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Street smarts of science for students

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Abstract

A workshop organized by the Society for Leukocyte Biology offers advice to graduate students on how to navigate educational and professional waters to find success in academia.

Once considered a traditional career choice, tenured research faculty positions in the biomedical sciences have diminished to the point at which they are now thought of as an alternative career path¹. Worldwide fiscal constraints have trimmed government and private sources of research funding, which has created an increasingly competitive landscape for young scientists looking to succeed in academia. Thus, students seeking tenure-track faculty positions must make efficient use of their training time and network with colleagues in their scientific discipline, including potential employers. To this end, the Trainee Task Force of the Society for Leukocyte Biology has identified areas in which the most junior members of the society—those enrolled in graduate school, medical school or combined degree programs—may need help navigating these waters. The pool of their collective knowledge and experience is presented yearly at the annual Society for Leukocyte Biology meeting as a workshop entitled “Street Smarts of Science for Students,” initiated by Elizabeth J. Kovacs (a professor at Loyola University Chicago), along with Sulie L. Chang (a professor at Seton Hall University). Below we discuss highlights of the advice presented at the workshop, including finding a mentor, self-marketing and making the most of scientific conferences.

Finding a mentor

A mentor is essential to a young scientist’s career success. Mentorship provides the student with guidance by an established investigator in applying scientific principles, developing an

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experimental design and conducting research with integrity. A good mentor will also offer perspective on professional development and the research-funding process and will provide opportunities for networking and collaborations. Sally Rockey (Deputy Director for Extramural Research at the US National Institutes of Health) has described the role of mentorship and new programs of the National Institutes of Health aimed at enhancing the training of future scientists². Despite such initiatives, the trend over the past decade has been for more support of graduate students and postdoctoral fellows by research grants than by training grants with built-in formal mentorship (such as institutional training ‘T’ grants, or individual ‘K’ or ‘F’ awards). This highlights the need for trainees to seek out formal and informal guidance from an experienced mentor or mentoring team. The “Street Smarts of Science” workshop provides tips to young scientists searching for a mentor.

Finding a mentor is about identifying someone with mutual interests. Junior researchers might have an interest in an area of research in which there are several faculty to work with. A good mentor should be someone who exemplifies what the young researcher wants to do professionally and whose research interests and passions align with theirs. This will facilitate a fruitful and close relationship, something essential for maximizing the effectiveness of the guidance provided by the mentor. Furthermore, the mentor-mentee relationship must be mutually beneficial. The junior researcher should ask “What can I bring to this relationship?” instead of “What can I get out of this relationship?” Preferably, a mentor should be in a tenured position or should at least be able to ensure that they will be around to see the graduate student through the entire project. Ample funding is another major consideration because research is expensive and can restrict what graduate students can achieve. The RePORT (Research Portfolio Online Reporting Tools) website of the US National Institutes of Health (<http://projectreporter.nih.gov/reporter.cfm>) is a great source of information on current and past mentor grant funding. Finally, an ideal mentor has ‘pull’, which means that they are well-established and credible in their field. Such people can assist in job searches, especially by writing recommendations. Perhaps most important, though, is finding someone who will take a personal interest in the junior researcher’s educational and professional development.

Before contacting a potential mentor, it is essential that the junior researcher knows about the research project the mentor is working on. Past and present trainees are good resources for such information. Talking to other students will provide an idea about the primary investigator’s research laboratory, including their success in obtaining grants, their record of ensuring students graduate within a reasonable time frame, their potential networking opportunities and their recent publications. Performing a literature search and tracking their research career is advisable. What sort of experiments are they conducting? What is their model organism? It is helpful to have answers to such questions before approaching the faculty or staff in the investigator’s laboratory. This enables the student to ask intelligent questions so they can decide if that potential mentor can provide a research path they wish to travel.

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Navigating the path to academic and professional success

Once a mentor is decided upon, the young scientist must contact that mentor to explain why they are interested in their research and ask whether they can be a part of their future projects. They should propose a plan for how they would contribute to the next phase of the potential mentor's research, and they should ask for the mentor's thoughts and opinions on their ideas. Asking to do a rotation or be a volunteer in their laboratory is useful. This will allow the student to determine whether they would enjoy being a part of the research team. It

is essential to discuss the goals and expectations of both the junior scientist and the mentor, as well as any potential pitfalls of working together. Finally, it is important to be excited! This is the beginning of a meaningful and productive relationship. In approaching a potential mentor, there are a few factors that can help ‘market’ graduate students, which we will discuss below.

Self-marketing

In today’s research environment, the ability to describe one’s own research is as important as, if not more important than, the research itself. In many cases, brilliant scientists with potentially groundbreaking ideas fall short because they cannot communicate their ideas or the importance of their research to the appropriate audience. Self-marketing and ‘elevator talks’ go hand in hand because scientists are often afforded only small windows of time in which to explain their work. Advice from the workshop on ways that young scientists can promote themselves include the following: being concise, being proactive and being honest.

The ability to be thorough and concise goes hand in hand with public speaking and effective presentation skills. As a rule of thumb, young scientists should be able to say all that is needed in 5 minutes or less. Ideally, they should have a prepared ‘elevator talk’—a description of their work and goals 1–3 minutes in duration, roughly the amount of time it takes for an elevator to travel from the bottom floor to the top floor. In this way, when asked what they do, they will be ready. If they are not asked, they should provide an introduction to identify who they are and what they do. The wording should be such that a member of the general public can easily digest the information and take away the key points. From a self-marketing perspective, young researchers should be able to express why they are the right scientist who should be hired.

It is imperative that young researchers engage in scientific conversations with senior investigators. They are generally happy to see that younger scientists are involved and are asking questions. Such opportunities can be a scheduled appointment at a conference symposium or an informal discussion in the hallway. Elizabeth Kovacs began one of her research projects of over 20 years on the effects of alcohol on recovery from traumatic injury after a friendly conversation with a research nurse in a restroom. When or where such opportunities will arise is an unknown factor. Young researchers should be ready to take advantage of them when they do.

Self-marketing involves being able to present oneself as an honest researcher. Is the researcher present and working in the laboratory, publishing data and troubleshooting when experiments do not go well? While such qualities are not readily apparent, these are the little things that set great researchers apart from the rest. Supervisors will pick up on these things over time, but when networking, young researchers must try to highlight their accomplishments as a way to showcase their hard work. Modesty and humility are important in any social setting, but junior researchers cannot afford to sell themselves short. A great work ethic, dedication and enthusiasm are highly sought-after attributes. Downplaying academic success will not enhance the credibility of a serious student. Once fully prepared

to network with other scientists, graduate students should seek out venues to try their new skills, such as scientific conferences.

Making the most of scientific conferences

In many ways, scientific conferences are invaluable for individual researchers and the advancement of their field as a whole. Oral and poster symposia allow the presentation of cutting edge research while providing face-to-face discussions with the leaders in a scientific discipline. This exchange of ideas, techniques and constructive criticism is paramount to progress and new developments. For students, it is an ideal setting for educational and professional growth. From honing presentation skills to meeting future colleagues and mentors, conferences are ripe with opportunity. The “Street Smarts of Science” workshop recommends ways that students can participate in, not merely attend, these useful events. Before attending a conference, graduate students should research the speakers and conference topics. This will allow the young scientists to ask more insightful questions and get more from each session. Graduate students should attend every conference with the mindset that they are there to learn, not just to present. Not every topic presented will be exciting or be related to their field, but that does not mean that there is nothing to gain from listening to each presentation. Being a scientist is about keeping an open mind and asking the right questions. Participants should ask questions, provide constructive comments if knowledgeable in that area and try to make connections. These events are an opportunity to make first impressions and solidify already established relationships with colleagues. While it is true that one cannot judge a book by its cover, first impressions are lasting. Junior researchers should dress as if attending an interview because every encounter might represent an opportunity for advancement.

Graduate students are representing not only themselves but also their laboratory and their university. It is safest to address other participants with a Ph.D. or M.D. as ‘doctor’ and to use first names once invited to do so. One of the greatest advantages of attending a conference is personal interaction. Cell phones should be set aside, as conferences are places to learn and network. Expressions of gratitude to the organizers and/or the award committee for any honors received are imperative.

When giving a presentation, graduate students must introduce themselves by name and mention their education level, their affiliation and their current research mentor—for example, “My name is Marie Smith. I’m a second-year post-doc in Dr. Elizabeth J. Kovacs’ lab at Loyola University Chicago.” This will give the audience a sense of the graduate student’s background and training level and may help the audience to remember them in the future. Abbreviations should be avoided unless it is certain that the audience is familiar with them. For example, using ‘DNA’ to talk about DNA is acceptable, but using ‘NIP’ to talk about neuroimmune pharmacology should be avoided. Presentations should be rehearsed before the conference to ensure a smooth and well-timed talk. When fielding questions, presenters should allow the audience member to complete their question before responding. It is important to understand the question asked and to respond to comments directly. Likewise, when asking questions about someone else’s research, participants should acknowledge what the speaker said, whether in agreement or not, and then ask the questions

or make comments. At larger conferences, there may be concurrent symposia going on. Participants should focus on particular people with whom they would like to talk. Being a 'social butterfly' is not the best approach. At professional conferences, exhibitions or career fairs, students should net-work with a select few. In this way, the young scientists can get to know more about those researchers and make themselves more personable; this allows them to pitch themselves more fully. Box 1 provides more tips on net-working at scientific events.

Final thoughts

The modern-day graduate student needs to take full advantage of the resources and opportunities available to trainees to competitively position themselves for a career in academia. Like many professional societies, the Society for Leukocyte Biology strives to foster the development of young scientists through mentorship and by encouraging a proactive and collaborative approach to training. The advice given during the "Street Smarts of Science" workshops is meant to help guide students on their path to academic and professional success.

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Box 1**Networking tips**

Seek exposure	Ask thoughtful questions after presentations and offer to present your work when appropriate. Write a review paper in which you cite the work of your peers and others.
Collaborate	Share your knowledge, resources and skills with others to work toward a common research goal.
Be friendly	Sometimes it is not what you know but whom you know when it comes to getting a job, grant, collaborative research opportunity, etc. You never know how far kindness can get you.
Put yourself out there	Tap into potential networking opportunities that coincide with your interests—for example, if you are a sports enthusiast, join a sports club so you can network there.
Keep in contact	Send updates and ask how things are going. Many people do not keep in contact with past networking contacts and thus miss out on potential employment opportunities.