COUNCIL OF CGS GRADUATE SCHOOLS

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SUBJECT: Responsible and Ethical Conduct of Research Requirement: Request for Comment

The Council of Graduate Schools applauds the National Science Foundation for its requirement that all graduate students and postdoctoral fellows, as well as undergraduate students, supported on NSF grant funds receive training in the responsible conduct of research (RCR). CGS also commends NSF for recognizing, in its emphasis on *institutions* as the locus of responsibility for this training, the pivotal role that institutions and institutional leadership must play in the oversight and effective implementation of these requirements. Based on our experience working directly with both institutional leaders and principal investigators, we believe that graduate institutions will rely strongly on a number of the important resources NSF is currently developing. One such resource is the publicly available, online digital library currently being planned. This database has the potential to ensure that principal investigators across all NSF-funded disciplines have a ready clearinghouse of resources at their fingertips as they develop optimal approaches to RCR training and education of students and postdocs.

The Council of Graduate Schools

The Council of Graduate Schools (CGS) is an organization of over 500 institutions of higher education in the United States and Canada engaged in graduate education, research, and the preparation of candidates for advanced degrees. Among U.S. institutions, CGS members award 95% of the doctoral degrees and 84% of the master's degrees. The organization's mission is to improve and advance graduate education, which it accomplishes through advocacy in the federal policy arena, research, and the development and dissemination of best practices.

CGS has worked closely since 2003 with graduate education leaders responsible for the oversight of the quality of graduate education at their institutions to develop institutional programs in RCR. An initial project supported by the Office of Research Integrity funded 10 universities to develop and evaluate RCR programs for graduate students; this project resulted in the 2006 publication *Graduate Education for the Responsible Conduct of Research (2006)*, with a discussion of the rationale for taking an institutional approach and six best practices in starting up RCR programs. A second project supported by the National Science Foundation EESE program funded 8 universities to develop and evaluate RCR programs in NSF-funded fields; this project resulted in *Best Practices for the Responsible Conduct of Research* (2009), which provided further ideas about how such institutional programs could be expanded to include NSF-funded fields and discussed how optimal approaches differ by institutional context (e.g. doctoral vs. master's-focused). Through a current project, The Project for Scholarly Integrity, and with support from ORI, CGS is working with seven universities to develop "comprehensive institutional approaches to RCR" that go beyond disparate, piecemeal workshops and small-scale curricular efforts. These projects integrate RCR into graduate education and evaluate those efforts via a shared, multi-level assessment strategy.

Graduate students comprise the pool of the nation's future researchers. It is important to emphasize the responsible and ethical conduct of research at this formative stage when they are establishing their identities as scholars. It is also important to recognize that some RCR issues for graduate students (e.g., in

the areas of authorship and the advisor-advisee relationship) may differ from those of other groups. Across the CGS RCR projects, the leadership of graduate deans has been essential to integrating these issues into RCR training in graduate education. Graduate deans have proven uniquely able to convene faculty and researchers from different fields and from different units on campus to develop broad resources and models for use by faculty across campus and (through CGS) by other universities.

Lessons Learned from the Project for Scholarly Integrity

The Role of Institutional Leaders and the Role of Principal Investigators

A year-long planning phase for the Project for Scholarly Integrity (PSI) determined that a comprehensive approach to institutionalizing RCR is needed because current efforts were all too often reaching small pockets of students or were minimally interactive, and thus had minimal impact on graduate student learning. Graduate schools leaders have served as agents of change to address these shortcomings, pioneering models to:

- raise awareness among faculty researchers and principal investigators of issues and curricular approaches,
- convene NSF (and NIH) PI's together with campus units (such as ethics centers) with particular expertise,
- promote the exchange of promising practices and resources between departments,
- draw faculty/PI attention to nationally available resources, and
- reinforce the importance of responsible and ethical conduct of research through incentives such as recognition and rewards for excellence in the training and oversight of students and postdocs on RCR and research ethics issues.

Our experience working with awardees and affiliates in CGS RCR programs as well as with the broader U.S. graduate community leads us to conclude that graduate deans already recognize the responsibility of their institutions on these issues but are looking for national resources to help them take the lead in assisting principal investigators. Graduate schools should be encouraged to work with NSF principal investigators to develop institutional plans that best take advantage of their institution's strengths and resources. The ability of institutional leaders to administer common institutional activity inventories and climate and learning assessments within the Project for Scholarly Integrity will contribute to the national dialogue about the effectiveness of the diverse activities that NSF's proposed implementation properly supports. We have learned from our experience thus far that graduate deans can be highly effective change agents because of their deep commitment to scholarly integrity and their sensitivity to the nuances of disciplinary differences that must be considered in implementing research integrity efforts.

Online Digital Library

NSF's proposed development of an online digital library with "research findings, pedagogical materials, and promising practices regarding the ethical and responsible conduct of research" will help meet the needs of principal investigators for a clearinghouse of available RCR and research ethics resources. Several national websites have already made some progress toward this goal. The Council of Graduate Schools Project for Scholarly Integrity website (www.scholarlyintegrity.org), for example, was developed to meet future needs of the graduate community with an emphasis on flexibility, expandability, and easy navigation of the best national resources and assessment strategies. Through this resource, institutional leaders and individual faculty can fashion their RCR and research ethics educational efforts, obtain instruments to measure their outcomes, and share their efforts with the broader graduate community. As described at the launch (February 2009), the website is to serve "as a tool for sharing ideas developed in these projects and as a clearinghouse of resources relevant to graduate deans and other university administrators, faculty, researchers, and graduate students. The resources on this site address curricular needs across a wide range of topics typically covered in responsible conduct of research (RCR) education and training. The site also addresses broad ethical issues, such as the ethical obligations of universities, as well as strategies for institutionalizing changes in the research environment." CGS and AAAS have agreed to migrate the content of the AAAS website (http://www.aaas.org/spp/sfrl/integrity/), co-sponsored by the National Academies of Science, onto the CGS website. AAAS requested this merger of content after reviewing the design of the CGS site and perceiving the broad target audiences of the site to extend across the science and engineering disciplines. We are currently in discussion with another national agency that has asked us to consider migrating their national repository of RCR resources.

Online resources are important, but in the final analysis the key elements are leadership and good models. Because institutions are the responsible parties in the proposed implementation, the online digital library should not only include curricular resources aimed at PI's but should also include resources for institutionalizing RCR programs for graduate students. CGS looks forward to any role that the PSI web resource can play in helping NSF achieve the goals of this requirement. We have learned from CGS RCR projects that in the absence of strong institutional leadership, the resources PI's are most likely to use to meet RCR requirements tend to be online modules with minimal time commitments and relatively little interactive functionality; more interactive solutions require institutional leadership if they are to be scaled up across the disciplines on campus.

Challenges of Implementation

A planning committee for the PSI project strongly recommended for the PSI website the language of "scholarly integrity" as encompassing the widest variety of disciplines and approaches (ranging from knowledge of professional standards to skills in ethical deliberation), since "ethical conduct" and "responsible conduct" may each require different sets of pedagogical responses and learning outcomes in the research setting. For some principal investigators, the responsible conduct of research may connote content and issues specific to NIH-funded fields only. "Ethics," on the other hand, may be perceived as requiring expertise that the PI lacks or additional content within an already busy curriculum. We have learned that by scanning available national resources and by pooling institutional resources to develop comprehensive, institutional programs and replicable models for the development of such programs, graduate education leaders can help overcome these challenges. Across the CGS RCR projects, graduate education leaders have been instrumental in integrating required RCR training of various forms into a variety of existing university mechanisms for recognizing student progress toward a graduate degree. In so doing, they have provided several institutional models for verifying that RCR training for students is in place. We have also learned in the CGS projects that graduate leaders can also provide and promote awareness of cross-disciplinary curricular resources so that principal investigators can focus on those skills specific to their disciplines.

Flexibility

A flexible approach is needed due to the different needs across disciplines and the diversity of US higher education institutions. The proposed NSF implementation is supportive of such a flexible approach and will help to ensure that activities adopted build upon current efforts already underway to develop innovative, effective, and efficient curricula and resources. We have learned in the first two CGS RCR projects, however, that the determination of evidence-based good practices in curricula, resource sharing, and institutionalization depends upon greater coordination of institution-wide activities, climate, and learning assessment efforts. We have built upon that lesson in the Project for Scholarly Integrity, where graduate schools are taking the lead in coordinating climate assessment, for example, using an instrument developed and validated by respected researchers in the field.

CGS looks forward to the additional enthusiasm and support for institutional approaches to integrating the responsible and ethical conduct of research into graduate education that will be generated by the NSF implementation. We are eager to assist NSF in addressing the role that institutional leaders can play in advancing the goals embodied in these new requirements.

Sincerely,

Debra W. Stewart
President

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