Workshop on Responsible Conduct of Research:

Data management and
Responsible authorship

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Sources:
National Academy of Sciences (2009) On Being a Scientist
Obligations to:

1. Other scientists

2. Your own career

3. Public

from: On Being a Scientist, 2009, NAS
Management of data and results:

1. What factors can result in generation of misleading results?

2. How do you determine standards for keeping and retaining data (results) in your discipline?

3. Who ‘owns’ the data (results)?

4. What are your obligations with respect to sharing of results?

5. What expectations do your co-workers, faculty or student, in or outside Rutgers, have of you with regard to the scientific standards of your discipline?
Authorship:

1. What criteria determine who is an author? Who decides?
2. What criteria determine order of authorship?
3. When are such decisions made? What if your co-author doesn’t contribute?
4. Are all authors responsible for any errors?
5. What happens when authors do not share the same expertise?
6. How should students approach authorship questions?
Skills to be learned:

Recognizing issues
Reasoning through dilemmas
Understanding your responsibilities
Planning and taking action
Analyzing case studies:

• Identifying the people with a stake in the outcome
• Identifying ethical issues and points of conflict
• Identifying obligations of the various parties
• Determining possible solutions, and the consequences of each
• Choosing and justifying better/best solution
Who Gets Credit?
Robert has been working in a large engineering company for three years following his postdoctoral fellowship. Using computer simulations, he has developed a method to constrain the turbulent mixing that occurs near the walls of a tokomak fusion reactor. He has written a paper for *Physical Review* and has submitted it to the head of his research group for review. The head of the group says that the paper is fine but that, as the supervisor of the research, he needs to be included as an author of the paper. Yet Robert knows that his supervisor did not make any direct intellectual contribution to the paper.
1. How should Robert respond to his supervisor’s demand to be an honorary author?
2. What ways might be possible to appeal the decision within the company?
3. What other resources exist that Robert can use in dealing with this issue?

From: On Being a Scientist
Authorship: What Happens When Someone is Omitted?

Yolanda, a graduate student in Prof. Zhu's lab, is talking with Wanda, Prof. Zhu's secretary. She notices the title page of a manuscript atop a pile of papers on Wanda's desk. When she looks at it more closely, Yolanda is surprised to see that there are only four co-authors: her, Valerie (also in Prof. Zhu's lab), Prof. Albert, and Prof. Zhu.

Four months ago, Yolanda spent several weeks in Prof. Albert's lab at a different university learning an experimental technique that she needed for her research. This was a technique with which the Zhu lab had had no experience. For most of her visit, she worked side by side with Ben Brown, a post-doctoral fellow. Ben not only taught her the technique she needed to master, he also gave her good advice on her experimental design, critiqued her interpretations, and during the last week of her visit, helped Yolanda complete a series of experiments. Those experiments became an important part of the experimental section of this research paper into which Wanda is entering various edits.

"Wanda, I think there's an error here," Yolanda begins. "Ben Brown's still missing from the co-authors, and I know I put a note on the last draft about this. He was on the first few drafts, but somehow he got dropped."

"Oh, now that you mention it, I do recall seeing his name before," replies Wanda. "Well, what I got from Prof. Zhu before he left on his trip was what he told me was the final version. I'm supposed to finish up the manuscript, and get it sent out to the Journal of Important Research today."

"But you can't do that," exclaims Yolanda. "It wouldn't be fair. You've got to put Ben's name back on the paper before you send it."

From http://ori.hhs.gov/education/products/rcradmin/topics/collscience/case2.shtml
The Selection of Data

Deborah, a third-year graduate student, and Kamala, a postdoctoral fellow, have made a series of measurements on a new experimental semiconductor material using an expensive neutron test at a national laboratory. When they return to their own laboratory and examine the data, a newly proposed mathematical explanation of the semiconductor’s behavior predicts results indicated by a curve. During the measurements at the national laboratory, Deborah and Kamala observed electrical power fluctuations that they could not control or predict were affecting their detector. They suspect the fluctuations affected some of their measurements, but they don’t know which ones.

When Deborah and Kamala begin to write up their results to present at a lab meeting, which they know will be the first step in preparing a publication, Kamala suggests dropping two anomalous data points near the horizontal axis from the graph they are preparing. She says that due to their deviation from the theoretical curve, the low data points were obviously caused by the power fluctuations. Furthermore, the deviations were outside the expected error bars calculated for the remaining data points. Deborah is concerned that dropping the two points could be seen as manipulating the data. She and Kamala could not be sure that any of their data points, if any, were affected by the power fluctuations. They also did not know if the theoretical prediction was valid. She wants to do a separate analysis that includes the points and discuss the issue in the lab meeting. But Kamala says that if they include the data points in their talk, others will think the issue important enough to discuss in a draft paper, which will make it harder to get the paper published. Instead, she and Deborah should use their professional judgment to drop the points now.

1. What factors should Kamala and Deborah take into account in deciding how to present the data from their experiment?
2. Should the new explanation predicting the results affect their deliberations?
3. Should a draft paper be prepared at this point?
4. If Deborah and Kamala can’t agree on how the data should be presented, should one of them consider not being an author of the paper?
Mis-coded data
Al Dunn, a 5th year Ph.D. student, was in the process of re-running some analyses for a revised manuscript submission. This publication is the remaining hurdle between Al and his dissertation defense. Al’s research has involved analysis of survey items. In preparing his data for analysis he has been careful to document all of the variables and their codes (i.e., 1=strongly disagree…5=strongly agree) in a code book. As he looks at the raw data prior to analysis, he sees one variable’s responses include several 0’s. This is unexpected because the range of responses is 1-5. He realizes that the 0’s actually represent missing data. But in his initial analysis he included the 0’s as real value. This erroneous analysis was used for the original submission. In a slight panic, Al deletes all of the 0’s from the database and reruns the analysis. He breathes a sigh of relief because his results are still significant (p=.048 compared to the previously reported p=.011). Al is concerned that if he makes public his error it could cast doubt on the integrity of his analyses; this could delay or preclude publication. He decides that since the results are still significant he will erase all evidence of the previous 0’s and the earlier analyses. He also plans simply to report p<.05. You are the senior postdoc in the lab. Al runs his plan by you and asks for advice. What do you tell him?

Data problems
Donna has collected blood samples from 100 human patients to test antibody levels against two different viruses. Relevant clinical histories of these patients, corresponding to the individual samples, are noted in her data book. She has carefully tagged the tubes with self-adhesive labels and stored them in racks of 20 in the freezer. She assays the samples in 3 of the 5 racks and obtains interesting results. She records her results meticulously in her lab data book, cross-referencing the antibody values to the clinical patient data.

When she opens the freezer to retrieve the sera in the 4th rack she discovers that all the labels have fallen off the tubes in racks 1 and 2 (she used the wrong kind of labels). Donna proceeds to number all the tubes in racks 1 and 2 by order of their rack location. Then she repeats the antibody assays on these samples. She arranges her resulting data into a summary table that she compares with her original assays of these samples. She is relieved that the data compare favorably with their original designations. She comes to you for advice and asks how, if at all, she should record these events in her data book. What do you tell her?

**Data ownership**

Jessica Banks, a student in Prof. Brian Hayward’s lab, has recently defended her dissertation and is ready to file it and leave for her new job. Her dissertation was closely related to Haywards’ grant at the time. Later, Banks’s experimental plan and early results were included in Hayward’s grant renewal.

Banks’s new job is a tenure track position. Shortly before leaving she comes into the lab to pick up her notebooks. She is eager to start new research, including on projects that she had started but not completed while a graduate student.

Professor Hayward meets Banks’s and says she can’t take the notebooks. Jessica: But I did the work and I want to follow up. I can’t do it without the notebooks.

Hayward: This lab is a joint enterprise and all the work you did was funded by money brought in by grants. The notebooks don’t belong to you or to me. They belong to the lab and the work will be continued in this lab. I’ve already talked to one of the new students about working on these projects in the fall.

Jessica protests to no avail. After all, she did the work that generated all the data. One of her friends suggests that she xerox the notebooks when Hayward isn’t around. That way Hayward keeps the books and Jessica gets the data. Jessica is uncertain. What should she do?

DISCUSSION: WHO GETS CREDIT?
Robert needs to know whether his company, the journal to which he plans to submit the paper, or his discipline has written policies pertaining to his situation. If so, he must decide whether to bring those policies to the attention of his supervisor, a research official in his company, or the editor of the journal; if not, he must decide whether to appeal to guidelines describing acceptable authorship practices in other documents. What are the possible outcomes of alternative actions that could help him make a decision?
Obligations
Wanda has an obligation to complete her work as directed by Prof. Zhu, but she is also obligated to help facilitate his work and the progress of his laboratory. Yolanda has an obligation to do all she can to see that those who have contributed to a body of research receive appropriate attribution. She also has obligations to inform her advisor, Prof. Zhu, of what occurred during her time in the Albert lab, and to seriously consider Prof. Zhu's evaluation of appropriate co-authorship. Prof. Zhu has obligations to ensure that appropriate attribution is given to all those who contribute to publications that originate from his laboratory, to honor agreements that he has made with colleagues, to communicate clearly with his students and staff, and to be familiar with the work of researchers in his laboratory. Prof. Albert has an obligation to honor agreements that he has made with colleagues, but he is also obligated to protect the interests of members of his laboratory.

Ethical Issues
Wanda's obligation to follow Prof. Zhu's instructions is in conflict with her interest in maintaining a good atmosphere within the research group, particularly with Yolanda. Yolanda's obligation to do all she can to see that Ben Brown receives what she perceives to be appropriate attribution appears to be in conflict with her obligation to honor Prof. Zhu's decision. There may also be conflicts related to obligations to honor agreements, and communicate clearly with students and other colleagues, but there is not enough information given in the scenario to be sure of what these are.
Consequences of Actions
If Wanda figures that it can all be sorted out later, and so accedes to Yolanda's demand to add Ben Brown's name before she sends off the manuscript, she is putting herself at risk for unpleasant consequences. She will have made a change in a matter that is of great importance to researchers, authorship. As a result, Prof. Zhu is likely to be upset not only because she has made an alteration without consulting him, but because her actions would be considered to be a breach of research ethics by his lab. It is considered unethical to list someone as a co-author without his/her permission, or if he/she does not meet the criteria for co-authorship. There may be good reasons why Brown's contributions were not considered to be significant enough to warrant co-authorship.

If Wanda simply ignores Yolanda and dismisses her concerns, Yolanda is likely to be upset and resentful toward both Wanda and Prof. Zhu. There is the potential for discord within the Zhu lab as well as between Prof. Albert and Prof. Zhu and their research groups. However, if Wanda explains that she can't make any changes without Prof. Zhu's direction, but that changes might be possible later, after Yolanda has a talk with Prof. Zhu, Yolanda may realize that she needs to talk directly with Zhu and make her case through the proper channels. After all, the manuscript still has to go through the review, revising and publishing processes, and so there is still time for changes to be made. In addition, it is not clear what agreements were made between Zhu and Albert, what Zhu knows of the work Yolanda did with Ben Brown, whether Yolanda has ever done more to address this question than just put notes on drafts of the manuscript, and whether there are reasons of which Yolanda is not aware for not including Brown as a co-author. What is needed here is some frank, open communication among the researchers concerning the work presented in the manuscript and the criteria for co-authorship. Wanda may be able to catalyze this conversation.