



The Huck Institutes OF THE LIFE SCIENCES

Molecular Toxicology Graduate Program

Degree Requirements Booklet

Fall 2011

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Molecular Toxicology (MT)

Course Requirements

Students in the IGDP in MT must take a minimum of four 3-credit graduate level or approved undergraduate courses in addition to the Ethics in the Life Sciences (1 credit) and the Huck Institutes' Colloquium (4 credits). These courses may range from organic chemistry to molecular biology, and cell biology. The selection of courses is left to the student, advisors, and thesis committee. The courses should build on background, fill in essential gaps in knowledge and prepare the student for thesis research. The Co-chair and/or temporary advisor will provide guidance in course selection until a advisor(s) is chosen. Sample curricula are shown below.

Responsible Conduct of Research Training Requirement: *NEW for Fall 2009!*

Starting in Fall 2009, all new students in the Molecular Toxicology graduate program must complete an online Responsible Conduct of Research (RCR) training course during their first year. The online course is offered through the CITI (Collaborative Institutional Training Initiative) Program and supplements the in-class, discussion-based RCR training provided in IBIOS 591, Ethics in the Life Sciences, a required 1-credit course typically taken during the second year. Together, these two courses satisfy RCR training requirements mandated by Penn State's SARI (Scholarship and Research Integrity) Program, an RCR initiative organized through the Office for Research Protections (administrative unit within the Office of the Vice President for Research).

First year students should register for the online CITI RCR course as soon as possible in the Fall semester. To register, go to the Penn State SARI website, Online Training Program page (<http://www.research.psu.edu/training/sari/program>) where you will find instructions and a link for the CITI Program website (<http://www.citiprogram.org/>). Select Pennsylvania State University as the participating institution and register for the CITI **Biomedical Sciences** course. Students must work on their own to complete the course modules and pass the on-line quizzes. All modules must be completed by the end of the first Fall semester; and a copy of the student's Completion Report must be submitted to the Program administrative office before January 15th.

First Year Advisor

The IGDP in MT Co-chair will serve as the first year advisor for each student upon entrance into the program. This advisor will serve as the primary program contact for the student if problems or questions arise until the student chooses a thesis advisor.

Rotations and Reports/Selection of Dual Advisors

Students will choose three laboratories for rotations during their initial Fall semester, in consultation with the co-chair of the IGDP in MT. The purpose of these rotations is to acquaint the student with several laboratories, their approach to scientific practices, and work habits. The rotations should help students determine which laboratories they would prefer to work in and advisors (or dual advisors) of interest. Rotations will also introduce students to a variety of technologies and experimental approaches to science.

The duration of the rotations is typically 5 weeks, but flexibility depending on the student's formal course requirements will be considered. At the conclusion of each rotation, the laboratory director may ask that the student write a short report (typed, double-spaced) on the purpose of the work done, methods used, results obtained, conclusions drawn, and suggestions for further work in the area.

Selection of Dual Advisors

On the basis of student and faculty preference, students are encouraged to choose dual advisors whose complementary areas of expertise will offer novel, interdisciplinary opportunities for thesis research. Alternatively, student can first choose a primary advisor, and subsequently develop a thesis committee which includes a second advisor and others with complimentary scientific interests.

Teaching Assistance (optional, discuss this with your mentor before pursuing this option)

Students receive either a lecture, lab, or recitation class to help teach. Students also participate in the Huck Institutes teaching assistant training sessions and receive A-F grades on their transcripts from their faculty course supervisors. Please note that these grades are not computed in with the overall GPA. International graduate students must pass an English proficiency exam before any teaching duties are assigned.

Candidacy Exam

The Candidacy Exam is uniquely designed for each student. The exam should be taken by the end or during the student's third semester (e.g. the Fall semester of the second year) in the IGDP in MT program. The student and his/her advisor are responsible for establishing an appropriate committee, typically consisting of 5 faculty members including the student's advisor who will also serve as the chair of the committee. The student is responsible for obtaining the required paperwork with the Huck staff PRIOR to taking the exam. The student will be assigned a scientific paper from the Molecular Toxicology literature to read and analyze; the paper will be selected based upon the student's background and coursework. The assigned paper will be selected by the student's advisor(s) but must be approved by a program co-chair before assignment. The analysis should involve exploring the relevant literature as well as the fundamental issues in toxicology, biochemistry and biology. The student will be given 10 days to write a 3 page single-space review. At the same time as the paper is assigned a meeting of the committee should be arranged for a 90 min oral exam by the committee to review the written assignment and discuss other issues. The committee meeting shall be within 21 days of the original assignment of the paper. The student is required to make a formal oral presentation, preferably using Powerpoint, with no more than 20-25 slides. The student should be able to integrate knowledge about chemical and biological aspects of the paper and understand and evaluate the experimental design, rationale, results, and the authors' interpretation of their work. In the event that the student does not pass this exam, the student's committee will make a recommendation as to whether to offer another opportunity or to terminate the student's tenure in the program.

Outline for the written critique:

Introduction:

Why was the study performed; what was the underlying hypothesis; background work from this or other laboratories that lead to the current hypothesis.

Results:

Critically discuss the result; was the series of experiments performed a sound approach; were the studies properly performed with all necessary controls; what was actually demonstrated by the results.

Discussion:

What the initial hypothesis addressed; what do the studies mean in context to the overall field of study; what questions of directions could be addressed in future studies.

Doctoral Committee

Upon successful completion of the Candidacy Examination, the student in consultation with the advisor will, as soon as possible, select a doctoral committee. The committee will consist of the advisor, two members of the IGDP in MT and up to two faculty members who are not a member of the IGDP in MT. If the student has selected the option of having dual advisors, then both of the advisors will be on the doctoral committee, along with two members of the IGDP in MT and one faculty member who is not a member of the IGDP in MT. If the faculty members from the IGDP in MT on the committee are also members of the same department, the one faculty member who is not a member of the IGDP in MT must be from a different department. This committee is responsible for supervising the academic program and monitoring the progress of the student towards his/her

degree. Doctoral Thesis Committee Composition is based on the information in the Graduate Degree Programs Bulletin prepared by the Graduate School regarding Doctoral Committees:
<http://bulletins.psu.edu/bulletins/whitebook>

First-Year Meeting with Doctoral Committee

The student is required to meet with his/her Doctoral committee by the end of the first year in residence if the Candidacy Examination has been passed and a Doctoral Committee has been chosen. The student should be prepared to discuss his/her accomplishments as well as plans for the next year. Topics to be discussed include courses, seminars, the comprehensive examination and the thesis research.

Seminar Requirements

Students enrolled in the IGDP in MT are required to present one seminar presented as a public defense of their thesis, however, student may be asked to present once in the Pathobiology seminar series. At Hershey, students are encouraged to present in the Pharmacology Seminar Series or in the Graduate Student Seminar Series.

However, students will also make presentations in their coursework. For example VSC 597A, 'Regulation of Gene Expression,' requires that students make formal presentations.

IGDP in MT students are further expected to attend seminars in their areas of specialization in addition to continuing their participation with the Colloquium throughout their graduate career.

Internship (optional, this must be discussed with and approved by the student's advisor)

The internship experience is optional. Typically after the first or second year in residence, students may spend a summer in an internship at a medical center, government laboratory or in an industrial environment. The time frame for the internship is negotiable with the Research and Training Committee. Non-traditional settings are available.

Comprehensive Examination

The purpose of the Comprehensive Examination is to assess the student's ability to design and interpret experiments, and the breadth and depth of knowledge related to Toxicology. This exam should normally be taken by the end of the second summer, but must be taken prior to completion of the fifth semester (e.g. the Fall semester of the third year). For the examination, the student will prepare an NIH-style postdoctoral research proposal on a topic related to the thesis research. This proposal will be the basis of an oral exam administered by the student's thesis committee. The student should be prepared to discuss the background, significance, experimental design, feasibility, and potential impact of the proposed work. The student and his/her advisor are responsible for establishing an appropriate supervisory committee, typically consisting of 5 faculty members including the student's advisor who will also serve as the chair of the committee. The supervisory committee will typically be comprised of the same members as for the candidacy committee but this is not a requirement, as the student's research directions may require a change in committee composition. At least one outside member of the committee is required. The student is responsible for obtaining the required paperwork with the Huck staff and the Graduate School PRIOR to taking the exam.

Post-Comprehensive Progress Assessment

Subsequent to the Comprehensive Examination, IGDP in MT students are encouraged to arrange annual meeting of the student's committee to assess progress on the student's thesis project. The advisor is responsible for communicating with the Co-Director Chair any potential problems that arise during the post-comprehensive period.

Thesis Requirement

Submission of a written thesis, a public presentation of the thesis, and its defense before the thesis committee are the final program requirements. Students must follow the thesis guidelines specified by the Graduate School.

Molecular Toxicology (MT) Curriculum **M.S. or Ph.D. degrees**

1. Foundation of basic knowledge in molecular biology, cell biology, biochemistry, and molecular toxicology. The IGDP in MT requires at least 9 credits in one or more of these disciplines, taken either as an undergraduate or as a part of the graduate curriculum. The following courses are requirements for respective campuses.

University Park students

BMB 400 MOLECULAR BIOLOGY OF THE GENE (3 credits)
VSC 430 PRINCIPLES OF TOXICOLOGY (3 credits)
VSC/IBIOS 530 REGULATION OF GENE EXPRESSION (3 credits)
VSC 433 MOLECULAR AND CELLULAR TOXICOLOGY (3 credits)

Hershey Campus Students

PHARM 520 Receptors and Principles of Drug Actions (2 credits)
BMS 501 Regulation of Cellular and Systemic Energy Metabolism (3 credits)
BMS 502 Cell and Systems Biology (3 credits)
BMS 503 Flow of Cellular Information (3 credits)
PHARM 551: Anti-infective Therapeutics (1 credit.)
PHARM 552: Integrated Systems Pharmacology (1 credit.)
PHARM 553: Gastrointestinal and Immunomodulatory Therapeutics (1 credit.)
PHARM 554: Anticancer Therapeutics (1 credit.)
IBIOS 591: Ethics in Life Sciences (1 credit.)
PHARM 597: Journal Club (1 credit.)

In addition to these required courses, electives must also be taken to fulfill the required number of academic credits for either an M.S. or Ph.D. degree. Elective courses in statistics and physiology are especially encouraged.

2. IBIOS 592 CURRENT RESEARCH SEMINAR (2 credits, 1 per semester during any of the first four semesters in residence), This course uses a weekly biological seminar as a springboard for discussion of a research topic of high current interest. **Note** : Class size, frequency of offering, and evaluation methods will vary by location and instructor. For these details check the specific course syllabus..

3. IBIOS 590 COLLOQUIUM (2 credits) All students are required to enroll for 4 credits of Colloquium. Students typically take this course in the Fall and Spring semesters of their first year. In Colloquium, students are introduced to a wide variety of topics of contemporary and future importance in the life sciences. A particular focus is placed on topics where science is likely to impact on society (and society on science). Topics are drawn from the area introduced by the speaker and can span the entire spectrum from basic research to the social, legal, moral and ethical implications of the science. A significant challenge in Colloquium is to organize and coordinate a presentation using contemporary presentation software, such as PowerPoint, in an environment in which part of the audience is present at a remote site. Students are required to attend the lectures and the dinners following the lectures. Students also participate in the group presentations during discussion sessions and submit written reports. Reports may be submitted to the co-chairs of the IGDP who may add them to the student's permanent record. Students receive A-F quality grades.

4. IBIOS 591. ETHICS IN THE LIFE SCIENCES (1 credit) Usually taken the Fall semester of their second year, students examine integrity and misconduct in life sciences research, including issues of data collection, publication, authorship, and peer review. Students receive A-F quality grades.

5. IBIOS 595. INTERNSHIP (1 credit, optional) For students interested in exploring academic, government, medical, law, or business corporate approaches to research. This is an external work assignment relevant to individual research or career goals. Students receive an R (satisfactory/passing) or U (unsatisfactory/failing). Only R credits are counted for credit totals. Students typically participate in an internship the summer of their first or second year. Contacts, positions, applications, course registration, course requirements, and grading are processed through the Eberly College of Science Cooperative Education Program (814-865-5000). Additional credits of IBIOS 595 are at the expense of the student. Interested graduate students are to discuss the opportunity with the IGDP in MT chair and/or their faculty advisor.

6. IBIOS 596. INDEPENDENT STUDIES: LABORATORY ROTATIONS (1-3 credits per semester) For students exploring potential Ph.D. projects and faculty advisors. Students receive an R (satisfactory/passing) or F (unsatisfactory/failing). Only R credits are counted for credit totals.

7. IBIOS 597 (optional, variable credits) SPECIAL TOPICS

8. IBIOS 600. THESIS RESEARCH (1-9 per semester) For students who have been matched with a faculty advisor AND have not taken/passed their comprehensive exams. Students may receive A-F grades or R/F grades at any time. By the time a student passes his/her comprehensive exam, up to 12 credits worth of IBIOS 600 may have the A-F quality grade.

9. IBIOS 601. THESIS PREPARATION (0 per semester) For those students who passed their comprehensive exams. This course appears on the transcript but does not have any grade or credit associated with it.

10. VSC 602/IBIOS 602. SUPERVISED EXPERIENCE IN COLLEGE TEACHING (1 credit, optional) All students are strongly encouraged to enroll for 1 credit (or the equivalent) of Supervised Experience in College Teaching before the beginning of their third year. Students typically take this course during the Fall semester of their second year. To encourage teaching experience in toxicological sciences, students will be encouraged to enroll in VSC 602 for supervised experience in college teaching for a toxicology-related course (VSC 433, VSC 430, ERM 431). As an alternative, after consulting with their respective advisor, students may elect to enroll in IBIOS 602. Teaching at Hershey is arranged by the Co-Chairs of the IGDP and Co-Director of Graduate Education for the IBIOS program. Students receive A-F grades on their transcripts but these grades are not computed in with the overall GPA. International fellows must pass an English proficiency exam before any teaching duties are assigned.

11. The Graduate School requires all graduate students to maintain a 3.0 grade-point average.

M.S. Degree Requirements

Masters students must have a minimum of 30 credits and a 3.0 overall GPA. If pursuing a masters thesis option, up to 6 IBIOS 600 credits may be A-F graded. 18 credits must be at the 500-600 level, and a minimum of 12 credits need to be in the major at the 400-600 level (excluding IBIOS 600). The student selects a thesis committee (upon consultation with faculty advisor), conducts a research project, then writes either a thesis or substitutes a first authored peer-reviewed published manuscript for the thesis requirement. The research proposal for the MS in Toxicology degree will follow the outlines and requirement described below for the Schreyer IUG program. . The thesis or manuscript is given to the faculty advisor, IGDP Chair and student's committee for evaluation. It is expected that the Masters' student will conduct a formal oral seminar presentation of their thesis research at the end of their program. IBIOS 595 (Internship) and 596 (Rotations) credits count toward the 30 credits. However, the 602 (Teaching) optional credits do not count toward the 30 credits. All IGDP in Molecular Toxicology graduate students must successfully take the following list of required courses and/or electives during the first two years of their graduate education. If all course credits and requirements are met, students do not have to be registered for classes while writing and/or defending his/her work.

Year 1-Fall Semester

<i>University Park</i>			<i>Hershey</i>	
Course	Credits		Course	Credits
BMB 400 Mol. Biol. of the Gene	3		BMS 501 Regulation of Cellular and Systemic Energy Metabolism	3
BIOS 570 Mol. Tox. Seminar	2		BMS 502 Cell and Systems Biology	3
IBIOS 590 Colloquium	2		BMS 503 Flow of Cellular Information	3
IBIOS 596 Ind. Studies, Lab rot.	1-2		IBIOS 596 Ind. Studies, Lab Rotation	1
VSC 430 Princ. of Toxicology	3		BMS 504 Art of Scientific Communication	1
Graduate elective	2-4		Register for CITI on-line RCR course	
Register for CITI on-line RCR course			Submit CITI RCR Course Completion Report to Program Office	
Submit CITI RCR Course Completion Report to Program Office				

Year 1-Spring Semester

<i>University Park</i>			<i>Hershey</i>	
Course	Credits		Course	Credits
VSC/IBIOS 530 Reg. of Gene Ex	3		PHARM 520 Principle of Drug action	2
IBIOS 570 Mol. Tox. Seminar	2		PHARM 597 Pharmacology Journal Club	1
IBIOS 590 Colloquium	2		IBIOS 596 Ind. Studies, Lab rotation	1
IBIOS 600 Thesis research	1-2		Graduate elective	3-5
VSC 433 Mol. and Cell. Toxic.	3		BMS 504 Art of Scientific Communication	1
Graduate elective	3-6		IBIOS 591 Ethics in Life Sci.	1

Year 2-Fall Semester

University Park

Course	Credits
IBIOS 570 Mol. Tox. Seminar	2
IBIOS 591 Ethics in Life Sci.	1
IBIOS 600 Thesis research	3-6
IBIOS/VSC602* Supervised teaching	1
Graduate electives	3-6

Hershey

Course	Credits
PHARM 597 Pharmacology Journal Club	1
PHARM 551 Anti-infective Therapeutics.	1
PHARM 552 Integrated Systems Pharmacology	1
PHARM 553 Gastrointestinal and Immunomodulatory Therapeutics	1
IBIOS 600 Thesis research	3-6
IBIOS 602* Supervised teaching	1
Graduate electives	3-6

Year 2-Spring Semester

University Park

Course	Credits
IBIOS 570 Mol. Tox. Seminar	2
IBIOS 600 Thesis research	3-6
Graduate electives	3-6

*optional

Hershey

Course	Credits
PHARM 590 Pharm. Colloquium	1
IBIOS 600 Thesis research	3-6
Graduate electives	3-6

Molecular Toxicology Graduate Program Policy on Schreyer IUG Master’s Degree Requirements

The Molecular Toxicology graduate Program has adopted the following guidelines regarding Schreyer Honors MT/ IUG Program requirements:

- Adherence to the Schreyer Honors College IUG application guidelines;
- No GRE requirement, but the MT/ MS graduate application will include copies of the undergraduate transcript as well as sponsorship letters and plan of study as detailed by the Schreyer Honors College IUG program;
- The following are specific requirements for completing the IUG Masters degree in Molecular Toxicology:
 - o Completion of the Molecular Toxicology graduate coursework/curriculum, as currently detailed above and online (<http://www.huck.psu.edu/education>);
 - o Approval by an MT faculty subcommittee and the MT graduate program director of the proposed MS research project – presented to the director in written form (see below); with the expectation that the research project will have a toxicology focus and constitute a substantive scientific effort;

- o A written MS thesis, in the form of a first-authored research journal article, accompanied by an introductory section to include a short background/ literature review and statement of hypothesis and specific aims of the project;
- o Requirement for a final oral presentation/ defense of the research project.

The thesis research proposal should generally follow NIH NRSA guidelines for graduate fellowships (<http://grants.nih.gov/grants/funding/416/phs416.htm#forms>), customized for Molecular Toxicology graduate applications as follows:

10-page max limit, single spaced (page limit does not include literature citations)

1. Hypothesis and Specific Aims

List the broad, long-term objectives and the goal of the specific research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm, address a critical barrier to progress in the molecular biosciences, or develop new technology.

2. Background and Significance

Briefly sketch the background leading to the present application, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill. State concisely the importance and relevance of the research described in this proposal to the molecular biosciences by relating the specific aims to broad, long-term objectives.

3. Preliminary Studies

Use this section to provide an account of preliminary studies, if any, that are pertinent to the research proposal.

4. Research Design and Methods

Describe the research design conceptual framework, procedures, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage over existing methodologies. Describe any novel concepts, approaches, tools, or technologies for the proposed studies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. As part of this section, provide a tentative sequence or timetable for the project. Point out any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised.

5. Literature Citations

Ph.D. Degree Requirements

Ph.D. students must have a minimum of 30 credits and a 3.0 overall GPA. If pursuing a Master's thesis option, up to 6 IBIOS 600 credits may be A-F graded and 12 credits need to be in the major at the 400-600 level (excluding IBIOS 600). The course requirements are essentially the same as that required for the M.S. degree listed above, with some discretion left to the student and advisor.

Grade Point Average/Unsatisfactory Scholarship: Students are required to maintain an overall 3.0 GPA throughout the program, and, in particular, must have a 3.0 to take the doctoral candidacy, the comprehensive examination, and the final oral examination. One or more failing grades or a cumulative grade-point average below 3.0 may be considered evidence of unsatisfactory scholarship and may be grounds for dismissal from the IGDP in MT.

General Information

English Requirement for International Students

The English Requirement for International students is that prescribed by the Graduate School. Depending on the graduate program, all entering international students, whether or not they hold a Teaching Assistantship, will be required to take the American English Oral Communicative Proficiency Test (AEOCPT) which is administered by the University's Department of Applied Linguistics.

Given at the beginning of fall and spring semesters, international students are required to pre-register for the AEOCPT. The test scores from the AEOCPT are posted on the University's Administrative Information System (AIS) computer. Below is the course of action for the various AEOCPT score ranges.

NR = No Restrictions. This person should be allowed to teach with no restrictions based on ability to communicate in English.

(Penn State AEOCPT Score of 250-300)

WR = Take ESL 118G. This person should not be allowed to teach before completing and receiving a grade of "A" in ESL 118G - "American Oral English for ITA's III."

(Penn State AEOCPT Score of 230-249)

TC = Take ESL 117G. This person should not be allowed to teach before completing and receiving a grade of "A" in both ESL 117G - "American Oral English for ITA's II" and ESL 118G - "American Oral English for ITA's III."

(Penn State AEOCPT Score of 200-229)

SL = Speaking/Listening. This person should enroll in ESL 115G - "American Oral English for ITA's I" and receive a grade of "A" before taking ESL 117G and ESL 118G.

(Penn State AEOCPT Score below 200)

Students, who are required to enroll in ESL courses, must complete the ESL requirement by the end of the second semester of residency. Students who fail to satisfy this requirement may be terminated from the respective graduate program, at the discretion of the graduate program chair.

Safety Training Sessions / Examinations

Within the first semester of residence, all students are required to take/pass the radioisotope safety and chemical waste disposal training sessions offered at the respective campus.

Grade Point Average

Credit hours are earned only for the grades A, B, and C. However, all A and F grades are included in the computation of the grade point average. Grade points are assigned as follows:

- A = 4 (above average graduate work)
- B = 3 (average graduate work)
- C = 2 (below average graduate work)
- D = 1 (failing graduate work)
- F = 0 (failing graduate work)

Grades D and F are not acceptable for graduate credit. If a course is repeated, then both grades are used in computing the cumulative grade point average.

Unsatisfactory Scholarship

Students are required to have a minimum grade-point average of 3.0 for the doctoral candidacy examination, admission to the comprehensive examination, thesis defense, and graduation. One or more failing grades, a cumulative grade-point average below 3.0, or failing any of the examinations may be considered evidence of unsatisfactory scholarship and be grounds for dismissal from the University (see the Appendix III of the Graduate Programs Bulletin <http://bulletins.psu.edu/bulletins/whitebook/appendices.cfm?section=appendix3>).

Assistantships and Student Status

Students with teaching or research graduate assistantships must be registered as full time students to maintain stipend eligibility. Full time status is considered either a minimum of nine credits each fall and spring semester (pre-comprehensive exam) or XXX 601 (0 credits, post-comprehensive exam). The assistantship appointments typically originate with the department of the faculty advisor. If no faculty advisor has been identified, as likely the situation with first year doctoral students, students should consult with their respective graduate program Chair.

Thesis Submission and Exit Interview

Upon completion of the degree, students are to provide the Graduate Program with a paper copy of their thesis. Students also participate in both the University and Huck Institutes' Exit Interview Process. For the latter, students may meet with the Graduate Program Chair or appropriate representative.

Activate Intent to Graduate

Students must present their thesis and Guideline in accordance with the Penn State University guidelines as described in the THESIS GUIDE "Requirements and Guidelines for the Preparation of Master's and Doctoral Dissertations". Current copies can be obtained from the Thesis Office:

115 Kern Building
University Park, PA 16802
Phone: 814/865-5448

Web site: <http://www.gradsch.psu.edu/current/thesis.html>

At the beginning of the semester that students wish to graduate, they are to either:

- (1) access eLion via www.eLion.psu.edu, if in the PSU computer system
- or

(2) call Graduate Enrollment at 1-814-865-1795, if not in the PSU computer system

Internships (optional)

As members of the Huck Institutes of the Life Sciences, all graduate students may participate in a three month internship in academia, industry, or government and receive credit on their transcript by enrolling in IBIOS 595 (1). Non-traditional settings are also available. Students interested in this opportunity should initiate discussion early on with their advisor and graduate program chair to help determine the best timing for this experience (typically the first or second summer).

Teaching

Depending on the graduate program, teaching experience may be required or optional.

For a teaching experience beyond a departmental funding means or as a requirement, the Huck Institutes of the Life Sciences Supervised Experience in College Teaching Booklet lists courses available and corresponding teaching responsibilities at the respective campuses. Besides an opportunity to develop teaching skills in a classroom setting, students also participate in the Huck Institutes teaching assistant training sessions and receive credit on their transcript by signing up for IBIOS 602 (1). Students interested in this opportunity should initiate discussion early on with their advisor and graduate program chair to help determine the best timing for this experience.

Vacation and Sick Leave

Full-time graduate students in the Molecular Toxicology Intercollege Graduate Degree Program (IGDP) who receive stipends are permitted two (2) weeks (10 week days) of vacation leave per academic year (July 1 to June 30). Vacation leave cannot be carried over from one academic year to another, it is either used or not during each academic year. Leave should be arranged with the appropriate Molecular Toxicology Graduate Program Chair (1st year students) or thesis advisor (2nd year and above students). Students should formalize their vacation dates in writing at least two (2) months in advance and, to alleviate any possible confusion, vacations requests should be made in writing. The Molecular Toxicology IGDP Chair or student's thesis advisor will agree or disallow the vacation request in writing within 72 hours of its submission.

RESTRICTIONS: No vacations can be taken unless approved in advance by the student's thesis advisor or Molecular Toxicology IGDP Chair. Approval should be granted unless the leave is believed to seriously compromise the academic progress of the student; in such cases the disapproval must be confirmed by the Molecular Toxicology IGDP Chair. Students will not be routinely granted vacation leave while enrolled in formal class work.

Additional vacation leave may be awarded by special arrangement between the student and the Molecular Toxicology IGDP Chair (1st year students) or his/her thesis advisor (advanced students) for extenuating circumstances, on a case by case basis. Vacation leave days do not accrue from year to year. Holidays designated by The Pennsylvania State University are separate and are in addition to vacation days. Spring break is not a designated holiday. Graduate students in the Molecular Toxicology IGDP must use vacation time if they would like time off during this time.

Sick leave will not be formally assigned or earned, but may be used as necessary with approval of the student's thesis advisor or Graduate Program Chair. Under normal circumstances, up to five (5) days of sick leave per calendar year will be granted, when necessary. Sick leave in excess of 5 days will be recorded as vacation time. It is the student's responsibility to contact their thesis advisor or Molecular

Toxicology IGDP Chair when he/she is absent from the classroom or laboratory due to illness. Sick leave cannot under any circumstances be used as a substitute for vacation leave.

Doctoral Thesis Committee Composition

According to the Graduate Degree Programs Bulletin published by the Graduate School regarding Doctoral Committees: (<http://bulletins.psu.edu/whitebook>) then click on “Advisers and Doctoral Committees” under the heading “Doctoral Degree Requirements.”

- 4 person minimum of approved PSU Graduate Faculty.
- 2 members must be inside the major and 1 member must be outside the major. Note - the outside member must be a member of the approved PSU Graduate Faculty. The outside member for intercollege graduate programs may be inside the major but committee membership must have representation from more than one department. The outside member represents a field outside the candidate’s major field of study and is expected to provide a broader range of disciplinary perspective and expertise.
- A person not affiliated with PSU may be added as a special member (beyond the 4 members of the approved PSU Graduate Faculty) upon recommendation of the head of the program and approval of the graduate dean. A memo plus the individual's C.V. must be drafted with approval signature spaces for the Graduate Program Chair plus Ms. Cynthia Nicosia (Director, Graduate Enrollment).
- Have committee chair or one of the co-chairs be a member of the approved PSU Graduate Faculty. Typically this is the faculty advisor or someone in the graduate program.
- The doctoral candidate and three committee members must be physically present for the comprehensive exam and defense. No more than one person may be present via telephone. Telephone or video conference arrangements must be approved by the Dean of the Graduate School. A form letter is available for this special request.
- Need approval of 2/3 of the committee members for passing comprehensive exam and defense dissertation.
- **Need to submit paperwork 3-4 weeks prior to your scheduled comprehensive exam and defense. Please contact the appropriate staff member:**

Hershey:

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- Please note- Graduate Programs may have additional committee composition criteria.

This publication is available in alternative media on request.

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