



**PHRD 678: Topics in Pharmacology: The Other Side of Drugs:
From Pharmacology to Toxicology
(offered with MPTX 510)**

Number of Units: 3 (PharmD)

Term: Fall 2020

Day: **Monday**

Time: afternoon (**1-3pm**)

Location: CHP-G23; School of Pharmacy (online/in person?)

Instructor/Course Coordinator: Martine Culty

Office: PSC 702

Office Hours: Friday 2 to 3pm

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IT Help:

Blackboard is utilized as the learning management system for this course. For help (at any time)

- Call 213-740-5555 and choose Option 2
- Visit USC's Blackboard Online Help site for how-to videos and guides.
- Send an email to blackboard@usc.edu
- Access additional Blackboard 9 training videos on Lynda.com at <http://www.usc.edu/its/lynda> and search for Blackboard 9 Essential Training

Mediasite is used for lecture capture and delivery. For help, send an email to USC School of Pharmacy IT at servicedesk@pharmacy.usc.edu

For other technology-related questions, call USC IT Services at 213-740-5555.

Course Description

This course is an interactive course at the nexus of pharmacology and toxicology, in which students get the opportunity to discuss the therapeutic use and toxicology of common drugs, directly with clinicians prescribing these drugs in their practice. The course combines didactic lectures by the clinician instructors with presentations of research articles by students, and discussion on beneficial versus side effects.

Program Outcomes

1. Provide patient care. Includes:

- 1.1 Provide patient centered care
- 1.2 Promote health and wellness
- 1.3 Provide population-based care
- 2. Apply medical and therapeutic knowledge to pharmacy practice. Includes:**
 - 2.1 Develop, integrate, and apply knowledge from the foundational sciences (Scientist)**
 - 2.2 Evaluate the scientific literature**
 - 2.3 Explain drug action**
 - 2.4 Solve therapeutic problems**
 - 2.5 Advance population health and patient centered care**
- 3. Demonstrate a comprehensive approach to practice and care. Includes:**
 - 3.1 Demonstrate problem solving skills (Problem Solver)**
 - 3.2 Demonstrate educator skills (Educator)**
 - 3.3 Engage in patient advocacy (Advocate)**
 - 3.4 Demonstrate interprofessional collaboration (Collaborator)**
 - 3.5 Demonstrate cultural sensitivity (Includer)**
 - 3.6 Demonstrate effective communication skills (Communicator)**
- 4. Demonstrate professional behavior. Includes:**
 - 4.1 Exhibit behaviors and values that are consistent with the profession of pharmacy**
 - 4.2 Demonstrate professionalism in interactions with patients
 - 4.3 Demonstrate professionalism in interactions with other healthcare providers**
 - 4.4 Demonstrate professionalism in interactions with society**
 - 4.5 Exhibit behaviors that demonstrate accountability and ownership in all professional activities (Professional)**
- 5. Manage and use the resources of the health-care system: Includes:
 - 5.1 Optimize safety and efficacy of medication use systems (Manager)
 - 5.2 Manage human resources
 - 5.3 Manage financial resources
 - 5.4 Manage technological resources
 - 5.5 Manage physical resources
- 6. Engage in personal and professional development. Includes:**
 - 6.1 Demonstrate self-awareness (Self-aware)**
 - 6.2 Demonstrate leadership (Leader)**
 - 6.3 Demonstrate innovation and entrepreneurship (Innovator)

Learning Objectives

The objectives of the course are to examine simultaneously the pharmacology and toxicology of common drugs through a discussion between clinicians/experts presenting their therapeutic use of drugs, and students presenting scientific articles on their side effects.

Upon completion of this course, students will be able to:

1. Generate informative and objective written report and oral presentation on the toxicology and therapeutic effects of a drug.
2. Explain the mechanisms mediating the therapeutic and adverse effects of common groups of drugs.
3. Describe the experimental and/or epidemiological findings that justify the decisions of allowing or banning a drug from use.
4. Evaluate the implications for patients of allowing or banning such drugs, the safety issues and potential alternative treatments.

Teaching Methods

Teaching methods utilized in this course:
Classroom lecture
Reading (journal or papers)
Small group discussion
Individual/group presentation (student)
Short assignments on BB

Course format:

The course comprises 12 modules, including:

- 1 Introduction as part of Module 1
 - 10 modules focusing on drug families, consisting of student presentations of pre-selected articles, a presentation by an expert on the clinical use of the drugs, and an interactive discussion of the topic.
 - 1 module devoted to student presentations on their own projects.
- See last page for detailed topics.

Student Activities

Article presentations: During each session, except the first class, 1 or 2 articles will be presented by students, including clinical, epidemiological article or basic sciences research articles. Reading materials will be available on the course website on Black Board at least one week in advance.

During the first session, students will choose which topic/session they want to present (first-come first-served basis).

Short assignments: Based on reading material posted on BB, to be discussed in class.

Student projects: Students will choose a project related to a drug/family of drugs, either in use or banned because of undesirable effects. Students will submit a written report and give an oral presentation on the project. Depending of the number of students, the format might be team projects.

Evaluation: Students will be evaluated on the completeness, quality, clarity, and critical discussion of the selected topic. Refer to the grading rubric posted in BB for more details.

Article presentation (20%): students will be evaluated based on the completeness and clarity of the presentation, critical analysis of data presented and ability to answer questions.

Guidelines: Use powerpoint and plan for ~20 min presentation. The presentation should include: Background/introduction on the topic; The question addressed by the study; Pertinent data from the article (selected figures/tables showing critical data needed to understand the issues and support the conclusions) - Include few words on methods if needed; Interpretation and take home message; Conclusions from the authors; The student's point of view: positive points and limitations of the study; if applicable, what could the authors have done better? Do you think the therapeutic benefits outweigh the adverse effects, and why (inviting discussion)?

Project: written report (30%) and oral presentation (20%): Students will be evaluated on the completeness, quality, clarity, and critical discussion of the selected topic. When gathering information, remember to use recent studies published on the subject. Do not use only reviews as sources, but read also original studies that you can find in Pubmed, the FDA and CDC websites, google scholar, medical websites and cited in reviews.

Send me as soon as possible the project topic you want to work on, as each topic can be selected only once. Select also your preferred date of presentation among the proposed days asap. Remember that the choices of topics and dates are on a first come-first served basis. Final reports are due on the last day of class.

- The report should include an introduction summarizing the issues, followed by clearly identified sections (each with a sub-title), a conclusion and the references. Provide the basic information on drug pharmacology and therapeutic mechanism of action; what is known of the side effects and their mechanisms; a discussion of the benefits vs risks; If the drug was banned, provide some facts/history leading to the ban and its consequences; available alternatives; a conclusion presenting the view of the student; and a list of references. Include at least one figure or diagram (e.g. figure from a pertinent article, with the legend including a title and the reference).

Students will have access to “turnitin” on Black Board 1-2 weeks before the deadline, to help them verify that they did not inadvertently plagiarize phrases from published documents. This verification phase is meant to help students and it is not graded. Submit only the text without references to turnitin (identity should be 10% max, accommodating for scientific/chemical/medical terminologies). You can verify subsequent versions on turnitin until you are satisfied of the result.

Format: Length: 10-14 pages, including references. It can be slightly longer depending on figure/diagram size. Font: either Times New Roman 12, Arial 11 or Calibri 11. Line spacing: double space or 1 ½ space. References format: any scientific journal style. Do not forget to proofread the text for grammar and spelling accuracy (“grammar checking” will be available on Turnitin).

- The oral presentation (~20 min) should include the main points of the topic, the take-home message and open the topic to discussion. It should summarize the issues with the drug; explain briefly the mechanisms behind the therapeutic and adverse effects of the drug; if there are safer alternatives; whether the student think that the decision of using or banning the drug is a good choice and why.

Take home essay (open book) (20%): Student will write short essays (1/2 to 1 page max each) on 3 class topics that they did not present themselves, using the class material (lectures, articles and PDFs of presentations) posted on BB.

Participation (10%): based on class attendance, completion of short assignments and participation to the discussion during class.

Technological Proficiency and Hardware/Software Required:

Please refer to the USC School of Pharmacy Technology requirements.

Required Readings and Supplementary Materials

Selected reviews and articles

Assessment Methods

Assessment Methods
Oral presentation of assigned research article
Term paper/report
Oral presentation of student report
Other: short assignments and participation
Other: take home short essay examination

Grading Breakdown

Assignment	% of Grade
Oral presentation assignment	20
Term paper/report	30
Oral presentation/report	20
Take home essay	20
Participation (including short assignments)	10
TOTAL	100

Assignment Submission Policy

Late Assignments: Late assignments with prior excuse are considered on a case by case base.

Additional Policies:

Class absence: Request for class absence must be submitted prior to the class to the class coordinator.

Policy Regarding Missed Examinations

The policy for this course will follow the policy contained in the Academic Policies and Procedures of the University of Southern California School of Pharmacy 2013 Edition. Students who miss an examination are referred to this policy.

Rule on Cell Phones and Other Electronic Equipment during Exams:

Only authorized calculators are allowed during exams. Absolutely no cell phones are to be in the immediate possession of the student. Cell phones and other electronic equipment not approved for the taking of the exam may be stored in the student's backpack that will be placed in the front of the room during the examination. All cell phones in the student's back pack must be turned off. Any student possessing a cell phone on them or other unapproved electronic device during an examination will be subject to a fail in that examination and disciplinary action.

Grading Timeline

According to school policies

Policy on Learning & Assessment Feedback (LAF)

Feedback on examinations will be provided using the following methods. Please indicate which method(s) you will use in the course.

Method of Providing Feedback on Performance
Other: written comments on report and presentations
Zoom meeting if needed

University Policy on Absences

University policy grants students excused absences from class for observance of religious holy days. Faculty are asked to be responsive to requests when students contact them IN ADVANCE to request such an excused absence. The student should be given an opportunity to make up missed work because of religious observance. Students are advised to scan their syllabi at the beginning of each course to detect potential conflicts with their religious observances. Please note that this applies only to the sort of holy day that necessitates absence from class and/or whose religious requirements clearly conflict

with aspects of academic performance.

School of Pharmacy policy for written assignments regarding citation style

All written assignments in the course should use the uniform style of the School of Pharmacy for formatting in-text citations and reference lists. This style corresponds to the AMA (American Medical Association) format and can be found in summary at <http://goo.gl/tvNiu2>. The complete AMA Manual of Style is also available as an e-book at <http://goo.gl/edJfN> and print book at the Norris Medical Library.

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu

About Your Instructor(s)

Dr. Martine Culty, PhD, is Associate Professor in the Department of Pharmacology and Pharmaceutical Sciences, School of Pharmacy, USC. Expertise: Male reproduction, reproductive endocrinology and toxicology. Her research focuses on identifying the mechanisms regulating male germ cell development and how perinatal exposures to endocrine disruptor chemicals (EDCs) and drugs such as NSAIDs and acetaminophen can disrupt testis development, in relation to infertility and testicular cancer.

Dr. Irving Steinberg, PharmD is Associate Dean for Faculty Affairs at the USC School of Pharmacy; Associate Professor of Clinical Pharmacy & Pediatrics; USC School of Pharmacy & Keck School of Medicine. He is Director of the Division of Pediatric Pharmacotherapy, Department of Pediatrics, LAC+USC Medical Center. Expertise: Pharmacokinetics, antimicrobials and drug resistance, antiepileptic and cardiovascular drugs, legal medicine involving pharmacologic and toxicologic issues. Research emphasis on predictive performance of pharmacokinetic models for dosing in children and novel pharmacotherapeutic applications of drugs such as amphotericin and erythromycin in neonates.

Dr. Laura A. Kalayjian, MD, is Assistant Professor of Clinical Neurology; Neurology Chief, LAC+USC Medical Center and Director, Neurophysiology Lab, LAC+USC Medical Center; Neurology. Expertise: Neurology. Epilepsy and clinical neurophysiology. Research interests in women with epilepsy, hormonal influences and pregnancy and quality of life issues in persons with epilepsy.

Dr. Vassilios Papadopoulos, DPharm, PhD, DSc (Hon) is the Dean of USC School of Pharmacy; John Stauffer Dean's Chair in Pharmaceutical Sciences; Professor of Pharmacology and Pharmaceutical Sciences at USC School of Pharmacy. Expertise: Endocrinology, environmental toxicology. Research focus: pathophysiology and treatment of diseases related to altered steroid hormone synthesis, including endocrine pathologies, male reproductive disorders, neuropathologies and cancer. Pharmacology of steroid formation in the periphery and brain; development of related diagnostics.

Dr. Julie Dopheide, PharmD, is Professor of Clinical Pharmacy, Psychiatry and the Behavioral Sciences; Clinical Pharmacy and Pharmaceutical Economics and Policy; USC School of Pharmacy; Keck School of Medicine of USC. Expertise: Clinical psychiatric pharmacy. Treatment of child and adolescent psychiatric disorders, ADHD, depression, child and adolescent psychopharmacology. Research focus: clinical research involving inpatients with psychiatric illness; roles for psychiatric pharmacists in primary care settings.

Dr. Tam Phan, PharmD, is Assistant Professor (Clinician-Educator) at USC School of Pharmacy. He completed his PharmD and PGY-1 Residency in Community Pharmacy at the USC School of Pharmacy, where he led and engaged in clinical services and pharmacy management. Concurrently, he serves as Faculty Advisor for Rx Pride, an LGBTQ+ Affinity Group. His current clinical practice is at the Los Angeles LGBT Center, where he provides clinical pharmacy services. Expertise and Research Interest: Community/Ambulatory care pharmacy, HIV pharmacotherapy, LGBTQ+ health, transition of care, integrative medicine.

Dr. Mary Samplaski, MD, is an Assistant Professor of Clinical Urology. She is a fellowship-trained, board certified (American Board of Urology) expert in Male Infertility, Andrology and Microsurgery. She is committed to educational excellence and advancing the field of male fertility. She has spent time in Ghana with the International Volunteers in Urology medical outreach program. She is routinely invited to speak as an expert at both domestic and international conferences, and has received numerous awards.

Dr. Ankit Shah, MD, JD, is an inpatient pediatrician at the LAC+USC Medical Center and directs the social science curriculum at the USC Keck School of Medicine. He is Lecturer in Law at USC Gould School of Law. Expertise: Pediatrics. Legal medicine, regulatory and ethical issues in pediatric medicine.

Course Schedule: A Weekly Breakdown

Note: All classes will include in person student presentations, while some of the guest speakers will present their lectures online. All class recordings will be available on BB. If a student cannot be present in class, Dr. Culty will organize online sessions at a time appropriate for the student.

2020	Topics/Daily Activities
Week 1 08/17	Module 1: Introduction (MC) - Drug therapies during pregnancy - part 1 (risks to the fetus) (IS)
Week 2 08/24	Module 2: Drug therapies during pregnancy - part 2 (placental transport) (IS)
Week 3 08/31	Module 3: Drug therapies during pregnancy - part 3 (treatment of fetal arrhythmia) (IS)
Week 4 09/14	Module 4: Chemotherapy and male infertility (MS)
Week 5 09/21	Module 5: Valproic acid, anti-epileptic drugs (LK)
Week 6 09/28	Module 6: HIV Anti-Retroviral Therapy (TP)
Week 7 10/05	Module 7: Statins and steroids (VP)
Week 8 10/12	Module 8: NSAIDs (TBD)
Week 9 10/19	Module 9: Antidepressants, anxiolytics (JD)
Week 10 10/26	Module 10: Lithium in pregnancy (JD)
Week 11 11/02	Module 11: Pediatric regulatory/legal/ethical issues in drug testing and use (AS)
Week 12 11/09	Module 12: Student project presentations (MC)