PHA 5933 Clinical Applications of Personalized Medicine

2 Credit Hours

Course Purpose:

Personalized medicine involves the use an individual's genetic profile to guide decisions made in regard to the prevention, diagnosis, and treatment of disease. This course will focus on how pharmacogenomic and genomic medicine data can be used in patient care. Students will be given the opportunity to have their personal DNA genotyped on a custom chip, and utilize this information for the class assignments. Alternatively students may work with a de-identified genotype dataset. This course will use a combination of interprofessional lectures, and case-based discussions of clinical pharmacogenetic guidelines and primary literature. The goal of this course is to provide health professional students with the knowledge and skills to use a personalized medicine approach in their future clinical practice in an interprofessional learning environment.

Course Faculty and Office Hours

Course Coordinator:

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Co-Coordinator:

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Office Hours

By appointment only.

Place and Time of Class Sessions

Online course material (e.g., recorded lectures, readings) will be made available on the course website, along with instructions for each topic discussion. Lectures, readings, and pre-discussion assignments must be completed prior to the live web-based session. The course has weekly 1-hour live online learning sessions. Meeting times will be provided at the start of the course.

How This Course Relates to the Learning Outcomes You Will Achieve in the Pharm.D. Program:

This course prepares the Pharm.D. student to accomplish the following abilities and the related Student Learning Outcomes (SLOs) upon graduation:

- **2.1. Patient-centered care (Caregiver)** - Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize patient needs, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

- **3.1. Problem Solving (Problem Solver) –** Identify and assess problems; explore and prioritize potential strategies; and design, implement, and evaluate the most viable solution.

- **3.4. Interprofessional collaboration (Collaborator) –** Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.

Course Objectives

Upon completion of this course, the student will:

1. Explain risks involved with pharmacogenetic testing.
2. Interpret and apply evidence for pharmacogenomics and genomic medicine from the medical literature to patient care.
3. Apply personal or de-identified genetic information to clinical decision-making for representative cases using the following pharmacogenomic drug-gene pairs:
    a. CYP2D6 and codeine
    b. Clopidogrel & CYP2C19
    c. SLCO1B1 and simvastatin
    d. CYP2C9, VKORC1 and warfarin
    e. TPMT and thiopurines
    f. IL28B (IFNL3) and PEG-IFN
4. Apply theoretical genetic information to clinical decision-making and disease risk prediction for the following types of diseases:
    a. Complex Diseases: Cardiovascular Disease Risk
    b. Somatic Genomics: Genomic Medicine in Breast Cancer
5. Demonstrate best practices for returning genetic and pharmacogenetic test results to a patient, including legal and ethical concerns and communication strategies.
6. Demonstrate the contributions and roles of other health care professionals in the clinical application of genomic information to patient care.
7. Summarize the challenges and opportunities in integrating genomic medicine and pharmacogenomics data into the clinical process of patient care.

Pre-Requisite Knowledge and Skills

Departmental approval required.