# Step up for quality research

In response to calls for change from within and outside the scientific community, funding agencies, journals, and professional societies are developing new requirements to promote reproducibility and integrity in research. Amid this activity, the voices of academic institutions—both their leadership and rank-and-file faculty—have largely been quiet. Yet journals, societies, and funding agencies are not in the laboratory, clinic, or field. They do not analyze data, write manuscripts, or prepare figures. Institutions that comprise the global academic community can do more to help their researchers produce the highest-quality results. The three areas of actions, described below, echo points highlighted in the recent U.S. National Academies of Sciences, Engineering, and Medicine report, *Fostering Integrity in Research*, as well as at the 2017 World Conference on Research Integrity in May.

University leaders should better promote the critical importance of research quality. It is easy to focus on funding successes and high-profile publications as surrogates for quality. But all achievements—from receiving a grant to publication—must have a solid base of robust methods and clear reporting. Universities should publicly reinforce the value of research quality by identifying it as a criterion for appointments, promotions, and adjustments in compensation. They should provide resources to support this message at all staff and student levels, such as thorough training in experimental design and data analysis.

There is also a need for universities to raise awareness among researchers that reproducibility and research misconduct are real issues. They must overcome the common belief that "it can't happen here." Recently, Columbia University and five other New York research institutions took a small first step to address this by holding a symposium on these topics. The positive response and vigorous participation by panelists and attendees, who included faculty, trainees, journal editors, academic leaders, and government officials, reflected the academic community's hunger for substantive discussion of these issues. The symposium inspired other institutions to consider hosting similar events.

Universities must also strengthen their research integrity offices, review and improve research integrity training programs, and develop proactive programs to prevent research misconduct. Focusing on two areas—mentoring and data management—could go a long way toward preventing falsification and fabrication. Programs like the University of Wisconsin–Madison's research mentor training program, which was tested and found effective in 16 academic medical centers, should be adopted. Another model is Columbia University's Research and Data Integrity (ReaDI) Program, which provides researchers with hands-on support and resources for data management and reproducibility.



*"The university community must ask itself tough questions..."*

The university community must ask itself tough questions: What incentives may influence or impede research integrity and reduce research quality and reproducibility of results? How can the value of quality control activities in research be promoted? How should young scientists be taught to avoid pitfalls? What is the role of making data publicly accessible? And how can healthy skepticism of results that may be "too good to be true" be reinforced?

Approaching these questions at all levels and from all angles—from institution leadership meetings to student seminars on research methods—may not be glamorous work. But to not do so risks the reputation of the scientific enterprise. Academic institutions should not simply outsource to others—journals, funders, and professional societies—the work of ensuring that the foundation of science is solid and that results are valid.

In an era when "alternative facts" and "fake news" are increasingly prevalent, research universities are guardians of evidence-based analysis. Interpretations of sound data may be debatable, but if the data are questionable, then the opportunity to expand scientific knowledge and earn public trust has been squandered.

–**Naomi J. Schrag and G. Michael Purdy**

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# Science

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