Jordan University of Science and Technology

Faculty of Science & Arts

Applied Biological Sciences Department

BIO732 Advanced Pharmacogenetics And Drug Safety

First Semester 2017-2018

Course Catalog
3 Credit Hours. Adavnced Pharmacogenetics and Drug Safty (B732) is devoted to advance our knowledge of the genetic basis for variable drug response. One of the great challenges in drug development and therapy is maximizing therapeutic response while avoiding adverse effects. Advances in genetic knowledge gained through sequencing have been applied to both of these areas and identifying heritable genetic variants that predict response and toxicity is an area of great interest to researchers. The ultimate goal is to identify clinically significant variations to predict the right choice and dose of medications for individuals-- ?personalizing medicine?. This is particularly desirable in the case of anticancer or antiviral agents where the therapeutic index is very narrow and a large proportion of patients do not respond. The study of pharmacogenomics is complicated by the fact that response and toxicity are multigenic traits and are often confounded by nongenetic factors (e.g., age, co-morbidities, drug-drug interactions, environment, diet, etc). Using knowledge of an individual?s DNA sequence as an integral determinant of drug therapy has not yet become standard in clinical practice; however, several genetics-guided recommendations for physicians have been developed and will be highlighted. As pharmacogenomic advances allow for individualized drug therapies based on genotypic information, the cost of and morbidity from drug toxicity is expected to decrease, and drug efficacy is expected to increase. The ethics and economics of pharmacogenomics will also be discussed.

Text Book	
Title	Clinical Application of Pharmacogenomics, (Despina Sanoudou, 2012)
Author(s)	Despina Sanoudou
Edition	1st Edition
Short Name	Clinical Application of Pharmacogenomics
Other Information	

Instructor	
Name	**Dr. Laith Al-Eitan**
Office Location	-
Office Hours	Sun : 08:30 - 10:30 Mon : 10:00 - 11:30 Tue : 10:30 - 11:30 Wed : 11:00 - 13:30

Email	lneitan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon : 11:30 - 14:30 Room: M3302

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Basics of Pharmacology	From **Clinical Application of Pharmacogenomics**
Weeks 3, 4	Pharmacogenetics: Matching the Right Foundation at Personalized Medicine in the Right Genomic Era	From **Clinical Application of Pharmacogenomics**
Week 5	Multiplexed Pharmacogenetic Assays for SNP Genotyping: Tools and Techniques for Individualizing Patient Therapy	From **Clinical Application of Pharmacogenomics**
Week 6	Role of Pharmacogenetics in Gastrointestinal Cancer	From **Clinical Application of Pharmacogenomics**
Week 7	Pharmacogenomics of Thiopurine S-Methyltransferase: Clinical Applicability of Genetic Variants	From **Clinical Application of Pharmacogenomics**
Week 8	S-Adenosylmethionine: A Novel Factor in the Individualization of Thiopurine Therapy	From **Clinical Application of Pharmacogenomics**
Week 9	Current Status of Pharmacogenetics in Antithrombotic Drug Therapy	From **Clinical Application of Pharmacogenomics**
Week 10	Clinical Implications of Genetic Admixture in Hispanic Puerto Ricans: Impact on the Pharmacogenetics of CYP2C19 and PON1	From **Clinical Application of Pharmacogenomics**
Week 10	Clinical Implications of Genetic Admixture in Hispanic Puerto Ricans: Impact on the Pharmacogenetics of CYP2C19 and PON1	From **Clinical Application of Pharmacogenomics**
Week 11	Neuropharmacogenetics of Major Depression: Has the Time Come to Take both Sexes into Account?	From **Clinical Application of Pharmacogenomics**
Weeks 12, 13	Pharmacogenetics of Asthma	From **Clinical Application of Pharmacogenomics**
Weeks 14, 15, 16	Beyond Pharmacogenetics	From **Clinical Application of Pharmacogenomics**

Mapping of Course Outcomes to Program Student Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**

Explain the basic principles of pharmacology [1A]	10%	Midterm Exam
Explain the basic principles of human genetics and heredity as they apply to inter-individual variation in treatment response [1A]	10%	Midterm Exam
Discuss how genetic variability in genes encoding drug metabolizing enzymes, drug transporting proteins, and drug receptors (targets) can contribute to variability in drug disposition and action, leading to changes in pharmacokinetics, pharmacodynamics, and clinical outcome [1A, 1B]	20%	Midterm Exam, Final Exam
Apply pharmacogenomic concepts to a particular drug therapy to solve relevant problems in pharmaceutical care [1A, 1B, 1C, 1D]	20%	Final Exam
Discuss impact of Pharmacogenomics in different therapeutic areas. Discuss case studies reporting the clinical consequences of pharmacogenomics on therapeutic efficacy or toxicity. [1A, 1B, 1D]	15%	Final Exam
Critically evaluate the current and future literature in the area of pharmacogenomics and identify key sources and reliable databases with pharmacogenomics knowledge base [1A, 1F]	25%	Seminar Discussion

Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
52.50	20	5	10		12.50

Evaluation	
Assessment Tool	**Weight**
Midterm Exam	25%
Seminar Discussion	25%
Final Exam	50%

Policy	
Class Attendence	Your class attendence is mandatory. Absences in excess of 20% of the total lecture hours will result in your being dropped from the course with a failing grade.
Make-up exam	Make-up exam appeals should be filed within Two days of the missed exam
Cell phones	Cell phones are prohibited during examinations and must be turned off during lecture. No incoming or outgoing calls or text messages are allowed
Unethical conduct	Unethical conduct, including cheating during examintions, will result in punishment by the university administration

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