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Young Investigator Perspectives. Choosing an intellectually generous mentor

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—Nigel W. Bunnett, Editor in Chief, American Journal of Physiology, Gastrointestinal and Liver Physiology

AS YOUNG INVESTIGATORS PURSUING careers in biomedical research, we spend close to a decade as "trainees." In the academic research sector, the training period typically encompasses graduate school followed by several years in postdoctoral fellowship(s). As the term "training" implies, this is not an independent exercise and depends heavily on input, guidance, and support from various mentors along the way. Furthermore, mentoring provides benefits that extend well beyond the trainee phase and is recognized as a critical part of career development for early- and mid-stage investigators. Those of us who are in the process of developing our careers are well aware that stagnant research funding and the scarcity of tenure-track positions lend to particularly uncertain and discouraging times. The resulting impact on the future of the biomedical research workforce has been a topic of much discussion for over 10 years, unfortunately with little resolution to date (1, 5). We have watched promising young investigators and senior scientists alike exit academic science unwillingly and others whose progress and innovation are stalled by limited resources and opportunities. Perhaps more than ever, it is important to place emphasis on the career moves you can influence and those that provide the broadest opportunities possible. In the case of the young investigator, these include choosing an intellectually generous mentor.

In the mid-1950s, the National Institutes of Health (NIH) introduced the Mentored Career Development Awards program to target promising young scientists following completion of their graduate and postdoctoral fellowships (2). These mentored awards, commonly known as "K" awards, account for the largest proportion of NIH funding allocated to young investigators. Recently, a working group of the Advisory Committee to the Director of the NIH was charged with the task of assessing the success of the K award program. According to their analysis and report, Mentored Career Development Awards positively impacted subsequent research success as indicated by awardee publication records and funding support compared with those without prior career development funding (3). Much like the NIH-funded National Research Service Awards funding graduate students and postdoctoral fellows, scoring of the application is heavily weighted on the applicant's mentor(s) and their mentoring plan. Interactions between the mentor(s) and awardee and the career development plan must be appropriately outlined to ensure progress towards defined goals and independence. Furthermore, recent requirements mandate that NIH progress reports for all research project grants supporting graduate or postdoctoral fellows include information on training plans, and institutions are strongly encouraged to adopt Individual Development Plans for their trainees (4). The tangible benchmarks in such plans often include publications, conference proceedings, and coursework. However, a successful mentoring relationship also includes many intangible aspects that are more difficult to assess and, arguably, may contribute more to an individual's future success as an independent investigator. In actuality, many young investigators in academic science receive little mentoring on laboratory management, ethics, budgeting, service, teaching and grantsmanship, all of which are critical elements for a successful academic career.

So how do you choose the best mentor? The reality is, there isn't one easy answer. Significant resources are available to guide both mentors and mentees through the mentoring process, as well as measures designed to assess the effectiveness of these interactions, but, like any relationship, it ultimately depends on the individuals. In the current funding climate, it is certainly important to consider a mentor who is likely to be able to support your studies for the duration of your project, but access to all the research money in the world won't prepare you for the day you need to start your own lab on a limited startup package or times when funding is tight. Most will suggest you speak to current and previous trainees in a prospective lab, and while this can certainly be enlightening, you should also do your homework and take note of their relative publication, funding, and job placement successes. In addition, your mentors received their training under different circumstances, and funding and job opportunities have dramatically changed. Will this mentor be supportive if your research interests or career goals shift?

It is easy to suggest that an open dialogue from the start can help to clarify the expectations of both the mentor and the trainee, but the academic hierarchy is real and the times where we as young investigators are looking for new mentorship are most often periods of uncertainty and vulnerability. For this reason, self-reflection is key. What do you need out of this mentoring relationship? Does this person seem capable of

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providing this? Are they an accessible, honest, patient, trustworthy, and generous person who puts the needs of their trainees ahead of their own? What do you bring to the table as a prospective mentee? Mentors may play multiple roles in your training, and in the case of a mentor who will also serve as your supervisor, you should consider whether this person will support and guide you in the development of your own ideas and projects. Although training plans account for mentored support and activities during fellowship or a formalized award period, it is also important to consider how the relationship will change or end, if needed. Young investigators transitioning to independence have little time to develop new projects before becoming faced with mounting funding pressures. An intellectually generous mentor will provide you not only with the guidance needed to achieve defined goals within your training period, but with the freedom to develop the tools and data to prepare an independent grant application. When preparing for this transition, setting expectations in advance can help to prevent unwanted conflict and define boundaries early on.

Ultimately, each mentoring relationship is unique and subject to change. The best outcomes, much like any research project, will come from careful planning, interim analysis, and reassessment of needs over time. If a mentoring relationship is no longer working for you, it may be time to move on. If you have a specific need not currently being met by your mentor(s), seek out and approach another. Mentorship, community, collaboration, and intellectual generosity are deeply ingrained in the rich history of academic science. Actively seeking out the best stewards of these values will only help to continue this tradition and ensure a successful future for our discipline while helping to foster our own independent careers.

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AUTHOR CONTRIBUTIONS

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