

## Human Physiology - Exam 4 Study Guide

Immunology

- Compare specific vs. non-specific defenses
- Describe inflammation and fever
- Describe the function of the immune system cell types as discussed in class
- Compare B and T lymphocytes: how they are made, what they do
- Define 'antigens' and 'antibodies' and 'immunocompetence'
- Describe the differences between cell-mediated and humoral immunity
- Compare active vs. passive immunity
- How do vaccines work? Why is the Hepatitis B vaccine so different?
- What is antigenic stability? How does it relate to the difficulty of making a vaccine for HIV?
- Describe primary and secondary immune responses
- What are monoclonal antibodies and what do we use them for?
- Compare immunodeficiencies and autoimmune diseases
- Why did improvements in hygiene lead to increases in polio cases? (from video)

Digestive Physiology

- What is the advantage of having a one-way gut?
- What are the functions and challenges of the digestive system?
- Describe the processes of digestion, absorption, motility and secretion
- Understand the organization, general and microscopic anatomy (tunic layers) of digestive system components
- Describe the functions and secretions of each part of the GI tract: esophagus, stomach, small intestine, large intestine
- Why are so many GI secretions produced as zymogens?
- What is the purpose of the low pH environment in the stomach?
- How does the stomach prevent it's own digestion?
- Accessory organs: know what they do / produce: liver, gallbladder, pancreas, salivary glands
- Digestive system disorders

Renal Physiology

- Anatomy and microanatomy of kidney, nephron
- What are the functions of the kidney?
- What is bladder plasticity?
- Why are UTIs more common in women than in men?
- Name and describe the four processes involved in urine formation
- Describe the process of glomerulus function and the regulation of GFR
- Describe the reabsorption of salt and water throughout the nephron - make sure you understand what happens where, which region is permeable to water and ions, etc.)
- What is a countercurrent system and how does it work?
- Describe the function of vasopressin on the nephron
- Describe the renin-angiotensin-aldosterone system
- What accounts for the variability of urine osmolarity? (How is it regulated)?

Reproductive Physiology

- What is the advantage of sexual reproduction? (biologically!)
- How is gender determined in humans?
- Why are the testes outside the body cavity?
- Describe the erection reflex
- Describe the exocrine and endocrine secretions of the testes and ovaries
- What fluids are secreted with the sperm? Functions of each?
- Compare male vs. female reproductive hormones
- Compare and contrast spermatogenesis and oogenesis
- What is the significance of female reproductive tract discontinuity?
- Describe the female menstrual cycle: hormones, secretions, uterus and ovary stages
- Contraceptive methods: how they work, which are most effective?
- Clinical conditions as discussed in class
- Aphrodisiacs? For real?