GENETICS IN PHARMACOLOGY
16:718:601

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Course Scope:

Pharmacology

• considers the effect of molecules (ligands, hormones, drugs, toxins) on receptors, cells, tissues and physiological systems.

Genetics

• confers susceptibility (or resistance) to such molecules
• influences metabolism of drugs and other agents
• may be useful in identifying drug targets
• can be used as a tool in drug development or production

Some concepts we will consider:

• Observations of genetic disease can lead to identification of a therapeutic intervention
• Genetics influences the response of individuals (and populations) to drug therapy
• Genome wide approaches can identify disease genes that may lead to therapeutic intervention
• How synthetic lethality can be used to improve cancer therapy
• Knowledge of how tumor cell differs from normal cell may offer a therapeutic advantage
• Oncogenes may be tantalizing drug targets, though not so easy to target
• Target-based drug screens have their limitations; a renaissance for phenotype-based screens?
• Model organisms can be used to identify potential drug targets and drug combinations

Topics
LDL Pathway and a Revolutionary Improvement in Cardiovascular Health
PCSK9: Positional Cloning of Disease Genes and Implications for Drug Therapy
Pharmacogenomics and Cardiovascular Disease
Cholesterol Absorption Inhibitors: Genetic Approaches to Drug Target Discovery
NPC1: A Critical Role in Ebola Virus Infection
Genetic Concepts for Developing Cancer Therapy Strategies
Exceptional Responders in Cancer Therapy
Drugging the Undruggable: Targeting Mutant Ras
Chemical Genetics: Drug Screening through Phenotype
Genetics of Model Organisms as a Means to Identify New Drug Targets