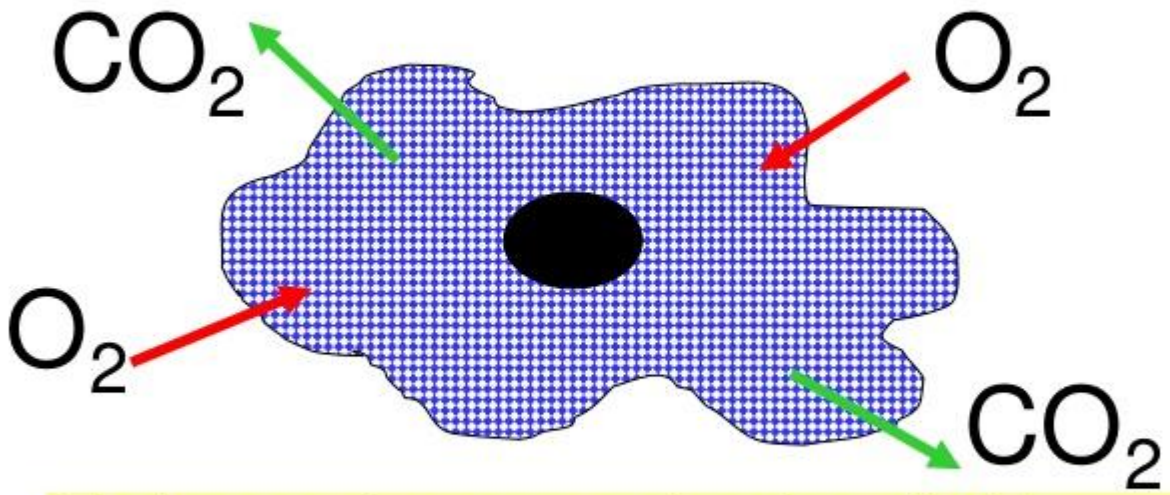
Animals excretion

- All animals eat to get energy, and their products of digestion have to be removed from body. This process is called **excretion**. All animals have special organs for excretion.

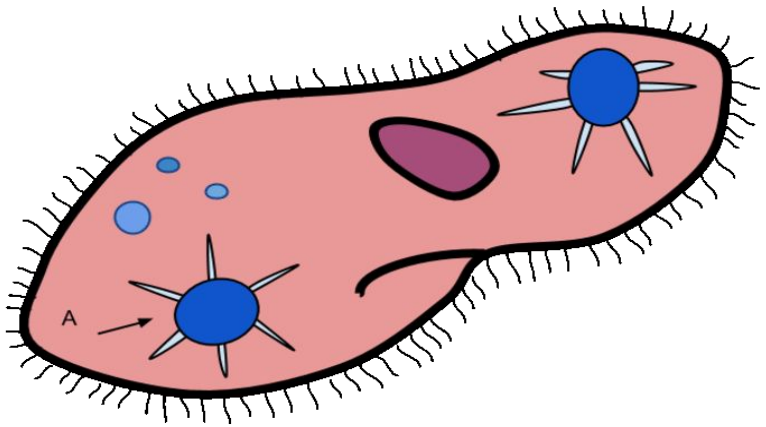
Protozoans (amoeba, paramecium)

- They have **contractive vacuole** to remove wastes, or **diffusion** is another way to remove waste(CO2) from the cell.

Respiration of Amoeba sp.

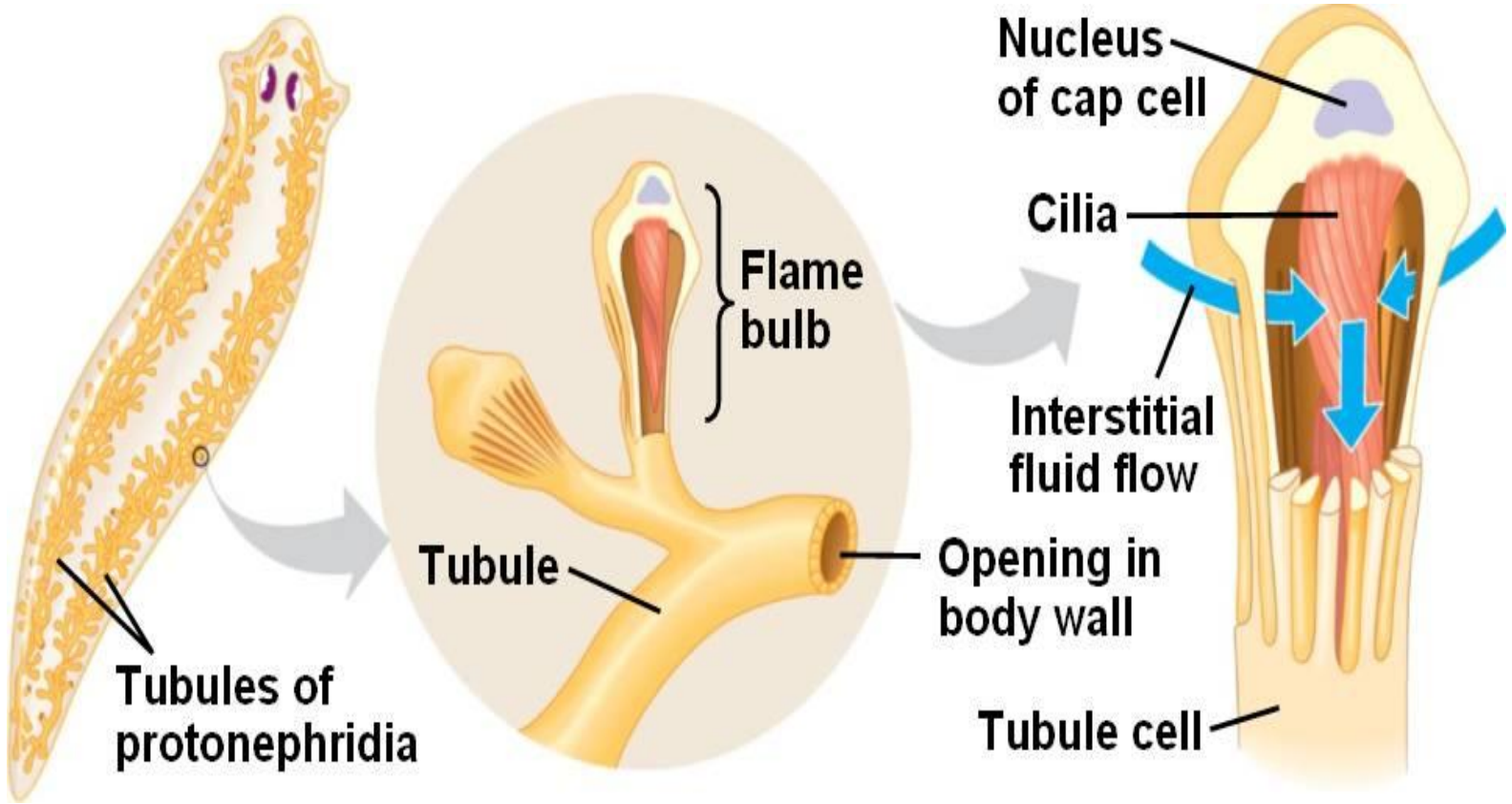


Exchange of oxygen and carbon dioxide occurs through the plasma membrane through simple diffusion.



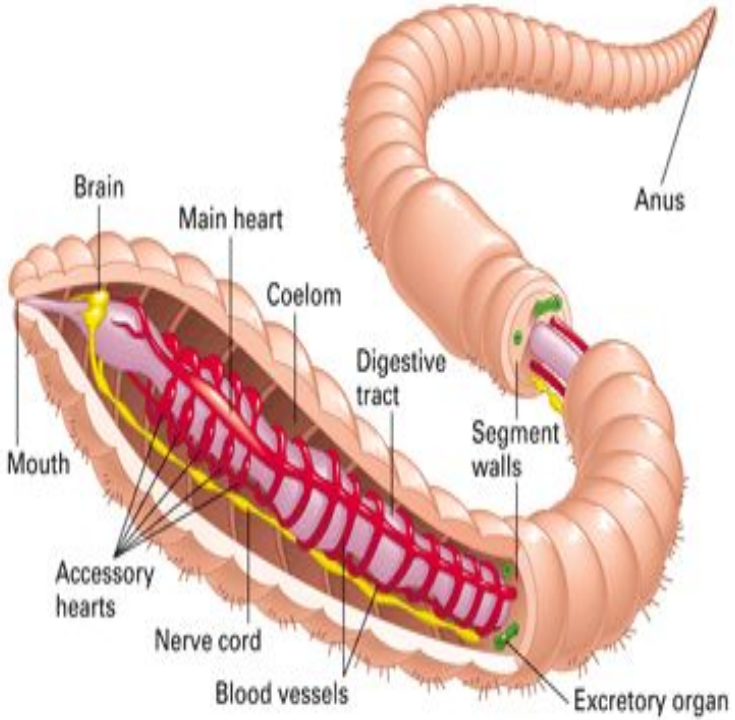
Flatworms(planaria)

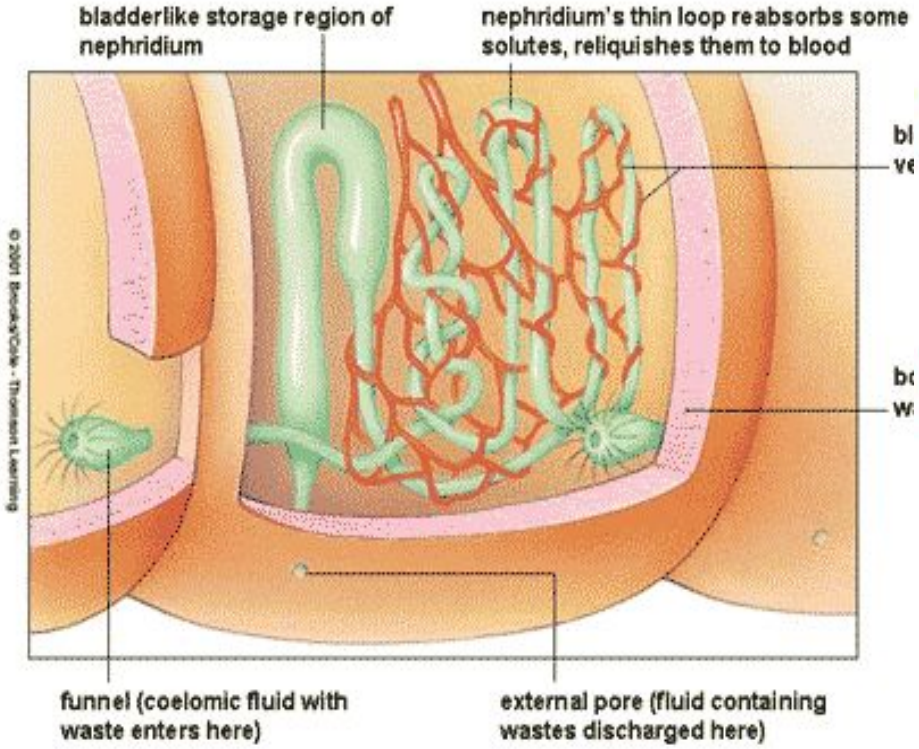
- Flatworms use **flame cells** to excrete wastes. Many flame cells come together to form a *net of tubules.* Tubule collect wastes and excrete them through pores.

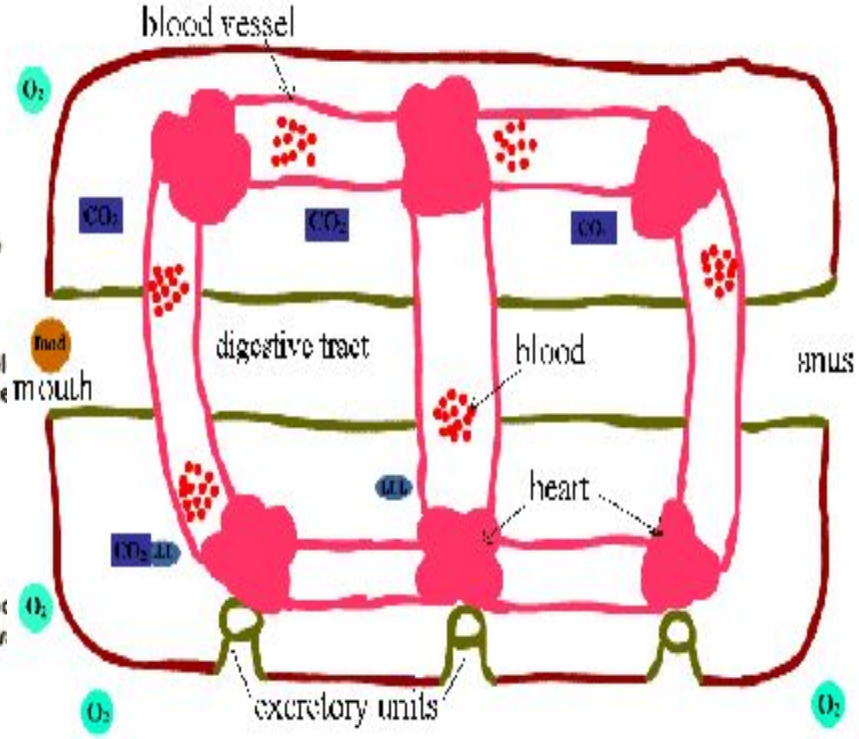


Segmented worms (earthworm)

- Segmented worms have net of ciliated tubules called **nephridia**. They remove wastes outside through the **pores.**

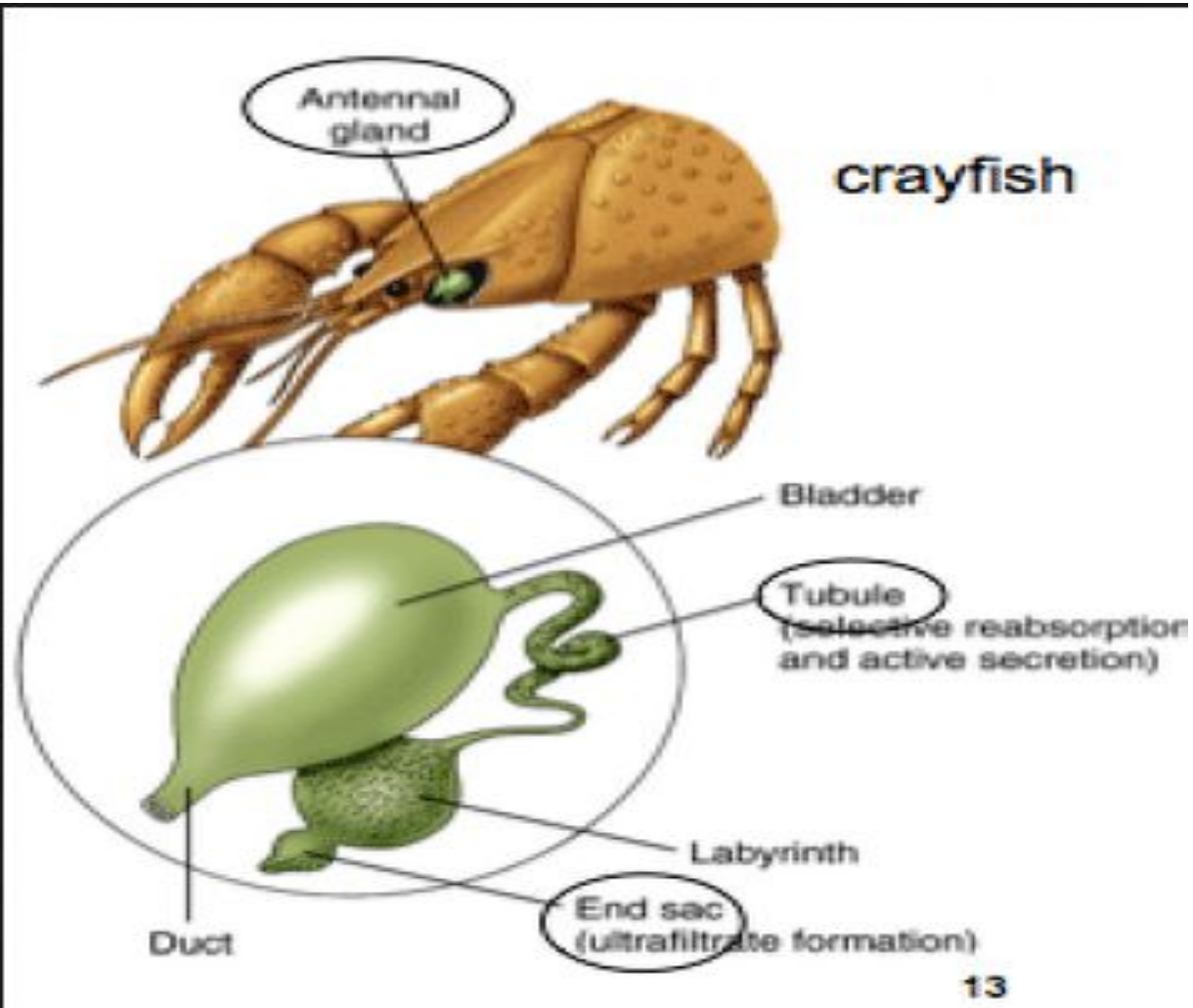


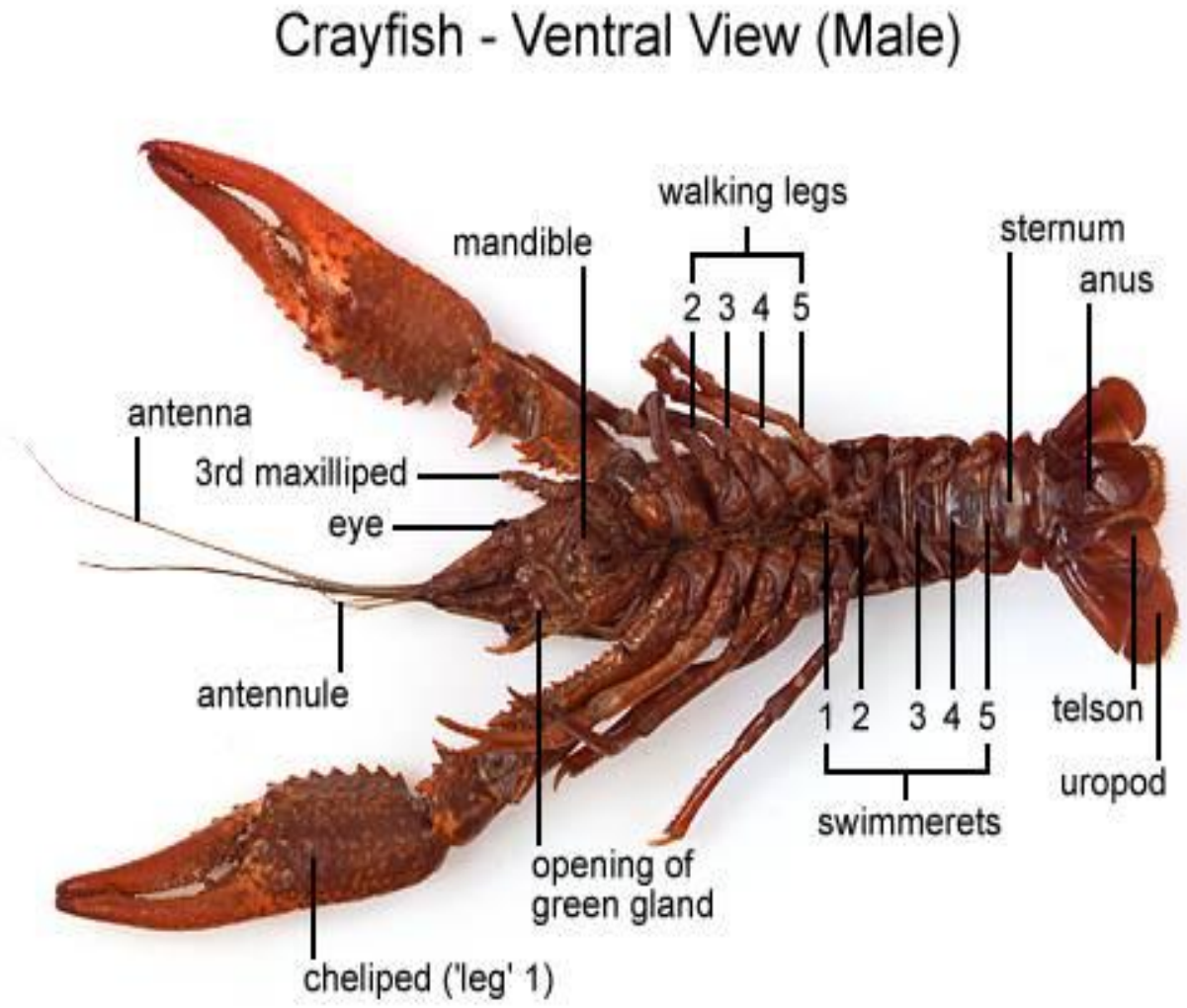




Crustaceans(crayfish, lobster)

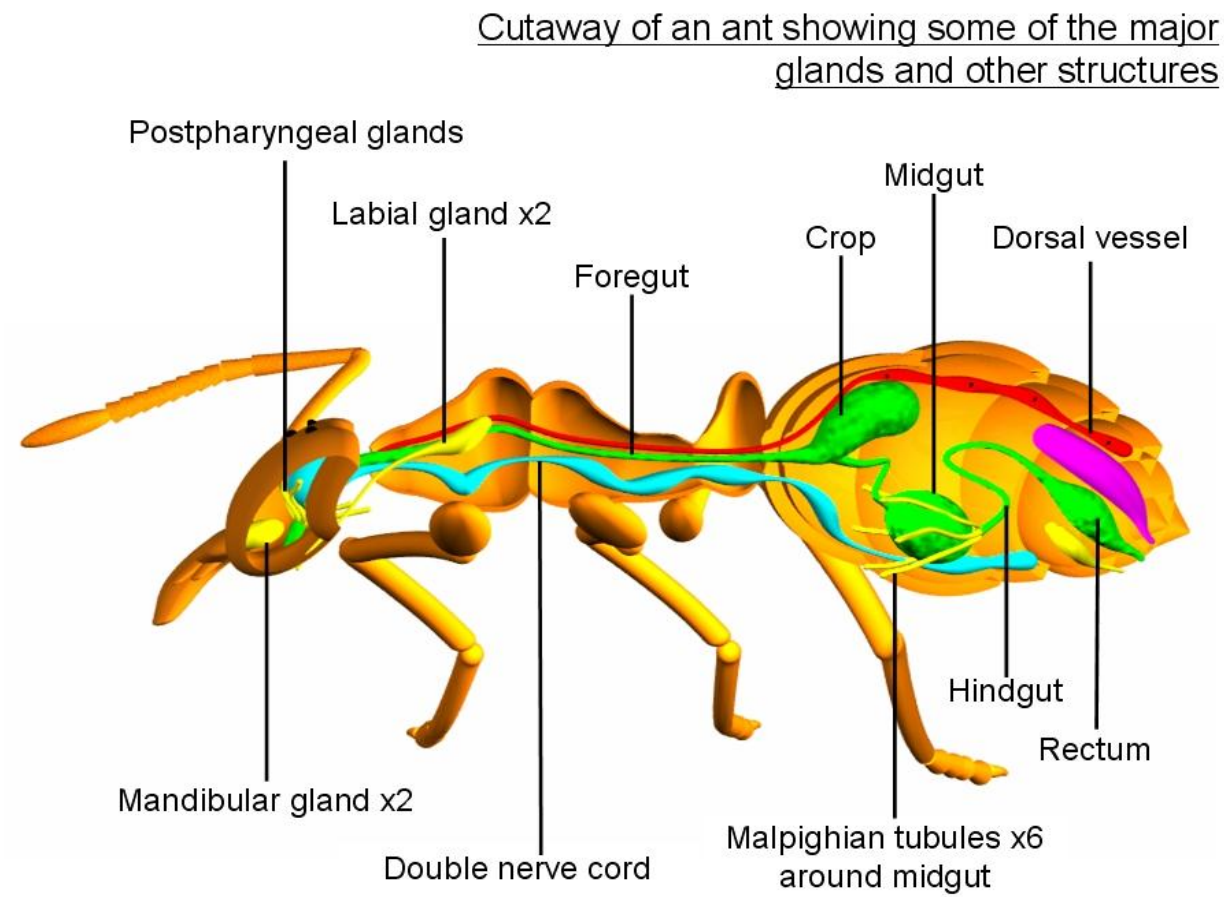
- Excretory organs of crustaceans are **green glands**.

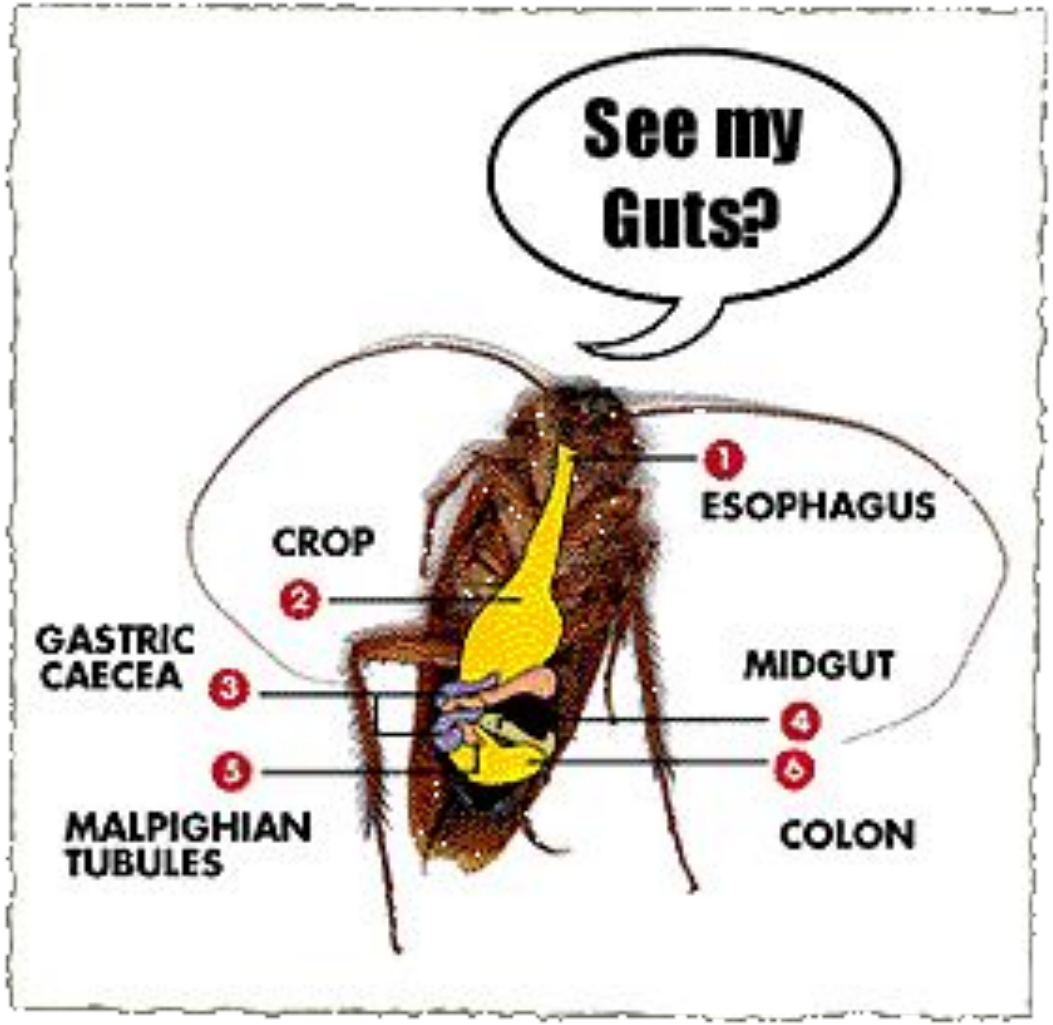




Insects(ant, bee)

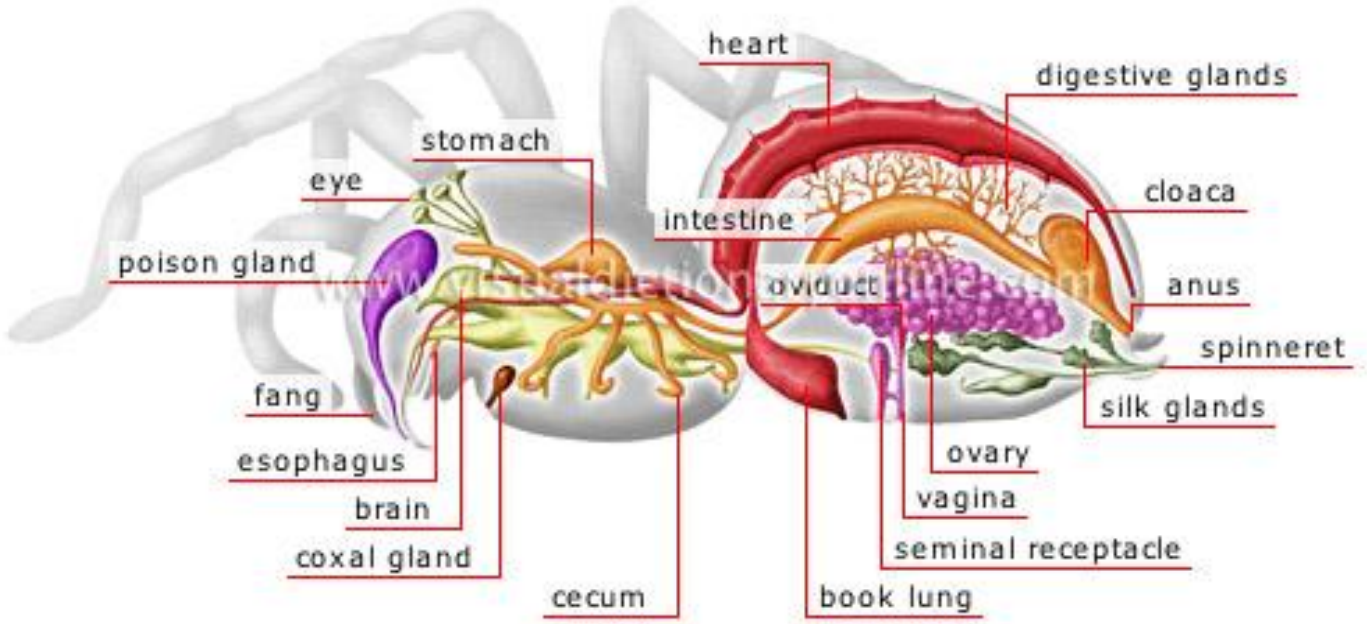
- Insects use **Malpighian tubules**





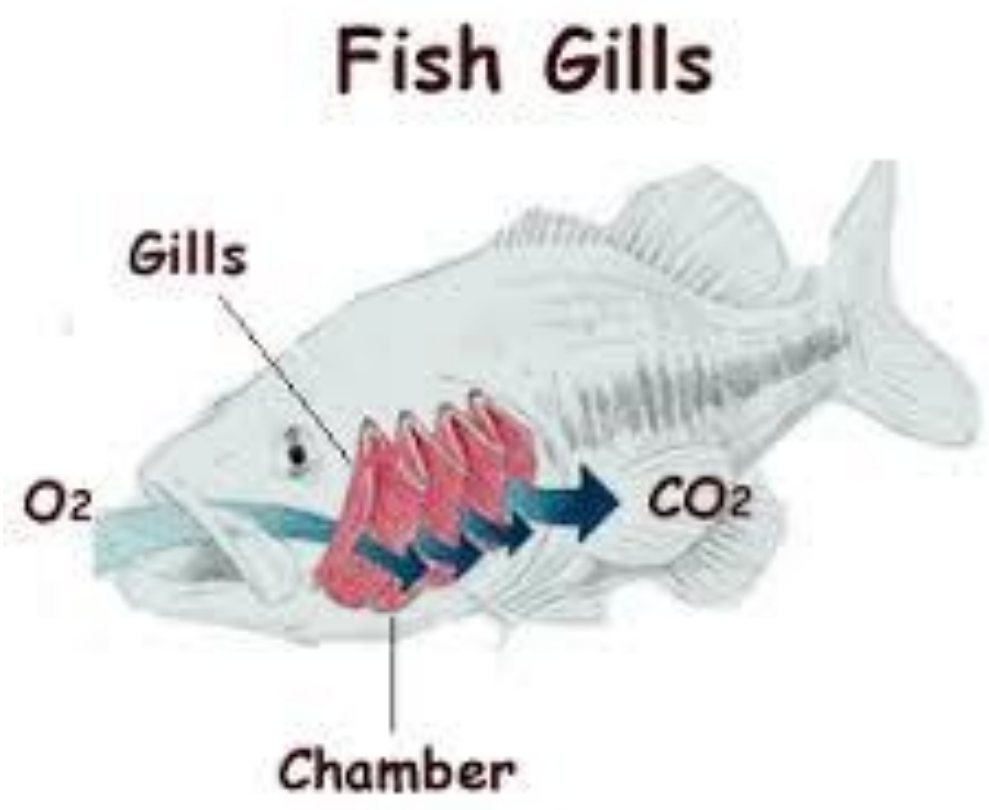
Arachnida(spider)

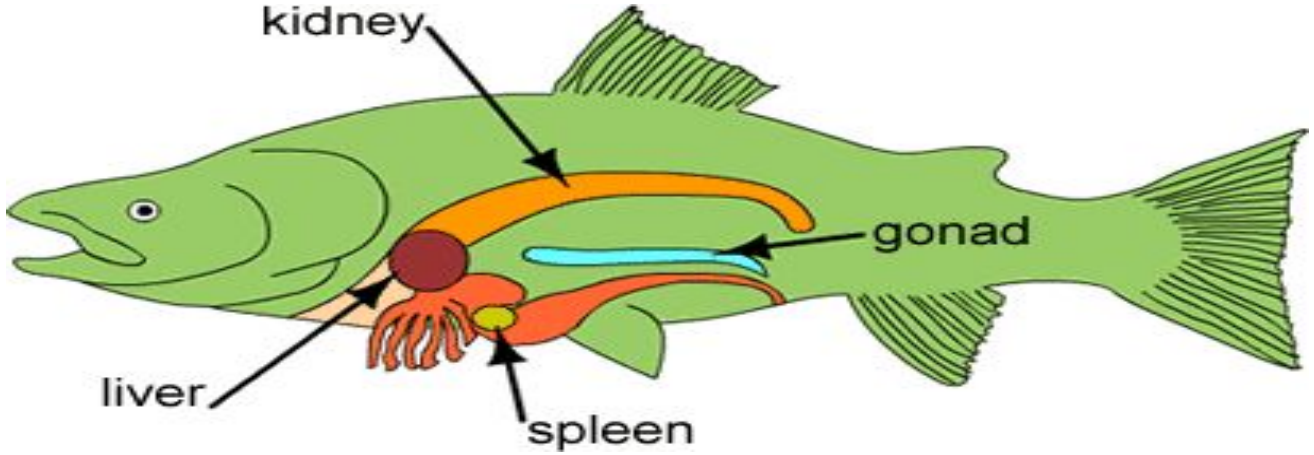
- **Coxal glands** and **Malpighian tubules**



Fish

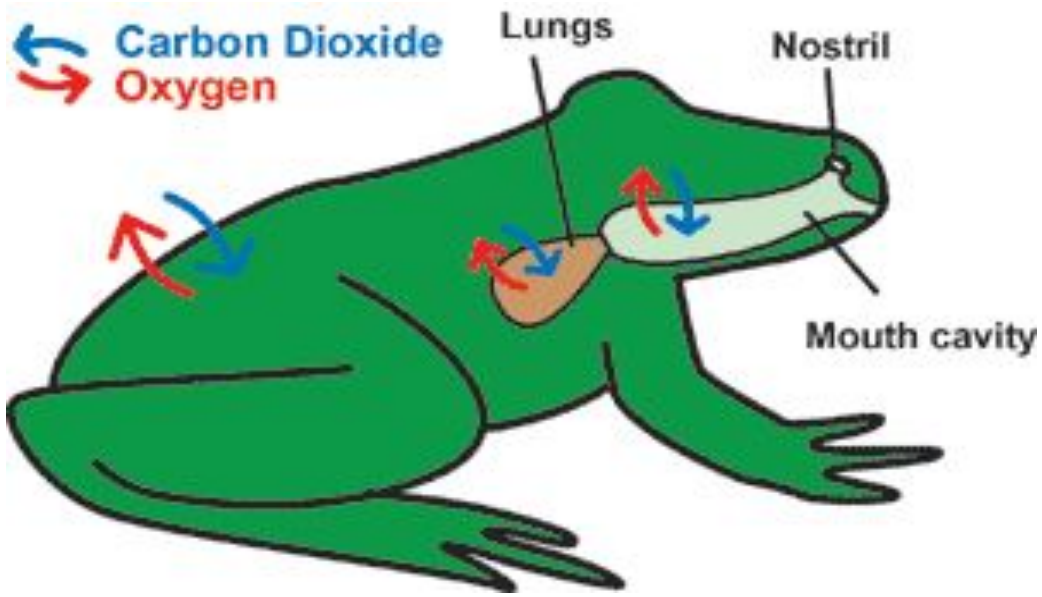
- They use **gills** to excrete CO2(carbon dioxide) and **kidneys** to remove *ammonia*.

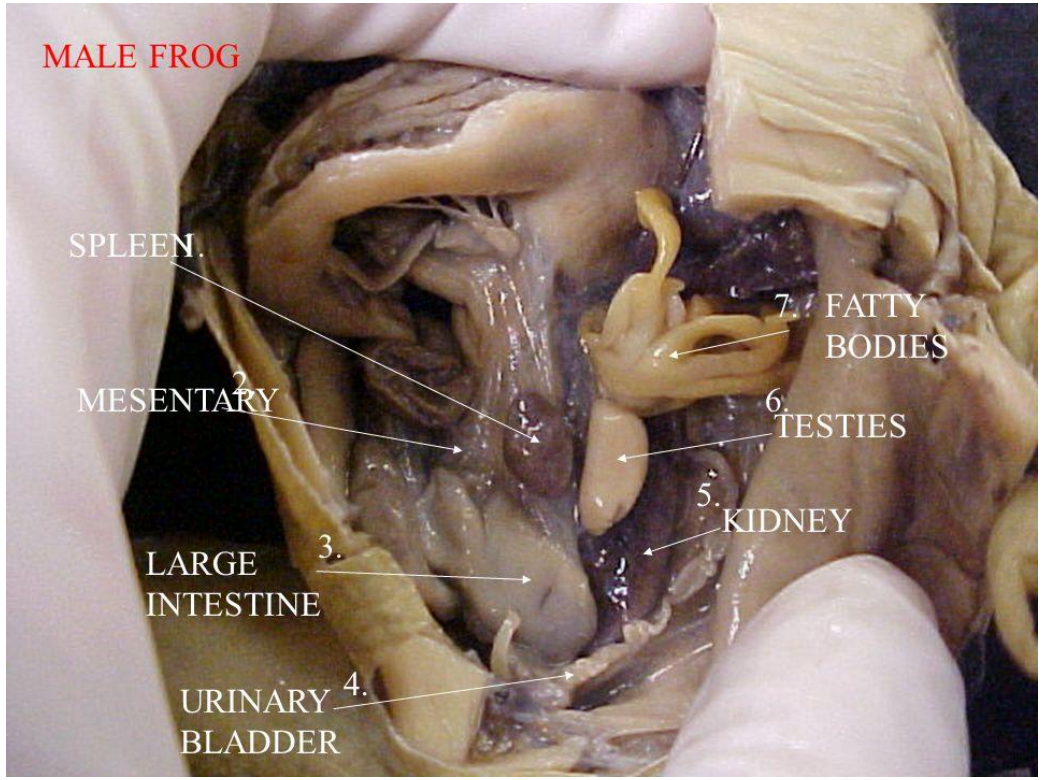




Amphibians (frog)

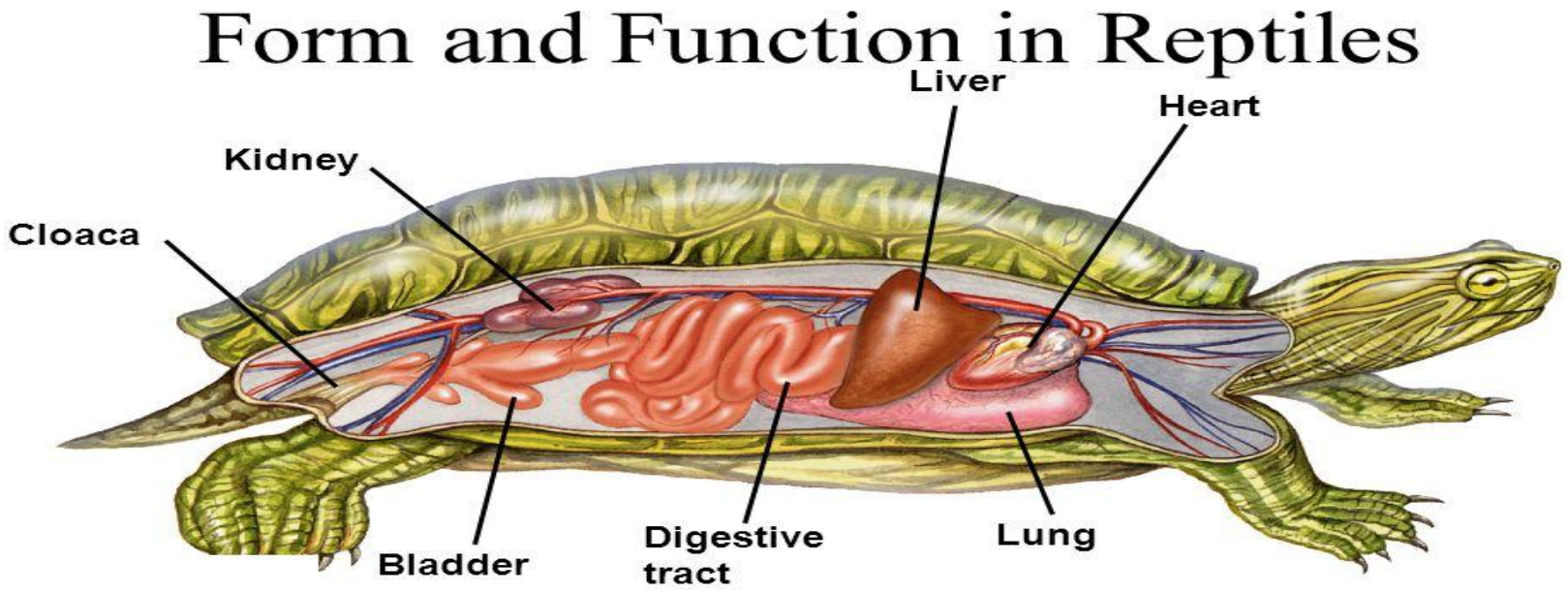
- Adult amphibians use **lung** and **skin** to excrete CO2, and **oval kidney** to remove *ammonia*





Reptiles(lizards and crocodiles) and birds

- They remove **uric acid** from **kidney** through **cloaca**, and **lungs** to remove CO2



Mammals

- They have bean shaped **kidneys** which are connected to **urinary bladder** by **ureters.** The waste products of mammals is *urine*. Some mammals also excrete salts by sweating.

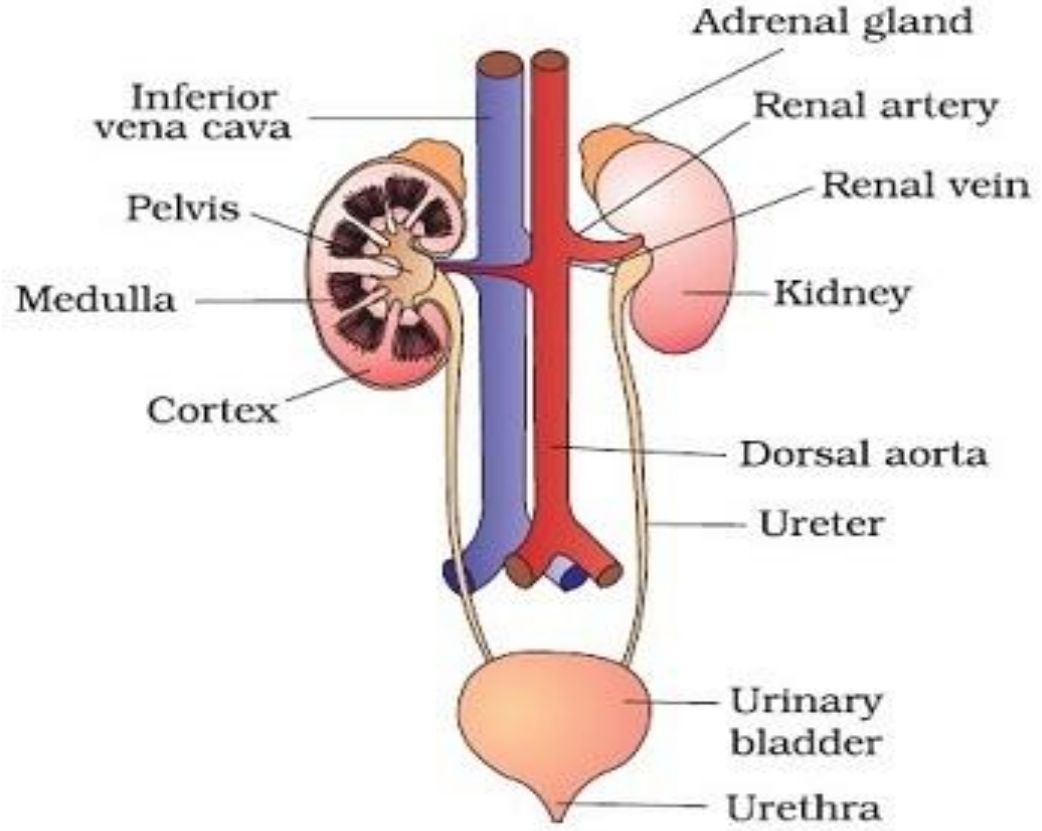


Figure 1. Human Urinary system