Grant-writing workshop recap

BY MARION B. SEWER

Two years ago, the American Society for Biochemistry and Molecular Biology Minority Affairs Committee embarked on an initiative to identify the perceived barriers encountered by faculty members from groups that are underrepresented in the sciences and by faculty members at minority-serving institutions. Although the committee identified several barriers, including an opaque review process, lack of a support network, a leaky pipeline of minority talent and a lack of initiatives directed at underrepresented minorities, the underlying issue common to all participants in the working group was the lack of formal mentoring (1).

To address this issue, the MAC held a mentoring and grant-writing workshop in June in Arlington, Va. Our initial plan was to invite 15 to 20 assistant professors who were in the first four years of tenure-track positions and to pair them with ASBMB members who had been successful in obtaining federal funding. However, in response to unexpected enthusiasm from the community at large and the overwhelming number of applications, we invited 32 faculty members to participate in this inaugural endeavor.

In addition to selecting minority faculty members and faculty members at minority-serving institutions, we selected nonminority applicants at research-intensive institutions and at primarily undergraduate institutions. This strategy enabled us to have a diverse cohort of assistant professors from various institutions, including the University of California, Berkeley; Grand Valley State University; the University of Michigan; the University of Southern Maine; Jackson State University; California State University–Fullerton; the University of Richmond; and the University of Texas at El Paso. Mentors included members of the MAC as well as faculty members with research programs in biochemistry and molecular biology. (See box for a list of mentors.)

The event began with a networking reception, which was followed by two days packed with interactive sessions. Ruma Banerjee of the University of Michigan opened the first day with an inspirational and poignant talk about the importance of developing a personal roadmap, marketing your research program and networking. Program officers from the National Institutes of Health (Barbara Gerratana) and the National Science Foundation (David Rockcliffe, Catalina Achim and Sussanah Gal) talked about funding opportunities and the proposal-submission and review processes.

A mock review panel provided an overview of the logistics of the NSF review process and insights into how panelists discuss the intellectual merits and broader impacts of an application. There also were sessions on the elements of a successful proposal, differences between the NSF and the NIH, and revising and resubmitting an application.

Significantly, prior to the workshop, participants submitted summaries (e.g., an NIH "Specific Aims" page or an NSF "Research Summary" page) of their research proposals and received feedback from the mentors and from the other assistant professor participants.

Perhaps the most valuable component of the workshop was that each participant gave a short presentation that encompassed the background, hypothesis, aims, preliminary data and experimental approach of a research proposal that he or she was expecting to submit. Mentors provided salient feedback with regard to the scope of the proposed studies, the novelty of the research questions and approaches, and the biological or biomedical significance of the areas of investigation.

The meeting closed with group discussions on bal-

Participating mentors

- Takita Felder-Sumter, MAC member
- Squire Booker, MAC member
- Marion Sewer, MAC member
- Ruma Banerjee, University of Michigan
- Vahe Bandarian, University of Arizona
- James Stivers, Johns Hopkins School of Medicine
- Reuben Peters, Iowa State University
- Wilfredo Colon, Rensselaer Polytechnic Institute
- Sarah Woodson, Johns Hopkins University
- David Wilson, MAC member

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Demystifying the chalk talk

BY CHARLES BRENNER

Congratulations! You've succeeded as a graduate student, changed institutions and obtained first-author publications. You've obtained funding for your postdoctoral fellowship or even for your transition to independence. You've identified some schools that are looking for faculty members in your area and have developed a brief, compelling research plan. Your referees are enthusiastic and prompt. You were personable and prepared during a phone call or Skype with the search committee chair, and you've been invited to a two-day campus interview. There, you will have meetings with members of the search committee and other members of the faculty, have lunch with graduate students and postdocs, take tours of shared resources and give two presentations.

On the first day, you'll give your 60-minute public seminar, being sure to finish in 45 to 50 minutes to allow for questions. On the second day, you'll be in the conference room for a 60-minute chalk talk.

Because chalk talks are not generally open to postdoctoral fellows, you've never seen one, but you've heard that great candidates do not always give good chalk talks.

What's a chalk talk?

A chalk talk is your opportunity to present your forward-looking research program to potential colleagues. They will have seen your seminar on the first day, so your research accomplishments will be fresh on their minds.

They will be wondering how you plan to organize your laboratory, what types of experiments you plan to do first, what your funding plans are, what your relationship is with your current principal investigator, who you think your major competition is and how well you have thought out your research plans in case things don't work out the way you think they will.

Do you have to use chalk?

Generally, no, though you should ask.

Channel your inner PI

Never interview as though you are a postdoc with only your two hands. Project your inner principal investigator, who is capable of defending a progressive research plan to successful colleagues and who appears capable of directing a small research group.

Though your plans probably require another two to three people to get off the ground, if you describe plans for your first eight trainees, you are likely to come off as far too ambitious (and expensive) to hire.

Organizing your presentation

Spend the first few minutes on a summary slide or two to remind the audience of your major findings. Don't assume a good memory or great insights into your experimental system.

The next slide is an outline of a couple of fundable directions in which you plan to take your work. You may have three or more ideas, but you won't have time to show more than one or two, and you should not show your third best idea during this hour. Your transition to independence will require intense focus and many tactical decisions. You do not want to look scattered. Determine your best project(s) in advance and practice your chalk talk with faculty members of diverse backgrounds.

As soon as you have sketched out the one or two projects you plan to launch, you might state that you'd like to spend the next 30 to 35 minutes on project 1 and the remaining time on project 2.

The best next slide is a bulleted list of the specific aims in your first project. Here, candidates with funding that will extend into their next positions have a huge advantage. These candidates can list the aims of their R00 or R01 or American Heart Association grant. Such aims are always easier to defend, because the candidates have defended them already to a review panel and because faculty will feel that one of two major risks has been taken off their hands. The first risk is that a new hire might fail to obtain external funding for the research program. The second risk is that, even if start-up and other funding is in place, the project may not work or may work and have limited scientific impact.

Faculty will interject freely during your presentation,

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What, how and why is problem-based learning in medical education?

BY JOSÉ M. BARRAL AND ERA BUCK

What is problem-based learning?

Problem-based learning, or PBL, is a pedagogical practice employed in many medical schools. While there are numerous variants of the technique, the approach includes the presentation of an applied problem to a small group of students who engage in discussion over several sessions. A facilitator, sometimes called a tutor, provides supportive guidance for the students. The discussions of the problem are structured to enable students to create conceptual models to explain the problem presented in the case. As the students discover the limits of their knowledge, they identify learning issues – essentially questions they cannot answer from their fund of knowledge. Between meetings of the group, learners research their learning issues and share results at the next meeting of the group.

How do faculty members participate in this process?

Faculty members often participate as facilitators. Indeed, the role of the facilitator and the nature of the problem are key to successful implementation. Facilitators must be supportive rather than directive. They ask questions to assist students with identifying the limits of their knowledge, monitor the group process (encouraging participation) and provide a framework for constructing models of understanding. Content expertise on the part of the faculty may be helpful but is not considered necessary for effective facilitation. Deeper understanding of the topic may allow the facilitator to guide student discussions to be more comprehensive. It also may increase the challenge of maintaining a nondirective role. Problems presented in cases are constructed at a level of complexity to activate students' existing knowledge and require integration and application of new knowledge. Cases contain contextual information so that the patients become more real to the students and therefore more memorable.

Why are medical schools incorporating PBL?

PBL has become popular in medical schools that have undergone curriculum reforms incorporating multidisciplinary-system-based courses rather than discipline-specific ones. For example, students may learn biochemistry as it relates to organ systems of the human body while they are solving problems presented in clinical cases. This approach provides relevance, encourages self-directed learning, targets higher-order learning and engages students in ways that result in better long-term retention of content than traditional, lecture-based courses.

Can you give me an example of how the process works?

During a traditional, lecture-based system, students learn the basics about the developmental and cell biology of erythrocytes (their lineage, shape, size, absence of nucleus, etc.); the biochemistry of hemoglobin (cofactor requirements, protein quaternary structure, cooperativity and allosterism, etc.); and the various mutations that result in disease states (sickle cell anemias, thalassemias, etc.). When asked about the phenotype of a sickle-cell hemoglobin carrier, a student who learned these concepts in a traditional, lecture-based environment might reply that there is no phenotype, unless the carrier is living in a region with malaria, in which case the carrier may be better able to resist the disease because of heterozygous advantage (classic concepts learned in genetics). However, if a group of students are presented with a case of a patient undergoing a sickle-cell crisis and are prompted to consider the many aspects of the disease, including the implications for family members, they might arrive at a different answer. They may come to the realization that the phenotype of a carrier could include the presence of some elongated cells in a smear of venous blood, particularly after exercise (which appears to occur in the majority of cases). In this manner, knowledge integration leads to critical consideration of how a phenotype is defined and how this indeed can depend on the variable being studied (a concept clearly generalizable beyond the hemoglobinopathies).

What student skills should we encourage for PBL-focused medical education?

Self-directed learning: Students who demonstrate adequate performance in PBL activities are capable of applying their knowledge to think critically. They must be trained to be able to use information rather than merely capable of remembering it. Students in PBL-based curricula increase the level of self-direction they bring to learning. The more self-direction they develop as undergraduates, the more likely it is that they will become independent learners as practicing professionals. Lifelong learning uses a set of skills that develop over time and require practice.

Reflection: Some of the critical skills can be encouraged and practiced in college classes. These include self-assessment, group learning and active learning. Students need opportunities to identify their strengths and weaknesses and figure out what it is that they do not know or thoroughly understand. They need to be encouraged to ask good questions. By encouraging students in formulating good questions, we empower them to identify their knowledge gaps.

Teamwork: Students also must develop skills necessary for learning in groups. They must be able to learn from peers and teach peers, moving readily between those roles. They need to be able to assist each other in integrating and applying knowledge to a given problem. These skills are acquired through active learning. Projects and lab work often promote these skills.

In summary, students need opportunities to assess their knowledge, identify and remedy knowledge gaps, and integrate and apply knowledge to real-world problems as part of a team.


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ancing teaching, research and service and on professional ethics.

A survey of the participants found that the workshop was an overwhelmingly positive experience. Seventy percent reported that the feedback they received about their research objectives was likely to improve their grant-writing skills, and 80 percent said they found the interaction with the mentors valuable. Significantly, 75 percent of the participants who had attended a grant-writing workshop in the past said they felt that the ASBMB workshop was more informative and helpful.

Efforts are underway to hold another workshop. For more information on this and other MAC activities, please visit http://www.asbmb.org/MinorityAffairs.aspx.

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REFERENCE

1. http://www.asbmb.org/asbmbtoday/asbmbtoday_article.aspx?id=11780

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in part to get their key questions answered and in part to see how you interact and think on your feet. Your ability to interact as a peer is paramount. If you have an advocate on the faculty, this person will help you get to your second project, especially if the discussion bogs down.

In general, you should describe experimental plans with as few slides as possible. You may get some bonus points if you can use the white board effectively in response to a question. You get major bonus points for composure, clarity and cutting-edge approaches to problems that will move your field forward.

If you are reading this column as a trainee who has yet to be invited to give a chalk talk, the best practice is to write a grant proposal to fund your research ideas. You can be assured that reviewers will identify the problems!

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