



## Preliminary Data

### Year

2001

### Description

This case highlights potential dilemmas encountered by postdoctoral fellows in a research setting, specifically determining whether scientific misconduct has been committed by falsified data.

### Body

Penelope Brighton is a second year graduate student in Dr. David Gilligan's cell biology lab. Gilligan is a highly productive, well-published, respected investigator whose students receive prestigious post-docs. As part of Brighton's thesis, she has begun to characterize the localization of a newly discovered protein within cells. In her first, quick experiments, Brighton found some potentially interesting results. Gilligan is quite excited about Brighton's project and is in the process of writing a grant using Brighton's results as preliminary data.

Brighton followed up the initial experiments by performing in-depth, well-controlled experiments. She changed several experimental conditions. She used immunopurified antibodies instead of crude antisera and changed blocking conditions to eliminate staining by preimmune sera. As Brighton sat by the microscope collecting data, she was surprised to find that her protein was present in all of the cells, but that it was not localized where she or Gilligan expected it to be. As she scanned several slides, she could find only two cells out of hundreds where the protein appeared to localize where they had hypothesized it would. In all

of the other cells, the staining was in a different, specific area. Brighton believed the new staining to be clean and consistent, but the staining does not look like the initial results with crude sera. Brighton realized that the characterization of the protein may not be as straightforward as originally expected.

Brighton attempted to discuss her new results with Gilligan. However, Gilligan did not seem interested in all of the data. He said that they would deal with the staining details later, but that they need to get the grant application out now. Gilligan asked Brighton to create a figure for the grant using one of the cells where the localization fit with the proposed hypothesis. In the grant application, Gilligan did not mention that the figure is an example of an atypical result. Instead, he suggested that all of the data from these experiments completely support the hypothesis.

Brighton read a draft of the grant and was shocked by the spin Gilligan had put on the data. When discussing the draft with Gilligan, she stressed that most of the localization data did not agree with the hypothesis. Gilligan insisted that the figure in the grant certainly supports the hypothesis. He said that the standards for presenting data as preliminary results in a grant application are not as stringent as those for publishing data in a journal article. Gilligan stated that it is better to present the data his way. Mentioning the unexpected results would only create doubt among the grant reviewers and decrease the likelihood of funding for the project.

## **Discussion Questions**

1. If the definition of scientific misconduct is fabrication, falsification, plagiarism, deception or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting or reporting research, did Gilligan represent his laboratory's work appropriately to the funding agency? Or is he guilty of scientific misconduct?
2. Would the situation be different if the research were being presented in another format?
3. How well-supported must a result be before it is presented at a seminar at another university? in a meeting abstract? in a progress report for the department? in a published paper?
4. What possible actions are available to Brighton and other graduate students who feel their work is being misrepresented?
5. Should Brighton take action? If so, what would be an appropriate form of action?

6. As a thesis adviser, what are Gilligan's obligations toward Brighton? In this case, is Gilligan fulfilling his obligations as a thesis adviser?

## **Notes**

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## **Contributor(s)**

Brian Schrag

## **Editor(s)**

Brian Schrag

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Hypothetical / Fictional Case

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