PROPOSAL PEER REVIEW: ENSURING FEDERAL SUPPORT OF HIGH-QUALITY STEM

In an increasingly globalized economic environment, federal support for basic research is the cornerstone of American leadership in science and technology. It drives U.S. economic growth, trains the next generation of scientists, and propels society forward. High quality science and engineering requires the review of experts throughout the process of establishing strategic directions, selection of hypothesis-driven research proposals, and the publication of findings. These experts are community-recognized individuals from the relevant science, technology, engineering, and mathematics (STEM) disciplines and adjacent fields of study.

Since World War II, an implicit partnership with distinct roles, has existed among government, industry, and the scientific and engineering community. U.S federal agencies contribute to this partnership when they award grants to members of the scientific research community. Federally funded research and development is typically research that cannot be accomplished within the mission space of industry but that often leads to new discoveries that provide new opportunities for industry, stimulating U.S. economic growth. Industrial partners also reach out to federally funded researchers to address problems and questions that help leapfrog their capabilities ahead of foreign competitors.

Agencies such as the National Science Foundation (NSF), the Department of Energy (DOE), the Department of Defense (DOD), and the National Institutes of Health (NIH), receive far more grant requests than they can accommodate with their budgets. Each agency uses a process called peer review to select the ideas that they fund. Peer review relies on the collective expertise of the scientific community to select research proposals with the highest merit. This process strikes a balance between awards that fund work that leads to steady progress and riskier investments that could lead to game-changing advances. An agency's peer review process may be tailored according to the agency's mission. Agencies and partners should collaborate as it is essential to promote high quality science.

At each federal funding agency, the scientific merit of research proposals is rigorously assessed by panels of fellow researchers who are intimately knowledgeable about the latest scientific developments. They come from federal agencies, industry, and academia, and have technical backgrounds with years of expertise.

In addition to finding the most scientifically meritorious proposals, certain agencies require researchers to evaluate the "broader impacts" of their research to the American public. Evaluating proposals on both intellectual merit and the potential for broader benefit to U.S. society increases the value of American research investments for all.

The public benefits most when research is determined by the scientific community to have technical merit. Every program involving public funding must have oversight, and any

The American Chemical Society (ACS) Board of Directors Committee on Public Affairs and Public Relations adopted this statement on behalf of the Society at the recommendation of the Committee on Chemistry and Public Affairs. ACS is a non-profit scientific and educational organization, chartered by Congress, with more than 230,000 chemical scientists and engineers as members. The world's largest scientific society, ACS advances the chemical enterprise, increases public awareness of chemistry, and brings its expertise to state and national matters.

management system can be improved; however, it is important to separate fiduciary oversight from scientific and technical evaluation.

Policy Recommendations

- The American Chemical Society (ACS) urges policymakers to support scientific peer review processes at federal agencies that:

- Evaluate research proposals based on intellectual and technical merit and the ability to advance science while also focusing on the well-being of our society;

- Draw on the collective experiences of the scientific community by engaging a variety of scientists with different expertise, organizational type, career stage, and demographics throughout the review process, including proposal review, grant management, and administrative and advisory roles;

- Provide reviewers with freedom from political interference in their assessments of the scientific merit of research proposals and approved grants;

- Incorporate ethics rules and training on addressing implicit bias to ensure objectivity, independence, and integrity in both the selection of reviewers and the reviewers' selection of ideas; and

- Encourage participation from the entire community of highly talented subject matter experts that may require a focused recruitment and training process

Additionally, ACS recommends that federal agencies and other stakeholders work together to:

- Periodically examine peer review systems to ensure their continued effectiveness for selecting, without bias, the most scientifically meritorious proposals;

- Implement methods to increase the funding rate while maintaining or increasing the size of the awards, and to enhance the processing time and overall efficiency of processing research proposal submissions; and

- Develop metrics to assess the effectiveness of the use of "broader impact" criteria in evaluating proposals.