

Mentorship in Graduate Education

BY MAUREEN ESTEVEZ

The first time I entered the Cornwall lab at Boston University School of Medicine, I was overwhelmed. Racks of electronic equipment filled the room. Microscopes, chemicals, and optical gear bordered every open space, while wires branched through the lab like roots seeking water. Dr. M. Carter Cornwall, the PI (principal investigator) and my future “boss,” was giving me a tour of the lab. He was telling me something about one of the monster microscopes, but I wasn’t listening to him. All I could hear was my own inner voice, saying, “I don’t belong here; I am completely inadequate for graduate-level research.” Despite my straight-A record, full scholarship, and other academic accolades, I was convinced that I was an imposter and that

BU had somehow made a big mistake in accepting me into the Ph.D. program.

Dr. Cornwall apparently sensed my apprehension and reassured me: “Don’t worry,” he said. “Everything you see here I can teach you. It’s simple when broken down to its fundamental parts. You can learn all of it.” And true to his word, when I joined the lab a few months later, he walked me through every bit of it, teaching me with enormous patience and humor.

He spent hours in the lab with me that first year as I fumbled my way through experiments, teaching me a technique that involved about 50 steps, each of which depended upon the success of the previous one. The goal was to record tiny electrical currents from neurons isolated from the retina of a model animal (usually salamander or toad). The experiments were conducted under a microscope and in complete darkness, with a night-vision type of apparatus. It was like trying to fly to the moon, and I spent my first year in the lab failing at it over and over again. I had never failed so much in my entire life.

Dr. Cornwall knew exactly when he needed to step in and teach me and when he just needed to let me struggle. But all the while, he was completely committed to my success. He told me that while in coursework failing means you’re not learning, failing in research means you’re making progress.

Dr. Cornwall’s complete confidence in me, despite my scientific naïveté and lack of technical skill, had profound significance for my academic development. Fears of not knowing something, looking stupid, or not “fitting in” evaporated in the climate he created.

(I have since learned that these fears are shared by many graduate students—in particular, by many other young women who aspire to be scientists.) But Dr. Cornwall transformed my intimidation into excitement. My skills steadily improved; I started making discoveries and publishing papers. I presented our data at national conferences and gave talks at international symposia. Soon I was getting job offers, accompanied by remarks like, “We know how well-trained students are

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when they come out of the Cornwall lab." I couldn't believe it. I was becoming a reputable scientist!

My interaction with Dr. Cornwall transformed not only my academic development but also my ideas about the importance of mentorship in science. Prior to my relationship with him, I saw only a broken system in which graduate students were lab rats released into a giant maze with no guidance or instruction. Most seemed to have minimal interaction with their advisors—maybe a lab meeting once a week or a conversation once a month—and rarely a word of affirmation. This seemed so wrong. Graduate students are expected in the future to write papers, submit grants, give lectures, and teach research seminars, yet they are rarely trained to do any of these things.

High-quality mentorship is crucial to graduate education. Just ask any student about his or her experience, and you will invariably find yourself in a conversation about the advisor. In fact, apart from the dissertation, I

would say that the advisor-student relationship is the single unifying component of all doctoral degree programs across all academic disciplines.

If mentorship is such a powerful and ubiquitous element of graduate education, then why is it often so poorly executed? The answer may be that PIs simply don't have time. As the CEO, CFO, and COO of the laboratory, the PI is entirely responsible for the conduct, success, and future funding of the lab. Most of them work over 12 hours a day and still barely stay afloat. It's no wonder that graduate students often fall to the bottom of their very long laundry list of obligations and receive the table scraps of their PIs' time and energy. Or perhaps some PIs don't know how to give affirmation to a student, due to a lack of such encouragement during their own academic training.

So, how is Dr. Cornwall able to do it? How does he find time to put graduate students at the top of his list and still maintain a 25-year record of consistent grant funding, repu-

table publications, and international recognition in his field? I think I've discovered his secret: collaborations. Dr. Cornwall understands the immense power of building strong relationships in science. Simply put, people continue to work with people they like. The short-term loss of the time invested in students is more than compensated for by the long term pay-off in fruitful collaborations. In fact, nearly all of Dr. Cornwall's former students and post-docs have maintained some kind of collaborative relationship with him.

Dr. Cornwall's ability to empower students is uncanny. I have never seen anyone invest in and advocate for students as he has done for me and his other students. He is a model for all teachers, advisors, and PIs of how high-quality mentorship can work to everyone's benefit. I can say that thanks to Dr. Cornwall, I no longer feel like an imposter. Instead, I'm growing into a real scientist, an independent thinker, a public speaker, an educator—and, I hope, a terrific mentor to my own students someday. ☐

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