



Introductory Comments for the Scientific Ethics Theme

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Providing instruction in research integrity is an obligation, not an option. Many reasons give rise to this obligation. We will mention two: First, research must be performed and reported responsibly to achieve “good science,” i.e., research that is as accurate as possible at the time it is performed. In this way, a body of information is built up that the scientific community can trust and, thus, can use in the pursuit of new knowledge going forward. We firmly believe that this reason is sufficient in and of itself. The second reason is that funding agencies and research institutions require training in the responsible conduct of research (RCR) in an effort to insure that researchers’ understanding and practices are consistent with achieving good science. And severe penalties can be incurred when the ethical principles and regulations of research are not followed.

One might have thought such training would be unnecessary, that anyone involved in research would understand that RCR is an absolute necessity. Sadly, that has proven not to be the case. Over the past few decades, those who believed that misconduct was virtually non-existent in science have learned otherwise. And those who believed that the relevant tenets of responsible conduct of research were known or intuited by researchers in the absence of RCR education have learned that this assumption, too, was wrong.

This special section within the *Journal of Microbiology & Biology Education (JMBE)* contains a collection of essays by leaders in the field of RCR education and, more broadly, ethics education and research integrity. We have divided our collection of essays into five categories. The first set focuses on RCR education—who, what, where, when, by whom, and how to evaluate what has been accomplished. The second set broadens the topic to include ethics in

science education—the goal of the ethics mindset, practical skills underlying ethical behavior, cross-cultural challenges, and the importance of including philosophical perspectives. The third set of essays focuses on the research community and matters regarding scientific publishing, authorship, and conflict of interest. The fourth set offers several new perspectives about research integrity—rethinking research integrity in the context of conflict of interest and the institutional reward system, broadening research integrity to include social context, reframing research integrity in terms of behavioral economics, and exploring the value of rehabilitation. Finally, the last set of essays describes innovative ways to introduce ethics into medical education in particular, including discussion of new methods of assisted reproduction and personal genomics as case studies, and more generally across all of STEM education.

These divisions are only approximate; issues related to more than one of these sections frequently will be found in any given essay. Moreover, some topics are discussed in more than one essay, sometimes from different perspectives and not always in agreement with each other. We judge the redundancy and the disagreements to be part of the healthy dialogue we seek to stimulate.

When we reached out to potential authors less than three months ago, very few declined to contribute despite their busy schedules and the extremely short lead time. Our thanks to each of them. Our thanks also to Samantha Elliott, the Editor-in-Chief of *JMBE*, who first conceived of the special issue; to the *JMBE* staff, particularly Kelly Gull and Kari Wester; and to the *JMBE* publishers, the American Society for Microbiology. We hope that our collective efforts will prove useful in efforts to promote research integrity.

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