

THIS WEEK

EDITORIALS

WORLD VIEW Appeal of Donald Trump should shake scientists **p.7**

SPORT Ketone drink helps cyclists to push their physiology **p.8**



SALMON Wild fish swimming into farmed genetic trouble **p.8**

Ease pressure on PIs

Britain's Research Excellence Framework assessment needs to boost support for over-burdened principal investigators — a point missed in a review of the process.

Last week, a committee led by economist Nicholas Stern published recommendations on how to improve the United Kingdom's Research Excellence Framework (REF). Rightly, they support the principle and much of the practice of this periodic assessment of the research strengths of UK universities — which drives the allocation of universities' core funding. Although many academics resent having to submit their achievements every few years, the review concludes that the REF's substantial costs are greatly outweighed by its benefits.

Importantly, the recommendations seek to mitigate distortions introduced when institutions attempt to game the REF, for example by claiming credit for papers written by staff before they joined (see *Nature* <http://doi.org/bm9x>; 2016). They also support efficient documentation of the societal impacts of academic research.

But the report has not gone far enough on behalf of the linchpins of research: principal investigators. It has not recognized the threats to good science that arise from the overwhelming pressures now being placed on them.

The Stern review has made one very positive recommendation in that direction: it suggests that heads of academic departments and institutes could take the heat off their staff by no longer requiring each investigator to submit the same number of research outputs to the REF. For the next assessment, in a few years' time, departments would instead be required to submit only a certain number of outputs overall: some principal investigators might report more than average; some might even report none. A good institute head would balance their virtues on the basis of the long-term character of their research.

The motivation for this is clear when the review says that a priority

is to find “ways to ensure that the REF can encourage researchers to explore big or fundamental problems, in ways that may not deliver a steady stream of papers or a quick monograph; to deliver academically excellent synthesis of evidence and meta-analysis to support policy making; and to develop game changing ideas that, for example, can lead to the development of new disciplines, or that have significant impact outside their discipline”.

But the pressures on principal investigators arise not only from research accountability. Alas, researchers are merely human. They have finite bandwidths, and it is difficult to balance their duties when journals, funders and universities are rightly increasing their demands for better data management and sharing, better reproducibility, better mentoring of postdocs and graduate students, better teaching and broader stakeholder engagement. No wonder many of the best principal investigators are wilting under the stress, and even leaving academia. This is exacerbated when funding allocation is ultracompetitive.

The REF should attend to this when it assesses a department's research environment. Stern's recommendations would empower universities to strengthen research cultures. But institutions and funders should act directly to mitigate pressures on principal investigators, for example by supporting staff for data-management planning and sharing, crafting grant applications and administrative tasks. This would combat a creed that research money is best spent only on yet more postdocs.

The REF should help institutions to counter such instincts without compromising the creative autonomy of the principal investigators on whom they depend. The Stern review could and should have pushed harder in that direction. ■

Cyborg Olympics

The Olympic Games celebrate physical skill; the Cybathlon honours innovation in prosthetics.

What defines human physical excellence? Is it the pain, sweat and grit of elite athletes using every slight genetic advantage to perfect their bodies for competition? Or is human ingenuity also to be celebrated, particularly when science can allow disabled athletes — who are just as gritty and driven as their able-bodied counterparts — to compete on a level playing field?

The Olympics (see page 18) and Paralympics already struggle with this question. Now, into the debate comes a ‘cyborg Olympics’ that melds human and machine to create a new kind of athlete. In October, nearly 80 teams from 25 countries around the world will gather in Zurich, Switzerland, to compete in the Cybathlon (see page 20).

Each team is made up of engineers and scientists who have created a powered prosthesis for a disabled ‘pilot’ to use in one of six competitions. Electrical stimulation of paralysed leg muscles allows pilots with spinal-cord injuries to ride bikes. Other races use robotic prosthetic arms to complete tasks such as setting a dinner table, or track brain activity to race avatars on a screen.

What sets the Cybathlon apart from other sporting events is how it celebrates human technological achievement rather than just physical excellence. The Olympic Games strictly limit the technology that athletes can use, for instance requiring cyclists to ride bikes that adhere to tight standards. The Cybathlon, by contrast, limits the humans, requiring that its cyclists must not be able to move their legs without the help of artificial stimulation.

The goals of the two events are very different, of course. The Olympics is a competition for fans' entertainment and athletes' glory, whereas the Cybathlon is intended to kick-start innovation in prosthetics for real-world uses. And as technology and opportunities develop, they should also spark broader debate about human enhancement. ■