

Pharmaceutical Gene Delivery

PHA 6183

Section #7050

Syllabus

Spring 2005

Course Coordinators: Sihong Song and Sean Sullivan
Pharmaceutics Department

- I. Review of Biochemistry and Molecular Biology
 - 1. Review of DNA replication
 - 2. Review of RNA synthesis
 - 3. Review of Protein Synthesis
 - 4. Design of Gene Expression Cassette
 - 5. Exogenous Drug Regulated Gene Expression Systems

EXAM I

- II. Gene Delivery Systems
 - A. Viral
 - 6. Retrovirus and Lentivirus (Foamy Virus)
 - 7. Adenovirus
 - 8. AdenoAssociated Virus
 - 9. Additional viral systems (HSV, SV40 etc.) (Optional)
 - B. Non Viral
 - 10. Naked DNA, Electroporation and Ultrasound
 - 11. Cationic Lipid/plasmid DNA
 - 12. Polymer/Plasmid DNA
 - 13. Hybrid systems: Viral and Non-Viral
- III. Diseases
 - 14. Genetic Diseases:
 - Hemophilia
 - Cystic Fibrosis
 - Alpha-1 Antitrypsin
 - XSCIDS
 - Muscular Dystrophy
 - 15. Cardiovascular Disease
 - Coronary Artery Disease
 - Peripheral Vascular Disease
 - 16. Cancer
 - Immunotherapy-Cancer Vaccines and Cytokine Expression
 - Prodrug-HSVTK and gancyclovir
 - 17. Neuronal
 - Parkinsons

Class size: 25 graduate students maximum

Prerequisites: Required: Biochemistry or Molecular Biology
Recommended: Virology

Credits: 3

Class schedule: 1.5 hr lecture twice a week

Grading: Exam and class presentation

Reference material: Book: Pharmaceutical Gene Delivery Systems,
Current research articles and reviews