

What is SCIENTIFIC misconduct and how should it be handled?

Alison Lakin, RN, LLB, LLM, PhD
Associate Vice Chancellor for Regulatory Compliance



Housekeeping

Zoom Etiquette:

- Silence personal devices.
- Stay muted when not talking.
- Set up in a quiet location.
- Remain attentive. Avoid checking email/phone/web.
- Use the Chat function to ask questions or get technical help.
- Use your full name, not an alias.

Receiving credit for attendance:

- To satisfy the [NIH Requirement for Instruction in the Responsible Conduct of Research](#), the following are required in order to receive credit for attendance:
 - **Attend the full 90 minutes of the training.** Attending any 8 out of the 9 RCR seminars we offer will satisfy the NIH requirement.
 - **Keep your video camera on throughout the session.** NIH requirements for RCR training specify face-to-face discussion.
 - **Participate interactively throughout the session.** Participate in discussions, respond to polls, and sign the attendance sheet (link will be distributed in the Chat).



For Vote Who is the audience?

1. Select your primary university position or affiliation:
 - PI/Faculty
 - PRA/Researcher
 - Study Coordinator
 - DFA/Admin Support
 - Other
2. Are you primarily working on campus or remotely/from home?
 - On campus
 - Remote
3. If you had the option, how would you prefer to attend RCR classes?
 - In person (e.g., on campus in an auditorium)
 - Online (e.g., Zoom)



The Research Integrity Officer (RIO) has lead responsibility for ensuring that the institution:

- Takes all reasonable and practical steps to foster a research environment that promotes the responsible conduct of research, research training, and activities related to that research or research training, discourages research misconduct, and deals promptly with allegations or evidence of possible research misconduct.
- Informs its institutional members who are subject to 42 CFR Part 93 or applicable policy about the research misconduct policies and procedures and the Institution's commitment to compliance with those policies and procedures.
- Takes appropriate interim action during a research misconduct proceeding to protect public health, federal funds and equipment, and the integrity of the PHS supported research process.



For Vote Who do you contact if you have concerns about possible misconduct?

- a. The PI of the lab
- b. The Department Chair
- c. The RIO
- d. The Ombuds Office



Definition of research misconduct at CU Denver | Anschutz Medical Campus:

- **Fabrication, falsification, plagiarism** and other forms of misrepresentation of ideas, and other serious deviations from accepted practices in proposing, carrying out, reviewing, or reporting results from research
- **Failure** to comply with established standards **regarding author name** on publications



Definition of research misconduct at CU Denver | Anschutz Medical Campus continued:

- ***Fabrication*** is making up data or results and recording or reporting them
- ***Falsification*** is 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*** is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit



Data

- 2010 there were 400 retractions but 2023 more than 10,000
- Equivalent of 0.2% of published papers are retracted—Oransky believes at least 2% of published papers should be retracted
- At least six of the U.S. News's top ten cancer centers retracted at least one paper last year alone, according to the [Retraction Watch database](#)

“Impact factor mania and publish-or-perish may have contributed to Dana-Farber retractions experts say.” *The Cancer Letter* February 2, 2024, Vol. 50 No. 05



Perverse incentives

- “All of this—whether it’s error or out-and-out misconduct—the root is ‘publish or perish.’ - Oransky, *Retraction Watch*
- “...we tend to publish what the principal investigator or institute or journal editor *wants* you to publish, rather than sometimes having a flaw, an unanswered question, or an imperfect story...”
- “There are so many people out there who are doing anything they can to get a paper in *Nature*, including falsifying data, choosing the best blot—do you choose the average western blot or the western blot which shows the best results, even through other western blots may be more modest? That’s just our culture,” Ellis, professor of surgery in the Department of Surgical Oncology at MD Anderson Cancer Center, said to *The Cancer Letter*.



Strategies – “Impact factor mania and publish-or-perish may have contributed to Dana-Farber retractions experts say.”

The Cancer Letter February 2, 2024, Vol. 50 No. 05

- Read papers before you cite them – not just the title or abstract – determine if robust science – uses blinding and randomization
- Review your lab’s raw data weekly – review all raw data prior to starting a manuscript
- Keep each other accountable – incorporate checks and balances
- Perform only high-performing experiments or be willing to publish negative studies or both



Fabrication is making up data or results and recording or reporting them

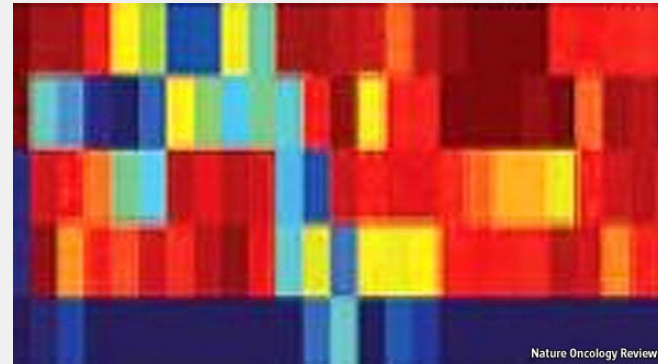
- Diederik Stapel, a Dutch social psychologist, perpetrated an audacious academic fraud by making up studies that told the world what it wanted to hear about human nature. *[Read: New York Times, By Yudhijit Bhattacharjee, Published: April 26, 2013]*
- When challenged with specifics — to explain why certain facts and figures he reported in different studies appeared to be identical — Stapel promised to be more careful in the future. As Zeelenberg pressed him, Stapel grew increasingly agitated.
 - » Finally, Zeelenberg said: “I have to ask you if you’re faking data.”
 - » “No, that’s ridiculous,” Stapel replied. “Of course not.”

- **Be wary of perfect data**



Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results in the research record

ANIL POTTI, Joseph Nevins and their colleagues at Duke University in Durham, North Carolina, garnered widespread attention in 2006. They reported in the *New England Journal of Medicine* that they could predict the course of a patient's lung cancer using expression arrays



Keith Baggerly and Kevin Coombes, had begun to find serious flaws in the work.

[*The Economist* Sept. 10, 2011]



Plagiarism is the appropriation of other person's ideas, processes, results, or words without giving appropriate credit

80% of the findings of research misconduct by NSF over the last 10 years involve plagiarism?



For Vote Why does plagiarism seem to have increased?

- a. Scientists are less ethical
- b. Social media makes science more accessible
- c. Journals on line are easier to plagiarize
- d. Journals and granting agencies use detection software



Use of AI and Machine Learning Tools

- Citation should include specific tool used and how it was used (outline generation, first draft, final draft).
- Failure to cite use of outside tools will be considered plagiarism
- How does that work in practice?

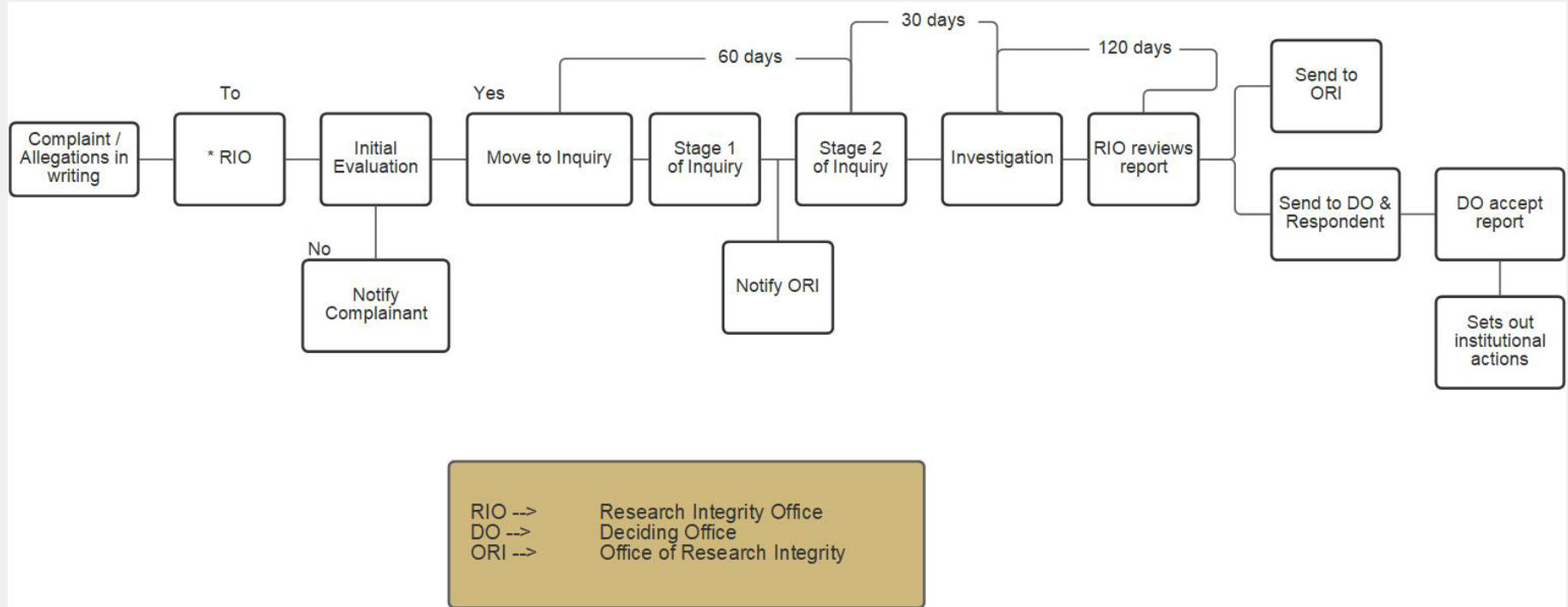


Sequestration:

- The RIO shall, on or before the date on which the Respondent is notified of the allegation, take all reasonable and practical steps to obtain custody of all records and evidence necessary to conduct the inquiry.
- The RIO shall inventory and sequester all such records and evidence in accordance with the guidance document on sequestration. The RIO shall confer with the Respondent to identify the records and evidence needed for the inquiry and the best means of preserving and maintaining the integrity of the records and evidence.
- Where the records or evidence encompass scientific instruments shared by a number of users, custody may be limited to copies of the data or evidence on such instruments.
- The RIO may consult with NIH/PHS or other similar parties for advice and assistance in this regard.



Process flow Summary:



Burden of Proof:

- **Respondent** has the burden of proving **by a preponderance of the evidence** any affirmative defenses raised, including honest error or a difference of opinion

Note:

- In a **criminal** case, the prosecutor bears the **burden** of proving beyond a reasonable doubt every element of the **crime**



When does falsification, fabrication and/or plagiarism = research misconduct?

A preponderance of the evidence establishes that:

1. The conduct meets the policy definition of research misconduct
2. The research misconduct is a significant departure from accepted practices of the relevant research community
3. The respondent committed the relevant research misconduct intentionally, knowingly, or recklessly



Main Challenges when issues arise:

- Document management
- Version control
- Photoshop
- Original data integrity
- Analysis documentation
- Long term storage
- Identifying specific data in manuscripts



Attendance, Case Studies, & Discussion

**Sign the Attendance Sheet by
clicking the link in the Chat.**



Case from On Being a Scientist - National Academy of Sciences:

- You are just months away from finishing your Ph.D. dissertation when you realized that something was seriously amiss with the work of a fellow graduate student, Jimmy. You are convinced that Jimmy was not actually making the measurements he claimed to be making.
- You share the same lab, but Jimmy rarely seemed to be there.
- Sometimes you saw research materials thrown away unopened.
- The results Jimmy was turning in to your common thesis advisor seemed too clean to be real.



Part 2

You will soon need to ask your thesis adviser for a letter of recommendation for faculty and postdoctoral positions. If you raise the issue with your adviser now, you are sure that it would affect the letter of recommendation.

Jimmy is a favorite of his adviser,



Part 3

- You and Jimmy are working with your thesis advisor on a manuscript together using data from both of them.
- Both you and your thesis adviser are planning to use Jimmy's results in a federal grant submission.



Contacts:

Research Integrity Officer:

Alison.lakin@cuanschutz.edu

303-724-0982

**Scientific Research Integrity
Officer CU Anschutz Medical
Campus:**

john.repine@cuanschutz.edu

303-724-4783

