MCMP 51400 Biomol Interactions, Thry and Practice **Spring 2011, M-Th 5:30-6:20, RHPH 162**
variable credits=1 to 3; module 005 required

Module : Energetics, Equilibria, Binding (coordinator Post) - MCMP 51400-005

Date	Instructor	#	General Topic	Specific Content	
10-Jan	Post	1	Energetics and Equilibria	Enthalpy, entropy, heat capacity, equilibrium conditions	
11-Jan	Post	2	Energetics and Equilibria	dG, equilibria constants, rate constants	
12-Jan	Post	3	Energetics and Equilibria	Boltzmann factor, van't Hoff plot	
13-Jan	Post	4	Energetics and Equilibria	Applications: conformational transitions & protein stability	
18-Jan	Post	5	Macromolecular Interactions	Concentration dependence, binding curves	
19-Jan	Post	6	Macromolecular Interactions	Multiple-site binding, allostery, cooperativity	
20-Jan	Post	7	Macromolecular Interactions	Scatchard and Hill plots	
24-Jan	Post	8	Macromolecular Interactions	Applications: Gel shift, equilibrium dialysis, calorimetry, SPR	
25-Jan	Post	9	Macromolecular Interactions	Applications: literature examples	
26-Jan	Post	10	Statistical Analyses	Distributions, mean, standard deviation and error	
27-Jan	Post	11	Statistical Analyses	P Values, t-Test	
31-Jan	Post	12	Statistical Analyses	ANOVA; Linear and non-linerar regression	
1-Feb	Post	13	in-class student presentations		
2-Feb	Post	14	in-class student presentations		
3-Feb		15	**Exam**		

Module : Bioseparations and Applications (coordinator Post) - MCMP 51400 - 006

	Instructor	#	General Topic	Specific Content	
7-Feb	Rochet	1	Chromatography	Principles of partitioning, peak broadening	
8-Feb	Rochet	2	Chromatography	Gas Chromatography	
9-Feb	Rochet	3	Chromatography	HPLC, reversed phase, gel filtration	
10-Feb	Rochet	4	Chromatography	Ion exchange, affinity chromatography, immunoprecipitation	
14-Feb	Rochet	5	Chromatography	2D chromatography, HPLC detection methods	
15-Feb	Rochet	6	Electrophoresis	1D PAGE, gel staining techniques	
16-Feb	Rochet	7	Electrophoresis	DNA and RNA electrophoresis, EMSA	
17-Feb	Rochet	8	Electrophoresis	IEF and 2D PAGE	
21-Feb	Rochet	9	Electrophoresis	Capillary electrophoresis, DNA sequencing	
22-Feb	Rochet	10	Electrophoresis	Transblotting (Western, Southern, Northern), detection methods	
23-Feb	Rochet	11	Chromatography	Literature Review	
24-Feb	Rochet	12	Electrophoresis	Literature Review (and First Student Presentation)	
28-Feb	Rochet	13	Applications	Student Presentations (2)	
1-Mar	Rochet	14	Applications	Student Presentations (2)	
2-Mar		15	**Examination**		

Module : Analysis of Protein Function (coordinator Hazbun) - MCMP 51400 - 009

	Instructor	#	General Topic	Specific Content	
7-Mar	Hazbun	1	Cell Localization & Trafficking	Protein tagging and imaging Part 1	
8-Mar	Hazbun	2	Cell Localization & Trafficking	FRET, BRET, BiFC Part 1	
9-Mar	LaCount	3	Protein-Protein Interactions	Yeast two-hybrid and related approaches	
10-Mar	LaCount	4	Protein-Protein Interactions	co-IP methods	
21-Mar	LaCount	5	Systems Biology	Cytoscape	
22-Mar	LaCount	6	Systems Biology	Next Gen sequencing	
23-Mar	LaCount	7	Quiz		20%
24-Mar	Hazbun	8	Genetic Analyses	RNA interference	
28-Mar	Hazbun	9	Genetic Analyses	Genetic Interactions	
29-Mar	Hazbun	10	Genetic Analyses	Chemical genetics/genomics	
30-Mar	Hazbun	11	Systems Approaches	DNA microarrays/Protein microarrays	
31-Mar	Hazbun	12	Systems Approaches	Analysis of large-scale data sets	
4-Apr	Hazbun	13	Quiz		20%
5-Apr		14			
6-Apr		15	**Cumulative Exam**		60%