EEMB150A/250A: Microbial Diversity I--Physiology and metabolism
Prof. Santoro and Jon Tarn - Winter 2020
B15 = Brock Biology of Microorganisms, 15th Ed.; Lehninger = Lehninger Principles of Biochemistry
Syllabus, v5 2 Mar 2020

Dates	Week	Lecture	Lab	150A Reading	Add'l 250A Reading	Assignment
7-Jan	1	Introduction to field and information resources; Review: Cell physiology and morphology	Lab safety, build Leeuwenhoek scope	B15, Ch. 1 and 2		
9-Jan		In class workshop - balancing chemical reactions		Lane 2006, B15 Ch. 3 (through 3.12)		
14-Jan	2	Thermodynamics I	Intro to sterile technique, subculturing, microscopy	B15 Ch. 14.7, B13 Appendix 1, Lehninger Ch. 13		
16-Jan		Thermodynamics II		B15 Ch. 3 (through 3.12); Lehninger Ch. 6		
21-Jan	3	Enzyme catalysis and kinetics	enrichment of purple non-sulfur bacteria, start Winogradsky columns	B15 Ch. 5; Ch. 19.1, 19.2	Maloney 1977	HW#1 due; final project topic must be approved by this day; bring glass vessel to lab for Winogradsky columns
23-Jan		Microbial growth and conservation of energy, Concepts of selective enrichment		B15 Ch. 14.1 - 14.5	Button 1978	
28-Jan	4	Growth continued; Chemoheterotrophy	luminescent bacteria enrichment, presentations of project ideas	B15 15.12		Prepare presentation on project topic
30-Jan		Chemoheterotrophic diversity by electron acceptor (paper discussion)		Myers and Nealson 1988; B15 14.13-14.15	Lovley and Phillips 1988	written media recipe for final project due
4-Feb	5	Photosynthesis and diversity of microbial C fixation pathways	make media for independent projects; wet mounts of Winogradsky columns (if ready)	B15 Ch. 15.1 - 15.8	Berg et al. 2010	HW#2 due (Wed); Single colony of luminescent bacteria
6-Feb		Anoxygenic photosynthesis		B15 Ch. 14.7 - 14.12; Ch. 15.9 - 15.15	Cohen et al. 1975	Lab notebook check (in lab)
11-Feb	6	midterm	Field trip to Arroyo Hondo Preserve to look for sulfur bacteria			
13-Feb		Chemolithoautotrophy	Field trip to Carpenteria Salt Marsh to look for microbial mats		Winogradsky 1890	
18-Feb	7	review midterm	independent project/isolations, wet mounts and subculturing of PNSB, wet mounts of Winogradsky columns			
20-Feb		In class assignment (replaces HW#3)				HW#3-in class assignment
25-Feb	8	C1 metabolism	independent project/isolations, wet mounts and subculturing of PNSB, wet mounts of Winogradsky columns	B15 Ch. 14.16 - 14.18	Daniels et al. 1977; King & Weber 2007	Lab notebook check (in lab)
27-Feb		Fermentation, methanogenesis and syntrophy		B15 Ch 14.19 - 14.23; Schink 2002	Evans et al. 2015	
3-Mar	9	Microbial taxonomic diversity and 16S rRNA based approaches (paper discussion)	Absorption spectra of purple non-sulfur bacteria; DNA extraction from single colonies	B15 13.7 - 13.11; Woese and Fox 1977		
5-Mar		Hydrogen-based ecosystems (paper discussion)		Spear et al. 2005		HW#4 in class; Single colonies of PNSB due
10-Mar	10	Early Earth and the origin and diversification of life	independent project/isolations, PCR	B15 Ch. 13, Spang 2017		
12-Mar		Origin of eukaryotes and microbial eukaryotic diversity		B15 Ch. 18, Keeling and del Campo 2017	Blattner et al. 1997	HW#5 due