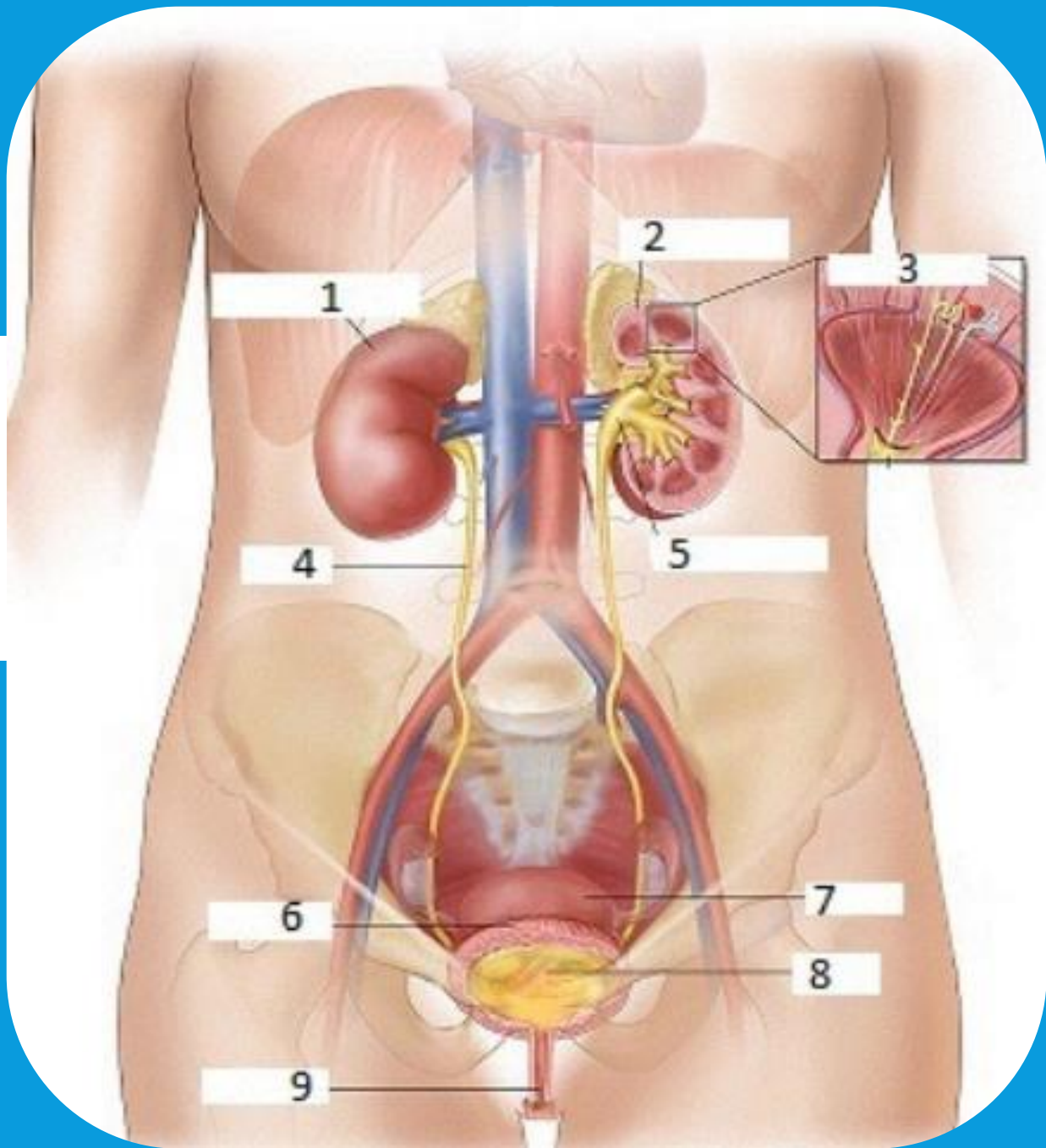
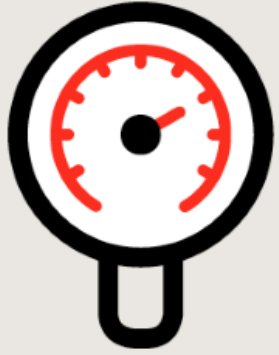


THE KIDNEYS





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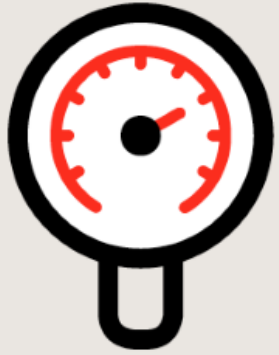


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Regulates
Blood Pressure



Cleans Blood



Balances Water



Vitamin D
Activators



Filters Waste
and Toxins

Cleans the blood by removing metabolic wastes (urea), excess solutes (salts, glucose, toxic substances), and excess water.

These wastes are excreted as urine.



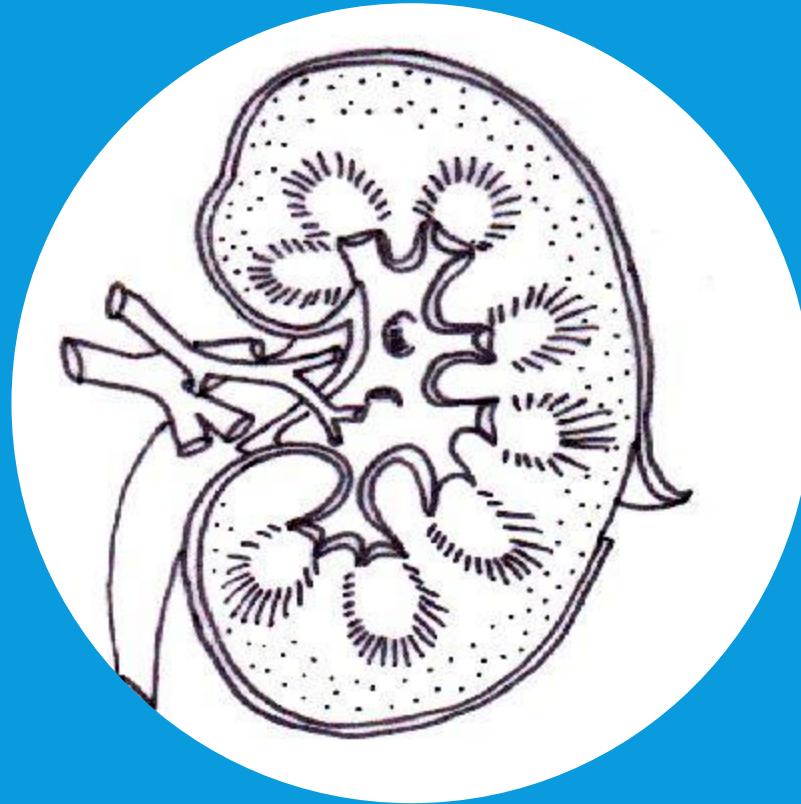
Kidneys regulate water content in the blood.

If the blood becomes too dilute or too concentrated with solutes it can interfere with normal cell activity

The kidneys regulate water concentration in the blood by removing excess water (if the blood is too dilute) or conserving water (if the blood is too concentrated)



Nephrons are the microscopic filters of the kidney



- **Bowman's Capsule**

Closed end at the beginning of the nephron

Located in the cortex

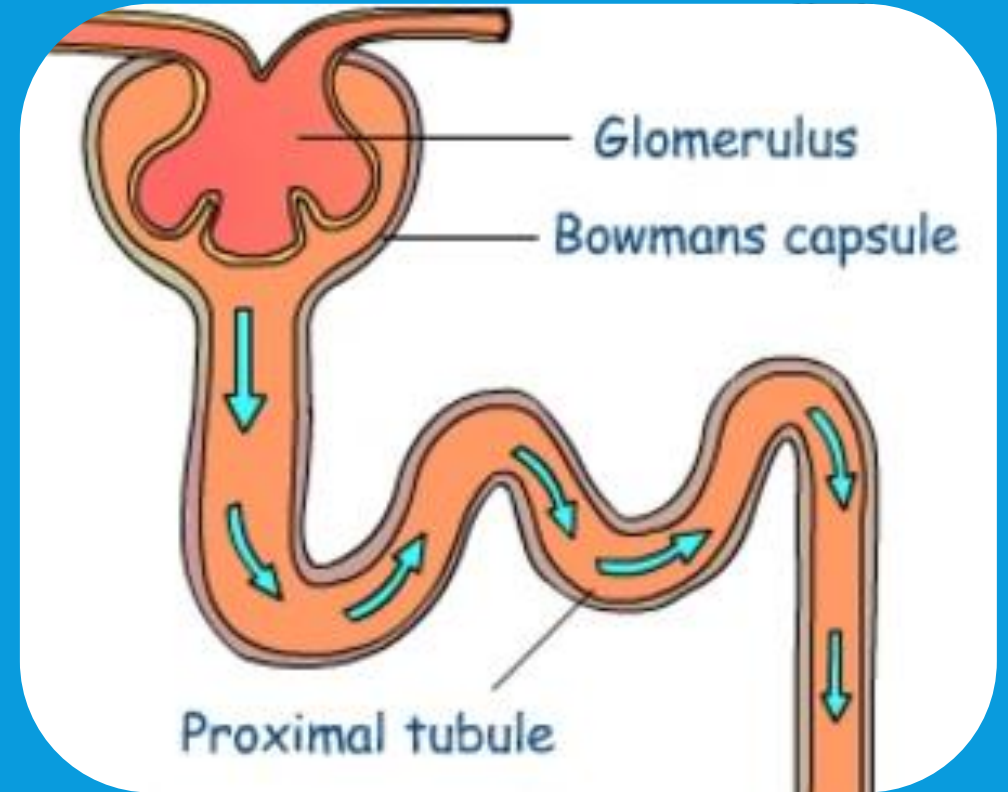
- **Glomerulus**

Coiled capillaries in the Bowman's capsule

- **Proximal Tubule**

First twisted region after the Bowman's capsule

Cells have many mitochondria to supply energy for active transport



Loop of Henle

Long, loop after the proximal tubule

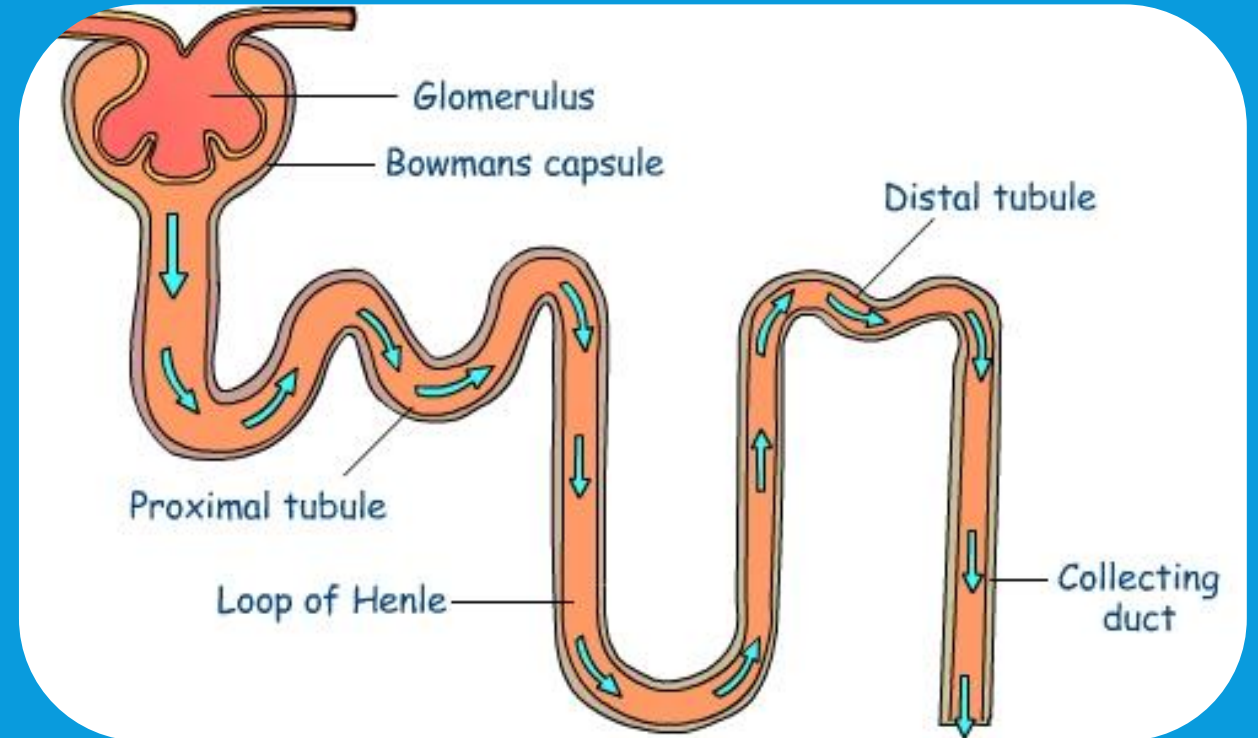
Descending part allows water to leave

Ascending part allows salt (NaCl) to leave

It extends from the renal cortex down into the renal medulla and back

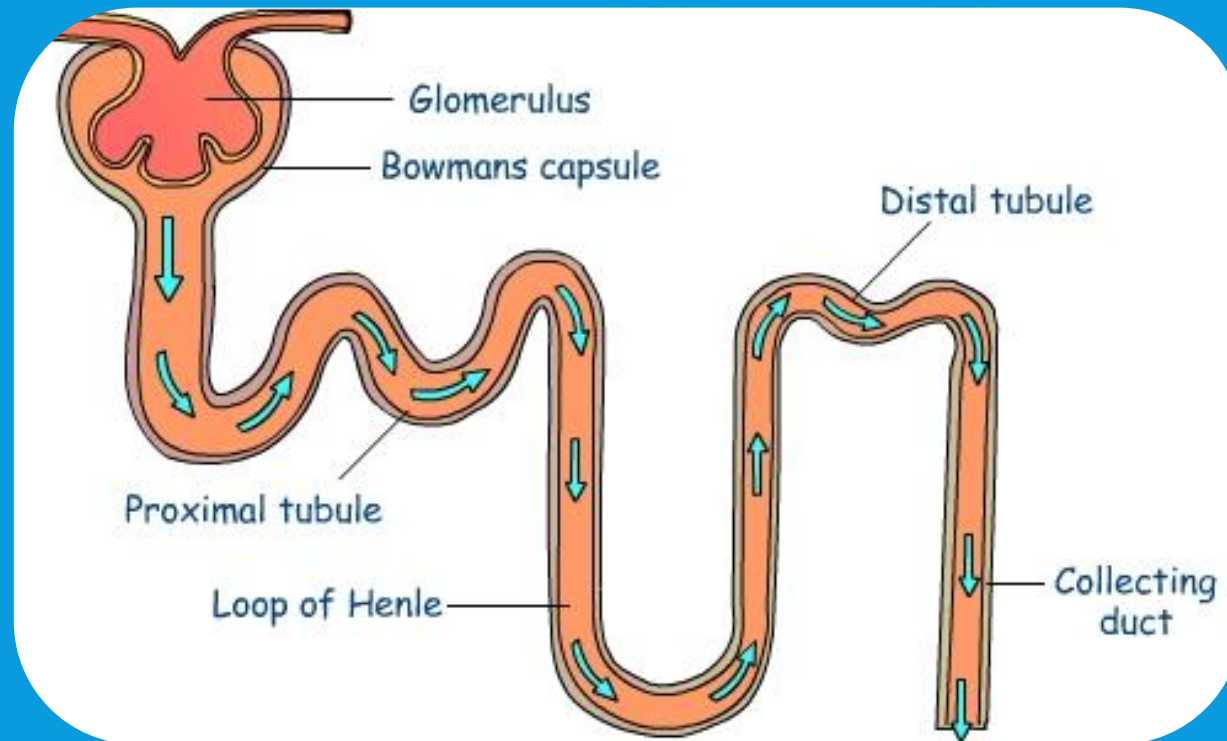
- **Distal Tubule**

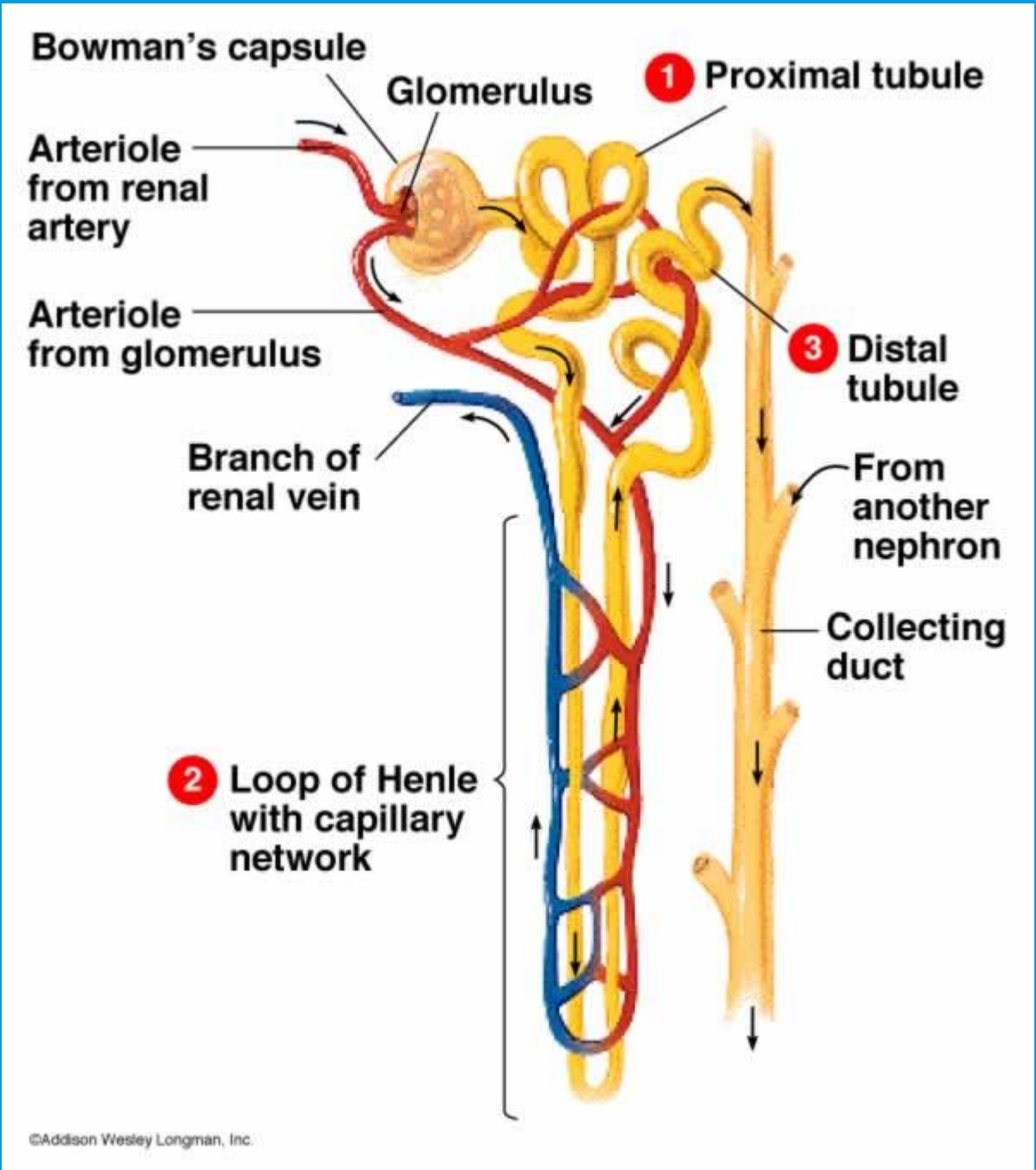
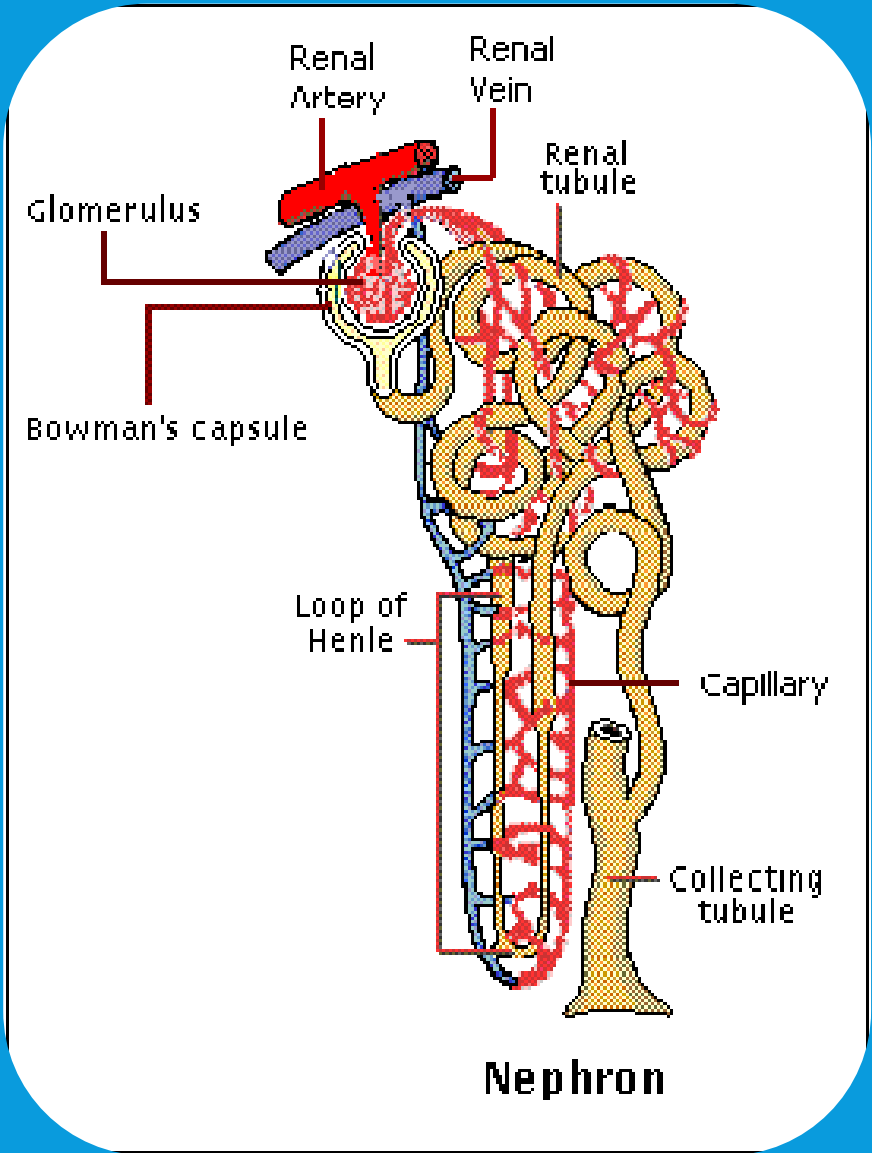
Second twisted portion of the nephron after the Loop of Henle



Collecting Duct

- Long, straight portion after the distal convoluted tubule that is the open end of the nephron
- Extends from the renal cortex down through the renal medulla
- Each kidney has many collecting ducts





The nephron has a unique blood supply compared to other organs.

- **Renal artery**

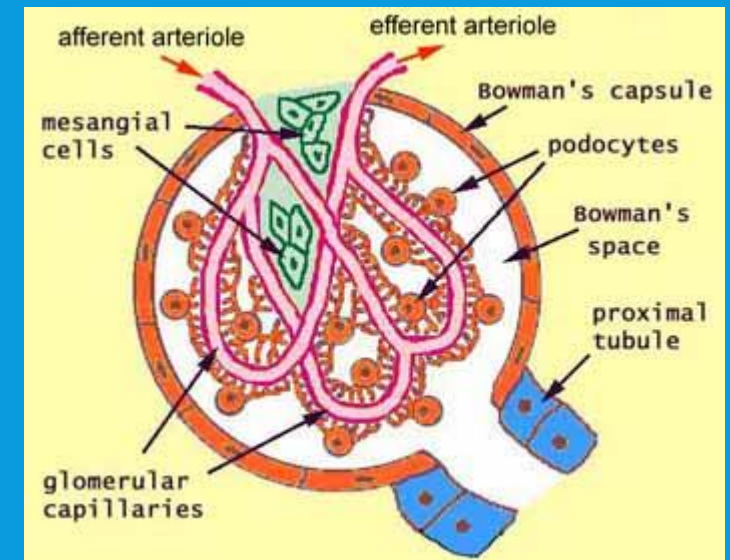
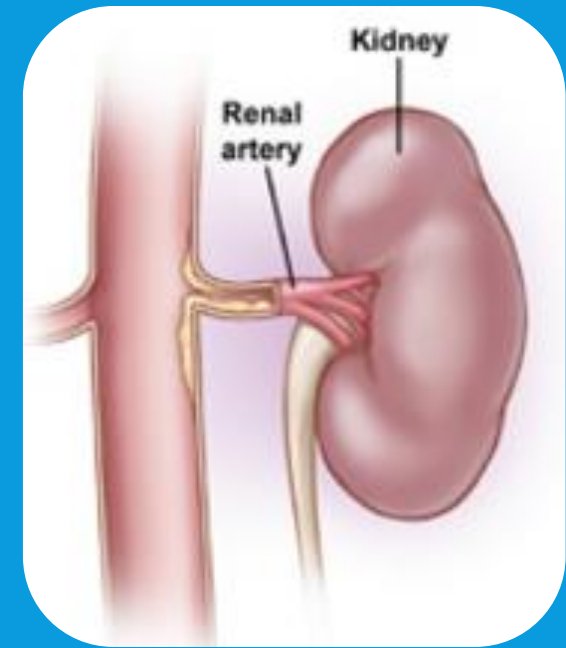
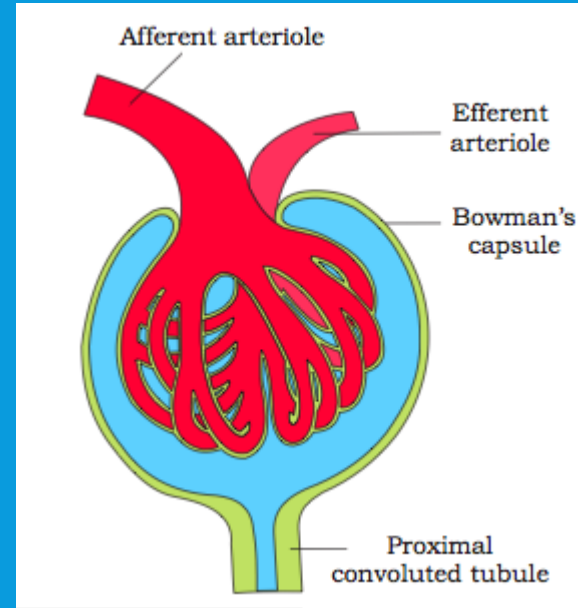
Supplies blood to the kidney from the circulatory system

- **Afferent arteriole**

Connects the renal arteriole to the glomerular capillaries

- **Glomerular capillaries**

Small cluster of capillaries inside the Bowman's capsule



- **Efferent arteriole**

Connects the glomerular capillaries with the peritubular capillaries

- **Peritubular capillaries**

Located after the glomerular capillaries and surrounding the proximal tubule, the loop of Henle and the distal convoluted tubule

Connects to the renal vein

- **Renal vein**

Returns blood from the kidney to the circulatory system

