

Ethics in the Conduct of Research
How It Applies to You

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IPPCR – February 8, 2016

Scientific Integrity

All scientists should be committed to the responsible use of the process known as the scientific method to seek new knowledge.

All research staff in the Intramural Research Program should maintain exemplary standards of intellectual honesty in formulating, conducting and presenting research as befits the leadership role of the NIH.

Why is Scientific Integrity So Important?

The scientific community and the general public rightly expect adherence to exemplary standards of intellectual honesty in the formulation, conduct, and reporting of scientific research.

Without a high standard of *Scientific Integrity*, the scientific community and general public may become victims of *Research Misconduct*.

What is 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 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

Research misconduct does not include honest error or difference of opinion

Scientific collaborators cannot plagiarize from each other

Real-life Examples of Research Misconduct

An infamous case, in 2006, involved the Korean investigator Woo Suk Hwang who claimed to have created the first-ever human embryonic stem cell lines whose DNA matched that of patients, promising great breakthroughs for diseases.

Real-life Examples of Research Misconduct

This case involved questionable data management: 9 of 11 cell lines fabricated, images of cells were manipulated.

One result is that major journals are changing their review processes to incorporate analyses of images that are submitted for publication.

Real-life Examples of Research Misconduct

Breast Cancer Prevention Trial

A data coordinator falsified and fabricated the dates of tests and exams

Nat. Surgical Adjuvant Breast & Bowel Project

A data coordinator falsified and fabricated follow-up data

Why Does This Matter?

Inaccurate information regarding patient status and date of death could result in an over- or under-estimate of treatment benefits, especially when length of survival and length of disease-free survival are end-points

Real-life Examples of Research Misconduct

High Dose Chemotherapy for Breast Cancer

HSCT for metastatic breast cancer widely performed by mid 1990's.

5 randomized studies completed

4 negative

1 strikingly positive (CR 51% vs. 4%)

Bezwooda JCO 1995

Why Does This Matter?

HSCT is very costly both in terms of monetary amounts and side effects.

Treatment related mortality is significant

(10-20%)

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How is Research Misconduct Handled at the NIH?

Data Management

Why would someone manipulate data?

They want to make their data appear more convincing

Yes, improving the quality of the data is a common reason for data manipulation.

They need a specific result to support their hypothesis

It is not uncommon for scientists to be so convinced of their hypothesis that they manipulate data to make it fit their model.

Data Management, continued

They need the experiment to finish a manuscript

The pressure to finish a manuscript and submit for publication, especially if a lab is in stiff competition with another lab, may result in data manipulation since that is easier and faster than doing the actual experiments.

They had to give a talk the next day and did not have all the data

This could happen as an individual might want impressive data to convince an audience of the novelty of their results.

Research Misconduct Penalties

Remember:

If you are caught manipulating data, you could be barred for life from ever receiving government financial support for your research, or even be sentenced to jail.

Plagiarism

Duplication

Legitimate

Clinical Trial Updates

Meeting Proceedings

Errata

Illegitimate

Plagiarism

Co-submission

Plagiarism Detection

NIH Supported Database

Duplication

Authorship Questions

Is authorship appropriate if?

You wrote the paper

Yes, if you wrote the paper, you should be an author.

2. You grew the cells used in the study

No, if you merely provided cells used in the paper, this would not warrant authorship.

Answers: Authorship

3. You performed 1/2 of the experiments

Yes, if you performed half of the experiments, authorship would be warranted.

You identified and ordered the commercial supplies used in the project

No, if you merely helped find the reagents used, this would not warrant authorship.

5. Your girlfriend worked on the project

No, personal relationships do not warrant authorship.

Answers: Authorship, continued

6. You thought up the idea for the project

This is the most difficult question. If you conceived the basic hypothesis, authorship might be warranted. If you casually mentioned an idea in a hallway conversation, authorship might not be appropriate.

Remember: Authorship is a privilege, not a right, and you must have made a meaningful contribution to the manuscript to earn it.

Summary

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The ethical conduct of science is your personal responsibility

You must not commit falsification or fabrication of data or plagiarize the work of others

Performing scientific research as a career is a privilege. By performing it in an ethical manner, you will maintain the highest standards of scientific integrity.