

What Every Researcher Should Know: The Responsible Conduct of Research Policy

Research Misconduct

- Research misconduct is a serious offense and punishments can be harsh. Research misconduct can easily destroy an otherwise promising career.
- Every university has its own definition of research misconduct that it must follow during a research misconduct investigation. However, most definitions are similar to (and include at minimum) the federal definition of research misconduct. ([ISU Research Misconduct Policy](#))

The Federal Definition of Research Misconduct:

“Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.”

- Fabrication: Making up data or results and recording or reporting them.
- Falsification: Manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
- Plagiarism: The appropriation of another person’s ideas, processes, results, or words without giving appropriate credit.
- Research misconduct does not include honest error or differences of opinion.
- A finding of research misconduct requires that:
 - There be a significant departure from accepted practices of the relevant research community;
 - The misconduct be committed intentionally, knowingly, or recklessly; and
 - The allegation be proven by a preponderance of the evidence.
- The rules against plagiarism, falsification, and fabrication hold at all times, whether in a manuscript, published paper, a poster given in any setting (even on campus), a grant proposal, a report to any entity (internal or external), a homework assignment, or a job application.
- Other questionable activities, such as giving courtesy or honorary authorship, do not constitute research misconduct, but they are considered unethical or simply unprofessional and engaging in them can seriously damage one’s professional reputation.
- It used to be that sloppiness or failing to keep adequate research notes was not considered research misconduct. However, federal regulations now allow for extremes of inadequate recordkeeping, to the point that data cannot be substantiated, to be considered misconduct.
- Repeated minor infractions of ethical norms usually don’t result in charges of research misconduct. However, they ruin reputations and cause scientists to become isolated and therefore less effective.
- Research misconduct, as defined by the federal government, does not encompass other acts, no matter how immoral, unethical, or illegal. For example, use of coercion to get persons to participate in human subject research violates federal regulations protecting human subjects, but is not considered research misconduct. Smuggling research materials is illegal, but is not considered research misconduct.

Plagiarism

- Plagiarism means using the ideas, processes, results, or words of other persons without making clear that items were “borrowed.”
- Plagiarism of words can occur in either writing or speaking, such as using another person’s speech without giving credit to the source.
- Citations give credit for ideas and information; they do not give credit for words or phrasing. Quotation marks, combined with citations, give credit for words and phrasing.
- It is also plagiarism to use images, graphs, tables, results, etc. from another person without giving adequate credit. You must indicate clearly the source of the items so that you do not appear to be taking credit for their creation.

Fabrication and Falsification

- Fabrication: Making up data or credentials.
- Falsification: Modifying data or credentials so that they no longer reflect the truth.
- Deletion or omission of data because it doesn’t fit one’s preconceived hypothesis is bad science and could constitute falsification.
- Listing a paper as submitted, in press, or published when it isn’t is fabrication of accomplishments and is a serious offense.

Reporting Suspected Research Misconduct

- All research universities are required by federal law to have a mechanism for handling allegations of research misconduct. In general, the person, known as the “Research Integrity Officer,” has a title such as Assistant/Associate Vice President or the equivalent. This is the best person to go to if you suspect research misconduct. ([Email Iowa State’s Research Integrity Officer](#))
- Note that the Research Integrity Officer is required by federal law to follow up on any complaints brought to his or her attention. Therefore, if you want to explore options, but are not sure that you want the Research Integrity Officer to investigate your complaint, be careful to discuss the issue only in general terms and to avoid giving specifics, such as names.
- Another option is to report the suspected misconduct anonymously on the [Iowa State University Compliance and Ethics Hotline](#).

Protection of Whistleblowers

- It is the responsibility of members of the scientific community to report suspected research misconduct. However, being a whistleblower can be difficult. Therefore, the federal government requires all universities to protect, to the extent possible, persons who, in good faith, make misconduct allegations. This includes keeping confidential the names of the persons making the allegations to the extent allowable by law and protecting the persons from attempted retribution. For example, a student who in good faith accuses his/her major professor of misconduct is generally given the option to transfer to a different major professor.
- Although protections extend to persons who report suspected misconduct in good faith, making unfounded allegations maliciously or frivolously may constitute academic misconduct. ([ISU](#))

Authorship

- Authorship disputes do not fit the definition of research misconduct. However, they are a major source of conflict among research collaborators.
- Having your name on a paper or grant proposal means that you are responsible for the contents of the paper or proposal, irrespective of whether that content brings credit or discredit to the authors.
- Putting a person's name on a paper implies that he or she has agreed to be responsible for its content. It is unethical to put a person's name on a paper without his or her permission.
- It is unethical to put a person's name on a paper if he or she did not contribute substantially to the scientific content of the paper. This is known as "courtesy authorship" or "honorary authorship." Situations that do NOT justify authorship include:
 - Providing a reagent (unless the reagent is unique, has not already been described in the literature, and its creation is described for the first time in the paper);
 - Serving as an administrator of the research unit (unless he or she is involved also in the scientific effort in a substantial way);
 - Providing routine services that do not require a deep understanding of the project, whether as a courtesy or for a fee. Examples include: editing, routine assays, use of a piece of equipment, and technical assistance.
- The meaning of the order of authorship varies among disciplines.
- It is wise to discuss the principles of authorship with your likely co-authors early in your collaboration to avoid misunderstandings. You should NOT decide before the research is complete who should be authors or what the order of authorship should be. However, you should discuss your views about possible scenarios such as: "If I contribute X and Y and you contribute W and Z, then the authorship might be [last name] A and [last name] B."
- When two or more investigators have collaborated on a project, each has the right to publish their own results. There is no rule that forces collaborators to publish together. Collaborators who no longer work well together each have the option to publish their own portions of the research separately.
- On a grant-funded project, it is the right and responsibility of the principal investigator to see that the results of the research are published in a timely manner. If there is a falling out between the principal investigator and an employee on the project, the principal investigator can publish the results without the employee. This is because persons paid to work on a project are considered "work for hire" and any results they produce belong to the project. However, the failure to include on a publication persons who made significant contributions can result in hard feelings and should be avoided whenever possible.

Recordkeeping

- The intellectual property contained in research records belongs to the university. For this reason, the principal investigator in the laboratory is expected to know where the records are at all times. Some non-federal funding sources may have rights to intellectual property in the research records as well, depending on their negotiated contracts with the university. The

federal government (such as the Department of Health and Human Services Office of Research Integrity) has the right to take the records for investigative purposes, irrespective of the funding source.

- Research notes should be kept for at least five years after the date of publication of the research results. Longer is better, especially if the data may have value in establishing patent rights. The federal Office of Research Integrity is currently recommending that all original data be kept for seven years after the publication of the research.

Sharing

- Once a paper describing a new reagent is published, the authors are expected to make the reagent available to other members of the scientific community to permit replication of the results and the furtherance of science. Failure to do so can hurt your reputation. Items often considered reagents include: plasmids, DNA probes, antibodies, new chemical compounds, enzyme preparations, transgenic lines, etc. The items should be available at reasonable cost in reasonable amounts; deposition of the items in a central repository is a convenient way to distribute the items at no cost to the author. The expectations for immediate sharing of reagents are less for items that are extremely valuable, such as mutants that took years to create. However, these should eventually be made available to the scientific community.
- Providing reagents is NOT a basis for authorship, unless the paper is the first description of the creation of the reagent.
- Once a paper describing a new computer program is published, the authors are expected to make the program available to the scientific community in a manner sufficient to replicate the results described in the paper.

Confidentiality

- It is unethical to share privileged information with persons not permitted to have that information. For example, the contents of grant proposals are privileged. You should not read a grant proposal if you do not have permission to do so from the funding agency.
- Most funding agencies require that the grants be destroyed when you are done reviewing them.
- Similarly, manuscripts that have not yet been published are considered confidential and should not be shared without the permission of the author(s) and/or journal editor. Sharing such manuscripts without permission is considered a breach of professional ethics.

Conflict of Interest

- Conflicts of interest refer to situations in which a person is in a position to influence decisions in ways that could lead to any form of personal gain for the individual or closely associated individuals, such as family members. ([ISU Conflicts of Interest and Commitment Policy](#))
- Many situations arise in which researchers must excuse themselves from involvement in decision-making processes due to real or perceived conflicts of interest. The most common situations occur during the review of grant proposals when a person with a close relationship (professional, personal, or financial) to an applicant is asked to review a grant proposal by that applicant. In these situations, it is important to excuse yourself from the decision-making

process. Most funding agencies have strict rules about conflicts of interest and will assist you in deciding if you have a conflict of interest and in avoiding that conflict of interest. If in doubt, ask!

- With the increasing emphasis of universities on economic development, more and more researchers are starting their own companies based on their university research. Although this activity is encouraged by many universities (including Iowa State), it brings with it conflict of interest issues. Universities manage conflicts of interest by the creation of Conflict of Interest Management Plans that specify how the entrepreneurial researcher will keep his or her company and university activities separate.
- The rules pertaining to conflicts of interest apply equally to relationships with for-profit entities, not-for-profit entities, and charitable foundations. For example, it is a conflict of interest for a researcher to accept a grant from a non-profit foundation in which he or she has a management role.
- It is also a conflict of interest to accept grant funds from an external entity for which one consults. Iowa Sen. Grassley has done intense investigation nationwide of conflicts of interests involving biomedical researchers who consult for pharmaceutical companies.
- If you think you may have a conflict of interest situation, the best thing to do is to disclose it to the appropriate office at your university. At Iowa State, disclose to the [Office of Research Integrity](#). Additionally, most universities require the annual online disclosure of situations that could be conflicts of interest. At Iowa State, this is currently done in AccessPlus.

Research Compliance and Permits

- Federal regulations that apply to research and the enforcement of those regulations have increased dramatically in recent years. These regulations apply to:
 - The acquisition, transport, possession, use and disposal of hazardous materials, including chemicals, radiation, and plant, animal and human pathogens;
 - The use of animals in research; and
 - Studies involving human subjects.
- Before initiating research in any of these areas it is essential to contact your [institutional assurance, compliance, and/or safety offices](#) to determine the regulations that govern your research. Failure to do so can result in loss of research data and funding. In certain circumstances it can result in fines and jail sentences.
- For research involving regulated activities, such as research with animals or humans, federal regulations prohibit the use of research data obtained without prior compliance approval.

Grantsmanship and Grants Management

- Sometimes, new faculty feel that their chances of getting a grant funded will be improved by adding a well-known investigator to their proposal. While this is sometimes true when the well-known investigator has a substantive role in the project, it is not true if their role is minimal. On the contrary, if the grant review panel perceives the role of the well-known investigator to be “honorary,” it could reduce the chances that the proposal will be funded. It could also make the new investigator ineligible for “new investigator” funds from the agency.
- Funding agencies generally have specific rules governing the expenditure of grant funds. Be sure that you understand those rules and that you carefully monitor how you spend your grant dollars. Audits of grant expenditures are increasing and misuse of grant funds can result in fines,

loss of funding, and, in some instances, criminal liability. Consult your department, college or university contracts and grants officer for help in understanding the rules specific to your grants.

- It is very important that you carefully read the “terms and conditions” on your grant or contract. Failure to follow the terms and conditions could result in loss of funding.

Protection of Intellectual Property

- Economic development through technology transfer is becoming increasingly important at major research institutions. Although the intellectual property generated in the course of employment at an institution generally belongs to the institution, benefit frequently accrues to the inventor (researcher).
 - For example, if an invention proves commercially valuable, the inventor will generally receive a portion of the royalties generated.
 - In addition, if the inventor wishes to start a company, some institutions, such as Iowa State University, will license the invention back to the inventor's company.
- To receive any of these benefits, however, researchers need to take special precautions throughout the life of the project to protect the intellectual property.
 - All notes related to the project should be dated and signed to help prove priority in the event of a dispute over who made the discovery first.
 - Researchers should also carefully read the fine print of any consulting contracts into which they enter; some consulting contracts can result in the unintended loss of intellectual property.
 - Most importantly, as the project proceeds, researchers need to be careful to avoid premature public disclosure of their discoveries that can result in the loss of patent rights. Examples of public disclosures include: publication, poster presentations, oral presentations, news releases, etc.
 - To patent a discovery in the U.S., a patent application must be filed **within one year of the first public disclosure**, offer for sale, or offer for commercial use.
 - To patent a discovery in most foreign countries, a patent application must be filed **prior to any public disclosure**, offer for sale or offer for commercial use.
- Most research institutions have [technology transfer offices](#) that can assist researchers in deciding whether a discovery has commercial value and/or is patentable. If the work is deemed patentable, the institution will also generally file a patent application at its own expense.

Professional Behavior

- Researchers pride themselves on their abilities to critique evidence. In fact, without these abilities, progress and discovery would be slowed. However, when criticism degrades to personal attacks or attempts to destroy other researchers' reputations, all parties, especially those doing the attacking, lose credibility and scholarship suffers.
- On the flip side, it is also considered unprofessional and immature to respond negatively to criticism, especially if that criticism was well-intentioned. It is not uncommon for new (and some seasoned) researchers to perceive criticism of their work as personal and irrational attacks, when the criticism was in fact intended to be helpful. Responding negatively to criticism, whether well-intentioned or not, hurts your reputation.

- Many people consider it unprofessional to volunteer negative information about a prospective employee unless they are specifically asked. That is, you should not call up employers and provide negative information about applicants. However, if an employer calls or writes you and asks for your evaluation of an applicant, you are expected to answer the employer's questions honestly.

For More Information

One of the best introductions to responsible research is: "[Introduction to the Responsible Conduct of Research](#)" by Nicholas Steneck.

Read an online version of "[On Being a Scientist.](#)"

The [federal Office of Research Integrity](#) has many excellent additional resources related to research integrity and the responsible conduct of research.