

Interdisciplinary Graduate Program
in HUMAN TOXICOLOGY
Student Handbook

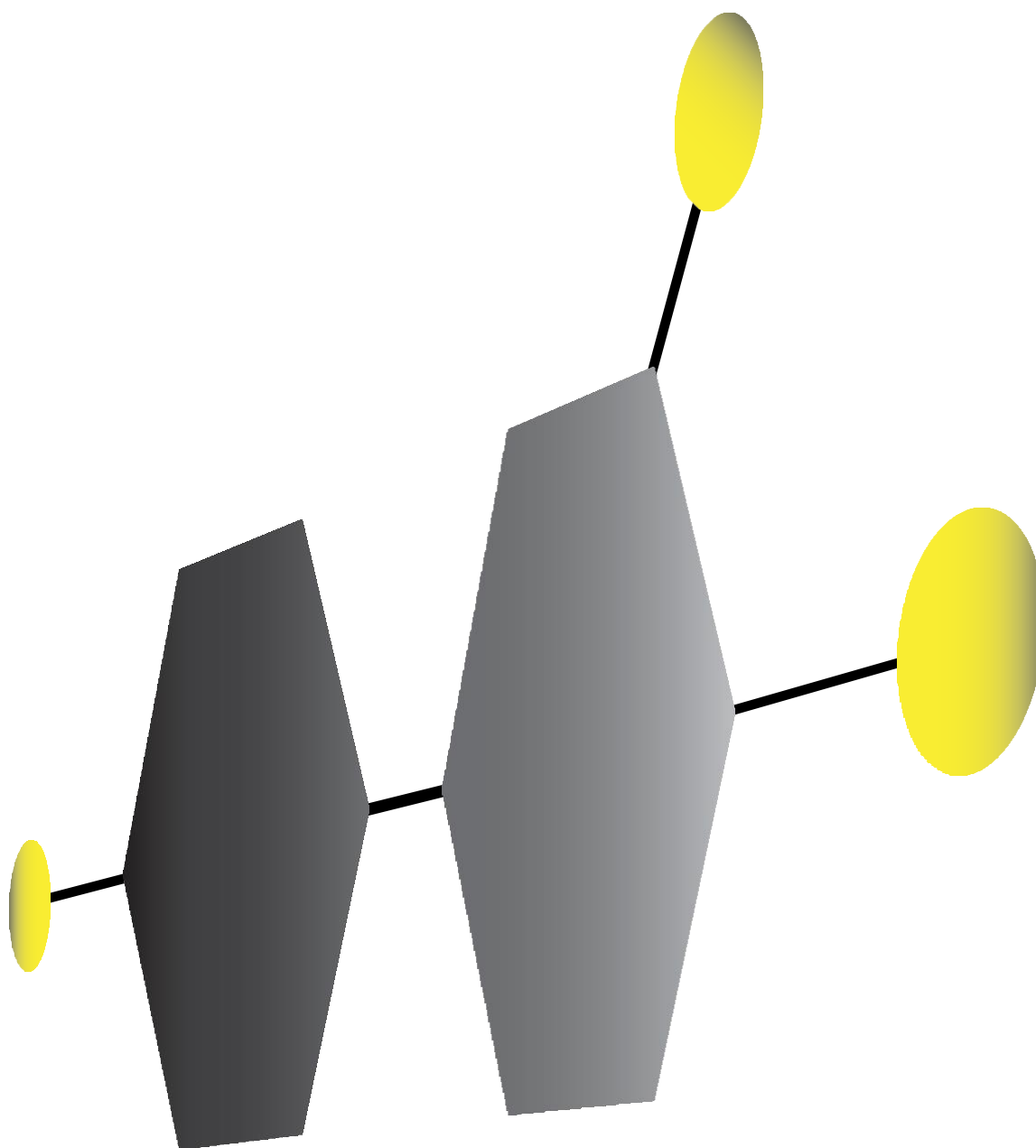


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Program Overview

Description. The Human Toxicology Program at The University of Iowa is located administratively within the Graduate College, along with several other interdisciplinary graduate programs.

Leadership. The Program is led by the Director. The current Director of the Human Toxicology Program is Dr. Peter Thorne. He is assisted by the Director of Graduate Studies, Dr. Gabriele Ludewig.

Faculty Members. Faculty from five Colleges (Public Health, Medicine, Pharmacy, Liberal Arts & Sciences, and Engineering) and thirteen departments participate in the Interdisciplinary Graduate Program in Human Toxicology. See **Appendix 1** for participating faculty members.

Committees

Faculty Committees. The faculty of the Human Toxicology Program will be the governing body of the Program, will approve membership of interested faculty from across campus and will decide all issues of Program policy and Program governance. An **Executive Committee** meets at least twice per year to discuss student issues (recruiting, adequacy of study plans, progress of individual students), training issues (improvement of existing courses, seminars and workshops, creation of new courses), and program issues (learning outcomes and assessment). An **Admissions Committee**, consisting of seven members of the Program Faculty representing diverse areas of research interest will be constituted and charged with reviewing all applications for admission to the Program.

Student Committees. Graduate students, primarily doctoral students, are recruited locally, nationally, and internationally. Each incoming student is offered financial support by the Human Toxicology Program for the first academic year, during which time he/she rotates through the laboratories of

participating faculty, with the purpose of identifying a mentor. Three, two-month rotations are required, and by the end of the first year, each student will be required to have identified a mentor. The mentor then assumes financial responsibility for the student. Within the first semester of identifying a mentor, and joining the mentor's laboratory, the student selects faculty members to participate on his/her **Advisory Committee**, in consultation with his/her mentor. The primary mentor chairs the Committee.

The student's Advisory Committee will consist of five members (doctoral committees) or three members (Master's committees), one of whom at least must be from outside the Program. Note, the committee must contain *at least two* faculty members who are members of the Program. The Committee will meet at least twice per year and will provide advice and consultation on all aspects of the student's coursework and research planning and execution. The Advisory Committee will also serve as the student's **Examination Committee** for the Comprehensive Examination and for the Final Examination (Defense of Thesis). It will be the responsibility of each student to call regular meetings of his/her Advisory Committee.

A **Student Advisory Committee** meets with the Human Toxicology Program Director several times per year to offer insights and make suggestions to improve the program. They also assist with admissions by matching with potential applicants and first year students to answer any questions. They created a New Tox Students FAQ booklet. They created a Diversity, Equity, and Inclusion initiative to assist domestic and international students. They have partnered with local high schools to bring Human Toxicology students to high schools to explain science and do hands-on projects. They create events and activities to inform undergraduate students about the field of toxicology. They host social events so Toxicology students can connect

Admissions

The **Admissions Committee** of the Graduate Program in Human Toxicology seeks to identify qualified students to enter the Program. Applications from individuals with disabilities and individuals from underrepresented groups/minorities are encouraged. Criteria for admission are chosen to select students who are likely to be successful in the Program, including:

- i. A minimum undergraduate GPA higher than 3.0, or the demonstration of success in graduate work, in fields of study within the scientific disciplines, such as chemistry, biology, physics, engineering and the health-related disciplines;
- ii. For international applicants, a minimum TOEFL total score of score 81 is required. As an alternative to taking the TOEFL, the IELTS may be taken. The IELTS total score must be 7.0 with no sub score less than 6.0. Duolingo may also be used, with a requirement of a score of at least 105.
- iii. At least three letters of reference that reflect positively on the potential of the candidate for success in graduate studies.
- iv. Applicants must also submit a CV/Resume, a description of their Research Experience, and a Statement of Purpose
- v. Generally successful applicants will have attained a Bachelor's or Master's degree in the sciences or engineering, and are well prepared to successfully negotiate the Program curriculum.
- vi. For best consideration, please submit completed applications by **January 1**. Applications received after January 1 will be considered on a rolling basis.

Financial Support

All Toxicology Program doctoral students receive stipends, tuition and a health insurance allowance. Students may be supported as research

assistants with funds from the Graduate College or they may be supported by training grants

and other grants. Stipend support is renewed based on satisfactory progress toward the degree.

Funding

Funding for the Human Toxicology Program comes from various sources including:

- vii. [Graduate College](#)
- viii. [NIEHS Iowa Superfund Research Program](#)
- ix. [EHSRC-Environmental Health Sciences Research Center pilot grant](#)
- x. [CHEEC-Center for Health Effects of Environmental Contamination seed grant](#)
- xi. [NCI-National Cancer Institute](#)
- xii. [NIEHS-National Institute of Environmental Health Sciences](#)
- xiii. [EPA STAR Fellowship Program](#)

M.S. Curriculum

Master's students will not be actively recruited, nor is it anticipated that they will be supported financially. Maintenance of a Master's program in toxicology will serve the needs of local and regional students who wish to pursue a Master's degree, as a second degree or part-time. Many of these individuals are non- traditional students, some working full-time, often performing the functions of toxicologists in their jobs, and needing more formal training. The M.S. is a thesis- only program.

Ph.D. Curriculum

A major goal of the Interdisciplinary Graduate Program in Human Toxicology is to provide flexibility. Students (in consultation with their Advisory Committees) may tailor their course of study to their individual interests and

goals within the broad framework that defines the field of toxicology. To assure that all students within the Human Toxicology Program have a common minimal level of training and experience in toxicology, all students will be required to successfully complete:

One of these two courses:

[OEH:6710](#) Human Toxicology and Risk Assessment

[PHAR:6501](#) Principle Mechanisms of Chemical Toxicology

And all of these:

[BMED:7270](#) Scholarly Integrity/Responsible Conduct of Research I (must be completed within first two years of graduate study)

[TOX:7173](#) Professional Development in Toxicology

[BIOS:4120](#) Introduction to Biostatistics

[BIOS:5120](#) Regression Modeling and ANOVA in the Health Sciences

[OEH:6720](#) Advanced Toxicology

[TOX:7180](#) Toxicology Research Seminar (enrollment is required each semester)

NOTE: Sample Ph.D. curriculums are presented in **Appendix 2.**

Rotations

Toxicology students are expected to complete three laboratory rotations in the first year. Although in exceptional circumstances a student may be permitted to take a fourth rotation, it is highly recommended that students carefully choose each rotation. The first rotation is expected to start within the first few weeks of the first semester. Importantly, students should contact faculty members whose research programs are of interest as early as possible; to be certain there is space available in that laboratory. Rotations can occur with any faculty member at the University of Iowa. They do not need to be solely with Human Toxicology Program Faculty members. The program has added ten new faculty members in the last few years. Most of them become faculty members after hosting a Human Toxicology student during rotations and then deciding to become their permanent mentor.

Rotations are approximately 2 months long. After each rotation, students will

be expected to give a 10-15 minute presentation to their colleagues in the Toxicology program. The weekly time commitment for the rotations is 20 hours per week—this is important to keep in mind when deciding which and how many courses to take.

Doctoral Comprehensive Examination

The comprehensive examination is required of all doctoral students. The timing of the examination is at the discretion of the student and his/her primary advisor; however, it cannot be taken before the student completes Advanced Toxicology. Prior to the examination, the student will assemble a Graduate Advisory Committee of no less than five qualified individuals, as per the Graduate College requirements. The student will present the committee with a description of the proposed doctoral thesis project, which must include: (1) the central hypothesis; (2) the Specific Aims; (3) the long term goals of the proposed research program; (4) a concise description of the research design to be employed; and (5) the methods to be used to accomplish the Specific Aims.

Once the student and the Graduate Advisory Committee have agreed on a suitable Hypothesis and Specific Aims, the primary advisor will allow the student to write the research proposal. Importantly, the student has **4 weeks to complete** the proposal. The student must distribute the proposal to the Graduate Advisory committee **at least 2 weeks prior** to the scheduled Comprehensive Examination. More information on format of the research proposal and timetable of the comprehensive examination is available in **Appendix 3** or at the following link:

<https://toxicology.grad.uiowa.edu/sites/toxicology.grad.uiowa.edu/files/2020-12/Format-%26-Timetable-of-Doctorate-Comprehensive-Exam.pdf>

Final Examination (Defense of Thesis)

[Master's Thesis Final Examination.](#)

Requirements for the **Master's degree** include a **Final Examination** (Defense of Thesis) that will be evaluated by the examining committee (student's advisory committee) as satisfactory or unsatisfactory, with two unsatisfactory votes making the committee report unsatisfactory. A candidate who fails the examination may present himself or herself for re-examination, but not sooner than the next regularly scheduled examination period in the following semester. The examination may be repeated only once.

Doctoral Thesis Final Examination

The written dissertation is prepared and submitted to the Graduate College according to specific guidelines available from the Graduate College (<https://grad.uiowa.edu/academics/thesis-and-dissertation>).

After consultation with the Program Director and the Graduate Advisory Committee, the student schedules a **Final Examination** (Defense of Thesis). Please note, a final draft of the dissertation should be given to each member of the Committee **at least two weeks** before the scheduled date of the seminar/dissertation defense. The examination will consist of two parts: 1) an oral presentation of the research results, and 2) questioning by interested persons and by the Committee. To schedule the dissertation seminar, contact Dr. Hans-Joachim Lehmler at (hans-joachim-lehmler@uiowa.edu).

At the conclusion of the Final Examination, the Committee may recommend 1) a "Satisfactory" completion of the examination, or 2) that the student's performance was "unsatisfactory". At the option of the Program, a reexamination may take place, but not until the next semester. The examination may be repeated only once.

Upon successful completion of all degree requirements, including the seminar, evaluation of the written dissertation and successful oral defense of the dissertation, the Ph.D. in Human Toxicology is awarded by the Graduate College.

Scholarly Integrity

Training in Scholarly Integrity

A course entitled Scholarly Integrity/Responsible Conduct of Research (SI/RCR) is required for all graduate students in the sciences at the University of Iowa. The course provides small monthly group round table discussions on integrity and responsible research issues. It is taken during the fall and spring semesters of the student's second year. All individuals taking these courses must have completed basic SI/RCR training through completion of CITI online training. More information about the course is available at the following Biomedical Program at <https://catalog.registrar.uiowa.edu/courses/bmed/>.

Academic Misconduct

Any form of cheating or plagiarism with respect to curricula, coursework, examinations, or research is grounds for dismissal from the Program. Plagiarism is defined as the act of taking another's ideas, words, or creative works and presenting them as your own, or presenting them without proper attribution.

Sexual Harassment

The University of Iowa has specific guidelines and regulations on sexual harassment. These guidelines are available from the University and should be reviewed by all members of the Human Toxicology Program. They are also posted on the University web site: <https://opsmanual.uiowa.edu/community-policies/sexual-harassment-and-sexual-misconduct>. All Graduate Research Assistants must complete a Harassment Prevention Education Course within 10 weeks of the start of their first semester at the University of Iowa.

Vacation and Sick Leave

Graduate training is a full-time, 12-month professional commitment with your mentor and with the Program. The University policy on vacation and

sick leave for graduate research assistants is negotiated with COGS, the graduate student union. Graduate research assistants (50% appointment) may take up to 15 work days of vacation per year without loss of pay. In addition, students shall receive the nine paid University holidays: New Year's Day, Dr. Martin Luther King Jr.'s Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, and the day before/after Christmas (as identified by the University). Graduate research assistants (50% appointment) may be absent due to illness for up to 18 work days per year without loss of pay. Students must notify their advisor about absences (vacation, sick leave) from the lab. Vacations or any other planned absences should be discussed in advance with your mentor and reported to the Program Office. Absences in excess of the above allowances must be requested in writing and approved by your mentor and the Program Director; stipends may be prorated to reflect all laws and regulations.

Appendix 1 Faculty College	Department	Faculty Member
College of Public Health	Occupational & Environmental Health	Jong Sung Kim, PhD Hans-Joachim Lehmler, PhD Gabriele Ludewig, PhD Matthew Nonnenmann, Ph.D. Thomas Peters, PhD, CIH Larry W. Robertson, PhD, MPH Diane Rohlman, PhD Peter S. Thorne, PhD
	Epidemiology	Paul Romitti, PhD
College of Medicine	Radiation Oncology	Bryan Allen, PhD Garry Buettner, PhD Prabhat Goswami, PhD Corinne Griguer, Ph.D. Michael K. Schultz, Ph.D. Douglas Spitz, PhD
	Pediatrics	Paul McCray, MD
	Internal Medicine	Robert Blount, MD, MAS Prajwal Gurung, Ph.D. Joel Kline, MD Shunguang Wei, PhD
	Neuroscience and Pharmacology	Kamal Rahmouni, PhD Stefan Strack, PhD
	Department of Anatomy and Cell Biology	Thomas Rutkowski, PhD
	Pathology	Andrean Simons-Burnett, PhD
	Psychiatry	Hanna Stevens, M.D., Ph.D.
	Radiology	Michael Schultz, PhD
College of Pharmacy	Pharmaceutical Sciences and Experimental Therapeutics	Ethan J. Anderson, Ph.D. Nicole Brogden, Ph.D. Jonathan Doorn, PhD Michael W. Duffel, PhD Marie Gaine, PhD Aliasger Salem, PhD
College of Liberal Arts & Sciences	Biology	Steven Green, Ph.D.
College of Engineering	Civil & Environmental Engineering	Keri Hornbuckle, PhD Jerald Schnoor, PhD

Appendix 2 Sample Curriculum Plans

Pharmacology Emphasis

PATH: 5461 Intro to Morphology
PHAR: 6501 Principle and Mechanisms of Chemical Toxicology
TOX 7173 Professional Development in Toxicology
TOX 7201 Toxicology Research
BIOS 4120 Introduction to Biostatistics
TOX 7180 Toxicology Research Seminar

FRRB 7000 Redox Biology and Medicine
OEH 6710 Human Toxicology and Risk Assessment
BIOS: 5120 Regression Modeling and ANOVA in the Health Sciences
TOX 7201 Toxicology Research
PHAR 5537 Enzymatic Basis of Drug Metabolism
TOX 7180 Toxicology Research Seminar

OX 7201 Toxicology Research
OEH 6720 Advanced Toxicology
TOX 7180 Toxicology Research Seminar
OEH 4240 Global Environmental Health
BMED 7270 Scholarly Integ/Resp Conduct of Rsrch I
PCOL 6080 Pharmacology Seminar
PCOL 6250 Advanced Problem Solving in Pharmacological Sciences

TOX 7201 Toxicology Research
PCOL 5136 Pharmacogenetics and Pharmacogenomics
TOX 7180 Toxicology Research Seminar
PCOL 5135 Principles of Pharmacology
BMED 7271 Scholarly Integ/Resp Conduct of Rsrch II
PCOL 6080 Pharmacology Seminar
PCOL 6250 Advanced Problem Solving in Pharmacological Sciences
PHAR 6504 Mastering Reproducible Science

RHET 7940 Public Speaking for Academics
TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar
PCOL 6080 Pharmacology Seminar
PCOL 6250 Advanced Problem Solving in Pharmacology Sciences

PCOL 6080 Pharmacology Seminar
TOX 7180 Toxicology Research Seminar
TOX 7201 Toxicology Research

TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar

TOX 7300 Toxicology Thesis/Dissertation
TOX 7180 Toxicology Research Seminar

Cancer and Pathology Emphasis

TOX 7173 Professional Development in Toxicology
TOX 7201 Toxicology Research
PATH: 5461 Intro to Morphology
TOX 7180 Toxicology Research Seminar
FRRB 7001 Molecular and Cellular Biology of Cancer

EPID 6700 Cancer Epidemiology and Control
BIOS 4120 Introduction to Biostatistics
TOX 7201 Toxicology Research
OEH 6710 Human Toxicology and Risk Assessment
TOX 7180 Toxicology Research Seminar
TOX 7201 Toxicology Research
PHAR 6501 Principles and Mechanisms of Chemical Toxicology

TOX 7201 Toxicology Research
FRRB 7000 Redox Biology and Medicine
BMED 7271 Scholarly Integ/Resp Conduct of Rsrch II
OEH 6720 Advanced Toxicology
IMMU 6247 Graduate Immunology and Human Disease
BMED 7270 Scholarly Integ/Resp Conduct of Rsrch I
TOX 7201 Toxicology Research

TOX 7201 Toxicology Research
BIOS: 5120 Regression Modeling and ANOVA in the Health Sciences
TOX 7180 Toxicology Research Seminar

TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar

TOX 7300 Toxicology Thesis/Dissertation
TOX 7180 Toxicology Research Seminar

Metabolism Emphasis

TOX 7173 Professional Development in Toxicology
TOX 7201 Toxicology Research
PHAR 6501 Principles and Mechanisms of Chemical Toxicology -
TOX 7180 Toxicology Research Seminar
PATH: 5461 Intro to Morphology

BIOS: 4120 Introduction to Biostatistics
TOX 7201 Toxicology Research

TOX 7180 Toxicology Research Seminar
FRRB 7000 Redox Biology and Medicine
OEH 6710 Human Toxicology and Risk Assessment
PHAR 5537 Enzymatic Basis of Drug Metabolism

TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar
BIOS: 5120 Regression Modeling and ANOVA in the Health Sciences
BIOS 5310 Research Data Management
OEH 6720 Advanced Toxicology
BMED 7270 Scholarly Integ/Resp Conduct of Rsrch I

TOX 7201 Toxicology Research
BIOS 4120 Introduction to Biostatistics
TOX 7180 Toxicology Research Seminar
OEH 4240 Global Environmental Health
PCOL 5136 Pharmacogenetics and Pharmacogenomics
BMED 7271 Scholarly Integ/Resp Conduct of Rsrch II

TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar
HHP 3450 Immunology in Health and Disease

OEH 7060 Research Design in OEH
TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar
CEE 5110 Managing Data to Facilitate Your Research

TOX 7201 Toxicology Research
TOX 7180 Toxicology Research Seminar

TOX 7300 Toxicology Thesis/Dissertation
TOX 7180 Toxicology Research Seminar

Appendix 3 Format and Timetable for a Comprehensive Examination

Title Page: Include the Title of the proposal, your Name, the Name of your Major Professor, the Names of the Members of your Doctoral Advisory Committee, and the Date of Comprehensive Examination.

Abstract: The abstract is a very important section since it serves as an accurate and succinct description of the entire proposal. It must include a description of the specific aims, central hypothesis, long-term goals of the work, a concise description of the research design to be employed, and the methods to be used to accomplish the specific aims. APPROXIMATELY ONE- HALF PAGE (Single Spaced).

Research Plan

Specific Aims: State concisely and realistically what the research described in this proposal is intended to accomplish and what hypothesis is to be tested. Provide a brief explanation of each Specific Aim to be completed in order to test the hypothesis. NO MORE THAN ONE PAGE (Single Spaced).

Research Strategy: APPROXIMATELY TWELVE PAGES (Single Spaced) for this section

Background and Significance: Briefly describe the background to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps in present scientific knowledge that the project is intended to fill. State concisely the importance of the research in the proposal by relating the specific aims to longer-term objectives.

Approach: Discuss the experimental design and procedures to be used to accomplish the specific aims of the project. It is usually best to organize this section in relation to the specific aims and specific studies or sub aims proposed under each aim. Include clearly identified preliminary data that you have obtained to support the aims and experimental design. Identify any steps or procedures that may be problematic and suggest what alternative methods you might utilize if these problems occur. Be sure to indicate a tentative sequence of the investigation. Point out any procedures, situations, or materials that may be hazardous to personnel and describe the precautions that will be utilized.

Literature Cited: USE PAGES AS NECESSARY

Choose the format for literature used by a prominent journal in toxicology, *Chem Res Toxicol*, *Tox Sci* or *Toxicol Appl Pharm*. Format your references accordingly, and provide complete citations.

Each citation must include the names of all authors, the full title of the article or chapter, the name of the journal or book, volume number, page numbers, and year of publication. The reference style should be consistent in its format.

Timetable: Once the student and the Graduate Advisory Committee have agreed on an Hypothesis and Specific Aims, the major professor gives the go-ahead for the student to write the proposal, which the student has 4 weeks to complete. The student then distributes the proposal to the Doctoral Advisory committee at least 2 weeks prior to the scheduled Comprehensive Examination.

Additional Information: Forms for the Doctoral Plan of Study, Appointment of the Doctoral Advisory Committee and Scheduling the Comprehensive Examination, may be found on the Graduate College's website (search "forms") or at the Human Toxicology website (<http://toxicology.grad.uiowa.edu/students/forms>). These forms must be completed, signed by the major professor and the Director of the IDGP in Human Toxicology or the DGS (electronic signatures are acceptable), and sent to the Graduate College at least 2 weeks prior to the scheduled comprehensive examination.