

**MACROMOLECULAR INTERACTIONS (Bio-5312)**  
**Spring-2009**

Coursemaster: T. Lohman (362-4393); (lohman@biochem.wustl.edu)

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MWF - 9:00-10:00 a.m., 264 McDonnell Sciences Bldg.

Prerequisites: Physical Chemistry, Biochemistry

1.	Jan. 12	Thermodynamic Approaches/Laws	TL
2.	Jan. 14	Chemical potential/equilibrium constraints	TL
3.	Jan. 16	Multiple Binding Equilibria and Cooperativity	TL
	<b>Jan. 19</b>	<b>Martin Luther King Holiday</b>	
4.	Jan. 21	Practical Aspects of Binding Analyses	TL
5.	Jan. 23	Computer use for simulation/analysis	AK
6.	Jan. 26	Non-linear least squares analysis	TL
7.	Jan. 28	Partition Functions and Linkage I	TL
8.	Jan. 30	Partition Functions and Linkage II	TL
9.	Feb. 2	Assembly and Polymerization	TL
	Feb. 4	<b>No class</b>	
10.	Feb. 9	Physical Linkages	TL
11.	Feb. 11	Large Ligand Binding to Linear Lattices	TL
	<b>Feb. 13</b>	<b>Exam I – in class</b>	
12.	Feb. 16	Binding to Linear Lattices-cooperativity	TL
13.	Feb. 18	Macromolecular Transport (Sedimentation)	TL
14.	Feb. 20	Calorimetry	AK
15.	Feb. 23	Alternative Binding Methods	TL
16.	Feb. 25	Allostery	ED
17.	Feb. 27	Allosteric Models: MWC	ED
18.	March 2	Allosteric Models: KNF	ED
19.	March 4	Allosteric systems I	ED
20.	March 6	Allosteric systems II	ED
21.	March 9	Electrostatics, Simple Salts: Debye-Huckel Theory	TL
22.	March 11	Ion Binding to Proteins-Preferential interactions	TL
23.	March 13	Ion Binding to Nucleic Acids-I	TL
24.	March 16	Ion Binding to Nucleic Acids-II	TL
25.	March 18	Diffusion-controlled reactions	TL
26.	March 20	Target location, dimensionality reduction	TL
	<b>March 23-30</b>	<b>EXAM II – take home-due before class March 30</b>	
27.	March 30	Conformational equilibria: one-, two-step, multiple step	RG
28.	April 1	Recognition I: one-step	RG
29.	April 3	Recognition II: two-step	RG
30.	April 6	Recognition III: multiple steps	RG
31.	April 8	Recognition IV: allosteric systems	RG
32.	April 10	Practical aspects of “recognition” kinetics	RG
33.	April 13	Steady-state I: basic concepts, Michaelis-Menten	CF

34.	April 15	Steady-state II: multiple ligands	CF
35.	April 17	Data fitting and simulation of full time courses	CF
36.	April 20	Pre-steady state I: basic concepts, Michaelis-Menten	RG
37.	April 22	Pre-steady state II: active site titration, complex reactions	RG
38.	April 24	Practical aspects of pre-steady state kinetics	RG
39.	April 27	Mechanistic enzymology I: TS stabilization	PC
40.	April 29	Mechanistic enzymology II: dynamics and catalysis	PC

**Exams begin April 30 and end May 6th**

**May 3-May 8 EXAM III**