

## Week 6 Osmoregulation

**Learning Goal:** Understand how the structure and function of the kidney allows mammals to maintain fluid balance while removing nitrogenous waste.

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

- Define the terms osmolarity, tonicity, hypertonic, hypotonic, and isotonic.
- Compare and contrast different forms of nitrogenous waste and their effect on osmotic balance.
- Explain what is meant by the phrase counter-current multiplier.
- Describe the structure and function of the mammalian kidney.
- Relate water and ion movement through the nephron
- Differentiate between passive and active transport as filtrate moves through the nephron

After this class meeting students will be able to

- Relate water balance and kidney function to changes in blood pressure.
- Predict how altering osmolarity or membrane permeability in the nephron will affect kidney function.
- Evaluate the effect of hormones (e.g., ADH and aldosterone) and drugs on the function of the kidney.
- Predict how water will move if the osmolarity of cells or body fluids is altered.

## Week 6 Nutrition, Digestion, and Absorption

**Learning Goal:** Understand how food is broken down and absorbed by the body through the process of digestion.

After completing the pre-class assignments, students should be able to...

- Relate food consumption to energy acquisition.
- Describe the process of digestion as food moves through the stomach, duodenum, and small intestine.
- Discuss the role of enzymes and other secreted molecules throughout the process of digestion.
- Describe how and where different nutrients are absorbed.

After this class meeting, students will be able to...

- Evaluate how changes in cellular physiology (i.e. altering transporters or cell-cell adhesions) could affect nutrient absorption.
- Explain the role of hormones in regulating the digestive system.
- Predict how altering the release of hormones or digestive enzymes will affect digestive processes such as the break down and absorption of nutrients.
- Relate the processes of digestion, nutrient absorption, and energy acquisition to homeostasis.