Collaborative Science

Research collaborations facilitate progress and should be encouraged; however, the ground rules for collaborations, including authorship issues, should be discussed openly among all participants from the beginning. The NIH encourages research collaborations, both within the intramural programs and with investigators at extramural sites, because they can enhance scientific progress. However, such collaborations may require the establishment of formal mechanisms, such as a material transfer agreement (MTA) or a human subjects protection review.

The NIH Center for Cooperative Resolution, directed by the NIH Ombudsman, has developed a template for use in establishing collaborations that may prove useful as you embark on a collaboration. The following cases illustrate some of the key issues that arise and therefore need to be addressed in any agreement before the collaboration starts.

CASE 1 - BASIC-CLINICAL COLLABORATION

adapted from Scientific Integrity by Francis L. Macrina

A clinical scientist and a basic molecular biologist are collaborating on a series of projects that involve patients and normal control subjects. Each investigator is funded from their IC's intramural program for work distinct from the collaborative project, and each has separate funds for the collaborative project. The clinical scientist views the patient records and diagnoses as her intellectual property and shares these data only when she is ready to prepare a manuscript. The molecular biologist has prepared and preserved cell lines, probes, and reagents that have been kept in facilities readily available to both collaborators. The molecular biologist believes that there are important results that merit publication. He prepares a manuscript up to the point of inclusion of clinical data. The clinical scientist refuses to provide the clinical data. In the dispute that follows, the clinical scientist asserts ownership of the cell lines, probes, and reagents that were developed from patient samples. The dispute is brought to you to mediate. Discuss the data ownership issues of this collaboration. Who owns the clinical data? Who owns the cell lines, probes, and reagents? Who has access to, and use of, the clinical data and the materials prepared from patient samples?

CASE 2 - WHEN DOES A COLLABORATOR DESERVE AUTHORSHIP?

adapted from Scientific Integrity by Francis L. Macrina

You have had a radical idea regarding how to get eukaryotic cells to take up DNA fragments much more efficiently than was previously possible. You tell your colleague Maria about your idea and how you plan on testing the hypothesis. Maria is not in your field of expertise, but you spend some time explaining to her the details of your study and the expected outcomes. Maria offers a number of unsolicited suggestions on how to improve the study. Because of her lack of experience, many of her ideas are not practical or are very elementary and part of your study anyway. However, Maria suggests some valuable control experiments involving DNA competition assays, which help you make a compelling case for the novelty and efficiency of your method: Maria talks to you frequently about the project and comes to several of your lab presentations. She comments critically on your work and makes other suggestions, including the idea that you try different cell types to further build your case. She offers to try your method on several cell lines that are routinely maintained in her laboratory. You are reluctant to do this, but you suggest that she give you the cell lines so you can do the experiments. She complies, and the experimental results you obtain with her cells further support your hypothesis. You decide to submit a provisional patent application and then submit your exciting results as a short communication to a prestigious journal. Maria argues strongly that her name should be included as a co-inventor on the application and a coauthor on the manuscript. How do you respond? What is the rationale underlying your response?

CASE 3 - EQUIPMENT SHARING AND AUTHORSHIP

adapted from Scientific Integrity by Francis L. Macrina

Dr. Otto Max recently was hired as a tenure-track investigator in the Laboratory of Biological Chemistry at NIH. As part of his recruitment package, the IRP has purchased a specialized, expensive instrument used to analyze macromolecules. The analytical power of this instrument and Max's expertise have PI's in several laboratories excited about the application of this technology to their research. PI's who approach Dr. Max to explore the use of the instrument in their research learn that he is happy to collaborate with them. But he spells out conditions for such collaborative research that have some PI's upset. For example, no one but Dr. Max or his technician may operate the instrument. The original printouts of all data must remain with Dr. Max. In addition, any paper submitted for publication that contains data obtained using the instrument must have Dr. Max's name on the author byline and his technician's name in the acknowledgments. Some PI's complain to Max's laboratory chief that these conditions are not collegial and are prohibitive. They argue that if IRP funds were used to purchase the instrument, its use should benefit all IRP PI's. As the laboratory chief, how would you handle this dispute?

CASE 4 - ASSAYS AND AUTHORSHIP

developed by the NIH Committee on Scientific Conduct and Ethics

Dr. Wong has developed a reputation in the local research community for performing well an effective, although somewhat tedious, method of gene expression analysis in her lab. Because the data obtained from this assay are very useful, many labs have an interest in obtaining such results but are reluctant to develop the technique. Dr. Suzuki , a fellow in a nearby lab in another Institute, approached her about performing the assay on a number of samples that he was preparing. Dr. Suzuki indicated that he considered the work to be a collaboration and Dr. Wong agreed to collaborate. A month later, Dr. Suzuki sent Dr. Wong the samples; she ran the assay within a week, providing Dr. Suzuki with the data in figure form as well as her interpretation of the data and some ideas about additional genes to analyze and experiments to perform. Approximately 9 months later, Dr. Wong was scanning the table of contents of a prestigious journal and was surprised to see an article authored by Dr. Suzuki on the topic on which she had thought that they were collaborating. On reading the article, she was surprised and a bit shocked to see the data she had provided to Dr. Suzuki as a figure in the paper and her name in the acknowledgements for performing the assay. Dr. Wong wrote by email to the Head of Dr. Suzuki's laboratory, Dr. Bigge, expressing her surprise and disappointment at seeing her data in a paper about which she was never informed. Both Dr. Bigge and Dr. Suzuki apologized by email and admitted that they were wrong in not sending Dr. Wong the manuscript and inviting her to decide whether she should be a coauthor based on her contributions. Dr. Suzuki indicated that he had decided not to include her as a

coauthor based on some training he had recently received on criteria for authorship.

Points to consider:

1. What is the proper procedure on deciding authorship, especially when a collaboration had been established?
2. Was Dr. Wong justified in being upset?
3. What role should Dr. Bigge have played regarding authorship?
4. Was it appropriate for Dr. Suzuki and Dr. Bigge to have used email to express their apologies?
5. What corrective actions might Drs Suzuki and Bigge take?

CASE 5: COLLABORATION AND CREDIT

adapted from Online Ethics Center for Engineering and Science, CASE Western Reserve University

Robert Kent, M.D., is an established and highly regarded investigator and clinician in breast cancer research and treatment. He holds a faculty position at a large medical institution, where he serves as the Director of the Schrag Center for Breast Cancer research and oversees the allocation of considerable federal monies granted to the Center. In this position, he acts as the facilitator of scientific discussions among clinicians and basic scientists doing work in breast cancer at his center. The members of the group hold appointments in various departments. While many of these investigators receive funding from the Schrag Center, all of them have their own resources as well (NIH, NSF, ACS, etc.). The investigators and members of theirs labs meet weekly to discuss the progress of each lab.

During a recent meeting, Taka, a graduate student, represented the lab of Dr. Sylvia Costa, Ph.D. Although Taka's work is not funded through a Schrag Center grant, Dr. Costa wanted to get feedback on Taka's new data. Taka presented some extremely interesting preliminary data (one set of replicates) regarding two drugs (Casodin and Fluox), both currently in clinical use. Taka's research shows that, when used together, these drugs dramatically inhibit the growth and progression of aggressive breast cancer tumors in mice. Dr. Kent and the rest of the group were very interested in Taka's findings since they held some promise for novel, efficacious therapies with drugs already in use in the clinics.

A few weeks later, Dr. Costa received a phone call from a long-time friend and colleague.

Dr. Costa: Anil, it's great to hear from you. How have you been? I read your last article; it looks like you are really on to something.

Anil: Well, I thought I was moving fast until I saw Dr. Kent give a talk with data from his lab at the International Breast Cancer Meeting last week. I remembered you two were at the same university and wanted to get your opinion of his findings.

Dr. Costa: Well, sure, I guess. To be honest, I haven't heard anything from his lab in quite a while. We both participate in our university's Breast Cancer Research Discussion Group, but those discussions are very informal. In fact, his lab skipped their turn to present data, and that was almost six months ago. What new data did he present?

Anil: He showed numerical data about a novel combination therapy he has been working on, something with Casodin and Fluox.

Dr. Costa: Oh, were these data from mice experiments?

Anil: Yeah. I thought you would be familiar with it. He claimed the results were preliminary, but the three sets of experimental replicates looked impressive.

Dr. Costa: And you're sure this was his work? He presented it as his work with replicate experiments?

Anil: Yup. Well, actually, he said his group. He's such a smart guy.

Dr. Costa: Listen, Anil, I've got to go. I'll talk to you later.

Dr. Costa immediately went to Dr. Kent's office to discuss the incident. Dr. Kent was shocked by Dr. Costa's reaction.

Dr. Kent: Listen, Sylvia, we're really on to something here, and I thought the scientific community needed to benefit from our findings. You weren't planning to attend the meeting, and this is ground-breaking stuff. As the leader of the discussion group and the senior faculty member, I felt the meeting was a great opportunity to present those data.

Dr. Costa: Excuse me, Dr Kent, but when did they become our data? Taka's work isn't even funded by the Schrag Center! This is absolutely outrageous behavior.

Dr. Kent: Well, then I wonder if you are interested in the drug company offers I have been getting to develop a combined delivery system. I really think we can work together on this, Sylvia. I hope you can put aside your reservations. This is just the way science works.

Discussion Questions

1. What should Dr. Costa do?

2. Was Dr. Kent justified in sharing Taka's data at the meeting? What if they were not preliminary data? Should Dr. Kent have any authority over the dissemination of any data discussed at the weekly group meetings?

3. What if Taka's work were funded by the Schrag Center?

CASE 6 - THE STATUTE OF LIMITATIONS

adapted from Online Ethics Center for Engineering and Science, CASE Western Reserve University

Part 1

Shanta is a professor of Biology at ESU (Enormous State University). Her recent work on the genetic structure of plant populations has been exciting and fruitful; she can hardly find the time to follow up on all her ideas. ESU has an informal "brown bag" seminar series in which graduate students and professors present and critique data and ideas. Shanta has always been an enthusiastic participant in the brown bag series, and one year ago she presented a particularly stimulating and untested idea that had spun off from her main avenue of research. Steve, a new graduate student in the department, approached Shanta after her talk and expressed enthusiasm about her idea. Steve felt that he knew just the empirical system in with which to test Shanta's idea, and he offered to collaborate with her on the project and share authorship on any resulting papers. Shanta politely declined. Steve was not her grad student, and she wanted to save the idea for one of her own students to test. A year after the brown bag, Steve approached Shanta again. None of Shanta's students had pursued the idea, and Shanta had not had time to pursue it herself. Steve renewed his previous offer. Shanta again rejected this course of action. It was her idea, and she would pursue it in due time.

Discussion Questions

1. Should Shanta have accepted Steve's offer after it became clear that none of her own current students were interested in following up the idea? When is it acceptable to reject an offer of collaboration?

2. What if Steve's proposed experiment would require seeking additional funding and would take three

years to complete? What if Steve's experiment could be done with materials and equipment on hand and would require only a few weeks? Does the type of collaboration proposed make a difference in when it is acceptable to reject a collaboration? i.e., do the duration and extent of the proposed collaboration matter? Why do you think so?

Part 2

A few days later, Steve approached Shanta a third time. This time Steve announced that he was going to go ahead and test Shanta's idea, with or without her approval. Steve promised that he would give Shanta full credit for her role in the genesis of the idea. Shanta stated that she felt that Steve's actions would be inappropriate since it would deprive her of the right to be the first to publish her new idea. Shanta approached Steve's major professor, Orlando, with her concerns about Steve's behavior. Orlando stated that he knew what Steve was doing, and furthermore he sanctioned it. Orlando and Steve felt that it was legitimate for Steve to pursue the idea, provided he properly credited Shanta as its creator. Shanta responded that her ability to develop and test the idea had been compromised and that Orlando should prevent Steve from pursuing the project. Orlando argued that after a year, the statute of limitations had run out. He asserted that the idea was public property from the moment Shanta gave her brown bag talk. Orlando then offered an indictment of Shanta's behavior.

"Look, Shanta," said Orlando. "Don't you remember how you used to tell us about that awful Professor Igneous you knew in grad school? You used to tell us how he would always claim to be working on all kinds of neat ideas, but in reality he was just trying to claim as much intellectual turf as possible. Igneous was taking advantage of the fact that most of us will avoid initiating a research project if we know someone else is already working on it; there's no sense in duplicating all that effort. You used to tell us how despicable you thought his behavior was, but now you are doing the same thing. You need to let someone pursue the idea who has time to do it now."

Shanta was outraged. "What I am doing is nothing like what Igneous used to do," she replied. "He never got around to doing anything with those projects. I, on the other hand, fully intend to follow up on the idea. What makes you think you get to decide at what point I have had enough time to pursue my own research?"

Discussion Questions

1. Are there ethical implications of "sitting" on an idea that someone else is eager to pursue? Would it change matters if Shanta's idea had potentially important applications in human medicine or the conservation of endangered species?

2. Orlando argued that the idea was fair game after Shanta's brown bag seminar. Would it matter if Shanta had published the idea in a short theoretical note? What if she had delivered the idea in a formal seminar at a national meeting as "work in progress"? Does the setting in which Shanta presented the idea (an informal, in-house presentation) matter? Why or why not?

3. Was Steve justified in pursuing the experiment on the basis that Shanta had had enough time to do the work herself? Should a statute of limitations apply to the ownership of research ideas?

4. Is Shanta's behavior like Dr. Igneous' behavior? Why or why not? Suppose her brown bag presentation had been an interesting idea she had thought of on the drive to work that morning, and the idea was pretty rough and undeveloped. Suppose instead that she had carefully developed mathematical and graphical models to support her idea and had presented those in the brown bag talk. Is the amount of work Shanta may have done relevant to assessing whether Shanta is like Dr. Igneous? Why or why not?

5. Suppose Shanta is delaying the pursuit of this idea until her current grant runs out because she does not have time to work on it until then. Suppose Shanta is teaching this term and intends to pursue it after she has finished. Do Shanta's reasons for delaying the work matter in assessing whether she is behaving like Dr. Igneous in this situation? Why or why not?

6. Should Orlando have tried to mediate the situation between Shanta and his student? Should Orlando prevent Steve from doing the study once it became clear that Shanta did not want Steve involved in the project?

7. Does Orlando and Shanta's argument suggest a tension between the concept of ownership of ideas and the value of collaborative relationships? How do you feel this situation should be resolved? Should Steve pursue the idea? Why or why not?