

Scientific Misconduct & Integrity

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1

What is scientific misconduct?

Misconduct in science refers to infractions such as fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within scientific community for proposing, conducting, or reporting research.

Misconduct does not include:

- Honest error
- Differences in interpretations or judgment of data
- Other misconduct (sexual, financial)

Misconduct is established when there is **intention to mislead and defraud**

(The US Public Health Service, 1989)

2

Some classical examples of misconduct

- **Fabrication.** This is the presentation of data that do not exist or presentation of data that was “cooked up”
- **Falsification.** This is a deliberate change or misreporting of data.
- **Plagiarism.** Using the ideas or words of another person without giving appropriate credit.
- **Withholding or delaying the publication of research results for financial reasons.**

3

Examples of misconduct in publication

- Complimentary or gift authorship
- Submission of paper with sections lifted from other papers without acknowledgements
- Resubmission of previously published data with minor alterations and no acknowledgements
- Lecturer submits paper with figures from students dissertation without students' permission
- Lecturer writes paper with data derived from students' dissertation without citing students as a co-author

4

Requirements for authorship

- Substantial participation in:
 - ✓ The design, including writing of the proposal, of the study
 - ✓ Data collection
 - ✓ Analysis & interpretation of data
 - ✓ Drafting, revision and approval of a manuscript to enable author take public responsibility for contents

5

Scientific Integrity

- Integrity refers to the ability of a professional to maintain **honesty or truthfulness** in performing responsibilities to clients and colleagues
- Scientific integrity refers to the ability of a scientist to perform his/her professional duties with honesty and truthfulness
- Scientific integrity is the **anti-thesis** or **direct opposite** of scientific misconduct including **fabrication, falsification, and plagiarism**

6

How is integrity developed?

- Initial & continue education
- Development of policies on integrity by institutions where researchers are employed
- Mentoring & role modelling
- Guidelines by regulating agencies
- Good conscience

7

Integrity matters in all phases of research

- Prior to commencement of study (Obtain ethical approval from an Ethics Review Committee; acknowledge sources of ideas)
- Collection of data (1) (don't fabricate)
- Collection of data (2) (receive valid informed consent, maintain privacy)
- Management & storage of data (maintain confidentiality; don't falsify)
- Publication of findings (include as authors those who deserve it; don't plagiarize)
- Correction of errors (admit errors)

8

Integrity in disseminating research findings

- Present data as collected
- Be objective in data presentation
- Include as authors only those who deserve to be authors
- Acknowledge contribution of others
 - Co-authors of paper
 - Cite others in references
 - Appreciation of those who assisted with data collection including **Research Assistants** & **Reviewers** of the manuscript

9

Characteristics of responsible conduct in research

- Integrity in conceiving, conducting, analyzing, & reporting research findings
- Accuracy in representing contributions of others
- Fairness in peer review of manuscript (objectivity and promptness)
- Disclosure in reporting conflicts of interests
- Protection of safety of human participants with respect to minimizing harm and guarantee of confidentiality of data

10

Causes of Misconduct

- Intense competition among scientists due to limited funding
- Pressure to succeed (publish or perish)
- Growing number of industry-funded health research (increasing chance of conflict of interests)
- Context of impunity of corruption

11

Consequences of misconduct

Fabrication & Falsification of data

- Hinder scientific progress & development
- Unjustified career advancement
- Removes incentives for hard work
- Public perception that scientists are rogues
- Ruin career and reputation of scientists

Plagiarism

- Misallocation of credit for scholarship
- Integrity & character of scientist questioned if detected

12

Mechanism for detection & prevention of misconduct

- Initial and continuing education of scientists
- Personal integrity
- Peer review
- Replication of studies (but large long term studies are difficult to reproduce; limited funds for duplicative studies)
- Formulation of guidelines, rules and recommendations for good scientific practice
- Use of software to detect plagiarized materials (Turnitin)
- Good role modeling
- Disclosure of potential conflicts of interests

13

Requirements for successful career as a researcher

- Inquisitive mind
- Challenge existing norms
- Team spirit
- Integrity
- Fairness in review of work of peers
- Ability to give and receive criticism without taking it personal
- Self improvement through initial & continuing education
- Excellent communication skills

14

Appreciation

