

**Section 41-3 The Excretory System**

(pages 908-911)

**SECTION REVIEW**

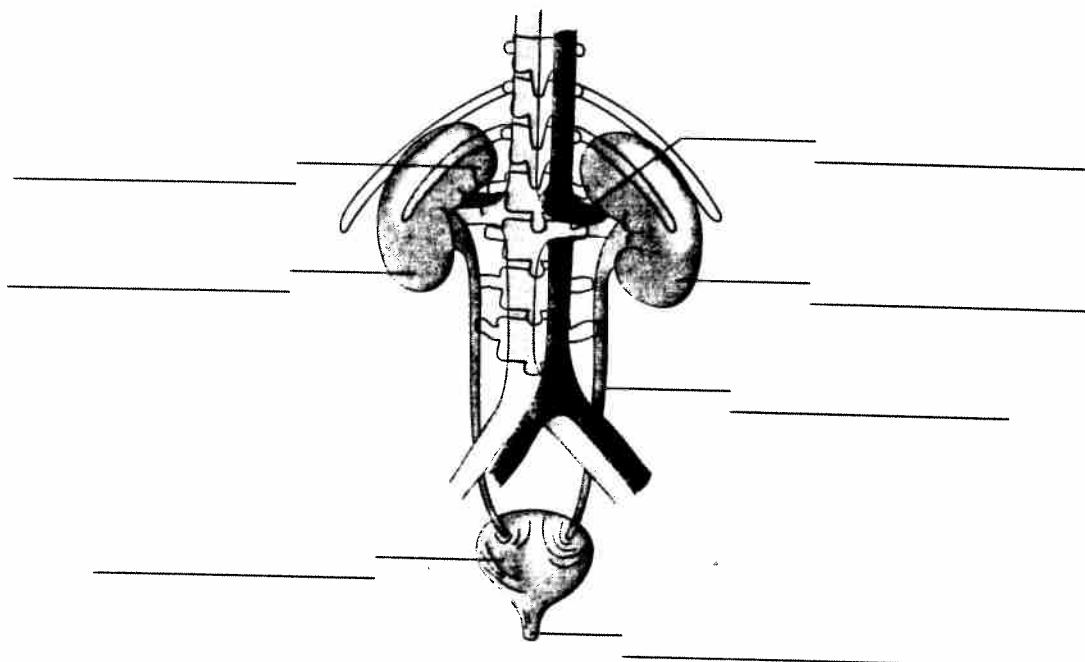
In this section you learned that the excretory system removes waste materials from the body. The lungs eliminate the waste gas carbon dioxide, and the skin excretes excess water and salts in the form of sweat. But the main organs of the excretory system are the kidneys. The two kidneys function to filter the blood of excess water, urea (a toxic compound produced when amino acids are used for energy), and other waste materials. The kidneys keep the composition of the blood constant.

In this section you learned about the structure of the kidneys. Each kidney can be divided into two distinct regions: the renal medulla and the renal cortex. The renal cortex contains about 1 million nephrons. Nephrons are the structures that actually carry out the purification of the blood. As blood enters a nephron, it passes into a network of capillaries

called the glomerulus. The fluid from the blood diffuses through the capillary walls into Bowman's capsule. Impurities are filtered out and enter a collecting tubule. Much of the fluid that diffuses from the capillaries is reabsorbed by the blood. Reabsorption takes place in the loop of Henle, where important minerals such as sodium and potassium; nutrients such as amino acids, sugars, and fats; and water are removed from the fluid and reabsorbed through the walls of the capillaries and back into the bloodstream. The filtered waste material, urine, is concentrated in the loop of Henle, where a specialized system helps conserve water and minimize the amount of urine requiring excretion. Urine passes from the kidneys to the urinary bladder, where it is held until it is excreted by the body through the urethra.

**The Excretory System: Labeling Diagrams**

1. Label the diagram of the excretory system shown below.



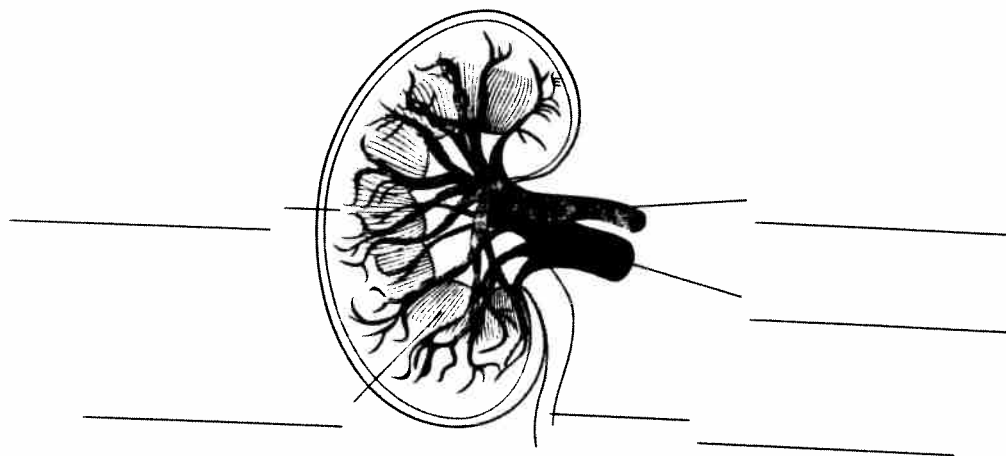
Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

2. Use the diagram on the previous page to match the parts of the excretory system to their function.

- a. Carries urine from the kidneys to the urinary bladder: \_\_\_\_\_  
\_\_\_\_\_
- b. Carries waste-laden blood into the kidneys: \_\_\_\_\_  
\_\_\_\_\_
- c. Purifies blood by removing excess water, urea, and other waste products: \_\_\_\_\_  
\_\_\_\_\_
- d. Collects and stores urine until it is excreted from the body: \_\_\_\_\_  
\_\_\_\_\_
- e. Carries purified blood from the kidneys toward the heart: \_\_\_\_\_  
\_\_\_\_\_
- f. Provides a passageway for urine as it leaves the body: \_\_\_\_\_  
\_\_\_\_\_

### The Kidneys: Relating Structures and Functions

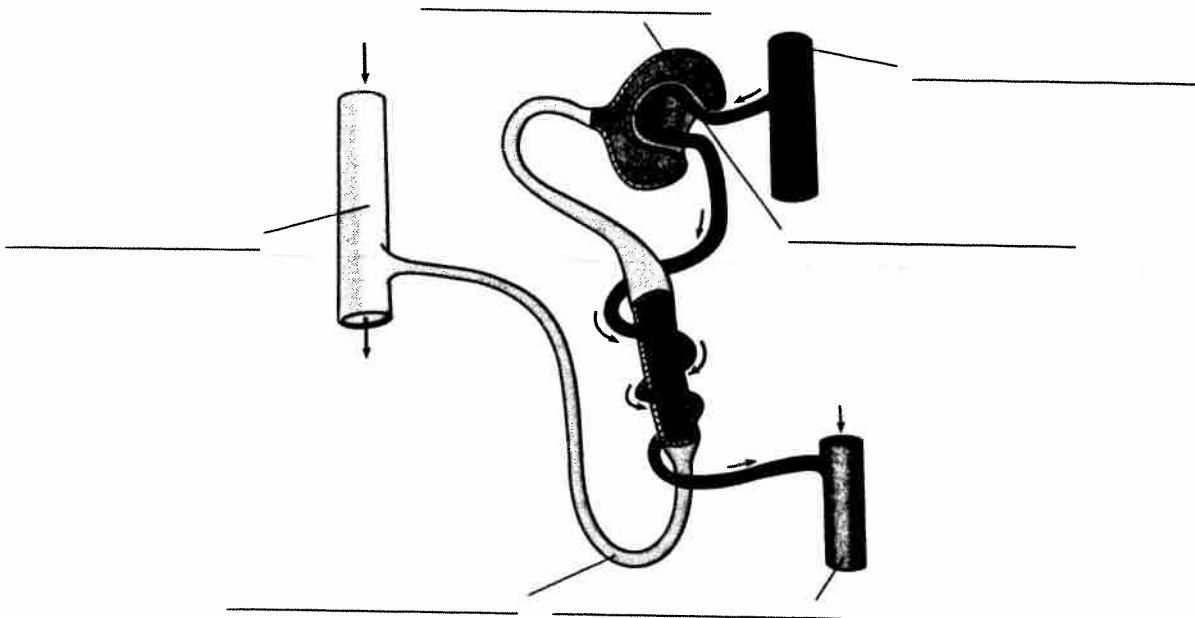
1. Label the diagram of the kidney shown below.



2. Which structure in the kidney actually carries out the purification process?

\_\_\_\_\_

3. Use the following terms to complete the accompanying diagram: *Filtration, Reabsorption, Arteriole, Venule, Bowman's capsule, Glomerulus, Loop of Henle, and Collecting tubule.*



Use the diagram you have just completed to help answer the following questions.

4. Where does the process of filtration take place? \_\_\_\_\_  
\_\_\_\_\_
5. What substances diffuse into Bowman's capsule? \_\_\_\_\_  
\_\_\_\_\_
6. What substances are reabsorbed into the blood? \_\_\_\_\_  
\_\_\_\_\_
7. Where does the process of reabsorption take place? \_\_\_\_\_  
\_\_\_\_\_
8. What substances are excreted as urine? \_\_\_\_\_  
\_\_\_\_\_

### Concept Mapping

The construction of and theory behind concept mapping are discussed on pages vii–ix in the front of this Study Guide. Read those pages carefully. Then consider the concepts presented in Section 41–3 and how you would organize them into a concept map. Now look at the concept map for Chapter 41 on page 402. Notice that the concept map has been started for you. Add the key facts and concepts you feel are important for Section 41–3. When you have finished the chapter, you will have a completed concept map.

Biology 12

Urinary System

Contrast blood in the renal artery and the renal vein with respect to the following: ("High" or "Low")

Substance	Renal artery	Renal vein
(1) glucose		
(2) urea		
(3) Ammonium ( $\text{NH}_4^+$ )		
(4) Amino Acids		
(5) $\text{Na}^+$		
(6) $\text{Cl}^-$		
(7) Protein		
(8) oxygen		
(9) Water		