

FORS 7094

Pharmacogenomics

Fall 2017

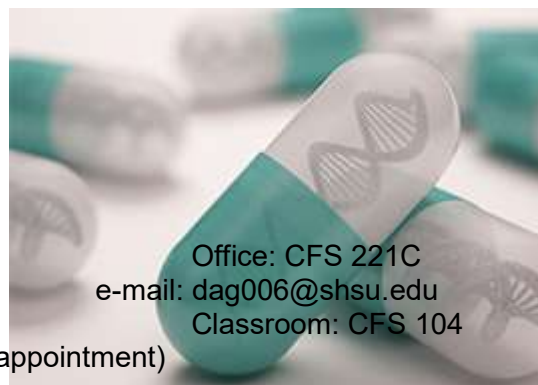
Instructor:

David A. Gangitano, PhD

Telephone: 936-294-4413

Class hours: Tuesday-Thursday 2-3.20

Office Hours: Thursday 10-2 (other times by e-mail appointment)



Office: CFS 221C
e-mail: dag006@shsu.edu
Classroom: CFS 104

Suggested readings:

- 1) Pharmacogenomics: An Introduction and Clinical Perspective (Pharmacology) (print)
ISBN: 978-0071741699 Author / Editor: Joseph S. Bertino (2012) Publisher: McGraw-Hill
Education / Medical
- 2) Principles of Pharmacogenetics and Pharmacogenomics (e-book) ISBN:
9781107377479 Author / Editor: Russ B. Altman (2012) Publisher: Cambridge University
Press
- 3) Psychiatric Pharmacogenomics 1st Edition Author: David A. Mrazek (e-book) ISBN-13:
978-0195367294 ISBN-10: 0195367294 Publisjer: Oxford University Press

Course description

This course will present different perspectives on Pharmacogenomics for graduate students, as well as a historical perspective on this rapidly evolving field. A brief description of the origins and evolution of Pharmacogenomics will be also covered. The reasons why after a decade of research, pharmacogenetics and individualized therapy have not yet emerged as an important part of patient care will be discussed. We will offer a glimpse of the future where increasingly complex technologies and more rapid advances in pharmacogenetic research will simplify the use of a patient's genetic variation for the selection of drug therapy and prediction of outcomes.

Course objectives

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

1. Understand the application of pharmacogenomics in drug therapy.
2. Comprehend genetic concepts of Pharmacogenomics
3. Discuss ethical, legal, and social issues associated with Pharmacogenomics.
4. Define the different analytical methods to identify genetic variations and Bioinformatics
5. Review principles of pharmacokinetics such as drug absorption, distribution, metabolism, and excretion.
6. Describe the pharmacogenetics of the Cytochrome P450

7. Outline the major pathways of drug biotransformation mediated by phase II enzymes, and define the multiplicity of genes that encode them.
8. Provide examples of how pharmacogenetic variants may affect pharmacokinetics of substrate compounds for different transporters.
9. Review the use of pharmacogenomic testing as it relates to the treatment of various psychiatric diseases.

Attendance policy

Attendance will be recorded in keeping with University policy. Students are expected to attend class. Class attendance requirements will be followed in accordance with Academic Policy Statement 800401. In accordance with university policy, students will not be penalized for absences of up to three hours as long as examinations and other assigned work have not been missed. If a student is absent it is their responsibility to obtain the class material and remain current with information distributed during class. Occasionally changes in schedule may be announced in class. These changes apply to all students, even those who were absent from class. One letter grade may, at the discretion of the instructors, be deducted from students' final grade if they miss more than four classes. There will be no distinctions between "excused" and "unexcused" absences. Students are expected to be on time to class. After the beginning of the class, late students may be counted as absent.

Grading Policy

Final grades will be based upon the following scale: 90 plus average an "A"; 80 to 89 a "B"; 70 to 79 a "C"; and below 70 an "F". Students should not count on a curve of the final grade. The instructors reserve the right to modify the grading scheme to accommodate for a missed test or final examination in extenuating circumstances.

The instructors reserve the right to assign a final exam grade of 0% should he/she deem the absence was not properly handled or was unjustified. Appeals will be handled in accord with University Policy Statement 900823, Academic Grievance Procedures for Students.

Make-up exams

If a student is absent from a mid-term exam he/she may not be given an opportunity to make up the mid-term exam, even if prior notice has been given the instructors. No make-ups will be given for the final exam unless arrangements have been made prior to the exam date. It is the student's responsibility to monitor the accuracy of the grades.

Annotated outline of topics to be covered for each class meeting (15 weeks)

Week 1. August 21

Developing perspectives on Pharmacogenomics

Week 2. August 28

Genetic concepts of Pharmacogenomics

Week 3. Sept 4

Analytical methods to identify genetic variations and Bioinformatics

Week 4. Sept 11

Pharmacokinetics: Absorption, distribution, metabolism, and excretion

Week 5. Sept 18

Adverse drug reactions

Week 6. Sept 25

Pharmacogenetics of the Cytochrome P450

Week 7. Oct 2

ISHI

Week 8. Oct 9

Phase II drug-metabolizing enzymes

Week 9. Oct 16

Drug transporters

Week 10. Oct 23

Non-genetic influences on drug metabolism

Week 11. Oct 30

The “fourteen genes”

Week 12. Nov 6

The drug-metabolizing enzyme genes

Week 13. Nov 13

The catechol-O-methyltransferase gene

Week 14. Nov 20 (Thanksgiving)

The neurotransmitter transporter genes I

Week 15. Nov 27

The neurotransmitter transporter genes II

Final Examination Dec 5

Examinations and Assignments

There will be different types of assignments throughout the semester (see course schedule above). The assignments will consist of an oral presentation and a practical work (to be announced). Students will prepare the presentation on an assigned pharmacogenomics topic. This presentation must be fully referenced and should cite published studies in the peer reviewed scientific literature. The oral presentation will take approximately 20 minutes and will be subjected to open discussion.

There will be two exams: one mid-term and one final exam that will cover all the topics discussed during the semester. These exams may be composed of multiple choice questions, true-false questions, fill in the blank questions, and/or short answer questions.

The oral presentation will account for 15% of the total grade and the practical work, for 15% of the grade. Every exam will account for 35% of the final grade.

	Number	Scope	Timeframe	Weight of Grade
Mid-term exam	1	Defined	Variable	35%
Final exam	1	Defined	Dec 5	35%
Oral presentation	1	Defined	Variable	15%
Practical assignment	1	Defined	Variable	15%

Material for the final exam may come from class material, supplemental reading material and/or class discussion that was not covered in the reading material. *In other words, attendance and active participation in class is extremely important in order to complete the course successfully and receive a good grade.*

Deadlines for assignments and other important announcements such as test times and locations will be announced either in class or by email. As a result, students *must* read their SHSU email in order to remain current.

Academic dishonesty

<http://www.shsu.edu/administrative/faculty/sectionb.html#dishonesty>

Disabled student policy

http://www.shsu.edu/~vaf_www/aps/811006.html

Services for disabled students

<http://www.shsu.edu/~counsel/sswd.html>

Student absences on religious holy day policy

<http://www.shsu.edu/catalog/scholasticrequirements.html#holyday>

Use of Cell & Smart Phones, PDA's & Similar Devices: Engaging in voice communication using a cell phone or similar communication device during class is prohibited. Leaving the classroom to receive a phone call is prohibited, except with prior approval of the instructor for urgent communications. Device sound alerts should be turned off during class. Engaging in text communication during class is discouraged, although non-disruptive occasional use is permitted. Persistent or extended texting is, however, not allowed. Per University policy communication using any electronic device during an in-class examination is prohibited.

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Disclaimer

The class schedule in this syllabus is subject to change. Announcements of any changes to the schedule will be made in class, via email, and/or posted in Blackboard. These announcements are considered proper notice of change.
