

Spring of 2020
Drug Discovery – Potential of Quantitative Systems Pharmacology (QSP)

MSMPHL 2370/MSCBIO 2370
Monday and Wednesday 11:30 – 1:00
BSTWR 995

Mark Schurdak, Director, D. Lansing Taylor, Lee McDermott, James Faeder, Timothy Lezon, Bruce Freeman, Michael Lotze, Edward Chu, David Whitcomb and Ivet Bahar Co-Directors

Title	Instructor	Date
Fundamentals of Therapeutics		
1 Overview of Quantitative Systems Pharmacology and Drug Discovery	M. Schurdak	1/6/2020
2 Concepts of Molecular-Based pharmacology	A. Bisello	1/8/2020
3 Origins of Small Molecule Drugs	L. McDermott	1/13/2020
4 Biologics as Therapeutics	M. Lotze	1/15/2020
No Class Monday, Holiday - Martin Luther King birthday		
5 Computational Biology: Target Structure	P. Doruker	1/22/2020
QSP to Advance Personalized Medicine		
6 Analysis of Clinical Samples to Identify Disease Pathway Modules	J. Xavier	1/27/2020
8 Chemical Proteomics/Target Identification	N. Yates	1/29/2020
7 Big data resources, mining and analysis	T. Benos	2/3/2020
9 Computational Models of Disease and Hypothesis Generation	T. Lezon	2/5/2020
10 Systems Biology and Mechanistic Modeling	J. Faeder	2/10/2020
11 Computational Biology: Drug Repurposing and Polypharmacology	I. Bahar	2/12/2020
12 Disease Relevant Experimental Models	L. Verneti	2/17/2020
13 Phenotypic Discovery: Cell-Based High Content Screens	B. Gough	2/19/2020
14 Phenotypic Discovery: Experimental Organisms	A. Vogt	2/24/2020
15 Heterogeneity Analysis	B. Gough	2/26/2020
16 Biomarkers for Diagnostics and Drug Discovery	A. Stern	3/2/2020
17 Precision Medicine	D. Whitcomb	3/4/2020
No Class – Spring Break March 9 -11, 2020		
Traditional Drug Discovery Workflow		
18 High Throughput Screening	M. Schurdak	3/16/2020
19 Computational Drug Discovery	D. Koes	3/18/2020
20 Hit to Lead Optimization	L. McDermott	3/23/2020
21 IND/NDA and clinical Trials	E. Chu	3/25/2020
22 PK and Other Challenges	J. Beumer	3/30/2020
23 Early Safety Assessment and Link to Pre-Clinical	L. Verneti	4/1/2020

Case Studies

24	Pharmacogenomics and personalized medicine	P. Empey	4/6/2020
25	Machine Learning applied to understanding colon cancer	S. Uttam	4/8/2020
26	Application of Microphysiological Systems and QSP to liver diseases	L. Taylor	4/13/2020
27	Application of QSP to Cancer	A . Stern	4/15/2020
28	Application of QSP to Neurodegenerative Diseases	Schurdak/Lezon	4/20/2020
29	Anti-Inflammatory Drug Discovery, Development and Commercialization	B. Freeman	4/22/2020

Note: The final two case studies on 4/20 and 4/22 occur during finals week.