



RUTGERS

Effective Mentoring of Undergraduates

PLEASE SIGN IN ON GOOGLE FORM IN CHAT



Janet Alder, PhD
Evelyn Erenrich, Ph.D.
Xenia K. Morin, Ph.D.

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virtual by Zoom
Rutgers University

Introductions

- Janet Alder (PhD in Neuroscience)
– janet.alder@rutgers.edu
- Evelyn Erenrich (PhD in Chemistry)
– erenrich@grad.rutgers.edu
- Xenia Morin (PhD in Biochemistry)
– xenia.morin@rutgers.edu



Effective Mentoring for Undergraduates Learning Goals

Attendees will be able to:

- 1) Define what mentoring is and the different kinds of mentoring
- 2) Discuss practical ways to mentor an undergraduate
- 3) Actively analyze case studies
- 4) Develop follow-up plan of action / sign up for Microbadge

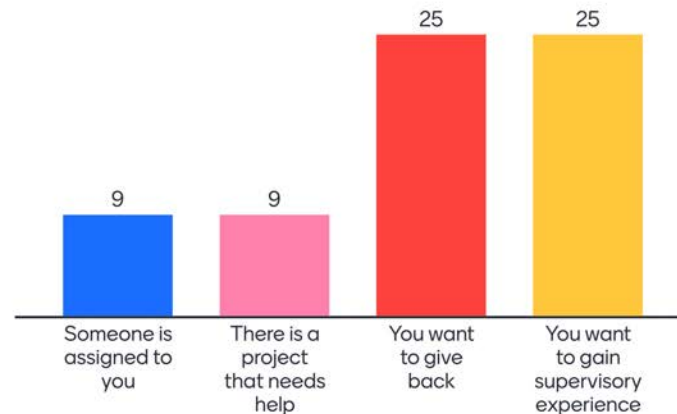
What is the primary reason you choose to mentor an undergraduate in research?

- Someone is assigned to you
- There is a project that needs help
- You want to give back
- You want to gain supervisory experience

Go to www.menti.com and use the code **1575 2321**



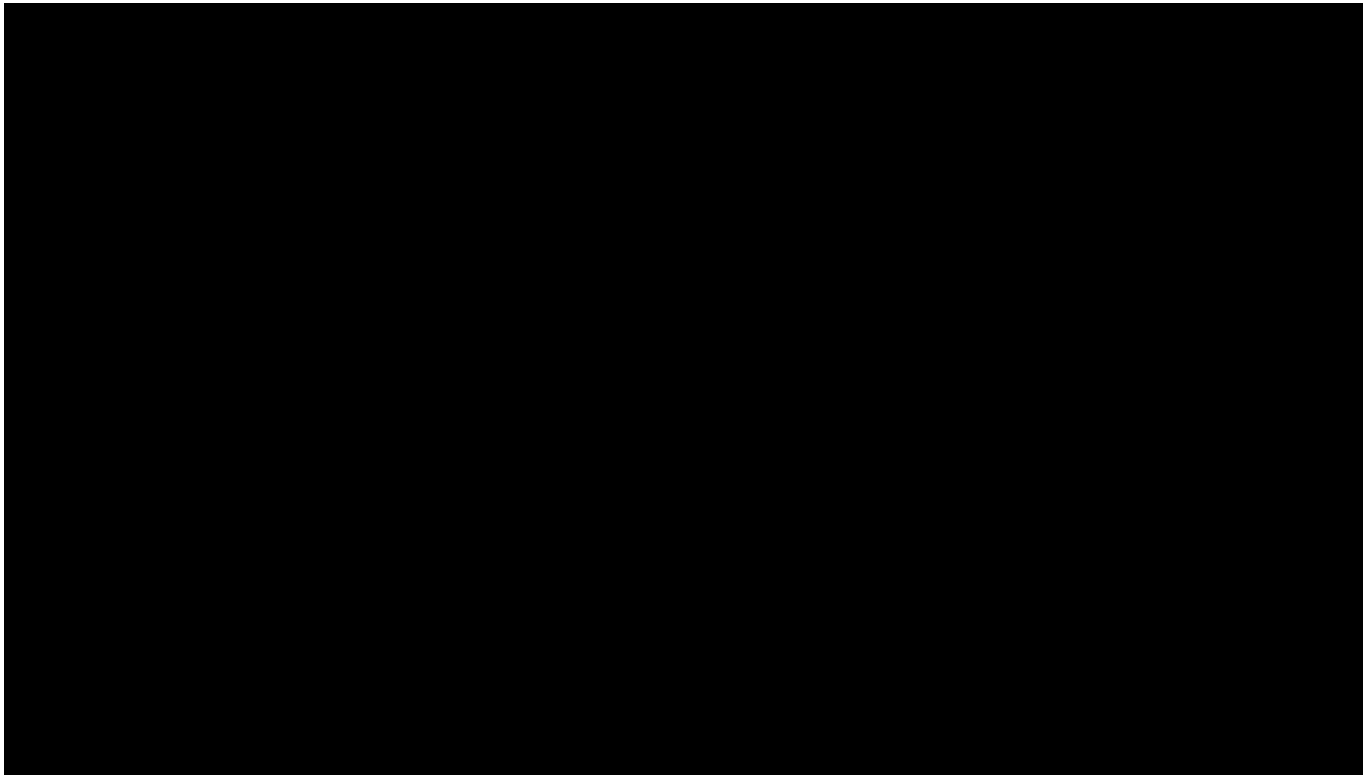
What is the primary reason you choose to mentor an undergraduate in research?



Mentor Defined

- A mentor is a person, often more experienced, who can serve to offer training, advice, and guidance, through discussions, and through interest in the mentee's goals and experiences.
- An effective mentor builds a two-way relationship with a mentee over the long-term based on trust.
- To an undergraduate, a mentor can play a critical role in shaping the experience.

Video: <https://vimeo.com/336213022>



Small Group Discussion in Breakout Room for 10 min

- Introduce yourself
- What challenges might you face when mentoring undergraduates?
- What principles are important in mentoring relationships? Each group will report top 2 principles so pick a representative to type responses
- Ground rules for breakout rooms



Word cloud

Go to www.menti.com and use the code 5613 0319

What principles are important in mentoring relationships



What principles are important in mentoring relationships?

1. Aligning Expectations
2. Promoting Professional Development
3. Maintaining Effective Communication
4. Assessing understanding
5. Mentee Self-Efficacy
6. Addressing Diversity
7. Fostering Independence
8. Navigating Mentoring Networks

Mentoring Contract



Template pasted in chat

Undergraduate Mentee Contract*

* Adapted from Branchaw, J. L., Pfund, C., and Rediske, R. (2010), *Entering Research: A Facilitator's Manual: Workshops for Students Beginning Research in Science*, Chapter 2 Aligning Expectations, W.H. Freeman & Company

Undergraduate Mentee:

Graduate or Postdoc Mentor:

This contract outlines the parameters of our work together on this research project.

1. Our major goals are:

A. Research project goals:

B. Mentee's personal and/or professional goals:

C. Mentor's personal and/or professional goals:

2. Our shared vision of success in this research project is:

3. We agree to work together on this project for at least _____ semesters.

4. The mentee will work at least _____ hours per week on the project during the academic year, and _____ hours per week in the summer.

The mentee will propose his/her weekly schedule to the mentor by the _____ week of the semester.

If the mentee must deviate from this schedule (e.g., to study for an upcoming exam), he or she will communicate this to the mentor at least _____ (weeks / days / hours) before the change occurs.

5. On a daily basis, our primary means of communication will be through (circle):
face-to-face / phone / email / text

6. We will meet one-on-one to discuss our progress on the project and to reaffirm or revise our goals for at least _____ minutes _____ time(s) per month.

It will be the (mentee's / mentor's) responsibility to schedule these meetings. (circle)

In preparation for these meetings, the mentee will:

In preparation for these meetings, the mentor will:

1. Aligning Expectations

- Setting clear relationship expectations
- Goals of project
- Estimating mentee ability
- Enhancing mentee skills

Suggested discussion:

- Ask why they want to do research
- Determine prior background and skill set of undergrad and tailor project accordingly
- Give background reading, explain repeatedly, and be wary of jargon
- Teach how to critically read the literature
- Explain what skills will be learned
- Discuss what success in this research experience look like to each of you
- Explain policy for authorship on posters and papers

2. Promoting Professional Development

- Helping network effectively
- Setting career goals
- Helping establish a work/life balance
- Helping mentees acquire resources

Suggested approaches:

- Bring them to seminars and introduce them to other scientists
- Help them explore career options and create an Individual Development Plan
- Assist with writing recommendation letter
- Understand that exams or personal issues may require time off from lab
- Ensure they have lab safety including Covid protocols, CITI training, IRB approval, IACUC training, and access to buildings
- Make sure that all resources and materials etc...are ready and available for their experiments

3. Maintaining Effective Communication

- Active listening
- Providing constructive feedback
- Developing a trusting relationship
- Accommodating communication style

Suggested discussion:

- Be a good listener. Ask how they are doing and if they need anything.
- Explain the communication structure between undergrad, grad student, postdocs and PI
- Discuss what is the preferred mode and frequency of communication
- Discuss the expected schedule
- Discuss how the results be documented
- Provide timely feedback on funding proposals, end of semester papers, honor theses, powerpoints etc... and explain your expectation of lead time to receive these items

4. Assessing Understanding

- Setting research goals
- Developing strategies to meet goals
- Assessing mentee knowledge and comprehension

Suggested approach

- Discuss with PI who will decide project and how much responsibility you have in mentoring
- Ensure undergraduate can
 1. explain rationale (big picture)
 2. state background for project (previous studies)
 3. state hypothesis
 4. explain why chose this technique and how it works
 5. explain steps in protocol
 6. explain how data is analyzed
 7. explain interpretation of data analysis
- Implementation: weekly meetings where one of the above aspects is reported out in in-person meetings or else videotaped and shared
- If problems persist what could be underlying the issue and how would you handle?

5. Mentee Self-Efficacy

- Motivating mentees
- Building confidence

Suggested approaches:

- The goal is to give them confidence that they can do some or all of the work by themselves
- Help them see the joys of research but understand that not everybody wants to get a PhD. How to motivate pre-meds is that cure could help hundreds of patients
- Teach them to accept that failure is OK and that we learn from these mistakes. If you screw up, speak up
- Don't put undue pressure to get positive results and enforce that negative results are still valuable

6. Addressing Diversity

- Considering differences may impact expectations
- Accounting for biases and prejudices
- Accounting for different backgrounds of mentors and mentees

Suggested approach:

- Be aware of unconscious bias - Refers to a bias that we are *unaware of*, and which happens outside of our control. It is a bias that happens automatically and is triggered by our brain making quick judgments and assessments of people and situations, influenced by our background, cultural environment and personal experiences
- Be aware of imposter syndrome
- Be culturally sensitive
- Be aware of microaggressions
- Be aware of first generation and college readiness
- Send to CAPS if anxiety is high

What to Do If a Student Shows Signs of Depression or Anxiety

There are professionals who can help our students in the case of more serious concerns.

Be direct with your concerns. Tell them what you are seeing that has you worried.

Helpful responses:

- Listening
- Conveying an understanding
- Expressing that you care
- Normalizing what they are feeling
- Validate the student's experiences and talk to them about helpful resources such as Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS) <http://health.rutgers.edu/medical-counseling-services/counseling/>
"Share-A-Concern" <http://health.rutgers.edu/do-something-to-help/>
"Everyone needs help sometimes."
"It sounds like you are dealing with a lot, it might be helpful to have someone to talk with."

Unhelpful responses:

- Judging
- Minimizing
- Implying what they are feeling is their fault

7. Fostering Independence

- Simulating creativity
- Acknowledging mentees' professional contributions
- Negotiating path to independence

Suggested approaches

- Discuss what level of independence is expected
- Encourage them to formulate questions and try to answer them themselves before asking you
- Teach excellent note taking and lab book maintenance
- Agree on how much practice they will need
- Have them watch you several times, then you watch them, and finally they do on their own while you are available for questions
- Have them teach someone else
- Analyze outcomes and have them do it in parallel to see if get same outcomes
- Create a reasonable timeline – make daily task list until they can do it for themselves
- Encourage creating check lists for protocols and locations
- Require “what did you learn this week and how” reports
- Some situations involving undergraduates require mentoring up from grad student to PI

8. Navigating Mentoring Networks

- Coordinating with other mentors

Suggested approach:

- Encourage trainee to find other mentors
- Be aware of other mentors that the trainee may have
- Discuss with those mentors if they have differences in approaches
- No single approach is correct and trainees may benefit from various perspectives



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Case Study #1: “Ready Mentee”

Case study adapted from:

Entering Mentoring, revised edition, by Christine Pfund, Janet Branchaw, Jo Handelsman

Case Study #1: Ready Mentee

An experienced undergraduate researcher was constantly seeking input from his mentor on minor details. Though he had regular meetings scheduled with his mentor, he would bombard her with several emails daily or seek her out anytime she was around, even if it meant interrupting her work or a meeting. It was often the case that he was revisiting topics that had already been discussed. This was becoming increasingly frustrating for the mentor, who knew the student was capable of more independent work. The mentor vented her frustration to at least one other group member and wondered what to do.

Small Group Discussion of Case 1 in Breakout Room for 10 min – Please select notetaker and spokesperson

- What should the mentor do?
- What could the mentee do differently?
- What is one element of mentoring that is present or missing?
- What are the main themes raised in this case study and the take away? Be prepared to have a spokesperson report out.
- **NOTE WHICH BREAKOUT ROOM NUMBER YOU ARE GOING INTO AND USE CORRECT GOOGLE SLIDE**

Google slides

- <https://docs.google.com/presentation/d/1Ws80caApQzAbwZKGkd061p-GP1jxwjfUV6Www5ax3Xk/edit?usp=sharing>

Large Group Discussion of Case 1 – Spokesperson from each group

- What are the main themes raised in this case study and the take away?

Room 6

Small Group Discussion of Case 1 in Breakout Room for 10 min – Please select notetaker and spokesperson

•What should the mentor do?

- Encourage note-taking
- Establish boundaries; clarify meeting times and availability
- Refer back to mentoring contract
- Build mentee confidence; affirm them!
- Ask for mentee feedback; something else they need to make the relationship work for them?

•What could the mentee do differently?

- Direct questions to other people in the lab
- Ask for clarity about their schedule and expectations
- Maintain list of questions and save for planned meeting

•What is one element of mentoring that is present or missing?

- Boundaries are missing

•What are the main themes raised in this case study and the take away?

- Set clear boundaries and reinforce them throughout mentoring experience

Room 10

Small Group Discussion of Case 1 in Breakout Room for 10 min – Please select notetaker and spokesperson

- What should the mentor do?
 - Connect other lab members with the mentee to provide teaching model
 - Set clear boundary (e.g. if in meetings, need to be focused, set specific meeting times)
 - Coming back to the contract
- What could the mentee do differently?
 - Focus on trying to work independently
 - Create a list of questions
 - Ask for regular appointment, get a sense of how regular appointments can be made
- What is one element of mentoring that is present or missing?
 - Clear boundaries/expectations, lab structures or “scaffolding” (e.g. create whiteboard for questions, shared calendar)
- What are the main themes raised in this case study and the take away?
 - Communication, expectations, accountability, independence



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Case Study #2:
“The Sulky Undergraduate”

Case study adapted from:
Entering Mentoring, revised edition, by Christine Pfund, Janet
Branchaw, Jo Handelsman

Case Study 2: The Sulky Undergraduate

A graduate student was assigned to mentor an undergraduate student, Deja, who came from a local small undergraduate college for the summer.

Because the professor and the graduate student did not think Deja had sufficient background for a more complicated project, a more basic project was chosen.

The graduate student explained the project to Deja and taught her some basic techniques and approaches needed for the project.

The Sulky Undergraduate (continued)

Deja was very quiet for the first 10 days of the project, and then she went to the professor and complained about the project. Deja said she wanted a project "like Michael's."

Michael was a student with a strong disciplinary background, and his project was much more advanced. The professor insisted that Deja keep the project that was designed for her, but she became sulky.

As the summer went on she didn't get much of her work done, and the graduate student mentor began to wonder if Deja understood what she was doing or even cared.

Small Group Case Study 2 Discussion in Breakout room for 10 min - Please select notetaker and spokesperson

- What kind of conversations regarding expectations might have been helpful early in this relationship?
- What kind of conversation would be helpful once the student asked for a different project? Who should be involved in this conversation?
- Try a role play between the grad student and the undergrad in your small groups.
- What are the main themes raised in this case study and the take away? Be prepared to have a spokesperson report out.

Google Slide

<https://docs.google.com/presentation/d/1e85rsLyW478yrip4L9WODILmyEp3kjm6z5arusqAEd8/edit?usp=sharing>

Large Group Discussion of Case 2 – Spokesperson from each group

- What are the main themes raised in this case study and the take away?

Room 12

Small Group Case Study 2 Discussion in Breakout room for 10 min -
Please select notetaker and spokesperson

- What kind of conversations regarding expectations might have been helpful early in this relationship?
 - *Have a discussion re: what does the student know*
 - *Background does not equal potential*
 - *Present multiple potential experiments to the student and hear their input/preference*
 - *Discuss general expectations: student's career goals, milestones, what would they like to get out of the experience*
 - *Mentor could be clearer on what is research: repetitive in nature, involves failure, projects are collaborative*
- What kind of conversation would be helpful once the student asked for a different project? Who should be involved in this conversation?
 - *Have the previous expectations been reached: do they have the skills*
 - *Active listening + respect towards the student for speaking up*
 - *Make an action plan for how to move forward*
 - *PI should be present for the chat*
- Try a role play between the grad student and the undergrad in your small groups.
- What are the main themes raised in this case study and the take away?
 - *Potential unconscious bias on the mentor's side...*
 - *Misunderstanding of the nature of research, glamourising lab work*

Room 4

Small Group Case Study 2 Discussion in Breakout room for 10 min -
Please select notetaker and spokesperson

- What kind of conversations regarding expectations might have been helpful early in this relationship?
 - Conversation with Deja about her background/experience, goals, and her expectations before designing a project (involve Deja from the beginning)
 - Role of unconscious bias on the side of the PI potentially
- What kind of conversation would be helpful once the student asked for a different project? Who should be involved in this conversation?
 - Similar to first point - conversation about Deja's input, get at root why she is "sulky" - Does she feel undermined? Does she feel her project is uninteresting? Does she understand the importance of her contribution/work?
 - More open communication: Developing trust, with Mentor backing-up Deja when talking to PI
- Try a role play between the grad student and the undergrad in your small groups.
- What are the main themes raised in this case study and the take away?
 - Self-efficacy, communication

What do you plan to do? Self reflection

- Write down a few approaches you will now use when mentoring undergraduates that you have not used before.



Optional follow up activities to earn Microbadge in Mentoring Undergraduates

You will be invited to Canvas site

1. Write a reflection on your mentoring style
2. Modify and personalize undergraduate contract
3. Take the implicit bias test <https://implicit.harvard.edu/implicit/takeatest.html>
4. Plan your first meeting with a new undergraduate considering how you may adapt your style if they come from a different background than you
5. Either a) compose an original case study using a situation that you have encountered with an undergraduate or b) address a third case study provided to you (The Sloppy Undergraduate)
6. Write a reflection of your mentoring experience 3 months after the undergraduate has started



What principles are important in mentoring relationships?

1. Aligning Expectations

- Setting clear relationship expectations
- Goals of project
- Estimating mentee ability
- Enhancing mentee skills

2. Promoting Professional Development

- Helping network effectively
- Setting career goals
- Helping establish a work/life balance
- Helping mentees acquire resources

3. Maintaining Effective Communication

- Active listening
- Providing constructive feedback
- Developing a trusting relationship
- Accommodating communication style

4. Assessing understanding

- Setting research goals
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5. Mentee Self-Efficacy

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7. Fostering Independence

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- Negotiating path to independence

8. Navigating Mentoring Networks

- Coordinating with other mentors

Material for this workshop

- Pfund, et al. *Entering Mentoring*, revised edition.
- NRMN-CAN workshops
- Lee, Steve "Mentoring Up: Pro-actively managing your mentoring relationship by assessing and applying your strengths". Graduate Diversity Office, UC Davis, University of California. PDF Presentation ABRCMS, November 12-15, 2014.
- Hyun, S.H. et al. Re-validation of the mentoring competency assessment to evaluate skills of research mentors: the MCA-2, *Journal of Clinical and Translational Science*. 10.1017/cts.2022.381 (2022)

Q & A

