MCB 102

"Survey of the Principles of Biochemistry and Molecular Biology"

Fall, 2015

Faculty Instructors:

Prof. Jeremy Thorner

Prof. Richard Calendar

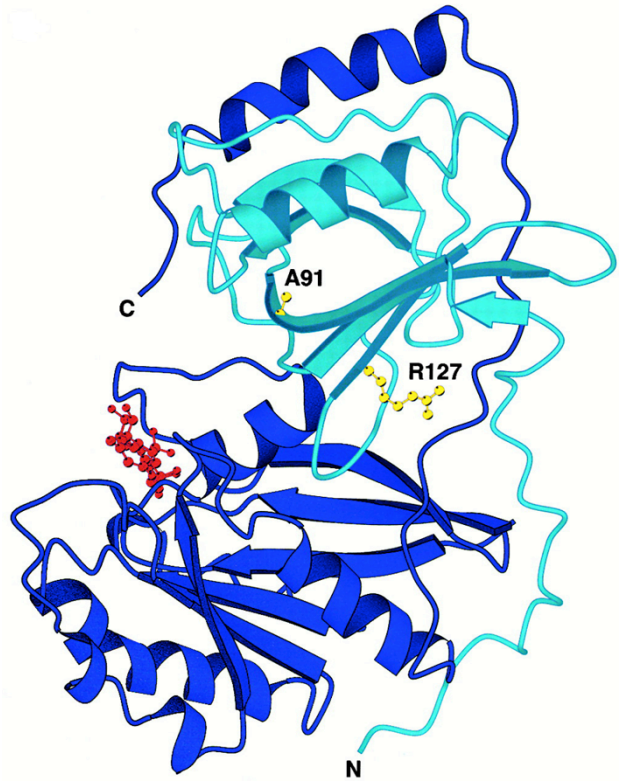
Asst. Prof. Nicholas Ingolia

GSIs: **Emma Carroll** **Janice Chen**

Oliver Davis **Robert Nichols**

Charlotte Nixon **Sasilada Sirirungruang**

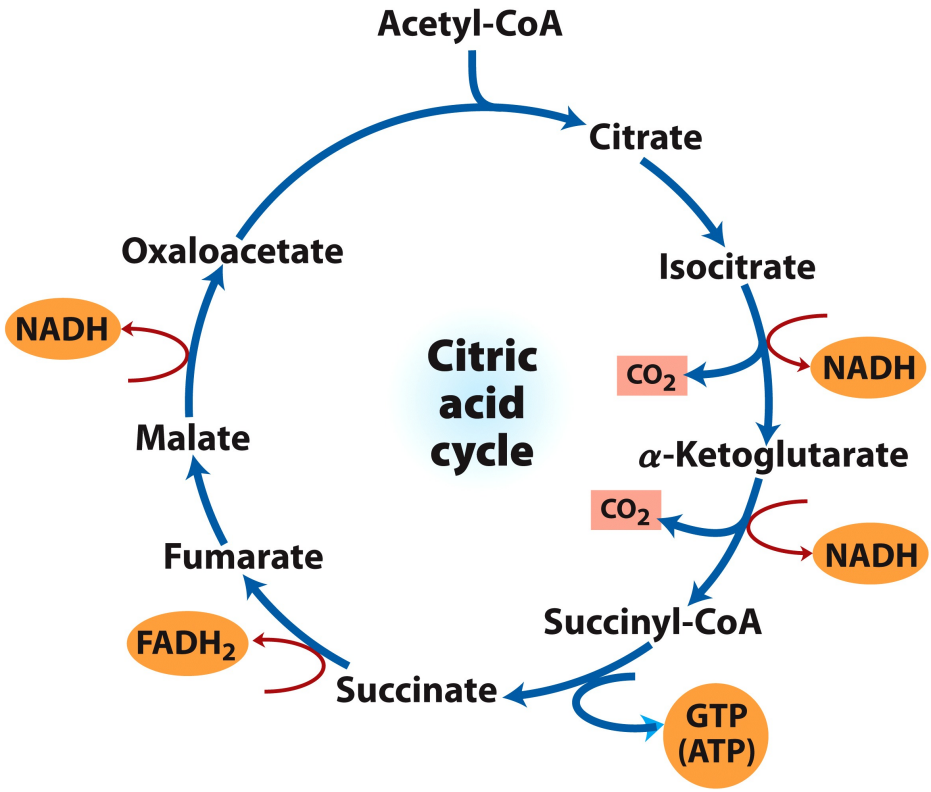
Ashley Thelen



MCB 102 - Part I - Fall, 2015
Instructor: Prof. Jeremy Thorner

Week	Day	Date	Topic	Reading*
1	M	08/24	—	vii; Ch. 1; Ch. 2
	W	08/26	Course overview; introduction to biochemistry	vii; Ch. 1; Ch. 2
	F	08/28	Properties of the amino acids; peptides and proteins	Ch. 3
2	M	08/31	Detecting and analyzing enzymes and other proteins	Ch. 3
	W	09/02	Protein purification and assessing protein purity	Ch. 3
	F	09/04	Protein sequencing and post-translational modifications	Ch. 3
3	M	09/07	HOLIDAY - Labor Day	—
	W	09/09	Physicochemical forces dictating protein structure	Ch. 4
	F	09/11	Protein structure and protein folding	Ch. 5
4	M	09/14	Structure-function relationships: globins	Ch. 5
	W	09/16	Enzymes and enzyme specificity	Ch. 6
	F	09/18	Enzymic catalysis and kinetic analysis	Ch. 6
5	M	09/21	Mechanisms of enzyme action: chymotrypsin	Ch. 6
	W	09/23	Enzyme regulation and allosteric control	Ch. 6
	F	09/25	Lipids and biomembrane structure and function	Ch. 10; Ch. 11
6	M	09/28	Monosaccharides and polysaccharides	Ch. 7
	Tu	09/29	**EXAM #1 (7 - 9:30 PM)**	—

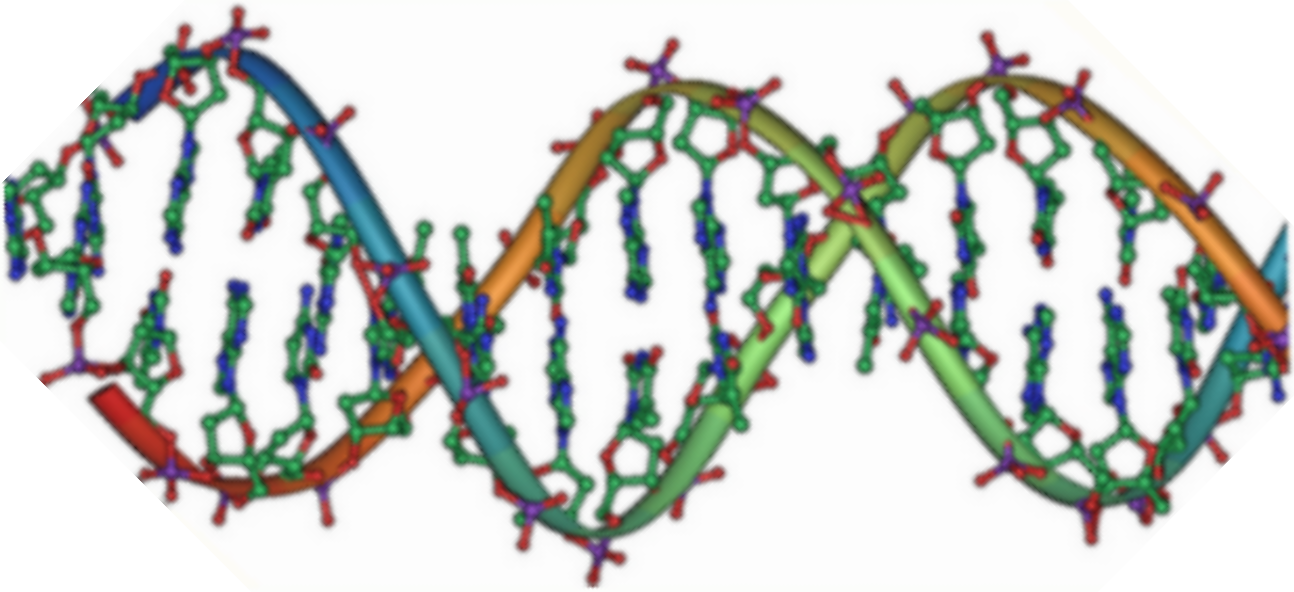
*All assigned reading is in Nelson & Cox
Lehninger Principles of Biochemistry, 6th Ed (2013).



MCB 102 - Part II - Fall, 2015
Instructor: Prof. Richard Calendar

Week	Day	Date	Topic	Reading*
6	W	09/30	Bioenergetics & biochemical reaction types	Ch. 13
	F	10/02	Glycolysis	Ch. 14
7	M	10/05	Pathways feeding into glycolysis; pentose phosphate shunt	Ch. 14
	W	10/07	Regulation of glycolysis & gluconeogenesis	Ch. 15
	F	10/09	Glycogen metabolism & its regulation	Ch. 15
8	M	10/12	Citric acid cycle (tricarboxylic acid cycle or TCA cycle)	Ch. 16
	W	10/14	Fatty acid catabolism	Ch. 17
	F	10/16	Amino acid oxidation & urea production	Ch. 18
9	M	10/19	Oxidative phosphorylation	Ch. 19
	W	10/21	Photosynthesis: light-driven energy-generating reactions	Ch. 19
	F	10/23	Photosynthesis: mechanisms of carbon fixation	Ch. 20
10	M	10/26	Fatty acid & cholesterol biosynthesis	Ch. 21
	W	10/28	Nucleotide synthesis & degradation	Ch. 22
	F	10/30	Review of metabolism	Your notes
11	M	11/02	**EXAM #2 (7 - 9:30 PM)**	—

*All assigned reading is in Nelson & Cox
Lehninger Principles of Biochemistry, 6th Ed (2013).



MCB 102 - Part III - Fall, 2015
Instructor: Asst. Prof. Nicholas Ingolia

Week	Day	Date	Topic	Reading*
11	M	11/02	The Central Dogma; Nucleic Acid Structure	Ch. 1.4, 8.1, 8.2
	W	11/04	Nucleic Acid Reactions	Ch. 8.3, 24.1
	F	11/06	DNA Topology; Chromatin	Ch. 24.2, 24.3
12	M	11/09	DNA Replication; Plasmids	Ch. 25.1
	W	11/11	*HOLIDAY - Veterans Day*	—
	F	11/13	DNA Repair and Recombination	Ch. 25.2, 25.3
13	M	11/16	Bacterial Gene Transcription and Regulation	Ch. 26.1, 28.1, 28.2
	W	11/18	Transcription and its Regulation in Eukaryotes	Ch. 26.1, 28.3
	F	11/20	RNA Processing; Reverse Transcription	Ch. 26.3, 26.3
14	M	11/23	The Genetic Code and Translation	Ch. 27.1, 27.2
	W	11/25	*"Non-Instructional Day*	—
	F	11/27	*HOLIDAY - Thanksgiving*	—
15	M	11/30	Protein Synthesis, Targeting and Degradation	Ch. 27.3
	W	12/02	MicroRNAs and Regulation of Translation	Ch. 28
	F	12/04	Genetic and Genome Engineering	Ch. 9.1, 9.2
RRR	M	12/07	—	—
	W	12/09	Review session (at normal time and place for this class)	Your notes
	F	12/11	—	—
Finals	M	12/14	**EXAM #3 (8 - 11 AM)**	Good luck!

*All assigned reading is Chapter & indicated Section in Nelson & Cox *Lehninger Principles of Biochemistry,* 6th Ed (2013).

SUMMARY OF EXAM DATES, PLACES & TIMES

EXAM #1 (Thorner):
TUESDAY, 29 September 2015, 7 – 9:30 PM
10 & 60 Evans, 101 Morgan, 159 Mulford,
105 North Gate, 2040 & 2060 VLSB (as needed)
Students assigned to rooms alphabetically by last name.

EXAM #2 (Calendar):
MONDAY, 2 November 2015, 7 – 9:30 PM
145 Dwinelle, 100 GPBB, 101 Morgan, 159 Mulford,
12040 & 2060 VLSB (as needed)
Students assigned to rooms alphabetically by last name.

EXAM #3 (Botchan):
MONDAY, 14 December 2015, 8 – 11 AM
Room(s) to be announced prior to Finals Week.

Any DSP student will be notified individually about her / his accommodation.

Basis of Assessing Student Performance in MCB 102

Three Exams (100 points each) =	300 pts.
Five (out of Six) Quizzes (6 points each) =	30 pts.
Disc. Session Attendance & Participation =	3 pts.
TOTAL =	333 pts.