

BIOCHEMISTRY 401**Spring 2019**

Instructors: Prof. M. Feig (MF; feig@msu.edu)
 Prof. J. Kaguni (JMK; kaguni@msu.edu)
 Prof. T. Zacharewski (TRZ; tzachare@msu)

M, Tu, Th, F; 9:10-10:00 a.m.
 E100 Vet. Med. Center

Teaching Assistant: Kelly Fader (kfader@msu.edu)

Recitation Wed; 9:10-10:00 a.m.
 A148 Plant and Soil Sciences

Office Hours: (MF) after class, 218 Biochemistry
 (TRZ, JMK) by arrangement
 (TA) Monday and Thursday, 5-7 pm, 502 Biochemistry

Text: Biochemistry, Garrett & Grisham, 5th ed.

Date		Chapter/Topic	G&G 5 th ed. pages
1/7/19	MF	1. Introduction	7-17
1/8	MF	2. Water, pH, and ion equilibria	30-50
1/10	MF	3. Thermodynamics	51-59
1/11	MF	3. Thermodynamics	59-74
1/14	MF	4. Amino acids	77-98
1/15	MF	4. Amino acids	77-98
1/17	MF	5. Proteins: primary structure and function	101-105,122-135
1/18	MF	6. Proteins: three-dimensional structure	141-188
1/21		Martin Luther King Jr. Day	No Class
1/22	MF	6. Proteins: three-dimensional structure	141-188
1/24	MF	13/14. Enzymes: Introduction; Transition State Stabilization	407-411,435-436, 447-455
1/25	MF	13. Enzymes: Kinetics part 1	134-135,411-423
1/28	MF	13. Enzymes: Kinetics part 2	411-423
1/29	MF	13/14. Enzymes: Inhibition and Pharmaceuticals	472, 423-429
1/31	MF	15. Enzyme regulation	481-503
2/1	MF	7. Carbohydrates	193-232
2/4	MF	7. Carbohydrates	193-232
2/5	MF	8. Lipids	233-255
2/7		EXAM 1 (includes Jan. 31 lecture)	
2/8	MF	8. Lipids	233-255
2/11	MF	9. Membranes	260-308

DNA STRUCTURE AND DNA TOPOLOGY

2/12	JMK	10. The composition of DNA and RNA	309-328 but not insets on 312, 325
2/14	JMK	11. DNA and chromosomes	341-363, 961-962 but not 352-3 on DNA quadruplex
2/15	JMK	11. tRNA; rRNA	365-374

THE THREE R'S: DNA REPLICATION, RECOMBINATION, AND REPAIR

2/18	JMK	28. Rules of DNA replication	947-950
		28. DNA polymerases	950-962
2/19	JMK	28. The replication fork	950-962
		28. RNA replication	963-964
2/21	JMK	28. DNA recombination	964-973 but not the part
		RecA, RecBCD, transposons	on 972 on fork restart
2/22	JMK	28. DNA repair	973-978
2/25	JMK	28. More DNA repair	973-978

TRANSCRIPTION

2/26	JMK	28. Mutations; mutagenesis	978-981
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2/28 EXAM 2 (includes Feb. 22 lecture, or as per instructor)

3/1	JMK	29. Bacterial transcription: initiation, elongation, and termination	993-1000
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SPRING BREAK (3/4-3/8)

3/11	JMK	29. Transcriptional regulation: <i>lac</i> , <i>ara</i> , and <i>trp</i> operons	1000-1011
3/12	JMK	29. Eukaryotic promoters, enhancers, and response elements	1011-1024
3/14	JMK	29. RNA processing in eukaryotes	1027-1036,
		29. Structural motifs	1024-1027

TRANSLATION

3/15	JMK	30. The genetic code; tRNAs and tRNA synthetases	1047-1057
3/18	JMK	30. Protein synthesis, ribosome structure	1057-1061
3/19	JMK	30. Mechanism of protein synthesis	1061-1080
3/21	JMK	31. Protein folding and translocation, degradation	1087-1099
3/22	JMK	31. Protein degradation	1099-1107

3/25	TRZ	17. Overview of metabolism	551-562
3/26	TRZ	17. Metabolic Energy	562-573
3/28	TRZ	17. Nutrition/vitamins	577-595
3/29	TRZ	18. Glycolysis	595-603
4/1	TRZ	19. TCA cycle	609-625
4/2	TRZ	19. TCA cycle	628-638
4/4	TRZ	20. Electron transport/oxidative metabolism	70-74,643-660
4/5	TRZ	20. Electron transport/oxidative metabolism	660-674
4/8	TRZ	22. Gluconeogenesis	719-731
4/9	TRZ	22. Gluconeogenesis and glycogen	719-731
4/11		EXAM 3 (includes April 5 lecture, or as per instructor)	
4/12	TRZ	22. Glycogen metabolism	731-744
4/15	TRZ	22. Pentose phosphate shunt	744-755
4/16	TRZ	23. Fatty acid catabolism	761-786
4/18	TRZ	24. Lipid metabolism	791-808
4/19	TRZ	24. Lipid metabolism	808-820
4/22	TRZ	24. Cholesterol & hormones	820-832
4/23	TRZ	24. Bile, steroids and nuclear receptors	833-837
4/25	TRZ	25. Nitrogen assimilation & metabolism	841-886
4/26	TRZ	25. Amino acid metabolism	841-886

FINAL EXAM: Tuesday, April 30, 12:45 pm - 2:45 pm, E100 VMC
Non-cumulative (emphasis on material covered since Exam 3 with some material carrying over from chapters 17-20)