

Bemidji State University

CHEM 4615: Medicinal Chemistry: Drug Action

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: *.*

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course focuses on drug targets such as enzymes, receptors, and nucleic acids and the mechanisms by which pharmaceuticals alter the normal cellular activity. Common classes of pharmaceuticals (antibacterial, antiviral, anticancer, opioids, etc) will be explored. Progress in pharmaceutical development will be highlighted through the incorporation of current literature article and drugs undergoing clinical trials. Prerequisite(s): CHEM 4411.

B. COURSE EFFECTIVE DATES: 08/27/2018 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Applications of the drug action classes to the development of antibacterials, antivirals, anticancer compounds, drugs that affect the peripheral or central nervous system, and opioids
2. Enzyme function (catalysis mechanisms, inhibition, and kinetics)
3. Protein structure
4. Receptor activation and signal transduction (of ion channels, G-protein coupled receptors, and tyrosine kinase-linked receptors)
5. Using agonists and antagonists to target drug receptors, nucleic acid structure and replication, and drugs that target nucleic acids (intercalators, alkylators, and chain terminators)

D. LEARNING OUTCOMES (General)

1. differentiate the methods that drugs use to bind nucleic acid targets.
2. classify the main biological targets of drugs and provide examples of how they interact with their targets.
3. identify and diagram covalent and non-covalent interactions within proteins and nucleic acids, and those between biomolecules and drugs.
4. recognize different types of enzyme inhibitors, diagram enzyme inhibitor mechanisms, and explain how enzyme activity is regulated.
5. investigate the structural and functional types of receptors and the types of molecules (agonists vs. antagonists) that bind receptors, as well as relate the binding of molecules to receptors to downstream signaling effects.
6. examine and summarize the common modes of action of antibacterials, antivirals, anticancer compounds, drugs that affect the peripheral or central nervous system, and opioids.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted