This issue marks the introduction of a new Cellular and Molecular Gastroenterology and Hepatology column, “Paths and Places for GI Research Success,” developed in part in response to the American Gastroenterological Association’s goal of providing more targeted information and services to the diverse groups within the membership. Gastrointestinal (GI) researchers, such as the American Gastroenterological Association’s constituency, are heterogeneous. Although the prototypical GI researcher is a physician-scientist or a scientist on the tenure track at an academic medical center, outstanding research is performed by researchers with a variety of educational backgrounds and titles, at all stages of their careers, in many kinds of institutions. Our goal with Paths and Places is to provide practical advice on career success to researchers in different career stages and settings. The column is specifically intended not to be a memoir, but rather a guide from experts: how to succeed, for example, as a GI researcher in a vet school, as a research scientist in a large laboratory, or as a scientist at or beyond the usual retirement age.

Our first columnist is Pamela L. Tuma, PhD, Professor of Biology at The Catholic University of America. The Catholic University of America is an Academic Research Enhancement Award-eligible institution—defined by the National Institutes of Health as an institution that has not received more than $6 million per year in National Institutes of Health support in each of 4 of the past 7 years. AREA-eligible schools serve primarily undergraduate student bodies. Faculty typically shoulder heavy teaching loads and research colleagues may be few. Despite these possible impediments, many researchers thrive at these institutions. Dr Tuma provides practical advice on making your teaching load work for you, managing undergraduates, and networking. Although the column is targeted for AREA researchers, we hope it will be more broadly applicable to all readers with active laboratories.

We welcome feedback on this new column as well as suggestions for future topics.

REBECCA G. WELLS, MD, AGAF

A Researcher at an AREA Grant-Eligible Institution

I joined the Department of Biology at The Catholic University of America in Washington, DC, fresh off my postdoctoral position at nearby Johns Hopkins University School of Medicine in Baltimore. I was filled with excitement about the prospects of setting up my own research program, but I soon found that the transition from such a research-intense institution to a so-called AREA-eligible institution was somewhat painful, and it took time to learn how to fully navigate these waters. In this column, I hope to share some of the lessons learned during these past 13 years that allowed me and my laboratory members to build a successful (we now have R01 funding) and enjoyable gastrointestinal research program here at The Catholic University of America—even without a medical school.

Time Management

We all know it is important to be organized and have good time management skills for success in any profession. I have highlighted a few lessons that I learned while trying to balance a sturdy teaching load with an extramurally funded research program.

Devote Entire Days to Research

I find it best to clear entire days for research-only activities (writing, reading, bench work), so that you can focus and achieve measurable progress. To do this, fill your teaching days (which already consume a lot of time in the classroom) with all other teaching-related activities, including advisee and student appointments, lecture planning, grading, and so forth. If possible, schedule your other university committee meetings on these days. Basically, kill your teaching days and leave open full days for uninterrupted research work. Even if it is only 1 day per week, it is much more productive than poking at research for an hour or so at a time.

Maximize Academic Breaks

Although it is tempting to take off during the time when students are away, this is the time to get things done. If possible, work over spring breaks, winter breaks, on those Monday holidays, and, of course, summer break is full-on research time. Be sure to take some time for you and your family—but it is useful to use breaks to catch up and even get ahead.

Set Boundaries With Undergraduates

Answering undergraduate student e-mails can be a 24/7 job, so do not do it. Set boundaries with students and respond only during business hours and avoid weekend messages. Do not even think of texting with undergraduates.

Use Teaching and Committee Obligations to Your Advantage

Many view teaching and committee service as a burden. Although both can be major time-sinks (be careful not to...
oversubscribe to either), I have found that there are advantages to both.

Teach Useful Lecture Courses

Do not avoid teaching the basic courses required for the major. For example, relearning biochemistry will only help you in your research. Ask to teach graduate electives in areas of your own expertise. This forces you to stay current. Also, it can be useful to request to teach electives in areas that you want to know more about. For example, if you want to know more about inflammation, ask to teach an immunology class.

Design Meaningful Laboratory Courses

Do not teach contrived laboratory experiments. If possible, incorporate the laboratory experiments into your research program. For example, if you study a genetically tractable model system, use the semester to perform mutational analysis on a protein of interest. In doing so, students can learn everything from polymerase chain reaction primer design to functional studies.

Recruit Students

You spend lots of time in the classroom and advising students. In the process, you likely will identify the “good” students with potential for research. Do not wait for them to ask to perform research with you, be proactive and ask them. However, make them commit to at least a year. It takes at least a semester for training, so do not train students just in time for them to leave.

Use Committee Service to Meet Researchers

At most AREA-eligible institutions, you spend little time outside of your own department. Service on school or university-wide committees gets you out of the department and forces you to meet faculty members from other departments. Cultivate relationships with researchers in related disciplines such as chemistry, biophysics, or biomedical engineering. Invite them to give a departmental seminar. You never know where research interests might overlap and lead to unique research collaborations.

Do Not Balk at Directing Seminar Series

Although being in charge of a weekly/monthly departmental seminar series is a lot of work, it offers serious advantages. You can invite a researcher you want to hear and who you hope becomes a collaborator. You can invite researchers in fields that you want to learn more about. Also, introduce your students to the seminar speakers for their professional development.

Your Network

Although all scientists know it is important to have a good network, this is especially true at an AREA-eligible institution. You often find yourself as the sole expert in a given field and have few in-house colleagues who really understand your research program. You must force yourself to stay current in your field, keep your work out there, and know what others are doing.

Maintain Your Network

Just because you left your postdoctoral laboratory does not mean you lost your connections. If you are lucky enough to land a position near where you were a postdoctorate, make it a point to stay in touch with your colleagues. Go to their seminars, attend their workshops, conferences, and, if possible, make arrangements to use their facilities. Take your students with you to let them see the high intensity and excitement and, hopefully, bring it back to the laboratory. It gives them aspirations. Go to your society meetings and make it a point to check in with old friends and colleagues. Share with them what you are doing in the laboratory and find out what they are doing. Take your students, too. Let them learn first-hand that their research is the real deal, not just another laboratory course. It makes them scientists, not just students.

Build Your Network

If you land in a large enough city, find a more research-intense institution and get to know other faculty in the appropriate departments and ask to attend seminars, conferences, and so forth. If possible, work out arrangements to use their facilities. Even if it costs money, it will be worth it. Agree to be an ad hoc panelist on study sections. Although proposal review is a lot of work, you cannot underestimate the advantages of interacting with other scientists in that format, not to mention what you learn about what others are doing and where your field is going.

Some Research Tips

It is a challenge for all new investigators to set up a laboratory and get an independent research program up and running. It can be especially challenging when you also are trying to develop courses, design teaching laboratories, and stay one step ahead of the students as you are doing so. I have listed a few important lessons learned on how to set up and maintain a successful program at a teaching-intense institution.
Find Your Niche

It is important to develop your program such that the routine methods for day-to-day progress are within your resources and can be supported by your on-site facilities. It also is important to realize that progress at an AREA-eligible institution will be slower than at other more research-intense facilities, so picking a niche that is too “hot” is risky. Tailor your program to cater to your unique expertise to avoid being scooped. Set up collaborations to help you perform the experiments that are outside of your institution’s resources. For example, animal studies may be better performed off-site.

Contract Out and Use Databases/Repositories

Although collaborators are important, do not be afraid to contract out. It is much better to spend the money upfront to have a company perform the more sophisticated or specialized experiments (eg, proteomics screens, quantitative reverse-transcription polymerase chain reaction arrays). It can take months to set-up such assays in-house, not to mention the small likelihood of having a student with sufficient skills to master the technique. In the end, it is worth the money with the time saved. Similarly, there are many available databases and sample repositories that are accessed easily when collaborations have not been established or pilot data are needed. For example, there are many vendors that provide animal/human tissues from different disease models that can be purchased for relatively nominal fees.

Invest in Training

At an AREA-eligible institution, it is likely that you will have mostly inexperienced undergraduate and graduate students join your laboratory. It pays to invest in rigorous training early on in your career. Teach those first sets of students yourself, and train them well. Once you have invested the effort, the more senior students then can train the next student generations, freeing you from the bench and allowing more time for grant writing, and so forth. Also, it pays to match undergraduates with senior graduate students for their direct training and mentorship. The graduate student can have the undergraduate perform specific experiments that directly impact his/her dissertation research. Not every student needs an independent project—it often is better to let the undergraduates fill in the gaps to move the whole laboratory forward. This arrangement also provides graduate students an opportunity to develop their own teaching and mentorship skills. Although you must be available for questions from your students at all times—an open door policy is required—you do not have to micro-manage or lead every training effort. All can benefit from the process.

Never underestimate the importance of in-depth, rigorous weekly laboratory meetings. All details must be discussed, every immunoblot examined, and all images reviewed. Calculations must be shown and how data were collected and plotted revealed. Inexperienced investigators will make honest mistakes that have to be caught as soon as possible, both to avoid major problems later, and to get them fully independent and confident in their research.

Take Your Sabbaticals

If your institution allows sabbaticals, make the best of that opportunity. If possible, set up a sabbatical off-site to learn a new technique, have continuous access to a specialized piece of equipment, or perform the pilot experiments for a new research initiative. If you take your sabbatical in-house, it often is easy to slip into your old routines. You will find that the semester slipped by with nothing to show for it.

Final Thoughts

Performing high-quality, extramurally funded research that contributes to the scientific community is possible at a teaching-intense institution. It takes some creativity and some practical skills, but it can be done, and can be done happily. In the process of setting up your program, you are also teaching and mentoring the next generations of scientists—you get to pay it forward. If done right, a career at an AREA-eligible institution can be fulfilling and even inspiring.

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