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Reflections on Undergraduate Research Mentoring

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The active involvement of undergraduates in meaningful and rewarding research projects has become more prevalent than in previous years, due in part to requirements from Federal funding agencies and undergraduate degree programs. Much, if not all, of this new emphasis is driven by the recognition that research experiences instill a multitude of advantages to undergraduates that extend well beyond formal classroom training, such as increased written and oral communication skills, as well as critical assessment abilities for objectively evaluating highly technical information.

As Chairman of the coordinating committee for the undergraduate degree program in Agricultural Biotechnology, and as coordinator for the Independent Study course ABT 395/399, I have had the pleasure of experiencing first hand the diversity and quality of undergraduate research projects from many different departments and colleges. I am continually impressed and amazed at the level of sophistication in these research projects and the performance of our undergraduates here at the University of Kentucky. Without exception, both students and research mentors communicate the mutual benefits, rewards, and enjoyment they have had working together.

My own experiences have done nothing but reaffirm the truly rewarding experiences that can be derived from mentoring undergraduate research projects. As an example, recently my laboratory became engaged in collaboration with a well-known and respected structural biologist at the National Institutes of Health (NIH). An enzyme that had been the focus of my research program for many years turned out to represent an ideal candidate for structural studies aimed at elucidating a novel and important protein structural motif. At the time, I had recently accepted an undergraduate in the laboratory, and she was quite interested in this project. The research turned out to be a race with several other laboratories for who would be the first to elucidate this structure and its associated functional significance. Unfortunately many personnel in the lab were away for the Christmas holiday, but the undergraduate was remaining in Lexington, because her home was not far away, in Somerset.

I vividly remember the eagerness with which she accepted my request to assist me in making all possible attempts to acquire the necessary information for our collaborator, and how excited she was at its possible significance. We both worked hard, including some evenings and weekends. I remember thinking that I had not seen the level of commitment and effort that she put forth from many of my previous graduate students, and how impressed and rewarded I felt at the excitement and satisfaction she exhibited when experiments worked and the discoveries we were after began to appear.

The work was completed and subsequently published in a prestigious journal with, of course, this undergraduate as a co-author. I will never forget the instrumental and important role Megan Flynn played in my research program during this time, or the gratification I felt seeing the rise in her self-confidence, interest, and abilities in scientific investigation. Megan will move on, as all students do, to meet new and additional academic challenges, in her case in graduate school at Berkeley.

I feel quite proud of the fact that I had the opportunity to work with Megan and serve as her research mentor. More than ever, I have come to realize that the real contribution research mentors provide for undergraduates seeking experiences in research are opportunities, and these opportunities provide the setting and outlet for our undergraduates to demonstrate their outstanding capabilities, and to capitalize on their academic education and intellectual curiosity.