PHRM 580: Topics in Pharmacogenomics 2017

Course Director: Alexander Steven Whitehead, DPhil; Department of Systems Pharmacology and Translational Therapeutics

11am-1pm, Fridays in BRB 501

This is a “literature-based” course (i.e. a seminar course/literature survey). It will survey the emerging technologies and computational advances that have permitted the field of Pharmacogenomics to mature into a major biomedical discipline over the past few years. It will consider the likely impact on disease target identification; the development of new drugs for established and “niche” markets; the advent of “personalized medicine” including the selection of therapies that have maximum efficacy and minimum side-effect profiles. This course will also touch on some of the ethical issues associated with the routine genetic testing of patients to facilitate treatment choices and clinical monitoring.

Proposed Sessions:

Each session will last for two hours (between 11am and 1pm on Friday mornings) and will be moderated by a faculty member. Most sessions will consider key original papers, reviews and, on occasion, articles from the popular press. In some sessions the students participating in the course will make presentations of the relevant material that are followed by group discussion. Some (but not all) sessions will require the faculty member to make a short “mini-lecture” to introduce the broad aspects of the topic under consideration. Students will be evaluated based on both participation in discussion (including presentation) and two essays: one dealing with one of the course topics other than one that they have been responsible for presenting to their peers, and one dealing with a relevant topic of the student’s choice (with approval of the course director). Evaluation will be based on these essays and the student’s contributions towards class discussions (and presentations).

The course director will make every effort to attend each session.

Jan 12\textsuperscript{th} - Course overview and introduction to pharmacogenomics. (Whitehead)

Jan 19\textsuperscript{th} - Modern methods for high throughput genotyping – essential tools for supporting large-scale pharmacogenomic studies. (Struan Grant, Ph.D.)

Jan 26\textsuperscript{th} - Gene expression profiling as a tool for the discovery of pathogenic pathways, candidate genes for disease association and pharmacogenomic studies, and the impact of drugs on cellular phenotype. (TBD)

Feb 2\textsuperscript{nd} - The use of proteomics in genetic and pharmacogenomic studies (Ian Blair, Ph.D.)

Feb 9\textsuperscript{th} - Biostatistical approaches to the analysis of genotype and phenotype data in pharmacogenomic studies and clinical trials. (Sean Hennessey, Pharm.D., Ph.D.)

Feb 16\textsuperscript{th} - Ethical issues posed by the application of pharmacogenomics. (Jon Merz, Ph.D.)

Feb 23\textsuperscript{rd} - Genetic factors influencing the maintenance of patients on Warfarin therapy within an acceptable therapeutic window of coagulation. (Stephen Kimmel, M.D.)
March 2nd - Thiopurine S-methyltransferase deficiency and life-threatening azathioprine and 6-mercaptopurine toxicity. (Whitehead)

March 9th - Spring break so no class

March 16th - Dihydropyrimidine dehydrogenase deficiency and its impact on cancer chemotherapy using fluorinated pyrimidines (Whitehead).

March 23rd - Polymorphism in the folate/homocysteine metabolic pathway: predictors of drug efficacy, drug toxicity and elevated risk of co-morbidity, Part I (Whitehead)

March 30th - Polymorphism in the folate/homocysteine metabolic pathway: predictors of drug efficacy, drug toxicity and elevated risk of co-morbidity, Part II (Whitehead)

April 6th - Online tools for pharmacogenomics (Caroline Thorn, Ph.D.)

April 13th - Application of online tools to irinotecan and clopidogrel pharmacogenomics (Caroline Thorn, Ph.D.)

April 20th - Open: students find a paper of interest and present briefly to class (Whitehead)