An association of 63 leading public and private research universities

UNDERSTANDING PEER REVIEW OF SCIENTIFIC RESEARCH

Brandeis University
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California Institute of Technology
Carnegie Mellon University
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Cornell University
Duke University
Emory University
Georgia Institute of Technology
Harvard University
Indiana University
Iowa State University
The Johns Hopkins University
Massachusetts Institute of Technology
McGill University
Michigan State University
New York University
Northwestern University
The Ohio State University
The Pennsylvania State University
Princeton University
Purdue University
Rice University
Rutgers, The State University of New Jersey
Stanford University
Stony Brook University - State University of New York
Syracuse University
Texas A&M University
Tulane University
The University of Arizona
University at Buffalo, The State University of New York
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Diego
University of California, Santa Barbara
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The University of Iowa
The University of Kansas
University of Maryland, College Park
University of Michigan
University of Minnesota, Twin Cities
University of Missouri-Columbia
University of Nebraska-Lincoln
The University of North Carolina at Chapel Hill
University of Oregon
University of Pennsylvania
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University of Rochester
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University of Toronto
University of Virginia
University of Washington
The University of Wisconsin-Madison
Vanderbilt University
Washington University in St. Louis

Peer Review Ensures the Highest Quality Science

An important factor in the success of America's national research system is that federal funds for university-based research are awarded primarily through peer review, which uses panels of scientific experts, or "peers," to evaluate the quality of grant proposals. In this competitive process, proposals compete for resources based on their scientific and societal merits.

Peer review offers several important benefits to federal agencies, researchers, and the nation. The peer review process:

--Helps ensure that federal agencies support the best, leading-edge science;
--Helps agencies develop research priorities by revealing research trends and opportunities;
--Provides peer feedback to scientists to help them improve their projects; and
--Ensures public accountability by assuring that tax dollars are spent wisely.

Harnessing the Best Technical Expertise and Consideration of Societal Needs

The National Institutes of Health (NIH) and the National Science Foundation (NSF) offer two examples of how peer review works at the agency level. These two systems are similar to those used by all federal science agencies with competitively funded research programs. Both NIH and NSF assemble panels (sometimes called "study sections") of scientists chosen for their technical expertise in the research area being reviewed; these panel members are subject to conflict-of-interest and confidentiality-of-information policies aimed at ensuring an unbiased review process and restricting the use of privileged application information.

Serving on a panel is voluntary, unpaid service that scientists consider to be an important part of their contribution to the research enterprise.

Peer reviewers rank proposals based on the quality of the science, according to criteria specified by the funding agency. While NIH and NSF have slightly different specific criteria for review, the panels consider whether the research is significant and innovative, whether the approach is feasible, and whether the researcher submitting the grant is qualified to conduct the research. At NSF, peer review includes consideration of the broader impacts of the research. NIH uses a second level of review to judge the broader impacts of research proposals on health. This review is conducted by an Advisory Council composed of scientists and members of the public chosen for their expertise, interest, or activities in matters related to health and disease.

Through this process, agencies ensure that they give highest priority for funding to research projects that represent the best science, address societal needs, and achieve the agencies' missions.

Exceptions to Peer Review

There are some limited examples when a competitive, peer review process may not be the best mechanism for funding research. For example, the high-risk, interdisciplinary, and development oriented research funded by agencies such as the Defense Advanced Research Projects Agency or the Advanced Research Projects Agency-ENERGY may not be suited to typical peer review panels, which have technical expertise in a narrow area of science. There also are times when agencies award research funds for “inherently unique research" to a single performer or team of performers without competitive selection because of unique capabilities or concern for timeliness.

At other times, research funding is directed, or “earmarked,” by Congress in law or through congressional report language. Historically, for example, large portions of research funding provided by the Department of Agriculture have been awarded through the direction of Congress.

The research and development section of the FY03 federal budget contains a useful description (page 173) of the ways in which federal agencies allocate research funds.

Circumventing Peer Review Undermines Our Scientific Capacity

AAU respects the authority of Congress and its Members to set priorities for the investment of federal funds in areas of research and in other programs. Indeed, Congress plays a critical role in helping federal agencies identify broad priorities for research funding, as well as emerging research areas of national importance (such as bioterrorism or nanotechnology). The association is concerned, however, that the allocation of funds by Congress for specific research projects without involvement or review by the scientific community harms both quality assurance and the agency priority-setting process. For this reason, AAU historically has discouraged its member universities from seeking congressional earmarks to support scientific research projects on their campuses.

The association also believes that Congress should not seek to rescind monies for specific grants. As detailed above, the peer review system ensures that both the best scientific expertise and consideration of the ultimate impact of research are used in determining the wisest investment of federal dollars. This determination is made after long, detailed review. Picking and choosing individual grants as targets to be defunded threatens to weaken the integrity of the entire peer review system and damage the competitive scientific enterprise. Moreover, basic research that may seem wasteful or unimportant has often led to valuable scientific and technological advancements.

Additional information on how the peer review system operates is available at:

National Institutes of Health: http://grants.nih.gov/grants/peer_review_process.htm
National Science Foundation: http://www.nsf.gov/bfa/dias/policy/meritreview/index.jsp
Department of Energy’s Office of Science: http://www.er.doe.gov/grants/merit.asp

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