

		Date		Topics	Assignment
1	AS/ SM	Th	9/1	Overview of microbial genetics and physiology Microbial gene pool: chromosomes, plasmids, and phage	
2	AS	Tu	9/6	Bacterial chromosome: DNA replication initiation, termination, segregation; supercoiling and topoisomerases (pulse labeling)	Post Hwk 1
3	AS	Th	9/8	Plasmid replication, partitioning, and copy-number control	
4	AS	Tu	9/13	Replication errors, mutations, and DNA repair; spontaneous mutations (temp conditional mutants), mutator strains, mutagens, and SOS	Discuss Paper 1
5	AS	Th	9/15	Genetic analysis: mutant isolation (selections, screens, enrichments) and complementation (dominance)	
6	AS	Tu	9/20	Reversion and suppression; informational and physiological suppressors	
7	AS	Th	9/22	Homologous recombination	
8	AS	Tu	9/27	Genetic exchange: mechanism of transformation and conjugation	Hwk 1 due Post Hwk 2
9	AS	Th	9/29	Conjugation (con't): Hfrs and genetic mapping	
10	AS	Tu	10/4	Genetic exchange (con't): lytic growth of phages, generalized transduction	Discuss Paper 2
11	AS	Th	10/6	Transcription: initiation and termination; polycistronic mRNA Translation: initiation and termination; Rho-dependent polarity	
12	AS	Tu	10/11	Regulation of gene expression: possible levels of regulation; On/off by site-specific recombination ( <i>hin</i> )	
13	AS	Th	10/13	Transcriptional regulation: repression ( <i>lac</i> operon; <i>lexA</i> & SOS regulon)	
14	AS	Tu	10/18	Transcriptional regulation (con't): activation ( <i>ara</i> operon; cAMP control)	Hwk 2 due
15		Th	10/20	<b>Midterm exam</b>	
16	SM	Tu	10/25	Transposons and transposition mechanisms	
17	SM	Th	10/27	Regulation of transposition	
18	SM	Tu	11/1	Genetic approaches to study regulation: operon and gene fusions	Discuss Paper 3
19	RE	Th	11/3	Genomic sequencing; sequence comparisons (BLAST); codon usage; what you can and can't learn from sequence analysis;	
20	Online	Tu	11/8	Reverse genetics and site-specific mutagenesis: when, why, how	
21	Cassel	Th	11/10	Molecular approaches to identify DNA-binding sites (gel shift, footprinting) and transcriptional regulation (microarrays, N-blot, RT-PCR)	
22	SM	Tu	11/15	Environmental sensing via two-component regulatory systems and phosphorylation (two-hybrid systems and FRET)	
23	SM	Th	11/17	Integrating regulatory mechanisms: Lysis-lysogeny decision in $\lambda$ (anti- termination, repression, activation, retroregulation)	Post Hwk 3
24	SM	Tu	11/22	Lysis-lysogeny decision (con't); integrating the decision with cell physiology (Hfl/FtsH and cAMP; FIS); examples and problems	
<b>25</b>		<b>Th</b>	<b>11/24</b>	<b>Thanksgiving</b>	
25	SM	Tu	11/29	Phenotypic conversion – toxins and other phage-encoded (virulence) factors	Hwk 3 due Post Hwk 4
26	SM	Th	12/1	Beyond the cytoplasm: structure, function, synthesis of cell envelope ( <i>phoA</i> <i>vs lacZ</i> fusions); Protein secretion ( <i>sec vs tat</i> ; synthetic mutations)	Discuss Paper 4
27	SM	Tu	12/6	Sensing the extracellular environment ( <i>cpx</i> and <i>rse</i> ), Flagella	
28	SM	Th	12/8	The bacterial cytoskeleton (Gfp fusions)	Hwk 3 due
29	SM	Tu	12/13	Bacterial differentiation (sporulation) or “overflow”	
		<b>Tu</b>	<b>12/20</b>	<b>Final Exam 1:00 – 2:30 PM</b>	

