

# ADVANCING HIGH SCHOOL CHEMISTRY

BY ADAM M. BOYD

FUNDED BY A GRANT FROM THE NATIONAL SCIENCE Foundation, the CUNY GK-12 Fellows Program provides graduate students the chance to work with teachers who are just beginning to teach high school sciences and mathematics at the Advanced Placement (AP) level. In this program, 10 graduate students in the sciences volunteer to serve as instructional fellows, while engaged in traditional research and coursework at the City University of New York (CUNY).

CUNY GK-12 fellows work closely with their cooperating teachers to plan their day-to-day activities, based on both the teachers' and students' needs. Fellows may also assist with setting up labs, grading, and instruction. During the academic year, fellows are required to spend 10 hours per week on in-class instructional activities at their assigned high school and an additional five hours per week on out-of-class preparation activities.

## Training

Both teachers and fellows receive training in the form of conferences and seminars, which ground them in teaching skills and practices. Overall, there are 10 days of training for the fellows, beginning with a five-day summer institute on teaching AP courses offered by the College Board. If the teachers involved are teaching their AP class for the first time, they actually attend the class with the fellows with whom they will be working. Later, during a five-day intensive training class organized by the CUNY program, fellows learn pedagogical techniques and strategies for effective teaching.

## Mentoring

The program also has intrinsic mentoring. Experienced fellows pair up with first-time participants to hold informal discussions on their classroom approach. These meetings, in addition to monthly program-wide seminars, provide a support system for new fellows.

## Impact

The program focuses not only on the graduate students serving as fellows, but also on the high school science programs in which they serve. At the outset of the program in 2003, only three of 28 schools in the Bronx School District offered any AP classes in the sciences. Since then, three additional schools have offered AP courses and several more have expanded their AP offerings as a direct result of the aid provided by the program.

For Nancy Medina, who is currently serving as a fellow for both AP chemistry and AP biology at Clinton High School in the Bronx, the most beneficial aspects of her experience have been learning *how* to teach — and at the same time, learning *from* teaching.


Medina is planning for a career as a high school teacher, and the experience has been invaluable. She's not only had the chance to be mentored by an experienced educator, but has practiced teaching herself, and learned about better ways to reach students.

"The teacher I was working with was great. He teaches high school and college chemistry, so he knows his field very well. I was able to observe how he taught the lessons, what he thought was important, and how he got results from his students. And because I had to prepare a particular section, it helped me sharpen my own chemistry knowledge. I really had to learn it better so I could teach it to children."

Another fellow, Mary Donovan, used the program to test the waters of academia before accepting a fellowship at Queens College. "If I had not been involved in the CUNY Fellows Program, or if I'd had a bad experience, I would never have accepted my position at Queens," says Donovan, whose fellowship requires her to serve as an adjunct professor by teaching four credits per semester in addition to completing her research. "I actually didn't know if teaching was something I wanted to do. However, I had a really positive experience teaching the class and the lab, and felt more confident about pursuing teaching as a career."

Donovan's early involvement with the fellows program consisted of her simply meeting with a teacher to discuss his lesson plans. Later, her participation grew into a much more involved endeavor. Slowly, she started incorporating some of her own ideas about teaching styles and how certain topics should be taught. After a while, she began collaborating with her teacher to develop lesson plans and to incorporate new methods, such as peer-led team learning, into the coursework.

Rising to the unique challenges of teaching in a high school setting, whether it meant finding a way to complete her lab work in an already busy schedule or simply maintaining control of her class, helped Donovan feel increasingly confident that she could tackle other teaching challenges.

With a comment fitting for a program based in New York City, Donovan observes, "If I could make it there, I could make it anywhere." 

ADAM M. BOYD is associate editor of **in Chemistry** and an education associate in the ACS Undergraduate Programs Office.

For more information about the NSF Graduate Teaching Fellows in K-12 Education Program, and a list of institutions with grants, visit [www.nsf.gov/funding](http://www.nsf.gov/funding).