JCB Journal of Cell Biology

PEOPLE & IDEAS

Early Career Advisory Board: Q&A on career and publishing

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We interviewed our Early Career Advisory Board to learn about their experiences finding their academic position and managing a new laboratory, and their views on peer review and scientific publishing. An excerpted version is presented here and all other responses are found in the supplemental material.

1. Applying for faculty positions. How did you decide when and where to apply, and how did you prepare for interviews? Would you have done anything differently?

Knowing when to apply for faculty positions can be tricky. Having your work published or nearly published is of course important, but so is feeling ready for what comes next and having an idea about your research questions. Practice mock interviews with colleagues, streamline your presentation, and anticipate questions that could arise. Examine the institute or department that you would be joining and have a good understanding of their research.

—Susana Godinho, Barts Cancer Institute, Queen Mary University of London

I applied widely for jobs with a broad description or that fit my skills as I would not have been able to predict which departments would interview me. Once I interviewed, it was immediately clear why I was a good fit. Had I restricted my search to departments I thought I was a good fit for, I would likely have landed no interviews.

Preparation is a years-long process of building a research vision and network. Grant applications, particularly the K99 application that provides detailed feedback on one's research plan and requires you to assemble an independent research and advisory network, were useful in my job search, even though I was not awarded the K99.

Finally, one should seek significant and broad feedback beyond your laboratory and immediate field. The impact of your work must be apparent to all members of a search committee with a wide range of scientific interests. Allowing many people, including nonexperts, to critically evaluate your ideas can dramatically improve your ideas and delivery. I would have done much more of this.

—Prachee Avasthi, University of Kansas Medical Center

I applied for faculty positions after acceptance of my second paper. I was surprised at how little notice I received before my first interview, so I would recommend preparing the interview talk and research plan when deciding to apply. I tried to make my talk clear for a broad group while also tailoring it to the interests of the audience. The department I was in was also recruiting, so I had the opportunity to sit in on several job talks, which I learned a great deal from.

—Huaqing Cai, Chinese Academy of Sciences

Applying for faculty positions is difficult and can benefit from a fair amount of strategic planning. Ideally you need to have your main papers out or at a very advanced stage, and a network of contacts through collaborations and meetings that will support you with reference letters and making you aware of potential opportunities. Deciding when you are ready might depend on the environment of your postdoctoral laboratory, but if you have a real urge to drive your own science and you are willing to put in the necessary effort to run a laboratory by yourself, then, most likely, you are ready.

Preparing for interviews is an essential part of the process. You need to find out who is going to be interviewing you and read through their past work. I have found that quite helpful when replying to panel members' questions during such interviews, since questions might be motivated by the background knowledge of the person asking. You also need to think about your fit to the institute or department and find specific examples for synergies and new interactions that you will make possible. Everybody likes working with nice and collaborative colleagues that will improve the current research environment.

—Juanma Vaquerizas, Max Planck Institute for Molecular Biomedicine

Prachee Avashti at the March for Science. Photo taken by David M. Mueller.

2. Negotiating an offer. What challenges did you encounter during the recruitment and offer stages? If you negotiated your offer, how did you decide what you were going to ask for and which items were deal breakers for you?

When negotiating an offer, it is important to have enough support for personnel and research costs to generate the first publications from your laboratory. In the beginning it will likely take longer than anticipated to generate research; therefore, it is critical that you have enough financial support to successfully obtain

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competitive funding that will ultimately support your research.

—Michael Lazarou, Monash University

The excellent advice I received and followed was: "Ask for what you really need to be successful." If you don't have what you need to run your own research program it is going to be a hard road.

—Lillian Fritz-Laylin, University of Massachusetts, Amherst

I worked out an equipmentlist before the second interview as my research relies heavily on a microscope suitable for live cell imaging. When I found out that the facility microscopes were not equipped for long-term live cell imaging and were reserved weeks ahead of time, I insisted on and received my own microscope in my start-up fund.

—Huaqing Cai, Chinese Academy of Sciences

3. Managing a laboratory.
What was the most difficult part of the transition from being a postdoc to running your own laboratory? What was your process for recruiting and training people and managing multiple projects? How have you found managing a budget and applying for funding? What advice would you give others in setting up their own laboratory?

I think of the setup phase as a resource management style board game with many tracks toward victory. Just like those games, focus on the path that meshes well with your strengths, your research program, and the resources you are starting out with. I spent a lot of time identifying and vetting people; therefore, as my laboratory was very small the first year I focused on writing grants rather than training personnel. This worked well as we were awarded a National Science Foundation and a National Institutes of Health grant; but I bet that for other new laboratories, a different approach would maximize success.

—Lillian Fritz-Laylin, University of Massachusetts, Amherst

A few major challenges include the transition from being self-motivated to motivating a team, learning how to manage a laboratory, raise money, attract talent, and establish a nice laboratory culture, and recruiting a responsible and long-term laboratory manager. When setting up your own laboratory, it is critical to find your interesting and important scientific questions, establish your own niche and quickly identify yourself in the field.

—Yan Song, Peking University

A sufficient budget to maintain your laboratory is essential. You may initially get enough support from your institute or any foundations to expand the size of your laboratory for the first several years. During that period, it is important to think about laboratory size and the budget you might have the next five years to plan accordingly. In my case, I started with a talented technician, then gradually increased to postdocs and graduate students. Recruiting nice coworkers is also an important requirement that I had not experienced before becoming a principal investigator (PI); therefore, I always ask opinions from all laboratory members when I recruit someone.

I typically train students or technicians myself, except for techniques only known by a technician, which I have them teach. When I train someone or involve people in projects, I consider that everyone has different skills and interests and I try to find the best project for them.

For managing a budget, what I do is keep applying for funding.

—Tomoko Nishiyama, Nagoya University

Effective time management was an initial struggle. I had to adjust to no longer having long periods of uninterrupted time. I enjoy all aspects of my job—mentoring, teaching, working at the bench, writing, traveling to meetings, etc.—but it took time to figure out how to balance everything effectively. When I first started my laboratory, I was at the bench a lot. Now much of my time is spent mentoring my students, writing papers and grants, teaching, and attending to my responsibilities at the department and college level. As I don't want to give up time at the bench entirely, I serve as a technician to my students, especially those trying to finalize a paper or address reviews, and help construct the strains and reagents they need. This work fits between meetings, still keeps me engaged in bench work and present in the laboratory, and frees up my students to do the exciting experiments.

I was very careful about the first few people I hired. I wanted people that were enthusiastic about my research and worked well with me and my mentoring style. The first few people set the laboratory tone, and I wanted to create a caring, compassionate, and supportive environment, all while being scientifically rigorous. I have seen a few young PIs panic about needing to fill their laboratories that ended up taking students or hiring technicians that were not good fits, which added unnecessary stress to what should have been an exciting time. Meetings with my students every other week works well as it gives them time to independently move their projects forward, think through their results, and plan their next steps while allowing me to step in and help fine tune their plans, if needed, with enough regularity to keep things moving forward.

Remember to celebrate! We celebrate all of our successes in the Lackner laboratory—big and small.

—Laura Lackner, Northwestern University

4. Life as a new PI.
What are some of the challenges and advantages you have experienced in running your own laboratory? Have you dealt with any regional differences in setting up a laboratory in different country?

The best thing is that you can realize your own ideas and research dreams. I enjoy project planning and thinking about approaches to solve problems. Also, it is fun to interact with my group and think as a group, bringing together everyone's experience and intellect. The challenging part is the responsibility for people and a solid financial plan that ensures everyone's salary at the end of the month. I am currently establishing my laboratory at Yale School of Medicine, where a major difference from the German system is that I will eventually have to raise part of my own salary.

—Julia von Blume, Yale School of Medicine

My research training was in the United States, and in 2011 I returned to India to join an institute started a few years earlier. Like

Huaqing Cai and her laboratory.

Julia von Blume and her laboratory members. Photo taken by Wolfgang Fink.

several of my colleagues, the major challenge was to adjust to the pace in India. There were challenges related to setting up the basic laboratory infrastructure and procuring reagents in a timely manner. Furthermore, unlike the West, there is a dearth of postdocs in India and thus research is primarily by graduate students, who must take time for their coursework and learning experimental designs, which creates an additional challenge as it can take longer before a research project is initiated.

—Mahak Sharma, Indian Institute of Science Education and Research

A challenging part of the transition to being a faculty member is the diversity of activities this job entails, including teaching courses, participating in departmental committees, managing personnel, and budgeting, on top of doing the actual science and writing papers and grants. Each of these tasks also has its own timescale. For example, writing a grant takes several orders of magnitude more time than arranging a schedule for a seminar speaker, but the latter needs to be done now. To keep on top of both short- and long-term projects, I regularly prioritize my time: monthly to decide what my major goals are, weekly to assess what my focus should be, and daily to decide what really needs my time immediately.

—Lillian Fritz-Laylin, University of Massachusetts, Amherst

5. Work–life balance.
How have you found managing a work–life balance while establishing your laboratory? What sort of support have your received or do you wish were available, for example, dealing with a "two-bodied" problem during the hiring process, children, and parental leave?

Work–life balance is a challenging issue to address since everyone has their own ideals. When I tried a balanced approach, I found that I could not give my best since my efforts were diluted. I therefore took a different approach that was not balanced on a day-to-day basis but was balanced over the course of the year. This involved working very hard, with full dedication to achieve certain goals, followed by periods of rest. In this way I could focus my attention on challenges, but also have no major distractions when taking a brief step back to reenergize and enjoy life outside of work.

—Michael Lazarou, Monash University

My husband is also a scientist and coordinating job applications and finding independent positions can be very stressful. We did not have any help with the two-bodied problem but were lucky enough to get PI positions. Starting laboratories at a similar time has been fun. We talk a lot about hiring and managing people, and it always surprises me how we all go through the same problems! Finding a good balance is never easy, especially when starting your laboratory, and I am not sure we manage that very well. We try to do activities outside the laboratory where we can just relax.

—Susana Godinho, Barts Cancer Institute, Queen Mary University of London

I am recently married and my wife is not in the sciences, so we did not have to deal with an academic two-body problem, nor do we (yet) have children. Rockefeller University does have on-campus daycare, which was an attractive feature when convincing my then-girlfriend that it was the place we wanted to go.

In terms of work–life balance, I have found it necessary to set clearer boundaries for the time I am willing to spend in the laboratory or working from home. I am now fairly certain that while I spent a lot more time in the laboratory when I was a graduate student and postdoc, it was not always productive. Furthermore, automation has mercifully eliminated some of the bench work I used to do such as collecting cryo-EM data in marathon 24-h sessions, and I have been fortunate to hire and train people who are now a lot better at experiments than I am. Essentially all of my work requires fairly clear thinking to be worthwhile, so it is often a better strategy to go home and take rest, then come back at a problem tomorrow. I feel am now (finally) better learning how to focus and be productive within an allotted time frame. Of course, sometimes there is still a last-minute crunch time, but I am certainly better than I used to be.

—Greg Alushin, Rockefeller University

6. *JCB* is excited to be including the thoughts of early career board members in shaping the journal. What prompted you to apply for the Early Career Advisory Board (ECAB)? What do you hope to contribute and what do you expect to gain from being a part of this board?

A senior colleague who is a *JCB* editorial board member informed and encouraged me to apply. I was fortunate to have an association with the journal early on in my scientific career as it is where my first paper was published. I have relied on the journal for knowledge throughout the years. I particularly admired its model as a journal "run by scientists and for scientists." I thus consider being a member of the ECAB an incredibly rewarding opportunity. As part of a young generation of cell biologists, I want to reach out to the next generation and the public about curiosity-driven research and help change the evaluation system to be based on the quality of the work and the impact to its field rather than some arbitrary numeric matrices.

—Huaqing Cai, Chinese Academy of Sciences

A couple of main reasons prompted me to apply, including gaining a better understanding of the editorial process and what makes research appeal to a broad audience. This understanding could subsequently provide me with an opportunity to give helpful feedback to the journal from the perspective of an early career researcher. By doing so I wanted to help contribute to policies that take into account the unique challenges of early career researchers, which include limited budgets for publication charges and costly revision experiments, while also helping to highlight excellent research generated by early career laboratory heads.

—Michael Lazarou, Monash University

As an author, it is somehow difficult to see what goes on behind the scenes during the peer-review process. Being part of the ECAB gives you a real opportunity to first see and learn how decisions are made—ranging from whether a manuscript would go out for in depth review to how reviewers are decided—and then put these in practice for the submission you are involved with. It is a process that requires a significant amount of work, but so far I have found the process very informative

and I am still amazed at the level of care that goes into properly evaluating each submission.

—*Juanma Vaquerizas, Max Planck Institute for Molecular Biomedicine*

I thought it was a great opportunity as a junior PI to get involved in the editorial process at *JCB*. Unfortunately, these types of opportunities are rather scarce. Most junior PIs review a considerable number of papers and grants but are not represented in editorial boards or grant panels, which makes no sense. I applaud *JCB* for taking the initiative to give junior PIs the chance to get involved in the editorial process. This will give us the opportunity to shape the journal and how manuscripts are assessed. This is particularly important at a time when there is a need and will to change the publication system. I am really excited to be part of this change.

—*Susana Godinho, Barts Cancer Institute, Queen Mary University of London*

I believe the definition of cell biology as a discipline is in flux, as cell-based studies are increasingly embraced by researchers who might consider their primary affiliation to be other fields, e.g., molecular biophysics, bioengineering, and structural biology. By serving on the ECAB, I am hoping to gain a high-level view of how the field is evolving and to have the opportunity to help shape it. As I am a structural biologist interested in dynamic cellular machinery, I will contribute this perspective to that endeavor. I am particularly interested in seeing the burgeoning field of in situ structural biology, solving structures of protein machines inside their native cellular context using cryo-electron tomography, represented in the journal.

—*Greg Alushin, Rockefeller University*

7. Thoughts on publishing.
In your opinion, what are the main strengths and weaknesses of the current scientific peer review and publication models? What exciting new developments do you foresee that could ensure that publishing best serves the scientific community and general public?

From my experiences, a strength of the *JCB* review process is that the academic and scientific editors are clear on what is expected in a revision and acknowledge which reviewer comments are tangential to the core findings or are beyond the scope of the manuscript. This allowed my laboratory to focus on revisions that truly impacted the work and, in the end, strengthened the manuscript. As a young PI, I find this type of review process extremely valuable as the publishing expectations for grant applications and tenure are high. Being able to focus on key revisions that enhance the paper is critical given what PIs are expected to accomplish in the first five years of their independent careers.

—*Laura Lackner, Northwestern University*

I may be a traditionalist in that I really think peer review enhances the scientific enterprise, although it can obviously be abused, for example, to suppress a competitor's work or derail truly transformative ideas. Thus, although I am a big fan of the rise of preprints in the biosciences, I don't think they should replace the peer-reviewed literature. I have certainly gotten comments from reviewers that really changed the trajectories of papers, which would not have been the same as public comments on a preprint. As a community, we need to decide how much preprints establish precedence in competitive areas. If some sort of middle ground is reached on this, it could eliminate some of the more toxic elements of peer review and make it more uniformly constructive rather than suppressive. I also think consultation among the reviewers before the reviews are sent to the author, as introduced by eLife and now embraced by other journals including *JCB*, helps make a cohesive review and cuts down on bad behavior.

In terms of publication models, there is a trend toward open access and exclusively digital distribution, which I support, as I suspect is true for most of my generation. What is not clear is how this will ultimately work out financially while still maintaining a rich ecosystem of high-quality publications, a parallel problem to that now plaguing print journalism. It may ultimately require an adjustment to how grant budgets are allocated in order to cover open access costs without negatively impacting other research activities, but this will likely not happen until there is a crisis. Unfortunately, we may need to ride it out until the overall community, including funding agencies, realize you can't demand open access and keep professionally staffed journals without changes to the funding ecosystem.

Finally, there are some exciting possibilities for developments in how content is presented. For instance, the integration of video and interactive media into most papers is still fairly primitive, and improving this could significantly enhance the digestibility of some studies. I have also seen a few really cool things on GitHub pages, like this interactive project from Andrew York at Calico: https://andrewgyork.github.io/adaptive_interference_inference/.

I think that format is great for computational-heavy/theory papers, where an interested reader might want to play with the code and interactive media to enhance their understanding as they go through the paper. However, I'll admit that 90% of the time, a PDF with embedded figures exactly like you find in a traditional journal is still my favorite!

—*Greg Alushin, Rockefeller University*

In my experience, peer review of my work has more often than not improved the quality of the work. Reviewers often provide helpful insights and suggest experiments that we had not previously considered. I think that when combined with scientific editors that make carefully considered decisions on which experiments are important for the main conclusions of the manuscript, the resultant revised manuscript is often much stronger. After all, this is the main purpose of peer-review. It can all fall apart, however, when reviewer feedback is not constructive, and this is often a limitation I hear about when speaking with my peers regarding their experience. Long laundry lists of experiments that do little to add to the manuscript can also be frustrating. Therefore, filtering which experiments are critical by editors is always very helpful. The move toward one major round of revision by many journals is very positive and making reviewer comments available online is also a valuable tool for early career researchers when evaluating a manuscript they are interested in reading. Scoop protection is another great initiative that helps promote reproducibility rather than confining corroborating studies to the graveyard.

The preprint server *bioRxiv* is a very interesting resource that I often use to read about the latest developments in my field of research. I wonder if in the future it might become an interactive resource in which readers can make suggestions and comments that are taken up by the authors if they are deemed constructive and helpful. This has the potential to improve a manuscript before submission or help authors solve a challenge they have encountered in their research. In this way, it could become a crowdsourcing platform for problem solving.

—*Michael Lazarou, Monash University*