

PubH 8161-01
Current Literature in Toxicology
Fall 2017

Credits: 1
Meeting Days: Mondays
Meeting Time: 4:25 – 5:20 pm
Meeting Place: Mayo 1155
Instructor: Lisa Peterson
Office Address: Cancer and Cardiology Building, Room 2-126
Office Phone: 612-626-0164
Fax: 612-626-5135
E-mail: peter431@umn.edu
Office Hours: by appointment

I. Course Description

Students will read, discuss, and present current primary literature in toxicology, with an emphasis on modern methods in toxicology and the development of critical thinking skills.

II. Course Prerequisites

One course in biochemistry, one course in molecular biology or instructor's permission

III. Course Goals and Objectives

1. To learn to think critically about experimental design and data interpretation in current approaches to toxicology.
2. To be able to develop strategies to investigate issues in toxicology.
3. To apply toxicology principles learned in other courses to real world research questions.
4. To learn to read and analyze primary literature in toxicology.
5. To learn to make scientific presentations to your peers.

IV. Methods of Instruction and Work Expectations

The class will discuss recent research articles in toxicology. The research articles will be chosen by the instructor. Most papers will be discussed over two class periods.

In the first class period, individual students will be assigned a method used in the paper. The students will present the biochemical and/or biological basis of the method and discuss the pros and cons (strengths/weaknesses/limitations) associated with the method. In addition, describe the important controls for the experimental method. Send a draft of your presentation to Dr. Peterson by end of business day on the Friday before the presentation for review/approval. An exception for this occurs with the first presentation. A draft of this presentation is due September 26, 2016.

The following week, the paper will be discussed as outlined below. Everyone is expected to read the papers and be an active participant in the discussion.

Guidelines for paper discussion:

1. Introduction

- a. State what question is being asked – State the hypothesis being tested.
- b. Explain why the question is being asked – describe the background leading up to the current study and how the results will advance the field. What aspects of the field have been established? What aspects of the field remain controversial?
- c. Explain how the authors are testing their hypothesis. Describe the model system and experimental approach. Address the pros and cons of the approach taken in the publication.

2. For each figure, table or experiment, present the following:

- a. The purpose of the experiment.
- b. The question being asked and methods used to answer the question.
- c. The results
- d. The author's interpretation of the results
- e. Your critique of the experiment: discuss appropriate controls, alternate methods, complementary experiments.

3. Discussion

- a. General critique
- b. List the contributions this paper makes to the field.
- c. Discuss whether the research actually answers the questions the authors set out to address.
- d. Describe any unanswered questions.
- e. Give your opinion about what the next study should be.

Participation in Class Discussions: You are expected to contribute to class discussion by providing questions and comments during the presentations. Your questions and comments should demonstrate that you have thoroughly read and thought about the paper.

V. Course Text and Readings

Primary literature and appropriate review articles

VI. Course Outline/Weekly Schedule

September 11, 2017:	Introduction	Lisa Peterson
September 18, 2017:	Receptor binding and reporter gene assay - Aleksandra PCR - regular and quantitative - Valeria transient and stable protein expression in cells - Thomas X-ray crystallography - Nate	Students
September 25, 2017	No class	

October 2, 2017	Paper Discussion: Environ. Health Persp. 119: 1227-1232, 2011 http://ehp.niehs.nih.gov/1003328/ has supplemental data.	Irina Stepanov and class
October 9, 2017	Methods (general methods): Cytotoxicity Assays: MTT, Cell Titer Glo - Nate Live/dead cells: Propidium iodide and Hoechst 33342 dyes Aleksandra Mitochondrial potential reagent JC-1 and Intracellular calcium reagent Fluo 4 Valeria Reactive oxygen species detection: MitoSox Red and dichlorofluorescein diacetate – Thomas	students
October 16, 2017	Paper Discussion: <i>ACS Nano</i> 4: 15–29, 2010 http://pubs.acs.org/doi/abs/10.1021/nn901503q http://pubs.acs.org/doi/suppl/10.1021/nn901503q	Lisa Peterson and class
October 23, 2017	Methods (general methods): Transgenic mice – normal and conditional knockout: Thomas Quantitation by LC-MS/MS: Nate Preparation of tissue subcellular fractions: Aleksandra Enzymatic reaction assays: Valeria	students
October 30, 2017	Paper Discussion: <i>Chemical Res. Toxicol.</i> 28: 2400-2410, 2015. http://pubs.acs.org/doi/pdf/10.1021/acs.chemrestox.5b00405	Lisa Peterson and class
November 6, 2017	Methods (describe those specifically in the paper to be discussed Nov 13): FACS and Mitochondria ALDH assay: Valeria 26S UPS Activity Assay: Thomas Quantitation of dopamine/metabolites: Nate Comparison of models: human/rat cell lines vs rat mitochondria vs zebra vs human: Aleksandra	students
November 13, 2017	Paper Discussion: PNAS 110: 636-641, 2013. http://www.pnas.org/content/110/2/636.long	Lisa Peterson and class
November 20, 2017	Immunohistochemistry: Aleksandra DNA sequencing methods – first generation as in the paper: Valeria DNA sequencing methods – next generation (i.e. by massively parallel sequencing): Thomas PCR-single stranded conformational polymorphism: Nate	students
November 21, 2017	Paper Discussion: <i>Cancer Res.</i> 57: 3471–3477, 1997. http://cancerres.aacrjournals.org/content/57/16/3471.full-text.pdf	Lisa Peterson and class
December 4, 2017	Paper Discussion: <i>Chem. Res. Toxicol.</i> 26: 1323-1332, 2013 http://pubs.acs.org/doi/pdf/10.1021/tx4001754 http://pubs.acs.org/doi/suppl/10.1021/tx4001754	Lisa Peterson and class
December 11, 2017	Paper Discussion: <i>Chem. Res. Toxicol.</i> 30:934-945, 2017. http://pubs.acs.org/doi/pdf/10.1021/acs.chemrestox.6b00345 http://pubs.acs.org/doi/suppl/10.1021/acs.chemrestox.6b00345	Lisa Peterson and class

VII. Evaluation and Grading

Course Evaluation

Beginning in fall 2008, the SPH will collect student course evaluations electronically using a software system called CourseEval: www.sph.umn.edu/courseval. The system will send email notifications to students when

they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy - A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change (if applicable)

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used

in the classroom. For complete information, please reference:
<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Scholastic Dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code:

http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:

<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Makeup Work for Legitimate Absences

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see:

<http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

Appropriate Student Use of Class Notes and Course Materials

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Sexual Harassment

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy:

<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, Equal Opportunity, and Affirmative Action

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy:

http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

Mental Health and Stress Management

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

Academic Freedom and Responsibility: *for courses that do not involve students in research*

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost. *[Customize with names and contact information as appropriate for the course/college/campus.]*

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

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