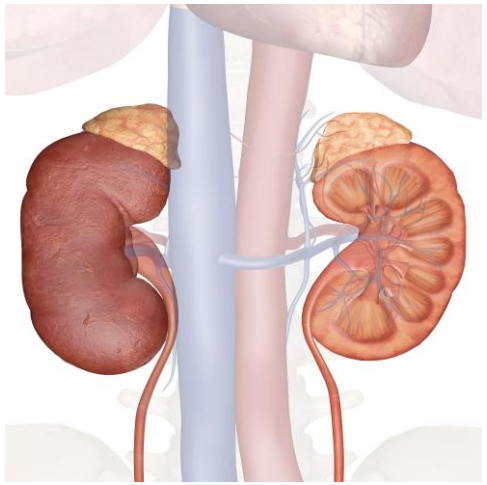
LIFE PROCESSES

Class 10 Biology

EXCRETION

PART 1/3



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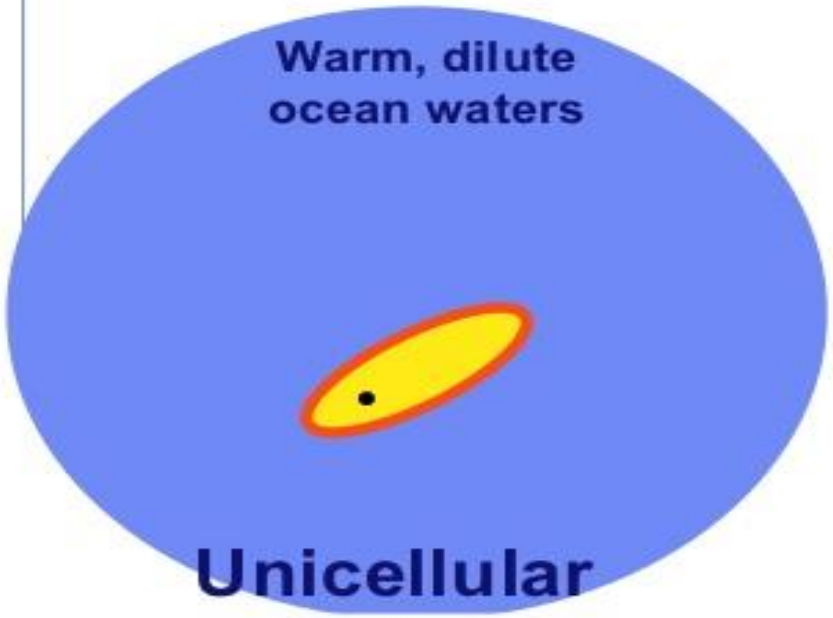
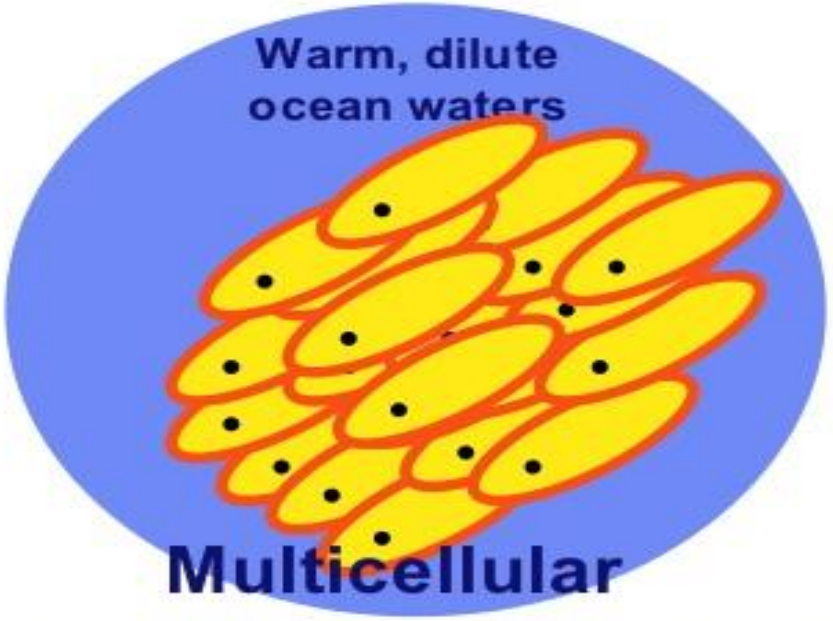
Unicellular → Multicellular



Unicellular

- All cells in direct contact with environment
- All cells can easily get nutrients in & waste out by diffusion



Multicellular

- Internal cells not in direct contact with environment
- Internal cells can't get nutrients in & waste out
- Need organ systems

EXCRETION

Life of every organism depends on certain basic processes. Excretion is one among them.

Organisms get rid of wastes from their body-

Plants remove gaseous waste through stomata.

Animals remove carbon-dioxide waste through respiration.

They remove undigested solid waste by defecation.

Other metabolic activities generate nitrogenous wastes that also need to be removed.

The biological process involved in the removal of these harmful metabolic wastes from the body is called **excretion.**

Every organism, from the smallest protists to the largest mammal must cleanse itself of the potentially toxic by-products of its own vital activities.

Different organisms use varied strategies to do this.

Comparing and differentiating between excretion in plants and excretion in animals

animal (human being)	Excretion	Plant
skin, lung, kidney	excretory organs	no particular organ
water, carbon dioxide, urea, mineral salt, and other nitrogenous materials	excretory materials	water, oxygen, carbon dioxide, latex, gum, acid, resin, oil and alkaloid
perspiration, discharging of urine and cellular respiration	method of excretion	photosynthesis, transpiration and cellular respiration
carbon dioxide is absorbed by green plants to carry out photosynthesis	use of excretory materials	oxygen is absorbed by living things for cellular respiration.

Many **unicellular** organisms remove these wastes by simple diffusion from the body surface into the surrounding water.

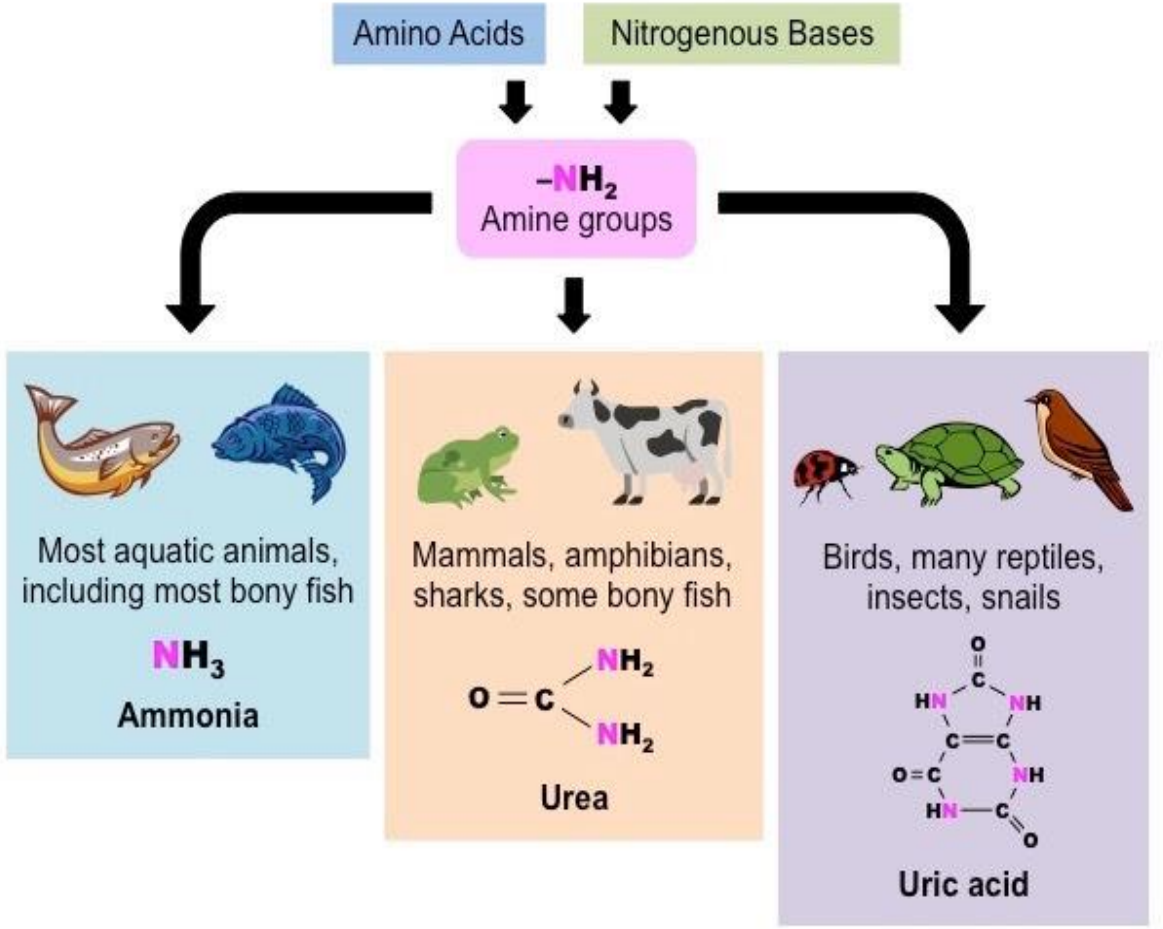
They often have very simple methods of **excretion**, involving dumping wastes to the outside of the cell.
Multicellular organisms have to deal with **excretion** on a number of fronts.
After individual cells expel their waste, the waste is simply deposited into a body cavity or blood vessel.

As we have seen in other processes, complex multi-cellular organisms use specialized organs to perform the same function.

Different organisms follow different modes of excretion such as kidney, lungs, skin and eyes depending on their habitat and food habit.

For example- Aquatic animals excrete waste in the form of **ammonia**, while birds and insects excrete mainly **uric acid**.

Humans produce **urea** as the major excretory product.



EXCRETORY SYSTEM ORGANS

The organs of human excretory system include:

A pair of kidneys **A pair of ureters** **A urinary bladder** **A urethra**

Kidneys

Kidneys are bean-shaped structures located on either side of the backbone and are protected by the ribs and muscles of the back.

Ureter

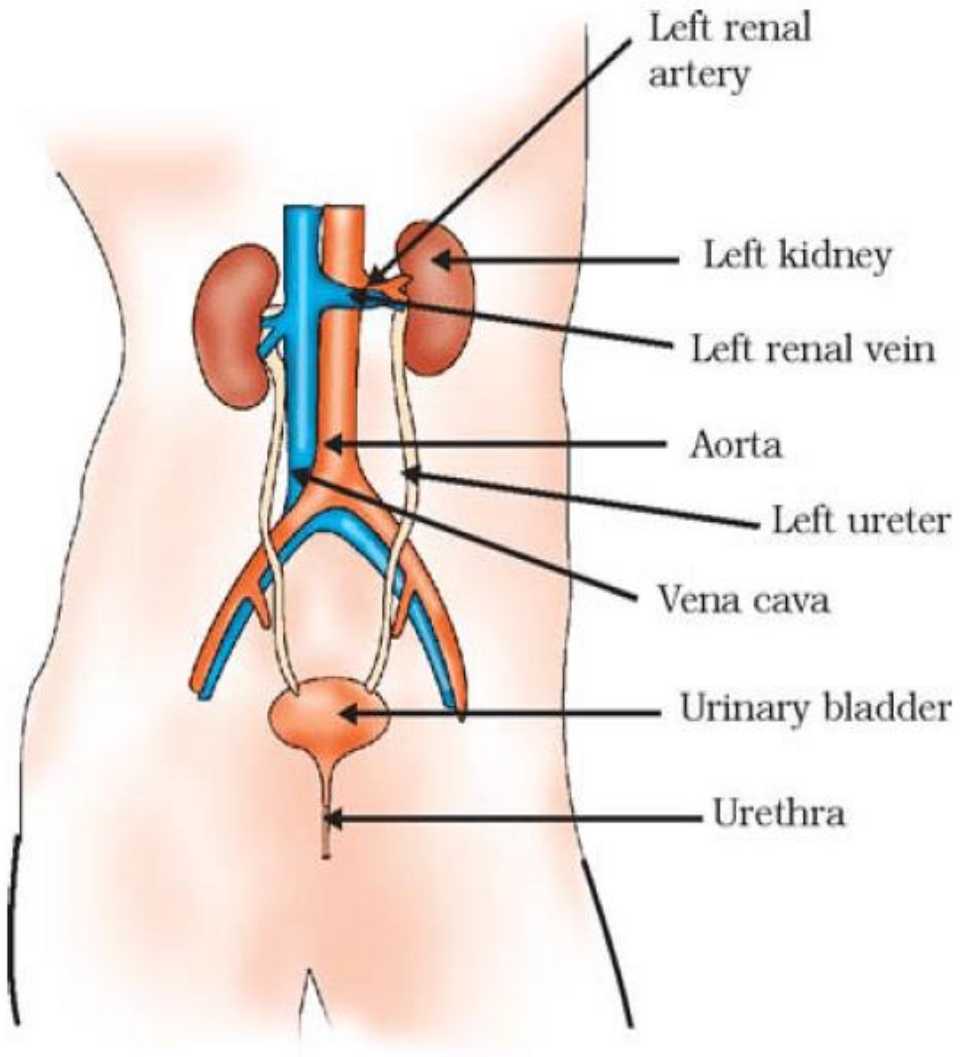
A thin muscular tube called the ureter comes out of each kidney. It carries urine from the kidney to the urinary bladder.

Urinary Bladder

It is a sac-like structure that temporarily stores urine until micturition. Micturition is the expulsion of urine from the body. The urine is carried to the bladder through the ureters.

Urethra

This tube arises from the urinary bladder and helps to expel urine out of the body. In males, it acts as the common route for sperms and urine. Its opening is guarded by a sphincter.



NEPHRON

Nephrons are the structural and functional units of the kidney.

Each nephron has **two parts- renal corpuscle (Bowman's capsule and glomerulus) and renal tubule.**

The renal tubule is attached to the Bowman's Capsule on one side and the collecting duct on the other side.

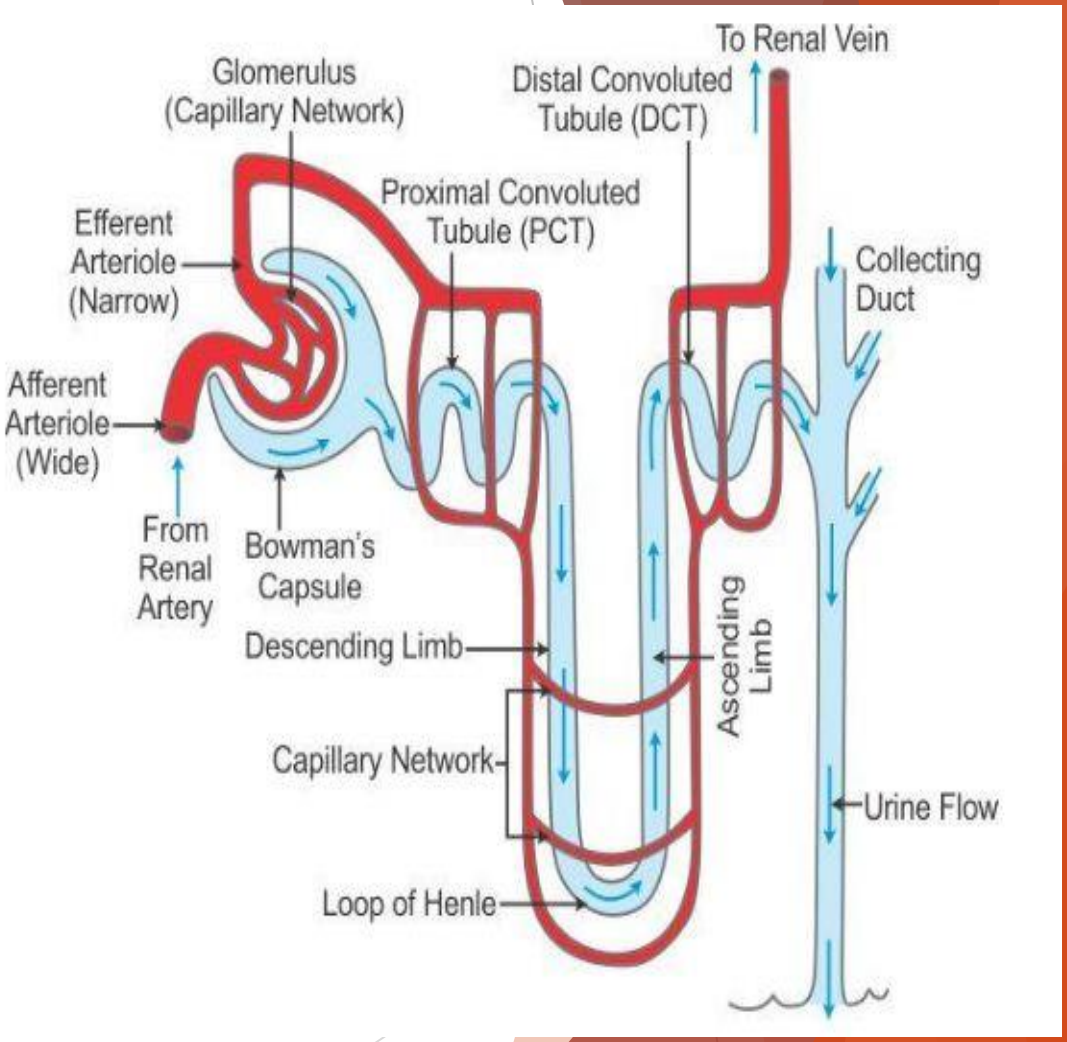
The renal tubule starts with a cup-like structure called Bowman's capsule and this encloses a tuft of capillaries called Glomerulus.

The first part of highly coiled structure in the tubule next to the Bowman's capsule is the proximal convoluted tubule.

The next part of the tubule is Henle's loop which has an ascending and a descending limb.

The tubule lastly is again highly coiled and called distal convoluted tubule and finally joins the collecting duct.

The collecting duct then passes the urine out of the kidney via the ureters.



Source: NCERT Text book and Google

Continued in part 2