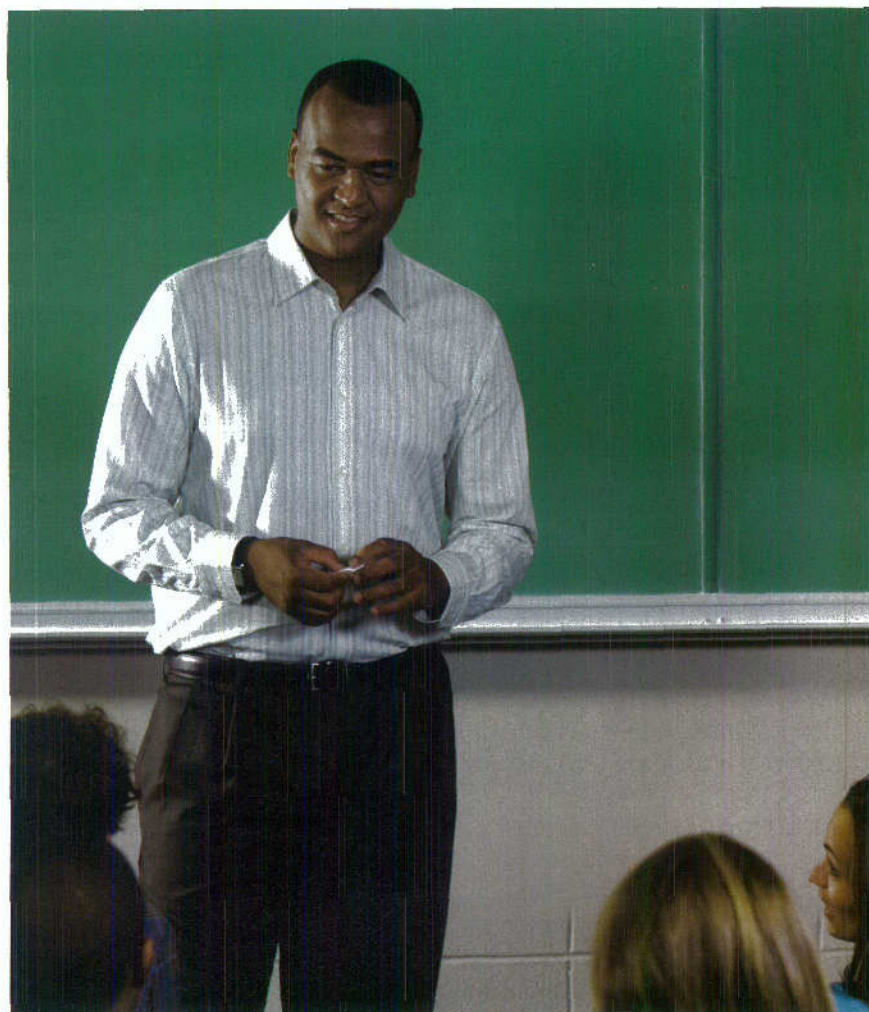


# Adapting an Annual Research Symposium to Recruit Underrepresented Minorities to Postcollege Education

By Rebecca M. Price, Alexa C. Rosypal, Britt Kern, and Traci Powell



*We describe an adaptable program for recruiting underrepresented minorities to the biological sciences that combines a research symposium with enriching activities.*

Scientists need to recruit underrepresented minorities (URMs) more effectively (e.g., Summers and Hrabowski 2006). Here, we describe a one-and-a-half-day Distinguished Scholar Symposium during which undergraduate URMs from nearby schools visit the University of North Carolina at Chapel Hill (UNC-CH) to learn about advanced degree programs. The symposium provides an opportunity for these undergraduates to interact with scientists and labs at a Research University/Very High (RU/VH) (Carnegie Foundation for the Advancement of Teaching 2006). Although our model focuses on postcollege biological and biomedical sciences, other educators will find it a useful tool to develop and adapt for recruiting students to any of the sciences.

## Background

The Minority Opportunities in Research Division of the National Institute of General Medical Sciences aims to increase the diversity of undergraduates in the biomedical sciences. They formally define URMs as “groups [that] have been identified as underrepresented in biomedical and behavioral research nationally: African Americans, Hispanic Americans, Native Americans (including Alaskan Natives), and natives of the U.S. Pacific Islands” (NIGMS). In addition to national programs designed to enhance diversity, we need to ensure that each institution does its utmost to recruit URMs.

The Seeding Postdoctoral Innovators in Research and Education (SPIRE) Postdoctoral Fellowship Program is funded by the Minority Opportunities in Research Division and trains PhDs to bring novel and effective pedagogical techniques into the classrooms of minority-serving institutions (SPIRE). SPIRE has worked with eight institutions throughout North Carolina: Elizabeth City State University, Fayetteville State University, Johnson C. Smith University, North Carolina A&T State University, North Carolina Central University, Shaw University, the University of North Carolina at Pembroke, and Winston-Salem State University

Beginning in the year 2000, SPIRE began hosting an annual Distinguished Scholar Symposium, and in 2004 we began encouraging students from our partner institutions to attend the event. The goal of this student-centered component was to bring minority students who were considering advanced degrees in the biosciences to UNC-CH. We wanted students to gain exposure to

an intensive research environment, and we used our institution as an example of the kind of university that they may attend in advanced degree programs.

Because of the demographics at our partner institutions, the vast majority of attendees were African Americans, but they also included Native Americans. Many students were also nontraditional, including veterans, spouses of military personnel, older adults, and parents.

This paper outlines the activities that make up the symposium. We discuss the symposium held in fall 2005, which turned out to be especially successful; the format has only been slightly modified in subsequent years. We describe how we employed extensive suggestions from students, the activities included, and a list of recommendations. We conclude with reflections on the entire experience.

### Setting the goals

Because of the ongoing collaboration with our partner institutions, we had already identified some of the activities that would complement their curricula. For example, many students think that a biology degree prepares them only for becoming a physician, even though they are exposed to a breadth of topics in introductory biology classes. Thus, we wanted to show students RU/VH research labs and the variety of scientists working in them. We especially wanted them to meet technicians who had joined the lab immediately upon completing their college education, so our students could see that tech positions are an excellent way to experience lab research before deciding whether to pursue further studies in that field.

We also reflected on our own experiences, especially the necessity of a good mentor and a strong base of support. We wanted to include activities to illustrate how successful scientists rely on mentors (DeWhyse 2004a, 2004b; Summers and Hrabowski 2006). Also, because scientific presentations are such a key component of graduate programs, we included a scientific seminar in our event.

To ensure that we specifically addressed students' goals, we asked them the following questions one month before attending:

- What do you want to learn during your visit to UNC-CH?
- What questions do you have about graduate or professional school?
- What questions do you have for our distinguished scientist?

The answers included both practical and emotional challenges. Students wanted more information about admissions and financial aid. For example, they asked for "advice and tips on how to pursue goals in the medical field," about "how to prepare for and what to expect from graduate school," and how "graduate school is different from undergraduate...and what graduate programs would best fit my interests." (Students' quotations have been corrected for spelling and grammar.) Students expressed both internal and familial pressures to stay close to home, feelings common among URMs (Zimbroff 2005).

As we predicted, one strong theme that emerged from the questionnaire is that students often equate an advanced degree in biology with a career as a physician. Thus, we endeavored to strike a balance between informing students about careers as medical doctors (the stated goal of most of our attendees) and introducing additional options in biomedical and traditional biological fields.

We extracted five goals from the aims of both SPIRE and our students' responses. At the Distinguished Scholar Symposium, we wanted students to

- learn how to find a supportive mentor who recognizes the challenges for URMs,
- network with a community of biological and biomedical scientists,
- gain exposure to the wide variety of biological and biomedical areas of research,
- begin writing a strong application

for graduate/professional school, and

- attend a seminar by a distinguished scientist.

### The event

We designed a series of activities, summarized in Table 1. Here, we describe why we included each activity and how each matches our goals. Each activity primarily addresses one or two objectives, but may also address others secondarily.

#### Evening social

The first activity planned for the symposium was a social in the bowling alley of the UNC-CH student union the night before the other activities. The open, informal atmosphere that we created encouraged supportive interactions (Sasso 2005) to nurture mentoring (DeWhyse 2004b), setting a positive tone for the entire event.

#### Breakfast panel

The first activity on the main day was a breakfast panel at which students conversed with faculty and staff about admission into professional or graduate programs. The panel consisted of three women, an African American representative from the admissions team from the medical school, an African American professor in the dental school, and a Caucasian biomedical professor from the graduate school. Panelists spoke briefly about their individual career paths, commented on their expectations of graduate/professional students, and answered students' questions. They discussed a wide range of jobs such as laboratory technicians, veterinary assistants, education experts, and grant writers. The panelists also explained that the qualifications required for admission, such as research experience and publications and the ability to focus on one particular research hypothesis, indicate the skills needed to succeed in competitive postcollege educational programs.

The panelists' personal experiences demonstrated that scientists pursue a variety of paths to obtain

careers. These unique approaches are essential to share with URMs, so that they avoid the trap of thinking that there is only one path to success (DeWhyse 2004a). Firsthand accounts can give URMs the confidence to identify their own directions (DeWhyse 2004a, 2004b).

The panelists discussed the value of mentors in great detail. They said that a good mentor helps students navigate the professional—but also the social—aspects of being a scientist. In response to one woman’s query about child care, for example, the panelists talked about how they helped parents in their own labs manage flexible schedules. Good mentorship is particularly important for minority students, who commonly experience feelings of isolation (Sasso 2005).

### Research opportunities workshop

Following the breakfast panel, the undergraduates attended an interactive workshop facilitated by Dr. Brian Rybarczyk entitled “Finding Summer Internships and Creating a Personal Statement.” His presentation included a timeline for applying to summer research programs and emphasized that this process parallels that for applying to advanced degree programs. To encourage students to start thinking about personal statements, he asked them to work in groups to evaluate sample personal statements that were

provided. Then, to begin writing their own statements, Dr. Rybarczyk asked students to respond to questions such as “Why do you want to go to graduate school?” and “What experiences make you qualified?” This activity was particularly important because, while personal statements are such a crucial component in application packets, undergraduates tend to wait until the last minute to write them (Rybarczyk 2006).

### Roundtable discussions with graduate and professional students

We designed the roundtable discussions to encourage open dialogue among our visitors and URMs at different stages of dental, medical, and biology graduate programs. Each graduate student led a discussion at his or her own table. Groups of four to five undergraduates visited each table for about 15 minutes, during which the graduate students introduced themselves and explained how their interests emerged. Then the undergraduates asked questions, and the conversations evolved. The moderators told students firsthand accounts about the considerable challenges that inevitably occur while pursuing postcollege education, but they also related the steps they took to triumph over these trials. They answered the undergraduates’ frank questions openly and honestly, encouraging

discussion about their personal experiences as URMs pursuing advanced degrees. The primary goal for this activity was to provide students with an opportunity to network with other minority scientists, but it also began building mentorships.

### Laboratory tours

To expose our guests to a wide range of research areas, we led small tours to different labs at UNC-CH in which SPIRE fellows worked. The undergraduates visited three or four labs, depending on how much time was available, and the research areas included bioinformatics, genetics, neurobiology, microbiology, molecular biology, immunology, and environmental ecology. Several of these labs worked on major animal model systems: *Drosophila melanogaster* (fruit fly), *Caenorhabditis elegans* (nematode worm), and *Mus musculus* (common mouse). Biology students are exposed to these models in their coursework, but not every undergraduate has the opportunity to interact with the systems. Once in a laboratory, SPIRE fellows described their research, often including a demonstration or hands-on activity. One fellow, for example, studies Crohn’s disease in a mouse model and showed students histological slides of mouse intestines. Another taught students how to determine the sex of *Drosophila*. The fellows encouraged

**TABLE 1**

**The recruitment tool: Activities we included on the campus visit.**

Activity	Description	Primary objectives met
Evening social	Visitors and postdocs meet informally	Networking
Breakfast panel	Faculty and admissions staff answer visitors’ questions	Admissions Mentor
Research opportunities workshop	Visitors interactively explore summer research opportunities and begin preparing applications	Admissions
Roundtable discussions	Small groups talk with URM graduate/professional students	Networking
Laboratory tours	Brief, hands-on tours guided by postdocs	Areas of research
Keynote address	Seminar with Q&A	Seminar
Discussion with the distinguished scientist	Opportunity to converse with seminar speaker	Mentor

students to ask questions, and those questions guided the experience.

### **Keynote address**

The program culminated in a research seminar about the hormonal regulation of diabetes by Dr. Joseph Dunbar, professor and chair, Department of Physiology, Wayne State University. Dr. Dunbar exemplified a biomedical research career, modeling an alternative to becoming a physician. In addition, he discussed his experiences as an African American climbing through the ranks of science and as a mentor to other URMs.

### **Discussion with the distinguished scientist**

Dr. Dunbar embodies successful scientific scholarship and good mentoring, and he was able to address the challenges he faced—and overcame—as a URM. The visiting students met him after the seminar to ask questions about his science and personal history. It was easier for the undergraduates to ask questions in this relaxed environment than in the formal question-and-answer period immediately following Dr. Dunbar's presentation.

### **Student response**

The 20 students who attended found the activities informative and relevant to their futures. All activities had a median score of "A" on a Likert scale, with the exception of the meeting with the distinguished scientist, which was unintentionally cut short because it was the last activity of the day and other activities ran overtime (median = B). The attendees wrote additional comments that praised the event highly. Data are available upon request.

### **Recommendations**

We recommend this symposium format for recruiting URMs. The type of personal connections that we fostered open opportunities to network with scientists and begin forming mentorships. It is a productive way for an RU/VH to reach out to students from nearby, primarily undergraduate uni-

versities and even high schools and community colleges.

The following six recommendations summarize the strongest elements that we incorporated into our planning for the event.

1. *Tailor the event to students.* We learned what to emphasize from students' input. Their responses to the initial questionnaire helped us choose activities that would make the most impact. For example, one reason Dr. Rybarczyk's workshop included information on applying to summer research opportunities was because a student asked to "learn more about summer internships."

2. *Adapt the format to suit your resources.* The event exposed our guests to a breadth of biological and biomedical research. Thus, the laboratory tours were one of the most noteworthy components—and we had access to the labs because SPIRE fellows worked in them. We also wanted to showcase student life, so we held the evening social at the student center.

3. *Create an open environment that encourages networking and mentoring.* The evening social, the breakfast panel, and the roundtable discussions all encouraged a comfortable environment that promoted discussion. One student commented that "everyone I came in contact with today was very friendly. I felt welcome at all labs and discussions." Creating an open, informal atmosphere encourages supportive interactions that nurture mentorships and networks (DeWhyse 2004b; Sasso 2005).

Our guests especially enjoyed the roundtable with graduate and professional students. The more advanced students answered the undergrads' candid questions openly and honestly. This kind of informal mentoring is vital for developing a successful career, particularly among minority scientists (DeWhyse 2004b; Sasso 2005; Quick 2002). The moderators shared stories about the serious obstacles common in any postgraduate program, but they also

explained how to overcome those challenges. This "reality check" is essential for the success of URMs in advanced degree programs (DeWhyse 2004b).

4. *Discuss expectations about performance.* For students to succeed in postcollege education, they must know what their mentors expect of them. The panelists at breakfast clarified admissions requirements and explained how those expectations align with the skills needed to enter and succeed in postcollege programs.

5. *Expose students to research at top-tier research facilities and offer guidance on how to pursue those opportunities.* For most people, first-hand exposure inspires passion for research far more than any reading can (Russell, Hancock, and McCullough 2007). Thus, the laboratory tours—and the activities they included—were vital components for the success of the symposium. We also included Dr. Rybarczyk's workshop on "Finding Summer Internships and Creating a Personal Statement."

6. *Include a keynote speaker, but schedule the talk carefully and prepare students.* The keynote address is essential for teaching undergraduates that graduate/professional students introduce themselves to the scientific community by giving presentations. However, students' evaluations indicated that the keynote address was by far the most difficult component of the symposium. In response to their comments, we offer three suggestions:

- Provide students with an abstract so they can become familiar with scientific vocabulary prior to attending.
- Schedule the seminar before lunch. Students will be more alert and attentive.
- Choose speakers who can talk to a general audience, and request that they minimize obscure vocabulary.

### **Reflections**

"This was the greatest opportunity you could have given undergraduates. We

got the opportunity to ask real questions and get the answers we need to continue on our journey. Thank you very much. I will always be grateful."

Everyone who pursues postcollege educational programs faces challenges, but URMs face more obstacles than others (DeWhyse 2004a, 2004b; Summers and Hrabowski 2006). We addressed some general concerns that all students have, such as learning about admissions requirements, becoming aware of a breadth of research areas, and gaining familiarity with scientific seminars. But we also provided a framework on which to build a social support network—the kind of network that is especially crucial to the success of URMs (Quick 2002; DeWhyse 2004a, 2004b). The attendees responded enthusiastically to the event; typical evaluations claimed that "the symposium was valuable in helping me make the choice to pursue graduate or medical school" and that "this [is] information...I can use and is helpful to the planning of my future."

The activities included in the symposium offer support to any student—not just URMs—considering a postgraduate education. We trusted ourselves to draw from the diversity of personal experiences in our postdoctoral program to identify time-honored activities that we found inspirational when we were college students. But we made this generic structure personal by adapting it specifically to student feedback. We also asked faculty, postdocs, and graduate students from similar ethnic and racial backgrounds to talk to students about their personal experiences as they navigate their way through scientific careers, offering firsthand success stories. Seeing these role models is essential for minorities to succeed (Nelson, Brammer, and Rhoads 2007). This structure, therefore, can easily be adapted to target relatively small groups of URMs. We expect that the best success occurs when the diversity of the breakfast panelists and roundtable discussants matches the diversity of the attendees.

The Distinguished Scholar Symposium created an environment that inspired URMs to continue their scientific education after college. We tailored a mixture of discussions, hands-on activities, and traditional experiences to address students' concerns. Faculty and administrators may find our program a useful model on which to base their own event for recruiting URMs to any science program at different levels of education, including high school, community college, four-year college, and postcollege programs. ■

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**Rebecca M. Price** (becca.price@uwb.edu) is an assistant professor in the Interdisciplinary Arts and Sciences Program at the University of Washington, Bothell, in Bothell, Washington. **Alexa C. Rosypal** and **Britt Kern** are assistant professors in the Natural Science and Math Department at Johnson C. Smith University, Charlotte, North Carolina. **Traci Powell** is an adjunct biology instructor at San Diego City College, San Diego, California.



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