

Building a sustainable career in science

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Establishing a successful academic career in the age of 'big science'.

The word “sustainability” derives from the Latin word *sustinere* (*tenere*, to hold; *sus-*, up), to support or endure. A principal concern of postdocs is our path to initiating and sustaining a fruitful career. Whereas approximately 79% of postdocs start out aiming for a tenure-track academic position, only about 30% end up with one¹. What does it take for postdocs to decide whether or not they want an academic job? What is a successful strategy for getting and sustaining one?

This was the subject of a roundtable discussion with David Roth, chairman of the department of pathology at New York University, at the fourth annual Rockefeller University postdoctoral retreat. Afterward, we polled Rockefeller postdocs and faculty on issues that were raised at the discussion. Here, we compile the opinions voiced at the retreat and in the surveys.

Defining “sustainability” in science

Our discussion title starting out was vague and open-ended on purpose. We wanted postdocs and faculty to tell us what concerned them most when thinking of their path to getting and sustaining a scientific career. Our own thoughts included getting a tenure-track position; sustaining funding; and becoming good mentors. In addition, to some, this meant balancing cost-effectiveness with creativity; sustaining a flow of creative ideas; ensuring that one's data upholds validity over time, and doing science without compromises. One Rockefeller faculty member defined it as the ability to conduct efficient research with effective reagents, tools and manpower in a cost-effective manner. Roth put foremost the ability to attract

good students to one's lab. But although a good career in science needs all of the above, many of us worry as much about the ability to sustain scientific temper and creativity as about funding and job-seeking. In the next few sections, we summarize these various facets of building a scientific career.

Sustainability in developing a scientific career. The median age for landing a faculty position is 38, and for one's first R01 grant from the US National Institutes of Health it is 42 (refs. 2,3). Given the strong competition, what makes a good job candidate in academia? Roth opined that good publications, pedigree and recommendations suffice. But is that all it takes? Our faculty added the following. First, most Rockefeller faculty (as well as postdocs) surveyed felt that networking at meetings and seminars was important. We find this of note because David Roth, as well as most principal investigators (PIs) in a recent *Science Careers* survey⁴, downplayed networking to an extent. Second, every single Rockefeller faculty member surveyed stated that good communication skills were crucial. This agrees with communication ranking first in a 2009 faculty survey on attributes of a successful postdoc^{4,5}. Given that communication ranked number 7 in a national postdoc survey⁴, postdocs should be aware of the importance faculty give to communication skills. More reason to keep using those lab meetings as practice ground! Teaching was another ingredient, but only for those applying to primarily teaching colleges. Mentoring undergraduates or summer interns, interestingly, did not make the cut.

We asked people to rank the relative weight of the following in choosing a job: location, salary, start-up package, department chair's leadership, and faculty profile. Roth, to our surprise, had brought up “the identity, vision and personality of the department chair” as his primary concern. Having a supportive,

mentoring and visionary department chair was important to his decision, and is something he was glad to have considered. Some faculty thought that the start-up package and location of the university (to attract good students and postdocs) superseded the faculty profile and department chair. Postdocs, on the other hand, rated the faculty profile highest. Salary remained the bottom contender on everyone's list.

Competition arises from disparity between supply and demand. Does this imply that the system trains more people than science needs? People were divided on this question. Some thought that this may be affected by the lack of a retirement cutoff for ‘baby boomer’ faculty. Others suggested that if all careers after the PhD are included, we are training just the right amount.

Part of this issue is that many postdocs and faculty consider nonacademic positions as ‘alternative careers’ as opposed to a primary career path. It need not be so, but many of us struggle with the decision to not set up a lab. This decision is often fraught with much soul-searching and indecision, and given that seven out of ten postdocs are in this position, this is not trivial. Approximately 95% of postdocs felt that they would appreciate honest input from their PI on their ability to pursue an academic career. Every single PI polled, including Roth, said that they would suggest an alternative career to someone whom they felt was making a poor decision based on their strengths. We were surprised by this because we were not aware if this did really happen. Understandably, some faculty hinted that it may be unwise for them to pass personal judgment on someone's career—what if they are mistaken? We hope that this candid feedback will encourage honest discussions on career goals between postdocs and PIs. Finally, although many postdocs are keen to explore nonacademic careers, many feel unsure on how to go about this

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and whom to tap for guidance. Be that as it may, most respondents said that finding a job in an alternative career remains the primary responsibility of the postdoc. PIs obviously cannot be our role model for a career outside the lab. The onus is on us, be it tapping into alumni networks or career networks such as the *Nature Network*, or proactively enhancing our resumes with skills we think we may need. What we can ask of and hope for from our PI is to be a sounding board, offering support and guidance in pointing us in the right direction.

Sustainability in running a lab. Two trends are gaining prominence in science: translational research and collaborative science. Are these just fads or are they a shift in scientific methodology? Discussion participants agreed translational research is getting more hype than is warranted but does seem to be here to stay. We asked people to list the importance of translational research from “Primary goal of my research” to “basic research, without an attempt to translation, is just as good”. Although some people did list it as critical, or somewhat important, it was interesting to note that the majority listed translational research as “somewhat important”, ranging from “yes, important for NIH objectives” to “a way to fool granting bodies”. Postdocs were much more likely than faculty to see translational research as important for publishing and funding.

Such science necessarily translates into collaborations—not all of us can with aplomb combine fields from genetics and

biochemistry to tissue samples and clinical models. Not surprisingly, 85% of postdocs felt that multilab collaborations will increasingly become the norm, compared to 64% of faculty. The need for collaborations in the long run brings back to us the importance of networking, with our peers as much as with senior faculty.

We asked whether it was appropriate for junior PIs to collaborate with their previous mentors. The general response was that although it is not advisable, neither is it a strict ‘no’. However, discussion participants indicated that in most cases, work done in collaboration with one’s mentor is not likely to be taken as one’s independent work—an important note for those pursuing tenure-track positions. Therefore, starting as postdocs, we should look for projects that will define our independent role and help augment our careers as postdocs today—and later our careers as independent investigators.

Sustainability of scientific temper. How do we know we will be able to sustain creativity, select and mentor students, and learn management of people and of costs? Is it a handicap to not have these skills honed during a postdoc? Although it may seem daunting, the faculty we surveyed said that, with common sense, developing these skills is easy, and lack of their prior development is not at all a handicap. However, they did highly recommend other skills as crucial: they suggested that postdocs ask to be involved in reviewing papers and writing grants. In addition, faculty suggested we should learn the skill of framing important

questions with testable hypotheses, and stay focused on only the skills needed to get the job done. The bottom line: learn how to get grants; you will manage them just fine. Learn how to get papers out; new ideas will likewise follow just fine.

Summary

At the end of our discussion and survey, postdocs signed off wishing for more mentorship and interaction with their PI and more help when gearing up for nonacademic routes. We urge all faculty to be more involved in helping sketch out the career paths of their postdocs. At the same time, we also remind postdocs to become more proactive. If you miss some aspects of mentorship from your PI, it is wise to tap into alumni, peers or other PIs. It remains our responsibility to build sustainable careers—ones to last us a lifetime.

ACKNOWLEDGMENTS

The authors thank the postdocs and faculty at Rockefeller University for participating in their survey. We thank David Roth for discussions. The postdoc retreat was organized by the Rockefeller University Post-Doctoral Association.

COMPETING FINANCIAL INTERESTS

The authors declare no competing financial interests.

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