

Mentor's Handbook

Pharmacology Graduate Training Program

I. EXECUTIVE SUMMARY

The Pharmacology Graduate Training Program is an interdepartmental Ph.D. degree granting program designed to educate students on the scientific principles and research paradigms important to a career in the pharmacological sciences. The Program combines a thorough didactic component with rigorous mentored research and peer-to-peer learning opportunities. Graduates of the Program are expected to compete successfully for postdoctoral training and have highly successful long-term careers in research, teaching, regulatory affairs, or industry.

Mentors in the Program have important responsibilities that are outlined in this Handbook. **Mentoring graduate students is a privilege.** Graduate students bring energy and enthusiasm into the laboratory, comprise the workforce that gets things done, and provide critical input into the design and interpretation of experiments. However, these key contributions of graduate students must be nurtured and developed. **Mentors are also expected to have active participation in all aspects of the Program.** Participation may include directing or lecturing in core or elective courses, serving on the Program advisory committee, serving on Phase I qualifying exam committee, serving on graduate student thesis committees, leading small group discussions on topics related to responsible conduct of research, and attending the annual retreat, research seminars, journal clubs, and works-in-progress seminars. Although the Program is supported by a National Institutes of Health institutional training grant (T32-GM007628-33), mentors bear ultimate responsibility for funding student stipend, fees and tuition. Career guidance and career development including mentoring the student to apply for appropriate extramural pre-doctoral funding are essential activities of a successful mentor.

From the onset of their training, graduate students are informed of the expectations and responsibilities that they must meet to complete the program. These are outlined in the “Handbook” for students and they are reinforced in coursework, journal clubs and seminars, and in meetings with program leadership. Upon entering a laboratory, the laboratory mentor and the dissertation committee form the most important source of continued guidance for the student. This manual serves as a guide to aid these mentors in this process and to outline the expectations and responsibilities of mentors in our program.

II. WHAT SHOULD A MENTOR KNOW?

Program Requirements

A laboratory mentor must understand and support the goals of the training program in order to minimize potential conflicts that might delay student progress through the program. Several resources are available for both mentors and students. The “Handbook for Graduate Students” outlines student responsibilities and requirements. This resource is updated annually to reflect changes in program structure and is available online or from the education office. All mentors should be familiar with the program requirements, training guidelines, and opportunities that are described in the “Handbook”. Mentors are encouraged to contact the Director of Graduate Studies to discuss the program and any trainee-specific issues. All first-time mentors must meet with the DGS to gain an overview of the program and to address any specific training-related issues.

Where do I go for help?

Mentors and students may encounter any number of challenges during the tenure of a student in the laboratory. These issues may range from academic performance to health issues to serious personal problems. Several resources are available for mentors and students to deal effectively with these challenges. Mentors and students are encouraged to contact the DGS who will direct the mentor or student to the appropriate resource or provide contact to available, comparable resources where possible. In an emergency where the Director is not available, the Associate Director, Department Chair, or representatives of the BRET office should be contacted. Get help early! The most common mistake made by mentors and students is not seeking help or alerting the program leadership of a problem in a timely fashion.

What can I do to ensure success?

1. *Clearly outline your expectations:* Students will respond to goals and challenges. Let students know what your expectations are for laboratory attendance, participation in journal or data clubs, interaction with laboratory colleagues, and their role in general laboratory duties. Write down these expectations for everyone. In addition general expectations, what are the specific goals for this student? What is the timeline for the completion of specific experiments? What are the priorities? What data or reagents are required for the next step?
2. *Keep in the conversation:* It is critical that mentors meet regularly with students. The format and timing of these meetings may vary from student to student or during the training period of a specific student. However, it is critical that one-on-one meetings be scheduled in addition to group meetings. A major goal of these meetings should be to discuss whether the student is attaining laboratory expectations. If these expectations are not being met, the cause must be determined and clear direction must be given to remedy the situation. Specific research problems should be discussed as well as an appraisal of the progression of the project based on an agreed upon timeline. If necessary, members of the dissertation committee can be consulted for advice or assistance. It is often helpful for both mentor and student if a journal or diary is kept that summarizes the major points and decisions of each meeting.
3. *Don't go it alone:* Mentors and students have important and valuable resources to help them during the laboratory phase of training. The dissertation committee is not meant to be a perfunctory body, but should be comprised of a group of mentors with expertise and interest in the student's research project. The committee must be consulted at regular intervals (as outlined in the "Handbook") to monitor the student's progress. However, the committee or individual members should be consulted whenever either the mentor or student deems it necessary. Often the perspective and advice of a committee member has provided the key insight necessary to move a project forward. Given the important role played by this committee, the mentor and student should carefully assemble this group. Guidelines as to the composition of the committee are contained in the "Handbook" but major criteria for inclusion should include scientific expertise, availability and willingness to serve as a mentor, and a genuine interest in the project and student.

How are student and faculty interests protected during disputes?

Good communication and prompt involvement of the program leadership resolves most disputes that arise between faculty and students. However, if discussions between the faculty mentor, student, and program directors fail to resolve a dispute concerning a student's effort or intellectual property, the matter will be referred to the program internal advisory board composed of 3 senior faculty members and the Chair of the Department. The DGS will serve as a counselor to this board and will represent the student's interests. If either the mentor or student do not accept or abide by the recommendations made by the internal advisory board, the matter will be referred to the proper university body (Faculty Senate or Student Affairs). During any phase of these negotiations, it is anticipated that the parties involved will refrain from any form of harassment or intimidation. This behavior will not be tolerated. In the case of faculty, such behavior will result in suspension of mentoring privileges and referral to the Professional Ethics and Academic Freedom Committee of the Faculty Senate. Students will be dismissed from the program and referred to the Honor Council.

III. CURRICULUM AND TRAINING

Matriculating in Pharmacology

Students can enter the Graduate Degree Program in Pharmacology through one of five routes, four of which involve a year of interdisciplinary studies.

Interdisciplinary Graduate Program (IGP). This one year umbrella biomedical sciences program offers formal course work that provide students with a firm grounding in basic concepts across the biomedical sciences. During the IGP year, students take two semesters of core coursework and rotate through four laboratories of their choice. At the end of the year, students choose a specific doctoral program. The largest group of students enters through this program, which is described in detail at <https://medschool.vanderbilt.edu/igp/>

Chemical Physiology & Biology Program (CPBP). This is another first-year interdisciplinary program for students who have strong undergraduate backgrounds in quantitative and/or physical sciences. Students entering the CPBP usually pursue a degree involving quantitative biomedical research. Students have the flexibility to explore their research interests from 14 participating departments and centers prior to choosing a dissertation laboratory. For further information go to <https://medschool.mc.vanderbilt.edu/cpb/>

Initiative for Maximizing Student Diversity (IMSD). This program is designed to increase the number of under-represented minority students that enter and complete a doctorate in biomedical research. Students in this program can enter either the traditional IGP or the new 2 year pre-IGP/IGP program. For additional information see <http://bret.mc.vanderbilt.edu/bret/>

Medical Scientist Training Program (MSTP). This program prepares students for positions of leadership in the biomedical sciences. MSTP students typically complete the first two years of Vanderbilt University School of Medicine prior to pursuing graduate training in Pharmacology for an additional three to four years. After the successful completion of their graduate training, students return to Medical School for the final two years of clinical training, culminating in awarding of both the M.D. and Ph.D. degrees: <https://medschool.mc.vanderbilt.edu/mstp/>

Direct Entry. Finally, in select cases students may directly enter the Graduate Program in Pharmacology without going through one of the programs described above. These students often but not always have a Master's Degree or other graduate training. For additional information concerning direct entrance to the Graduate Program in Pharmacology, please contact the Director of Graduate Studies in Pharmacology.

Curriculum and Course Work

Course work required of Department of Pharmacology graduate students includes a total of 72 credit hours of combined didactic courses and research hours. Students who enter with a Master's Degree or matriculate from another program may be able to transfer graduate credit hours. However, at least 24 credits of the required 72 must be in didactic courses and seminars at Vanderbilt. Transfer students should direct inquiries to the Director of Graduate Studies. After the 72 hour requirement has been met, students still register, but for 0 hours until successful defense of the doctoral thesis.

Year 1. Students in the IGP or CPBP program generally will have completed 16 of the 72 required credit hours by the end of the spring in the first year. These include

- Fall – Bioregulation I course
- Spring – Bioregulation II course (Students interested in joining Pharmacology will take the Receptors module)
- Spring – Elective course(s)
- Fall and Spring – Lab Rotations

Year 2 (Pharmacology Year 1). Once selecting the Pharmacology program after the first year rotations, students continue with didactic training that includes

- Summer – PHAR 324 Receptors (3 credit hours)
- Fall – PHAR 322 Communications (1 credit hour)
- Fall and Spring – Elective course(s) (2-3 credit hours)
- Fall and Spring – PHAR 320 Targets, Systems, and Drug Action (7 credit hours)
- Spring/Summer – PHAR 332 Experimental Statistics (1 credit hour)

These hours are supplemented with research credit hours as needed to meet 12 hours per semester.

Year 3 (Pharmacology Year 2) and Beyond. To meet the required 72 hours, students generally register for research credits in the summer following their second academic year of graduate school (12 hours), the fall (12 hours), and finally the spring (5 hours). This may continue as necessary until the requirement is met, after which registration for 0 hrs continues until the dissertation defense.

Choosing a Preceptor/Mentor in the Pharmacology Department

During the four IGP rotations students are expected to find a suitable laboratory to carry out their thesis research. If a mentor in the Pharmacology department is chosen, the student can be accepted into the Pharmacology Graduate Program. Under rare and special circumstances, a student, in consultation with the mentor and DGS, might decide to leave the dissertation research laboratory. The decision to change laboratories is not to be taken lightly and requires both the student and mentor to communicate this intent and reasons to the Chair and the training program leadership. Prior to any formal declaration concerning a wish to change laboratories, the student must consult with the DGS and Chair of the department about their options, which include a Leave of Absence or a single laboratory rotation of no more than 8 weeks.

It is anticipated that the mentor will alert the DGS to any consideration of removing a student from the laboratory. It is never appropriate for a mentor to abruptly dismiss a student without consulting with the DGS prior to announcing such a decision. In the event of gross misconduct or insubordination on the part of the student it is important that the DGS be notified immediately.

Qualification Exams and Dissertation Committees

The admission to candidacy for a Ph.D. in Pharmacology requires successful completion of a two-part examination to insure students have mastered core information from their didactic training and to prepare them for dissertation research. Acquisition of such skills is a crucial prerequisite for success in any scientific environment and therefore must be developed and evaluated.

Qualifying Exam Part I: The Preliminary Examination. Part I of the qualifying examination is consists of a 1-2 hr oral presentation that will be evaluated as pass/fail, generally at the end of the second academic year. Twenty-four hours prior to their examination, the student will select questions from a set developed by the faculty based upon didactic course material. Once questions are selected, no written materials may be consulted. However students may choose to prepare diagrams or other visual aids that would be effective in conveying understanding to the examination committee. Questions are designed to provide raw data to the student, who will provide interpretations using receptor theory, drug metabolism and disposition, signaling pathways, and other topics relevant to training in pharmacology. Faculty members provide both the specific question and additional discussion points to be probed by the Examination Committee.

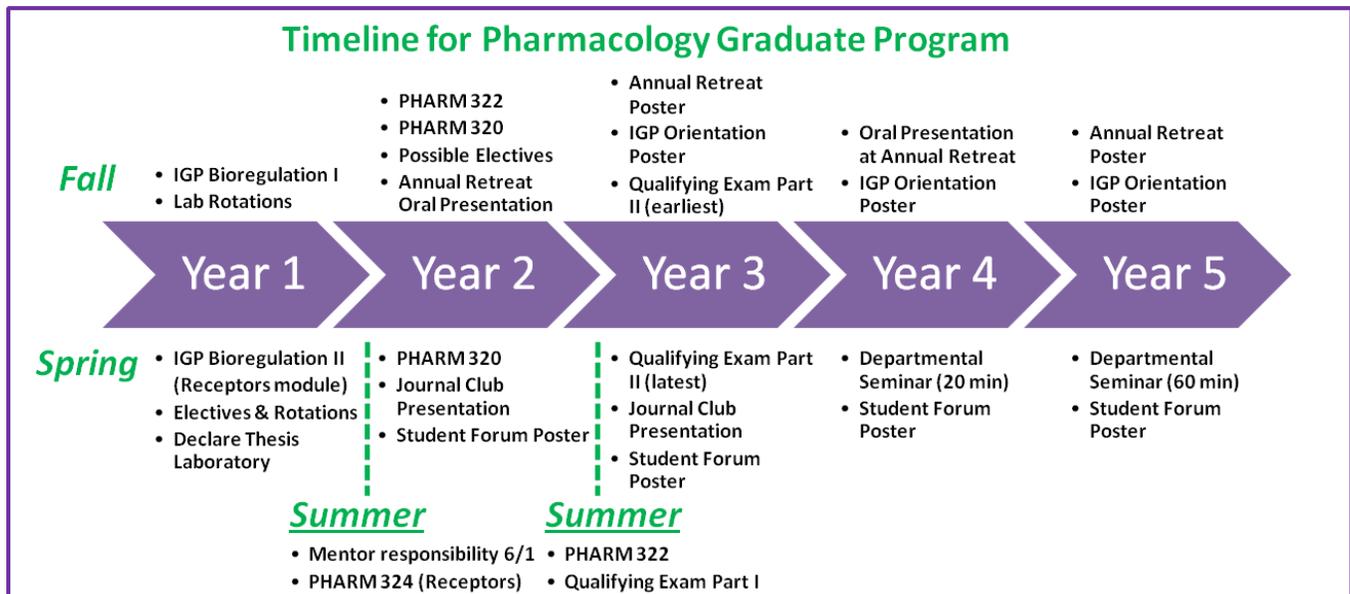
The Examination Committee consists of four faculty members, each rotating for two years, who provide a written summary of the examination to detail both strengths and deficiencies. This summary will be made available subsequently to the student's Dissertation Committee, so that areas of concern can be addressed during the Part II exam (see below). Students who fail the Part I must retake the examination within six months. A second failure results in dismissal from the program.

Qualifying Exam Part II: The Dissertation Committee and Proposal. Upon successful completion of the Part I, the student selects a Dissertation Committee consisting of at least five graduate faculty: four with primary or secondary appointments in the Department of Pharmacology (including the student's advisor) and one with an appointment in some other basic science department. The Director of Graduate Studies in Pharmacology will serve in an *ex officio* capacity, unless selected as an official committee member, who must approve the composition of the committee before submitting it to the Dean of the Graduate School for final approval. Together with the thesis advisor, the student will select a chairperson for the committee with an appointment in Pharmacology. The chairperson will be responsible for providing written feedback to the student, filing evaluations with the Education Coordinator's Office after each Dissertation Committee meeting, and facilitating both the Part II examination and the dissertation defense later on. The Dissertation Committee serves as a working team to help the student in any number of ways, including participating in the Qualifying Examination evaluation process, offering suggestions about experimental technique and design, and providing continual encouragement to be innovative and take risks, characteristics that are crucial to long-term success in research.

Part II of the qualifying examination should be scheduled within 120 days of successful completion of the Part I. It consists of a 1-2 hr oral presentation and defense of a written proposal containing details of the dissertation project. One purpose of Part II is to ensure that the student, advisor and Dissertation Committee have a general concept of the dissertation project, its goals and execution. The major objective of Part II is to evaluate the ability of the student to pose a scientific question, state a hypothesis, develop reasonable strategies to test the hypothesis, anticipate possible outcomes and forecast reasonable interpretations of those outcomes. Before beginning work on Part II, the student and advisor should discuss the direction of the dissertation work, general objectives, and approaches. The involvement of the advisor at this planning phase is essential and represents a critical component of the mentor-student dialogue that should continue throughout the dissertation research. Although cooperation between student and advisor is necessary for developing ideas for the dissertation early on, it is the sole responsibility of the student to compile and defend the written proposal. The advisor is not to assist in the drafting, revising or editing of the written document, nor are other students allowed to review or proofread the proposal.

Training in Pharmacology Timeline

In addition to didactic coursework and the Qualifying Exam Parts I and II, students in the Pharmacology Training Program also participate in a variety of program events. These include poster and oral presentations at the Department of Pharmacology Annual Retreat (usually in the fall), poster presentations at the IGP Orientation and Student Forums and seminar presentations for the department. These events are integrated into the training program at various points in progression. The timeline below summarizes the critical didactic and research components of the program. Students and advisors aim for completion of graduate studies within 6 years, including the IGP or CPB year. The majority of students graduate within this period. All students are expected to graduate within 4 years of passing Part II of the Qualifying Examination. If necessary, the student can submit a formal petition to request an extension of the training period to the Graduate Education Committee, via the DGS, with an explanation for the inability to complete training within the allotted time and a projected date for completion. The DGS will petition the Dean of the Graduate School if an extension is recommended by the Graduate Education Committee.



Throughout training students are expected to engage in scholarly activities, such as studying the scientific literature and attending lectures, journal clubs, and scientific meetings to keep abreast of recent scientific achievements. Meeting these expectations will foster a student's professional development, establishing a scientific lifestyle of learning that will persist throughout the professional career.

IV. COSTS AND FUNDING

Associated Costs

The financial responsibility for a student begins with their commitment to the advisor's laboratory after matriculating into the Pharmacology program at the end of the first year of graduate school. This includes the annual stipend, tuition, activity & recreation fees, insurance, and possibly course audit fees. The financial burden for a student can be met by a variety of sources, including federal individual and training grants, unrestricted awards to the adviser, and tuition remission through the office of Biomedical Research Education & Training (BRET: <https://medschool.vanderbilt.edu/bret/>). Costs for **2011-12** are:

- Stipend: \$26,538 annually including activity fee costs (federal or other sources – exception is if students are paid from an NIH training grant or NRSA then the stipend rate is \$26,000 *see activity fees below*)
- Tuition
 - \$1,704 per 1 credit hour (up to 12 hours each semester until a total of 72 hours is met)
 - \$200 student maintenance fee for after full hours are met – paid each semester
 - Payment generally is divided between three sources:
 - Restricted sources (federal investigator or training grants): up to 35%
 - Non-restricted sources (investigator): up to 20%
 - Vanderbilt remission: 60% - 80% of fully registered tuition; not useable on student maintenance fee

- Insurance
 - \$2,142 total made in two \$1,071 payments (fall and spring)
 - Spring premium can be waived if a student graduates and walks in December. Waivers are available from Joey Neil.
- Activity Fees
 - Beginning July 1, 2011 all Medical Center graduate programs are rolling the cost of activity fees in to the students' stipends. Students will be required to use this additional amount to directly pay for their own activity fees. NIH training grants and NRSA's, however, specifically include funds for these fees so any student paid from one of these sources will have their fees paid through the department and their stipend remains at \$26,000.
- Audit fee
 - \$10 per audited course

Thus, financial responsibility is generally heaviest during the first two years in the Pharmacology program, when students still have didactic course hours and fully registered research credit hours and are charged significant tuition.

Federal Training Grants

Vanderbilt is home to over 25 federal training grants with slots for pre-doctoral support. These are described in detail at <https://medschool.vanderbilt.edu/bret/content/training-grant-support>. A student matriculating into the Pharmacology program can be nominated by the adviser for one or more of these grants, depending on the nature of the thesis project. Nominations generally are solicited late in the spring term. For many grants, students may be nominated for a second full year of support. This includes the Training in Pharmacological Sciences grant. A description of the goals of this grant can be found at: http://projectreporter.nih.gov/project_info_description.cfm?aid=7871503.

Other Sources of Funding

Advisers who serve as the principal investigator for an individual federal grant can request a supplement to support a student from an underrepresented minority population. Students are also encouraged to apply for a Ruth L. Kirschstein National Research Service Award (NRSA), which are offered through a variety of National Institutes of Health agencies (<http://grants.nih.gov/training/nrsa.htm>). Other sources can be found through the Vanderbilt Office of Research FIND Grants initiation organized through the Foundation Relations program: <http://www.mc.vanderbilt.edu/root/vumc.php?site=findgrantsint>

V. EDUCATIONAL ISSUES

Student Travel

Funding. Prior to travel, students should fill out a travel authorization form and travel liability waiver with their mentor's home department. **These forms must be filled out regardless of the amount of reimbursable expenses.** The Graduate School will provide annually \$500 towards domestic travel or \$1000 every two years for foreign travel. The meeting must be a major regional, national, or international conference. Some training grants also provide travel reimbursement, and departmental awards are occasionally possible. The form to complete for the Graduate School travel is located at: http://www.vanderbilt.edu/gradschool/current_students/pdf/Request_for_Travel.pdf.

Points to remember are:

- For foreign travel (including Canada and Mexico) paid from a federal grant, at least 2 months notice is needed review and approval.
- Graduate School award applications are submitted **at least** two weeks prior to the travel for review and approval. The letter of approval should be taken to the mentor's home department administrative office to be placed with their travel authorization form.
- Transportation, registration, hotel and airfare are the only allowable expenses on travel grants and most training grants. Food expenses are paid by the mentor using unrestricted funds. The reimbursement of alcohol is highly discouraged and it is suggested that these expenses be charged separately. Alcohol **CANNOT** be reimbursed from a federal grant.
- Any reimbursable receipts must be submitted to the home department administrative office **within 7 days of travel**. Receipts for purchases made with a p-card also must be submitted for documentation.

Dissertation Enhancement Awards (Travel Only)

The Department of Pharmacology also offers a limited number of awards for dissertation support and related travel expenses. These include the Lee L. Limbird Dissertation Enhancement Award and the Pharmacology Graduate Education Enhancement Award. Please contact the Pharmacology Director of Graduate Studies for details. Also, the Graduate School of the Vanderbilt University also offers a limited number of Dissertation Enhancement Awards:

http://www.vanderbilt.edu/gradschool/current_students/#enhancement.

Student Personal Emergencies

On occasion, graduate students experience unexpected personal emergencies. Sarah Bass has generously donated funds to help cover some expenses that arise for students in these situations. Please contact the Education Coordinator or Director of Graduate Studies for information regarding this fund.

Leaves of Absence

Students wishing to take a leave of absence must apply to the Director of Graduate Studies who will then petition to the Dean of the Graduate School. The maximum leave of absence is one year. The Graduate School allows 6 work weeks of paid leave per year for the adoption or birth of a child. Students that have obtained their own funding through the National Institutes of Health are allowed 8 work weeks of paid leave for the adoption or birth of a child. For all other leaves of absence, 30 work days are allowed before placed in an unpaid status. This follows the established honor-based policy of 15 sick days and 15 vacation days per year.

Pre-Graduate Student Programs

High School Students. High School students OVER THE AGE OF 16 may be brought in during the summer under the approved *PharmX* internship program. They are registered with the BRET Office and paid a stipend up to \$2000 (non-federal funds only). For high school students UNDER the age of 16, Pharmacology works in conjunction with the *Center for Science Outreach*. They may not actively participate in research work and are not paid a stipend. For details, see

<http://www.mc.vanderbilt.edu/root/vumc.php?site=pharmacology&doc=3657>

Undergraduate Students. Vanderbilt-registered undergraduate students may work up to 40 hours during the summer and 20 hours during the academic year. They are hired directly through the department and paid biweekly. Some undergraduates may qualify for the *Federal Work Study* program through Student Financial Aid. Students must contact their Financial Aid Officer to complete the application for the award. The mentor pays only 25% of the desired hourly rate with the remainder through a federally subsidized grant. Once the student's award has been exhausted, the student is moved to 100% funding through their supervisor. Other programs include

- The ASPET-Sponsored Summer Undergraduate Research Fellowship is a special summer program administered in conjunction with the *Vanderbilt Summer Science Academy*. Deadline for admission is February 1:
<http://www.mc.vanderbilt.edu/root/vumc.php?site=pharmacology&doc=3656>.
- The Lipscomb University School of Pharmacy sponsors a joint program in which Lipscomb PharmD candidates compete for slots to work within Pharmacology labs during the summer.
- Non-Vanderbilt students who wish to work during the summer can be appointed as Undergraduate Research Interns through the department. These are paid an hourly rate at the mentor's discretion and paid bi-weekly. Students coming from another country must contact the departmental administrators to begin the 1-2 month visa application process.

VI. DEPARTMENTAL CONTACT INFORMATION

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- Courses and Registration
- Qualifying Exams
- Dissertation Committee Meetings and Defenses
- Pharmacology Retreat
- Student Forum
- Graduate Student Journal Club
- Works In Progress talks
- ASPET Summer Undergraduate Research Fellowship Program, Program issues

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- Hiring/Termination of Students (graduate, undergrad, high school, FWS, etc)
- Student Financial and Insurance Issues (payroll, student accounts, etc)
- Training Grant Appointments & Terminations
- ASPET Summer Undergraduate Research Fellowship Program, financial issues
- Pharm X (high school) payments and processing
- Student visas