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Prove the worth of basic research

European agencies are backing fundamental science and working to prove that it pays off. Other national and international bodies should follow suit.

The happy accidents that come from blue-skies research are gold dust for scientists, and help them to push back against political demands for applied work. Who doesn't know by now that we have basic research to thank for the World Wide Web? Who hasn't heard that curious researchers trying to work out how bacteria biochemically tick stumbled on the CRISPR–Cas9 gene-editing techniques that have gone on to transform biotechnology?

Still, political support for a thriving fundamental research base cannot be taken for granted. So two unexpected — and quite different — moves announced this month are worth noting and celebrating.

On 15 July, the hard-nosed European Investment Bank, which lends with favourable terms to European Union member states to support EU policy objectives, gave a massive loan to Greece to start up an agency for basic research. This not only provides a much needed moral boost for Greece, which has had to live for years with the label 'credit-unworthy', but it also sends a crystal-clear message to politicians around the world on the clear importance of pure science to a secure economic future.

Then, at the biennial European Open Science Forum in Manchester, UK, on 26 July, European Research Council (ERC) president Jean-Pierre Bourguignon announced that the council will start to monitor the outcomes of the research it funds. The ERC, which was founded in 2007 and awards sought-after grants that confer immense prestige on recipients, aims to systematically build a body of evidence to demonstrate the value of pure research beyond well-celebrated examples such as those mentioned above.

In the past 18 months, the ERC has quietly carried out a pilot effort to evaluate 199 of its first completed projects. It did not take the easy option of just looking at bibliometrics. It wisely took the more informative but more difficult option of asking experts not to get hung up on numbers, but to make judgements based on their expertise. They had to grade the scientific success of each project and assess its impact on the world outside science.

The results? The ERC seems to be a resounding success. (Although most of the reviewers had worked with the council before and so can't be classed as wholly independent.) Almost three-quarters of the projects were judged to have generated a scientific breakthrough or major scientific advance, and one-quarter had — or might have in the future — an impact on the economy, society or policymaking. The exercise cost a mere €200,000 (US\$220,000), a tiny fraction of the ERC budget.

This is a very small qualitative study that has some flaws (see page 477), and the results cannot be extrapolated to the 6,000 or more grants, worth €9.8 billion, that the ERC has so far paid out. But the evaluation process is itself under constant review and many of its flaws should be ironed out in future rounds.

The results of the pilot will surprise few scientists, given the well-honed and widely admired selection procedures of the ERC. But as

the years go by, they will add up to a convincing portfolio to present to politicians, showing that ERC spending on basic research is not wasted — it usually leads to scientific success, which in turn often leads to positive outcomes for society.

This type of retrospective audit is rare. And it is perhaps surprising that national research agencies around the world do not do it. The DFG in Germany, for example, feels that its own selection processes are reliable enough not to require further proof of this type — but then, in Germany, basic research is unusually well protected from the vagaries of politics. The time may be ripe for a modest investment like the ERC's to be more widely applied.

“The struggle between politicians and fundamental researchers is eternal.”

The struggle between politicians and fundamental researchers is eternal, and understandably so. In democracies, politicians have to demonstrate to their electorates every five years or so that they have presided over serial successes and have not thrown away taxpayers' money on self-indulgent frippery. The scientific community has to find ways to continually show them that it is producing some of the successes. The strong endorsement of basic research by the European Investment Bank is a useful card that can be widely played to this end. And the ERC's example is one to follow: gather evidence for the worth of evidence-based arguments. ■

Cures for all

US lawmakers should give drug firms the confidence to test cancer therapies in children.

A cancer diagnosis is a shock, but adults with the disease can take some comfort in the numerous treatments available to them — both through clinical trials and as drugs that are already on the market. Children cannot. Because they make up only 1% of US patients with cancer, children are a low priority for pharmaceutical companies that want to launch an effective drug quickly. The hassle of a paediatric clinical trial may not seem worth it until after the drug has proved to be safe and effective in adults. This process can take decades, leaving children with therapies that are sometimes almost obsolete.

To access therapies early, parents of these children can turn to compassionate-use programmes, in which companies give experimental drugs to people who are in desperate need. In the United States, firms that agree to provide medicines in this way will ask the Food and Drug Authority for emergency permission, which is almost always granted.

This system, although helpful for some, is rife with complications.