# Physiology of Urine formation:

Urine formation involves three main processes namely,

- glomerular filtration,
- reabsorption and
- secretion

  Filtration-

- Water & solutes smaller than proteins are forced through the capillary walls and pores (of the glomerulus) into the renal tubule (Bowman's capsule).

- Blood courses through the glomeruli, much of its fluid, containing both useful chemicals and dissolved waste materials, soaks out of the blood through the membranes (osmosis & diffusion)
- It is then filtered and then flows into the BOWMAN'S CAPSULE
- The product formed is collectively known as GLOMERULAR FILTRATE
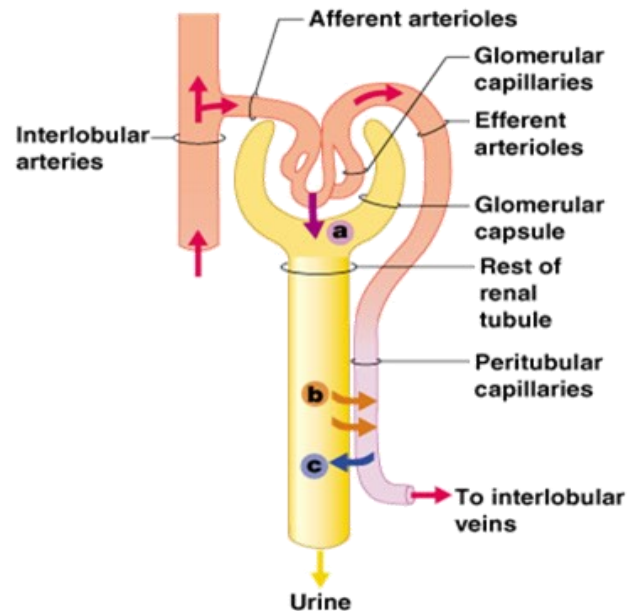
Reabsorption-

- Water, glucose, amino acids & needed ions are transported out of the filtrate into the peritubular capillary cells and then enter the capillary blood.
- Reabsorption begins in the proximal convoluted tubules and continues in the loop of Henle, distal convoluted tubules, and collecting tubules.
- about 99% of the 180L of water that leave the blood each day by glomerular filtration returns to the blood from the proximal tubule through the process of passive reabsorption.
- nutrient glucose is entirely reabsorbed back into the blood from the proximal tubules. In fact, it is actively transported out of the tubules and into the peritubular capillary blood.

- Sodium ions (Na+) and other ions are only partially reabsorbed from the renal tubules back into the blood.
- Amount depends largely on how much salt we take in from the foods that we eat. ↑Na+ intake = ↓Na+ reabsorption in the blood.

Secretion-

- Hydrogen ions, Potassium ions, creatinine & drugs are removed from the peritubular capillaries (blood) and secreted by the peritubular capillary cells into the filtrate.
- substances move into the distal and collecting tubules from blood in the capillaries around these tubules.
- Substances are secreted through either an active transport mechanism or as a result of diffusion across the membrane.
- Secretion plays a crucial role in maintaining the body's acid-base balance