Responsible Conduct of Research

(or, how to keep from destroying your career before it gets started)

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Sources

- A. Shamoo and D. Resnick, “Responsible Conduct of Research”. Oxford University Press, New York (2003)
- “On Being a Scientist: Responsible Conduct in Research”, 2nd ed. National Academy Press, Washington, DC (1995)
- F. Macrina, “Scientific Integrity”, ASM Press, Washington, DC, 4th ed. (2014)
- “Fostering Integrity in Research”, The National Academies Press, Washington, DC (2017)

Scientific Research Takes Place Within a Variety of Contexts

- ☐ Social
- ☐ Political
- ☐ Economic
- ☐ Cultural
- ☐ Religious

in addition to the scientific ones.

All influence research goals, resources and practices.

Consider:

Climate Change

- Temperature rise
- Air/water quality
- Land loss
- Forest fires
- Petrochemical combustion
  - Oil/gas exploration
  - Fracking
  - Deep water drilling (DWH)
- Emissions controls
- Coal-fired industrial processes
- Methane & CO_2
- Epidemics/Pandemics

Population growth and available resources

- Efficient use of land/water
- Meat
  - Acreage
  - Methane
  - Negative effects on human health
- Sustainable agriculture
- Sewage/waste disposal

Family planning

- Sex education
- Birth control
- Abortion
- STDs/Vaccines
- Medical care

Scientific (Mis) Conduct

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In 2000, the OSTP at the White House proposed the following definitions of scientific misconduct:

Falsification—

- manipulating research materials, equipment or processes OR
- changing or omitting data or results such that the research is not adequately represented in the research record.

Fabrication—

- making up data or results and recording or reporting them.

Plagiarism—

- appropriation of another person's ideas, processes, results or WORDS without providing attribution.

(Shamoo & Resnick)

Scientific Misconduct (cont.)

- or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting or reporting research.

- Scientific misconduct does not include
  - honest error or
  - honest differences in interpretations
  - or judgments of data (Code 7, Fed. Reg. (1989)

Scientific Misconduct does NOT include:

- ☐ Ownership of data including
- ☐ Authorship disputes
- ☐ Methodology claims
- ☐ Sexual harassment
- ☐ Careless (i.e., not intended or malicious) mistakes

Misconduct does NOT include:

Poor scientific practices, including, but not limited to:

- Incompetence
- Breach of confidentiality
- Misuse of privileged information
- Criminal activities

Problems associated with experiments involving animal use and human subjects are not directly part of official misconduct, although serious violations are dealt with by other federal agencies.

Scientific Misconduct (and its implications)

- Over the last 40+ years—
  - # of highly publicized reports of scientific misconduct
    - Summerlin/Good (transplant rejection)
    - Burt (twins & inherited IQ studies)
    - Darsee/Braunwald (drugs for myocardial ischemia)
    - Imanishi-Kari/Baltimore (Abs in mice)
    - Wakefield (vaccine threats to health)
    - Hwang, Kim, Schatten (stem cells)
    - He & Moon (faked e-mail addresses)
    - Obokata, Sasai, Vacanti (stress→stem cells)

- **What are some of the factors that can lead to misconduct?**
- A sense of entitlement from an early age
- Not being taught that losing is a part of life (e.g., all players get trophies)
- Grade inflation
- Standards and limits either are not set or are not enforced
- Success pushed at all costs
- Non-uniform standards (including cultural differences)
- Everyone else is doing it
- General inattentiveness, cluelessness, carelessness
- NB: All of the above are due to failures by parents, coaches, mentors, teachers, administrators, in addition to the perpetrators.
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