

## **Martin J. Cohn, Ph.D. Personal Statement – 2023 Doctoral Dissertation Mentoring Award**

When I accepted my first graduate student, only 2 years after obtaining my own Ph.D., I wasn't ready for the responsibility of guiding a student through graduate school. In hindsight, my perspective on graduate students was backwards. I viewed my student as someone who was there to help carry out my funded research. That perspective played a role in my being a bad mentor. Of course, I provided her with good technical training, and I taught her the importance of scientific rigor, attention to detail, honesty and integrity, and a strong work ethic. Unfortunately, having a work-life balance was not part of my consciousness. She was remarkably productive, and she published elegant papers that remain among the most highly cited papers from my lab. She was a great student, a fine person, and a gifted researcher. She left science after she completed her Ph.D.

It took a few years of reflection, and some more experience, for me to realize that my first graduate student quit science because I -- her Ph.D. "mentor" -- was so focused on the work and I pushed her so hard to be productive that I didn't give her a chance to enjoy the process, to experience the thrill of discovery, to get excited about reading and writing papers, or to take time to think and be creative. Those were the very things that made me fall in love with science. An advisor who doesn't give their graduate student the opportunity to have those experiences might be functioning as a supervisor, but that person is not a mentor.

I recognized that my first attempt at graduate student mentoring did a disservice to the student and the field, which would not have the opportunity to benefit from her contributions. I sent a letter of apology to my former student, and I radically changed my approach to graduate student mentoring. Although I began with the view that graduate students provide an opportunity to do more research, I came to realize that research provides the opportunity to mentor graduate students.

Preparing a student for a successful career in science involves educating them about all facets of a scientific career, not just technical training. Graduate school is not vocational school; it is about education and intellectual development. Most students are driven to graduate school by passion and curiosity, which leads to a desire to learn the technical and intellectual skills that will enable them to pursue their interests. Although technical skills enable their Ph.D. research, it is more important that graduate students learn how to learn, continuously, to avoid being left behind as the field advances.

I want my graduate students to know what they can expect from me and what is expected of them. In order to be transparent, I provide them with a copy of my mentoring plan, which is a program that I have developed to provide training and education in several areas that I think are important for their success. I encourage them to identify and be open about deficiencies in their knowledge, rather than being embarrassed by them, so that we can work together to fill those gaps. Learning becomes easier if we allow students the freedom to be honest about what they don't know and to view ignorance of a particular area as an opportunity to gain new expertise.

When I finished graduate school and started a postdoctoral fellowship in a new lab, I thought that being an independent scientist meant that I should not have to ask others, particularly students, for help or advice in the lab. It was a mistake that inhibited my intellectual growth. When I came to the realization that the point of postdoctoral training is to learn new skills and perspectives -- not

simply to publish papers and to land a good job -- and that I was not expected to know everything, it was liberating. I then benefitted from the expertise of other postdocs, graduate students, and experienced undergraduates. I try to help my mentees avoid making the same mistake. Therefore, we have no hierarchy in my lab because rank or seniority should not be mistaken for expertise. If a freshman undergraduate has mastered a new technique, then that student has something to offer. I want everyone to recognize that individual's expertise and to be comfortable approaching that person for help. I hope that my own practice of asking my mentees and colleagues to teach me new approaches that they have mastered will encourage my mentees to do the same. Again, being honest about what one doesn't know is essential to the learning process.

I value open and direct communication with my mentees, and I provide formal and informal opportunities for discussion. When graduate students join my lab, we meet weekly to discuss their ideas, progress, problems, and questions. These meetings focus on short- to medium-term goals, to review their research progress and results, and to help them develop their plans for the next steps. Each week, we review the goals for the past week, assess progress towards those goals, and establish the next set of milestones. As students get more comfortable with their projects and independence, we transition to monthly meetings (in addition to frequent informal/ad hoc discussions). These regular meetings are scheduled so that graduate students have protected mentoring time. My mentoring plan also includes periodic "career development meetings", in which students perform a self-assessment, receive feedback from me, discuss any obstacles to progress, provide me with feedback on the training that they are receiving (or want to receive), and to determine action items that will help them to achieve their career goals.

In addition to practical training in the lab, I place heavy emphasis on my mentees' progression towards independence. To this end, I include them in the range of activities that goes into being an academic scientist. While they develop their own projects, I encourage them to apply for independent funding and awards. This provides several training opportunities, including how to develop specific aims and hypotheses, design experiments, and respond to peer reviews. To teach them how peer review works, I invite them to co-review manuscripts and grant applications with me. I also encourage them to identify meetings and conferences where they can present their work and develop professional relationships with others in the field.

To help my graduate students learn mentoring skills, I use a tiered mentoring system, in which graduate students supervise undergraduate research students. The goal is for them to learn how to mentor while they still have the safety net of their own mentor. I help them to work through issues ranging from personnel management to study design. I am also very frank about the importance of mental health, which involves sharing my own personal experiences and fostering an environment of trust, so that they feel comfortable coming to me if they are struggling or need help.

In summary, my approach to mentoring graduate students recognizes that they are students and colleagues. My goal is to provide them with a solid foundation for continued intellectual and personal development throughout their careers. My role as a mentor does not end when they graduate. I remain available to my mentees for professional advice, to provide comments on papers and grant proposals, to send professional opportunities their way, and to be a sounding board for their ideas or problems. Working with smart, creative, and passionate graduate students continues to be the most rewarding part of my job.