Why should scientists be trustworthy?

• Public, government and philanthropic agencies have high ethical expectations
• Potential to harm animal and human subjects
• Direct impact on human health
• Scientists have mutual interdependency
Retractions on the Rise

PubMed Retraction Notices - By Year

-Neil Saunders
Research Misconduct

- **Fabrication** - making up data or results

- **Falsification** - inaccurate representation of the results by changing or omitting data, by manipulating research materials, equipment or processes

- **Plagiarism** - appropriation of someone else’s ideas, results or words without giving appropriate credit

… in proposing, performing, reviewing research, or in reporting research results

- committed intentionally, knowingly or recklessly

- **DOES NOT** include honest error, conflicting data, differences of opinion, or differences in interpretations or judgments about data or experimental design.
Are You Authorized To Collect Data?

• Human subjects:
  – CITI training, IRB submission or addition

• Animal subjects:
  – IACUC approval, vivarium training and tour

• Radioactive materials:
  – Training

• Laboratory safety:
  – Training
Human Subjects: Informed Consent

• Voluntary: problems with prisoners, students, employees, children, etc.
• No undue inducements
• Must be understandable to subject
• Risks and potential benefits must be presented accurately
• Right to withdraw at any time
• Deception is generally not allowed
Animal Subjects: The Three Rs

• **Replace** the use of animals with alternative techniques, or avoid the use of animals altogether.

• **Reduce** the number of animals used to a minimum, to obtain information from fewer animals or more information from the same number of animals.

• **Refine** the way experiments are carried out, to make sure animals suffer as little as possible. This includes better housing and improvements to procedures which minimize pain and suffering and/or improve animal welfare.
Enhancing Reproducibility through Rigor and Transparency

Four areas that NIH is now requiring in applications and reviewing:

• **SIGNIFICANCE:**

  Describe Scientific premise: consider strengths and weaknesses of published research or preliminary data crucial to the support of the application
  (rigor of previous experiments; methodology, analysis and interpretation, relevant biological variables, authentication of key resources)

• **RESEARCH STRATEGY:**

  2) Describe rigorous experimental design and methods and how will achieve robust and unbiased results: sample size calculation for significance (# mice per group), randomize subjects, blinded, inclusion/exclusion criteria etc.

  3) Consider relevant biological variables for vertebrate animals or human subjects: e.g. Sex, weight, age, genetic strain etc.

  4) Authentication of key biological and/or chemical resources; how plan to authenticate; methods to ensure identity and validity
  e.g. Cell lines (not mis-identified or contaminated), speciality chemicals, antibodies, other biologicals
Fabrication and Falsification

Best way to prevent scientific misconduct is promote good research practices:
• Good record keeping
• Solid basis for data selection
• Talking to each other, to PI, to other researchers; don’t get isolated
Data Acquisition and Lab Tools

- Data are the basis of science
- Who owns them?
- Data entry into lab book
  - Date
  - What you did
  - Why you did it
  - How you did it
  - Where the materials are
  - What happened
  - Your interpretation
  - Contributions of others
  - What’s next
- Notebooks - paper or electronic (not erasable)
- Computer files (not editable)
- Physical samples (not removable)
- Confidentiality
- Keep for how long?
What if You Suspect Cheating or Professionalism Violations?

Report it:

• During the exam/exercise to the proctor
• As soon as possible after the exam/exercise to either the course director program directors
  Assistant Deans: Janet Alder and Smita Thakker-Varia
  Sr. Assoc. Dean: Jim Millonig
• Talk to the Student Ombudsperson
  Dr. Peter Lobel lobel@cabm.rutgers.edu 848-445-9831
  Dean Barbara Bender Barbara.bender@rutgers.edu 848-932-7747
What if You Suspect Research Violations?

Report it immediately to either:

- PI
- Senior Associate Dean for Research: Celine Gelinas
- The Research Ombudsperson
  Dr. Paul Manowitz manowitz@rutgers.edu 732-235-4347
Protection and Responsibilities of “Whistle Blowers”

• Initially, the identity of a complainant can be kept confidential.

• Should the allegation lead to an inquiry or investigation, testimony by the complainant may be required.

• The University is committed to the protection of “good-faith” whistleblowers.

• However, “whistle-blowers” whose allegations which prove to be untrue and which are found to have been made in bad faith will be subject to appropriate disciplinary actions by the University.
Policies of Rutgers

• Student handbooks online at http://rwjms.rutgers.edu/gsbs/current/student_handbook.html additional information about expected professional conduct and policies. Ignorance of rules is not an excuse!

• Rutgers Academic Integrity Policy: http://academicintegrity.rutgers.edu/integrity.shtml

• Rutgers Policy on Research Misconduct 90.2.2 http://policies.rutgers.edu/view-policies/research-section-90#2
Expectations

• Check and respond to email
• Ensure we have correct contact information
• Read handbooks
• Familiarize yourself with website content
• Complete and submit academic forms in timely manner
• Maintain 3.0 GPA
• Let us know if there is a problem
• Let us know when something good happens!
• Academic Integrity
• Research Integrity