

A Comment on H.R. 3293

John P. Holdren

February 9, 2016 (revised February 10)

In 1950, Congress passed the National Science Foundation Act to “promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and other purposes” by creating the National Science Foundation. The Act authorized and directed the Foundation to “initiate and support basic scientific research and programs to strengthen scientific research potential and science education programs at all levels in the mathematical, physical, medical, biological, social, and other sciences”. The 1950 Act also authorized and directed NSF to fund applied scientific and engineering research.

Plainly, the Congress recognized promotion of the progress of science, which is the aim of basic research, as a worthy goal in its own right, alongside the goals of advancing health, prosperity, welfare, the national defense, and other aims through applied research. And it is implicit in the fact that the Congress passed the 1950 Act with these purposes that it considered them all to be in the national interest.

Since that time, the science-and-engineering-peer-based, merit-review process that NSF developed as the basis for its funding decisions has become widely regarded as the gold standard for funding science and engineering research, both basic and applied, helping to make U.S. science the envy of the world. And today, to ensure that policymakers and the public can see what projects and programs are being funded by NSF with the taxpayers’ money, the Foundation publishes online the abstracts of every one of the more than 10,000 awards it makes every year.

Yet a bill under consideration in the U.S. House of Representatives—H.R. 3293, the “Scientific Research in the National Interest Act”—seeks to superimpose onto NSF’s current process of merit review and transparency the requirement that each NSF award “for basic research and education in the sciences” be accompanied by a public written justification describing how the award not only “promotes the progress of science in the United States” but is also “worthy of Federal funding” and “in the national interest”. This requirement is both unnecessary and potentially damaging.

It is unnecessary because its ostensible aims are already met by the existing process. According to the clear wording and intent of the 1950 Act, promoting the progress of science through basic research is in the national interest. And the NSF’s merit-review process is designed to, and does, determine which proposals for such research are most worthy of Federal funding. No further certification of national interest and worthiness is required beyond a proposal’s having survived the NSF’s merit-review process.

Illogically, moreover, most of the criteria offered by the bill for determining whether an award for basic research is in the national interest are not applicable to basic research at all—they relate to whether the research will increase economic competitiveness, increase health and welfare, strengthen the national defense, and so on, and, thus, they are applicable only to applied research. Is it possible that the drafters do not understand that basic research entails the pursuit of scientific understanding without anticipating any particular benefit?

History has shown, of course, that basic research often leads to results with immensely beneficial consequences for specific aspects of societal well-being, but it is precisely the character of such

research that these cannot be predicted and offered as an *a priori* justification for doing the research. Who would have initially predicted, for example, that genomic studies of nematode worms would lead to the discovery of genes that control cell death and, in turn, to new treatment possibilities for cancer and Alzheimer's Disease? Or that the quest to understand atomic physics would lead to the development of the atomic clocks that now enable the highly precise Global Positioning System (GPS) on which so many Americans rely?

By muddling the distinction between research aimed solely at promoting the advance of science, on the one hand, and applied research carried out with immediate practical benefits for societal well-being as the aim, on the other, H.R. 3293 would create doubt at NSF and in the research community about Congress's real intent in calling into question the adequacy of NSF's gold-standard merit-review process, for applied as well as for basic research. This could not only have a chilling effect on the total amount of basic research that scientists propose and that NSF chooses to fund, but it would also be likely to reduce the amount of high-risk/high-return research proposed and funded in both the basic and applied domains.

There is simply no good reason to place at risk, with this bill's attempt to fix what is not broken, the NSF's crucial role in maintaining this Nation's leadership in science, technology, and innovation alike. That is why the Administration has issued a [threat to veto](#) H.R. 3293 should it reach the President's desk.