Laboratory Ethics and Relationships

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The US Office of Science and Technology Policy defines **misconduct** as “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.”

Scientists Behaving Badly

- 3600 surveys to mid-career scientists with a 52% response rate
- 4160 surveys to early-career scientists with a 43% response rate

What are the potential flaws or disadvantages of a study like this?

- Non-response bias

Admitting to misconduct

- Sanctionable
- 33% of respondents admitted to engaging in at least one of these behaviors in the last 3 years

Table 1 | Percentage of scientists who say that they engaged in the behaviour listed within the previous three years ($n = 3,247$)

Top ten behaviours	All	Mid-career	Early-career
1. Falsifying or 'cooking' research data	0.3	0.2	0.5
2. Ignoring major aspects of human-subject requirements	0.3	0.3	0.4
3. Not properly disclosing involvement in firms whose products are based on one's own research	0.3	0.4	0.3
4. Relationships with students, research subjects or clients that may be interpreted as questionable	1.4	1.3	1.4
5. Using another's ideas without obtaining permission or giving due credit	1.4	1.7	1.0
6. Unauthorized use of confidential information in connection with one's own research	1.7	2.4	0.8 ***
7. Failing to present data that contradict one's own previous research	6.0	6.5	5.3
8. Circumventing certain minor aspects of human-subject requirements	7.6	9.0	6.0 **
9. Overlooking others' use of flawed data or questionable interpretation of data	12.5	12.2	12.8
10. Changing the design, methodology or results of a study in response to pressure from a funding source	15.5	20.6	9.5 ***

Which group had higher instances of engaging in misconduct?

28% of early-career respondents

38% of mid-career respondents

- Opportunity
- Consequences change
- Different behavioral standards
- Under-reporting

Addressing the Issue

- Early approach: “bad apples”
  - Laboratory and departmental contexts

- Moving towards something more systemic
  - University level

The Marty Brown Case

- Research involved using transgenic tobacco plants to produce foreign proteins
- Factor VIII
- 100 transgenic tobacco plants
  - Plant growth
  - Factor VIII production
- 12 plants nearest the door get sick
  - Producing consistently more factor VIII than the other plants

The Marty Brown Case

- “Human Factor VIII production in Transgenic Tobacco Has No Deleterious Effect on Plant Growth”

- Excluding data
  - They were too close to the door
  - The paper would be more impressive
  - Published faster

What should he do with the data on the 12 sickly plants?

Research, evidence, and ethics

- China has less restrictions on human experiments
  - “breeding ground for gray medicine”
  - Bone breaking, leg-lengthening, artificial heart implantation

- Constraints
  - Nuremberg code
  - Declaration of Helsinki
  - Belmont Report

1. Identify indications and contraindications clearly

- **Avastin** in patients with macular degeneration
  - Declaration of Helsinki
    - “Physicians can only adopt medical therapy that has not been tested if no effective therapy exists”
  - Lucentis
    - More expensive
- **Superindication drugs**
- **TKI as an adjuvant therapy**

2. Obtain informed consent and permission of patients

- Belmont Report
- Black market of **stem cell therapy** in China
  - Unconfirmed safety and effectiveness
  - China’s Ministry of Health failed to prevent commercialization
  - Free online resources for patients
  - High medical expenses
  - Cochrane’s solution
    - only “effective” treatments should be free

3. Supervise medical practices effectively according to laws and ethics

- **Xiao's reflex arc**
  - Urination can be controlled by stimulation of the skin of the thighs when the somatic nerves of the knee-jerk reflex are connected to visceral nerves of the bladder
  - Published papers with high scores
  - National Prize for Progress in Science and Technology
  - No controls = no validity!