Special Symposium on Research Responsibility

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With support from the Office of Research Integrity (ORI), U.S. Department of Health and Human Services, the Council on Undergraduate Research held a special symposium on Research Responsibility at its 9th National Conference at Connecticut College. The National Institutes of Health and the Mellon Foundation also contributed support in the form of travel grants for faculty and administrators from minority-serving colleges.

A plenary session featuring Kay Fields, Public Health Service Fellow of ORI, and James Knoll, Head of Administrative Investigations of the NSF Office of Inspector General (OIG), kicked off the symposium. It is the role of these offices to respond to allegations of scientific misconduct that have occurred in the course of research supported by these agencies, and also to promote research integrity. Some of the issues that investigators should keep in mind, according to the speakers, are:

- Conflicts of interest;
- Funding of same items by more than one agency or grant;
- Proper disposition of program income; and
- Plagiarism.

Dr. Fields reminded the audience that institutions seeking PHS (Public Health Service) funding must have internal regulations concerning scientific misconduct and must inform the ORI of any internal investigation of misconduct and the outcome. She spoke of how her office can help investigators. In the past the ORI focused solely on the investigation of misconduct. Dr. Fields explained that the Office now also tries to aid researchers by providing guidelines on the keeping of lab notebooks and other aspects of sound laboratory practices, including providing a definition of scientific misconduct. Dr. Kroll encouraged the audience to invite representatives of the Office of Inspector General to visit their campuses to speak about research ethics. He suggested that a group of institutions in the same region could invite a representative to make a single trip to speak to faculty from several campuses.

In a workshop session that followed, the two plenary speakers focused in depth on the evolving federal definitions of scientific misconduct. Elements of the latest federal definition include fabrication, falsification, and plagiarism. The greatest change is the dropping of a clause citing "other significant deviations" from scientific practice. The consensus in the scientific community appeared to be that this clause was too vague. Many universities have their own internal definitions of scientific misconduct that include a larger number of specific infractions than the federal definition. Other significant deviations from accepted scientific practice may include abuse of the mentoring relationship. NSF adopted the new federal definition in April 2002, but NIH is still in the process of moving to the new definition.

Plagiarism in grant proposals is the most commonly reported offense of scientific conduct at NSF. NIH has dealt with a significant number of cases of fabrication/falsification (some of which have been highly publicized). However, over 80% of allegations of scientific misconduct are not borne out, so it is important that the allegations be kept confidential in early stages. Fields emphasized that when "whistle blowers" are involved and there is the issue of retribution for such actions, resolution in a timely manner is particularly important, and mediation often plays an important role.

Careful mentoring could help to avoid cases of scientific misconduct. Too much pressure on junior lab members to produce certain types of results, and/or requirements to meet unrealistic deadlines can cause data fabrication. High standards in the laboratory are a key to training both undergraduates and graduate students. Cases of undergraduate scientific misconduct are almost universally handled within the campus setting and do not reach NIH and NSF.

A Sampling of Other Research Responsibility Workshops

Administrative Compliance

CUR member Barbara Byrne led an important workshop on administrative compliance with federal policies and requirements. Her panel discussed OSHA laboratory standards and chemical hygiene plans as well as institutional review boards (IRBs) for human subjects research. In these areas, faculty and students must periodically take training courses. It is important to keep records of who has taken the training, and when. The trend is for training courses now to be offered online. Even the Coast Guard now has an online course for boating safety that is relevant for field courses that involve the use of boats. There are web site such as **www.irbforum.org** that can help administrators learn about requirements for OSHA and IRBS, and where they can ask questions of experts.

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Workshop participants were told that administrators often do not pay much attention to compliance issues until they hear about or are themselves involved in a legal case. Further, some administrators feel that to maintain the democratic process in the institution, the structure and protocols of the campus IRB should be voted upon by the faculty. However, it was emphasized that faculty approval should NOT be sought in setting up the IRBs - it is considered a conflict of interest for the faculty to establish the IRB rules under which they will work. IRB members should not be elected by faculty but appointed by the provost or similar academic officer; it was stressed that all IRB related decisions should be made outside the faculty governance process. Of course the faculty should be kept informed of the requirements and processes, but the IRB fall within administrative purview.

Social Impacts of Research

Kraig Steffen of Fairfield University reported to the *CUR Quarterly* on the session, "The Social Impact of Scientific Research," led by David Koetje of Calvin College and Ann Kleinschmidt of Allegheny College: "The session began with Dave explaining how discussion in his capstone courses often led to topics that have more to do with ethical and social implications of the use and/or abuse of new molecular biology techniques than with the science of these techniques. Alas, students noted that in the public arena such discussions tend to devolve into people yelling at each other… not listening to each other. How can scientists guide these discussions to foster true debate and searching?

'Ann brought up the challenge of students seeing far beyond the basic application of the tools to get a job done (insert a new gene from one organism into another for example) and brought up many worrisome questions about humanities rights and responsibilities. Who controls the technology? For what end? At what cost to other organisms?

'Dave emphasized his concern that a tendency to rely excessively on reductionism has led to less support among biotechnologists for approaches, such as evolutionary ecology, that emphasize systems level interactions and concentrate on emergent phenomena not apparent through investigations focusing on underlying layers of explanation. (Try talking to a condensed matter surface physicist as a chemist!)

'The audience was then given a series of published excerpts outlining some examples of the intersection of science, applied science, and problems that have risen from the abuse of scientific ideas or output. Each group was asked to write down some new ideas they found in their writings and evaluate the perspective of the authors. A very lively discussion ensued… some of the excerpts were quite polemical in their critique of science! Ranging from fundamental questions about Descartes and Reductionism to practical concerns about genetically modified foodstuffs, we soon found that 45 minutes was simply way too short of a time to consider these questions!

'Some take-home messages: Scientists must accept and embrace the challenge that even the most basic science will have social implications. We do not live in a vacuum, and we must always be aware of the possibility that people may misuse/abuse/exploit the work that is done in ways that may very well be considered unacceptable to a majority of humans. The dangers inherent here are much like those of any process that gives people access to power, whether it be a political faction, a religious order, or a potent new anti-bacterial drug. As with other human activities we must always strive for a balance between the individual and the group good, not to mention the good of the systems in which the human animal is embedded!"

Peer Review

Joyce Iutcovich of the American Sociological Association led a workshop on the Ethics of Peer Review, covering the functions of and expectations of peer review, the challenges associated with peer review and its ethical dimensions. The group discussed in detail a case study involving what to do when an editor had rejected a manuscript for publication and was later asked to serve as a reviewer of the author in a rank and tenure case. Information about this and other case studies related to peer review can be found on the CUR web site, **www.cur.org/conferences/responsiblility/resrespons.html**. All summaries of workshops in research responsibility that were received by CUR following the conference are posted at this web address, along with pre-conference materials.