

Science in the age of Trump

The steep cuts in science funding proposed in the 2018 US budget blueprint have raised alarm in scientific quarters, and signal the current administration's disregard for the significance of science and research in modern society.

For those hoping that President Trump's inauguration remarks that we stand "ready to unlock the mysteries of space, to free the earth from the miseries of disease, and to harness the energies, industries and technologies of tomorrow" heralded a pro-science turn for his administration, the release in March of the fiscal year (FY) 2018 US budget blueprint (<http://go.nature.com/2o1maG0>) was a harsh return to reality. The "America First" budget outline proposes sweeping cuts across federal science agencies, with a whopping 17.9% decrease in funding for the Department of Health and Human Services, and a 5.6% decrease for the Department of Energy. The National Institutes of Health (NIH) are threatened with a 20% cut of US\$5.8 billion, which would reduce spending power to below 2003 levels. Beyond decreasing fiscal support, the budget blueprint proposes a major reorganization of the NIH "to help focus resources on the highest priority research and training activities". Exactly what this might entail for the 27 Institutes and Centers of the NIH, each of which has its own focus and mission, remains nebulous.

If ratified, the reductions proposed in the President's FY 2018 budget blueprint would cripple biomedical research for years to come. In the already extremely competitive US research landscape, where federal funding represents the main support for many universities and institutes, reducing the availability of federal grants would lead to shrinking or closing of laboratories and departments, with established researchers struggling to maintain the same level of scientific output and talented young investigators unable to start or sustain their academic careers. The repercussions would supersede academia, as the inevitable slowing of biomedical discovery would reduce the potential of translating new advances into therapies, technologies, and tools to improve health and wellbeing, and would impact the growth of the biotechnology and pharmaceutical industries. At a time when rhetoric about achieving greatness is rampant in the political discourse, the irony of proposing to cede the United State's leading position in science and innovation by crippling federal research funding is striking.

Unsurprisingly, the budget proposal has met with fierce opposition from researchers, scientific organizations, and advocates. Science bodies including the Federation of American Societies for Experimental Biology, the American Society for Cell Biology, the American Society for Biochemistry and Molecular Biology, the American Association for Cancer Research (AACR), and the International Society for Stem Cell Research were quick to issue statements expressing grave concern over the proposed cuts and the stifling effect these would have for US research, urging Congress to reject them and to instead boost federal

investment in science. Advocates of research into specific diseases are also voicing their dismay. One such advocate gave an impassioned speech in support of cancer research at the AACR annual meeting in Washington DC in April. Having launched the Obama administration's Cancer Moonshot only last year, former Vice President Joe Biden addressed the AACR conferees acknowledging the complexity and multidisciplinary nature of cancer research, noting the progress the initiative has already achieved, and denouncing the proposed funding reductions that now threaten cancer research. "This is not the time to undercut progress — this is the time to double down." Biden said, pledging to continue to advocate for researchers, and for bipartisan cooperation.

Many note that biomedical research has traditionally enjoyed bipartisan support in the United States, making the congressional approval of these draconian cuts unlikely. Indeed, although federal science spending has stagnated in the United States for over a decade, with the NIH's capacity to fund research dropping by 22% between FY 2003 and 2015 (<http://go.nature.com/2ohggQG>), recent years have raised optimism. The year 2016 saw a US\$2 billion increase in NIH spending, and additional fiscal support came in December 2016 through the 21st Century Cures Act, when this same Congress voted to allocate US\$4.8 billion to NIH-driven biomedical research over the next 10 years. This bill gained strong congressional backing, and already politicians on both sides of the aisle are voicing their opposition to the current President's proposed cuts. Indeed, it is hard to envision that the government of a country that has traditionally fostered discovery, exploration and innovation, would deliver a blow of this magnitude to scientific endeavour, especially at a time when progress is rapid, and the benefit to society palpable. As an example, the cancer mortality rate has dropped in the United States by approximately 13% between 2003 and 2014 according to the National Cancer Institute's Surveillance, Epidemiology, and End Results Program (<http://go.nature.com/2nZzveO>), owing in part to the contributions of biomedical research to the prevention, diagnosis and treatment of the disease.

How Congress will act remains to be seen, but regardless of the outcome, the President's budget blueprint indicates an alarming disregard for the contribution of science in modern society and a lack of understanding of the need to nurture scientific endeavour. In a 1962 speech about the original moonshot, President Kennedy said "we set sail on this new sea because there is new knowledge to be gained". The Trump administration's stated intent to take the wind out of the sails of scientific enterprise must be vigorously opposed — now is the time to step beyond party lines, and speak up in defence of science.