Drug Delivery Systems: Targeted Therapeutics and Translational Medicine

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Class Meeting: 9:00-9:50 am in Towne 319 on Monday, Wednesday and Friday

Office Hours: Please schedule appointments by email with Dr. Wattenbarger or speak to the instructors after class.

Course Description: The course will be divided into four sections.

I. Drug distribution and delivery in the body and drug interactions with the body: challenges and specific aspects of biotherapeutics
II. Drug delivery systems and nanocarriers
III. Targeted and smart drug delivery systems, cellular delivery
IV. Translational aspects of drug delivery systems

Text: References from current journals on major topics will be provided. The following text may be used as a reference: Drug Delivery: Fundamentals and Applications. Anya M. Hillery and Kinam Park, eds. CRC Press, Second Edition, 2016.

Grading: Group Project 40%
Midterm Exam on Sections I and II 30%
Final Exam on Sections III and IV 30%

Course Goals:
1 The students should be able to discuss and explain the following concepts after completing the course.
   a. The need for new drug delivery systems
   b. The advantages and applications of biotherapeutic drugs
c. The routes for drug transport in the body
d. The benefits of nanocarriers as a drug delivery system
e. Several systems used to target drugs to specific areas in the body
f. Current drug delivery systems in research
g. The design and application of targeted drug delivery systems
h. The challenges involved with developing new drug delivery systems
i. The translational aspects of gaining approval and starting a company for a new drug delivery system

2. Develop skills in reading current scientific articles on drug delivery topics.
3. Develop skills for working in groups to schedule meetings, divide tasks, prepare reports and give presentations for the proposal.
4. Participate in a peer review process.
5. Develop written and oral communication skills.

**Group Project:** A proposal will be written by groups of students for a research project on a new or improved drug delivery system. Three papers and an oral presentation will be required. The group may choose their own topic. Further details are provided in a separate document on the project. Details of the project are given on the project description document.

**CT3N Seminars:** Students are encouraged to attend seminars sponsored by the Center for Targeted Therapeutics and Translational Nanomedicine (CT3N). Announcements will be made for the seminars during class and on the Canvas site. The seminar list for the semester may be found online at [http://www.itmat.upenn.edu/ct3n/seminars.html](http://www.itmat.upenn.edu/ct3n/seminars.html). Students may sign up to receive the seminar announcements by sending an email to Jessica Bickhart at bickhart@upenn.edu.

**Academic Integrity:** All students are expected to be familiar with and follow the Penn guidelines for academic integrity. Scientific articles used in writing proposals and figures, graphs and tables taken from articles must be referenced. Sentences may not be copied from articles and pasted into reports. Information taken from articles must be rewritten in the student’s own words.

Any student suspected violating academic integrity will be penalized. The web link for the Penn graduate academic integrity code is [http://www.seas.upenn.edu/graduate/handbook/student-ethics.php](http://www.seas.upenn.edu/graduate/handbook/student-ethics.php).