

Comments and Study Questions for Campbell, pp 922-942 (Excretion)

General Biology 2
Spring 2008

General Comments: Some of the material we will cover on the kidney is quite easy and other parts are very difficult for most students. You would be well advised to learn the easy stuff (anatomy and what happens where) as quickly as possible so that you "have it" when doing the more difficult material that we will dwell on in class. **DO NOT PUT THIS OFF TILL THE TIME WHEN YOU ARE SUPPOSED TO BE REVIEWING FOR THE EXAM.**

Terms: renal artery, renal vein, ureter, urinary bladder, urethra, renal cortex and renal medulla, nephron, cortical nephron, juxtamedullary nephron, Bowman's capsule, glomerulus, proximal and distal (convoluted) tubules, collecting ducts, renal pelvis, loop of Henle, afferent and efferent arterioles, peritubular capillaries, anti-diuretic hormone, renin-angiotensin system.

Questions and suggestions for reading:

1. Review osmosis and concepts of conformity and regulation. There is no reason beyond general interest in the natural world (I hope) to concentrate on pp 923 to the first half of 925. Do read the section on land animals carefully -- in particular note the sections on water sources and water balance. Read page 926 for interest.
2. What is the ultimate source of all nitrogenous waste? What are the main forms of nitrogenous wastes in animals – e.g., fish, birds and reptiles, and mammals? Why are urea and/or uric acid produced instead of simply eliminating ammonia?
3. To get a general idea about all excretory systems read the overview of systems on pp 928 and the first half of 929 carefully. It is not important to concentrate on p. 929 (starting with the survey of animal excretory systems) and 930.
4. Carefully review the structure of the kidney and associated circulation and other organs. See term list above. In particular look at the diagrams on pp. 932-933.
5. Read the sections on filtration, the proximal and distal convoluted tubules and collecting ducts as an overview (pp 933-34.) We will cover these in more detail in class.
6. Page 935 gives as an excellent overview of the counter-current multiplier system of the loop of Henle in juxtamedullary nephrons. We will not spend much time on its operation in class but you may find this section useful in your studies for the MCAT. Otherwise, concentrate on how urine is concentrated and how this is controlled by hormones; we will go over this in more detail in class.