“The Responsible Scientist”
Responsible Conduct of Research

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The scientific enterprise is built on the foundation of trust
Ethical Values

Research is based on the same ethical values that apply in everyday life including:

- honesty
- fairness
- objectivity
- openness
- trustworthiness
- respect for others
“Scientific standard” refers to the application of these values in the context of research.

- **openness** in sharing research materials
- **fairness** in reviewing grant proposals
- **respect** for one’s colleagues and students
- **honesty** in reporting research results
Responsible Conduct of Research

Topics

- Advising and Mentoring
- Treatment and Sharing of Research Data and Results
- Mistakes and Negligence
- Research Integrity
- Collaborative Research
- Authorship and Publication
- Peer Review
- Competing Interests, Commitments and Values
Advising and Mentoring

The main role of an adviser or mentor is to help a researcher move along a productive and successful career trajectory.

- suggest a productive research direction; offer encouragement
- during a difficult period, help a beginning researcher gain credit for work accomplished; arrange a meeting that leads to a job offer
- offer continuing advice throughout a researcher’s career
Researchers can be exposed to:

- new ideas
- build a strong research program
- network of collaborators
- gain the friendship and respect of beginning researchers

Mentoring fosters a social cohesion in science that keeps the profession strong.
Researchers have an obligation to the public, to their profession, and to themselves to be as accurate and as careful as possible.

Scientific disciplines have developed methods and practices designed to minimize the possibility of mistakes, to show how researchers should collect, store, protect and share data; mindful of the need to maintain its integrity, validity and accuracy

Failing to observe these methods violates the standards of science.
Treatment and Sharing of Research Data and Results

Four considerations that apply to all data collection:

- Appropriate methods: reliable data = reliable methods
- Attention to detail: recorded, interpreted, and published
- Authorization: know when permission is needed
- Recording: document what is actually done and the results
Treatment and Sharing of Research Data and Results

Data Protection/Storage
To confirm research findings, establish priority or re-analysis

- Data Storage-protection from accidental damage, loss or theft
- Confidentiality-protection of collected information
- Period of retention-reasonable amount of time for usefulness as dictated by guidelines
Imagine what you are preparing to do will be reported the next day on the front page of the newspaper......

Research Misconduct

The most serious violations of standards have come to be known as “scientific misconduct.”

The U.S. government defines misconduct as “fabrication, falsification, or plagiarism (FFP) in proposing, performing, or reviewing research, or in reporting research results.”
Research Misconduct

**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 research is not accurately represented in the research record

**Plagiarism**-appropriation of another person’s ideas, processes, results, or words without giving appropriate credit
Mistakes and Negligence

- All scientific research is susceptible to error.

- Honest errors
  - Inability to identify reliable data in a mass of confusing and/or contradictory observations
  - Reliance on a theoretical or experimental technique not fully developed

- Negligence
  - Haste, carelessness, inattention-human factor
  - Reliance on peer review to replicate research
Test for Misconduct

Research Misconduct actions must:

- represent a significant departure from accepted practices
- have been committed intentionally, or knowingly, or recklessly
- be proven by a preponderance of evidence
Does not include:

* errors of judgment;
* errors in the recording, selection, or analysis of data; differences of opinions involving the interpretation of data;
* misconduct unrelated to the research process;
* criminal behavior, personal disputes, violations of grant management policies;
* behaviors not unique to research-discrimination or harassment

* Case Study- http://wn.com/research_misconduct
The effects of misconduct in terms of lost time, damaged reputations, and feelings of personal betrayal can be devastating.

Individuals, institutions, and even entire research fields can suffer grievous setbacks.

Acts of misconduct draw the attention of the media, policymakers, and the general public with negative consequences for all involved.

Example: http://ori.hhs.gov/TheLab/TheLab.shtml
Researchers increasingly work with colleagues who have the expertise and/or resources needed to carry our a particular project, whether in their own discipline or in other disciplines, at other institutions, and in other countries.
Research has no value if it is not made public
Results are shared to be tested, used to advance knowledge, and put to work

covers responsibilities researchers have when they share results with others through informal communications, oral presentations, scholarly publications, and public statement.
Elements of Responsible Publication

- **Abstracts** - summarize content in sufficient detail to allow other researchers to assess its relevance to their own work
- **Methods** - described in sufficient detail to allow other researchers to replicate them
- **Results** - reported in sufficient detail to allow other researchers to draw their own conclusion about the work
- **Discussion** - evaluate the significance of findings
Evaluation by colleagues with similar knowledge and experience

Peer Reviews must be:

Timely - meeting deadlines
Thorough - assessing quality
Free from personal bias - judging importance
Respectful of confidentiality
Peer Review Do’s and Don’ts

**Do’s**

- Treat the writer with courtesy and respect.
- Comment on the performance, not the person.
- Focus on how the argument is supported (or not), rather than whether you agree or disagree with it.
- Aim for balance and completeness in pointing out strengths and problem areas.
- Comment on specific examples of strengths and problem areas.
- Aim to help the writer see how to improve future work as well as the current draft.

**Don’ts**

- Use snippy marginal comments such as "So what?" or "What's your point?"
- Get into debates over unresolvable questions of individual value and belief (for example, questions relating to religion, gun control, or abortion).
- Argue with the writer. Raise objections or ask for explanations only to clarify and suggest ways of strengthening the argument.
- Confine your comments to mechanical details.
- Make vague, global comments.
- Rewrite for the writer.
Researchers have many interests (personal, intellectual, financial, and professional interests); interests sometimes clash.

The term “conflict of interest” or “COI” refers to situations in which financial or other personal consideration may compromise, have the potential for compromising, or have the appearance of compromising a researcher’s professional judgment.
Conflicts of Interest Examples

- A researcher who wants to start a company to commercialize research results generated in the laboratory might feel pressure to compromise the progress of students by having them work on company-related projects that are less related to their academic interests.

- A researcher might need to decide whether to publish a series of narrowly focused papers that would build the researcher’s record of publication but not help the field progress as quickly as would a single paper containing the researcher’s main conclusions.

- A researcher might have to decide whether to accept a grant to do routine work that will help the researcher financially, but may not help the researcher’s career or the careers of the students in the research group.
Researchers have to make difficult decisions:

- how to divide their time between research and other responsibilities
- how to serve their scientific disciplines
- how to respect their employer’s interests, mission, and values

Someone might have strong philosophical, religious, cultural, or political beliefs that could influence scientific judgments.

Conflicts between these commitments, values and beliefs can be a source of considerable strain and can cause career problems.
Competing Interests, Commitments and Values

- COI is not a reflection of character or integrity
- Institutions and Individuals have them
- A COI does not necessarily mean that you cannot do the project
- Need to be managed by:
  - transparency through disclosure;
  - oversight through monitoring and independent review;
  - disengagement
“It takes less time to do a thing right than it does to explain why you did it wrong.”

Henry Wadsworth Longfellow-American Poet & Educator
Resources

* This presentation was designed to give an introduction and overview of components for Responsible Conduct of Research.

* ORI Introduction to the Responsible Conduct of Research (N.H Steneck, 2003) http://ori.dhhs.gov/education/products/RCRintro/


* http://wn.com/research_misconduct - Univ. of Wisconsin

* http://ori.hhs.gov/TheLab/TheLab.shtml - ORI-The Lab
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