

Microbial Genetics and Physiology 2018 Schedule

M-F: 9:00-10:30 AM, MSB 1.180

Block I

Week 1 (1/8-1/12): Bacterial genetics (Kaplan)

- Screens, Selections, and Inheritance
- Genetic Analysis of the Lac Operon
- Mapping mutations
- Learning activity: Three factor crosses and complete Table 4 Mapping by Hfr and co-transduction

Week 2 (1/16-1/19): **HOLIDAY MONDAY** Bacterial cell structures (Ton-That)

- Cell biology of bacteria and phage
- Cytoskeleton, membrane and cell wall

Week 3 (1/22-1/26): Growth, Division and Signaling (Margolin (.75), Kaplan (.25))

- Cell Division in Prokaryotes
- Cell cycle regulation
- Cell division and growth rate

Week 4 (1/29-2/2): Metabolism (Ling)

- Central biochemical pathways
- Respiration, fermentation, and anaerobiosis
- Nutrient uptake

Week 5 (2/5-2/9): Fungal genetics and cell biology (Kim (.75), Van Hoof (.25))

- Classical and reverse genetics of fungi
- High-throughput genetic analysis in yeast
- Mating and differentiation
- Yeast Genetics to Human Disease: Yeast as a model eukaryote

Block II

Week 6 (2/12-2/16) Wonderful world of parasites (Li)

- Parasite life cycle and biology
- Genetic methods in parasites

Week 7 (2/20-2/23): **Holiday Monday** Bacterial gene expression (highlighted via nutrient sensing and response) (Koehler (.50), De Lay (.50))

- General mechanisms of nutrient sensing and response
- Catabolite repression
- Stringent response and oxidative stress

Week 8 (2/26-3/2): Molecular machines and bacterial secretion (Christie)

- General secretory pathways
- Post-secretory protein modification
- Intracellular compartments and protein sorting
- Intracellular vesicular trafficking, secretion and endocytosis

Week 9 (3/5-3/9): Stress response (De Lay (.50), Morano (.50))

- The general stress response activator: small RNAs
- Promoting tolerance: protein folding and heat shock response (protein methods: pulse-chase labeling, protein gels etc.)

GSBS SPRING BREAK (3/12-3/16)

Week 10 (3/19-3/23): Differentiation and Multicellularity (Margolin (.75), Kaplan (.25))

- Cell differentiation
- Sporulation
- Biofilms
- Symbiosis

Block III

Week 11 (3/26-3/30): Microbial virulence – what is it and how do we study it? (Lorenz (.50), Garsin (.50))

- Defining and measuring virulence
- Using model hosts to identify virulence factors
- Genetic and genomic approaches for identifying virulence factors

Week 12 (4/2-4/6): Virulence mechanisms (Koehler)

- Adherence and invasion
- Toxins
- Translocated effectors

Week 13 (4/9-4/13): Antimicrobial immunity (Norris)

- Innate immunity system
- Adaptive immunity system
- Immune evasion

Week 14 (4/16-4/20): Microbiome (Krachler (.75), Van Hoof (.25))

- Microbiome profiles of disease, treatment response, and environmental changes
- Mechanisms for combatting microbial infections
- Methods for study

MMG RETREAT WEEK (4/23-4/27, retreat is 4/26-4/27)

Week 15(4/30-5/4): Mechanisms for combatting microbial infections (Garsin, Arias)

- Antimicrobials and resistance
- Vaccination

Last day of semester 5/4