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TOPIC: Lancelet: characteristics, its importance in evolution. Phylogenesis of the phylum chordata excretory system. Developmental disorders of the excretory system in human

LANCELET

- Lancelets: Translucent, fish-shaped animals, small elongated marine invertebrates that resemble a fish but, lack jaws and obvious sense organs.
- Ranging from the very small to the very large, from animals with shells to animals with fur, from those that fly to those that swim in the sea



SubPhylum Cephalochordata

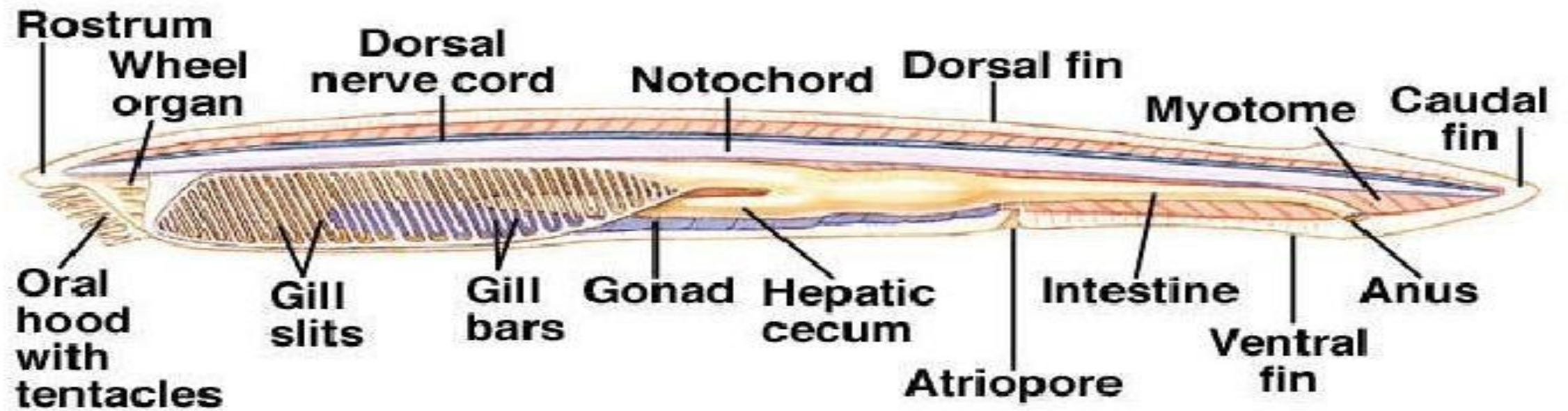
Exclusively marine animals ; they are capable of swimming but usually are buried in the sand with only their anterior end being exposed



CHARACTERISTIC OF LANCELET

At some time of its life cycle, a chordata has a **notochord**, a dorsal hollow tubular **nerve cord**, **pharyngeal slits**, **endostyle/thyroid gland**, and a **post-anal tail**.

They do not have a true brain, but the **notochord** extends into the **head**. They lack **paired fins**, **jaw**, **sense organs**, a **heart** and **well defined brain**.

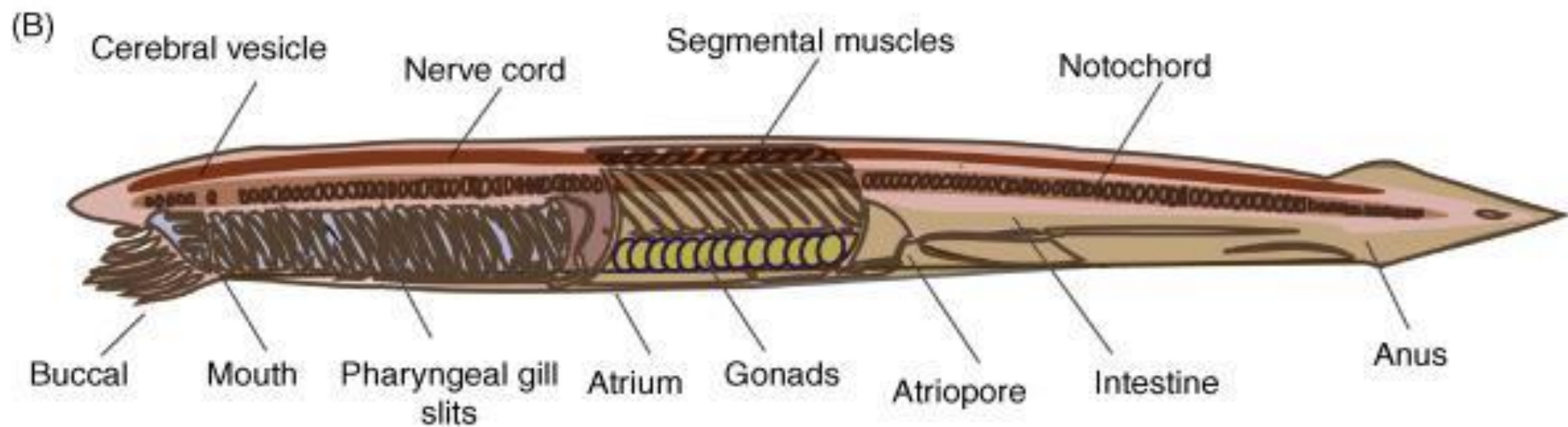
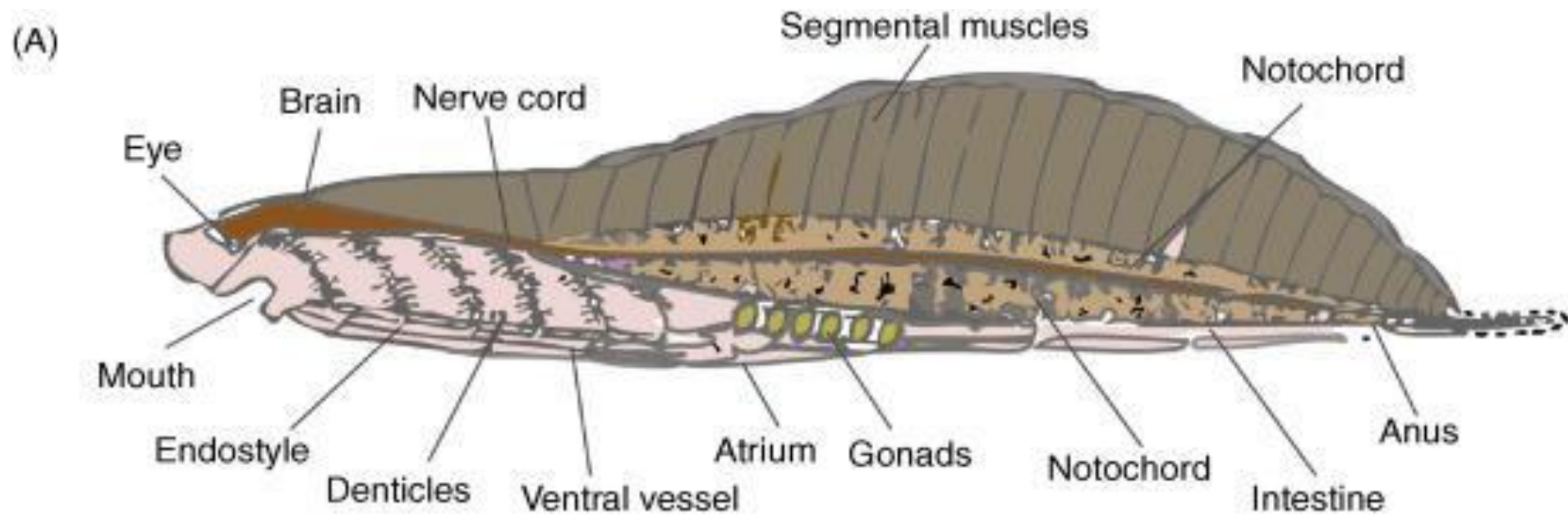


LANCELET IMPORTANCE IN EVOLUTION

- **VERTEBRATES:** Members of subphylum vertebrata.
- Cephalochordates, commonly called **amphioxus** or **lancelets**, are marine invertebrate chordates. Such comparisons are also providing **important** biological insights into the functional biology of cephalochordates and the **evolutionary** origin of developmental mechanisms that led to the emergence of the vertebrate body plan.

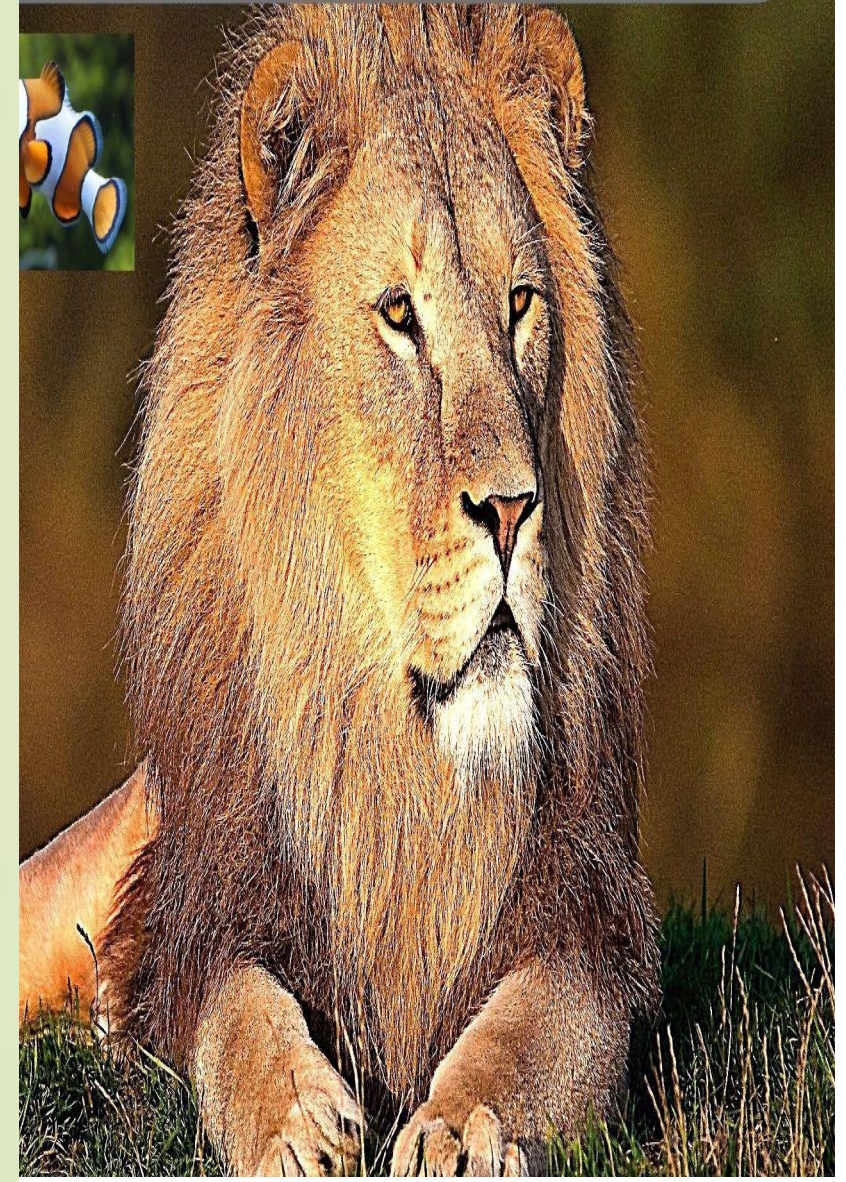
Another vertebrate characteristic is called **cephalization**

Evolution and development of the cartilaginous skull:
from a lancelet towards a human face



- **What did Lancelets evolve?**
- The researchers are trying to reconstruct what happened at the end of the Cambrian period 550 million years ago, when a creature similar to the **lancelet evolved** and diverged into three types of chordates:
cephalocordates like the **lancelet**;
urochordates like the sea squirt; and
vertebrates like us.

PHYLUM CHORDATA



Phylogenesis of the phylum chordata

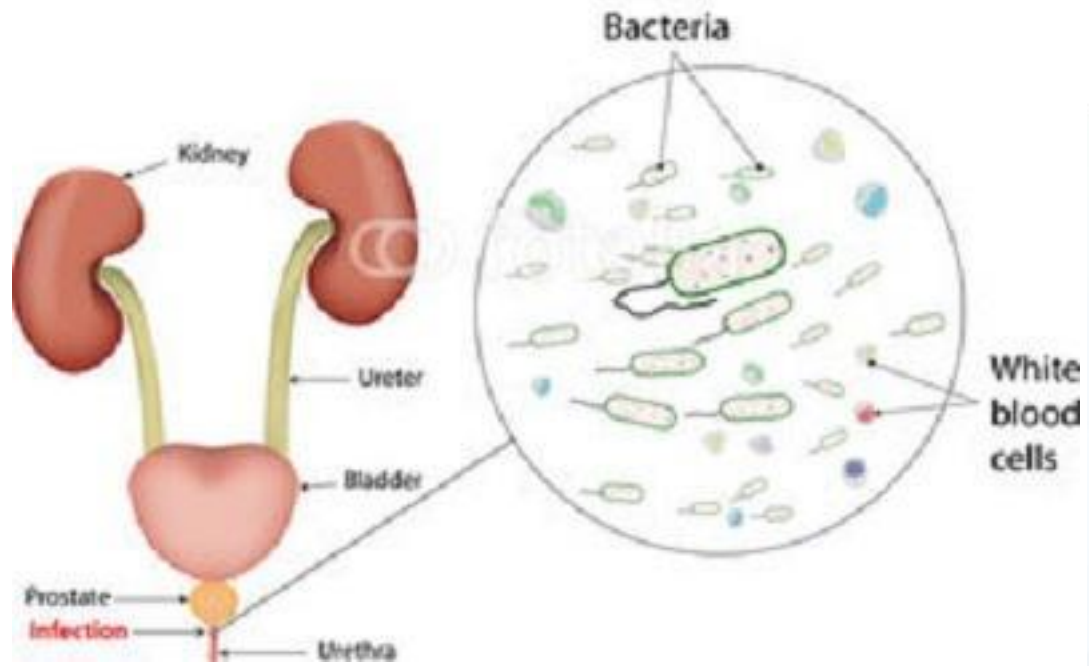
excretory system

- Metabolic waste are excreted by segmentally arranged, ciliated Protonephridia that open into the Right atrium.
- For many chordates, the **urinary system** is a critical component of the excretory system. It is made up of organs such as the kidneys and bladder, structures such as a urethra or cloaca, and even arteries such as the aorta.

Developmental disorders of the excretory system in human

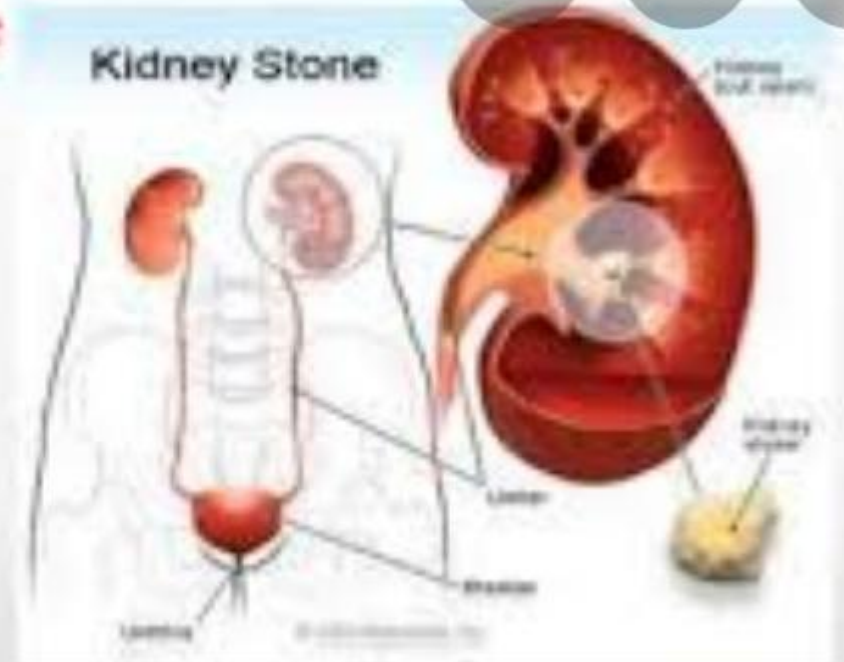
- Major Disorders of Excretory System
Uremia. Under this condition, the urea accumulation is comparatively high.
Renal Failure. Renal Calculi or Kidney Stones. Nephritis or Bright's Disease.
Hypertension due to Renin Secretion. Renal Tubular Acidosis. Diabetes Insipidus.
Oedema.

Urethritis



DISEASES OF

- **Kidney stones** → crystals of uric acid



Thank
you