Personal Statement
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At NYU, I have had the opportunity to develop new classes for undergraduates, I have involved students in the research activities of my laboratory, and I have created an imaginative science outreach program. These experiences have been personally rewarding, and have also transformed the types of questions we are pursuing in my lab. The scope of my educational efforts extends to a broad academic community, and this past summer I gave the plenary lecture to an international audience at the Biennial Conference in Chemical Education.

My teaching efforts have featured the revision of two challenging laboratory classes: the Honors Organic Laboratory, and Experimental Biochemistry.

My teaching philosophy centers around the concepts of engaged learning, personal involvement, and broad outreach. I believe that students can learn effectively when they feel that their work engages topics that are current, evolving and relevant to their own experiences.

I employed the concept of engaged learning in the Honors Organic Chemistry laboratory class. We sought to incorporate ongoing research projects at NYU into the teaching lab content. I created new modules in the area of chemical nanoscience and peptide mimicry. The students felt these experiments were exceptionally challenging, but also exciting because they were at the forefront of ongoing research in Chemistry. Largely because they became engaged in chemistry as an evolving science, many of the students went on to conduct their own independent research projects. Due to the innovative aspects of our approach, we communicated our advances to colleagues through peer-reviewed publications, leading to three articles in the Journal of Chemical Education.

I employed the concept of personal involvement in my Experimental Biochemistry lab, which I was asked to revamp for Fall of 2010. This was a class that I myself loathed as an undergraduate because few of the experiments worked. To address this problem, I picked the experimental procedures that I thought would be most relevant to the largely pre-med students enrolled in this class (protein purification, enzymatic assay, DNA amplification). I met with grad student instructors in the summer prior to the class to check the experimental modules personally. We jettisoned experiments that proved unreliable. Typically, the lab sessions themselves are conducted by grad student instructors. In order to evaluate if the experiments were suitable for upcoming years and to ensure that critical concepts were communicated in the lab setting, I was personally involved in most of the lab session instruction. I was able to question students directly about their observations during the
course of their experiments. Overall, the class ran smoothly and was very successful, which was a pleasant surprise for the first semester of a completely revised lab class.

The concept of engaged learning is also apparent in the extensive involvement of undergraduate students in the research efforts in my lab. Since 2006, NYU undergraduates working in my lab have been co-authors of six journal articles and one book chapter. An undergraduate, Neel Shah, was the lead author on an article in the Journal of the American Chemical Society, the most prestigious journal in the field. Neel’s discoveries have provided us with new insights that have fundamentally changed the research goals of my lab. NYU undergraduates have contributed to biomedical research with significant potential for improving human health. My student Sofia Gilels is collaborating with Medical School researchers in the area of Alzheimer's Disease, and has results suggesting that some of our compounds are capable of stimulating neuronal growth. I have taken NYU undergrads to national meetings of the American Chemical Society. Students I have mentored have won prestigious awards, including the United Negro College Fund-Merck undergraduate fellowship to Tracey Spencer.

I am committed to scientific education not only at NYU, but I am also passionate about conducting science outreach for the public. In order to engage a general audience on topics related to chemistry and the natural sciences, I co-founded the “Experimental Cuisine Collective”. This science outreach organization gathers chefs, scientists, students, and "foodies" to discuss how scientific advances are leading to a better understanding of cooking processes and to innovations in food preparation. The Experimental Cuisine Collective meets once a month and has hosted some of the most renowned chefs from New York and Europe, along with scientists from Rockefeller, NYU, Columbia, the University of Southern Denmark, and other institutions. Our group has been featured in many national magazines and television shows. I have developed science education content for NPR's Science Friday, NBC-Learn, PBS's Sid the Science Kid, and Scientific American.

References:

