

## GUIDELINES FOR GRADUATE PROGRAM IN PHARMACOLOGY

### I. GOALS OF GRADUATE TRAINING IN PHARMACOLOGY

Doctoral training in pharmacology is designed to prepare students to think critically concerning problems involving biochemical, physiological and molecular aspects of pharmacology. Successful students should, by the completion of their graduate training, be able to identify - and to design experiments to test - ideas at the limits of current knowledge in one of the major areas of pharmacology. Students should also learn to analyze, interpret and communicate effectively the results of their thoughts and their experiments to both scientific and lay audiences.

To help students achieve these goals, the Department of Pharmacology has designed a program of study that involves required and elective graduate courses, laboratory rotations involving various approaches to pharmacological problems, journal clubs and seminars.

Graduate study is a full-time responsibility and demands a sustained effort on the part of students. Laboratory studies may require that students be in the laboratory at night, on weekends or on holidays in order to complete important experiments. Students are allowed to arrange for approximately one month of vacation each year. Doctoral training generally requires approximately five years for completion and is completed when the student submits an approved dissertation embodying the results and discussion of original research on an acceptable subject.

### II. FINANCIAL SUPPORT OF GRADUATE STUDENTS

The Department of Pharmacology endeavors to provide financial support to all students accepted into the doctoral program. Normally, students will be supported on Graduate Assistantships provided by the University for the first two years of their program. These University assistantships provide a stipend plus full tuition credit along with a health care plan. Stipend support for subsequent years must come from sources other than the Graduate Assistantship. The thesis advisor may provide this support from research grant funds or from other available sources including: the Thomas Rumble University Fellowships, University Professional Scholarships, the Pharmaceutical Manufacturers Association Fellowships, the NIH Cancer Biology Training Grant, Graduate Research Assistantships, Office of Neuroscience Programs, and NSF Graduate Fellowships.

### III. COURSE REQUIREMENTS

It is expected that doctoral students will meet all of the University degree requirements as printed in the Wayne State University Graduate Division Bulletin. The course requirements for the doctoral degree total 90 semester credit hours. These are divided into two subdivisions: (1) 30 semester credit hours of Ph.D. Candidate Status, and (2) 60 semester credit hours of course work. The course work should include at least 30 credit hours in the student's major area and one minor area of 8 or more credit hours. Thirty hours, not including Candidate Status, must be at a level of 7000 courses or above.

A listing of required courses and a selection of available elective courses can be found on the last two pages of this document. Additional elective courses can be found in the University catalog under both the School of Medicine and the College of liberal Arts.

#### **IV. ROLE OF DEPARTMENTAL GRADUATE STUDENT OFFICER**

The Graduate Student Officer/Director acts as academic advisor for the student until the major advisor (PhD thesis mentor) has been selected. The student should consult with the Graduate Student Officer before selecting courses; the signature of the Graduate Student Officer is required on University registration materials. After the Plan of Work has been approved by the University (see below), approval and signature by the Graduate Student Officer are no longer necessary.

#### **V. ROTATIONS**

##### **A. DEFINITION**

Rotations are projects carried out by beginning graduate students under the supervision of a faculty member associated with the Department of Pharmacology in that faculty member's laboratory. (Faculty member affiliation/association with the Department of Pharmacology comprises adjunct, fractional, or full-time appointment with the Department.) A rotation should have defined objectives that can be accomplished within the allocated time span.

##### **B. PURPOSES**

The rotations exist to serve at least three purposes:

- (1) The student gains training and experience in laboratory research
- (2) The student gains an appreciation of various techniques and philosophies which can be applied to pharmacological research
- (3) The student is provided with a basis for choosing a specific faculty member to direct her/his PhD thesis research

##### **C. NUMBER OF ROTATIONS**

Each graduate student will complete three rotations within the first year and a half of the graduate program.

##### **D. DURATION**

The rotation will normally extend through one semester (or summer) during which time the student is expected to carry out laboratory work for a minimum of 16 hours per week. During the

summer, the student is expected to work full-time on the rotation project.

#### **E. SELECTION OF ROTATION ADVISOR**

During the first two weeks of his/her program, each student is required to talk to Pharmacology faculty members to learn about each laboratory and available rotation projects. This is to insure that students have an adequate basis for the selection of the rotation advisor. A faculty list will be provided by the Graduate Student Officer, and is also available online through the Department of Pharmacology website.

Before the start of each rotation, the student will indicate his/her first three preferences for advisor by submitting a list to the Graduate Student Officer for approval.

Since stipend support for the completion of thesis research will normally be supplied from the major advisor's research grant funds, each faculty member should indicate to the student the prospects for student financial support in future years during the initial meeting when potential rotation projects are discussed. Students should also keep in mind that they might learn highly useful techniques when rotating in laboratories where the funding outlook is unclear.

#### **F. ACADEMIC CREDIT FOR ROTATIONS**

Students will sign up for one or more credits of PHC 7710, Individual Studies, for each rotation. The Summer rotation credit will be given in the following fall semester if it cannot be given in the Summer. The faculty advisor will be responsible for assigning the rotation grade (Satisfactory/Unsatisfactory).

#### **G. EXEMPTIONS**

The student may petition the Graduate Student Officer for an exemption from the third rotation. Documentation of prior research experience must be presented as part of the justification for the exemption. The Graduate Student Officer will base her/his judgment upon the variety of experiences and maturity of the student.

#### **VI. SELECTION OF MAJOR ADVISOR**

Students are urged to select a major advisor as soon as possible so that he/she can advise them on which additional course work would benefit their thesis research. In general, experiences derived from the three rotation projects will provide the basis for this selection. A student may choose an additional rotation if more experience is needed. Selection of the advisor should be completed by the end of the Fall semester in the second year.

By September 1 of the second year in the program (or December 1 for students electing a fourth rotation), each student will have submitted to the Graduate Student Officer a list of three choices ranked from 1 to 3 for his/her major advisor. The Graduate Student Officer will confer with the faculty member(s) involved before assigning the major advisor.

For thesis work carried out in the laboratory of a faculty member not affiliated with the Department of Pharmacology, a faculty member with affiliation (i.e. adjunct, fractional or full appointment) with the Pharmacology Department must serve as Co-Advisor. The Co-Advisor shares academic responsibility for the student's program.

## **VII. DEPARTMENTAL SEMINAR AND JOURNAL CLUB**

The departmental seminars are presentations and discussions of research work given by local faculty and invited speakers from other institutions. These seminars are normally scheduled on Friday afternoons during the Fall and Winter semesters. All students should register for 1 credit of PHC 7890 (Seminar) per semester. Grading is based on participation and is assigned by the Graduate Student Officer as Satisfactory/Unsatisfactory.

Journal Club consists of student presentations of current research papers. Students are required to register for 1 credit of PHC 7700 each semester, starting with the Winter semester of their first year and continuing through the fourth year of the program. Attendance is required of all students. Each semester a grade will be assigned based on attendance, their presentation performance, and their critiques of other student presentations.

## **VIII. ACADEMIC REQUIREMENTS**

All students are required to maintain at least a "B" grade point average (3.0 GPA). If a student's GPA drops below 3.0, that student cannot be supported by a Graduate Assistantship and is placed on academic probation for the next semester. Failure to raise the grade point average to the minimum 3.0 level in the subsequent semester is grounds for dismissal from the program. A grade lower than "B" in any of the required Pharmacology courses is grounds for dismissal from the program. A failure (grade lower than "B", an Unsatisfactory or a Fail) in any other course may be grounds for dismissal from the program. A grade of "B-" is considered a failing grade by the Graduate School at Wayne State University.

## **IX. ADVANCEMENT TO CANDIDACY**

The second year in the Pharmacology Program entails the student's **Advancement to Ph.D. Candidacy**. This significant step depends on the prior successful completion of the following tasks:

1. Submission/approval of the **Plan of Work**.
2. Selection of a **Doctoral Committee**.
3. Passing the **Written Qualifying Exam**.
4. Submission/approval of the **Recommendation of Candidacy Status** form.

Each of these tasks is described below in its own separate section.

## **X. PLAN OF WORK**

The University **Plan of Work** form should be prepared in conjunction with the major advisor before the end of the Fall semester of the second year. The Doctoral plan of work requires the signed approval of the student's advisor and the Departmental Graduate Student Officer.

Forms are available from the Graduate Programs Office or online at [http://www.gradschool.wayne.edu/forms/plan\\_of\\_work.html](http://www.gradschool.wayne.edu/forms/plan_of_work.html).

## **XI. SELECTION OF DOCTORAL COMMITTEE**

The doctoral applicant, together with his/her advisor, should select a Doctoral Committee during the Winter semester of the second year. This committee shall consist of five members of the Graduate Faculty. One member of the committee should be chosen from another department. The other members must include the student's advisor and three other departmental faculty members. The committee must be approved by the Departmental Graduate Student Officer.

The Doctoral Committee both administers the Oral Examination, which is part of the Prospectus Presentation, and further serves to monitor the student's dissertation progress at biannual meetings. Finally, this committee serves as the Doctoral Dissertation Defense Committee. Additions or deletions from the original committee must be approved by the Departmental Graduate Student Officer and Graduate School.

## **XII. WRITTEN QUALIFYING EXAMINATION**

During the Winter semester of the second year the student writes and submits her/his Written Qualifying Exam by May 1 of their second year. This will be a three-page, fully-referenced mini-review of their chosen field of study. This approach encourages the student to deeply dive into the relevant scientific literature, providing thus, solid footing for subsequent dissertation research. The written qualifying exam will be graded by the Graduate Student Officer plus two other faculty, chosen by the Graduate Student Officer. An overall grade of B is required for advancement.

## **XIII. RECOMMENDATION TO CANDIDACY STATUS**

After completing the three above tasks, the student submits the Recommendation of Candidacy Status form for approval by the University Graduate School. This form requires signatures of the Doctoral Committee members, indicating their willingness to serve, and also the Pharmacology Graduate Student Officer. Following University Graduate School approval, the student advances to Ph.D. candidacy, allowing her/him to begin registering for the required 30 credits of dissertation research (7.5 credits over four semesters).

#### **XIV. THE PROSPECTUS**

The Prospectus, which provides an overview of the dissertation research, is written in the form of an NIH F31 predoctoral proposal.

1. The F31 proposal will be written entirely by the student although he/she will be able to consult with experts in the field, including their advisor.
2. All portions of the grant that are relevant to the student including the forms and addenda will be completed according to the accompanying instructions. Although the grade will be based on the Research Plan, the examination will not be graded unless forms and addenda are complete.
3. The month of June in the second year will be set aside for this task; exceptions can be made when necessary.
4. It is expected that the student's advisor would complete the relevant portions of the application and that the grant will be submitted (if the student is either a U.S. citizen or U.S. permanent resident).

#### **XV. PROSPECTUS PRESENTATION and ORAL EXAMINATION**

The student should set a date/time for their Oral Presentation of the Prospectus that is convenient to all Dissertation Committee members, with a copy of the Prospectus being made available to Committee members at least two weeks prior to this date. At the Prospectus meeting, the student will present the key aims of their proposal, along with any relevant preliminary data collected during their research in the mentor's laboratory. This presentation, which is expected to be 30-60 min, will be followed by a 1-2 hr question and answer period, during which the student will be asked not only about details of the project, but also about general aspects of their field of study. Thus, the faculty committee will judge both the feasibility of the proposed dissertation project and also the student – does the student have a broad understanding of the key scientific issues in the chosen field of study? Satisfactory performance will be determined by having no more than one dissenting vote on passing. In the event of failure, the Committee may recommend to the Graduate Student Officer either (a) that a second examination be taken no sooner than one (1) term, yet within 12 months, or (b) dismissal of the student.

Following this meeting, the **Prospectus and Record of Approval Form** should be completed and signed by members of the Dissertation Committee, by the student and the Graduate Student Officer. The completed form, together with the student's Prospectus (F31 application) must be submitted to the WSU Graduate Office for approval. The Prospectus process should be successfully completed prior to the beginning of the Fall semester of the student's 3rd year.

#### **XVI. STUDENT RESPONSIBILITY FOR DOCTORAL COMMITTEE MEETINGS**

To insure that the student's Doctoral Committee is kept informed of progress in thesis research, each doctoral candidate is responsible for convening meetings of his/her Doctoral Committee at six months intervals. Prior to such meetings, the student will provide a written summary of progress to all members of the Doctoral Committee. At least four members of the committee

must be in attendance at these meetings. These meetings are to be chaired by a committee member *other than* the primary advisor of the student. After the meeting has taken place, the student and the meeting chair will prepare and submit a copy of this summary to the Graduate Student Officer by December 20 and June 30 of each year as evidence that the semiannual meeting has taken place. This brief report should include the following information:

- Date of meeting
- Attendance
- Summary of progress
- Summary of areas in need of improvement
- Plans for the upcoming months
- Signatures of all of the committee members

Failure of the student to comply with these deadlines may result in suspension of pay by the Department.

## **XVII. ANNUAL EVALUATION**

Students will be provided with a written evaluation of progress by the mentor and the Graduate Program Officer annually, each August.

## **XVIII. ANNUAL INDIVIDUAL DEVELOPMENT PLAN**

Individual Development Plans (IDPs) are documents designed to support doctoral students and postdoctoral trainees in developing career plans and trajectories. The IDP provides a structure to identify concrete steps towards long-term goals and a framework for constructive conversation between students and their mentors/advisors. Because of the importance of an IDP in a trainee's career development and recent mandates from federal agencies, an annual IDP is required for all doctoral students and postdoctoral trainees regardless of funding status. Information on the IDP and forms to complete it are listed below.

<https://gradschool.wayne.edu/phd/idp-faculty>

## **XIX. DISSERTATION**

To give members of a student's dissertation committee adequate time to review the dissertation, students should give their dissertation committee members their dissertation at least 2 weeks before the committee signs the "Final Report: Dissertation Public Lecture Presentation-Defense" form, which allows the student to schedule his/her Ph.D. dissertation defense.

This form should then be given to the Graduate Student Officer to turn in to the Graduate School at least 2 weeks prior to the date that the committee agrees on to schedule the defense.

## EXAMPLE COURSEWORK for Ph.D. PROGRAM

### COURSE (SEMESTER CREDIT HOURS)

#### YEAR-1:

##### Fall:

IBS 7015: Cell & Molecular Biology (6)

PHC 7710: Laboratory Rotation (2)

PHC 7700: Journal Club (1)

PHC 7890: Departmental Seminar (1)

*Total 10 credits; Course credits = 10; PHC course credits = 10*

**Winter:** IBS Systems Biol. Course (4 credits required; variety of available courses)

PHC 7010: General Pharmacology (4)

PHC 7700: Journal Club (1)

PHC 7710: Laboratory Rotation (1)

*Total 10 credits (20); Course credits = 10 (20); PHC course credits = 10 (20)*

**Summer:** PHC 7710: Laboratory Rotation (2)

*Total 2 credits (22); Course credits = 2 (22); PHC course credits = 2 (22)*

*During this year, either in the Winter or Fall semester, every student must also complete the Responsible Conduct of Research course, offered by the Graduate School*

*<https://gradschool.wayne.edu/phd/research-conduct>*

*Choose major advisor at end of Summer*

#### YEAR-2:

**Fall:** PHC 7700: Journal Club (1)

PHC 7890: Seminar (1)

PHC 7650: Minicourses (0-3)\*

PHC 7996: Research (1-5)\*\*

Elective: (3)

*Total 10 credits (32); Course credits = 10 (32); PHC course credits = 7 (29); PHC 7996 tot = 1-5*

\*A minimum total of 6 credits of PHC 7650 (1-credit minicourses) are required over the course of study.

\*\*Maximum total allowed for PHC 7996 = 20 credits.

**Winter:** PHC 7650: Minicourses (0-3)

PHC 7700: Journal Club (1)

PHC 7890: Seminar (1)

Elective (2-4)



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PHC 7996: Research (2-8)  
*Total 10 credits (42); Course credits = 10 (42); PHC course credits = 4-10 (33-39);  
PHC 7996 total = 3-13*

**ADVANCEMENT TO PHD CANDIDACY:**

1. File PLAN OF WORK form with WSU Graduate School (by December 1, Year 2)
2. Successfully pass WRITTEN QUALIFYING EXAM (by May 1, Year 2)
3. Choose members of DOCTORAL EXAMINATION COMMITTEE (May, Year 2)
4. File RECOMMENDATION FOR CANDIDACY STATUS form with WSU Graduate School (June, Year 2)

*Once the student advances to CANDIDACY STATUS, he/she is eligible to register for dissertation credits.*

**PRESENTATION OF THE DISSERTATION PROPECTUS**

to DOCTORAL EXAMINATION COMMITTEE (Summer of Year 2)

File PROPECTUS AND RECORD OF APPROVAL form with WSU Graduate School)

**Summer:** PHC 7996: Research (2)  
*Total 2 credits (44); Course credits = 2 (44); PHC course credits = 2 (35-41)*

**YEAR-3:**

**Fall:** PHC 7650: Minicourses (1)  
PHC 7700: Journal Club (1)  
PHC 7890: Seminar (1)  
\*PHC 9991: Doctoral Candidacy: (7.5)  
*Total 10.5 credits (54.5); Course credits =3 (47); PHC course credits = 3 (38-44)*

**Winter:** PHC 7650: Minicourses (1)  
PHC 7700: Journal Club (1)  
PHC 7890: Seminar (1)  
\* PHC 9992: Doctoral Candidacy: (7.5)  
*Total 10.5 credits (65); Course credits = 3 (50); PHC course credits = 3 (41-47)*

**Summer:** PHC 7996: Research (3)  
*Total 3 credits (68); Course credits = 3 (53); PHC course credits = 3 (44-50); PHC 7996  
total = 6-16*

**YEAR-4:**

**Fall:**           PHC 7700: Journal Club (1)  
                   PHC 7890: Seminar (1)  
                   PHC 7996: Research (1)  
                   \* PHC 9993: Doctoral Candidacy: (7.5)  
*Total 10.5 credits (78.5); Course credits = 3 (56); PHC course credits = 3 (47-53); PHC 7996 total = 7-17*

**Winter:**        PHC 7700: Journal Club (1)  
                   PHC 7890: Seminar (1)  
                   PHC 7996: Research (1)  
                   \* PHC 9994: Doctoral Candidacy: (7.5)  
*Total 10.5 credits (89); Course credits = 3 (59); PHC course credits = 3 (50-56); PHC 7996 total = 8-18*

**Summer:**      PHC 7996: Research (1)  
*Total 1 credit (90); Course credits = 1 (60); PHC course credits = 1 (51-57)*

**YEAR-5+ (all semesters):**

Maintenance Status

\*Student must attain doctoral candidacy to take these credits.

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REQUIRED COURSES	Credits	Semester
IBS 7015 Cell and Molecular Biology	6	F
PHC 7010 General Pharmacology	4	W
IBS xxxx IBS Systems Biology (variety of topics: Immunology, Neuro, Functional Genomics, etc.)	4	W
PHC 7650 Pharmacology Minicourses (variety of topics; min. 6 credits total)	1	F/W
PHC 7700 Recent Developments (Journal Club) (7 credits total)	1	F/W
PHC 7710 Indiv. Studies (Rotations)	1-2	F/W/S
PHC 7890 Seminar (6 credits total)	1	F/W
PHC 999x Dissertation Research 30 total		(4 semesters x 7.5)
<b>ELECTIVES (List is not all inclusive)</b>		
PHC 7410 Toxicology	3	F
CB 7210 Fundamentals of Cancer Biology	3	W
CB 7240 Principles of Cancer Biology	2	W
PHC 7220 Cell/Mol. Biol. of Cancer 3		
PHC 7230 Breast Cancer 2		
PHC 7240 Cancer Chemotherapy 2		

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PHC 7996 Research Variable (20 max. total)

BCH 7310 Adv. Biochem. Mol. Biol. 3 W

BCH 7320 Adv. Biochem. Proteins 3 W

BCH 7660 Bioenergetics 2 W

MBG 7010 Mol. Biol. 3

PSL 7640 Cell & Mol. Physiol 3 W

PSL 7660 Neurophysiol. 3 Alt. Yrs.

PSL 7820 Membrane Biophysics 3

CHM 8690 Chemical Carcinogenesis

PYC 7010 Neurobiology I 3 F

PYC 7020 Neurobiology II 3 W

PYC 7510 Neurochem. Monoamine-Containing 3 Alt. Yrs.

Neurons

PYC 7520 Mol. Biol. Approaches in Neurobiol. 3 Alt. Yrs.

Notes:

1. All Pharmacology graduate students are required to attend all departmental seminars and Journal Club presentations.
2. There is no foreign language requirement for the doctoral degree.
3. Students must complete 90 semester hours for graduation including:  
30 in Pharmacology lectures, seminars and Indiv. Studies  
8 in the minor (usually Physiology or Biochemistry)  
30 in Ph.D. Candidate Status (Dissertation Research)