

PHM809 (Section 001)/ CEM809 (Section 001) /BMB961 (Section 004): Drug Discovery and Medicinal Chemistry (2 Credits)

Schedule:

Spring 2023, Tuesday, Thursday (9:10 to 10 am)

Room: B448 Life Science Building

Instructors (Tentative):

Dr. Kin Sing Lee, Dr. Edmund Ellsworth, Dr. Rick Neubig, Dr. Jetze Tepe, Dr. Erika Lisabeth, Dr. Marc Bailie, Dr. Alex Dickson, Dr. Bryan Copple, Dr Andy Vick, Dr. Jim Vrbanic, Dr. Ken Waterman

Students:

PHM doctoral students, Chemistry doctoral students, doctoral students from the BMS program, pre-approved PHM minor or CEM UG

Course Description:

Drug Discovery is a complicated and fascinating adventure, engaging multiple disciplines, strategic decision-making, and problem-solving skills. The selection of a finalist from a pool of drug candidates is often driven by a careful balance of efficacy, safety, and economic considerations. Expert practitioners have knowledge in chemistry, biochemistry, molecular biology, pharmacology, informatics, toxicology, and physiology to make key decisions.

This course will cover the fundamentals of the drug discovery process, including but not limited to basic chemical knowledge, drug design principles, high-throughput screening, computational modeling, drug metabolic pathways, and pharmacokinetics/pharmacodynamics. The goal of this course is to equip students with the knowledge of discovery pharmaceutical research and to prepare them ultimately to work as team members in a discovery program.

Outline of Major Topics:

- History of Drug Discovery and Development
- Screening Strategy
- Multiple Parameters Optimization
- Identification of Drug Targets
- Bioinformatics
- Drug Design and Optimization Strategies
- Computational Programs used for Drug Design
- Medicinal Chemistry
- Chemistry of Drug Metabolism
- Drug Formulation
- Pharmacokinetic/Pharmacodynamic/Toxicokinetic in Drug Development
- Development of an *in vivo* Model for Drug Assessment

Assessment:

The assessment will be based on attendance (>90%) and the group project in which the group of 4 or 5 will build up their drug discovery program throughout the semester based on the data given every 2 to 4 weeks.