’s book *The Lifters*, in which some mysterious force is carving out tunnels beneath a town, “How can we walk, and run, and live and laugh, when we can't count on the ground beneath us”.

While walking, running, living and laughing might not obviously match the job specifications of most research scientists, the central importance of dependable foundations clearly applies just as much to research careers, both to facilitate imaginative research and to make the profession attractive to people. However, when I took on the role of representative for preclinical neuroscience for the British Neuroscience Association (BNA) in 2022, my sense was that I was representing a community that increasingly felt unsure that they could count on the ground beneath them.

This was borne out by a survey the BNA ran into the UK’s preclinical neuroscience environment, published in early 2025, which revealed widespread dissatisfaction with the current system and concern for its long-term sustainability.¹ While most respondents wished to continue in research, a concerningly large proportion expressed doubt about their ability to do so, highlighting funding insecurities, bureaucratic burdens, and uncertain career prospects as issues that are making it increasingly difficult for people at all levels to sustain meaningful research careers.

Where has this discontent arisen from? On top of the reverberating shocks caused by the COVID-19 crisis, and the increasing bureaucratic burdens that consume research time (an issue already highlighted in this journal²), one potential cause comes from recent changes in key parts of the UK's funding ecosystem and regulatory frameworks, which have had a particularly pronounced impact on scientists focusing on fundamental, curiosity-driven research questions.

In the UK, as in other parts of the world, funders have increasingly focused on projects seeking to directly address health and societal problems. The research community is challenged to aim for higher risk, ambitious goals, to be “distinct, disruptive ... and have the potential to prove transformative” (MRC Centres for Research Excellence, <https://www.ukri.org/who-we-are/mrc/centres-of-research-excellence/>), “pursue breakthroughs at the edge of the possible” (ARIA, <https://www.aria.org.uk>), “deliver significant shifts in understanding related to human life, health and wellbeing” (Wellcome Discovery Awards, <https://wellcome.org/research-funding/schemes/wellcome-discovery-awards>). Many of these awards also come with significant funding.

At one level, there is obvious logic to this; who among us would not like to achieve such advances? Neurological and psychiatric diseases are an enormous and increasing societal burden for which, despite many years of research, we still have few efficacious therapies. Moreover, many existing pharmacotherapies date back decades, and often were discovered through serendipity rather than targeted design. There is a compelling argument that a dose of innovation applied to research methods and funding models is just what the field needs to help incentivise ambition, new partnerships and novel approaches to address previously intractable problems.

Moreover, it might be an apposite moment to be pushing for such advances. There have been remarkable developments in recent years in the methodological tools available to interrogate and modulate brain function, allowing us to measure and manipulate neural activity with ever greater precision and scale. This not only enables researchers to construct increasingly sophisticated theories of how nervous systems support intelligent behaviour, but also provide potential directions and technical tools that may translate into therapeutic interventions. While the challenges of translation necessitate a strong dose of grounded caution over the speed and viability of many of these, there are sufficient examples of promising innovations – from gene therapies to neuroprosthetics – to justify genuine confidence in the substance of these aspirations.

Yet, in times when the research community is facing constrained funding and increased costs, the drawback of prioritising mission-driven, transformative projects is that this inevitably squeezes resources available for basic, curiosity-driven neuroscience research. Nearly three-quarters of those surveyed by the BNA cite insufficient funding, alongside 63% highlighting the rising costs of research, as major barriers to conducting such work in the UK.

Paradoxically, this issue is increasingly prominent in part because of the remarkable methodological advances in recent years. State-of-the-art equipment often comes with a significant price tag, both for the hardware itself and, just as importantly, for the multidisciplinary teams of skilled researchers required to generate and analyse the complex data. With university finances stretched and running costs rising rapidly, particularly for work using animals, even modest fluctuations in funding can mean that whole avenues of research come to a stop, in turn prompting institutions to consider withdrawing the costly infrastructure, such as animal facilities, required to sustain preclinical neuroscience.

The survey also highlighted a specific hurdle faced by preclinical neuroscientists endeavouring to sustain their research funding: over half of respondents reported uncertainty over which funding calls were even appropriate to support their projects. For instance, the two major UK government-funded research councils that fund such work – the Medical Research Council (MRC) and Biotechnology and Biological Research Council (BBSRC) – require that the research advances our knowledge, respectively, of disorders of the nervous system and of fundamental biology. Yet, a large body of neuroscience research sits squarely between basic investigations and directly clinically relevant questions. To take one example from my own work, is a project aimed at understanding the neural circuits supporting motivation and impulse control a fundamental biology question or, given that lack of motivation and impulse control problems are core transdiagnostic features of many neurological and neuropsychiatric conditions, one addressing disorders of the nervous system? In practice, whether a preclinical neuroscience proposal falls within remit often comes down to a subjective judgement call, with triage decisions frequently resulting in significant delays. A lack of alignment between the councils' application dates and processes in turn adds to the frustration.

Compounding these barriers is that the rhetoric around innovation and breakthroughs, and the perception of prioritising mission-driven neuroscience aimed at improving human wellbeing, risks impelling researchers to overstate the potential clinical relevance of inherently curiosity-driven investigations into how nervous systems work. One persuasive explanation for the

troubling disconnect between progress in understanding brain function and available treatments is that funding prioritises neatly packaged proposals emphasising translational potential over research that acknowledges the fundamental gaps in our understanding of the brain's essential functions and of the manifest complexity of clinical conditions (see Gu *et al.*³ for discussion of the merits of a “messy science” approach). This persists despite compelling evidence that many of the current most promising therapeutic prospects emerged not from directly solution-oriented research, but from years of meticulous basic discovery science coupled with a good dose of serendipity (see Marshall⁴ for several examples).

Most concerningly, the combined effect of all these pressures is to erode the notion of a research career as a viable and rewarding option. Reading the responses to the BNA survey, it is not hard to see why. At the junior end, people experience long years of training and yet still face persistent job insecurity and low salaries. And what awaits the lucky, determined few who make it into more permanent positions appears to be a continuous treadmill of funding applications to support their specialist teams and, for those doing animal work, the retention of valuable colonies, all of which needs to be fitted in alongside the other required roles such as teaching, reviewing, leadership, and (often the first casualty) thinking. In this environment, nearly 60% of respondents are finding it challenging to recruit and retain team members, despite over 70% of those surveyed reporting a desire to remain in preclinical neuroscience research.

These issues are becoming particularly acute for two reasons. First, as already discussed, we are in an era when the questions and available methods often require highly skilled, interdisciplinary teams working over sustained periods of time to address today's research questions. Yet, the traditional academic structures – PhD and post-doctoral training leading to an academic position on the one hand, and relatively short project-specific and equipment grants to support research on the other – do little to support retention of the key people with the expertise to drive research forwards. Many of us will know of examples of highly experienced and talented research scientists who ended up compelled to leave science simply as they could see no route to job security. While this is not a new phenomenon, it is particularly corrosive and wasteful at a time when research increasingly depends on teams of specialists whose expertise can take years to hone.

Second, these highly skilled people increasingly see a potential job market outside academia that values precisely the practical and analytical skill sets that most preclinical neuroscientists will naturally possess – and that is often willing to pay several times more to employ them.

While having a range of career pathways is undoubtedly beneficial for our trainees, this competitiveness ultimately risks depleting the academic research workforce. In spite of an acknowledgement of this issue by institutions and research funders, for instance through the Concordat to Support the Career Development of Researchers (<https://researcherdevelopmentconcordat.ac.uk/>), over three-quarters of respondents stated that they did not believe that their institutions or research funders were supporting the long-term retention of researchers working across preclinical neuroscience.

Individually, each issue described here might seem manageable – minor cracks that can be bypassed or patched over. Yet within the research community, these cracks are increasingly recognised as signs of something more alarming: the ground supporting basic and preclinical neuroscience is being hollowed out beneath the surface, and a gradual subsidence of resources and morale is already underway. The challenge for the community is to act before collapse becomes inevitable, by shoring up the foundations on which meticulous, curiosity-driven science depends.

There are innovative ideas for how to make this happen. In the BNA report¹, we outline ten practical steps that funders, institutions and government could take to do just this, spanning funding reform (such as streamlining and aligning funding calls and application processes), workforce support (developing a range of sustainable career paths, reviewing stipends, reforming visa systems), and regulatory changes to better support and reduce bureaucracy around essential animal work (see also Walton *et al.*⁵). There is also active consideration on how to design structures and funding models to incentivise creativity and ambition allied to scientific rigour. For instance, a recent report⁶ highlighted the value of flexible, longer-term funding, such as institutional block grants, for sustaining innovative basic research, and separate research has emphasised the importance of supporting smaller, agile teams that combine existing ideas in novel ways to foster discovery.⁷

It is not yet too late to repair what has been gradually eroded; the tools to do so are available. Yet, as the BNA survey shows, there must be concerted effort to rebuild a stable, sustainable and attractive environment for preclinical neuroscience. The research infrastructure must be reinforced for scientists to feel confident to pursue fundamental questions about how nervous systems operate in the world, even when the immediate application may be unknown.

Otherwise, if left unaddressed, the ground on which such discovery science rests could all too easily – and perhaps suddenly – give way, with profound consequences for scientific progress in the decades ahead.

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