Additional Educational Information

The Pharmacology Graduate Group (PGG) at the University of Pennsylvania

The PGG is a collaborative and interdisciplinary Ph.D. program that brings together over 95 faculty from 25 academic departments in the Schools of Arts and Sciences, Dental Medicine, Engineering, Medicine, and Veterinary Medicine at the University of Pennsylvania and in the associated Children's Hospital of Philadelphia. The PGG is part of an umbrella organization called Biomedical Graduate Studies (BGS), which provides financial support and administrative oversight.

The structure of the PGG, including required milestones and their usual timing, is as follows:

Coursework is required of all PGG students during their first two years. Every PGG student is required to take four Core courses that introduce the broad basis of modern neuroscience:

1. Cell Biology (Fall, Year 1)
2. Fundamentals of Pharmacology (Fall, Year 1)
3. Medical Pharmacology (Fall, Year 2)
4. Medical Physiology (Fall, Year 2)

The first 1.5-2 years of study are devoted to classes and laboratory rotations. For most students, this period begins with the Fall semester of the first year and ends with the Spring semester of the second year upon completion of the preliminary/qualifying exam. A total of 20 credit units are required prior to officially beginning thesis research; students take 4 credits each semester. Most classes are worth one credit unit; exceptions are Medical Pharmacology (PHRM 600) and the laboratory rotations. Medical Pharmacology is a capstone of the program and quite demanding. The class meets twice a week for two hours; however, to introduce drugs and therapeutic approaches that are not covered in the lectures additional Problem Sets are assigned. Most assignments consist of series of research papers/reviews and associated short answer essay questions that require the students to synthesize what they have read, understand the mechanism of drug action, and apply it to clinical problems.

In addition, second-year PGG students take a 10-session scientific writing/proposal development course to help them prepare for their Candidacy Exam (see below). Starting in the Spring 2015, all PGG students must also take an introductory biostatistics course, run by Penn’s Epidemiology and Biostatistics Faculty. Students with prior statistical training can elect to take a higher-level statistics course instead, choosing among Penn’s many offerings.

PGG students also take 1–3 elective courses, chosen from all relevant, graduate-level courses offered across campus; one elective must be a “topics” course. The PGG teaches 14 Pharmacology courses ranging in topics from Cardiovascular Pharmacology, Cancer Pharmacology, Cardiovascular Pharmacology, Cell Signaling, Environmental Health, Neuropharmacology, Pharmacogenetics, Pharmacological Chemistry, Radiation Oncology, and Targeted Therapeutics. Courses offered by other
Departments or programs can be taken with permission from the Academic Advising and Curriculum Chair. Students may also take a small number of courses during their Thesis years but must first obtain permission from their Thesis Advisor and the PGG Chair.

Laboratory Rotations are required of all incoming PGG students. Students complete between two and four (median=three) rotations during their first and second years in the program. Each rotation is chosen by the student, under the guidance of the Academic Review Committee. Rotations provide students with opportunities to learn a wide range of modern laboratory techniques and gain first-hand experiences that will aid in the selection of a thesis laboratory. Lab rotations end with an oral presentation explaining the work at an open talk. In addition to the rotation advisor, 2-3 additional faculty as well as first and second year students attend and provide written evaluations about the content and form of the presentation. The Rotation Advisor also provides a written evaluation of the rotation, which includes a description of the student’s strengths, weaknesses, potential for success in the field, and suitability for the lab.

The Candidacy Exam is taken by PhD students at the end of their second year in the program. The Exam consists of two parts: a written Proposal (in the format of an NRSA application) and an oral Defense. Both must reflect a substantial depth of knowledge in the topics covered by the proposed thesis research and an understanding of the broader significance of the work. Preparation includes a Candidacy Exam Workshop run by experienced faculty, with input from past students and the Chair of both the PGG and the Chair of the Department of Systems Pharmacology and Translational Therapeutics (SPATT) who is also the Director of the Institute of Translational Medicine and Therapeutics. While many proposals are concerned with basic pharmacology and mechanism, the programs strives to instill a translational influence to the work.

Training in the Responsible Conduct of Research (RCR). In accordance with NIH regulations, all PGG students receive formal RCR training every year, via BGS. Topics include: Research Misconduct; Data Acquisition, Management, Sharing and Ownership; Mentoring; Collaboration; Conflicts of Interest; Publication Practices, Responsible Authorship and Peer Review; Human Subjects and Animal Welfare. Training consists of on-line courses and quizzes, small-group workshops, courses, seminars, and symposia.

Workshops. Mandatory workshops include: 1) An overview of the process of applying for an NSF fellowship, which we require for first-year students; 2) An overview of the Candidacy Exam, for second-year students; and 3) a TA workshop, run by the Center for Teaching and Learning, for third-year students. In addition, each year PGG students typically organize several optional “Secrets for Successful Scientists” workshops; recent topics included How to Get Published, Communicating Tough Ideas, and How to be an Effective Teacher.

Seminars and retreats. All pre-Candidacy Exam students are required to attend, and all Thesis-level students are strongly encouraged to attend, a weekly Pharmacology seminar series sponsored by the Department of Systems Pharmacology and Translational Therapeutics. Students are also encouraged to attend other relevant seminars provided by the Center for Excellence in Environmental Toxicology and
the Institute for Translational Medicine and Therapeutics. Students and participate in retreats that occur throughout the academic year, including a student-organize Symposium that occurs once a year. Starting in Spring 2015, the Department seminar series will allocate a number of seminar slots to advanced students to allow them greater access to oral presentation.

Journal clubs. All students participate in the Pharmacology Journal Club. Third-year students organize the assignment of topics and each student gives a presentation at least once per semester.

Research and Dissertation. The most important element of the Ph.D. is the generation of a body of original research, completed during the research phase. During these years, the student works with the Thesis Advisor and the student-selected Thesis Committee toward the execution of original research and the communication of this research with the scientific community through meeting attendance, scientific talks, and publication. The work is then organized into the Dissertation, which includes a general introduction and conclusion encapsulating the published research required to qualify the student for graduation. The PGG requires at least one to two first authored manuscripts towards completion of the Ph.D. thesis; however, the thesis committee ultimately determines whether the student has met this requirement. An oral defense of the document, to the Thesis Committee and an additional outside judge, completes the Ph.D.

The average (median) time to degree in our program over the past 10 years is 5.5 years. There is, of course, considerable variability in this number particularly for a program as large as ours (currently we have over 65 students): the interquartile range for the past 10 years is 5.3 – 6.9 years.

This F31 applicant (INSERT NAME HERE) is currently a 3rd/4th year student in the program. Thus, he/she has completed ... indicate what courses you have completed and any other educational opportunities/training opportunities...

Progress of all PGG students is formally monitored and evaluated via three primary mechanisms:

1. The Academic Review Committee (ARC) provides advising, monitoring, and evaluation of all students in their first and second years in the program. The ARC consists of five faculty members who meet with students, one at a time, twice a year. At these meetings, the ARC reviews and addresses any concerns from the student’s performance in courses and the laboratory rotation from the previous semester and helps finalize plans for the upcoming semester, including coursework, laboratory rotations, and longer-term plans for the dissertation. At each meeting, the student is required to provide and be prepared to discuss an updated Individual Development Plan (IDP) based on a template provided by BGS for junior (pre-Candidacy Exam) students. This IDP includes two distinct sections: i) “Skills and Motivations,” which helps the ARC get to know the student better, and ii) “Plans/Goals for the Coming Year,” which includes written lists of specific courses and laboratory rotations that are planned and saved as part of the student’s academic record. In addition, first and second year students are assigned to one faculty
member of the ARC, who serves as their individual advisor. The completed form is reviewed by the PGG Chair and ARC Chair. The ARC also reviews the overall performance of all junior and senior PGG students on a yearly basis and is available to consult on any other academic-related issues for dissertation-level students.

2. The Candidacy Exam evaluates and provides feedback for students as they transition to their Thesis work. Feedback is provided via a written evaluation of both the Written Proposal and Defense, which is immediately shared with the student. There are three possible outcomes to the Exam: i) Unconditional pass, allowing the student to begin his or her Thesis work; ii) Conditional pass, which is assigned if the Committee feels that the student would benefit by, for example, re-writing and/or re-defending part or all aspects of the proposal, which typically must be completed within 1–3 months following the initial Exam; or iii) Fail, in which case the student is told why in the most specific terms possible and is a candidate for dismissal from the PGG. The PGG and ARC Chairs review all of these evaluations and provide additional feedback, as needed, including possible dismissal following failed Exams.

3. The Thesis Committee meets with Thesis-level students every 6–12 months. At each Thesis Committee Meeting, the student is required to provide: i) a written progress report describing current progress and future plans; ii) a copy of the previous Thesis Committee Report, to remind the Committee of the student’s progress at that time; iii) lab notebooks used since the previous meeting, to ensure that they are organized and well managed; iv) an up-to-date copy of the student’s CV; and v) an IDP, following the BGS-provided template that includes sections on “Skills and Motivations and Career Planning,” “Achievements and Plans/Goals,” and “Skills to Improve.” The IDP and an extensive Thesis Committee Report, which is filled out by the Committee Chair and shared with the student at the end of the meeting, are placed in the student’s academic file, which is reviewed annually by the PGG and ARC Chairs, who provide additional feedback and guidance as necessary.

Provided by:

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