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Syllabus

Lecture #	Date	Topic	Speaker
Lecture 1	Jan 10	Challenges of drug design, development and delivery	Bommarius, Prausnitz
Lecture 2	Jan 12	Current practice of developing new drugs	Prausnitz
Lecture 3	Jan 17	Successful examples of drug design and development	Bommarius
Lecture 4	Jan 19	Successful examples of drug delivery	Prausnitz
Tutorial 1	Jan 19 4:30-5:45pm ES&T room L1205	Tutorial on bioorganic chemistry	Bommarius
Tutorial 2	Jan 20 4-5pm ES&T room L1255	Tutorial on transport phenomena	Prausnitz
		DRUG DEVELOPMENT	
Lecture 5	Jan 24	Manufacturing and process development in pharma: metrics, scale-up, QbD	Bommarius
		QUIZ and Homework No. 1 due at beginning of class	
Lecture 6	Jan 26	Small-molecule manufacturing: important reactions, green processing	Bommarius
Lecture 7	Jan 31	Manufacturing of protein therapeutics	Bommarius
Lecture 8	Feb 2	Formulation in pharma: stabilization of therapeutics	Bommarius
Lecture 9	Feb 7	Development of vaccines	Bommarius
		Homework No. 2 due at beginning of class	
		DRUG DESIGN	
Lecture 10	Feb 9	Overview of protein-ligand interactions and enzyme catalysis	Kelly
		QUIZ at beginning of class	
Lecture 11	Feb 14	Principles of drug discovery and drug design	Kelly

Lecture 12	Feb 16	Principles of drug discovery and drug design	Kelly
Lecture 13	Feb 21	Enzyme inhibition and drug design	Kelly
		Homework No. 3 due at beginning of class	
Lecture 14	Feb 23	Pharmacology	Keith Easterling, Emory University
		QUIZ at beginning of class	
		DRUG DELIVERY	
Lecture 15	Feb 28	Pharmacokinetic modeling; oral delivery	Prausnitz
Lecture 16	Mar 1	Polymeric controlled release systems	Prausnitz
Lecture 17	Mar 6	Transdermal delivery	Prausnitz
Lecture 18	Mar 8	Ocular and other routes of delivery	Prausnitz
Lecture 19	Mar 13	Clinical Trials	Eric Felner, Emory University
		Homework No. 4 due at the beginning of class	
Lecture 20	Mar 15	Microneedles: science and commercialization from bench to bedside	Prausnitz
		QUIZ at beginning of class	
	Mar 17-22	PLANT TRIP TO PUERTO RICO (optional)	
Case Study 1		CASE STUDY I: OCULAR DORZOLAMIDE	
Oral Presentation 1	Mar 27	Topical dorzolamide delivery to the eye	Team 1 (P)
Oral Presentation 2		Molecular design of ophthalmic drugs	Team 2 (P)
Oral Presentation 3	Mar 29	Dorzolamide synthesis by conventional chemoenzymatic synthesis	Team 3 (B)
Oral Presentation 4		Dorzolamide synthesis by novel chemoenzymatic routes	Team 4 (B)
Case Study 2		CASE STUDY II: CONTRACEPTIVE HORMONE PATCH	

Oral Presentation 5	Apr 3	Chemical synthesis of contraceptive hormones	Team 5 (B)
Oral Presentation 6		Microbial synthesis of contraceptive hormones	Team 6 (B)
Oral Presentation 7	Apr 5	Transdermal patch delivery of contraceptive hormones	Team 7 (P)
Oral Presentation 8		Other methods of contraceptive hormone delivery	Team 8 (P)
Case Study 3		CASE STUDY III: LEUPROLIDE IMPLANT	
Oral Presentation 9	Apr 10	Solid-state synthesis of leuprolide	Team 9 (B)
Oral Presentation 10		Enzymatic synthesis of leuprolide	Team 10 (B)
Oral Presentation 11	Apr 12	Polymeric controlled release of leuprolide	Team 11 (P)
Case Study 4		CASE STUDY IV: INSULIN	
Oral Presentation 12		Injection, pen, jet, and pump-based delivery of insulin	Team 12 (P)
Oral Presentation 13	Apr 17	Production of insulin in yeast	Team 13 (B)
Oral Presentation 14		Production of insulin in E. coli	Team 14 (B)
Oral Presentation 15	Apr 19	Pulmonary delivery of insulin	Team 15 (P)
Oral Presentation 16		Closed-loop and responsive delivery of insulin	Team 16 (P)
Lecture 21	Apr 24	Review for the Final Exam	
Lecture 22	Apr 26	Pharmaceutical marketing	Charlie Thompson, The White Oak Group
	May 1	Final Exam 2:50 - 5:40 pm	