

Tips for Success: Fostering a Good Mentoring Relationship

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A mentor can mean the difference between a mentoree's failure and success. Yet mentoring is more than an altruistic venture. A good mentor will be more likely to recruit and retain strong student and postdoctoral candidates, and cultivate productive personnel. Despite these advantages, faculty often receive little, if any, mentoring training. Here, three panelists, Marianne Bronner-Fraser, Ph.D., Kathy Iovine, Ph.D., and Carl Thummel, Ph.D., share their mentoring tips. Their mentorees also articulate how these accomplished mentors helped them to grow professionally and personally. Together, their insights outline ways to achieve a productive mentoring relationship, a topic of interest to mentors and mentorees alike. *Developmental Dynamics* 239:2136–2139, 2010. © 2010 Wiley-Liss, Inc.

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INTRODUCTION

A mentor can be many things: Advisor, Scientist, Manager, Confidante, Role Model. Each is executed with the purpose of helping a mentoree to achieve certain goals. In the case of a graduate student, this may be becoming an expert in a scientific area, and acquiring the abilities to problem solve and think independently. For a postdoctoral researcher, this may include accruing a competitive publication record, formulating and furthering big-picture ideas, and learning how to be a manager. A mentor must draw upon a vast collection of skills to produce a successful protégée.

Insights from accomplished mentors can help eliminate some of the common mistakes made during a new mentor's first years, and offer fresh perspectives to the more experienced. Such information can also be useful to prospective mentorees as a guideline of what to look for in a new mentor. What's more, a mentoree may identify

desirable qualities that a current mentoring relationship lacks, and that he and his mentor can work to achieve together. Presented here are tips for achieving a fruitful mentoring relationship, as described by our three panelists and their mentorees (Figs. 1, 2).

COMMIT TO A LONG-TERM RELATIONSHIP

Akin to a marriage, mentoring is a long-term relationship that must persevere through good times and bad. The relationship will only succeed if it is based on trust and respect.

The first step toward establishing a good relationship is choosing a suitable mentoree, something for which there is no magic formula. For Carl Thummel, Ph.D., Professor of Human Genetics at the University of Utah, the decision is a personal one. "Because mentoring involves a long-term commitment, I do not enter into it lightly," he said. "Thus, in addition to the standard qualities of

dedication, creativity, and excitement about science, I am looking for students and postdocs who are friendly and easy to get along with. Part of this process involves the insights and opinions of colleagues currently in the lab, to see how they respect and get along with the person being considered."

By contrast M. Kathryn Iovine, Ph.D., Assistant Professor of Biological Sciences at Lehigh University, will typically say "yes" to anyone who asks, provided she has money and space, and makes assessments from there. "I find it easier to see students' qualities when working with them directly. If I feel that things are not working out within the first couple of months, I talk with the student about what I think the problems are, discuss expectations, and set a future date to see if things improve." Once a mentoree is chosen, it is the mentor's responsibility to try their best to help them achieve their goals.

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Fig. 1. The mentors. L–R: Marianne Bronner-Fraser, Ph.D., M. Kathryn Iovine, Ph.D., Carl Thummel, Ph.D.



Fig. 2. The mentorees. Top, L–R: Kathryn McCabe, Ph.D., Isha Jain. Bottom, L–R: Meghan Adams, Ph.D., Jason Tennesen, Ph.D., Matthew Sieber.

A trainee should select a mentor who will give them adequate support, has leadership skills they admire, values mentoree's contributions, and publishes their work in a timely manner. Iovine added, "You need to have a mentor whose advice you trust and that you feel comfortable communicating 'bad news' to. Only then can you work together to solve the problems at hand." Their ability to mentor well should be reflected by a respectable training record. "Otherwise, their advice may be suspect," warned Marianne Bronner-Fraser, Ph.D.,

Professor of Biology at the California Institute of Technology.

If successful, a mentoring relationship will become a long-term partnership. "My graduate students and postdocs tend to remain as my mentorees for years and even decades," noted Bronner-Fraser, a recipient of the Caltech Graduate Student Council Mentoring Award in 2009. "This is a natural bond that comes from working closely together."

Sometimes despite a mentor's best efforts, it becomes clear that it is best if the trainee leaves the lab prema-

turely. "There is a tendency to look to oneself and wonder if you did not do enough to engage the student," said Iovine. "Therefore, it is useful to have a set of 'markers' that you can use to decide if the student should remain as a mentoree. How often do they take initiative in moving their project forward? Do they miss important meetings with you? Do they miss lab meetings? Does the student respect your advice? Does the student respect others in the lab? Does the student set his or her own goals? If it becomes clear that the student does not have a vested interest in the success of their project, or respect for you and the lab, then it is time for them to move on to another lab or elsewhere."

LIVE BY EXAMPLE

Daunting as it may sound, mentors should consider themselves as role models in nearly every aspect of their career. Students will naturally strive to emulate a mentor's strengths, which can include anything from work ethic to attitudes. "My graduate advisor Bob Tijan [Robert Tijan, Ph.D., Professor of Biochemistry and Molecular Biology, University of California, Berkeley] is a role model I continue to respect and learn from. He was in lab all day, every day, when I was a graduate student. We spent hours looking over data, talking about results, and designing the next study," said Thummel.

Thummel, awarded University of Utah's Graduate Student and Postdoctoral Scholar Distinguished Mentor Award in 2007, models this same rigorous work ethic, and attitude toward mentoring, to the next generation of scientists. "He attends nearly every student seminar and journal club, and will sit down with everyone who wants to and give them useful advice," said Jason Tennesen, Ph.D., a postdoc in Thummel's lab. Matthew Sieber, Thummel's graduate student, added, "He sets very high expectations, so that you want to improve and don't get complacent." A good mentor can impact generations to come.

Equally as important, mentors model aspects of their personal life that have the potential to impact their career. Iovine is a successful scientist with a prolific publication

record who also makes time for her two preschool-age children. “This is exactly the future I strive for,” said Isha Jain. As a high school student, Jain published two papers in Iovine’s lab, including a first author paper. “I have learned so much just by observing her,” she said. Nevertheless, Iovine feels it is important to convey to her group that hers is just one of many possible choices. “I feel that people should be permitted to have a full and balanced life. Many factors contribute to the equation that determines the best time to start a family. The ‘correct’ answer is the one that allows the individual to move forward with their own priorities in place.”

PROVIDE SUPPORT

A relationship can only grow if the mentor is available to give ample advice and support. Many mentors make sure they live up to their end of the bargain by establishing regular meetings. Iovine ensures these meetings are productive by setting an agenda. “We usually go over the next important goal and define what needs to happen to accomplish that goal. Then, we set a timeline and prioritize the experiments,” she explained. “I see my role in these meetings as keeping the student focused enough to move their project forward.”

During these meetings, the trainee should be treated more like a colleague than a subordinate. “A tendency in mentoring is for the advisor to talk more than listen. It is important to hear what the mentoree has to say and carefully consider their point of view,” noted Thummel. Including them in discussions signals that you respect their opinions and trust their decisions.

In addition to regular meetings, mentors need to be able to support mentorees through unexpected difficulties. Thummel remains available by having an open-door policy. If other commitments require his attention, he simply works elsewhere, at the library or at home. Iovine’s approach is to nip problems in the bud by discussing matters as they arise. “Mentoring happens everywhere, in the lab, in the hallways, during lab meetings, or via e-mail,” she said.

Bronner-Fraser admitted that due to her frequent travel and large group size, she doesn’t always meet with students as often as she’d like. To solve this problem, she relies on a postdoctoral researcher to function as a co-mentor. “This generally works out well because not only does the student have constant input, but the postdoc also learns what it takes to become a good mentor.”

CULTIVATE INDEPENDENCE

A mentor’s job is to help a trainee mature as a scientist, a step-by-step process. Throwing someone into the pool without first giving them swimming lessons is stressful, and can provoke unorthodox and inefficient swim techniques that lead to failure. Investing the time to teach career skills takes considerable effort, but in the end produces a lab member who will be ready to take on new challenges.

Iovine explained that when someone relatively new to science joins the lab, she starts small, keeps expectations low, and builds from there. “I like to have them first learn some techniques while stressing how their particular experiment fits in with the larger goals of the lab. In parallel, I often have them read, and we review together, a common set of literature that everyone in my group should be familiar with. As they gain confidence at the bench and learn the relevant background, I like to have them define the next important questions. As they continue, they should be able to identify and design the next experiment.” She added that when they come up with ideas that differ from their advisor’s, this is a signal that they are able to think independently and are ready to move on.

A trainee will be unable to achieve independence until they become adept at problem solving. An effective way to teach the skill is if the mentor demonstrates her approach and includes the mentoree as an active participant. Kathryn McCabe, Ph.D., described how her postdoc advisor, Bronner-Fraser, helped her tackle experimental difficulties. “She would discuss the problem and ask pertinent questions. If you were lacking resour-

ces, she helped you track down the things or people you needed. If it was a technical problem that should otherwise be fixable, but wasn’t, she advised you to take a break and do something else more productive.” Teaching how to break seemingly insurmountable problems into achievable goals will help trainees learn to problem solve and keep them from becoming overwhelmed.

Although the mentor may have a strong urge to continually come to a trainee’s aid, they should also be allowed the freedom to make mistakes and come up with solutions on their own. However, Iovine noted, “Letting a student struggle in the name of training does not help anybody. The line between freedom and flounder is different for everyone. Finding that line brings a new challenge with each new person that enters the lab.” More than an exercise, giving autonomy demonstrates that the mentor has confidence in the mentoree’s abilities.

Thummel has a different tactic for sharpening his trainees’ problem-solving skills. “Carl will challenge your preconceived notions about pretty much anything and is constantly asking what is motivating your experimental design, or life for that matter, which can be rather maddening,” said Tennesen. “His skepticism forces you to rethink what you are doing, which often results in a modified approach that solves the problem.” The ability to solve problems well depends on creativity, confidence, and independence — qualities that successful scientists share.

RESPECT INDIVIDUALITY

One of the most challenging prospects for new mentors is recognizing that each trainee has his/her own strengths and weaknesses. “Starting out, you expect everyone to work, think, and act like you,” said Iovine. “The more individuals you work with, the more you understand that everyone works differently, responds to advice differently, and has different needs for motivation.”

Accordingly, the mentor should tailor a mentoring approach to accommodate an individual’s needs. Projects shouldn’t stem solely from a mentor’s

“to-do” list, but rather should be designed based on a trainee’s interests and skill level. Iovine said that she develops projects based on repetition and routine for scientists that are new to the bench. By contrast, she gives more complex projects to experienced scientists who are adept at troubleshooting, and spends much of her time with them discussing how to further big-picture ideas.

Mentors should also appreciate that work styles under which each individual performs best can also vary. For example, some are motivated by positive feedback and/or work better under deadline, while others find these tactics stifling. Mentorees should also be granted the freedom to work on their own schedule, as long as they remain productive and attend required meetings and seminars. Some are most productive at nighttime when there are fewer distractions, while others can accomplish just as much from nine-to-five. McCabe found that adapting her schedule facilitated her transition back to work after maternity leave. “Marianne’s advice to visit my new baby during lunch-time made it easy for me to focus on work while in the lab.”

Despite any special accommodations, the best source of motivation is a mentoree’s own passion for the science. Mentors can help rejuvenate that feeling when times are tough. “It is very easy to feel that there is no end in sight for your project,” said Jain. “This was never the case in Professor Iovine’s lab. She ensured that I always knew what the ultimate goal of the project was and the time frame in which it could be completed.” Meghan Adams, Ph.D., also relayed how her graduate advisor, Bronner-Fraser, kept her spirits up. “Marianne is the kind of mentor who inspires people to perform at their best. She is a very positive person who is genuinely excited about interesting data, but is also encouraging when an experiment or project is not going as well.”

Even when a mentor has a good mentoring system in place, unforeseen circumstances may call for a new approach. “I destroyed my left knee and was unable to do any experiments for quite some time,” said Adams. “Although I felt derailed, Marianne

encouraged me to do what I could, to prepare a manuscript for submission, to think more thoroughly about my project, and to identify what pieces might be missing from the work we were doing.” The key is to remain adaptable, and be creative.

HONE COMMUNICATION SKILLS

In order to be a successful scientist, a trainee needs good communication skills, both oral and written. Once trainees improve in these areas, a mentor may be surprised at how much more effective they become at even routine tasks like lab meetings and one-on-one discussions. More importantly, a scientist will struggle to obtain grants, publish papers, and teach classes without them.

The mentor should encourage mentorees to perform these skills as often as is feasible and in a variety of formats. Adams explained that Bronner-Fraser helped her refine her writing techniques as they worked together on manuscripts, reviews, a book chapter, and portions of grants, and urged her to practice speaking by presenting at meetings, journal clubs, and by teaching classes. Bronner-Fraser also encouraged her to reach beyond the academic realm, and give lectures through outreach programs. “These experiences taught me how to incite the interest of different types of audiences, and improved my ability to communicate immeasurably,” she said.

When the time comes for the trainee to give a talk or write a manuscript, Thummel turns it into a learning exercise. When writing a manuscript, for example, the trainee is expected to write the first, and all subsequent drafts, on his own. At each stage, Thummel points out what still needs work and how to go about improving it, and indicates how the most recent draft improved over the last. Sieber explained that this method taught him how to structure a paper that is concise, clear, and maximizes the impact of the study. “Carl is as willing to put as much time and effort into it as you are,” said Sieber.

PAVE A PATH TO THE FUTURE

The role of a mentor is not only to help trainees acquire skills that will help them move up the career ladder, but also to open doors to ease that climb. Thummel prepares trainees for their future by encouraging them to think about their options, and helping them make contacts. “At meetings he introduces me to people whose work I find interesting, and he lets me meet with visiting seminar speakers during his allotted time slot,” said Sieber. “Now that I’m looking for a postdoc position, he has been fantastic about telling me what to look for in a lab and how to go about approaching them.”

Aware that many in her group were interested in academic jobs, Bronner-Fraser gave a presentation to her lab describing how to land a professorship and be successful at it. She described her own successes and failures and what she learned from them. “A good mentor can provide advice, usually from personal experience, that helps young people navigate through the system and to expedite that navigation,” said Bronner Fraser.

Although it is easiest to advise a trainee how to follow one’s own career path, mentors need to accept that their job may not suit a trainee’s strengths or ambitions, and find ways to guide them in the right direction. “All the post-docs in the lab with the exception of one other, had taken academic jobs before me. I was hesitant to admit to Marianne that I had changed my mind about an academic path,” said McCabe. “However, she was wonderful. She immediately asked what she could do to help, and was willing to call a colleague to help with my networking.” McCabe is now working as director and senior scientist at a biotechnology company.

Ideally, a mentor’s motivations for helping mentorees to attain their career goals will mirror those of Bronner-Fraser. “It is extremely satisfying to watch young people develop and achieve,” she said. “I get such pleasure out of helping people and knowing that I have made a difference in their lives.”

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