

# Syllabus

Date	Topic	Speaker	Reading
Jan 8	Challenges of drug design, development and delivery	<a href="#">Bommarius</a> , <a href="#">Prausnitz</a>	<a href="#">Reading</a>
Jan 10	Current practice of developing new drugs	<a href="#">Bommarius</a> , <a href="#">Prausnitz</a>	<a href="#">Reading</a>
Jan 15	Successful examples of drug design and development	<a href="#">Bommarius</a>	<a href="#">Reading</a>
Jan 15	Tutorial on transport phenomena (6 pm, ES&T L1255)	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
Jan 16	Tutorial on bioorganic chemistry (7 am, ES&T L1105)	<a href="#">Bommarius</a>	<a href="#">Reading</a>
Jan 17	Successful examples of drug delivery	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
	<b>DRUG DESIGN</b>		
Jan 22	Drug characteristics; Sources of drugs	<a href="#">Powers</a>	<a href="#">Reading</a>
	<a href="#">QUIZ</a> and <a href="#">Homework No. 1</a> due at beginning of class		
Jan 24	Drug design	<a href="#">Powers</a>	<a href="#">Reading</a>
Jan 29	High throughput screening	<a href="#">Powers</a>	<a href="#">Reading</a>
Jan 31	The story of four enzymes	<a href="#">Powers</a>	<a href="#">Reading</a>
	<a href="#">Homework No. 2</a> due at beginning of class		
	<b>DRUG DEVELOPMENT</b>		
Feb 5	Manufacturing and process development in pharma: goals, metrics, and issues	<a href="#">Bommarius</a>	<a href="#">Reading</a>
	<a href="#">Quiz</a> at beginning of class		
Feb 7	Small-molecule manufacturing: important reactions	<a href="#">Bommarius</a>	<a href="#">Reading</a>
Feb 12	Small-molecule manufacturing: scale-up	<a href="#">Bommarius</a>	<a href="#">Reading</a>
Feb 14	Development of protein therapeutics	<a href="#">Bommarius</a>	<a href="#">Reading</a>
Feb 19	Development of vaccines	<a href="#">Bommarius</a>	<a href="#">Reading</a>
	<a href="#">Homework No. 3</a> due at beginning of class		
	<b>DRUG DELIVERY</b>		
Feb 21	Conventional delivery methods; Pharmacokinetic models	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
	<a href="#">QUIZ</a> at beginning of class		
Feb 26	Polymeric controlled release systems	Prausnitz	<a href="#">Reading</a>

Feb 28	Transdermal delivery	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
Mar 4	Ocular and other routes of delivery	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
Mar 6	Microneedles: science and commercialization from bench to bedside	<a href="#">Prausnitz</a>	<a href="#">Reading</a>
	<a href="#">Homework No. 4</a> due		
	<b>PHARMACOLOGY AND CLINICAL TRIALS</b>		
Mar 11	Pharmacology	<a href="#">Heather Kimmel and Keith Easterling</a> , Emory University	<a href="#">Reading</a>
	<a href="#">QUIZ</a> at beginning of class		
Mar 13	Clinical Trials	<a href="#">Eric Felner</a> , <a href="#">Emory University</a>	<a href="#">Reading</a>
Mar 16-20	<b>PLANT TRIP TO PUERTO RICO (optional)</b>		
Mar 25	Pharmaceutical marketing	<a href="#">Charlie Thompson</a> , <a href="#">Marketrx</a>	<a href="#">Reading</a>
	<b>CASE STUDY I: TESTOSTERONE PATCH</b>		<a href="#">Reading</a>
Mar 27	Transdermal patch delivery of testosterone	<a href="#">Team 1 (P)</a>	<a href="#">Reading</a>
	Other methods of testosterone delivery	<a href="#">Team 2 (P)</a>	<a href="#">Reading</a>
Apr 1	Chemical synthesis of testosterone	<a href="#">Team 3 (B)</a>	<a href="#">Reading</a>
	Microbial synthesis of testosterone synthesis	<a href="#">Team 4 (B)</a>	<a href="#">Reading</a>
	<b>CASE STUDY II: OCULAR DORZOLAMIDE</b>		<a href="#">Reading</a>
Apr 3	Topical dorzolamide delivery to the eye	<a href="#">Team 5 (P)</a>	<a href="#">Reading</a>
	Drug structure - tissue permeability relationships for ocular delivery	<a href="#">Team 6 (P)</a>	<a href="#">Reading</a>
Apr 8	Dorzolamide synthesis by conventional chemoenzymatic synthesis	<a href="#">Team 7 (B)</a>	<a href="#">Reading</a>
	Dorzolamide synthesis by novel chemoenzymatic routes	<a href="#">Team 8 (B)</a>	<a href="#">Reading</a>
	<b>CASE STUDY III: LEUPROLIDE IMPLANT</b>		<a href="#">Reading</a>
Apr 10	Solid-state synthesis of leuprolide	<a href="#">Team 9 (B)</a>	<a href="#">Reading</a>
	Enzymatic synthesis of leuprolide	<a href="#">Team 10 (B)</a>	<a href="#">Reading</a>

Apr 15	Polymeric controlled release of leuprolide	<a href="#">Team 11 (P)</a>	<a href="#">Reading</a>
	<b>CASE STUDY IV: INSULIN</b>		<a href="#">Reading</a>
	Pulmonary delivery of insulin	<a href="#">Team 16 (P)</a>	<a href="#">Reading</a>
Apr 17	Injection, pen, jet, and pump-based delivery of insulin	<a href="#">Team 17 (P)</a>	<a href="#">Reading</a>
	Closed-loop and responsive delivery of insulin	<a href="#">Team 12 (P)</a>	<a href="#">Reading</a>
Apr 22	Production of insulin in yeast	<a href="#">Team 13 (B)</a>	<a href="#">Reading</a>
	Production of insulin in E. coli	<a href="#">Team 14 (B)</a>	<a href="#">Reading</a>
Apr 24	Stability issues of proteins (example: insulin)	<a href="#">Team 15 (B)</a>	Reading>Reading 644
	Discussion of broader impacts		
May 1	Final Exam 11:30 am - 2:20 pm		