Review sheet for exam II

WARNING: I have tried to be complete, but I may have missed something. You are responsible for *all* the material discussed in class. This is only a guide.

NOTE: the extra material I provided is *not* on this review sheet (you are *still* responsible for this).

1) Circulatory system:

- Be familiar with capillary function. How can capillary beds be turned on and off? What is the advantage of this? What is the danger from anaphylactic shock?

- What is the lymphatic system? What does it do? Where does it put lymph? What can happen if lymph vessels get blocked? How is lymph moved?

- What % of blood is living? Non-living? What are the components of blood? How many molecules of hemoglobin in a red blood cell? What are stem cells (in regard to blood)? What can happen if they do not work correctly?

- What triggers blood clotting? What are the steps in blood clotting? Why would you want two steps here?

2) Heart disease:

- Know the risk factors for heart disease. Are they the same as for hypertension? Which factors can you control? Which can you not control? Why? What effect do these factors have?

- What are the different kinds of heart disease discussed in class? What is a heart attack (what are coronary arteries)? What is a stroke? Why are these so serious?

3) Immune system:

- What is a immune response? What are non-specific defenses? What defenses non-specific defenses do you have? How can non-specific defenses destroy bacteria or viruses (careful here - some defenses only work on one or the other). What happens after a cut? What are phagocytes? Macrophages? What is an inflammatory response? Make sure you can describe all steps in this response. Understand complement proteins and interferon.

- What function does the lymphatic system play in the immune system? What are lymphocytes? Lymph nodes?

- What is an antigen? Antigenic determinant? Antibody? Know how B and T cells develop and where they develop. How many different kinds of B and T-cells do we have (i.e., how many antigenic receptors do we have)?

- How do B-cell defenses work? What is an effector cell? What are memory cells? Clones? Why is the immune response so much faster the second time you are exposed to a specific antigen? What do effector cells make?

- Know the structure and function of antibodies (in what four ways do they help the immune system? What role do phagocytes play in all of this?

- How do T-cells work? How can they attack infected body cells? What are APC's? What does a helper T-cell do when presented with an antigen? What are cytotoxic T-cells and how do they kill cells? Can T-cells attack things other than viruses and bacteria?

- Why are organ transplants so difficult? What happens when the immune system attacks your own body? Be able to recognize and give some examples. What happens when the immune system overreacts to harmless antigens (e.g. pollen)? What is one possible very serious outcome of allergies? What does the immune system do when it overreacts?

- What is the problem with AIDS? How is it different from HIV? Can AIDS be cured? treated? How does the virus overwhelm the immune system? What parts of the immune system are attacked?

- What does malaria do? What are some symptoms? How is the immune system compromised by the malaria parasite? When can the immune system find the malaria parasite? What is the problem with drugs for malaria?

4) Osmoregulation and excretion

- What is diffusion? Osmosis? What problem do aquatic animals face? What are osmoconformers? osmoregulators? How are things different for a salt water and fresh water animal? How do they deal with their environment?

- What problem do terrestrial animals face? How do they restore and conserve water?

- What substances are excreted? How are the three substances different? How do mammalian kidneys work?

- understand the structure and function of mammalian kidneys. What is a nephron? Be able to describe what happens in each of the following: bowman's capsule, glomerulus, proximal tubule, loop of Henle, distal tubule, collecting duct.

- what happens to the filtrate in each step? What role does osmosis play? Active transport? What is special about the membrane in the collecting duct?

- What is the role of ADH in the kidney? Be able to diagram all parts in the ADH pathway. What happens when there is too much salt in the body? Not enough? What

does alcohol do to this pathway?

- What is the RAAS pathway, and why is it important (you do not need to know all the steps in this pathway, just what it does and what it responds to).

5) Hormones

- What is a hormone? What are endocrine glands? Exocrine glands (you only need to know what they are, nothing else)?

- What hormones are made by the anterior pituitary? The posterior pituitary? (Note: the posterior pituitary doesn't actually make any hormones - why?)? What does each of the hormones do that is released by the pituitary? What is the function of the hypothalamus in all this? How is this different in the anterior vs. posterior pituitary?

- Know what the pineal gland does.

- What hormones does the thyroid release? The parathyroid? What do these hormones do? What do the thyroid and parathyroid respond to?

- How is blood sugar controlled? What is the role of insulin? glucagon? Where are these hormones made and how do they work? What kinds of diabetes are there? What does diabetes do to the body? To the cells? What are the symptoms of diabetes?

- What is the difference between the adrenal medulla and the adrenal cortex? How do these differ in their response to stress? How do different kinds of stress affect the adrenal glands? What do corticosteroids do? What are the advantages/disadvantages of cortisone?

6) Reproduction

- what is the difference between sexual and asexual reproduction? What kinds of asexual reproduction are there? Be able to give examples of each. What is parthenogenesis? What kinds of animals have parthenogenesis? Why do some organisms switch between sexual and asexual reproduction?

- what is a hermaphrodite? Why would an animal be a hermaphrodite? What is sequential hermaphrodism?

- what kinds of fertilization are there? What different kinds of birth do vertebrates have? what are gonads? gametes?

- Understand all parts of the male reproductive system. Make sure you know what each of the following parts does: testes, epididymis, vas deferens, seminal vessicles, prostate gland, urethra, ejaculatory duct, bulbourethral (= Cowper's) gland. What do the various gland contribute to the sperm? What is the composition of semen? What is the problem

that most men have with the prostate gland as they get older?

- Understand the parts of the female reproductive system. What do the following do: ovaries, follicles, oviducts (= fallopian tubes), uterus, cervix, vagina, endometerium? Make sure you understand follicles and their role in ovulation.

- How do hormones contribute to the formation of secondary sexual characteristics? What are primary and secondary sexual characteristics?

- What is an estrous cycle? Make sure you know how the menstrual cycle works. What does FSH do? LH? estrogen? progesterone? How do they interact? What effect do they have on follicles? On the uterine lining? What is the Corpus luteum and what does it do? Make sure you thoroughly understand all parts of this cycle!

- What happens during pregnancy? What is the role of estrogen during pregnancy? What is the placenta? What does oxytocin do? prostaglandins? What triggers the contractions associated with birth?

- Where does the infant get its immunity? Why doesn't the mother's immune system attack the infant (hint: we don't know!!)? What are the advantages of breast feeding?

- How does meiosis differ in the formation of sperm and egg (you don't need to know the details, just the outcome)?