

## Enrichment Activities for Cross Training of Undergraduate Students

A variety of enrichment activities supplement the laboratory work for students in the Cross Training program. The intent of the program is to prepare students for graduate study, and many skills in addition to laboratory experiences will be very helpful for students.

The Writing Component (WC) is perhaps the most helpful non-laboratory activity available, in that it helps students with scientific writing. Most graduate students, and virtually all undergraduate science and engineering majors, can use help with their writing skills. Briefly, we use the science section in the Tuesday edition of the *New York Times* as a trigger device to allow students to identify a topic of interest, then funnel them into using the PubMed or Scopus facilities to identify an original scientific publication. Students then write up a description of the science paper. They get detailed, individual feedback on each of their weekly WC submissions. This has been of outstanding success, as each student progresses at their own rate and works on the skills they need to develop. Many students finish the summer writing (and reading the literature) at the level of a first year graduate student.

We do a terrific job of training in the Responsible Conduct of Research (RCR). We have a series of interactive training sessions to develop the concepts of RCR. Undergrads in a variety of summer programs work together and also get to work with medical students. In addition, our *RCR Night at the Movies* is well received every year, and ties in to our Writing Component. Students write one or more essays related to the RCR aspects of one of the movies (*Gattaca*, *Ms Ever's Boys*, *etc.*) in lieu of a weekly science article.

We have an outstanding seminar series specially designed for the Cross Training students. These seminars are intended as eye-opening, or at least career-awareness opening, opportunities for Cross Training students. As an interactive session, speakers highlight some of the most exciting science on the horizon, and show how Cross Training students could get in on it. An example listing from last summer is attached.

We have Career Day early in the summer. We find it important to provide guidance as to how to prepare for and apply to graduate school and medical school, and to trace possible career paths after professional school for each track. We do this *early in the summer* because we want to tip off the undergrads to the differences that exist between typical graduate students and typical medical students, both/either of which may be working along side the undergrad in the lab.

We have a Meet the Researcher series of lunches for undergrads, and we encourage students to ask the researchers about their science and especially about their career paths and experiences.

We train students in preparation of abstracts and posters, and of course we have Poster Day at the end of the summer. We have training sessions on how to keep a laboratory notebook, and some other sessions. Students develop camaraderie during extensive interactions and team building things early in the summer. Our campus is not large, and students interact with other undergrads on a daily basis. We do not let undergrads from distant colleges become isolated in laboratories all summer.

Students spend 90 % of their time in the lab, 10 % in Enrichment. Our program is very selective and attractive: typically 160 applications for 10 slots, 10-12 offers to get 10 acceptances.