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At the Royal Society "Research culture: Changing expectations" meeting

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This is a meeting about Research Culture – and this is an issue of fundamental importance to UK Research and Innovation. We need to be clear what we mean by Culture, it comprises social behaviours and associated norms. These can be codified by value systems.

First, the general values of the "liberal democracy" in which we live: respect for each other and for the rule of law, equality, diversity, and inclusion, tolerance, freedom of speech, personal autonomy. These are values our society operates in, and which research operates in.

Second, the values of research and society: openness, respect, curiosity and scepticism, rigorous methodology and enquiry, openness to challenge, reproducibility.

These are the shared values that we – funder, researcher, institution, entrepreneur – have a responsibility to uphold and they must form the core of our research culture.

So where do we find ourselves?

On the positive side of the balance sheet: we are world leader in many areas of research, effective innovators and widely respected. In a world with much more investment in research and investment in other countries we can't be complacent.

On the negative side, and in line with other global leaders in research and innovation, we have a hypercompetitive environment, characterised by: pressure to publish in prestige journals; rewards (such as promotion, prizes or academy fellowships) for awarded on basis of individual success rather than for team work (especially compared with industry); pressure to publicise the new and exciting at the expense of the overall state of knowledge and uncertainty, and insufficient focus on diversity and the full breadth of talent.

And too much bad behaviour including: non-reproducible findings from, for example, poor statistical knowledge and input, underpowered studies or data dredging; failure to share data; bullying and harassment; inadequate mentoring and career support (associated with a narrow view of what constitutes success).

All of these are interrelated, and we will need a 'systems engineering approach' to tackle them across our own (i.e. UKRI's) approaches to funding, to the researchers and innovators we employ directly and to our other staff generally. And we must pick-up on the findings and recommendations of the excellent report on research culture from the Nuffield Council of Bioethics, chaired by Ottoline Leyser.

We need to work with an interconnected network of participants in the research and innovation enterprise: first, researchers and innovators themselves; second, the organisations that employ them – universities, institutes, businesses and government; third, public and private funders; fourth, national academies and learned societies; and fifth, the outlets for research: journals and communications teams.

It is important to set out the principles for our own work – we should be rigorous and evidence based – and support "research on research and its culture". We will be collaborative in our working. We will aim to work through 'carrot' rather than 'stick' wherever possible – and in particular avoid the creation of perverse incentives that drive bad behaviours underground. We are working closely in consultation with our excellent Board on these matters.

We will not reinvent the wheel and it is important to acknowledge the work that has been done over the last few years on the topic of research culture. A few examples of many would be:

- the Royal Society report on Science as an open enterprise;
- the work I've just mentioned of Ottoline Leyser with the Nuffield Council of Bioethics;
- the Concordat on Research Integrity – and its update working with other funders, UUK and others;
- the work of UK Research Integrity Office (UKRIO);
- the work of the HoC Select Committee on Research Integrity
- and work internationally through the Global Research Council, and with the Department for International Development.

So where are we heading?

On EDI – equality, diversity and inclusion – I have asked Jennifer Rubin, Executive Chair of ESRC, to lead and champion work across UKRI on EDI – and we have appointed an External Advisory Group following an open competition.

On Diversity, we start with an abundance of evidence that the research and innovation community does not mirror the diversity in society at large at entry to university, particularly in some of the sciences, and the divergence increases at each stage of research and innovation careers.

Our Board is actively engaged in this challenge and has agreed that we will commission two evidence reviews that will shed light on the nature and scale of EDI challenges across the research and innovation communities in the UK and internationally, and also uncover the interventions and practices which have been shown to be effective, and those that are not.

The data on gender diversity are similar to those on ethnic diversity. The Athena Swan scheme has had important successes and is undergoing a review at the moment – and we are, and will continue, to work with Julia Buckingham and her colleagues, including David Sweeney from UKRI, who are conducting this review.

On bullying and harassment, the UKRI Board have agreed similarly that we will commission an evidence review to inform our approach to the prevention and handling of cases of bullying and harassment in the research and innovation sector.

We have a range of options available to deal with bullying in the community, including collaborating with other funders and stakeholders to highlight and share best practice, conducting advocacy and communications work to ensure that the organisations that we fund, who are the employers of researchers and innovators, have appropriate policies, processes and training in place.

We also have a range of hard levers that we can consider using. For instance, we can make it a condition of funding that strong policies for students and staff are in place – and audit these and their application. We can require disclosure of allegations at the point of grant application, and we can impose sanctions ranging from training in best practice for all staff through to the removal and possible reallocation of funding when our requirements are not met or allegations have been upheld.

We will have a strong distaste for confidentiality agreements that prevent legitimate transparency when there are good grounds for concern.

There is no excuse for poor process by employers who have a duty of care to all their employees.

And equally it is not acceptable for outcomes to be determined by "trial by Twitter", this conflicts with the fundamental values of respect for each other and rule of law.

The creation of UKRI provides an important opportunity for us to look across our nine councils to define and spread best practice. It is an opportunity to, without breaking what works well, consider all aspects of our investments to ensure that, as far as possible, we provide the support to researchers to give them the best opportunities to make discoveries and generate new knowledge; and to innovators to turn this knowledge into societal benefit.

People are at the heart of culture.

Starting with the people, our job is to identify and support talent by; providing sufficient time and financial resource to tackle hard problems; and ensuring that they work in an environment that contains the right infrastructure, is supportive, and provides appropriate training, development and opportunities at every career stage. The best environment will enable team working and facilitate collaboration.

We will only succeed if we engage the most talented researchers and innovators to help us in our peer review processes. Because that's how we ultimately make our choices – it's not UKRI that turns down grants, but 'you', the research community, as a group of peer reviewers and panelists.

We will only succeed if we work closely with others – and universities, institutes, business and government are our key partners, in the UK and in the rest of the world.

We need to work to identify and sweep away perverse incentives. The best culture is an open culture. Where research findings and the data and metadata behind these are made openly available. Where there is not inappropriate bias towards publication of robust positive results in comparison with robust negative results.

The name of the journal must not be used as a surrogate for the quality of the work. It is what has been discovered that matters, and how it is applied, not where it has been published! In the 21st century, technology offers powerful new tools for the dissemination and scrutiny of research and innovation. We are in the foothills of the opportunity to use and exploit these new tools. We are still very wedded to the traditional method of publishing a paper and need to harness new technology to disseminate research more effectively.

To conclude: the UK is a world leader in research and innovation and a positive, healthy, research culture is vital to help us maintain this position. We must protect and uphold the values that promote an environment for research and innovation that attracts, supports and develops all the talents – and an environment that undergoes continuous improvement.

To achieve this, we will adopt an evidence-led approach. We will be a world leader in analysis, understanding and continuous improvement. We will be robust in our monitoring and evaluation and will share guidance on what works – and what does not.

I am pleased to have had the opportunity to set out UKRI's early thoughts and actions. I am extremely pleased that this conference is being held at the Royal Society today and look forward to hearing the outcomes of the sessions throughout the day.

Thanks for your attention and I look forward to working with you all as we address the challenges and strengthen our culture for the benefit of all.