

MICHIGAN STATE UNIVERSITY

<Date>

[Title] [name]
[address1]
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[city, state, zip]

Dear <Title> <Last Name>,

What are the exemplary character traits that scientists aspire to and value in their colleagues? What are the distinctive values that are part of the scientific mindset that scientists hope their best students will exemplify? What are the stories that they tell to try to highlight and pass on these character virtues and values in scientific mentoring relationships? *We write to ask your assistance in what will be the first national study to try to answer these questions by asking scientists themselves.*

Our study will interview 1000 American scientists whose research is in the basic natural sciences. To get a representative sample and to see whether scientific values have changed over time, half of these will be mid or late-career scientists who have been recognized as exemplary by their peers (Nobel laureates, members of the National Academy of Science, Fellows of the AAAS, and similar distinctions) and half will be early-career scientists. We hope you will allow us to interview you for this important investigation of scientific values.

Unlike previous surveys on science and ethics, this is not a study about scientific misconduct. There are no questions about politics, religion or any scientific controversy. Rather, it is an investigation of what scientists take to be the regulative *ideals* of scientific practice and how these are transmitted in the scientific community. We have attached a one-page summary of this study and several endorsements by other exemplary scientists.

We hope that you can spare about 30 minutes to answer a series of mostly open-ended questions that our respondents have found to be thought-provoking and stimulating. One of our graduate student interviewers will contact you by email in a few days to try to arrange a convenient time.

Sincerely,



Robert T. Pennock
Professor of Philosophy of Science & Computer Science
Michigan State University



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The Scientific Virtues:

A National Survey of the Ethical Perceptions of Scientific Leaders

Within the scientific community, the professional research values of working scientists, and especially the character virtues of the most exemplary scientists, become the foundation for the practice of scientific research in all fields. Professional ethical virtues affect the way that scientists think about each other and their work as well as non-scientific issues. But despite the importance of these values, there are many unanswered questions about them. What *are* the normative virtues that are taken to constitute the scientific character? Do all scientists share a common conception of scientific virtue or are there significant differences between disciplines? How are normative virtues transmitted and instilled by the scientific community?

We are particularly interested in the distinctive epistemic and ethical values of science. These are professional ideals of character and, derivatively, of conduct. This is not an abstract ideal but one with important consequences for responsible action. While we do not dismiss traditional principle-based ethics, we believe that there is much to be gained conceptually and practically by emphasizing the notion of moral *character* in its distinctive scientific sense.

Viewing science and virtue in this way will seem paradoxical to those who are used to thinking of science as being amoral or free of values. However, while there are certainly logical limits to what scientific methods can do by themselves regarding ethical questions, we believe that there is a deep ethical structure to science that is closely connected to its goals and methodology. We hypothesize that scientists do share a tacit conception of the virtues that constitute the ideals of the scientific character, but that they do not typically come to understand these by formal means. Rather, they primarily absorb these through mentoring relationships with senior scientists who pass them on by example or through anecdotes about other researchers who are seen as exemplifying one or another aspect of scientific virtue.

We developed and piloted tested a survey instrument which we will use to collect information from a representative sample of 1000 leading scientists about their views about science and virtue and their current thinking about the translation of these ethical values into research practices and their transmission to young scientists. Using the same sampling and measurement methods used to examine the attitudes and policy preferences of science leaders on other topics, we aim to provide an accurate summary of the current ethical thinking of scientific leaders individually and as a leadership group.

In addition to the general value of this information for understanding community norms and mechanisms of self-regulation, we expect that such information will provide a new model that will be of benefit for responsible conduct of research education and mentoring. Science leaders influence both the research agenda within their selected fields and provide the ethical foundation that defines acceptable and unacceptable research practices. Although there is a growing literature on many of the operational issues involving research integrity and scientific misconduct, there has been very little empirical research on the development, structure, and nature of the scientific character virtues and the professional ethical values that form the foundation of professional conduct and against which violations of ethical research practices are judged.

The knowledge gained from this survey will be of interest to professional scientists, sociologists, philosophers, and other scholars whose work touches on issues of science and its values. Scientific funding agencies, especially NIH and NSF, will be interested because of their involvement in funding and fostering research. We expect that the picture of the scientist that emerges from this study will also be of interest to the general public and that explicit attention to values will help researchers better communicate about science to non-scientists.

"As individual scientists, we have a sense of the values and character traits that make for an excellent researcher, but we have no information about how widely our personal perceptions of these values are shared across different scientific disciplines. This important study is the first to systematically investigate what character virtues the scientists themselves take to be essential for conducting exemplary science. Getting representative data about this issue will be very useful to the scientific community, so that we may better mentor and inspire future scientists."

Francisco J. Ayala

University Professor and Donald Bren Professor of Biological Sciences, University of California, Irvine

National Medal of Science; Member National Academies of Science, American Academy of Arts and Sciences, American Philosophical Society; Templeton Prize; President's Award, American Institute of Biological Sciences; AAAS Leadership Medal and Scientific Freedom and Responsibility Award.

"In the current tumultuous political and financial climate, the scientific community needs a better understanding of the values its members hold true. I encourage you to respond to this survey that speaks to the importance of scientific values and professional ethics."

- Alan I. Leshner

CEO of AAAS and executive publisher of *Science*

Member Institute of Medicine of the National Academies of Science, National Science Board Fellow of AAAS, the National Academy of Public Administration, the American Academy of Arts and Sciences

"I am glad to endorse this survey. Having participated in the meeting discussing the planning grant, I understand the background and the concepts of this project. I have been involved in technical studies for more than four decades. Unfortunately, all scientists and researchers do not demonstrate the same values. This survey will get at the underlying factors that both lead to sound practices and lessons that should be passed on to those being mentored."

- John F. Ahearne

Emeritus Executive Director, Sigma Xi: The Scientific Research Society

Member NAE, American Academy of Arts and Sciences

Fellow of American Physical Society, AAAS, Society for Risk Analysis