

Schedule for MBioS 304 Experiments, Fall 2008

This is a tentative schedule and is subject to change. Any schedule changes will be announced in class. There is no lab manual or textbook for this course. Protocols for the experiments will be posted on the WebCT site. It is the responsibility of each student to download, print out and study the protocol in time to complete required prelab assignments.

Week 1, 25 to 29 Aug

M, Tu session: Check in, lab orientation, safety training. Introduction, general methods, including pH and buffer preparation
(No lab Wednesday or Thursday; no lecture Friday)

Week 2, 1 to 5 Sept

M, Tu session: Labor Day—no lab
W, Th session: Basic Lab Methods
Lecture: Concentration determination methods/ Amino acid properties

Week 3, 8 to 12 Sept

M, Tu session: Glucose assay; Use of Excel to analyze data
(End of experiments to be used in 1st lab report)
W, Th session: Protein assays: Bradford, BCA, UV absorbance
Lecture: Chromatography & Electrophoresis ; Quiz 1: Buffer calculations

Week 4, 15 to 19 Sept

M, Tu session: Ion-exchange chromatography I—column preparation
SDS-PAGE I: make gels
M, Tu session: Ion-exchange chromatography II—protein separation
Lecture: Western blots
(Draft of 1st lab report due)

Week 5, 22 to 26 Sept

M, Tu session: SDS-PAGE II; Analysis of ion-exchange column fractions
M, Tu session: Western Blot 1
Lecture: Malate dehydrogenase ; Quiz 2: Amino acids
(Homework #1 due)

Week 6, 29 Sept to 3 Oct

M, Tu session: Western Blot 2
(End of experiments to be included in second lab report)
W, Th session: Make-up lab section
Lecture: Protein purification
(Final version of 1st lab report due)
(Lab notebook turned in: graded to SDS-PAGE II)

Week 7, 6 to 10 Oct

M, Tu session: MDH purification I – column and buffer preparation; basic MDH assay
W, Th session: MDH purification II—extraction and precipitations
Lecture: Enzyme assays, specific activity calculations
(Homework #2 due)

Week 8, 13 to 17 Oct

M, Tu session: MDH purification III—affinity chromatography

W, Th session: MDH purification IVa—enzyme assays for purification table, SDS-PAGE

Lecture: Enzyme catalysis and irreversible inhibition

(Draft of 2nd lab report due)

Week 9, 20 to 24 Oct

M, Tu session: MDH purification IVb—enzyme assays for purification table, SDS-PAGE

W, Th session: MDH, chemical modification

Lecture: Enzyme kinetics—Michaelis-Menten & Lineweaver-Burk; Quiz 3: Electrophoresis, chromatography

Week 10, 27 to 31 Oct

M, Tu session: MDH, chemical modification, pH dependence

W, Th session: Enzyme kinetics I—MDH, Michaelis Menten kinetics & Inhibitor studies

Lecture: Enzyme kinetics & inhibition

(Lab notebooks turned in: graded to MDH IVb)

Week 11, 3 to 7 Nov

M, Tu session: Enzyme kinetics II—MDH, Michaelis Menten kinetics & Inhibitor studies

W, Th session: Enzyme kinetics III—MDH, Michaelis Menten kinetics & Inhibitor studies

Lecture: X-ray crystallography, NMR and mass spectrometry

(Final draft of 2nd lab report due)

Week 12, 10 to 14 Nov

M, Tu session: No lab Veterans Day Holiday

W, Th session: Set up lysozyme crystallization

Lecture: Protein denaturation and stability; Quiz 4: Enzyme modification & kinetics

(Lab notebooks turned in: graded to Enzyme kinetics IIc)

Week 13, 17 to 21 Nov

M, Tu session: Check lysozyme crystals; Facilities Tour

W, Th session: Activity of immobilized peroxidase

Lecture: Protein Denaturation; Quiz 5: X-ray, NMR, mass spectrometry

(Homework #3 due)

24 to 28 Nov: Thanksgiving

Week 14, 1 to 5 Dec

M, Tu session: Protein denaturation I—chemical denaturation

W, Th session: Protein denaturation II—acid denaturation

Lecture: Review & Quiz 6: Protein modification and denaturation

Week 15, 8 to 12 Dec

M, Tu session: Lab Skills Final

W, Th session: Check out and lab cleaning

Lecture: Written Final

Important due dates (In general , late assignments will lose 10% of their value for each day that they are late—including weekend days.)

19 Sept	Lecture	Draft of 1 st Lab Report: The Glucose Assay
26 Sept	Lecture	Draft of 1 st lab report returned
26 Sept	Lecture	Homework #1: Amino acid titrations
29 Sept	437 Abelson	BEFORE noon; Early bonus submission of 1 st lab report
3 Oct	Lecture	Notebooks collected, graded through SDS-PAGE experiment
3 Oct	Lecture	Final version of 1 st lab report due
10 Oct	Lecture	Homework #2: Gel filtration & SDS-PAGE
17 Oct	Lecture	Draft of 2 nd Lab Report: Western Blot
24 Oct	Lecture	Draft of 2 nd lab report returned
31 Oct	Lecture	Notebooks collected, graded through MDH IV b
3 Nov	437 Abelson	BEFORE noon; Early bonus submission of 2 nd lab report
7 Nov	Lecture	Final version of 2 nd lab report
14 Nov	Lecture	Notebooks collected graded through Enzyme kinetics IIc
21 Nov	Lecture	Homework #3: MALDI analysis of peptide fragments
8 Dec	In lecture	Notebooks collected for final grading