

# Practices and Procedures for the Ph.D Graduate Program in Pharmacology & Toxicology

Department of

# Pharmacology & Toxicology



Michigan State University  
East Lansing, MI  
48824-1317

2010-2011

**MICHIGAN STATE**  

---

**UNIVERSITY**

[www.phmtox.msu.edu](http://www.phmtox.msu.edu)

(517) 353-9619

## TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	DOCTORAL GRADUATE PROGRAM.....	2
A.	Goal.....	2
B.	Basic Components.....	2
III.	PROGRAM REQUIREMENTS.....	2
A.	Admission.....	2
1.	Admission requirements.....	3
2.	Admission procedures.....	3
B.	Course Requirements.....	4
1.	Course requirements for Ph.D.....	4
a)	Students beginning with a B.A. or B.S. degree.....	4
b)	Courses for graduate students in Pharmacology and Toxicology.....	5
(1)	Grading.....	5
(2)	Instruction.....	5
(3)	Evaluation of the Faculty.....	5
(4)	Pharmacology and Toxicology required courses.....	5
c)	Students beginning with an M.S. degree.....	5
d)	Students entering with a professional doctorate (MD, DO, DVM, DDS).....	5
C.	Research Requirements.....	5
1.	Student evaluation during the First Year.....	6
2.	Academic standing after First Year.....	7
3.	Grading Status.....	7
4.	Student seminars.....	7
D.	Graduate Teaching Requirement.....	7
E.	Guidance Committee Requirement.....	7
F.	Comprehensive Examination Requirement.....	8
1.	Written examination.....	8
a)	Goals of the proposed written comprehensive examination.....	8
b)	Design of the written comprehensive examination.....	8
2.	Oral Portion of the Comprehensive Examination.....	9
a)	Goals of the oral examination.....	9
b)	Format of the oral examination.....	9
c)	Evaluation of the oral exam.....	9
d)	Grading.....	9
e)	Reporting the grade.....	9
f)	Waiver of enrollment for Summer semester.....	9
G.	The Dissertation Defense.....	10
H.	Dissertation Requirements.....	10
I.	Microfilm Publishing of Thesis/Dissertation.....	10
J.	Academic Standards.....	10
K.	Residency.....	11
L.	Transfer Credits.....	11
M.	Work in Absentia.....	11
N.	Time Limits for Requirement for Ph.D.....	12
O.	Foreign Language Requirements.....	12
P.	Time Line of Years of Study in Pharmacology and Toxicology.....	12

IV.	SELECTION OF THESIS/DISSERTATION ADVISOR .....	12
A.	Changing Thesis Advisors .....	12
V.	FORMATION OF GUIDANCE COMMITTEE .....	13
A.	Guidance Committee Selection .....	13
B.	Preparation of Program Coursework and a Thesis Proposal .....	13
C.	Notification of Student's Progress .....	13
VI.	THESIS/DISSERTATION DEFENSE .....	14
A.	Oral Defense Dissertation .....	14
B.	Written Dissertation .....	14
C.	Degree Completion.....	15
D.	Publishing Agreement with ProQuest .....	15
E.	Career and Professional Development.....	15
VII.	STUDENT CONDUCT, INTEGRITY AND CONFLICT RESOLUTION .....	15
A.	The Ombudsman of MSU .....	16
B.	Grievance Procedures.....	16
VIII.	TERMINATIONS AND WITHDRAWALS.....	17
A.	Voluntary Withdrawal During the Semester.....	17
B.	Voluntary at the Close of a Semester .....	17
C.	Unauthorized .....	17
D.	Involuntary .....	18
E.	Disciplinary .....	18
IX.	DEPARTMENTAL ORGANIZATION.....	18
A.	Personnel .....	18
1.	Chair .....	18
2.	Office Staff and Responsibilities .....	18
3.	Faculty Committees .....	19
a)	Committee duties .....	19
(1)	Faculty Advisory Committee .....	19
(2)	Course and Curriculum Committee .....	19
(3)	Graduate Committee .....	19
(4)	Affirmative Action Committee .....	19
(5)	Cores and Biohazards Committee .....	19
(6)	Scientific Integrity Committee .....	19
(7)	Awards Committee .....	19
(8)	Student Advisory Council .....	20
(9)	Secretarial Support for the Faculty.....	20
4.	Graduate Student Participation in Departmental Academic Governance.....	20
X.	FINANCIAL SUPPORT .....	20
A.	Stipends and Benefits.....	20
1.	Stipends and Advanced Stipends.....	20
a)	Graduate Assistantships .....	20
b)	Research and Teaching Assistantships .....	21
(1)	Tuition waiver .....	21
(2)	Exemption from out-of-state tuition .....	21
(3)	Matriculation and Support fees .....	21
(4)	Health insurance .....	21
(5)	International Student Accident and Health Insurance .....	21
2.	Stipends and Additional Benefits, Other Information .....	22

3.	Registration and Credit Load Requirements.....	22
a)	Maximum and Minimum credits .....	22
	(1) Maximum.....	22
	(2) Minimum.....	22
b)	Full-time Students .....	22
c)	Fellowships .....	23
	(1) Registration and Credit Load Requirements .....	23
	(2) Graduate School Dissertation Fellowships .....	23
	(3) Sponsored Fellowships .....	23
	(4) University Distinguished and University Enrichment Fellowship Programs.....	23
	(5) University Graduate Recruiting Fellowships and University Graduate Fellowships .....	24
4.	Insurance .....	24
a)	Student Health Subsidy Program (SHSP) .....	24
XI.	ACADEMIC INTEGRITY, COPYRIGHT INFRINGEMENT AND THE USE OF MSU NET .....	25
XII.	APPENDICES .....	ii-xxii

## I. INTRODUCTION

The Department of Pharmacology and Toxicology at Michigan State University (MSU) is a medical science department with academic and administrative responsibility to the Colleges of Human Medicine, Osteopathic Medicine, and Veterinary Medicine. The Department provides courses that are presented to graduate students, students of the three medical colleges, nursing students and advanced undergraduates. In addition, the Department offers advanced elective courses and the integrated teaching of pharmacology and toxicology with other subjects to all medical students.

The Department of Pharmacology and Toxicology uses effective leadership, productive collaboration, and expertise in molecular, cellular and integrative pharmacology and toxicology to excel in research, graduate and professional education and service.

The graduate program, the cornerstone of the Department in Pharmacology and Toxicology, was initiated in 1966 coincident with the establishment of the College of Human Medicine. Since that time, the alumni of this program have been placed in responsible academic, industrial and governmental positions in pharmacology and toxicology.

The principal objective of the graduate program is to prepare a student for a career in research, teaching or other related scientific pursuits. Training culminates with the awarding of the Doctor of Philosophy degree. The Department is staffed by members with experience in several areas of pharmacology, including biochemical/molecular pharmacology, cardiovascular pharmacology, drug metabolism, immunopharmacology and toxicology, neuroendocrine pharmacology, neuropharmacology, gastrointestinal pharmacology, toxicology, and carcinogenesis (see departmental website for details on faculty research interests <http://www.phmtox.msu.edu/>).

The Department has specific obligations to graduate student trainees, and conversely, trainees have obligations to the Department and to themselves. The most important shared obligation is to maintain an environment in which there is mutual trust, respect, personal integrity and continuous striving toward excellence in scholarship.

### The Department will provide for the student:

1. An environment in which scholarly attainment and conduct of meritorious scientific research can be achieved with an expected completion time of 4-5 years.
2. Responsiveness to valid academic needs and goals.
3. Support and encouragement of creative original study and research.
4. A periodic evaluation of the program and a willingness to make changes as appropriate.
5. Opportunities to experience/visit different employment options.
6. Training in scientific communication in both written and oral form.
7. Career guidance and mentorship for a life in science; perspectives on professions and the meaning of being a professional.

### The student has the following responsibilities and goals:

1. To demonstrate a clear aptitude for the various aspects of scientific research: commitment and effort, knowledge of the literature, formulation of hypotheses, experimental tests of hypotheses, analysis of experimental data and clear presentation of data in both oral and written form.
2. To produce, during his/her period of training, research work that is worthy of peer-reviewed publication. Publication is a responsibility to share information with the scientific community.
3. To strive for superior performance in academic courses.
4. To participate in the teaching program of the Department as a practical means of training in the presentation of lectures and laboratory work. Graduate teaching assistants, fellows and trainees are expected to fulfill effectively all of their assigned responsibilities. Where applicable, faculty will provide each student with a confidential rating of his/her instructional performance. This includes lecturing, proctoring of examinations and potential tutoring of students when requested.
5. To participate in Departmental seminars both as a speaker and a member of the audience.
6. To interact with faculty and students as colleagues.

## II. DOCTORAL GRADUATE PROGRAM

### A. Goal

**Doctor of Philosophy (Ph.D.)** – The Ph.D. Program in Pharmacology and Toxicology prepares students for positions in research, teaching and related endeavors in settings that include but are not limited to:

- academe
- industry
- private research institutes/foundations
- government.

**Master of Science (M.S.)** – The M.S. in Pharmacology and Toxicology is currently given as a terminal degree to those who did not pass Written or Oral Qualifying Exams or elected to terminate their study at this time.

### B. Basic Components

The basic components for a PhD degree include:

- coursework
- dissertation proposal seminar and defense
- laboratory research
- service/teaching (proctoring, lecturing)
- dissertation seminar and defense.

## III. PROGRAM REQUIREMENTS

This section will have three entries in each listing for University, College and Departmental requirements. Departmental requirements are the ones on which students should focus.

### A. Admission

- University:** Minimum GPA of 3.0; completion of bachelor of sciences or arts degree
- College:** Same as University
- Departmental:** As described below

#### 1. Admission Requirements

Since the fields of pharmacology and toxicology encompass a wide range of research problems drawing upon the concepts and tools of biological and physical sciences, students with diverse interests and backgrounds may enter the program. Students admitted to the graduate program must have a baccalaureate degree from an accredited college or university.

Students applying for admission to the graduate program should have a 3.3 grade point average minimum in their last two years of undergraduate work. A strong background in biological and/or physical sciences is required. Applicants should have successfully completed course sequences in general chemistry, organic chemistry and biology. Experience in biochemistry is desirable. It is ***strongly recommended*** that applicants have some laboratory research experience or other evidence of a serious commitment to a scientific career before applying to our program.

The Graduate Record Examination (GRE) is required for admission of **all** students applying to the Department. Only the scores of the General Test (verbal, quantitative and writing assessment sections) are required. GRE scores are used as one piece of information in the selection process, and other information listed below is equally important. Foreign applicants for whom English is not the native language must submit the results of their Test of English as a Foreign Language (TOEFL) examination. A ***minimum*** score of 600 (paper-based), 250 (computer-based) and 100 (iBT-based), or 7-8 on the IELTS is required to be considered for admission to the Department of Pharmacology and Toxicology at Michigan State University.

## 2. Admission Procedure

Admission to graduate work requires acceptance by the Department of Pharmacology and Toxicology. Administratively, such acceptance will be assigned to one of the medical colleges. Application involves the:

- 1) Completion of a formal Michigan State University Graduate application form (<http://admissions.msu.edu/apply.asp>).
- 2) One properly authenticated transcript from each university attended (undergraduate and any graduate work).
- 3) Submission of an academic statement of your plans for graduate study, your career goals, and how the Pharmacology & Toxicology Doctoral Program will help you meet your career and educational objectives. This statement should also contain a brief autobiographical sketch, including intellectual background and interests, a discussion of any laboratory research experience, and a statement regarding professional objectives.
- 4) Submission of a separate personal statement about how your background and life experiences, including social, economic, cultural, familial, educational, or other opportunities or challenges motivated your decision to pursue a graduate degree.
- 5) Submission of three letters of recommendation from persons who are able to judge the applicant's academic ability and accomplishments. A Michigan State University Recommendation form should be included with each letter of recommendation.
- 6) (Optional) Submission of a copy of a research paper written by the applicant.

The application is reviewed by the Graduate Committee, a yearly-elected group of four faculty and one student representative from the Department. Factors that determine the applicant's acceptance are: 1) academic record; 2) GRE scores (plus TOEFL scores for international applicants); 3) professional goals; 4) evaluations by others [i.e., letters of recommendation]; 5) evidence of perseverance; and 6) the Department's ability to give personal direction to the prospective applicant's program and goals.

An applicant already holding a Masters degree from another University may request to be evaluated further by the Graduate Committee for advanced status in the program.

In all areas of graduate education pertaining to admission or academic rights and responsibilities, there shall be no discrimination on the basis of age, race, color, creed, ethnic origin or sex. Members of minority groups are encouraged to apply. The rights and responsibilities of graduate students as itemized in this document do not nullify the rights and responsibilities of students as stated in the publication Academic Freedom for Students at Michigan State University (<http://www.vps.msu.edu/SpLife/acfree.htm>).

To apply for admission to the Graduate Program in Pharmacology and Toxicology, an applicant should write to the Director of the Graduate Program, presenting his/her academic background and general interests in the field. All completed domestic and international applications **must** be received by the end of the first week in January for admission the next Fall semester. Applications are acted upon as they are completed; therefore early application is encouraged. Usually, students are admitted only in the Fall semester. Applicants are accepted for other than the Fall semester only under special circumstances.

**Direct all inquiries to:**

Doctoral Graduate Program  
Department of Pharmacology and Toxicology  
Michigan State University  
B405 Life Sciences Building  
East Lansing, MI 48824-1317

**or by email to:**

[hummeld@msu.edu](mailto:hummeld@msu.edu)

## B. Course Requirements

- University:** Determined by Department for Ph.D.
- College:** Same as University
- Departmental:** As described below.

### 1. Course Requirements

This is intended to provide a general outline of course requirements; modifications to students' required courses may be requested by the faculty mentor dependent upon students' background. The Graduate Committee in consultation with the Coordinator of the course in question must approve requests for waiver of any course requirements. Should this request occur in the student's first year, then the Director of the Graduate Program will serve as the student's mentor. The final decision will be first sent to the student and a copy of this decision placed in the student's Departmental file.

The intention of this coursework is to provide a solid background upon which to build an understanding of pharmacological/toxicological concepts. Biochemistry (BCH) and Physiology (PSL) serve as this background, and thus the first year is composed of these courses. Beginning in the summer after the first year, students begin a series of pharmacology/toxicology courses (PHM). The minimum acceptable grade point average after the end of the first year is 3.0.

#### a) Students beginning with a B.A. or B.S. degree:

COURSE NAME AND NUMBER		CREDIT HRS
1	Biochemistry and Molecular Biology (BMB) 801 (3), BMB 802 (3)	6
2	Pharmacology (PHM) 827	4
3	Physiology (PSL) 828	4
4	PHM 819 (2), PHM 820 (4)	6
	PHM 830	3
	PHM 870 (Research Rotation)	1
	PHM 910 (Seminar)	1
	PHM 999 (Dissertation Research)	24 minimum

**5** **Electives** – Students are required to take a minimum of *one* elective course. There is no credit minimum or maximum. Elective course selection should be made by the student *following* consultation with the student's dissertation advisor and Guidance Committee.

**A** A *minimum* of **one** PHM 800 level course, listed below (additional courses may be developed)

PHM 810, Synaptic Transmission	3
PHM 813, Cardiovascular Pharmacology	3
PHM 816, Integrative Toxicology: Mechanisms, Pathology and Regulation	3
PHM 839, Systems Neuroscience	4

**B** A student may be required by his/her dissertation advisor to take any appropriate course(s) presented in any department relevant to his/her research program. **These courses must be approved by the Guidance Committee and listed in the student's departmental file.**

**C** If the student is enrolled through the dual degree program in *Environmental and Integrative Toxicological Sciences*, there are several additional courses the student will be required to take for completion of his/her program.

**6** Students will be required to give **at least 3 course lectures every year after passing qualifying examinations** in a departmental undergraduate course during their third and fourth years. The faculty coordinator of the course will provide a written evaluation of the student's performance; the evaluation will be placed in the student's departmental file.

OUTLINE OF COURSEWORK FOR THE FIRST TWO YEARS			
YEAR I		YEAR II	
<b>Fall</b>	Biochemistry (BMB 801) Physiology & Pharmacology of Excitable Cells (PHM 827)	<b>Fall</b>	Cellular, Molecular and Integrated Systems Pharmacology and Toxicology (PHM 820) Experimental Design & Data Analysis (PHM 830)
<b>Spring</b>	Biochemistry (BMB 802) Cellular and Integrative Physiology (PSL 828)	<b>Spring</b>	Elective and/or Research credits ( PHM 999)
<b>Summer</b>	Principles of Drug Tissue Interaction (PHM 819) Research Rotations (PHM 870)	<b>Summer</b>	Elective, and/or Research credits (PHM 999)
		<b><i>Written Comprehensive Examination between the Spring and Summer semesters</i></b>	

**b) Courses for Graduate Students in the Department of Pharmacology and Toxicology**

**(1) Grading.** Course grades in all departmental courses shall represent the instructor's professional and objective evaluation of the student's academic performance. The student shall have the right to know all course requirements, including grading criteria and procedures, at the beginning of the course.

**(2) Instruction.** Within the constraints imposed by the discipline, class size, and specific subject matter, instruction in the Department of Pharmacology and Toxicology shall encourage free and open communication and shall attempt to fulfill the needs and aspirations of individual students. Students and faculty have a responsibility to maintain at all times the kind of classroom decorum and atmosphere that ensures that the process of learning can take place.

**(3) Evaluation of the Faculty.** To aid the faculty in its responsibility for the quality of graduate education, student confidential instructional rating reports shall be used in each graduate course in accordance with the stated policy of the Academic Council. Such reports shall be considered carefully when graduate course teaching assignments are made.

**(4) Pharmacology and Toxicology required courses:**  
See Appendices, pages xv-xvi.

**c) Students beginning with a Master of Science degree:**

Course and rotation requirements are the same for students entering the PhD program with a Masters degree as they are for students entering with a Bachelors degree.

**d) Students entering with a professional doctorate (e.g., DO, MD, DVM or DDS)**

The Graduate Committee in consultation with the Coordinator of the course in question and the student's mentor must approve requests for waiver of any core courses. The student's Guidance Committee will make recommendations for appropriate elective courses.

**C. Research Requirements:**

•**University:** Uniform requirement of a minimum of 24 research credits, in addition to the course work prescribed by the Guidance Committee.

•**College:** Same as University.

•**Department:** The predoctoral training program culminates in the Ph.D. degree and ordinarily requires at least 4 years. Students are expected to devote the full twelve-month year to graduate work and are not permitted outside employment if funds administered by the department/laboratory are provided for support.

The training program has two main aspects: 1) specific coursework and didactic instruction presenting the language and vocabulary of pharmacological sciences (e.g., biochemistry, physiology, biostatistics, pharmacology and toxicology); and 2) training in research and the scientific method, as well as presenting one's research in both oral and written form. Training in both areas begins the first

semester and is under the direction of the Graduate Program Director who will act as the student's major professor until a permanent advisor is selected. All new students will meet with the Director of the Graduate Program before the start of classes. During this meeting, the student's coursework for the first semester will be determined. The selection of courses depends on the student's background and research goals. To facilitate the tracking of each student's progress, a "Graduate Student Progress Flow Sheet" is maintained for each individual; starting at the time they begin graduate study. (These will be kept and updated periodically by the Administrative Assistant to the Graduate Committee and will be available for the student's or advisor's perusal at any time).

### 1. Student Evaluation During the First Year

A research rotation system (PHM 870, 2 credits) spans the Fall, Spring and (if necessary) Summer semesters of the first year. It provides the opportunity for each student to become familiar with research activities of the faculty in the Pharmacology and Toxicology Department and members of the Training Faculty outside the department before selecting a major advisor. In the week prior to beginning the Fall semester, first-year students in the department participate in a Joint Biomedical Sciences Orientation Program. During this week, principal investigators from Biochemistry, Cell and Molecular Biology, Genetics, Microbiology, Physiology, and Pharmacology and Toxicology present short talks on their work, with the goal being to familiarize students with the breadth of research performed on this campus and to help them choose laboratories in which to rotate.

During the first three weeks of the Fall semester, incoming graduate students are introduced to the research activities of Departmental Faculty. Students will meet as a group with one or more faculty members per week during which time they will learn of the activities of each training faculty and where feasible, they will engage in hands-on laboratory exercises. Subsequently, students will have the opportunity to perform 13-week research rotations in up to three different laboratories. Students will select the laboratories in which they wish to study after discussing the opportunities for research with the faculty during the initial 3-week period of introduction to research.

The Department requires the first-year students to participate in **at least** two research rotations. However, under exceptional conditions, a student may petition the Graduate Committee for a waiver of the requirement for the second research rotation. A final decision regarding selection of a dissertation advisor will be made by the faculty prior to the start of the student's third semester, as described below.

Emphasis during the rotation period should be on: 1) active participation and intellectual engagement in laboratory research, 2) gaining a working knowledge of the field, and 3) production of sufficient experimental results that a valid evaluation of the student's potential for a career in research can be made. A high quality effort is expected.

Each faculty member with whom the student works during the rotation periods will make continuous evaluation of a student's performance. The student will meet with each faculty member during the rotation period to discuss performance. At the end of each rotation period, a written evaluation will be discussed with and signed by the student. The rotation faculty advisor will discuss student's performance during a faculty meeting at the end of each research rotation. The written evaluation will be maintained in the student's file. [see Appendices, pg. iii for form]

At the end of the second semester in the first year the student's performance in the academic and research arena will be evaluated by the Graduate Program Director. A student is expected to maintain a minimum GPA of 3.0 (out of 4.0) and show commitment to ascribed work in the laboratory. Should lack of such success be evident, actions including dismissal or a leave of absence may be implemented after consultation with the Graduate Committee and remaining Pharmacology & Toxicology faculty.

At the end of the second semester of a student's first year, the student will present a 30-minute seminar to the Pharmacology and Toxicology Department summarizing some aspect of one of his/her research rotation experiences. Student performance during the seminar presentation and the subsequent questioning period will be evaluated on the basis of: organization, presentation and knowledge of content. The faculty will fill out a "Student Seminar Evaluation" form, which is given to the student and a copy maintained in the student's file. Before the beginning of the third semester of the first year, the faculty will evaluate each student on the basis of:

- i) Academic achievement (course grades). A 3.0 minimum overall grade point average from among the coursework (including PHM 870) is required.

- ii) Performance during rotations (demonstration of interest, research ability and perseverance).
- iii) Performance in the departmental seminar (see section on Student Seminars).

Students who are recommended to continue in the Ph.D. program will select a dissertation (major) advisor and guidance committee as described below.

**2. Academic Standing After the First Year:**

Students in the department are required to maintain at least a 3.0 grade point average; failure to do so will result in placement of the student on probationary status. In addition, a grade of 3.0 or better should be attained in all departmental courses as well as in all courses required by the Pharmacology and Toxicology Department. This does not mean that an occasional grade of 2.0 or 2.5 is not tolerated, but more than two such grades will result in faculty consideration of the student's status, and possible dismissal.

**3. Grading Status:**

Michigan State University employs three systems of grading: 1) a numerical system, 2) a supplemental credit-no credit system, and 3) a non-numerical pass-no pass system. The Pharmacology and Toxicology Graduate Program predominantly uses the Numerical System. In only three departmental courses does a Pass/No Pass system apply (PHM 910, PHM 899 and PHM 999). All campus 899 and 999 courses are given an automatic "DF" (Deferred) by the University until the student graduates. Once the student passes, the University applies "P" (Pass) to the course.

**4. Student Seminars**

All graduate students in the Pharmacology & Toxicology Graduate Program will present at least three seminars during their graduate career, in the following sequence:

<u>Year</u>	<u>Seminar</u>
1	A 30-minute presentation on some aspect of the research rotation.
3	A 50-minute research-in-progress seminar may be primarily a literature review and serves as a Dissertation Proposal Seminar.
4 or 5	A 50-minute research seminar suitable for use in a job interview and that serves as a Dissertation Defense Seminar.

Guidelines for seminar preparation.

- a) The organization of a seminar is the responsibility of the student, but the student's advisor should provide assistance.
- b) The amount of direct assistance provided by the advisor should diminish with increasing experience of the student. Specifically, unlimited advice (both general and specific) should be offered to the student presenting his or her first seminar. By comparison, little advice should be required for preparation of the student's last seminar, whereas some intermediate level of advice should be available for any seminars presented between the first and last years of the student's tenure. Please note that the actual interaction of student and mentor in preparing these seminars is at the discretion of the student and mentor.

**D. Graduate Teaching Requirement:**

- University:** At the discretion of the department.
- College:** At the discretion of the department.
- Department:** Students are required to proctor professional school examinations and (after completion of their second year in the program) participate in teaching in undergraduate courses offered by the department.

**E. Guidance Committee Requirement:**

- University:** Committee of four or more regular faculty members
- College:** No statement as to number or composition

•**Department:** Please refer to Sections IV and V on pages 14-16

**F. Comprehensive Examination Requirement:**

•**University:** May be taken when 80% or more of the prescribed course work is completed. The examination must be passed within five years after the student's first enrollment as a doctoral student.

•**College:** No statement at this time.

•**Department:** This examination consists of three parts: 1) written examination; 2) written dissertation proposal; and 3) oral presentation and defense of the written dissertation research proposal.

The Doctoral Graduate Program in Pharmacology and Toxicology has as its main goal the training of students to become professional pharmacologists and toxicologists. Graduate students are to be provided the necessary core knowledge and skills to be successful researchers (in an academic, Pharmaceutical, biotechnology or other industrial setting, or in government), teachers, and sophisticated analysts of new knowledge in the fields of pharmacology and toxicology.

Accomplishing the above goal involves two separate but complementary phases of learning by the students. In the *first phase of training*, emphasis is placed on new knowledge acquisition, integrative thinking, the value of an eclectic view of science and the need for a continued emphasis on learning and re-orientation. This includes basic science information necessary for beginning a study of pharmacology and toxicology. Next, a firm grounding in the knowledge and concepts that set pharmacology and toxicology apart from other basic biomedical sciences. Finally, more detailed information on selected areas of pharmacology and toxicology are tailored to individual students, based upon their interests. Selection of areas to be taught is based on the particular interests and expertise of the faculty, rather than on an effort to be inclusive. In the *second phase of training*, students perform advanced research projects under the direction of a primary mentor and a research advisory committee. During this time students learn specialized laboratory skills in a specific area of pharmacology and/or toxicology. In addition, it is expected that they will be made proficient in: experimental design, analysis of the research literature in their area of study; and preparation of scientific grants and reports (written and oral).

It is the obligation of the Department to evaluate in an objective manner the degree to which each student meets the training goals outlined above.

No *single* test, examination, experience or method *alone* is sufficient for the Department to meet its obligation to evaluate students on *all* of the training goals outlined above.

**1. Written Portion of the Comprehensive Examination**

The WRITTEN comprehensive examination proposed will be given after the first phase of training described above. Therefore, the comprehensive examination is designed to evaluate only a subset of the student skills that the graduate program is expected to produce. The dissertation proposal defense meeting is another opportunity for evaluating student knowledge and abilities.

**a) Goals of the proposed written comprehensive examination:**

To test student *mastery* of the *core knowledge, concepts and skills* shared by all professional pharmacologists and toxicologists.

To test the ability of students to use their core knowledge to: 1) *design experiments* aimed at understanding the responses of biological systems to drugs or toxicants; and 2) *interpret and critically evaluate experiments* others have performed to understand responses of biological systems to drugs or toxicants.

**b) Design of the written comprehensive examination:**

A *mastery examination* section in which students provide short answers to ~30 questions covering basic principles, definitions and concepts of pharmacology and toxicology. Students must achieve a score of 80% or better to pass this part of the examination.

A *problem-solving examination* section in which students would write detailed, essay-type responses to 4-6 questions focused on understanding the actions of xenobiotics on biological

systems. The questions would require the students to either: design appropriate experiments to solve a problem, or interpret experimental findings of others related to xenobiotic action. The questions focus less on detailed understanding of very specific areas of pharmacology and toxicology and more on broad topics chosen to be representative of issues that any pharmacologist or toxicologist might face. Students must achieve a score of 70% or better to pass this part of the examination.

## **2. Oral Portion of the Comprehensive Examination**

The oral portion of the comprehensive examination consists of the defense of a dissertation research proposal written in the format of an NIH/NSF research grant application, including a detailed first-year budget and a 10-page research plan.

### **a) Goal of the oral examination:**

The goal of the oral examination is to make an in-depth evaluation of the student's dissertation proposal, including an evaluation of the student's knowledge of related areas of pharmacology and toxicology.

### **b) Format of the oral examination:**

The student will present a seminar that may be scheduled outside of the Pharmacology and Toxicology Department's regular seminar series based on the thesis proposal. This will be scheduled for one hour (to include 45 minutes, or less, for the talk plus time for questions). At the end of the seminar the student will meet with the members of the Oral Comprehensive Examination Committee (described below) during which time the Committee will ask questions related specifically to the proposal and evaluate the student's knowledge of areas of pharmacology and toxicology (and the underlying conceptual framework, e.g., biochemistry and physiology) related to his/her dissertation project.

### **c) Evaluation:**

The Oral Comprehensive Examination Committee will make the evaluation of student's performance. The Committee will be comprised of the student's Guidance Committee (minus the Dissertation Advisor) plus a faculty member in the Pharmacology and Toxicology Department who will be designated by the Graduate Committee. This latter individual will serve as Chair of the Oral Examination Committee. The roles of the Chair are to serve as a representative of the faculty with the responsibility of insuring that the student's seminar and the Oral Comprehensive Examination are conducted pursuant to the format outlined above and to report the student's grade, as indicated below.

### **d) Grading:**

There are three (3) possible grades: 1) Pass, 2) Conditional Pass – A relatively small portion of the student's proposal needs to be revised and re-evaluated and/or selected aspects of the student's knowledge of pharmacology and toxicology were deemed deficient and need to be re-evaluated, or 3) Fail – The student needs to repeat the oral examination. The Oral Examination may be repeated once; if failed a second time the student will be dismissed from the Graduate Program or given the option of finishing with a Masters degree.

### **e) Reporting the grade:**

The Chair of the Oral Examination Committee will draft a brief, written report indicating the grade, summarizing the Committee's overall impressions, including comments on the written proposal, and, if appropriate, noting any of the student's shortcomings. This report will become a part of the student's file, and copies will be provided to the Guidance Committee members, the Chair of the Graduate Committee, the student's dissertation advisor and the student.

### **f) Waiver of enrollment for Summer semester:**

For students enrolled in the Spring and are presenting their Oral Comprehensive Examinations during the immediate Summer semester, the Department can request a waiver of the requirement that the student be enrolled for at least one credit the semester of the examination. These requests are to be directed to the Graduate School but must first be endorsed by the Department and the student's College. This applies *only* to the Oral Comprehensive Examination.

### G. The Thesis/Dissertation Defense:

1. The final oral examination for the Ph.D. degree is a defense of the Ph.D. dissertation and the student's knowledge of related scientific areas. ***The Dissertation Seminar must be presented to the Pharmacology and Toxicology Department on the same day as the defense.***

2. Students taking the examination must previously have filed an Application for Graduation; see the University calendar for deadlines (form available online through the Registrar's Office website, <http://www.reg.msu.edu/StuForms/GradApp/GradApp.asp>; you will need your MSU NetID to do this).

3. Candidates should circulate copies of the dissertation to their Guidance Committee *at least* two weeks prior to the examination. This employment of "prereading" greatly facilitates production of an acceptable thesis.

4. When the Guidance Committee has reviewed and approved the thesis and the student has passed an oral examination in its defense, the student may be required to incorporate in the thesis any recommended changes before having it permanently bound. Failure to meet these criteria will delay the awarding of the degree.

### H. Dissertation Requirements:

- University:** Must be in accordance with "The Graduate School Guide to the Preparation of Masters Theses and Doctoral Dissertations" (<http://grad.msu.edu/format.htm>). A final copy of the dissertation, an abstract and an abstract title page must be submitted to the Graduate School.
- College:** Same as University
- Department:** An optional "Journal Article" format may be used. One bound copy of the dissertation is to be given to the Department.

Students must successfully complete a scholarly research project and prepare a written dissertation based upon this research. The dissertation must be organized, typed, duplicated and bound according to the regulations described in the "Michigan State University Guide to a Graduate Degree". At a minimum of two weeks prior to a set defense date, the student must submit his/her dissertation for review by the Guidance Committee. The Guidance Committee must approve the dissertation and the student must successfully pass an oral examination involving an explanation and defense of the dissertation and knowledge of related scientific areas. The Department requires a copy of the dissertation in final form prior to certification to the Graduate School that the student has completed the requirements for his/her degree. The student is responsible for the cost of the bound dissertation.

### I. Microfilm Publishing of Dissertation:

- University:** All doctoral dissertations will be copied to microfilm and the abstracts published in Dissertation Abstracts. This process is considered by the University to be a form of publication but does NOT preclude printing the dissertation in whole or in part as a journal article or monograph.
- College:** Same as University
- Department:** Same as University

MSU theses are sent to University Microfilm's International (UMI) Dissertation Services, reproduced on microfilm and bound. The fee charged to the student covers the cost of microfilming and binding of the unbound copy submitted to the Graduate School. For more information on UMI, visit <http://www.umi.com/>.

**J. Academic Standards:**

- University:** Normally a 3.0 (B) GPA is necessary to meet minimum standards. A minimum grade of 2.0 (C) is required for credit in individual courses.
- College:** For retention, the major professor, Guidance Committee and Department make decisions. For graduation, a GPA of at least 3.0 in prescribed courses, exclusive of collateral courses and research, is required.
- Department:** Same as College.

**K. Residency:**

- University:** One year of residence on the campus after first enrollment for doctoral degree credit is required to permit the student to work with and under the direction of the faculty, and to engage in independent and cooperative research utilizing University facilities. A year of residence will be made up of two consecutive semesters, involving the completion of at least six credits of graduate work each semester.
- College:** Same as University
- Department:** Same as University

**L. Transfer of Credits:**

- University:** Graduate credits may be transferred from other accredited institutions or international institutions of similar quality if they are appropriate to a student's program and provided they were completed within the time limits approved for the earning of the degree desired at Michigan State University. The department chairperson or director and dean must grant approval. Only graduate-level courses in which at least a 3.0 (B) grade was received will be considered for transfer.  
The University allows a combined maximum of 9 credits to be applied to a PhD program from transfer courses, Lifelong Education enrollment status, and the Graduate Certificate level.  
<http://www.reg.msu.edu/Read/UCC/combinedmax.pdf>
- College:** Same as University
- Department:** Same as University

**M. Work in Absentia:**

- University:** Officially, students are not allowed worker's compensation or maternity leave.
- College:** Same as University
- Department:** Illness/Injury/Pregnancy Leave  
(<http://www.reg.msu.edu/academicprograms/text.asp?section=111#s405>)

A graduate student unable to fulfill the duties of his or her appointment because of illness or injury shall notify the administrator of his/her major unit as soon as circumstances permit. Similarly, a Graduate Assistant unable to fulfill the duties of her appointment because of pregnancy shall notify the administrator of her major unit as soon as circumstances permit.

During the illness, injury, or pregnancy, the major unit shall adjust (reduce, waive, or reschedule) the Graduate Assistant's duties as those duties and the Assistant's physical circumstances reasonably dictate. If total absence from duties becomes necessary, the major unit shall maintain the stipend of the appointment, provided the Graduate Assistant is still enrolled, for a period of two months, or to the end of the appointment period or of the semester, whichever should occur first.

The Graduate Assistant shall have the right to return to the assistantship within the original term of the appointment at such time as he/she is able to reassume the duties of the position.

**N. Time Limits for Requirements for Ph. D.:**

- University:** Comprehensive examinations must be taken within five years and all requirements completed within eight years of initial enrollment as a doctoral student. If degree is not completed within eight years, written portion of the comprehensive examination must be passed again.
- College:** Same as University
- Department:** Same as University

**O. Foreign Language Requirements:**

There are no set requirements of the University, College or Department.

**P. Responsible Conduct of Research Series Requirement:**

The Offices of the Vice President for Research & Graduate Studies and the Dean of the Graduate School presents a series of workshops to be presented throughout the academic year that highlights issues concerning the responsible conduct of research. This series is intended to provide specific information about the responsibilities of students, faculty and research staff in conducting research, interacting with others both within and outside defined research groups, and complying with policies and regulations of sponsors and the University. It is designed to stimulate local discussions, complement department activities, and reinforce issues raised by the Research Integrity Newsletter in responding to these needs. *(See Appendix for list of lectures for 2008-09.)*

Attendance at the full series will be recognized with a certificate of attendance. The series is designed to enable the student to comply with newly enacted and proposed requirements by the National Institutes of Health for formal training in the responsible conduct of research as a requirement for working on research funded by the Public Health Service. It is expected that the workshops will be expanded and adapted as appropriate from one year to the next to respond to current issues and needs. However, students do not need to attend the full series in the same year in order to receive a certificate of attendance.

**IV. SELECTION OF DISSERTATION ADVISOR**

The Graduate Program Director of the Pharmacology and Toxicology will serve as the advisor for all Year I graduate students. Those students who are recommended for the PhD program will select a dissertation advisor and guidance committee as described below.

The selection of a Dissertation Advisor is based on a student's choice of laboratory work as well as the faculty member's willingness to accept the student into his/her laboratory. During the course of rotations, a student will have experience working in two or three different laboratories. These rotations serve to help the student ask the following questions:

- Is this research exciting and satisfying to me?
- Could my research rotation project turn into a dissertation?
- Would the principal investigator of the laboratory be a good mentor?
- Is the laboratory a place in which I want to work?

There have been examples in the department in which a student works in two different laboratories concurrently such that he/she has what amounts to two major advisors. In practice, one of these individuals must agree to serve as official Dissertation Advisor.

**A. Changing Dissertation Advisors:**

The relationship between a graduate student and dissertation advisor is critical to a student's development. Both parties should strive to obtain a mutually productive and collegial association. Situations may develop such that this relationship deteriorates, and the ability of the student to make satisfactory academic progress is impaired. The selection of a dissertation research advisor is not irrevocable, but a request by a student for a change in dissertation advisor is a serious issue that should only be made with clear cause. A student considering this possibility should consult with the Graduate Program Director before proceeding.

## **V. FORMATION OF GUIDANCE COMMITTEE**

Students who are recommended for the PhD program will select a major advisor and guidance committee as described below.

### **A. Guidance Committee Selection**

Before the start of the third semester of their first year of graduate study, a student will request one faculty member to serve as his/her advisor for dissertation research, the student's dissertation advisor (see section IV). Graduate students in the Department of Pharmacology and Toxicology will have a member of the department serve as their dissertation advisor. This does not require, however, the student to conduct their dissertation research in the advisor's laboratory. They may work on a project jointly supervised by a faculty member in Pharmacology and Toxicology plus a member of the training faculty whose appointment is outside of the department. The Dissertation Advisor will serve as Chair of the student's Guidance Committee, which consists of at least four MSU appointed faculty. The Committee must include, in addition to the Advisor, two other members of the Department of Pharmacology and Toxicology and one individual who does not have a full-time appointment in the department. The Guidance Committee may consist of more than four members if the dissertation research advisor and the student feel this would be advantageous. The additional member(s) may be an MSU faculty member (tenure or non-tenure stream), a faculty member (tenure or non-tenure stream) at another College/University or an individual working in industry. This Committee will oversee the student's coursework, advise the student concerning dissertation research, and conduct the oral defense of the research proposal and dissertation. In some instances, students may elect to perform their dissertation research in a laboratory that is outside of the Department of Pharmacology and Toxicology. The principal investigator of this laboratory can serve as Dissertation Advisor in every day matters, but a departmental faculty member will need to be chosen as official head of the committee.

If the Dissertation Advisor and student choose an individual for the Committee who has a non-tenure appointment, an adjunct appointment or is not affiliated with MSU, approval must be obtained from The Graduate School for such an individual to be a member of the Guidance Committee. Please see the Department's Academic Office for the proper procedure to obtain approval.

### **B. Preparation of Program of Coursework and a Dissertation Research Proposal:**

Shortly after selecting their Dissertation Committee, the student, with the help of his/her dissertation advisor will prepare a program of coursework and a dissertation research proposal. The proposal will be distributed to the other members of the Guidance Committee and will serve as the basis for an oral portion of the comprehensive examination. At all times during a student's course of study and research, members of the Guidance Committee will be available for consultation and advice; there should be at least one meeting *once a year* to discuss progress. The student should take the initiative for his or her committee to meet once a year, but it is the duty of the Dissertation Advisor to verify in the student's annual evaluation that this meeting occurred. This letter, addressed to the Graduate Administrative Assistant, will then be placed in the student's departmental folder. Under some circumstances, replacement of Guidance Committee members will be necessary. The reason(s) for this action must be stipulated in a letter to the Dissertation Advisor and copied to the Associate Chair of the Academic Office and Chair of the Graduate Committee. Both individuals must approve this action. The letter will then be placed in the student's departmental folder.

### **C. Notification of Student's Progress:**

During a regularly scheduled faculty meeting sometime at the beginning of Spring semester, the Graduate Program Director will inform all members of the faculty of the Department of Pharmacology and Toxicology of the progress of each student. At the end of each Spring semester, the Dissertation Advisor will provide the student with a written evaluation of progress in meeting the research goals of the student's dissertation project and academic requirements of the program during the preceding year. The written report will also contain a plan for the coming year to address any deficiencies in the student's progress, and will be signed by the Dissertation Advisor and the student. The student will meet with the Graduate Program Director, who will review and sign the report and place it in the student's file.

## VI. DISSERTATION DEFENSE

*Intent:* The final doctoral examination is the culmination of a student's graduate education and training and reflects not only on the accomplishments of the graduate student but also on the quality of the graduate program. The following policies and procedures are designed to ensure the maintenance of expected professional standards in the preparation of the written documents and in the oral defense of the dissertation. An approved dissertation that is accepted by the graduate school becomes a single-author publication and contributes to the body of knowledge of the discipline.

**Students taking the examination must previously have filed an Application for Graduation; see the University calendar for deadlines (see <http://www.reg.msu.edu/ROInfo/Calendar/Academic.asp>).**

### A. Oral Defense of Dissertation:

The student is encouraged to talk with the Graduate Administrative Assistant to set a date for their final Dissertation Seminar.

- All members of the Guidance Committee will read and critique the dissertation, and will participate in the oral part of the examination.
- As a portion of the oral examination, the graduate student will present the results of the dissertation in a seminar open to the community.
- The oral examination is a comprehensive explanation and defense of the research project and the student's knowledge of related scientific areas.
- To fulfill degree requirements the Guidance Committee must approve the dissertation and the student must successfully pass an oral examination.
- The Chair of the Guidance Committee will submit a report to the Department Chair.

### B. Written Dissertation:

Students must successfully complete a scholarly research project and prepare a written dissertation based upon this research. The dissertation must be organized, typed, duplicated and bound according to the regulations described in the "Michigan State University Guide to a Graduate Degree". The Guidance Committee must approve the dissertation and the student must successfully pass an oral examination involving an explanation and defense of the dissertation and knowledge of related scientific areas. The Guidance Committee will conduct the examination, but other interested faculty members may attend the dissertation seminar.

- For the Ph.D. degree, a student must successfully complete a scholarly research project and prepare a written dissertation based upon this research.
- For assistance in preparing the written dissertation, the Pharmacology and Toxicology Department will provide the student access to dissertations located in the department office that have been accepted.
- The dissertation must be organized, typed, duplicated and bound according to the regulations described in the "Michigan State University Guide to a Graduate Degree".
- At least six weeks before the end of the semester that the student expects to complete requirements for the Ph.D. degree and at least two weeks before a scheduled oral Defense, the student must submit his/her dissertation for review by the Guidance Committee.
- When the Guidance Committee has reviewed and approved the dissertation and the student has passed an oral examination in its defense, the student must incorporate in the dissertation any recommended changes before having it permanently bound. Failure to meet these criteria will delay the awarding of the degree.
- The Pharmacology and Toxicology Department requires a copy of the dissertation in final form prior to certifying to the Graduate School that the student has completed the requirements for his/her degree.
- The graduate student is required to bear the expense of preparation of the dissertation although arrangements may be made with the major advisor to share in this cost.

### C. Degree Completion Sequence:

- Deadline dates should be confirmed by the department and student.
- Student obtains a copy of the Formatting Guide for Theses/Dissertations and Dissertation Submission Packet from the Graduate School website
- Student completes and submits the *Application for Graduation* to the Registrar's Office
- The Final Certification form is mailed by the Registrar's Office to the Department
- Department verifies student's records for completion of program requirements. Refer to the *Academic Programs* catalog for complete program requirements – on the web at <http://www.reg.msu.edu/ucc/ucc.asp>.
- Student schedules and completes the oral examination.
- Department completes the *Record of Completion of Requirements* form and forwards it to the college.
- Student submits an unbound copy of their dissertation to the Graduate School.
- Upon acceptance of the dissertation, the Graduate School forwards a copy of the title page to the Registrar's Office.
- Department completes Final Certification form and returns it to the Registrar's Office.
- Registrar's Office approves Final Certification form, confirms receipt of dissertation by the Graduate School and issues diploma and transcripts to student.
- Student attends commencement.
- Final degree list is sent to departments.

### D. Publishing Agreement with ProQuest:

The new publishing agreement for dissertations with ProQuest now provides an "Open Access Publishing Option" as an alternative to the traditional publishing option available to our students. The Open Access option gives ProQuest the authorization to make the electronic version of the document accessible to all via the internet, including the selling of the document by commercial retailers and the accessibility to the work via search engines. A student selecting the Open Access option will not be eligible to receive royalties. The pros and cons of selecting this new option differ significantly across disciplines, and the graduate handbook could be a way to inform students of benefits and problems associated with each option. For more information, visit: <http://www.umi.com/>

### E. Career and Professional Development:

The Graduate School offers a variety of Career and Professional Development Resources at MSU. Their website ([www.msu.edu/user/gradschl/](http://www.msu.edu/user/gradschl/)) features relevant workshops, activities, web links and contact people that helps graduate students organize a wealth of available information according to different phases of a doctoral program.

**PREP** focuses on four professional skills that are key to career and professional development: **planning** throughout the graduate career to identify and successfully achieve career goals; developing **resilience** and tenacity to thrive through personal and professional stages; practicing active **engagement** in making important life decisions and in acquiring the skills necessary to attain career goals; and attaining high standards of **professionalism** in research and teaching. Employing these skills at every stage of the graduate program helps students to maximize their opportunities for professional growth and to discover a fulfilling career path. In partnership with graduate and professional programs across campus, the Graduate School seeks to introduce students to a range of career activities and opportunities with the goal of assisting degree completion and enhancing professional success. Our workshops are based on current scholarship on graduate student development and are themselves part of an ongoing research project through evaluation and assessment. See <http://grad.msu.edu/cpd.htm> for more detailed information on the PREP program.

## VII. STUDENT CONDUCT, INTEGRITY AND CONFLICT RESOLUTION

Conflicts can be broadly defined and include both personal and professional interactions that have reached a perceived impasse. Students who develop conflicts with laboratory personnel or with their mentors should try to resolve these within the laboratory first. Should this not be feasible, the Graduate Program

Director and/or Vice Chair should be contacted to discuss the situation with both parties involved. A goal of the Department is to try and resolve difficulties in-house first and to have both student and advisor on equivalent ground when working to resolution.

The Graduate School runs a program entitled "Conflict Resolution" (<http://www.msu.edu/user/gradschl/conflict.htm>). We encourage all those involved in a situation or potential situation of conflict to investigate these programs.

**A. The Ombudsman of MSU:**

There may be occasions when a student believes that a conflict is not resolvable within the department. A resource for the student, then, is the MSU Ombudsman (<http://www.msu.edu/unit/ombud/>). What is an Ombudsman? The Ombudsman is the "complaint" person for the students. The student should contact the Ombudsman when having real difficulty with any part of the University and when he/she doesn't know where to turn for help. No miracles are promised, but the University Ombudsman may be able to help with the problem or concern. The student will get an *independent* point of view in an *informal* and *confidential* way. The Ombudsman's office is the first place to contact should a Grievance need to be filed.

**B. Grievance Procedures:**

A grievance involves a formal hearing before a panel of students and faculty to resolve a student's allegation of a violation of his or her academic rights, as set down in the Academic Freedom Report (AFR) or the companion document for graduate students, called Graduate Rights and Responsibilities for Students at Michigan State University (GSRR). The AFR and the GSRR documents require departments, schools and colleges to develop grievance procedures consistent with these documents.

It's important to recall that the AFR and GSRR require a student in conflict with an instructor to attempt to resolve the dispute before filing a request for a grievance hearing. The student should start the process by meeting with the instructor and then with the department chair/school director and/or the Ombudsman. Most of the time, the parties to a dispute settle the issues during these discussions.

However, if a student remains dissatisfied with the outcome of these conversations, the student may submit a written request for a grievance hearing to the Department Chair/School Director to whom the instructor reports. The letter must state the specific nature of the complaint and the redress, or remedy, the student seeks as an outcome of the hearing. (Note the word "request" and read on.)

Upon receiving a request for a grievance hearing, the unit administrator forwards the letter to the Chair of the department/school hearing board. The hearing panel for graduate students is chaired by the department chair/school director or designee and is made up of an equal number of faculty and students (undergraduate or graduate, depending on the status of the student requesting the hearing). The chair of the hearing board in cases involving undergraduate students may be a faculty member, not the chair or chair's designee.

After receiving the written complaint, the hearing board can request a response from the instructor and then decide if the request for a hearing has merit. If so, the chair of the hearing board will schedule a hearing; if not, the hearing board can dismiss the case--a decision that the student can appeal to the college hearing board.

Both the student and the instructor are allowed to call on witnesses to appear at the hearing on their behalf, and they can seek an adviser to help them throughout the process. The advisers must be members of the MSU community—faculty, staff or students.

If the student prevails at the initial hearing, the hearing board asks the department chair/school director to implement an appropriate redress to accommodate the student. If the instructor prevails at the hearing, the student can file a request to appeal the department/school hearing board's decision to the college-level hearing board.

The Ombudsman is available to assist students, instructors and hearing boards through every stage of the grievance process. The office is open 8 a.m. to noon and 1 to 5 p.m. Monday - Friday throughout the year and is committed to accommodating all students.

## VIII. TERMINATION AND WITHDRAWALS

Should a decision to terminate a student be made, all information regarding the decision will be held strictly confidential between the student and the concerned faculty and be released only with the consent of the student involved, unless this decision becomes the substance for a grievance procedure in which case such information shall be released to the Grievance Committee. The same privacy will be accorded the reasons for a student's temporary or permanent withdrawal from the Department of Pharmacology and Toxicology.

A decision to terminate may be made on the grounds of a failing academic performance, lack of sufficient definable progress (e.g. not meeting goals of yearly evaluation), or dishonest laboratory practice. The decision to terminate a student is a serious one and is not made lightly.

Students may choose to withdraw from the department for personal or professional reasons. It is our hope that the student will talk openly and honestly with their advisor, fellow students, Graduate Program Director, Vice Chair, and/or Department Chair while making this decision. Should a student choose to withdraw, a letter addressed to the Graduate Program Director must be written that details the specifics of withdrawing, including reasons for the withdrawal and the date on which this is effective. The following is from the University's policies and procedures:

### A. Voluntary Withdrawal During the Semester:

A student may voluntarily withdraw from the University prior to the end of the twelfth week of a semester, or within the first 6/7 of the duration of the student's enrollment in a summer or special sessions (calculated in weekdays). Withdrawal is not permitted after these deadlines.

After submission of the Departmental letter described above, the withdrawal procedure within the University begins in the office of the Associate Dean of the college *in which the student is enrolled* or in the Office of the Registrar, Room 150 Administration Building. Upon official voluntary withdrawal from the University, symbols are assigned to courses in which the student was enrolled according to the effective date of the withdrawal as follows:

1. If withdrawal is before the middle of the semester or summer session, no symbols will be assigned to courses in which the student was enrolled.
2. If withdrawal is after the middle of the semester or summer session, symbols will be assigned by instructors to courses in which the student was enrolled as follows: *W* (no grade) to indicate *passing or no basis for grade* regardless of the grading system under which the student is enrolled; *N* to indicate *failing* in a course authorized for P-N grading, or 0.0 to indicate *failing* in a course authorized for numeric grading.

- In case of official withdrawal from the University, fees are subject to refund according to the refund policy.
- A student living in an off-campus organized living unit should consult the individual unit for policies regarding room and board refunds.
- If three or more complete semesters of school are missed subsequent to withdrawal, including the summer sessions, the student must apply for readmission online at [www.reg.msu.edu](http://www.reg.msu.edu).

### B. Voluntary at the Close of a Semester:

There is no formal procedure for withdrawal at the end of a semester with the exception of submitting the departmental letter; however, a student living in University housing should notify the manager of the appropriate unit.

### C. Unauthorized:

A student who leaves the University during a semester or summer session without obtaining an official withdrawal will be reported as having failed all courses.

The withdrawal procedure will not take place automatically for the student who leaves campus because of illness, of either one's self or family member, but must be initiated by the student. If this cannot be done in person, withdrawal may be initiated by writing the associate dean of the college in which the student is enrolled or the Office of the Registrar, 150 Administration Building.

A student who leaves the University without withdrawing formally forfeits any fees or deposits paid to the University.

**D. Involuntary:**

A student who is called into the Armed Forces during the semester should present orders for induction at the office of the associate dean of the college in which the student is enrolled or at the Office of the Registrar for appropriate action.

**E. Disciplinary**

If a student is dismissed for disciplinary reasons during a semester, courses are dropped without grades and without refund and the registration canceled.

**IX. DEPARTMENTAL ORGANIZATION**

**A. Personnel:**

**1. Chair:** Dr. Joseph R. Haywood, Professor

In the absence of the Chair, individuals designated as official signers of University documents are Dr. John Thornburg (Professor) and Dr. James Galligan (Professor).

**2. Office Staff and Responsibilities:**

Renee Bockes, Administrative Assistant III/S (Office Manager) -- Manages and supervises office staff for the Department. Manages appointments/reappointments for faculty, postdoctoral fellows, and office staff.

Pamela Hathaway, Administrative Assistant III/Supervisor (Budget Officer) – Accounting Manager/Bookkeeper – manages departmental funds which include general and research funds; balances monthly ledgers; submits account reports to faculty and Department Chair; works with Chair and Colleges on annual general fund budgets. Pre- and post-award grant administrator.

Linda Mix, Secretary II – Completes requisitions, direct pay, travel and reimbursement vouchers. Submits orders using the University Web Requisition system for the department, assists in reconciling ledgers, maintains accounting files, tracks and updates department purchasing cards.

Shannon Hicks, Executive Secretary - Liaison for the Department Chair in internal and external organizations. Attends and prepares minutes for the faculty meetings. Coordinates new faculty orientation, interacts with Faculty Advisory Committee, manages faculty evaluation process, maintains security of key distribution process, manages Chair's calendar, appointments and correspondence; maintains conference room and library schedules. Collects and sorts departmental mail.

Diane Hummel, Administrative Assistant I -- Assistant to the departmental Graduate Committee; assists the Educational Programs Coordinator. Schedules department seminars, prepares examinations for distribution, manages syllabi, examinations, course schedules, CLIFMS, class lists and SIS. Assists with student enrollment system, providing overrides, referrals to degree program directors, assists with Angel. Provides support for marketing/communications, graphic design, alumni planning, course evaluations.

Patti Banyas, Educational Programs Coordinator -- Organizes ongoing activities and plans new educational projects including contracts, facilities, schedules, and budgets; coordinates publicity and organizational procedures in order to implement conferences, workshops and programs; evaluates programs in order to enhance future programs and to increase student participation and retention; acts as resource to instructors for educational technology and pedagogical strategies.

Steven Stofflet – Manages the Professional Science Masters Program for Integrative Pharmacology and the Plan B Masters Program. Assists with students enrollment system, providing overrides, referrals to degree program directors, assists with Angel. Coordinates all stages of development and creation of publications and promotional materials, including departmental web site, logos, brochures, and multimedia components. Duties also include: writing and editing copy for all publications, taking photographs, operating digital video cameras at special events, and assisting the Education Programs Coordinator.

### **3. Faculty Committees:**

Each September, faculty gather to elect new committees that serve the Department as a whole. Central to this is election of a Faculty Advisory Committee (FAC). This committee then determines the composition of the other departmental committees, on each of which graduate students at any level of study is invited to participate.

#### **a) Committee Duties:**

##### **(1) Faculty Advisory Committee:**

The Faculty Advisory Committee advises the Departmental Chair concerning the discharge of his/her responsibilities by a direct representation of faculty opinion. The Committee can also mediate on behalf of an individual faculty member or communicate with the Department Chair for the entire Pharmacology and Toxicology Department. The Committee also advises the Department Chair on annual faculty evaluations.

##### **(2) Course and Curriculum Committee:**

The Course and Curriculum Committee is responsible for determining requirements for degrees offered by the department, reviewing and recommending courses, and evaluating course objectives, contents and presentations both in the Department and in cognate areas. The Committee also is responsible for compiling the written component of the comprehensive examination.

##### **(3) Graduate Committee:**

The Graduate Committee is responsible for recommending to the Chairperson candidates for admission to the Graduate Programs and advises the Chairperson in selection of departmental graduate assistants. The Committee is also responsible for recommending to the faculty required courses for graduate students (in conjunction with the Course and Curriculum Committee), administration and grading of the written comprehensive examination, and recommending nominees for fellowships, various honors and scholarships.

##### **(4) Diversity Committee:**

The Diversity Committee develops and implements strategies for the recruitment of under-represented minorities to faculty and staff positions. The Committee will also work with the Graduate Committee in the recruitment of under-represented minorities to the graduate program. To achieve these ends, the Committee will work with the University Office for Inclusion and Intercultural Initiatives.

##### **(5) Core and Biohazards Committee:**

The central mission of the Departmental Biohazard Committee is to support the guiding principles of the Office of Radiation, Chemical & Biological Safety (ORCBS) on regulatory compliance related to the use of biohazardous materials within the Department. The Committee reports directly to the Department Chair. The duties of the Committee include the ORCBS mandated biological safety laboratory and clinical inspections, autoclave inspections, scheduling of annual biological safety cabinet and laminar flow hood certifications, reporting to ORCBS of biohazard incidences, personal exposure and/or injuries, and biological spill response. The above duties will be carried out in close coordination with ORCBS.

##### **(6) Scientific Integrity Committee (ad hoc):**

The role of this Committee is to be an impartial body to which Departmental personnel can bring complaints regarding issues of scientific integrity. The Committee is responsible for investigating any such complaints, providing guidance to the complainant, and communicating with relevant college and university committees on professional integrity regarding all complaints made by or against departmental personnel and involving this Committee.

##### **(7) Awards Committee:**

In 2000, the Department instituted the Ken Moore Distinguished Alumnus/Alumna Award. Faculty are invited to submit names and Curriculum Vitae for individuals they believe are deserving of such an award. The Committee reviews these applications in May/June and notifies an

awardee as soon as possible. A seminar in the Fall semester is then scheduled such that the awardee can present their work and meet with current graduate students and faculty.

In 2008, the Theodore M. Brody Distinguished Lectureship was established. This award is in memory of Dr. Ted Brody, first Chair of the Department of Pharmacology and Toxicology at Michigan State University. This award is presented to individuals throughout the scientific community who have achieved distinction in the varied careers of Pharmacology and Toxicology.

**(8) Student Advisory Council:**

The Student Advisory Council is composed of student representatives from the first through fourth year classes and advises the Department Chair concerning the discharge of his/her responsibilities by a direct representation of student opinion. The Committee communicates information, queries and opinions from the student body to the faculty through the Department Chair or the Graduate Program Director. The Student Advisory Committee assigns student representatives to the departmental committees and proctors for the departmental professional school examinations.

**(9) Secretarial Support for Faculty Meetings:**

The role of the Secretary is to record the proceedings of regular faculty meetings and of faculty retreats, and to distribute minutes of these meetings and retreats. The minutes are not considered verbatim record but should record topics of the meeting, important comments regarding discussion by faculty on each topic, and decisions made by faculty at the meeting regarding departmental activities.

**4. Graduate Student Participation in Department Academic Governance:**

Graduate Students are invited to have a participant on every committee that serves the department.

**X. FINANCIAL SUPPORT OF GRADUATE STUDENTS**

**A. Stipend and Benefits:**

**1. Stipends and Advanced Stipends:**

The following is taken from the Academic Programs catalog of Michigan State University.

Financial aid for graduate students is available in several forms. A number of scholarships and fellowships are awarded each year by The Graduate School to the colleges, and there are many opportunities for graduate assistant appointments for part-time teaching or research.

Students already admitted to regular graduate status at Michigan State University and seeking an assistantship or other financial aid should consult the department concerned. Since graduate assistantships and fellowships are usually awarded beginning in February for the following academic year, it is essential that the applications and supporting documents be submitted in December or early in January to assure adequate consideration.

Students in Pharmacology and Toxicology are guaranteed funding by their advisor and/or the Department until they pass their dissertation defense. This includes stipend, tuition and fees, and medical insurance.

**a) Graduate Assistantships:**

Graduate assistantship (GA) is a generic term referring to financial support of graduate students that results in a stipend and compensation and for which performance of defined duties is expected. Specific GA appointments are made in one of three categories: research assistants, teaching assistants represented by the Graduate Employees Union (GEU) and teaching assistants not represented by the GEU. For more information on the GEU Contract see their website at <http://www.geuatmsu.org/>. (The Department of Pharmacology and Toxicology has only research assistantships since we do not have an undergraduate program.)

GAs must be actively pursuing degree programs and making satisfactory progress toward their degree. The academic year encompasses two appointment periods: August 16-December 31 and January 1-May 15. During each appointment period a GA's responsibilities require an average of 10 hours per week for a quarter-time appointment, 20 hours per week for a half-time appointment,

and 30 hours per week for a three-quarter-time appointment. Summer appointments cover the intervening period but the distribution of duties may vary. Anticipated distribution of duties over the weeks of a semester should be communicated to the GA by the appointing unit at the time of appointment.

To the extent that current policies and procedures contain provisions about wages, benefits, or other terms and conditions of employment, they are, for teaching assistants included in the collective bargaining unit, subject to negotiations with the Graduate Employees Union/American Federation of Teachers.

**b) Research and Teaching Assistant** (not covered by the GEU Contract):

The information listed below is subject to yearly change. Please consult The Graduate School home page for the latest information at [www.grad.msu.edu](http://www.grad.msu.edu).

Checks are distributed biweekly. GAs at any of the three levels may be appointed on a quarter-time, half time, or three-quarter-time basis with an appropriate adjustment in the stipend. Changes in level, stipend, or percentage of time become effective only at the beginning of a semester. Additional benefits, even though the graduate student does not enroll for 10 credits or more, include the following:

**(1) Tuition Waiver:**

Tuition waiver in the amount of 9 credits for Fall semester, 9 credits for Spring semester, and 4 credits for summer session. The tuition waiver will be provided during the period of the assistantship, to a maximum of 22 credits per year.

**(2) Exemption from Out-of-State Resident Tuition:**

This exemption applies to a summer session that precedes or follows an appointment for an entire academic year, regardless of whether the student was previously enrolled at MSU. If the student does not have a signed GA form before registering for summer session, he/she will pay out-of-state resident course fees and tuition. Upon receiving a copy of the appointment form for the entire academic year through the middle of the semester of the subsequent Fall semester, the Office of the Registrar will refund the full amount of out-of-state tuition that the student paid for the summer session.

**(3) Matriculation and Support Fees:**

Matriculation and infrastructure/technology support fees are waived.

**(4) Health Insurance:**

GAs (domestic and international) are automatically enrolled in a health insurance plan, the premium of which is paid by the University. The plan provides the following coverage:

- (i) Fall appointment only—coverage from August 15 to February 14 of the following year.
- (ii) Fall and Spring appointments—coverage from August 15 to August 14 of the following year.
- (iii) Spring appointment only—coverage from January 1 to August 14.
- (iv) Summer appointment only—coverage from May 15 to August 14.

Enrolled students may also insure their eligible spouse and/or dependent children (residing with the insured). For questions regarding coverage, enrollment or premium payment, contact the MSU Benefits Office at (517) 353-4434 or (800) 353-4434, or email:

[studentinsurance@hr.msu.edu](mailto:studentinsurance@hr.msu.edu). The Benefits Office is located at 1407 S. Harrison Road, Suite 140A (Nisbet Building), East Lansing, MI 48823, and on the web at MSU Benefits Office, <http://www.hr.msu.edu/HRsite/Benefits/Students/HealthCov/>; Aetna Student Health Group at [http://www.aetnastudenthealth.com/stu\\_conn/student\\_connection.aspx?groupid=711130](http://www.aetnastudenthealth.com/stu_conn/student_connection.aspx?groupid=711130).

**(5) International Student Accident and Health Insurance:**

International students are required to have health and accident insurance. Students are required to purchase the MSU Student Accident and Health Insurance Plan unless they have evidence of alternative insurance equal in benefits and provisions to the MSU plan. Fees for the student's

insurance are included with the bill for tuition and fees during registration. Waivers to allow purchase of alternative plans must be approved by the Benefits Office, Human Resources, 140 Nisbet Building.

**2. Stipends and Additional Benefits, Other Information:**

- Library privileges, intramural and recreational facilities privileges, and eligibility to the Michigan State University Federal Credit Union.
- Eligibility for student discounts on football, basketball, and/or hockey season tickets for themselves and their spouses.
- Eligibility for free admission to other regularly scheduled MSU athletic events when presenting a valid student ID card.
- Eligibility for student discounts on series tickets to professional performing arts events at the Wharton Center for Performing Arts, including one guest ticket at the student rate.
- Exemption from payment of the Social Security tax on the stipend. Stipends are subject to income taxes with few exceptions. The taxability of stipends is subject to review by the IRS. Please call the Payroll Office for more information (355-5010). Please note that tax laws are subject to continuing revision and students should verify their tax liability each year.

**3. Registration and Credit Load Requirements:**

GAs must be registered each semester in which they hold an assistantship. The following is from MSU's Academic Program Catalog.

**a) Maximum and Minimum Credits:**

**(1) Maximum:**

Graduate students may carry up to 16 credits each semester. The department or school, however, determines the maximum number of credits. A student load above 16 credits requires approval by the student's dean. Enrollment in doctoral dissertation research (course number 999) credits need not be counted in determining maximum credits.

**(2) Minimum:**

All students using University services (faculty consultation included) for graduate work must be registered each semester. Minimum registration consists of one course of 1 credit.

**b) Full-Time Students:**

In order to be considered full-time for academic purposes, students must carry the minimum number of credits per semester as defined below:

Master's level . . . . .	9 credits
Doctoral level . . . . .	6 credits
Graduate-Professional level . . . . .	12 credits

All GAs are classified as full-time students during the semester(s) of their appointments as long as they are enrolled for the minimum credits required for the assistantship. Full-time status for doctoral students is defined as a minimum of 1 credit for those students who:

1. have successfully completed all comprehensive examinations and are actively engaged in dissertation research; or
2. are doing department-approved off-campus fieldwork related to preparation of their dissertation.

For those students who decide to enroll for 1 credit each semester, the student should take into account the number of 999 credits he/she still needs to complete their program.

**NOTE:** If a student has outstanding student loans (even though currently on deferment), the student may have to be enrolled for a certain number of credits

each semester to maintain the deferment status. It is the student's responsibility to notify the Department's Assistant to the Graduate Committee of this status.

**c) Fellowships:**

A variety of graduate fellowships are available to Michigan State University students. Stipends and sources of support vary widely. In addition to applying for fellowships offered by the University and through the University by outside agencies, students are encouraged to consult such publications as the following, which are found in most libraries:

- i) *Financial Aids for Graduate Students*, Bernard G. Maxwell, Editor.
- ii) *The Foundation Directory*, Marianna O. Lewis, Editor.
- iii) *Scholarships, Fellowships, and Loans*, Normal Feingold.

Michigan State University annually awards a number of fellowships and tuition scholarships to encourage and assist high achieving students to pursue study leading to a graduate degree. A recipient of one of these awards must be enrolled in a degree program but is not required to give formal service to the University or to the department.

For a student not currently enrolled in a graduate program at Michigan State University, the application for admission also serves as an application for these awards. A student currently enrolled may apply through the respective department or college.

**(1) Registration and credit Load Requirements:**

Most fellowships require full-time pursuit of a graduate program. Unless the fellowship carries specific requirements for determining eligibility, the department or school is responsible for determining and certifying the full-time status of the student. All predoctoral graduate fellows paid through the University must be registered during the period for which payment is made.

**(2) Graduate School Dissertation Completion Fellowships:**

These fellowships allow students to devote full time to writing the doctoral dissertation. Stipend is \$6,000 for the semester. This fellowship program is for students in the final months of their programs and are about to defend. About 25 fellowships are awarded each year. Application must be made directly to the department or college.

**(3) Sponsored Fellowships:**

Fellowships sponsored by industries, foundations, and government agencies are available to high achieving students for graduate study in various departments or colleges at Michigan State University. These fellowships are awarded through individual departments or colleges. Information on available fellowships and the procedure for applying may be obtained by writing to the department or college concerned.

Receipt of externally funded fellowships by students who have written their own grant applications and worth at least \$20,000 (direct costs), now makes the students eligible for in-state tuition rates. The in-state tuition rate applies only to the semester during which the student is supported by the fellowship. This policy applies only to grants funded through a competitive process by a US institution/agency/foundation. Funds obtained through non-competitive processes (e.g., need-based fellowship) or from international sources do not qualify the students for in-state tuition rates. For more information contact Melissa Del Rio ([mdelrio@msu.edu](mailto:mdelrio@msu.edu)) in 110 Linton Hall.

**(4) University Distinguished and Enrichment Fellowship Program:**

The Graduate School offers fellowship programs that provide financial support for outstanding students who plan to enroll in a doctoral or master of fine arts program. In assisting MSU to achieve its educational mission, our goal is to foster an intellectually vital and diverse educational community that will prepare graduate students to assume their professional roles in a diverse society. MSU is particularly aware of the special role that graduate education plays in training the next generation of leaders in academia, government and the private sector. To support that role, The Graduate School's recruitment fellowships assist departments and programs in attracting a cohort of students who: have demonstrated

academic excellence; articulate their commitment to research goals well matched to department or program doctoral emphasis areas; show evidence of leadership potential or the capacity to make a distinctive professional or scholarly contribution; contribute to a diverse educational community, as evidenced in personal history and experience, research goals, or the promotion of understanding among persons of different backgrounds and ideas; have different racial, ethnic, gender and disciplinary backgrounds.

Two kinds of fellowship awards are available:

**University Distinguished Fellowships:** recognizing academic achievement, research goals, demonstrated leadership potential, and contribution to a diverse educational community.

**University Enrichment Fellowships:** recognizing academic achievement, research goals, contribution to a diverse education community, and a record of overcoming obstacles.

Fellowship recipients beginning study for the 2008-2009 school year will receive a 12-month stipend of \$23,000, plus health insurance. In addition, tuition and related fees will be waived within some limits. Fellows must maintain strong academic performance and make normal progress toward their degrees.

**Doctoral students** receive five years of support. The first and fifth years are funded by the Graduate School, with no teaching or research service required of the student. During the second, third, and fourth years of fellowship support, students receive a departmental assistantship that may require them to assist in research and/or teaching.

**(6) University Graduate Recruiting Fellowships and University Graduate Fellowships:**

These awards are for recruiting new master's or doctoral students or for outstanding master's or doctoral students who are making good progress toward their degrees. Students must be U.S. citizens or permanent residents. Colleges set stipend levels.

**4. Insurance:**

Some form of health insurance should cover all students. Michigan State University offers a student health insurance plan through Aetna/The Chickering Group that provides reasonable protection against sickness and accidents at an affordable cost. This information may be accessed through <http://www.hr.msu.edu/HRsite/Benefits/Students/HealthCov/>.

The MSU Student Health Insurance Base Plan is an illness and injury insurance plan that covers a variety of health care services including office visits at Olin Health Center, prescription drugs up to an annual maximum of \$2,000, diagnostic treatment such as lab work and x-rays, hospitalization and specialty care.

The MSU Graduate Assistant Health Insurance Plan covers a variety of health care services including office visits at Olin Health Center, one of these office visits may be used for a general physical examination. The plan offers prescription drug coverage up to an annual maximum of \$5,000, diagnostic treatment such as lab work and x-rays, hospitalization, specialty care and one annual gynecological examination including mammography services. MSU will contribute \$1,000 annually towards the cost of a spouse\* or child and \$1,300 annually towards the cost of a spouse\* and/or multiple dependents. For more information on Graduate Assistantships please visit the Office of Planning and Budgets website. (\*Reference to spouse includes MSU recognized same-sex domestic partners of Graduate Assistants.)

**a) Student Health Subsidy Program (SHSP):**

SHSP will provide health care support for qualifying low-income students and their spouse/MSU recognized same-sex domestic partners of graduate assistants, to provide access to care, as well as, added help with prescription drug purchases.

SHSP offers unlimited office visits and University-recommended immunizations at Olin Health Center, and prescription drug coverage up to an annual maximum of \$1,400. The program is intended for MSU students and their spouse/MSU recognized same-sex domestic partners of graduate assistants, who have no means of obtaining health insurance.

## **XII. ACADEMIC INTEGRITY, COPYRIGHT INFRINGEMENT AND THE USE OF MSUNET**

(From a memo distributed by David Gift, Vice Provost, Libraries, Computing and Technology, 10/04/2004).

“As an academic community, we value the exchange of ideas and respect the intellectual work and property of others. Consistent with these values, we do not condone plagiarism, nor do we condone the unlawful copying, distribution or use of copyrighted works in any form.

All Michigan State University students, faculty, staff, and anyone else using MSU’s computing systems and digital network (MSUnet), are expected to abide by the copyright laws of the United States. Unauthorized copying and sharing of copyrighted music, videos, movies, documents and other electronic files is illegal. Users of MSUnet bear individual responsibility for their use of the network, and personal liability for any legal or criminal action brought against them.

Various industries are quite aggressive in their detection and pursuit of individuals they believe are infringing copyright, including seeking monetary damages in lawsuits against these individuals. MSU complies with the federal Digital Millennium Copyright Act (DMCA), and cooperates with copyright owners and their agents who file complaints alleging copyright infringement against MSUnet users. MSU’s DMCA-related policies and procedures may be found at <http://lct.msu.edu/guidelines.html>. The University also may refer student repeat infringers to the University student judiciary system, and may refer University employee repeat infringers to their supervisors or unit managers, for further disciplinary action as appropriate.

There are an increasing number and variety of legitimate uses of peer-to-peer file sharing programs to support the scholarship and collaborative work of students, faculty and staff. The MSU community has a collective interest in protecting these legitimate uses, as well as protecting the available bandwidth and security of our shared network.”

## XIV. APPENDICES

Pharmacological Sciences Training Program Forms .....	ii-vi
Graduate Student Progress Flow Sheet.....	ii
Rotation Evaluation .....	iii
Course Lecturing Evaluation .....	iv
Student Seminar Evaluation.....	v
Annual Student Performance Evaluation .....	vi
The Writing Center .....	vii
Resource Materials .....	viii
2009-2010 Program .....	viii
Series Presentations for Responsible Conduct in Research.....	viii-x
List of Faculty in Pharmacology and Toxicology .....	xi
Research.....	xi
Administrative and Teaching .....	xii
Fixed-Term .....	xii
List of Recent Theses (2004-2008).....	xiii-xiv
Graduate, Undergraduate, and Medical Courses Offered by Pharmacology and Toxicology .....	xv-xvi
Interdisciplinary Programs Associated with Pharmacology and Toxicology .....	xvii-xix
Equipment Available to Departmental Core Facilities .....	xx-xxi
Copy of Regular Employee Hire/Change Form.....	xxii

# GRADUATE STUDENT PROGRESS FLOW SHEET

<b>Student Name/PID No.:</b>	<b>Matriculated:</b> <u>F</u> <u>S</u> <u>US</u> <u>20</u>
<b>Degree Sought:</b> <u>MS</u> <u>PhD</u> <input checked="" type="checkbox"/>	<b>Program:</b> <u>2794 Pharmacology and Toxicology</u>

Rotation	Advisor(s) + Semester/Year	Seminars	Dates
1/ PHM 870	General 1 <sup>st</sup> 10 wk	Rotation	
2/ PHM 870	10/wk	Thesis Proposal	
3/ PHM 870	10 wk	Dissertation	

COURSES TAKEN – In addition to 899 (min of 4 credits required) OR 999 (min of 24 credits required)											
PHM Required Courses				Additional Required Courses				Electives (1 course min)			
Course	Sem	Cr	Gr	Course	Sem	Cr	Gr	Course	Sem	Cr	Gr
819	Summer	10	2	BMB 801	Fall	09	3				
820	Fall	10	4	BMB 802	Spr	10	3				
827	Fall	09	4	PSL 828	Spr	10	4				
830	Fall	11	3								
870	Summer	10	2								
910			1								

**Comments:** PHM 999 Credits to Date (9/21/2009): **0**

COMPREHENSIVE EXAM	DATE PASSED	SIGNATURE
Written Exam <i>(Chair, Graduate Committee)</i>		
Oral Exam <i>(Chair, Guidance Committee)</i>		

COURSE LECTURING (includes tutoring PHM 430, PHM 431, PHM 450, Others):			
(Course(s)/Lecture(s) Title(s)/Sem:			

GUIDANCE COMMITTEE MEMBERS:	(MS – at least 3 reg MSU Faculty; PhD – at least 4 reg MSU faculty [ 1 req from outside Dept])
1 <i>Chairperson,</i>	
2	
3	
4	
5	

Responsible Conduct in Research (University Series)	Date Offered	Taken
Investing in Responsibility & Integrity for a Productive Career		
Responsible Decision-making in Academic Research: Ethical & Moral Perspective		
Maintaining a Productive & Responsive Environment for Conducting Graduate Research		
Personal Responsibility in Conducting Graduate Research & Advancing Your Career		
Responsibility to the Subjects of Research: Animals		
Responsibility to the Subjects of Research: Humans		
Objectivity & Conflicting Interests in Academic Research		

ANNUAL EVALUATIONS RECEIVED:					
Year	Semester	Rating	Comments	Date	Signature

CERTIFICATION THAT ALL COURSE REQUIREMENTS HAVE BEEN MET:	
<b>Signature (Chair, Guidance Committee:</b>	<b>Date:</b>

Degree	Date Defense Passed	Semester Degree Awarded	Signature (Chair, Guidance Comm)

## Pharmacology and Toxicology Graduate Program – **Rotation Evaluation**

Student:

Rotation Advisor:

Evaluation Period (Check One):

**Fall**

**Spring**

**Summer**

***Please evaluate the student on the basis of the following criteria:*** Reliability, initiative, perseverance, ability to express himself/herself, commitment, and laboratory skills. Evaluation on the basis of any additional criteria are welcome.

Faculty Signature

Date

Student Signature

Date

**After signing, student must return form to Diane in B440 Life Sciences. Form will be placed in student's file.**

## Pharmacology & Toxicology Graduate Program – **Course Lecturing Evaluation**

Student:

Course Coordinator:

Evaluation Period:

**Fall**

**Spring**

**Summer**

Course in which lecture(s) were given:

**PHM**

Number of lectures given:

Lecture Title(s)

Date(s) of Lecture(s)

Give a brief summary of the student's performance and recommendations for improvement (if any)

Course Coordinator's Signature

Date



**Pharmacology & Toxicology Graduate Program – Annual Student Performance Evaluation**

Student:	Thesis Advisor:
----------	-----------------

Evaluation Period:

Coursework and academic requirements completed (6/09-5/10)	Grade(s)
--	----------

--	--

Summary of research progress during past year (*attach publication list including abstracts, if any*):

Evaluation of Student Performance (Circle one):      **Satisfactory**      **Needs improvement**

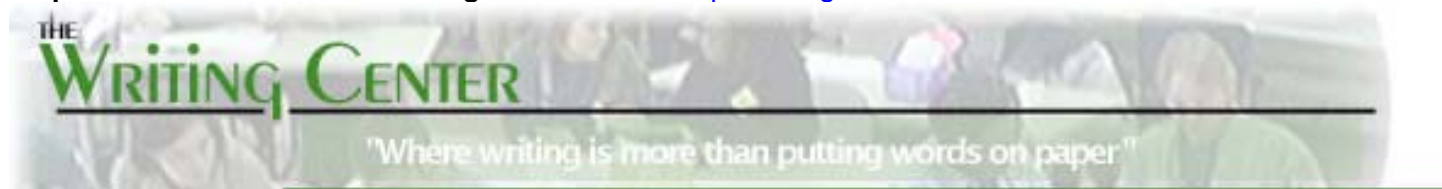
Research Plans for Coming Year:

Specific recommendations for performance improvement:

Student's Signature	Date:	Thesis Advisor's Signature	Date
---------------------	-------	----------------------------	------

Graduate Committee Chair's Signature	Date:
--------------------------------------	-------

The Graduate School has provided a helpful set of guidelines and a Writing Center (see below) to help the Graduate Student writing their theses. <http://writing.msu.edu/>



### Information for Graduate Students

[What services does the Writing Center offer graduate students?](#)

[How do I make an appointment with a writing consultant?](#)

[What should I bring with me to a consulting session at the Writing Center?](#)

[What are Graduate Student Writing Groups?](#)

[What are the science writing groups \(Nat Sci 840\)?](#)

[Where is the Writing Center located?](#)

[How might I become a graduate writing consultant?](#)

### What services does the Writing Center offer graduate students?

The Writing Center offers a variety of services for graduate students. Graduate Writing Consultants (GWCs) act as supportive readers to respond to developing drafts of:

- \* dissertations and theses
- \* conference papers
- \* seminar papers
- \* journal articles
- \* reports on empirical research
- \* cover letters
- \* résumés and curriculum vitae
- \* applications to graduate schools
- \* creative writing

The Writing Center also coordinates peer response writing groups for graduate students. These include special opportunities for graduate students writing in the sciences.

### How do I make an appointment?

Call (517) 432-3610 or stop by 300 Bessey to make an appointment.

### What should I bring with me to a consulting session at the Writing Center?

Writers are invited to schedule appointments with writing consultants to discuss any type of writing at any stage of the writing process (e.g., brainstorming, researching, drafting, editing). Dialogue at the beginning stages of the writing process is often the most fruitful, so we encourage writers to visit the center at the beginning stages of a writing project. Often it is useful to bring materials relevant to that project (e.g., assignments, project guidelines, course texts, application requirements) to consulting sessions.

### What are Graduate Student Writing Groups?

Graduate Student Writing Groups are composed of a writing center consultant and three to six graduate students who read and respond to one another's writing over time. Often these groups support one another's writing of theses or dissertations. Graduate students from all disciplines are invited to form or join groups. Ask about our special opportunities for writing in the sciences.

### NSC 840

#### [Science Writing](#)

### Where is the Writing Center located?

The Writing Center is located at 300 **Bessey Hall**, on the west side of Farm Lane across from the Auditorium.

## **RESOURCE MATERIALS**

A parallel effort of the Graduate School and the Vice President for Research & Graduate Studies will be to organize and make available [Resource Materials Concerning Responsible Conduct of Research](#) to facilitate communication, education and understanding of this topic. Where possible, links will be to the actual documents, or as an alternative the link may be to the source organization where the document may be requested. This site will include such things as instructional and training materials; case studies; readings; federal rules, regulations and guidelines; news; and sources for additional information.

## **2009-2010 PROGRAM**

Colleges and Universities are made up of professional scholars (faculty) and aspiring scholars (students and trainees) who coexist in a rich but competitive environment for the common purpose of learning, creating new knowledge, developing new insights through synthesis of existing knowledge and disseminating information and ideas for the benefit of their peers and the general public. Academic excellence comes through recognition by one's peers. Some new and innovative ideas have the potential for generating widespread professional interest and credit in the area of their scholarship for purely academic reasons. Others have the potential for generating substantial commercial interest and financial gain. Either can be motivation to stretch and even exceed acceptable standards of conduct in how scholarship is conducted. At the same time, differing academic and personal perspectives and interests can lead to interpersonal conflicts that detract from achieving common goals. Collectively, these challenges are integral to the broader paradigm of professional responsibility to one's students, senior advisors, peers, and institutions.

This series responds to graduate student and postdoctoral requests for more information and discussion of ethics and responsible conduct as it impacts on research and scholarship. It will emphasize ethical analysis and problem-solving along with summaries of specific requirements for both students and faculty. It will also highlight best practices to help insure the integrity of not only the research process but also the research findings.

## ***Schedule of Presentations***

### [Investing in Responsibility & Integrity for a Productive Career](#)

This first program in the Responsible Conduct of Research series is intended to focus attention on the broad issues of Integrity in Research and Creative Studies that will be discussed in more detail throughout the remainder of the series and to stress the importance of conducting research with integrity and the consequences when it is not, both at MSU during graduate school and afterward within professional disciplines and in diverse employment situations.

This session will highlight issues related to:

#### Key Principles of Integrity

- International Policies, Guidelines and Disciplinary Options for Promoting Integrity in Research
- Graduate Handbooks
- Graduate Student Rights, Responsibilities & Obligations
- [Guidelines for Integrity in Research & Creative Activities](#)
- Important Indicators of Integrity
- Ready Sources of Information for Daily Support
- Reasons for Acting with Integrity in Your Career

### [Responsible Decision-making in Academic Research: Ethical & Moral Perspectives](#)

Dr. Fleck will set the stage for subsequent discussions of specific aspects of academic responsibility by offering lessons to be learned from his perspective as a medical ethicist. He will provide a lay summary of common perspectives on ethical and moral values, features that guide a moral point of view, types of moral inquiry, and recurring dilemmas or problems in ethical decision making. He will discuss how these relate to matters of integrity and academic freedom and raise important questions for discussion concerning decision-making in academia and the conduct of research. He will consider the ethical dimensions of such things as academic freedom in relation to professional standards of conduct (academic duty); conflicting responsibilities and duties of faculty in relation to graduate students (multiple roles, expectations, and needs of students); and institutional responsibility to oversee and promote free and objective inquiry.

## [Maintaining a Productive & Responsive Environment for Conducting Graduate Research](#)

This program will highlight issues of interest to both graduate students and faculty where expectations may differ, leading to conflicts that are ultimately unproductive to all. We will discuss what we are attempting to achieve through responsible conduct of research education with examples of mutual responsibilities by students, faculty, and staff in creating and maintaining a productive and responsive environment for achieving our collective personal goals - for students, a productive graduate experience leading to a rewarding professional career.

## [Personal Responsibility in Conducting Graduate Research & Advancing Your Career](#)

Academic research is based on trust in the work of others. Also, information generated may often be used just as readily for destructive purposes as for helping mankind in a constructive manner. Therefore, researchers have a great personal responsibility, both individually and collectively, to others. This workshop highlights university guidelines, policies, procedures, and regulations related to institutional and public expectations about personal responsibilities and the consequences if personal actions violate or do not meet these expectations.

## [Responsibility to the Subjects of Research: Animals](#)

Many research questions to benefit the health and welfare of humans, as well as animals, could not be answered without studying animals in laboratories and in their natural environments. It is important that individuals and institutions conducting such studies recognize the significant responsibilities that this carries with it to do all possible to treat these animals with care and respect. This workshop will highlight historical perspectives and events in the public discussions of whether or not it is ethically appropriate to use animals in research. It will also stress the key laws and policies that have been implemented by the Federal government to accomplish this. Examples and case studies will also be presented to explain how MSU's Institutional Animal Care and Use Committee reviews proposed research and teaching protocols to ensure that research animals are cared for in a humane and ethical manner to minimize pain and distress.

## [Responsibility to the Subjects of Research: Humans](#)

With emphasis on university policies and procedures for acceptable practices and procedures for conducting studies of humans (concern for vulnerable populations, obtaining informed consent, maintaining confidentiality, etc.), this session will also highlight the historical basis for human research protections and how to obtain institutional approval for the conduct of such research.

## [Objectivity & Conflicting Interests in Academic Research](#)

"A conflict of interest is a situation in which someone in a position of trust, such as a lawyer, insurance adjuster, a politician, executive or director of a corporation or a medical research scientist or physician, has competing professional or personal interests. Such competing interests can make it difficult to fulfill his or her duties impartially. A conflict of interest exists even if no unethical or improper act results from it. A conflict of interest can create an appearance of impropriety that can undermine confidence in the person, profession, or court system. A conflict can be mitigated by third party verification or third party evaluation ... but it still exists." [from Wikipedia]

"As the only land-grant institution in the state, Michigan State University is committed to providing equal educational opportunity to all qualified applicants; to extending knowledge to all people in the state; to melding professional and technical instruction with quality liberal education; to expanding knowledge as an end in itself as well as on behalf of society; to emphasizing the applications of information; and to contributing to the understanding and the solution of significant societal problems. Michigan State University's adherence to academic freedom and open scholarly inquiry supports these essential academic functions." [from MSU's Mission Statement approved by the Board of Trustees on June 24-25, 1982]. Michigan State University is now advancing a strategic commitment to become recognized worldwide as the United States' leading land-grant research university for the 21st century.

One of the foundations for earning this recognition is public trust, in Michigan and worldwide. One factor contributing to public trust is faith that university efforts are carried out as objectively as possible. The Spring 2007 issue of the Research Integrity Newsletter addresses the meaning of "objectivity" and the importance of striving to minimize bias. This workshop will highlight and discuss issues and examples from

varying disciplinary perspectives, including why objectivity is important to graduate students and why graduate students themselves should strive to be objective

---

The above presentations were retrieved from <http://www.msu.edu/user/gradschl/all/respconduct.htm>. You may find more information at this site concerning the above presentations.

## FACULTY INTERESTS IN PHARMACOLOGY AND TOXICOLOGY

### Research Faculty

- Atchison, William D.**, Ph.D., University of Wisconsin; Postdoctoral Fellow, Northwestern University; Professor. Neurotoxicology; effect of drugs and chemicals on neurotransmitter release.
- Barman, Susan M.**, Ph.D., Loyola University; Postdoctoral Fellow, Michigan State University; Professor. Neural control of the cardiovascular system.
- Cobbett, Peter J.R.**, Ph.D., St. Andrews University, Scotland; Postdoctoral Fellow, Michigan State University; Academic Fellow, AFRC Institute, England; Associate Professor. Examination of properties of and effects of drugs on isolated muscle from *Schistosoma mansoni*. Effects of nanoparticles on mammalian neurons.
- Dorrance, Anne M.**, Ph.D., University of Glasgow, Scotland ; Postdoctoral Fellow, University of Michigan; Associate Professor. How circulating factors and hypertension affect the outcome of ischemia, and the structure of the cerebral blood vessels; how the mineralocorticoid, aldosterone, and hypertension increase an individual's risk of having a stroke and exacerbate the damage caused by stroke.
- Fink, Gregory D.**, Ph.D., Tulane University; Postdoctoral Fellow, University of Iowa; Professor. Neural control of the cardiovascular system, body fluid homeostasis, hemodynamics, venous function and vascular capacitance, hypertension, cardiovascular disease.
- Galligan, James J.**, Ph.D., Arizona; Postdoctoral Fellow, Flinders University, Australia; Postdoctoral Fellow, Massachusetts Institute of Technology; Senior Research Associate, Oregon Health Sciences University; Professor. Autonomic physiology and pharmacology with emphasis in the nervous regulation of gastrointestinal function.
- Ganey, Patricia E.**, Ph.D., Michigan State University; Postdoctoral Fellow, University of North Carolina; Professor. Mechanisms of liver injury; role of phagocytic cells in hepatotoxicity.
- Goodman, Jay I.**, Ph.D., University of Michigan; Postdoctoral Fellow, McArdle Laboratory for Cancer Research, University of Wisconsin; Professor. Chemical carcinogenesis; toxicology.
- Goudreau, John L.**, D.O./Ph.D., Michigan State University; Associate Professor (joint with Neurology and Ophthalmology). Genetic and environmental factors involved in the pathogenesis of neurodegenerative disorders such as Parkinson's Disease.
- Haywood, Joseph R.**, Ph.D., University of Florida; Research Fellow, University of Iowa; Professor and Chair. Neural control of the circulation in hypertension, genetics of sodium-dependent Hypertension, regulation of central and peripheral neurotransmitter release.
- Hegg, Colleen C.**, Ph.D., University of Wisconsin-Madison; Postdoctoral Fellow, University of Utah; Assistant Professor. Elucidating the mechanisms of neuroregeneration using the olfactory system as a model; confocal microscopy, live cell imaging, enzyme immunoassays, Immunohistochemistry, luminometry and electrophysiology in whole animal studies, *in situ* preparations and cell culture.
- Jackson, William F.**, Ph.D., Michigan State University; Postdoctoral Fellow, University of Virginia; Professor. Microvascular physiology and pharmacology, smooth muscle and endothelial cell ion channels and electrophysiology, calcium signaling.
- Kaminski, Norbert E.**, Ph.D., North Carolina State University; Postdoctoral Fellow, Research Instructor, Assistant Professor, Medical College of Virginia; Professor and Director of the Center for Integrative Toxicology. Role of the cannabinoid receptor in immunomodulation by cannabinoid compounds; signal transduction in T-cell activation; immunotoxicology of cholinated hydrocarbons; interactions between the liver and the immune system.
- Lookingland, Keith J.**, Ph.D., University of Maryland; Research Associate, Michigan State University; Associate Professor. Development of neuroprotective pharmacological agents and strategies for the treatment

of dopamine neurodegenerative disorders including Parkinson's Disease and Restless Legs Syndrome (RLS)

**Northcott, Carrie A.**, Ph.D., Michigan State University; Research Associate, Michigan State University; Assistant Professor. Neural control and intracellular signaling mechanisms involved in blood pressure regulation.

**Roth, Robert A., Jr.**, Ph.D., Johns Hopkins University; Postdoctoral Fellow, Yale University; Professor and Associate Director, National Food & Safety Toxicology Center. Toxicology of the lung and liver; metabolic function of lung in disease; mechanisms of lung vascular injury.

**Watts, Stephanie W.**, Ph.D., Indiana University; Postdoctoral Fellow, The University of Michigan; Professor. Role of serotonin, altered signal transduction and vascular smooth muscle in hypertension.

### **Administrative and Teaching Faculty**

**Moore, Kenneth E.**, Ph.D., University of Michigan; Associate Professor, Dartmouth Medical School; Professor Emeritus. Biochemical and toxicological aspects of drugs which act in the peripheral or central nervous systems; catecholamines; neuroendocrine systems.

**Thornburg, John E.**, Ph.D., Purdue University; D.O., Michigan State University; Postdoctoral Fellow, Michigan State University; Professor. Neurochemistry; receptor supersensitivity; neuropharmacology; clinical pharmacology.

### **Fixed Term Faculty**

**Bian, Xiaochun**, Ph.D., University of Melbourne, Australia; Postdoctoral Fellow, Michigan State University; Assistant Professor. Neural control of gastrointestinal motility and blood flow.

**Kaplan, Barbara L.**, Ph.D., Michigan State University; Ph.D., Michigan State University; Postdoctoral Fellow, University of Chicago; Assistant Professor. T-cell signaling; regulation of interleukin-2; cannabinoid-induced modulation of tumor growth.

**Maddox, Jane**, D.V.M., Michigan State University; Ph.D., The Pennsylvania State University; Assistant Professor. Inflammation and eicosanoids in arthritis and liver toxicity; effect of antioxidants.

**Mohankumar, Sheba**, BVSc (DVM equiv.), Tamilnada Agricultural University, India; Ph.D., Kansas State University; Postdoctoral Fellow, Kansas State University; Assistant Professor. Mechanisms by which the immune system communicates with and regulates the neuroendocrine system to affect various body functions; cellular and molecular changes that occur in the neuroendocrine system during aging and obesity.

**Xu, Hui**, M.D., Xinjiang Medical College/China; Ph.D., Kagawa Medial University/Japan; Assistant Professor. Neurohumoral control of vasculature, intracellular signaling and ion channels in hypertension.

**Yu, Seong-Woon**, Ph.D., Seoul National University, Korea; Postdoctoral Fellow, Johns Hopkins University School of Medicine; Assistant Professor (joint with Neurology and Ophthalmology). Neuronal cell death mechanisms in neurodegenerative diseases, such as Parkinson's Disease and Huntington's Disease.

**Yuan, Yukun**, Ph.D., Michigan State University; Postdoctoral Fellow, University of Michigan; Assistant Professor. Effects of environmental neurotoxicants on central synaptic function in the central nervous systems, particularly visual synaptic pathway.

## LIST OF RECENT THESES

Students are required to deposit a copy of their bound thesis with the Graduate Administrator of Pharmacology & Toxicology. All theses are shelved in B440 Life Sciences Building, and can be checked out. Following is a list of thesis titles published in the last 4 years:

### 2005

Lyle D. Burgoon (**Advisor** – T.R. Zacharewski/Biochemistry). Design, management, and quality control of toxicogenomics experiments

Alex A. Pérez-Rivera (**Advisor** – J.J. Galligan). Mechanisms behind the increased adrenergic reactivity of mesenteric veins compared to arteries in a murine model of hypertension

Gautham K. Rao (**Advisor** – N.E. Kaminski). Mechanism of cannabinoid-mediated elevation of intracellular calcium in T cells

Cheryl E. Rockwell (**Advisor** – N.E. Kaminski). Inhibition of interleukin-2 secretion by 2-arachidonyl glycerol and anandamide occurs through peroxisome proliferator activated receptor gamma independently of the cannabinoid receptors

Hong Wang (**Advisor** – G.D. Fink). Neurohumoral control of splanchnic circulation in DOCA-salt hypertensive rats

Diana Ye (**Advisor** – L.K. Olson, Physiology). Low potency poly(ADP-ribose) polymerase inhibitors (Ip-PARPi) induce insulin gene expression through the upregulation of MafA in INS-1 pancreatic  $\beta$ -cells

### 2006

Ammie Bachman (**Advisor** – J.I. Goodman). Progressive, non-random altered patterns of methylation in gene-specific and GC-rich regions of DNA underlie tumorigenesis

Steven Bezdecny (**Advisor** – P.E. Ganey). Signal transduction pathways involved in the upregulation of cyclooxygenase-2 by 2,2',4,4'-tetrachlorobiphenyl

Wei Ni (**Advisor** – S.W. Watts). The presence of a local serotonergic system in peripheral arteries

Keshari Thakali (**Advisor** – S.W. Watts). Endothelin A (ET<sub>A</sub>) and ET<sub>B</sub> receptor interaction in arteries and veins.

### 2007

John Buchweitz (**Advisor** – N.E. Kaminski). Characterization of delta-9-tetrahydrocannabinol-mediated alterations in leukocyte and airway epithelial cell responses to a primary challenge with influenza A/PR/8/34 in C57BL/6 wild type and CB1/CB2 receptor-null mice

### 2008 (to date)

Dina Schneider (**Advisor** – N.E. Kaminski). The role of PAX5, BLIMP-1 and AP1 in the suppression of B cell differentiation by TCDD

Andrew King (**Advisor** – G.D. Fink). Neurogenic mechanisms of salt-sensitive hypertension

Alexandra Hlavacova (**Advisor** – J.J. Galligan). Enhanced adrenergic sensitivity of mesenteric veins compared to arteries and its relation to calcium utilization and handling

Wei "Melissa" Li (**Advisor** – G.D. Fink). Blood pressure, venomotor tone, neurohumoral activity, and oxidative stress

Patrick Shaw (**Advisor** – R.A. Roth). Inflammation and idiosyncratic drug reactions: Inflammatory mechanisms and interactions in a murine model of trovafloxacin hepatotoxicity

## **2009 (to date)**

Colin North (**Advisor** – N.E. Kaminski). *In vivo* and *in vitro* mechanisms for disruption of the toll-like receptor activated primary immunoglobulin M response by 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

## GRADUATE COURSES

Following are the Graduate Courses offered within the Department of Pharmacology and Toxicology.

### Required Courses:

- PHM 819** - Principles of Drug Tissue Interactions. Summer semester every year. Variable 1 to 2 credits [PHM/TOX students required to take the full 2 credit course]. General principles relevant to the inter-action of chemicals with biological systems. Topics include pharmacokinetics and pharmacodynamics.
- PHM 820** - Cellular, Molecular and Integrated Systems Pharmacology and Toxicology. Fall semester every year. 4 credits, 4(4-0). Comprehensive overview of the cellular and molecular mechanisms of drug and chemical actions on the major organ systems of humans and other mammals.
- PHM 827** - Physiology and Pharmacology of Excitable Cells. Fall semester every year. 4 credits, 4(4-0). [Interdepartmental with the Departments of Physiology, Zoology, and the Neuroscience Program. Administered by Pharmacology and Toxicology) Function of neurons and muscles at the cellular level: membrane biophysics and potentials, synaptic transmission, sensory nervous system function.
- PHM 830** – Experimental Design and Data Analysis. Fall and Summer sessions. 3 credits, 3(3-0). Practical application of statistical principles to the design of experiments and analysis of experimental data in pharmacology, toxicology, and related biomedical sciences. This course is offered online.
- PHM 870** – Research Rotations. Fall and Spring, and/or Summer session. Variable from 1 to 4 credits. Limited amounts of work on selected research problems performed in a laboratory situation.
- PHM 910** – Seminar. Fall and Spring semesters. 1 credit. [A student may earn a maximum of 3 credits in all enrollments of this course.] A series of seminars by members of the Department and invited speakers on current research.
- PHM 980** – Problems. Fall and Spring semesters, Summer session. Variable credit from 1 to 5. [A student may earn a maximum of 20 credits in all enrollments of this course.] Limited amount of individual work on selected problems.
- PHM 999** - Doctoral Dissertation Research. Fall and Spring semesters, Summer session. Variable credit. [A student may earn a maximum of 50 credits in all enrollments of this course.]

### Pharmacology/Toxicology Elective Courses:

- PHM 810** - Synaptic Transmission. Spring semester, odd-numbered years. 3 credits, 3(3-0). Chemical and electrical aspects of nerve impulse transmission at synaptic neuroeffector junctions. Influence of drugs.
- PHM 813** - Cardiovascular Pharmacology. Spring semester, even-numbered years. 3 credits, 3(3-0). Cardiovascular signal transduction and control in normal and pathophysiological states.
- PHM 816** – Integrative Toxicology: Mechanisms, Pathology and Regulation. Fall semester, odd-numbered years. 3 credits, 3(3-0). Biochemical, molecular and physiological mechanisms of toxicology. Functional and pathological responses of major organ systems to chemical insult. Mechanisms of mutagenesis, carcinogenesis, and reproductive toxicology. Concepts in risk and safety assessment.
- PHM 839** - Systems Neuroscience. Spring semester every year. 4 credits, 4(4-0). [Interdepartmental with the Departments of Neuroscience, Human Anatomy and Physiology, Psychology, and Zoology. Administered by the Neuroscience Program.] Anatomy, pharmacology and physiology of multicellular neural systems. Sensory motor, autonomic, and chemo-regulatory systems in vertebrate brains.

### **Courses Required from Outside the Department:**

**Biochemistry (BMB) 801 - Molecular Biology.** Fall semester. 3 credits. Organization of genes. Regulation of gene expression, replication, and recombination.

**Biochemistry (BMB) 802 - Metabolic Regulation and Signal Transduction.** Spring semester. 3 credits. Molecular basis for metabolic regulation. Molecular signaling mechanisms and mechanisms for allosteric and covalent protein modifications.

**Physiology (PSL) 828 -- Cellular and Integrative Physiology.** Spring semester. 4 credits. Cellular physiology as basis for understanding integrative functions of various body systems, including nervous, cardiovascular, respiratory, urinary, gastrointestinal, endocrine, reproductive, and immune.

### **Undergraduate Courses:**

**PHM 340 – Principles of Drug Action.** Summer every year. 1 credit, 1(1-0). Factors influencing drug action. Absorption, distribution, and elimination of drugs. Factors controlling intensity, selectivity of drug action, and nature of drug action. Mismatches of drug presence and drug action including receptor effector coupling mechanisms and mechanisms of tolerance to drug action. Offered first half of semester.

**PHM 350 – Introductory Human Pharmacology.** Spring every year. 3 credits [3(3-0)] (Not open to Freshmen). General principles of pharmacology. Central and autonomic nervous systems. Cardiovascular and renal drugs. Chemotherapy. Anti-infective drugs and endocrine agents.

**PHM 431 – Pharmacology of Drug Addiction.** Fall of every year. 3 credits [3(3-0)]. Introduction to pharmacology and neuropharmacology. Understanding of the biological basis for drug abuse and addiction.

**PHM 450 – Introduction to Chemical Toxicology.** Spring every year. 3 credits [3(3-0)]. Mammalian toxicology. Disposition of chemicals in the body, detoxication, elimination, and mechanisms of toxicity in major organ systems. Selected toxic agents. [Not open to freshman or sophomores]

**PHM 480 – Special Problems.** Fall and Spring semesters; Summer session. 1-3 credits. Individual work on selected research problems. A student may earn a maximum of 9 credits in all enrollments for this course. Approval of Department.

### **Medical Courses:**

**PHM 552 – Veterinary Pharmacology I: Principles and Neuropharmacology.** Spring every year. 2 credits, 2(2-0) (Open to Veterinary Medical Students only). Basic principles of pharmacology and mechanisms of action of drugs used to affect nervous system function.

**PHM 553 – Veterinary Pharmacology II: Systems and Infectious Diseases.** Fall every year. 3 credits, 3(3-0) (Open to Veterinary Medical Students only). Principles of pharmacology of infectious disease and specific organ systems, including mechanisms of action and adverse effects of drugs.

**PHM 557 – Veterinary Toxicology.** Fall every year. 2 credits, 2(2-0) (Open to Veterinary Medical Students only). Determinants of toxic responses, analytical toxicology, genetic toxicology, and toxin management. Diagnosis, prevention, and treatment of common toxicoses.

**PHM 563 – Medical Pharmacology.** Spring of every year. 3 credits [3(3-0)] (Human and Osteopathic Medical Students only). General principles of pharmacology and selected drugs. Rational drug therapy.

**PHM 590 – Case Studies in Clinical Pharmacology.** Spring of every year. 2 credits 2(2-0) (Human and Osteopathic Medical Students only). Selected case studies emphasizing clinical applications of pharmacological principles. Evaluation of new drugs, drug advertising, and adverse drug reactions

**PHM 658 – Research Problems in Pharmacology or Toxicology.** Fall and Spring semesters; Summer session. Variable from 1 to 3 credits. (Completion of Semester 4 Veterinary Medical Students only). Selected research problems.

## INTERDISCIPLINARY PROGRAMS ASSOCIATED WITH PHARMACOLOGY AND TOXICOLOGY

Our Department is fortunate to be involved in a number of programs that are thematic in their scientific nature and programming. Below are listed those programs in which our faculty are currently involved and the faculty which our students can consider as research mentors. Their involvement extends to that of the incoming graduate students, and thus the student should look at the non-degree programs as a way to enhance their training. Please note that enrollment/participation in one of these programs is **NOT** required to be a graduate student in this department; it is a student's choice. Involvement in some of these programs requires acceptance in a free-standing graduate program such as Pharmacology and Toxicology, while others are degree granting on their own (CMB, Neuroscience).

### 1. **Cell and Molecular Biology (CMB)**

**Director:** Susan Conrad (Microbiology and Molecular Genetics, [conrad@msu.edu](mailto:conrad@msu.edu))

**Web site:** <http://cmb.msu.edu/index.php>

The CMB Program at MSU is an interdepartmental Ph.D. program with participating faculty from many different departments and administrative units. The research programs address a wide variety of biological questions with an equally diverse array of organisms. However, they are all related in that they depend upon the ideas and approaches unite the research programs of the participating faculty whether they are interested in herbicide resistance in crop plants, DNA replication in bacteria, or tumor development in humans.

The CMB training program is designed to be flexible so that the student may focus on a particular area of research experiences in cellular and molecular biology as he/she desires. The primary requirement for the Ph.D. is the completion of original research and the publication of a Ph.D. thesis describing that research. The CMB program emphasizes the importance of high quality research, and is designed to assist students in fulfilling their potential as research scientists. During the first academic year at MSU, most students complete three rotations (ten weeks each) in the laboratories of three different faculty members. This provides the student with in-depth exposure to several different research programs, and assists him/her in choosing a major professor with whom they will do their Ph.D. research. From that point on, students are advised by both their major professor and their Graduate Advisory Committee which is made up of four or five other CMB faculty. Generally, about four years beyond the rotation period are required to complete the Ph.D. program in CMB.

### 2. **Center for Integrative Toxicology (CIT)**

**Director:** Dr. Norbert Kaminski (Pharmacology and Toxicology, [kamins11@msu.edu](mailto:kamins11@msu.edu))

**Asst Director:** Dr. Robert Roth (Pharmacology and Toxicology, [rothr@msu.edu](mailto:rothr@msu.edu))

**Web Site:** <http://cit.msu.edu/>

CIT enjoys the support and participation of outstanding faculty members who represent thirty departments, institutes, and centers within seven colleges. Their knowledge makes possible innovative solutions to environmental problems that cross college and disciplinary boundaries.

The goal of the Environmental and Integrative Toxicological Sciences Training Program (EITS) is to train future scientists with specific research expertise in biomedical science developed in one of the department-based Ph.D. programs and with an additional working knowledge in the broad, interdisciplinary area of environmental toxicology. This approach overlays a high quality, department-based (i.e., disciplinary) Ph.D. program in the basic sciences with a broad-based, interactive education in the toxicology of chemicals found in the environment. Implicit in this approach is the recognition that environmental toxicology is a multidisciplinary effort requiring well trained scientists from a variety of disciplines to contribute to the solution of complex problems associated with environmental contamination and toxic responses. The EITS program brings together faculty and students in diverse disciplines such as biochemistry/molecular biology, zoology, pharmacology and food science and human nutrition, all of whom are interested in environmental toxicology. The active participation in toxicology-related workshops and seminars and the interactions of the students in EITS-required courses provide a setting conducive to learning the broad base of information necessary for excellence in the discipline of toxicology. Interests of individual trainees are also met through research in laboratories of department-based faculty members who have affiliations with the CIT. Successful completion of this program allows students to be knowledgeable

and competitive in their chosen, basic science discipline and in a position to make significant scientific contributions to the field of environmental toxicology.

### 3. **Comparative Medicine and Integrative Biology (CMIB)**

**Director:** Dr. Vilma Yuzbasiyan-Gurkan (Microbiology and Molecular Genetics)  
[yuzbasiyan@cvm.msu.edu](mailto:yuzbasiyan@cvm.msu.edu)

**Web Site:** <http://cvm.msu.edu/Education/cmib/>

The graduate program in CMIB offers graduate students the understanding of how molecular and cellular events integrate into whole-animal systems, knowledge of how appropriate animal models can be used to study human and animal disease, and the understanding of how species differences and similarities can be used to investigate basic biology and disease.

Graduates of the masters and/or the doctoral program in CMIB will find employment opportunities in academia, governmental research and regulatory agencies, and in pharmaceutical industry research. They will become leaders in discovery and problem-solving research in medical science and will play an instrumental role in the translation of new knowledge to address current issues in human and animal health and clinical, cellular, and molecular problems in CMIB. It emphasizes development of a firm scientific background in clinical and basic biomedical sciences and the conduct of original research.

### 4. **Environmental Sciences and Policy Program**

**Director:** Dr. Tom Dietz (ESPP Program; [tdietz@msu.edu](mailto:tdietz@msu.edu), [espp@msu.edu](mailto:espp@msu.edu))

**Web Site:** <http://www.environment.msu.edu/specialization/index.html>

Doctoral students pursue a Ph.D. in one of MSU's many existing doctoral programs that have an environmental focus. In addition, they complete the coursework for the ESP Program. The Specialization provides students with an understanding of diverse disciplines brought to bear on contemporary environmental problems. Each course is designed to provide an understanding of how various disciplines conceptualize environmental issues and how scientific information can be brought to bear on environmental decision-making and environmental policy.

### 5. **Neuroscience Program (NSC)**

**Director:** Dr. Cheryl Sisk (Psychology; [sisk@msu.edu](mailto:sisk@msu.edu))

**Web Site:** <http://neuroscience.msu.edu/>

The Neuroscience Program is an interdepartmental graduate program that awards a Ph.D. degree in neuroscience. This is a broad-based, integrated curriculum that is complemented by research training in specialized areas of neuroscience. Faculty research interests span the molecular to behavioral levels of analysis. The combination of classroom, research and professional skills training equips students with an excellent understanding and appreciation of the richness and diversity of approaches to study of the nervous system, and prepares them for successful careers in either the public or private sector.

### 6. **Quantitative Biology and Modeling Initiative (QBMI)**

**Contact:** Claire Vieille (Biochemistry and Molecular Biology; [vieille@msu.edu](mailto:vieille@msu.edu))

**Web Site:** [http://biomodel.msu.edu/grad\\_research.php](http://biomodel.msu.edu/grad_research.php)

The new dual-major Ph.D. program trains Ph.D. students in the quantitative, computational, and biological aspects of structural biology or systems biology. The QB program features an inter-disciplinary research project with two faculty mentors, one each from biological and non-biological disciplines, coursework apportioned between three QB courses and the primary department's courses, and teaching responsibilities and comprehensive exams centered in the primary department. While very similar in organization and requirements to the other dual-major Ph.D. programs described below, the QB program includes specially designed courses that offer more flexibility for the students who can belong to one of many primary departments (e.g., Biochemistry and Molecular Biology, Chemical Engineering and Materials Science, Chemistry, Civil and Environmental Engineering, Computer Science and Engineering, Mathematics, Microbiology and Molecular Genetics, Pharmacology and Toxicology, Physics and Astronomy, Physiology, Plant Biology, or Statistics and Probability) in addition to the QB program. A large emphasis is placed on interdisciplinary training through interdisciplinary teamwork, crossing-training from student to student, laboratory rotations, and the QB interdisciplinary student community and activities. Receiving a

dual-major degree in a traditional discipline plus QB indicates proficiency in that discipline (as fundamental training to ensure future job prospects) as well as expertise in the rapidly growing area of quantitative biology.

7. **Interdisciplinary Graduate Studies in Biomolecular Sciences (BIOS)**

**Contact:** Dr. Richard Schwartz (College of Natural Science; [schwartz9@msu.edu](mailto:schwartz9@msu.edu))

**Web Site:** <http://biomolecular.msu.edu/>

Students have access to training in over 150 research laboratories connected with many different departments. This interdisciplinary approach provides students the flexibility to develop their education to fit their career goals. Program fields include Biochemistry, Bioinformatics, Cancer, Cell biology, Genomics, Genetics, Immunology, Microbiology, Molecular biology, Pharmacology and toxicology, Physiology, Plant molecular biology, Structural biology, Systems biology, Virology.

8. **Students from Other Programs Which are Currently Training with Pharmacology and Toxicology Faculty:**

Biochemistry and Molecular Biology

Chemistry

Microbiology and Molecular Genetics

Physiology



**MICHIGAN STATE UNIVERSITY  
DEPARTMENT OF PHARMACOLOGY/TOXICOLOGY  
B405 Life Sciences Building, East Lansing, MI 48824**

**Diane** Office phone (517) 353-9619      Office Fax (517) 353-8915

New       Reappointment       Change       Termination

STUDENT INFORMATION			
Employee Name:	<u>Last:</u>	<u>First:</u>	
Appointment Type:	<input type="checkbox"/> Graduate Assistant <input type="checkbox"/> Graduate Fellowship <input type="checkbox"/> Student Labor		
Supervisor:		Student's Department:	Date:

EFFECTIVE DATE(S)			
<input type="checkbox"/> Summer 2009 (student labor)	<input type="checkbox"/> Fall 2008	<input type="checkbox"/> Spring 2009	<input type="checkbox"/> Other (from-to):

ACCOUNT NUMBER CHANGE(S)							
FROM				TO			
Account No.		Pct		Account No.		Pct	
Account No.		Pct		Account No.		Pct	
Account No.		Pct		Account No.		Pct	

SALARY ADJUSTMENT			
FROM		TO	
Current Salary:		New Salary:	

REASON FOR ACCOUNT/PERCENT/DATE/SALARY CHANGE(S)	
Reason for change(s):	

TERMINATION DATE AND REASON	
Date:	Reason for Termination:

LOCAL HOME ADDRESS CHANGE			
Current Address:		New Address:	
City/State:		City/State:	
Zip Code:	Ph:	Zip Code:	Ph:

SIGNATURES	
Supervisor's Signature:	Date:

**Please complete, print, sign and turn into Diane.**