Macalester College
Responsible Conduct of Research Policy
(Effective January, 2011; Revised September 30, 2014)

In January 2010, the National Science Foundation (NSF) implemented a requirement that all undergraduate students, graduate students, and postdoctoral researchers who work on NSF-funded research receive training on the responsible conduct of research. Other federal agencies have also implemented such mandates (e.g., National Institute of Health). Macalester College must now provide assurance that a viable training program is in place and that all students conducting applicable research will receive suitable ethical training.

While Macalester is legally required to show RCR certification for some federal grants, training in research ethics is important for all Macalester students and several types of student research beyond those supported with federal funds will benefit from a systematic process of training.

To that effect, Macalester College requires that students engaged in the following types of research must be certified as having appropriate training in the responsible and ethical conduct of research:

- Student research supported by any externally funded grant and/or matching funds provided by Macalester College;

- Student summer research supported by Student Faculty Summer Research funds or department-administered funds;

- Student independent projects utilizing unit-level data provided by Institutional Research or the Assessment Office;

- Student independent research projects to be conducted while studying abroad.

In practice, RCR certification means that prior to beginning research work, all students participating in any of the above types of research projects must successfully complete the appropriate Collaborative Institutional Training Initiative (CITI) modules (https://www.citiprogram.org/) by scoring 85% or higher.

- The required CITI modules will include:

    o **For student research supported by externally funded grant and/or matching funds provided by Macalester College:**
        - Research Misconduct
        - Data Acquisition, Management, Sharing and Ownership
        - Publication Practices and Responsible Authorship
        - Peer Review
        - Mentor and Trainee Responsibilities
        - Conflicts of Interest and Commitment
        - Collaborative Research
        - Human Subjects
        - Using Animal Subjects in Research

- and any additional modules determined by the faculty member supervising the student research

- o **For student summer research supported by Student Faculty Summer Research funds or department-administered funds:**
  - Research Misconduct
  - Data Acquisition, Management, Sharing and Ownership
  - Publication Practices and Responsible Authorship
  - Peer Review
  - Mentor and Trainee Responsibilities
  - Conflicts of Interest and Commitment
  - Collaborative Research
  - and any additional modules determined by the faculty member supervising the student research

- o **For student independent projects utilizing unit-level data provided by Institutional Research or the Assessment Office:**
  - Research Misconduct
  - Data Acquisition, Management, Sharing and Ownership
  - Collaborative Research
  - Human Subjects
  - and any additional modules determined by the faculty member supervising the student research

- o **For student independent research projects to be conducted while studying abroad:**
  - Students in Research
  - International Research
  - and any additional modules determined by the faculty member sponsoring the research prior to a student's departure;

- A CITI completion record will be automatically sent to the Associate Dean of the Faculty, who will keep a record of all such documents in addition to communicating about and verifying compliance with the policy;

- Once students have received RCR certification through one of the above types of research, they will be considered certified for the modules that they have completed, with other modules being necessary if another type of research is undertaken that requires additional certification.

Students not on record as having successfully completed the requisite CITI modules for any of the above types of research projects will be disallowed from participating in research work associated with the project. Both the student and principal investigator will be notified by the Provost or Associate Dean of the Faculty of such a situation.

Note that the CITI modules provide the minimum training to augment discipline-specific training that must be provided by a faculty supervisor.

Responsible Conduct of Research CITI Modules

(Adapted in part from the University of South Carolina's Office of Research Compliance)

1.   Research Misconduct

Student researchers should be aware of the potential for misconduct involving themselves or others, and understand what constitutes misconduct. Misconduct in this regard is defined as: 1) fabrication or falsification of data, plagiarism, or other practices that seriously deviate from commonly accepted practices for proposing, conducting, or reporting research; 2) material failure to comply with requirements for protection of researchers, human subjects or the public, or for ensuring the welfare of laboratory animals; or 3) failure to meet other material professional standards or legal requirements governing research. This does not include honest error or honest differences in interpretations or judgments of data. The Macalester College community has an obligation to report incidents of misconduct and respond to such reports in accordance with established policies and procedures. Further, individuals reporting misconduct must be protected from reprisals or negative repercussions.

2.   Data Acquisition, Management, Sharing and Ownership

The integrity of research data and the usefulness of the research it supports depend on careful attention to detail, from initial planning through final publication. While different disciplines and types of research may differ in data management practices, there are generally accepted standards that student researchers should be aware of and adhere to relative to data ownership, data collection, data protection and data sharing. Key considerations for data collection include using the appropriate method, providing attention to detail, obtaining the appropriate permissions for use of certain categories of data and the accurate and secure recording of data. Data should be maintained and secured in such a way as allow it to confirm research findings, establish priority, and be reanalyzed by other researchers. Data should be stored in such a way as to protect confidentiality, be secure from physical and electronic damage and destruction and be maintained for the appropriate time frame dictated by funder and college policies.

3.   Publication Practices and Responsible Authorship

Researchers share the results of their works with colleagues and the public in a variety of ways. Early results are usually shared during research meetings, in seminars, and at professional meetings. Final results usually are communicated to others through scholarly articles and books. Whether structured or informal, responsible publication in research should ideally meet some minimum standards. All forms of publication should present: a full and fair description of the work undertaken; an accurate report of the results; and an honest and open assessment of the findings. In assessing the completeness of any publications, researchers should ask whether they have described: what they did (methods); what they discovered (results); and what they make of their discovery (discussion).

The names that appear at the beginning of a paper serve one important purpose. They let others know who conducted the research and should get credit for it. It is important to know

who conducted the research in case there are questions about methods, data, and the interpretation of results. The authors listed on papers should fairly and accurately represent the person or persons responsible for the work.

4.   Peer Review

Peer review, evaluation by colleagues with similar knowledge and experience, is an essential component of research and the self-regulation of professions. The average person does not have the knowledge and experience needed to assess the quality and importance of research; therefore, many important decisions about research depend on advice from peers, including: which projects to fund (grant reviews); which research findings to publish (manuscript reviews); which scholars to hire and promote (personnel reviews); and which research is reliable (literature reviews and expert testimony). The quality of the decisions made in each case depends heavily on the quality of peer review. Peer review can make or break professional careers and directly influence public policy. The fate of entire research programs, health initiatives, or environmental and safety regulations can rest on peer assessment of proposed or completed research projects. Researchers who serve as peer reviewers should be mindful of the public as well as the professional consequences of their evaluations and exercise special care when making these evaluations.

5.   Mentor and Trainee Responsibilities

While conducting investigations, researchers often assume the added role of mentor. The mentor-trainee relationship is complex and brings into play potential conflicts. The essential elements of a productive mentor-trainee relationship are difficult to codify into rules or guidelines, leaving most of the decisions about responsible mentoring to the individuals involved. Common sense suggests that good mentoring should begin with: a clear understanding of mutual responsibilities; a commitment to maintain a productive and supportive research environment; proper supervision and review; and an understanding that the main purpose of the relationship is to prepare trainees to become successful researchers. Knowing the importance of personal commitments, researchers should carefully consider what responsibilities they have to trainees before they take on the essential task of training new researchers. Trainees, in turn, should be we aware of their responsibilities to mentors before accepting a student researcher position.

6.   Conflicts of Interest and Commitment

Macalester College is committed to ensuring that the research, consultation, and other activities of faculty and non-faculty employees are conducted properly and consistently with the principles of openness, trust, and free inquiry that are fundamental to the autonomy and well-being of a college and with the responsible management of the college's business. Toward that end, each member of the Macalester community has an obligation to act in the best interests of the college, and must not allow outside activities or outside financial interests interfere with that obligation.

7. **Collaborative Research**

Researchers often collaborate with colleagues who have the expertise and/or resources needed to carry out a particular project. Collaborations vary from being as simple as one researcher sharing specific techniques with a colleague or as complex as multi-centered clinical trials that involve academic research centers, private hospitals, and for-profit companies studying thousands of patients in different geographic regions. Any project involving more than one person requires some collaboration. Collaborative projects require that researchers assume some additional responsibilities stemming from relationships with co-investigators, research associates and consultants involved in the research.

8. **Human Subjects**

In accordance with federal law, accepted ethical principles, and college policy, every Macalester investigator conducting human subject research, whether or not funded by a federal sponsor, must submit a proposed research plan to a college ethical review board. In addition, investigators who participate in human subject research must complete training in human subject research, and otherwise must comply with a college ethical review board's policies and procedures. Research may not begin until an ethical review board approves the research plan and all related consent documents.

9. **Using Animal Subjects in Research**

Macalester College recognizes that the use of laboratory animals for teaching and research is fundamental to advances in science and medicine, and is a privilege regulated by a variety of agencies. The college adheres to the PHS Policy on Humane Care and Use of Laboratory Animals; and follows the recommendations of The Guide for the Care and Use of Laboratory Animals (National Research Council). Macalester maintains an approved PHS Animal Welfare Assurance and full AAALAC accreditation. Work with live vertebrate animals may not begin until approval by the Institutional Animal Care and Use Committee (IACUC) is obtained.

10. **Students in Research**

Macalester College ensures that students conducting research projects that include human, animal, or plant subjects become familiar with basic concepts. A review of the history and principles of ethics for research, including a definition of research; students as researchers; the role and operations of institutional review boards (IRBs); and the issues related to students as subjects are provided, as well as a resource section.

11. **International Research**

Macalester College often sends students around the world to conduct research. Consequently, cognizance of applicable regulations and guidelines and the importance of the local context is important. Because international research may also include collaborating institutions, students must know information related to "engagement" in research. As well, students need to be able

to determine where research should be reviewed, exempt research, and informed consent considerations.