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Engaging Students in Research Ethics: A Cross-Campus Partnership

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RCR training for undergraduates at Cornell:

Partners

- Vice Provost for Research
- Vice Provost for Undergraduate Education
- Office of Research Integrity Assurance
- Office of Undergraduate Biology
- Office of Undergraduate Research
- Cornell Commitment
- Cornell University Library

In which of the following behaviors is an early-career scientist most likely to engage?

A. Dropping observations or data points from analyses based on a gut feeling that they were inaccurate.
B. Using another's ideas without obtaining permission or giving due credit.
C. Inadequate record keeping related to research projects.
D. Ignoring major aspects of human-subject requirements.

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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 ***
Other behaviours			
11. Publishing the same data or results in two or more publications	4.7	5.9	3.4 **
12. Inappropriately assigning authorship credit	10.0	12.3	7.4 ***
13. Withholding details of methodology or results in papers or proposals	10.8	12.4	8.9 **
14. Using inadequate or inappropriate research designs	13.5	14.6	12.2
15. Dropping observations or data points from analyses based on a gut feeling that they were inaccurate	15.3	14.3	16.5
16. Inadequate record keeping related to research projects	27.5	27.7	27.3

Note: significance of χ^2 tests of differences between mid- and early-career scientists are noted by ** ($P < 0.01$) and *** ($P < 0.001$).

Source: Martinson et al. 2006

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How do graduate students in the life sciences learn about research and scholarly integrity topics?

A. Advisor
B. Course / workshops
C. Online / print
D. None

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How do your graduate students learn about the following research and scholarly integrity topics?

Field/Discipline: Life Sciences

General Topics	Advisor	Course	Workshops	Online/Print	None	N/A
Data Acquisition	74%	64%	26%	35%	0%	0%
Conflict of Interest/Commitment	72%	51%	25%	39%	2%	0%
Human Subjects	64%	48%	22%	58%	0%	7%
Animal Care	55%	27%	19%	48%	2%	21%
Research Misconduct	74%	62%	32%	42%	0%	0%
Publication/Authorship	74%	59%	28%	38%	0%	0%
Mentoring Relationships	76%	35%	19%	31%	1%	2%
Peer Review	74%	44%	19%	33%	1%	5%
Collaborative Research	75%	35%	8%	21%	4%	2%
Personnel Management	44%	21%	9%	15%	6%	20%
Financial Stewardship	45%	16%	5%	13%	9%	18%
Hazardous Materials	59%	32%	24%	48%	2%	14%

Source: Council of Graduate Schools 2012

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Responsible Conduct of Research (RCR) topics ORI / HHS:

- Data management practices
- Conflict of interest and commitment
- Human subjects
- Animal care
- Research misconduct
- Publication practices and responsible authorship
- Mentor/trainee responsibilities
- Peer review
- Collaborative science

http://ori.hhs.gov/documents/rcrintro.pdf

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RCR topic: Data management practices

- Ownership
  - Funder's role/interest
  - Institution's role/interest
  - Research subjects' role/interest
- Collection
  - Appropriate methods
  - Attention to detail
  - Authorization (human subjects, haz mat, ©)
  - Recording
  - Protection (preservation)
- Storage (safety, security)
- Sharing (what, when, with whom)

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RCR topic: Publication practices and responsible authorship

- Authorship, contribution, role
- Components: abstract, methods, results, discussion, notes/bibliography, acknowledgements
- Problematic practices:
  - Honorary authorship
  - “Salami publication” or LPUs
  - Duplicate publication
  - Premature public claims

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RCR topic: Peer review

- (not just about publications -)
- Assessing quality:
  - methods
  - calculations
  - logic/reasoning
  - supported conclusions
  - citations of relevant literature
- Judging importance
- Problem: bias (personal, methodological, ...)

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