

GRADUATE PROGRAMS

1. Notable Accomplishments

Prior to 2003-2004, each of our degree and non-degree granting Ph.D. graduate programs recruited students independently. However, in 2004-2005 we implemented a major reorganization of our graduate programs that has greatly simplified and improved the overall quality and attractiveness of our SOM graduate programs. The major accomplishment of the new system includes the following:

- Consolidation of more than 20 entry programs into seven umbrella Biomedical Sciences (BIMS) Graduate Programs that cross departments and schools and include Neuroscience; Cell and Developmental Biology; Biochemistry, Molecular Biology and Genetics; Molecular Medicine; Biomedical Engineering; Structural and Computation Biology and Biophysics; and Microbiology, Immunology, and Infectious Diseases. Students select a Ph.D. mentor and degree program at the end of year 01 but also continue their affiliation with their BIMS program throughout their training.
- Full institutional funding of all first-year students.
- Facilitation of the ability of physician scientists and Ph.D. faculty in clinical departments to participate in training graduate students.
- Implementation of new initiatives in recruiting under-represented minority (URM) graduate students including attendance of BIMS program directors at national URM meetings, an improved student mentoring and advisory system, and more active recruiting at selected undergraduate institutions with a large percentage of URM students.
- Development of various new joint courses and workshops taken by students across all BIMS programs including graduate Physiology and Pathology courses that promote the ability of students to understand and carry out more translational research projects.
- Since the restructuring, applications for the programs have increased 31 percent.
- Preliminary results based on entry qualifications (e.g., grade point averages, GRE scores, number of competing offers for matriculated students), and performance in courses indicate significant improvements in the overall quality of our graduate students.
- The revised system has contributed to major improvements in recruitment and retention of URM students. The minority applicant pool increased 109 percent as a result of the reorganization and other initiatives. Moreover, >20 percent of our domestic BIMS applicant pool and matriculates in 2004-5 were URM students (up from 8 and 12 percent respectively in 1998). In addition, the number of Ph.D. degrees awarded to URM students within the UVa SOM has increased dramatically in recent years from 3.6% of total SOM graduates in 1998 to 23 percent in 2005.

- Extramural training grants from the National Institutes of Health and other granting agencies increased from \$1.6 million in 2001-02 to more than \$3 million in 2004-05. This amount represents more than 28 percent of the total graduate student budget, a figure nearly twice that of many peer institutions.
- There have been major improvements to the overall quality of the M.D./Ph.D. (NIH Medical Scientist – MST) training program in the last few years. Historically our program ranked in the lower quartile of funded NIH MST programs, however during the five-year competitive renewal last year, the UVA program scored among the top third of all funded MST programs in the country.

2. Two-Year Goals and Metrics for Success

Although we have significantly improved our graduate programs in recent years and successfully implemented virtually all major recommendations of the 2002 SOM Decade Plan in this area, there are several areas that should be the focus of future efforts as outlined below.

- **Improve mechanisms to better integrate Ph.D. training and application of basic research findings to advances in clinical medicine, especially in the areas of translational research including use of mouse and other whole animal models, mammalian and human genetics, and bioinformatics.**
 - Implement new courses, workshops, and other training activities to enhance the ability of our faculty and trainees to conduct outstanding translational research. For example, workshops/courses that: a) train students to do small animal surgery and physiological assessments of blood pressure, heart rate, and other physiological parameters as well as imaging methods; b) familiarize students with animal models of disease; and c) educate students on the process by which new drugs and devices are commercialized and obtain regulatory agency approval. Outcome measures will include having students write translational research proposals for grading by faculty.
 - Develop more effective mechanisms to promote productive interactions of medical and graduate students and to build a mutual understanding of professional tracks and how basic research can be translated into advances in medical practice. Outcome measures will include evidence of development of joint research projects between graduate and medical students, and increased frequency of medical students doing an elective research year.
 - Establish a monthly "Dean's Research (Lunch) Seminar" during which speakers give a research presentation that appeals to medical, graduate and nursing students.
 - Establish a special seminar series to highlight translational research, and require that a number of key translational courses in physiology, pharmacology, and pathology be a required component of our graduate core curriculum.
- **Improve overall quality and consistency in the evaluation of faculty with respect to graduate student teaching and Ph.D. mentoring skills/effectiveness.**

- **Develop vehicles for the integration of Ph.D., medical, and nursing students, such as pairing medical and nursing student with Ph.D. students for a research year.**
- **Implement a more rigorous evaluation process of graduate teaching and mentoring and mechanisms to better recognize excellence in this area within the next two years including establishing a minimum of 5 graduate and mentoring awards.**
- **Increase our stipend to at least the 50th percentile within the next two years or to be able to compete for the best students.**
- **Streamline and improve the Ph.D. granting process.**
Although the new integrated BIMS structure is highly attractive to students and provides a very effective training format, the relationship between BIMS programs and Ph.D. degree granting mechanisms in our new system remains overly complicated, and should optimize overall training quality, efficiency, and cost effectiveness.
- **Develop a rigorous but more straight-forward mechanism that facilitates having qualified faculty in clinical departments join graduate programs.**
The outcome measure is to include a question on this issue in our annual faculty survey.
- **Recruit sufficient numbers of high quality physician scientists, and/or provide adequate protected time or infrastructural support for those we have to optimize the chance they will succeed.**
We feel that the recruitment, retention, and success of our physician-scientists is absolutely critical to enhance our ability to effectively train Ph.D. and M.D./Ph.D. students who are going to be the leading biomedical scientists of the future and who can effectively translate basic research findings into advances in clinical practice. We also need to continue initiatives to better support the success of these individuals by providing adequate protected time and outstanding mentoring by senior faculty.
- **Establish a new Ph.D. degree program in translational medicine as part of the restructuring of our NIH GCRC grant.**

3. Five-Year Goals and Metrics for Success

- Continue efforts outlined in two-year goals to improve support mechanisms for physician scientists.