

BIOLOGY

SHORT STUDY NOTES

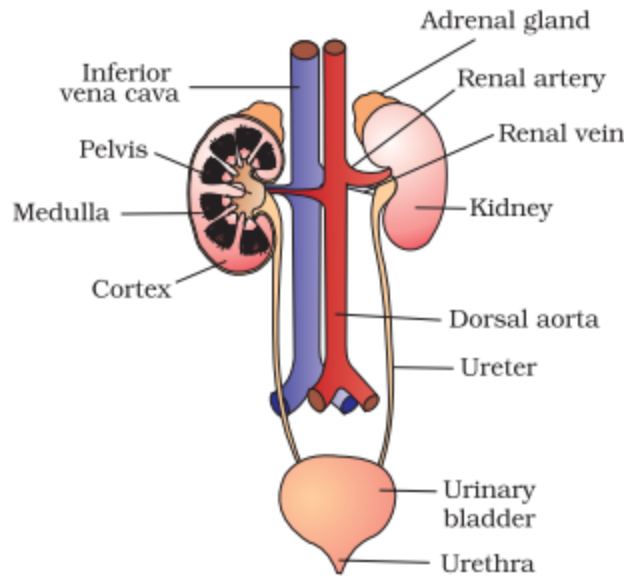
**EXCRETORY
SYSTEM**

CLASS 11

BY LEARNINGMANTRAS.COM

Excretory System

The excretory system is the system of an organism's body that performs the function of excretion, the bodily process of discharging wastes. The Excretory system is responsible for the elimination of wastes produced by homeostasis. There are several parts of the body that are involved in this process, such as sweat glands, the liver, the lungs and the kidney system.



Functions of Excretory System

- Eliminating waste products such as urea, uric acid ammonia, and other chemical products via urine.
- Maintaining the osmotic level of blood and plasma.
- Maintaining the electrolyte balance in the body.
- It helps in the metabolism of those drugs that do not get metabolized in the liver.

Parts of Excretory System

- 2 Kidneys
- 2 Ureters
- 1 Urinary bladder
- 1 Urethra

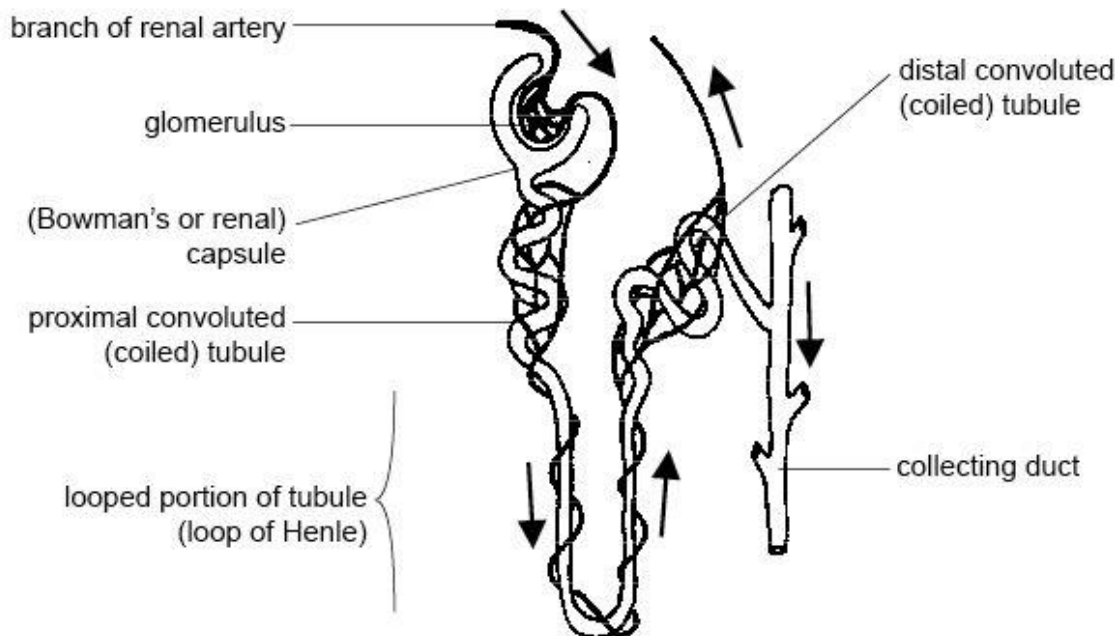
Kidneys

- The Kidneys are located in the abdominal cavity, situated below the level of last thoracic and third lumbar vertebra close to the dorsal inner wall of the abdominal cavity.
- Each kidney is reddish brown.

- The right kidney is lower and smaller than the left kidney because the liver takes up much space on the right side.
- The outer surface of each kidney is convex, and the inner surface is concave, where it has a notch called hilum.
- Each kidney has three protective covering that is renal fascia (outermost layer), the adipose layer and then renal capsule (innermost layer).
- Inside the kidney, outer cortex and inner medulla region are present. The medulla is divided into a few conical masses called Medullary Pyramids.
- The cortex extends in between the pyramids as the renal column is called the Column of Bertini.
- Each kidney has nearly 1 million Complex structures called nephrons which are the functional unit.

Structure of a Nephron

Each kidney consists of millions of nephrons. They all function together to filter blood and expel waste products. It consists of the following parts:



- **Bowman's capsule:** It is the first part of the nephron. It is a cup-shaped structure and receives blood vessels. Glomerular filtration occurs here. The blood cells and proteins remain in the blood.
- **Proximal Convoluted Tubule:** The Bowman's capsule extends downwards to form the proximal tubule. Water and reusable materials from the blood are now reabsorbed back into it.
- **Henle's Loop:** It is a quite narrow and U-shaped hair pin like loop with a descending limb that ends into the medulla and an ascending limb that coars back to the cortex.
- **Distal Convoluted Tubule:** The ascending limb on entering the cortex becomes a highly coiled distal convoluted tubule. It then continues as a short straight collecting tubule that joins the collecting duct. Each collecting duct receives the collecting tubules of the number of nephrons.

- **Collecting Duct:** The Distal Convolutated Tubule of each nephron leads to the collecting ducts. The collecting ducts together form the renal pelvis. Through the renal pelvis, the urine passes into the ureter and then into the bladder.

Ureters

- A pair of thin muscular tubes called the ureter comes out of each kidney extending from the renal pelvis.
- Each ureter is a small tube, about 25 cm long.
- It carries urine from the kidney to the urinary bladder.

Urinary bladder

- The urinary bladder is a temporary storage reservoir for urine.
- It is located in the pelvic cavity, posterior to the symphysis pubis, and below the parietal peritoneum.
- The size and shape of the urinary bladder varies with the amount of urine it contains and with the pressure it receives from surrounding organs.
- The inner lining of the urinary bladder is a mucous membrane of transitional epithelium that is continuous with that in the ureters. When the bladder is empty, the mucosa has numerous folds called rugae. The rugae and transitional epithelium allow the bladder to expand as it fills.
- The second layer in the walls is the submucosa, which supports the mucous membrane. It is composed of connective tissue with elastic fibers.
- The next layer is the muscularis, which is composed of smooth muscle. The smooth muscle fibers are interwoven in all directions and, collectively, these are called the detrusor muscle.

Urethra

- The urethra is a thin-walled tube that arises from the urinary bladder.
- Its function is to expel the urine outside by micturition.
- In females, the urethra is short, only 3 to 4 cm (about 1.5 inches) long.
- In males, the urethra is much longer, about 20 cm (7 to 8 inches) in length, and transports both urine and semen. The first part, next to the urinary bladder, passes through the prostate gland and is called the prostatic urethra.

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