# Team Work

**SESSION #1**

**Page 1**

**20 minutes**

Scenario:

You are a second-year graduate student working with Dr. Candice Mason, a well–known biophysicist who specializes in molecular interactions modeling. Back when you were looking at grad programs, several people had said Dr. Mason would be a great choice. Rather than letting trainees struggle by themselves on totally independent projects, she organizes lab personnel into project groups, each led by a senior postdoc. Individuals usually pursue sub-projects or different technologies, but these all support the basic research questions of their project group. Groups are not exclusive or competitive though, and Dr. Mason expects everyone to share data, reagents and techniques with others who need them. As a result, the lab generates a lot of collaborative papers.

Your project group hopes to model how molecules of tau protein misfold then assemble into the telltale plaques found in the brains of patients with Alzheimer’s disease. It is led by Josh Stanley, now in his 4th year with Dr. Mason, who seems to be a sort of “professional postdoc”. It includes an experienced lab technician, and a 5th-year graduate student. Josh has identified sequence changes in tau proteins that can speed up or slow down the rate of misfolding and assembly. Your dissertation project will focus on characterizing the intermolecular interactions of several of these variant tau proteins in greater detail.

Tasks:

* What might be the potential advantages and disadvantages of Dr. Mason’s team-centered approach to lab management, compared to a less formal arrangement with independent projects?
* Discuss your responsibilities (role obligations) as a graduate student working in Dr. Mason’s lab management style. How might this differ from a grad student working alone, with a faculty advisor?
* What responsibilities and role obligations should the group and other team members of the Mason lab have toward you, a 2nd-year student?

**SESSION #1**

**Page 2**

**20 minutes**

Scenario, continued:

A few months later, a new grad student named Ethan Tompkins joins the lab. He did a summer internship in the lab so has prior experience with the projects, and he is anxious to get started. His initial assignment will be to study the same tau proteins you are working with, but he will be looking at how small drug molecules interact with the proteins to alter their properties.

Since there is considerable overlap between your projects, Josh ask you to watch over Ethan as he settles in, show him how to use the core equipment, introduce him to the departmental staff, etc.

One day, you are having lunch with Fiona, a close friend and the sole student in Dr. Pashtan’s lab down the hall. She expresses pessimism over your assignment.

“I don’t trust Ethan,” she declares. “At orientation he acted as if he already knew everything. He seems really arrogant and driven for success. I’d be worried with someone like him studying the same questions as me. You watch, he’ll try to steal the credit. The worst thing to have in graduate school is a dissertation that doesn’t demonstrate you are a strong independent researcher.”

Tasks:

* Discuss your understanding of how the lines of authority work in this lab, and your project group. As a late second year graduate student, should it be your responsibility to train a new member of the group?
* Put yourself in the position of Dr. Mason, Josh Stanley, and Ethan. What do you imagine are the expectations and responsibilities each of them has for this group?
* Suppose Fiona is right. Within a team-centered group, how much overlap in research between you and Ethan is reasonable and appropriate? How can you establish your credentials as an “independent researcher” in a team-centered lab such as this one?

**SESSION #1**

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**20 minutes**

Scenario, continued:

It is 6 months later, and it’s been a long 6 months for you. You’ve spent considerable time helping Ethan and established a decent working relationship with him. Yet everyone else has ostracized him because he is not the best team member. He prefers to work late into the night, and people arriving in the morning find experiments strewn across shared lab spaces. If someone touches his samples left on common equipment, everyone has to endure his loud outbursts of objection.

Both the lab manager and Josh, your team leader, have repeatedly told Ethan to clean up the shared work areas and the common-use equipment. Ethan claims that it is the lab techs’ job, not his, to clean up any mess. The university’s mass spectroscopy lab flatly refuses to accept or process his samples anymore because they continually clog up the equipment. Ethan accuses them of messing with him experiments on purpose.

Furthermore, Ethan now refuses to present his results at lab meetings. He claims it is an unfair practice because, “everyone can use any of my data they want in support of their papers, but I don’t get to use theirs!” No one in the project group sees any of his results now; he shows them only to Dr. Mason. Besides, because lab meetings always start at 8:30 am, they are “too early for my late hours.”

Dr. Mason seems pleased with Ethan’s results and says he is making excellent progress. Everyone else imagines that Ethan probably exaggerates his progress with Dr. Mason, and may be maligning other lab members during these one-on-one sessions.

You defend Ethan to some extent to your lab mates, explaining that he learned very quickly how to perform several complex assay that are producing excellent results. In addition, Ethan has always seemed willing to work with you personally.

Tasks:

* Does Ethan have any obligation to keep the laboratory clean?
* Does Ethan have any obligation to share his results with others in the group?
* If Ethan is producing good results, is it still necessary to address his inability to work collaboratively with the group?
* Whose responsibility is it to address dynamics of working relations in a lab group? Should you get involved in all this? If so, how?
* Put yourself in Dr. Mason’s place for a minute. Suppose you observed all of Ethan’s behavior firsthand. How would you as the faculty director manage or resolve a conflict like this between a grad student and other lab members?

**SESSION #1**

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**20 minutes**

Scenario, continued:

A few days later you decide to ask Dr. Mason for advice regarding Ethan. She tells you she has seen firsthand how Ethan does not work well with the other lab members.

“I am going to tell Ethan that he has to try much harder to work with others in the lab. I cannot let him undermine our lab’s overall collaborative spirit. But in his defense, he has identified several small molecules that alter how tau proteins assemble.” Dr. Mason then suggests that you should use Ethan’s results and assays in your own dissertation research. “It will save you six months, at least.”

Dr. Mason continues, “Ethan has complained to me that many of our expectations for his behavior are in fact ’unwritten rules’. This may be a good time to formalize our expectations for team research and collaboration, because we are getting ready to start a very important collaboration with Dr. Livan Hernandez in Miami, that will impact both your project, and Ethan’s.” She goes on to explain how this will give you access to new reagents, high-level technical expertise, and a very high profile of recognition for your work. Wow! This is big news.

“In the meantime, it'll be important for you to continue keeping Ethan out of trouble. You get along so well with him. We can probably recruit other new grad students to work on questions that spin off from things that your project develops. OK? I have to talk with Ethan now.”

You can’t wait to relate this conversation to your friend Fiona. At first she is excited about this opportunity but she practically goes into heart failure over the suggestion for you to continue shepherding Ethan. “Are you crazy? I told you he was bad news! Don’t sacrifice your own career to baby-sit Dr. Mason’s problem child.”

Tasks:

* Put yourself in Dr. Mason’s place. What would you say to Ethan during your meeting, particularly about working better with the whole lab team?
* Put yourself in Ethan’s place. What are his concerns? What justifies his thinking?
* Suppose Ethan fails to improve his relationships with the team. What then?
* What topics, expectations, or issues should be covered by “ground rules for collaborating with a project working group”? Should these same rules apply to collaborations with another department or groups at another university?
* Where might you find resources or guidance for professional collaboration standards?

For Session 2, prepare the following:

As a group, decide which of the guide resources you identified on the previous page would be the most valuable. Divide them up among the group members. Over the break, each group member should explore the resource guide they chose (or the group assigned to them). Try to find out what the standards and expectations of your field’s professional community are for collaborative work. (Do not be surprised if there are different standards between biology, chemistry, and physics, or between subdisciplines.)

Next week, come prepared to give a short summary of what you learned about professional expectations for collaboration in your discipline. This is not a written assignment; you will expand on the information you identify next week.

***To turn in by Monday at 12 noon:***

Each student should write a 1–2 page letter to Dr. Mason formalizing the expectations and ground rules for collaboration:

* Within a team research setting, and
* Between two independent research groups collaborating from different institutions.

Explain your rationale and support your rules as needed by appealing to principles and norms for science. Document your sources. Be prepared to share your ground rules with the group in Session 2.

**STOP**

**End of Session 1.**

# Case 2: Team Work

**SESSION 2**

**Page 1**

**40 minutes**

Beginning Tasks:

Each group member should take 5-6 minutes to report to the group: 1) the general expectations of their professional community for collaboration, and 2) the ground rules for collaboration they proposed in their letter to Dr. Mason. If needed, have one group member act as scribe and record each person's major points.

Assemble a consensus list of essential rules for the class. Are there specific rules that would be different when collaborating with another group, at a different department or university? If there is time, prioritize your principles, rules, and policies.

Complete this task before going to the next page.

**SESSION #2**

**Page 2**

**20 minutes**

Scenario, continued:

It has been quite a year since your private talk with Dr. Mason. Whatever she said to Ethan seems to have worked a miracle. To everyone’s relief, he seems to realize that it is better to work with the support of an existing project group than in isolation, and agreed to let you use his small molecule assays and data. Sure, some days in the lab are still tense. The lab manager still complains that Ethan is messy and disorganized. But at least he is coming again to lab meetings, and is sharing his results.

Your own work has gone wonderfully. Having Ethan’s materials has allowed you to spend more time measuring protein expression and other markers.

The collaboration with the Hernandez lab in Miami is well underway. Dr. Mason has asked you to be your lab’s liaison between the two groups. Up to this time, the Miami collaboration has not been discussed openly in lab meetings. You are not really sure if Ethan even knows about it. He hasn’t been copied on the emails, nor has he participated in any of the conference calls with Miami.

One afternoon you ask Dr. Mason why Ethan is being left out of any discussions of the collaboration. She tells you in confidence that, because of Ethan’s past behavior, it is best that he not work directly with the Miami group for now. “While Ethan’s work certainly is relevant to our collaboration, his data are fact part of my laboratory’s overall work. I have the responsibility to put the best teams together, to keep everything moving forward.”

Tasks:

* As the graduate student at the center of this story, how do you feel about this arrangement?
* Put yourself in the place of Dr. Mason; based on what you learned from your outside research, are you right to exclude Ethan from an important outside collaboration using his construct. Why or why not?
* Put yourself in the place of Ethan; how would you feel about this arrangement if you knew?

**SESSION #2**

**Page 3**

**20 minutes**

Scenario, continued:

Two months later, everyone is attending the national ASEC meeting in San Diego. You meet up with Justine Seller, the Hernandez group postdoc who is your direct contact for your collaboration. Justine tells you that she talked with Ethan Tompkins for the first time at his poster earlier that morning.

“I saw his poster in the abstract book and I stopped to ask some specific questions about his small molecules. At first, he seemed pleased to have this attention, probably because he knew of my connection to Dr. Hernandez. However, I rather innocently happened to refer to our collaborative work using them, and Ethan just went ballistic! His anger initially focused on me, but then he began ranting and raving about you and Dr. Mason.”

Justine declares, “You are a saint to work with that man. I can see why Dr. Mason never let us meet him.”

Stunned by this news, you email a warning to Dr. Mason. Fortunately, this has occurred on the last full day of the meeting. You get some emails from Ethan, but don't even want to open them until you get back to the lab.

Tasks:

* What should you do at this meeting?
* Put yourself in the place of Dr. Mason. What should she do now?
* What do you think Ethan will do?

**SESSION #2**

**Page 4**

**20 minutes**

Scenario, continued:

Monday morning. Before you can even hang up your coat Ethan spots you.

“You are despicable! I’ve lost all respect for you as a colleague. I know that you've been telling everyone how I'm so hard to get along with, so now you steal my reagents and give them to a competitor.”

Ethan has apparently taken it as a personal affront and is deeply hurt. He trusted you, and thinks you deceived and betrayed him, just to get ahead.

You try to counter, that if anyone is at fault, he is. “Everyone calls you 'Ethan-the-Tantrum' behind your back. Why do you think that is? Your temper and inability to get along with anyone is a liability to yourself and the lab. I’ve been doing you a favor for the last two years, trying hard to get along and put up with you, when one no one else will. Dr. Mason has just been protecting our research reputations.”

Dr. Mason walks in at that moment. Ethan sees her but doesn’t let up. “Go ahead try to throw me out of the lab, I’m filing a complaint with the graduate dean because you all stole my reagents without my knowledge, stole my research ideas, and now you’re squashing my career.”

Tasks:

* Discuss each of the following questions:
  + Are any of Ethan’s claims valid?
  + Where does real responsibility lie with for oversight of Ethan and his work?
  + Does Ethan’s threat to file a compliant with the Dean have any merit?
* Who has legitimate ownership of reagents and/or project concepts that come out of Dr. Mason’s group?
* Think back over this entire case.
  + What might you have done differently to change the outcome?
  + Would adoption of your group’s rules for collaboration have reduced the chances of this event happening? If not, what other rules for collaboration need to be added?
* Put yourself in Dr. Mason’s position.
  + What should be done at this point to rectify the situation?
  + What will you say to both students?
  + What will you say to Dr. Hernandez, when he hears about Ethan's tirade from Justine Seller, his postdoc?

**Session 2, Debrief**

**10 minutes**

**Debriefing the Case**

* In your small group, decide what you think the main learning objectives for this case were.
* Compare your group’s list with the learning objectives of the other groups. How did your group do?
* Compare the class list of objectives with the list the facilitator provides you. How closely do they match? If they do not match well, what could your group do differently next time to improve how it functions?
* As a class or in your groups, discuss any other ways the group process be improved.

**For Instructors**

**Learning Objectives of this Case**

The students will be able to:

1. Explain generally accepted principles of good lab etiquette for their discipline.
2. Describe how laboratory management structure, particularly independent versus team research, influences individual responsibilities
3. Gain insight into responsibilities of other members of a research team by assuming various roles.
4. Contrast the goals and expectations of individual work versus the team’s work.
5. Recommend appropriate strategies for collaborative research, within a lab group, between labs, and between research programs at different institutions
6. Identify and assemble professional guidelines based on accepted resources, then collaborate with team members to assemble a consensus summary.
7. Demonstrate moral sensitivity by looking at a situation from multiple perspectives.

**RCR Topic:** Collaboration

**Principle of Practice:** Research Freedom & Scientific Community

**Virtue:** Excellence, Accountability & Respect for Colleagues

**Aspects of moral reflection in the case:**

Questions and tasks focus on *moral sensitivity* and *moral commitment*. Role playing is used to explore obligations (moral commitment), and then asks students to step into the scenario circumstances, from the perspectives of other team members, in order to gain insight into the interests and needs of others (moral sensitivity).

**Session 1**

**Synopsis**

Students are placed as a 2nd year graduate student in the successful university-based research lab of Dr. Candice Mason. The student is placed on a team lead by a 4th year postdoc Josh Stanley with another postdoc, technician and 5th year graduate student. Later a new graduate student, Barbara Tompkins is assigned to the 2nd year student to train. Barbara proves to be a difficult person, that most of the group ultimately ostracizes for messiness and selfish behavior. She is tolerated by Dr. Mason because she is productive and because her project is a favored interest of Dr. Mason.

Dr. Mason permits Barbara to report directly to her, which the rest of the group interprets as a sign that her productivity gains her unique privileges in spite of her poor skill at working with others. Dr. Mason reiterates to the 2nd year student her confidence in Barbara’s work, yet she realizes that Barbara is difficult to work with and that this may reflect poorly on the laboratory. Dr. Mason chooses to overlook Barbara when establishing an outside collaboration with Dr. Hernadez’s lab - a very prominent group at another university. The student is asked to be the Mason lab liaison in the collaboration with the Hernadez group.

**Discussion Points:**

Start the discussion on the advantages and disadvantages of various styles of laboratory management.

* A useful contrast is presented in the form of Evan, a close confidant of the 2nd year student, who works alone and independently with a different faculty advisor. Explore how expectations can be quite different when working on *my project* versus *team collaboration*.
* Use this as an opportunity to discuss with your group the challenges they may have had and then (gently) discuss strategies to work more effectively within various management styles.

Discuss your group’s understanding of lab etiquette and how it affects co-workers.

* Barbara highlights a worst case scenario of a work relationship totally lacking in lab etiquette. For example, Barbara shows no respect for how her approach to common use equipment and lab space affects her co-workers.

This scenario highlights a prevalent management style of some labs—a sort of *hands off* approach with co-worker relationships e.g. allowing the lab members (particularly students) to fight their own fights.

* Explore how this style can affect a collaborative environment.
* You can ask the students to comment on the types of management style they have observed, or what they prefer and why.

The questions promote moral sensitivity (i.e. seeing the situation from other’s people’s perspective). For example, the group is asked to identify with the student, with Dr. Mason, and with Barbara. Involve your group in speaking for each character.

* If your group seems to rest too comfortably on one side of an issue, advocate the other perspective. Emphasize trying to “see the other perspective” at each step.
* You can promote provocative discussion: “Is Barbara wrong to…….?” or “Should Dr. Mason have said …….?”
* After someone has stated the case from one perspective, for example as Barbara, probe the ability to see things from other perspectives by asking, “if you were Dr. Mason, would you be comfortable living with what Barbara suggested?”

An interesting observation will be if your group’s opinions start to change as the tension builds or as the stakes rise. Is what seemed like a good idea initially (“They’ll get over it.”) an acceptable strategy later on? This is an intentional component of our case design, to illustrate how small, seemingly innocuous problems can expand into unavoidable challenges. A successful manager recognizes and eliminates molehills before they become mountains.

**Assignment for Session 2:**

Each student should write a 1–2 page letter to Dr. Mason formalizing the expectations and ground rules for collaboration within a team research setting, and between two independent research groups collaborating from different institutions. They should explain their rationale and support their rules by appealing to principles and norms for science and documented sources.

The quality of the written assignment may not be as important as the use of it as a means for accountability that a student has actively sought information about the topic area. Discuss as a group where good content information may reside, such as professional organizations, journals, funding sources, the Office of Research Integrity, the Office of Research at Wake Forest or other schools, books, articles, etc.

**Session 2**

**Reporting on the Assignment:**

* Have each member report to the group his/her findings.
* Next, have your group explore and develop consensus ground rules that are necessary for conducting successful collaborative research.

As the case unfolds, refer to the consensus list to see if it might have helped avoid some of the scenario’s pitfalls.

**Scenario:**

As the case continues Barbara’s attitude and team approach have improved, and her work is productive. However, Dr. Mason continues to keep her out of the collaborative loop, and assigns the student to handle collaborations with the Hernandez lab.

The scene shifts to a national meeting where Barbara learns through an encounter with someone from Dr. Hernadez’s lab that her boss has been collaborating with them on a project related to her work. Our student tries to avoid a confrontation and emails Dr. Mason. Barbara feels that she was required to play by “collaboration rules” within her group, yet the standards were broken by ignoring her contribution as they collaborate with an outside group. Barbara confronts our student and Dr. Mason, declares that her life is ruined and threatens action.

**Discussion Points:**

Use the case to discuss:

* *Ownership of projects-* How much of the project concept belongs to a student? You might also discuss ownership of projects after someone leaves the lab. How do you split ownership in a collaboration?
* *Collaborating with other groups-*Are the expectations the same or different for collaborations outside the laboratory group. Does it make a difference if the group is in the same institution, a different one, in a different scientific field?
* *Confronting others-* What can your students learn about effective ways to confront others as well as how to deal with someone who is confronting you.

Compare the consensus list of ground rules for successful collaboration with this scenario.

* If you hear comments like, “Dr. Mason should never have….” or “You could never trust the old Barbara to stay hidden forever” follow up by asking the group to describe *where* something should have happened, or to analyze *why* the earlier situation was misjudged.
* Discuss how to move forward from here. What are Barbara’s real needs? What is Dr. Mason feeling about now? What’s her best course of action? What might Dr. Hernandez be thinking? Can our student do anything?
* Discuss whether the rules your group suggested for best collaborations might have helped avoid the scenario that played out. Should your group’s rules be modified now?

The story is purposely unfinished to maintain pressure on student involvement. Perhaps there is no pleasant resolution, but professionals learn from their mistakes and craft a way forward.

**Debriefing**

The debriefing activity reinforces the 1) expectations for course, 2) “concrete” learning objectives, 3) what skills students are acquiring, and 4) the importance of the course.

Debrief on learning objectives and group process.

**Learning objectives**

Ask the students to discuss what they think the learning objectives for the case are.

* Why are these important to professional development? Compare their answers with those for the case.
* Did they have other issues that should be learning objectives for the case? If they missed the learning objectives, have them discuss why that happened.

Ask the students if moral sensitivity, i.e. see the situation from other people’s perspective is useful? Why or why not.

* Why would being able to see things from other people’s perspective be useful for professional development and/or ethics?
* How difficult is it to accurately see things from other people’s perspective?

**Group Process**

Spend some time considering group process and if the group improved from the last case.

* What are the expectations for good group functioning, what are value-added behaviors and contributions, and what are undesirable behaviors specifically?
* What are additional areas that the group needs to improve on?
* Remind the students that in all likelihood most of their professional life will be working in groups. Therefore this aspect of the PBL format is an important professional skill. Gaining the skills to work productively in a group, even with those that are hard to get-along with, is essential to succeed in science.

**Grading**

Reminder, conduct a brief evaluation of each student after Session 2, using the electronic scoring sheet. Prepare one product from both facilitators. The grades should be posted for the student to see. Use the comments sections to suggest areas where the student can improve and/or what their strengths are.

Remind the students to discuss with you any area that they do not agree with your assessment. Give them suggestions for how to improve.

**Resources for this Case:**

* Office of Research Integrity (ORI) division of the Department of Health & Human Services and their [website](http://ori.dhhs.gov/) is rich in resource material. The section on collaboration is: <http://ori.dhhs.gov/education/products/rcr_collaboration.shtml>
* The [Roadmap Initiative](http://nihroadmap.nih.gov/initiatives.asp) of the NIH emphasizes development of collaborative, interdisciplinary research teams for the future, has some useful materials on the proper conduct of collaborative science.

Some resources that were identified by former students:

*Guidelines for Negotiating Scientific Collaboration*, that lists several issues to be considered when forming collaborations (N.R. Smalheiser et al., PLoS Biology, 2005).

**1-** No Author, *Collaboration and Credit*, Retrieved on November 15, 2006 from

<http://www.onlineethics.org/reseth/appe/vol3/collaboration-c1.html>

**2-** NC State University, *Research Ethics Modules*, Retrieved on November 15, 2006 from <http://www.fis.ncsu.edu/grad/ethics/modules/index.htm>

(resources for the collaboration expectation came from Cornell University

<http://www.biotech.cornell.edu/pdf/Collaboration_Guidelines.pdf> Nov. 2006)

Raza, Mohsin. Collaborative Healthcare Research: Some EthicalConsiderations. *Science and Engineering Ethics (2005)* ***11****, 177-186*

1: Effective Communication

2: Setting Baseline Goals and Objectives

3: Sharing and Assigning Responsibilities

4: Setting Up Future Milestones for the Project

5: Rules and Norms for Sharing and Handling Data

6: Writing and Publishing Together

7: Disclosing and Settling Financial Interests

8: Informing Each Other and Following Rules and Regulations

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