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World Science Academies Release Report to Promote Research Integrity

AMSTERDAM, Netherlands, and TRIESTE, Italy — To encourage researchers around the world to adhere to universal science values and ethical behavior, a new report on responsible science has been issued by the InterAcademy Council and the IAP – the global network of science academies. The report is the first product of the IAC and IAP's project on scientific integrity, initiated in response to several major trends reshaping the research enterprise, including the increasingly global and interdisciplinary nature of science, its heightened role in policy debates, and the continued emergence of high-profile cases of irresponsible research behavior in many countries.

"Humanity has placed its trust in science to solve many of the world's toughest problems, and researchers must preserve that trust by working ethically and responsibly," said Indira Nath, co-chair of the authoring committee and emeritus professor at the National Institute of Pathology, New Delhi, India. "All researchers have an obligation to act in accord with the values and principles of research integrity."

The committee stressed that responsible conduct allows the self-correcting nature of research to operate effectively and accelerates the advance of knowledge. The committee also emphasized that while procedures and institutions to effectively investigate and punish irresponsible research are needed, mentoring and education efforts aimed at preventing irresponsible conduct are ultimately more important.

"Countries define and deal with irresponsible research practices in different ways, and some aspects of how research is conducted also vary widely among disciplines, countries, and cultures," said Ernst-Ludwig Winnacker, committee co-chair and secretary general of the Human Frontier Science Program, Strasbourg, France. "Nevertheless, global standards of behavior reflecting the universal values of research are not only possible, but necessary."

The committee said that it is not currently possible to authoritatively estimate how often irresponsible research practices occur, but it also noted that the incidence of irresponsible conduct is likely to rise with the growing amount of research being undertaken. More researchers are working worldwide than ever before, and global R&D expenditures almost doubled to \$1.3 trillion (U.S. dollars) between 1996 and 2009, reinforcing the need for new guidance. “With the growth of the research enterprise throughout the world and increasing multi-national research teams, this important report can serve as a catalyst for developing international consensus on responsible scientific conduct,” said IAC Co-Chair Robbert Dijkgraaf, director, Institute for Advanced Study, Princeton, New Jersey, U.S., and former president, Royal Netherlands Academy of Sciences.

The new report identifies fundamental values and principles that researchers should incorporate into every part of the process, from developing a research plan to reporting results and communicating with policymakers and the public. The principles identified build upon efforts of several organizations and conferences that have focused on conducting research responsibly. “As the worldwide research enterprise will have enormous economic and social impact, shared scientific core values are critical for public confidence in science,” added IAC Co-Chair Lu Yongxiang, vice president, Standing Committee of the National People’s Congress, China, and former president, Chinese Academy of Sciences.

The report's recommendations address several trends in research that are raising issues about proper conduct. For example, new technologies that enable more data-driven approaches to research have led to questions about how to allocate credit or share data properly. And the increasing globalization of research raises concerns about ensuring that all students and researchers in a collaborative project have shared values and common training. All research fields need globally common and regularly updated mechanisms to examine these issues and arrive at collective judgments about how best to handle them. In particular, potential problems that arise from international research collaborations, like intellectual property issues, need to be addressed beforehand.

Many kinds of irresponsible and undesirable practices are associated with publication of research results such as claiming or granting undeserved authorship or duplicating publication of material that readers expect to be original, a practice sometimes referred to as self-plagiarism. Both journals and authors should guard against this and refrain from citations designed only to boost a journal's impact factor, the report says. Journals have a special responsibility to protect research integrity and should not only issue corrections or retractions when they publish fraudulent papers, but also take steps to ensure that the papers do not continue to be cited. In addition, journals should use technological means, such as software that detects plagiarism, to maintain integrity.

Peer review -- or evaluation by experts prior to funding a grant proposal or prior to publishing research results -- is an important step for ensuring evidence supports claims, enhancing quality, and correcting errors. Researchers have a responsibility to participate in the review of proposals and not to abuse the trust on which the review process is based, the report says. And pre-publication reviewers need to assess publications fairly with full disclosure of conflicts of interest.

Because science is increasingly used to help form public policies, scientists need to communicate about their work clearly and comprehensively -- including clearly assessing the uncertainties associated with their results, the report says. At the same time, they need to avoid advocacy based on their authority as researchers, being careful to distinguish between their roles as scientists and as advocates.

The report also includes recommendations for public and private funding agencies, including that funding agencies should avoid policies that might put more weight on quantity over quality of research. Research institutions, with the support of funding agencies, should establish clear rules that define responsible research, provide training on responsible conduct, and establish mechanisms for addressing allegations of misconduct and the protection of whistleblowers. "Too often there is an overemphasis of quantity over quality in the reward systems for researchers, which can send the wrong message to young researchers," said IAP Co-Chair Howard Alper, chair, Canadian Science, Technology, and Innovation Council, and former president, Royal Society of Canada. "Funding agencies and research institutions should promote and reward excellence."

National academies should provide forceful leadership on issues related to responsible conduct in research, including establishing and disseminating standards, said the committee, which is being expanded to now develop international educational materials based on the report. The committee said that the ultimate goal of its project is to help the global research enterprise develop an ethical framework that applies to every individual and institution involved in research. "National scientific academies throughout the world can play a critical role in promoting the establishment and maintenance of standards of scientific integrity, and we look forward to new global and regional initiatives on behalf of the academies," stated IAP Co-Chair Mohamed H.A. Hassan, chair, Council, United Nations University, and former president, African Academy of Sciences.

The IAP is a global network of the world's science academies, launched in 1993. Its primary goal is to help member academies work together to advise citizens and public officials on the scientific aspects of critical global issues. The IAP Secretariat is hosted by TWAS - the academy of sciences for the developing world, and IAP activities are supported by the Government of Italy and by in-kind contributions of science academies worldwide. The InterAcademy Council, founded in 2000, mobilizes top scientists and engineers around the world to provide evidence-based advice to international bodies; its secretariat is hosted by the Royal Netherlands Academy of Arts and Sciences in Amsterdam.

The new report, Responsible Conduct in the Global Research Enterprise: A Policy Report, can be found on the IAP and IAC websites: www.interacademies.net and www.interacademycouncil.net.

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