Week 7 The Human Microbiome

Learning Goal: Understand how hosts can influence their microbiome and how the microbiome can influence its host.

After completing the pre-class assignments, students will be able to…

- Define and differentiate between the terms microbiome, microbiota, metagenome, and holobiont
- Explain how and when the human microbiome is formed
- Describe how major life events influence the microbiome
- Identify selective pressures present in the developing and adult microbiome

After this class meeting students will be able to…

- Explain in general terms how 16S rDNA sequencing data is collected
- Differentiate between alpha diversity and beta diversity
- Interpret 16S rRNA gene sequencing data
- Interpret data relating to microbe-microbe and microbiota-host interactions
- Describe ways in which the host can alter the microbiota and vice versa
- Discuss what constitutes a “healthy” microbiome

Week 7 Immune System

Learning Goal: Understand the difference between innate and acquired immunity

After completing the pre-class assignments, students will be able to…

- Define pathogen
- Differentiate between adaptive and innate immunity
- Explain the ability of the innate immune system to combat a variety of pathogens.
- Describe inflammation and why this is sometimes observed with injury

After this week’s class meeting, students will be able to…

- Relate exposure to pathogens to triggering the adaptive immune system for B-cell development
- Compare and contrast what happens during primary and secondary immune responses
- Evaluate the effect of immunizations on immune system development
- Describe the structure and function of an antibody
- Explain how the process of VDJ recombination leads to the production of a diverse set of antibodies
- Describe in general terms how the gut microbiome contributes to immune system health
- Predict the type of immune response a particular pathogen would likely elicit