PHARMACOLOGY AND TOXICOLOGY (GS13)

GS13 1011 Computer Aided Drug Design (1 Credit)
Prerequisites: None, but a basic knowledge of chemistry (2D chemical structures, amino acids, etc.) is recommended. This course gives introductory knowledge of computer-aided drug design, including both cheminformatics and bioinformatics. All drug discovery stages will be discussed with emphasis on the application of computational approaches in the pipeline, consisting target identification and validation, hit and lead discovery and optimization, and ADME/Toxicity studies. The objectives of this course are to introduce the participants to different computational methods for drug discovery and development. After finishing this course, the students are expected to be familiar with modern cheminformatics and bioinformatics approaches, including QSAR, pharmacophore modeling, molecular docking, virtual screening, ADME/Toxicity predictions, sequence alignment, homology modeling, and protein structure prediction. Letter Graded

GS13 1024 Molecular Basis of Cell Signaling (4 Credits)
Prerequisite: Background in biochemistry and cell biology; Permission of the instructor. This course provides a detailed exploration of the molecular basis of cell signaling with emphasis on recent developments, structure-function, and quantitation. The course will include both the regulation of second messenger systems (GPCRs, G proteins, cAMP, IP3 and lipid), ion channels, growth factor-regulated tyrosine kinases, small G proteins (ras, GEFs, Gaps), kinase/phosphatase pathways, steroid hormones/ transcription, and the modeling of these systems. Letter Graded

GS13 1111 Case Studies in Drug Development (1 Credit)
Prerequisite: None. This course will be an intensive 2-week Foundations of Cancer Therapeutics (FCT) Crash Course that surveys key elements in the process of discovering, developing and commercializing cancer therapeutics. A major component of the crash course is the Merck drug discovery material for TIPS T32 trainee course plus live lectures from drug discovery experts. It will introduce students to the basic principles of drug discovery and development, including how such research is conceived, conducted, evaluated, explained to patients, and applied to patient care. Students will then apply these principles to analyze and discuss specific and current drug discovery and development projects at both UT Health and pharmaceutical companies. These cases will each have associated questions to be explored so students may learn to identify optimal patient targets for new drugs while ensuring the safety of their subjects. Each discussion will include issues of science, ethics, conflict of interest, and intellectual property. Pass/Fail