Young Investigator Perspectives. Teaching and the postdoctoral experience: impact on transition to faculty positions

Jennifer Uno1 and Kristen L. W. Walton2

1Department of Biology, Elon University, Elon, North Carolina; and 2Department of Biology, Missouri Western State University, St. Joseph, Missouri

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This editorial continues with our Young Investigator Perspectives series. Drs. Uno and Walton are young investigators who hold faculty positions. They completed a K12 postdoctoral program through the IRACDA (Institutional Research and Career Development Award) program sponsored through the NIGMS institute at NIH. IRACDA programs exist at multiple institutions in the USA to combine postdoctoral training with formal training in academic skills and teaching at partner institutions. I thank Drs. Walton and Uno for a thoughtful perspective on how this experience shaped their career goals to combine teaching and research and inspire undergraduates to science careers. Given the current national dialog on broadening career paths and outcomes for PhD scientists, this is a timely perspective. —P. Kay Lund

THE TRADITIONAL SEQUENCE of training in the basic biomedical sciences includes formal coursework in undergraduate and graduate programs and research training in graduate programs and postdoctoral positions. Many graduate programs include teaching assistant (TA) opportunities and workshops or seminars on grant writing, professional ethics, and other related topics. However, although individuals interested in a career in academia are almost certainly going to be expected to participate in formal teaching, formal training in pedagogy and best practices in teaching are often not included or not emphasized in graduate and postdoctoral experiences. Some notable exceptions to this include Preparing Future Faculty (PFF) programs for graduate students such as those at Duke University, the University of Missouri, Virginia Commonwealth University, and others (7–9). These programs vary in structure but generally include more formalized and extensive exposure to teaching methodology than is typical in most graduate programs.

Our graduate experiences were fairly typical for students in departments within medical schools at research-intensive universities. Students were not required to teach but could seek out TA experiences in the courses taught by the department, usually including a course for medical students. For example, one of us (K. Walton) had decided fairly early in graduate school that her career goal was within academia and aspired to a position that would emphasize teaching more than is typical for tenured and tenure-track faculty in a research-intensive medical school environment. “My graduate advisor was very supportive of my taking time to lead small groups in our department’s medical physiology course and remained supportive when later I was given the opportunity to give several guest lectures in our department’s undergraduate human physiology service courses. These teaching experiences were invaluable. They helped solidify my intent to pursue a career that emphasized teaching.” Within our pool of acquaintances in PhD programs at UNC-Chapel Hill and other similar universities, this was an unusually high amount of teaching experience during graduate school.

Anecdotally, some graduate students who aspire to teach may not have the full support of their graduate advisors. Significant teaching takes time away from research and many students are supported on R01 grants; yet many of those graduate students will not “grow up” to become just like their graduate advisors and have a research-focused career. There are far more PhD students in the biomedical sciences pipeline than there are faculty positions (1). With the current limitations of federal funding for research, even graduate students who desire a faculty position at a research-intensive university may choose to also apply for jobs in which the teaching load is heavier but the requirement for successful R01 or other major research grant funding is lower (2). The recently announced Broadening Experiences in Scientific Training (BEST) award program recognizes the need for broadening the range of experiences that graduate and postdoctoral trainees are exposed to to accurately reflect a range of careers they may choose, including research- or teaching-intensive academic institutions as well as industry, clinical research, writing, or policy (5). This program is an important step forward because it formalizes and provides federal funding for professional development to prepare trainees for a broad variety of careers within biomedical sciences. However, because a major focus is on broadening training for careers outside of academia, many of the recently funded BEST programs listed do not appear to include formal training in teaching in their project descriptions. We feel that recognition of the variety of academic institutions at which a biomedical sciences PhD can become employed is an important area of emphasis for broadening the training experiences for these scientists.

If formal training in teaching is relatively rare in graduate programs, it’s even more so at the postdoctoral level. Traditional postdocs are expected to have high research productivity, and so the focus is primarily, if not exclusively, on research. Postdocs who want to boost their teaching credentials might seek out adjunct positions to teach one or more classes or may teach with supervision by their research mentors if possible. However, these are generally the exceptions, not the norm. Many postdocs will exit the research-intensive career track and apply for faculty positions at non-research-intensive academic institutions. The importance of formalized teaching training and experiences at the postdoctoral level has been recognized and incorporated by several programs funded by the Institutional Research and Career Development Award (IRACDA) program through the Minority Opportunities in
Research and Education (MORE) division of the NIGMS (4). The overall structure of each IRACDA program differs, but all include teaching. We both participated in an IRACDA program termed Seeding Postdoctoral Innovators in Research and Education (SPIRE) at the University of North Carolina at Chapel Hill (11). This program combines two years of traditional, research-intensive postdoctoral training with two full semesters of teaching one or more classes at one of several partner institutions that serve historically underrepresented groups. The research-intensive portion included time spent in workshops and seminars on pedagogy as well as other topics relevant to an academic career. During the teaching semesters, postdocs were the sole faculty of record teaching a class at the partner school, with an assigned mentor available for important feedback and support. Postdocs in this program have exited to a variety of career paths, but the majority are currently employed in tenure-track faculty positions at non-research-intensive institutions (10). Other IRACDA programs report similar job placement successes (for example, Refs. 3, 6). By several measures of productivity, including peer-reviewed publications, postdocs who complete these programs are comparable to their peers who experienced more traditional research-based training (10). The additional research experience provided by postdoctoral training programs can be a major benefit in supporting the transition to a faculty position of any kind, including those at primarily undergraduate institutions such as ours. It is a common misconception that faculty working at primarily undergraduate institutions don’t have active research labs. In fact, most non-research-intensive four-year institutions have expectations of scholarly activity from their tenure-track faculty members in addition to their teaching and service responsibilities. The biggest difference is that the majority of research is done with undergraduate students, without the support of staff scientists, graduate students, postdoctoral fellows, or big budgets. From our two biology departments, despite very few NIH or NSF funded research grants, nearly all of the faculty are active in research and have undergraduate students presenting work at local, regional, and national conferences.

Since we both trained in translational gastrointestinal research as both graduate students and postdoctoral scholars, we rely heavily on the networks we established as graduate students and during postdoctoral training to continue to do research in the GI field. Collaborations can range from short research visits to the labs of colleagues or former research mentors at research-intensive institutions, to sharing critical reagents or equipment. Furthermore, participating in the Gastrointestinal and Liver section of the American Physiological Society has helped both of us to stay current in the field and has allowed us to continue to foster collaborative relationships with established GI scientists.

Our formal postdoctoral training in teaching as well as research has proven invaluable in the transition to a full-time faculty position in which a major percentage of time is spent on teaching. We both relied heavily on prior experiences, workshop suggestions, and the support of our network of SPIRE peers in the first few years as a full-time, tenure-track faculty with a heavy teaching load. In addition, we both went into our current positions with the knowledge that research in biology and biomedical education is a valid avenue for scholarship and publications, which is a big plus in meeting tenure expectations as a GI researcher in a small institution and the accordingly small research budget. Having now sat on several faculty search committees, it is clear to us that formal training and experience in teaching are primary considerations during review of applications for faculty positions. We hope that, with the call for broadening scientific training for graduate and postdoctoral trainees, more programs will begin to include an option for formalized training and participation in teaching as invaluable experience for those who intend to pursue a faculty position. Success of such programs would also require that research mentors recognize and value the inclusion of teaching in career development activities. This also has the important downstream consequence of training more future faculty at research intensive or non-research-intensive institutions in the best practices in teaching as well as current research in their fields, which has the potential to positively impact undergraduate students throughout the country.

REFERENCES


2. Carulli AJ. Reduced funding and sequestration impact young biomedical researchers. Am J Physiol Gastrointest Liver Physiol 305: G761–G762, 2013.


