PRESIDENT'S Column

Sink or Swim: Talent Management in Academic Research

As a graduate student Jane was among the top of her class. Thankfully, she had a creative and conscientious advisor who assigned her a great project—other students in her department were not so lucky. Jane worked hard to generate lots of interesting data, and together with her advisor wrote and published several papers. This early success made her competitive for a prestigious postdoctoral fellowship and hence an independently funded position in a large, big-name lab at a top-tier research university.

Sandra Schmid

As a postdoc, Jane needed to establish her independence and to identify a project that she could take with her. Thus, after she made a serendipitous discovery, she began to work independently. Jane was ambitious and in a hurry to get a "real" job and to run her own lab. So she focused on her own work and didn't interact much with others in the lab. In fact, Jane was afraid that other postdocs, lost in a large group and largely neglected by a busy PI, might jump on her project; so she avoided sharing her ideas, even with her advisor. Jane published a single, high-impact paper and successfully landed a coveted tenure-track assistant professorship at a prestigious medical school (PMS).

Getting Started

As a "hot," new assistant professor, Jane was given a million dollar start-up package and 1,500 square feet of empty lab space. For the first year, she could focus on equipping and setting up her lab, hiring a technician, recruiting a postdoc, and starting her own research program. New graduate students, who are attracted by shiny new equipment and a young and enthusiastic faculty member, line up to do rotation projects in her lab. However, in Jane's second year, just as her new student and postdoc are starting, she would need to prepare and give lectures to the medical students twice a week. She would also need to begin participating in department committees. She would have to write grants that would provide operating expenses for the lab, and salary support for her students, postdocs, and technician. Eventually she would also be expected to support at least half of her salary. At her current burn rate, the "generous" start-up package would be depleted in less than three years. Lastly, Jane's five-year tenure clock starts ticking the moment she enters her new lab.

Very little Jane learned as a graduate student or postdoc had prepared her to run a small business, be a fundraising entrepreneur, manage a budget, hire and train employees, negotiate with journal editors, or teach. Certainly, there had been no formal training in any of these areas. Similarly, there were no classes in lab or conflict management, leadership, or finance offered at her PMS: few how-to books have been written. Jane's department chair is a nice guy, but he's very busy running his own lab and writing his own grants and papers, and he travels a great deal. Jane hardly sees him and, when she does, he only wants to talk about her or his latest experiment. She has been assigned a faculty mentor, but this senior colleague is also very busy, and she feels uncomfortable imposing on his time.

What's Wrong with This Picture?

Embedded in this, albeit slightly exaggerated, description of the current process for training, recruitment, promotion, and tenure (i.e., what businesspeople call talent management) in the world of academic research are several areas which, when viewed from the perspective of the "real" world, seem flawed or even nonsensical. Is there a better way?

One-Size-Fits-All Graduate Student/Postdoc Training

Graduate student/postdoc training at major research institutions is still largely geared toward a single career path, i.e., to be an experimentalist and conduct independent research. Yet, U.S. statistics show that we train many more PhD graduate students than there are ultimately

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positions for. According to a study by the U.S. National Academy of Sciences,[1] 61% of life scientists who received their PhDs in 1963–64 eventually acquired tenured faculty positions. This number dropped to 54% for the 1971–72 cohort and 38% for the 1985–86 cohort. Even when academe, government, and industry are combined, the respective fractions of PhDs in permanent U.S. research positions declined from 89% of 1975 graduates to 61% of 1995 graduates. And it continues to decline. The consequence is a logjam before the constriction point of permanent employment. Young scientists pile up in low-paying postdoc positions, which provide neither retirement benefits nor long-term security. The morale and, therefore, motivation levels among postdocs stuck in this holding pattern can be low. Jane's hard work, ambition, and luck allowed her to be hired into a tenure-track position by age 33. Today, the average new American assistant professor will be closer to 40.

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This situation is discouraging many bright young undergraduates from pursuing careers in academic science. It is also preventing diversification of our academic ranks. Economically disadvantaged minorities and others might understandably think twice about the time commitment (more than 10 years postgraduate) and hurdles that must be overcome before the possibility of permanent employment. Because this holding pattern occurs during prime childbirth years, women are also more likely to seek alternate careers.

Equally troubling, the system of one-size-fits-all training wastes talent. As recent college graduates, entering PhD students are among the most educated, highest-potential young adults in society. Further education in the scientific method, in critical thinking, in research and communication, only serves to increase the recipients' potential value to society. Such training provides transferable skills that would ensure students' success in whatever occupation matches their innate talents and passions. I can't help but imagine how much more effective corporations and government would be if more scientifically trained, critically thinking professionals were in leadership roles. Yet we expect our graduate students to focus on and become experts in a single area of research, and to make an independent, high-impact discovery. Fulfilling these latter expectations, which often takes six years or more, is important if one is to pursue an academic career. But it may even be counterindicative for success in other arenas. Moreover, smart and talented PhD students slow to fulfill these expectations become discouraged and lose the self-confidence they should have as potential leaders in society.

Training for Success

While we provide ample opportunities for discovery, too few of us as mentors *explicitly* train our students and postdocs for success. We give our students the "freedom" to learn from their mistakes. We think that, as Efraim Racker famously said, "Troubles are good for you." One often hears advisors proudly recalling that their students fumbled around for a few years learning from their own mistakes and then suddenly "got it" before proceeding more linearly to completion of their thesis research. Perhaps we could increase the efficiency and effectiveness of this training if we were more directive and more explicit and by helping our students learn from the mistakes we have already made. When was the last time you talked to your trainees about long-term strategies and decision-making; about how to look at your data, formulate questions, and generate a testable hypothesis; about the sources of innovation? While some of these abilities are innate, I believe good teachers can more quickly bring these skills to fruition.

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We also do not train our students/postdocs to be effective lab managers. Typically, a new faculty member will no longer be performing his or her own bench work within approximately three years of appointment. In well-run businesses, the highest-potential employees are typically required to partake in management and leadership classes, because they are aware that "the greatest

transition of all—from doing the work to seeing that it is done by others, from being motivated to motivating others, from being developed to developing others, from managing our work to managing the work of a unit, from working to delegating,"[2] is also the most difficult. Yet, in academic research, we hire assistant professors and then set them loose to run a lab without any previous experience or training.

The consequences of this sink-or-swim mentality are: 1) unnecessary and preventable failures, 2) perpetuation of poor practices of lab management, 3) re-inventing the wheel, by repeating others' mistakes until stumbling onto formulas that work, and 4) inefficient training, lower motivation, and, consequently, reduced productivity of lab personnel. More directed training could eliminate or at least reduce each of these consequences.

Winds of Change

The U.S. National Institute of General Medical Sciences has recently published a strategic plan for biomedical research training,[3] which repeats many of the conclusions and objectives of a U.S. National Academies study on graduate education published in 1994.[4] Why has progress been so slow? In part, it is because established investigators continue to train their students the way they were trained. They have no other models and, after all, it worked for them. One suggestion is for PhD programs to collaborate with business schools to create courses on management and leadership skills that are applicable not only in the laboratory but in any career.

I would also suggest that graduate students begin to focus more on their specific and individual career objectives, to think more broadly about how they can apply their skills, and to identify what they are passionate about. Individual development plans (IDPs) are available from numerous sites on the Web to serve as templates. Students must share this vision for their career objectives with their advisors and committees to create an IDP and expectations commensurate with that vision. One ought to be able to obtain the training and transferable skills needed to succeed in virtually all endeavors in four years. The singular discovery and demonstrating the persistence to see it through could, depending on luck, take longer. However, although accomplishing this research objective may be a necessary prerequisite for a research scientist, it is not a prerequisite for success in the many other worthy endeavors toward which individuals can apply their PhD experience. Certainly in most European countries, four years is the maximum for completing a PhD, and our European colleagues are making significant contributions in science and other important arenas. Given today's realities, we need to help all of our graduate students and postdocs, who constitute an incredible pool of young talent, achieve success.

Epilogue

Jane submits and receives her first R01, aided in part by the clear mandate of the U.S. National Institutes of Health to fund early investigators. Although stumbling at the outset, her first graduate student publishes two excellent papers in *Molecular Biology of the Cell* (*MBoC*), successfully defends his thesis, and begins a career as a science technology writer. Her first postdoc co-authors the *MBoC* papers and takes a position as an AP Biology teacher at a local private high school. Although she runs a small lab, Jane continues to make creative contributions in the research area she's passionate about, thanks in part to interdisciplinary collaborations with her colleagues at her PMS. She is on a path toward tenure. Mostly, despite the pressures and problems, she loves her job and the excitement of discovery. And she helps her students and postdocs to achieve their goals too. ■

Comments are welcome and should be sent to president@ascb.org.

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