BPS 2110 Introduction to Biopharmaceutical Science 2019

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Web Site: The web site can be accessed through Virtual Campus

Discussion: A discussion group is available on the course website for any aspect of the course.

Office Hours: Wednesdays 13:00 – 14:00
Thursdays 13:00 - 14:00
(If you can't make it during these hours, please make an appointment by e-mail)

Prerequisite: CHM 1321, BIO 1140

Lectures: Mondays 14:30-16:00 MRN 150
Thursdays 16:00-17:30 MRN 150

Assessment:

Mid Term 1: Monday September 30	**10% - 20%**
Mid Term 2: Monday November 4	**10% - 20%**
Final Exam:	**60 - 80 %**
Total:	**100%**
Bonus:	**+ 1 %**

Absence from a mid-term without an *approved* exemption will result in a grade of 0. If you miss a test contact me immediately to arrange a make-up test.

Academic Fraud http://web5.uottawa.ca/mcs-smc/academicintegrity/students.php

Approximate Course Outline (subject to modifications):

Module 1: Drug Discovery
1) The pharmaceutical industry
2) Drug discovery process
3) Drug development

Module 2: Biological Targets
1) Amino acids, proteins, enzymes
2) Non-covalent interactions in protein structure
3) Enzyme inhibitors
4) Chemical messaging, agonists, antagonists, partial agonists, inverse agonists, allosterics
5) General biological assays, protein based, cell based, animal based

Module 3: Drug optimization
1) Non-covalent interactions in drug function
2) Solvation and de-solvation
3) Structure property relationships
4) Drug properties and biological activity, solubility, lipophilicity, pKa, permeability,
5) Lipinski's rules and related methods
6) Drug metabolism
7) Techniques of molecular modification, isosteres, pharmacophores

Module 4: Examples of drugs discovered by different methods
1) Antibiotics, drugs from natural products, property improvement using artificial molecules
2) Virology, high throughput screening, rational drug design, molecular modelling

3) Cholesterol control, choice of molecular targets, marketing, three-dimensional structure of drugs, artificial vs natural sources, effect of stereochemistry
4) Anti-ulcer, use of pharmacophores in drug optimization, use of isosteres in drug optimization, use of molecular properties to optimize drug activity

Module 5: Biologics and recombinant drugs

1) Insulin, large scale manufacture of protein-based drugs, protein purification, recombinant manufacturing methods, optimization of protein properties using recombinant methods
2) Human growth hormone, safety issues in biologics, applications of engineered protein, off-label uses of drugs
3) Hepatitis B, immunogenic proteins, safety issues for biologic sources, manufacturing issues with biologic drugs, engineered vaccines

Module 6: Special topics

1) Drug regulation and pricing