

PREFACE

Ethics and Responsible Conduct of Research within the Chemical Community. Ideas and Experiences Worth Sharing

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This open-access issue of *Accountability in Research* is intended to serve as a special resource.

There is little need to justify providing resources that can be useful in the instruction of scholarship in Responsible Conduct of Research (RCR) for readers of *Accountability in Research*. At present, there are no specific, detailed, line-by-line RCR requirements for institutions that apply for research grants from the U.S. National Science Foundation or the National Institutes of Health. Both NSF and NIH have implemented Section 7009 of the American Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act (42 U.S.C. 1862o-1) (Federal Register, 2009; National Institutes of Health (NIH), 2011). For example, “the Act requires that ‘each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral

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researchers participating in the proposed research project” (Federal Register, 2009).

For the past several years, I have given lectures on RCR at a number of academic institutions around the world, including RCR workshops in my own university. Sometimes, my lectures are part of the institution’s mandated RCR training program. Other times, I speak about my own research in RCR (House and Seeman, 2010; Seeman and House, 2010a,b) and history and sociology of chemistry as they relate to RCR (for example, see Seeman, 2007). While there are many valuable resources available for use in RCR educational programs, including a number of excellent texts (Beach, 1996; Committee on Assessing Integrity in Research Environments, 2002; Panel on Scientific Responsibility and the Conduct of Research, 1992; Panel on Scientific Responsibility and the Conduct of Research, 1993; Lock and Wells, 1996; Macrina, 2014; Resnik, 1998; Seebauer and Barry, 2001; Shamoo and Resnik, 2015; Steneck, 2007), there is only one that specifically focused on the chemical community—the book *The Ethical Chemist: Professionalism and Ethics in Science* (Kovac, 2004). More than coincidentally, this book was written by one of the authors of an article in this project.

My idea was to publish a single, permanently open-access issue of *Accountability in Research* with articles written by chemists and articles devoted to ethics and RCR in chemistry. However, the articles were also intended to provide meaning and useful information throughout the research communities. In addition to speaking to the most controversial areas of RCR (i.e., fabrication, falsification and plagiarism), the articles were to make clear that “RCR is simply good citizenship applied to professional life” (Steneck, 2007). True, this special issue of *Accountability in Research* was designed to serve as a resource in chemistry departments to meet the federally-mandated education in RCR referred to above. Nonetheless, the articles were to be of interest and value to the broadest range of readers, from the general public to government policy makers to those professionals who work in the fields of RCR and ethics.

I proposed this idea to Professor Adil E. Shamoo, Editor in Chief, who immediately and enthusiastically said “yes.” The Innovative Project Grant Program of the American Chemical Society approved my grant proposal to fund the issue’s open access feature. And a number of chemists agreed to and have provided their articles.

The articles in this special issue are:

“Ethics in Science: The Unique Consequences of Chemistry” by Jeffrey D. Kovac (Department of Chemistry, University of Tennessee)

“Tension in Chemistry and Its Contents” by Roald Hoffmann (Department of Chemistry and Chemical Biology, Cornell University)

“Authorship Issues and Conflict in the U.S. Academic Chemical Community,”
by Jeffrey I. Seeman (Department of Chemistry, University of Richmond)
and Mark C. House (Giant Steps Research, Gainesville, FL)

“Social Media, Peer Review, and Responsible Conduct of Research (RCR)
in Chemistry: Trends, Pitfalls, and Promises,” by Ashutosh S. Jogalekar
(Cambridge, MA)

“Ethics and the Responsible Conduct of Research in the Chemical Community:
The Unique Role and Challenges of the News Media” by William G. Schulz
(*Chemical & Engineering News*, American Chemical Society)

The titles and authors of these five articles illustrate another goal of the project: to obtain a wide diversity of subjects, written by authors who are themselves researchers and experts in the subjects covered.

I thank the authors for participating in this project and the Division of Professional Relations of the American Chemical Society (Dr. Joseph Stoner, Chair) for supporting the proposal and encouraging this project. Time will tell whether we—all the authors and many others who participated in the project, as well as the American Chemical Society—have provided a resource that is used by students of RCR and ethics within and outside the chemical community. We hope so.

REFERENCES

- Beach, D. 1996. *The responsible conduct of research*. Weinheim, Germany: VCH.
- Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002. *Integrity in scientific research: Creating an environment that promotes responsible conduct*. Washington, DC: National Academy of Sciences.
- Federal Register. 2009. National Science Foundation, Responsible Conduct of Research. Volume 74 (August 20), Number 160, pp 42126-42128, <http://www.gpo.gov/fdsys/pkg/FR-2009-08-20/html/E9-19930.htm>, (accessed June 5, 2015).
- House, M. C., and J. I. Seeman. 2010. Credit and authorship practices. Educational and environmental influences. *Account Research* 17: 223–256.
- Kovac, J. D. 2004. *The ethical chemist: Professionalism and ethics in science*. Upper Saddle River, NJ: Prentice Hall.
- Lock, S., and F. Wells, 1996. *Fraud and misconduct in medical research*. Plymouth, England: Latimer Trend.
- Macrina, F. L. 2014. *Scientific integrity*. 4th ed. Washington, DC: ASM Press.
- National Institutes of Health (NIH). 2011. Responsible conduct of research. <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-10-019.html> (accessed November 30, 2014).

- Panel on Scientific Responsibility and the Conduct of Research, Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. 1992. *Responsible Science, Ensuring the Integrity of the Research Process*. Vol. I. Washington, DC: National Academy Press.
- Panel on Scientific Responsibility and the Conduct of Research, Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. 1993. *Responsible Science, Ensuring the Integrity of the Research Process*. Vol. II. Washington, DC: National Academy Press.
- Resnik, D. B. 1998. *The ethics of science*. London, UK: Routledge.
- Seebauer, E. G., and R. L. Barry, ed. 2001. *Fundamentals of ethics for scientists and engineers*. New York and Oxford: Oxford University Press.
- Seeman, J. I. 2007. The Woodward-Doering/Rabe-Kindler total synthesis of quinine. *Angewandte Chemie International Edition* 46: 1378–1413.
- Seeman, J. I., and M. C. House. 2010a. Influences on authorship issues. An evaluation of giving credit. *Accountability in Research* 17: 146–169.
- Seeman, J. I., and M. C. House. 2010b. Influences on authorship issues. An evaluation of receiving, not receiving, and rejecting credit. *Accountability in Research* 17: 176–197.
- Shamoo, A. E., and D. B. Resnik. 2015. *Responsible conduct of research*. 3rd ed. New York, NY: Oxford University Press.
- Steneck, N. H. 2007. *Introduction to the responsible conduct of research*. Washington, DC: U.S. Department of Health and Human Services.