

Chordata

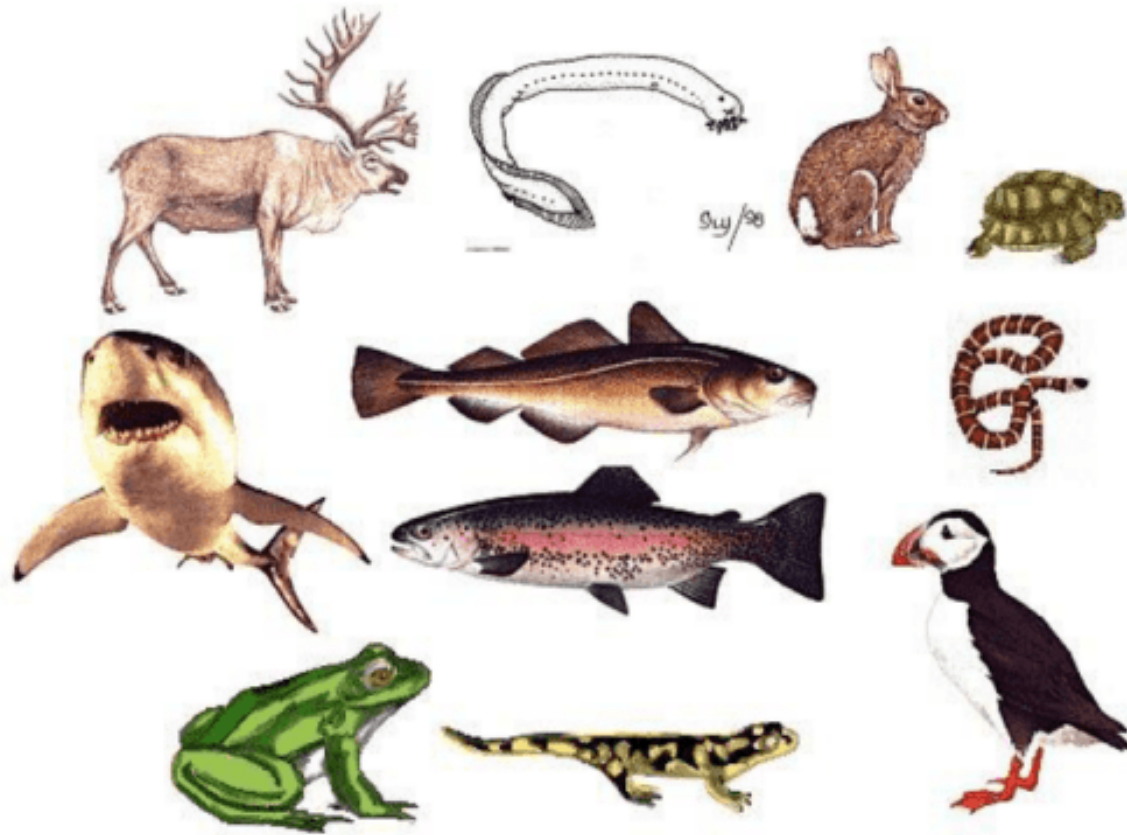


INTRODUCTION TO PHYLUM CHORDATA

Chordata (Greek: Chorde= a string or cord; ata= bearing)

- Phylum Chordata is the last major group of animal kingdom created by **Balfour** in 1880.
- The animals of this phylum bears notochord, are called chordates. (Notochord- Gr.- noton= back; chorda= cord)
- Notochord is a stiff, supporting rod-like structure along the back. It found in all members of phylum Chordata at some stage of their life. Thus, chordates are those animals having a cord i.e. notochord.
- About 49,000 species of chordates have been recorded. These are most successful animals occupying variety of habitats.
- The animals of all other phyla of animal kingdom are called as ‘non-chordates’ or invertebrates. They do not have notochord or backbone.

Phylum Chordata

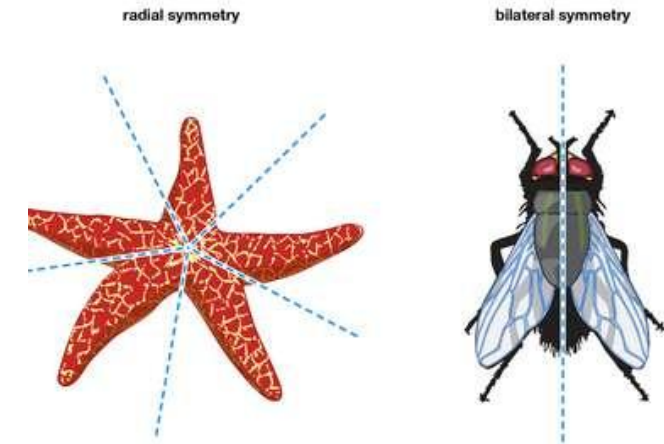


The Chordates!

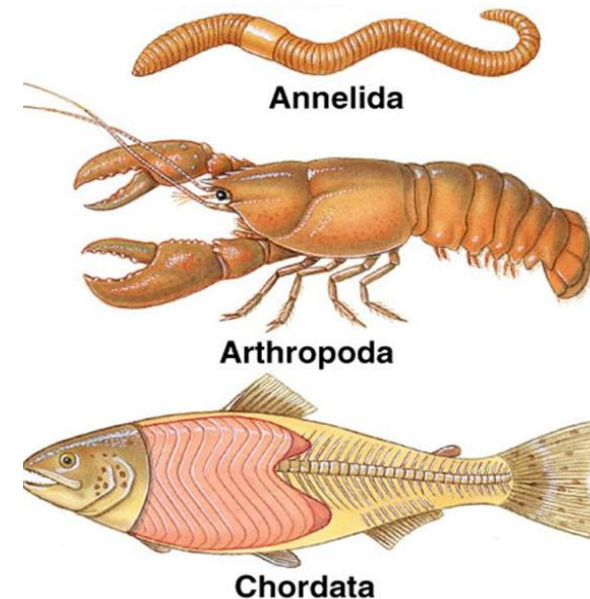


Comparison between Chordates and Non-chordates

Characters	Chordata	Non-chordata
Symmetry	Bilaterally Symmetrical	Bilateral, bi-radial, radial or asymmetrical
Metamerism	True Metamerism	True or pseudo metamerism or absent
Post anal Tail	Present	Absent
Organization	Organ system	Protoplasmic to the organ system



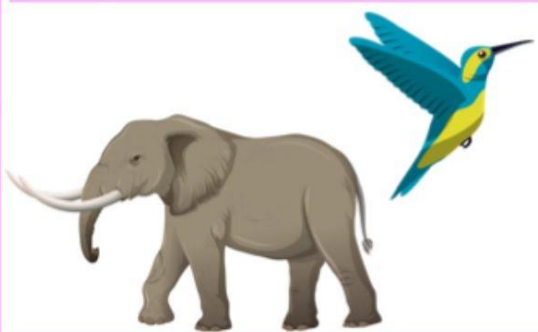
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Body temperature	Cold or warm blooded	Cold blooded
Germ Layers	Triploblastic	Diploblastic (2 germ layers), Triploblastic (3 germ layers), or absent
Coelom	True Coelomates	True coelomates, acoelomates or pseudocoelomates

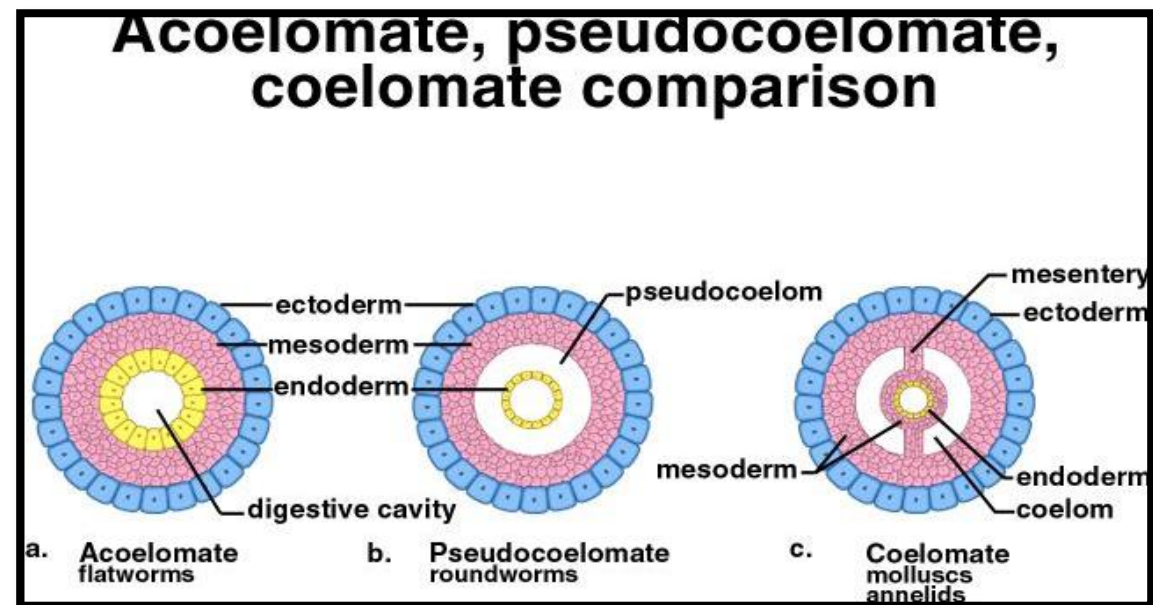
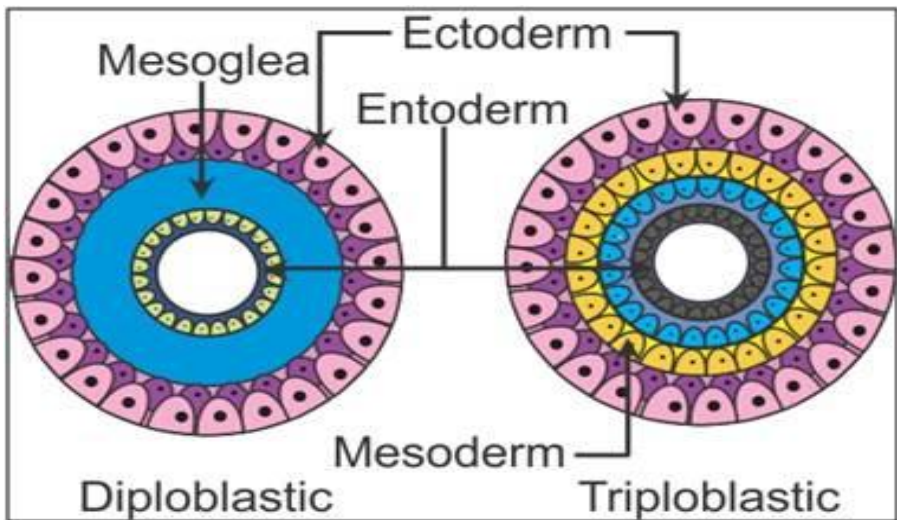
Warm-blooded

Animals that are able to maintain a nearly constant body temperature.

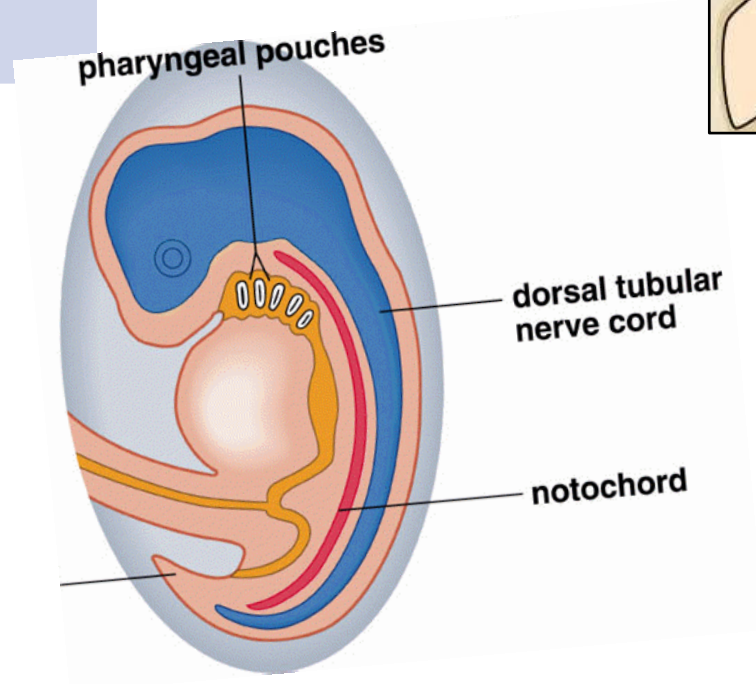
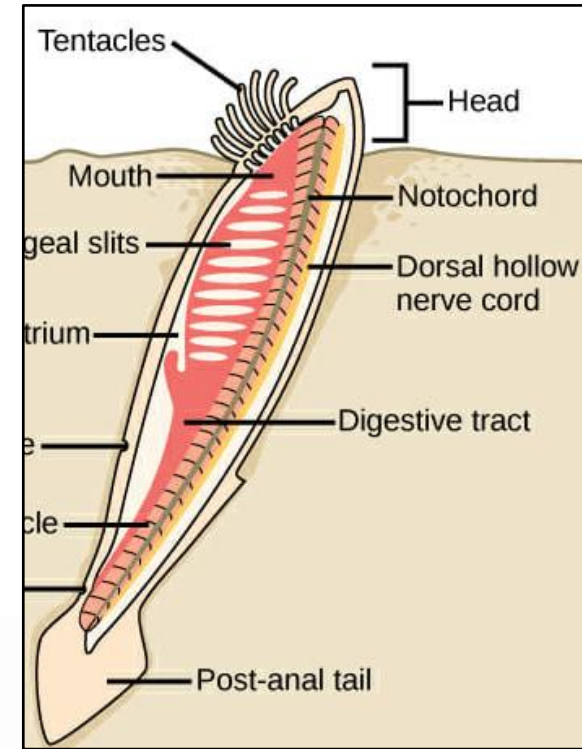


Cold-blooded

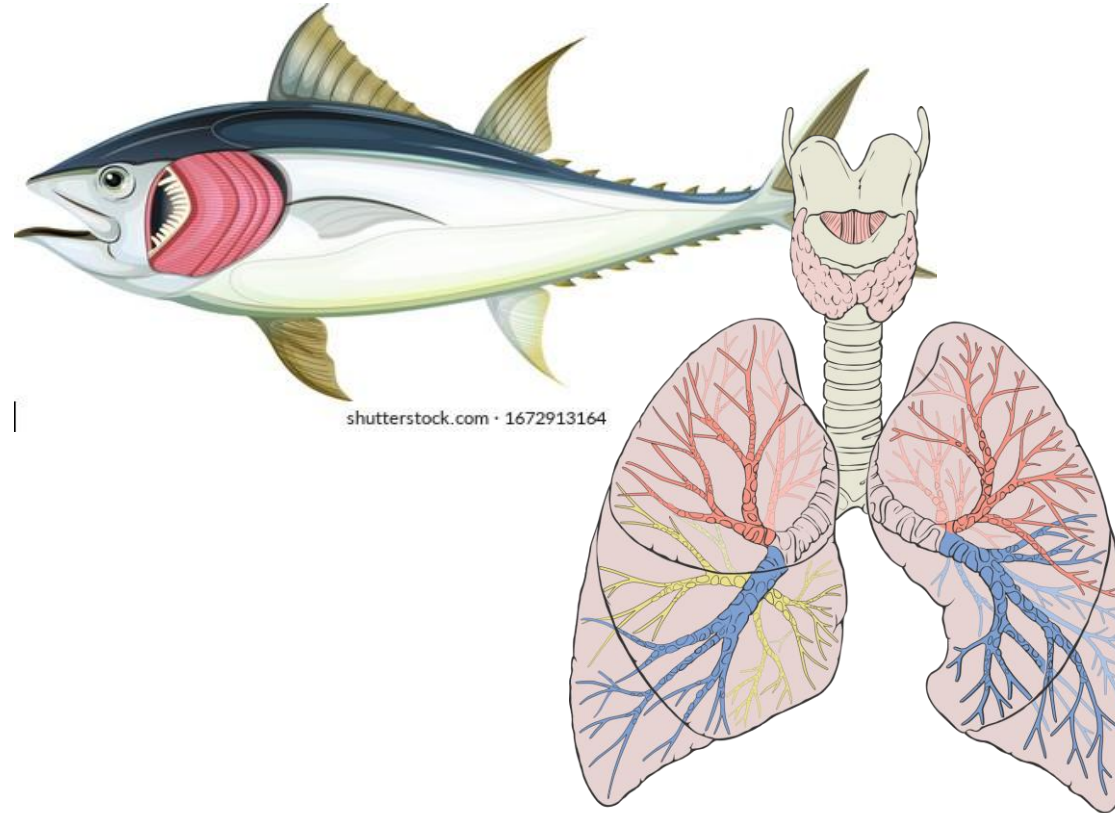
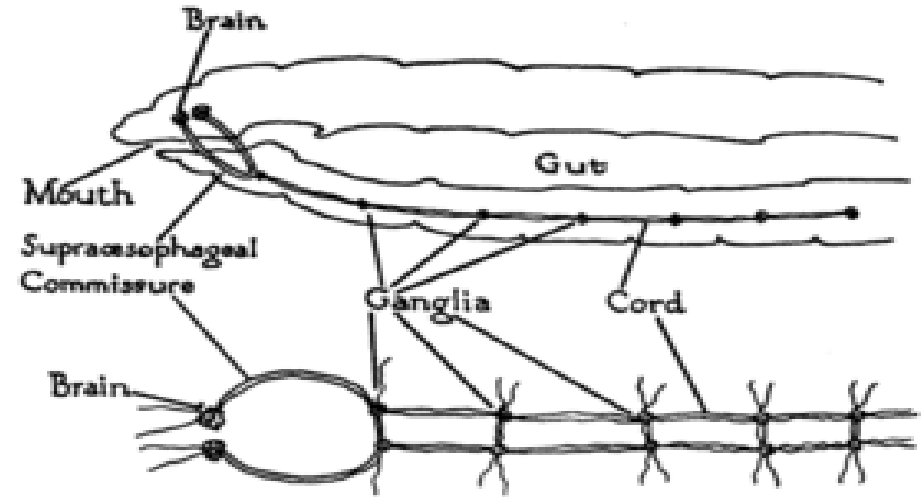
Animals that aren't able to maintain a nearly constant body temperature.

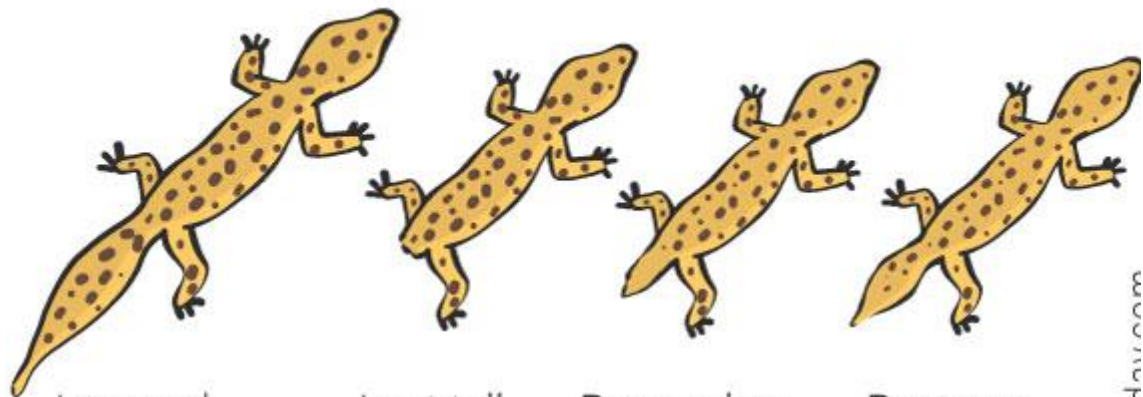



Notochord	With a notochord or backbone	Notochord or backbone is absent
Pharyngeal Gill Slits	Present at some stage of life	Pharyngeal gill slits absent.
Blood vascular system	Closed type	Open, closed or absent
Heart	Ventrally placed	Dorsal, Lateral or absent



Haemoglobin	Present in RBCs	Instead of hemoglobin, hemolymph is present, which is comparable to blood invertebrates.
Respiration	Through the gills or the lungs.	Through trachea, gills, or body surface.
Nervous system	Hollow	Solid
Nerve Cord	Dorsal, single, hollow and tubular	Double, solid and ventrally placed.
Reproduction	Mostly Sexual	Mostly asexual, rarely sexual





Leopard gecko before autotomy

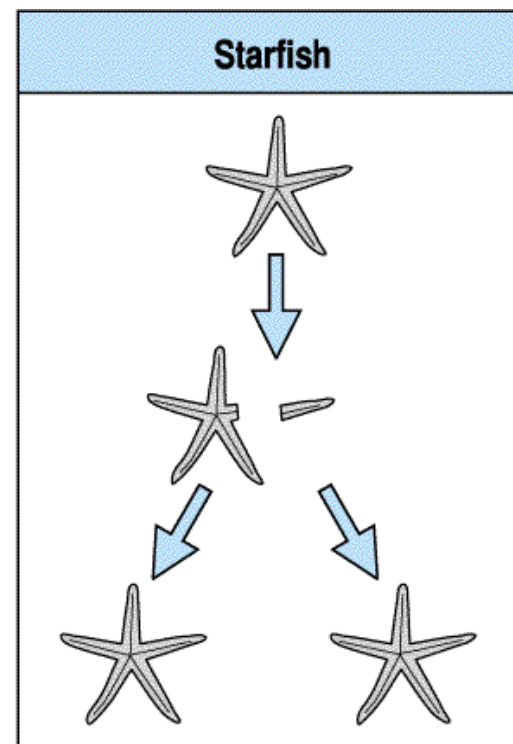
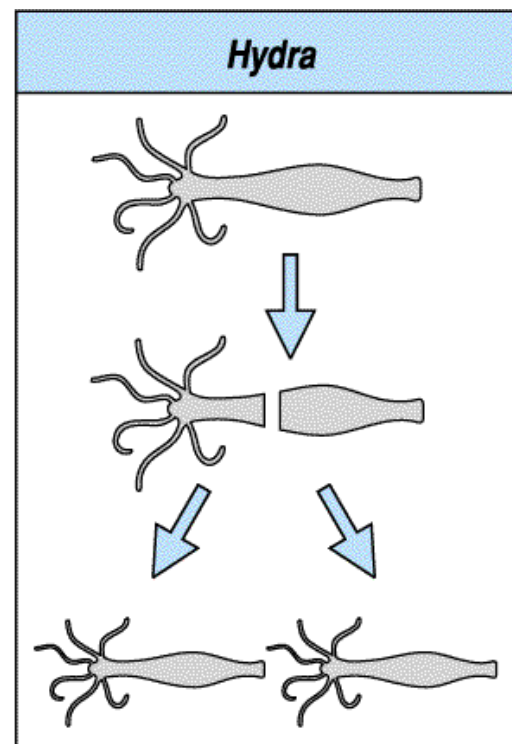
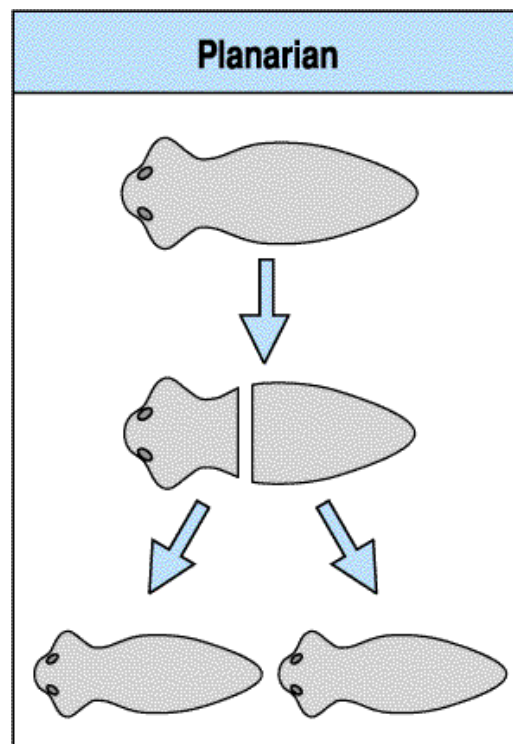
Lost tail

Regrowing tail after 4 weeks

Regrown tail after 22 weeks

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Regeneration

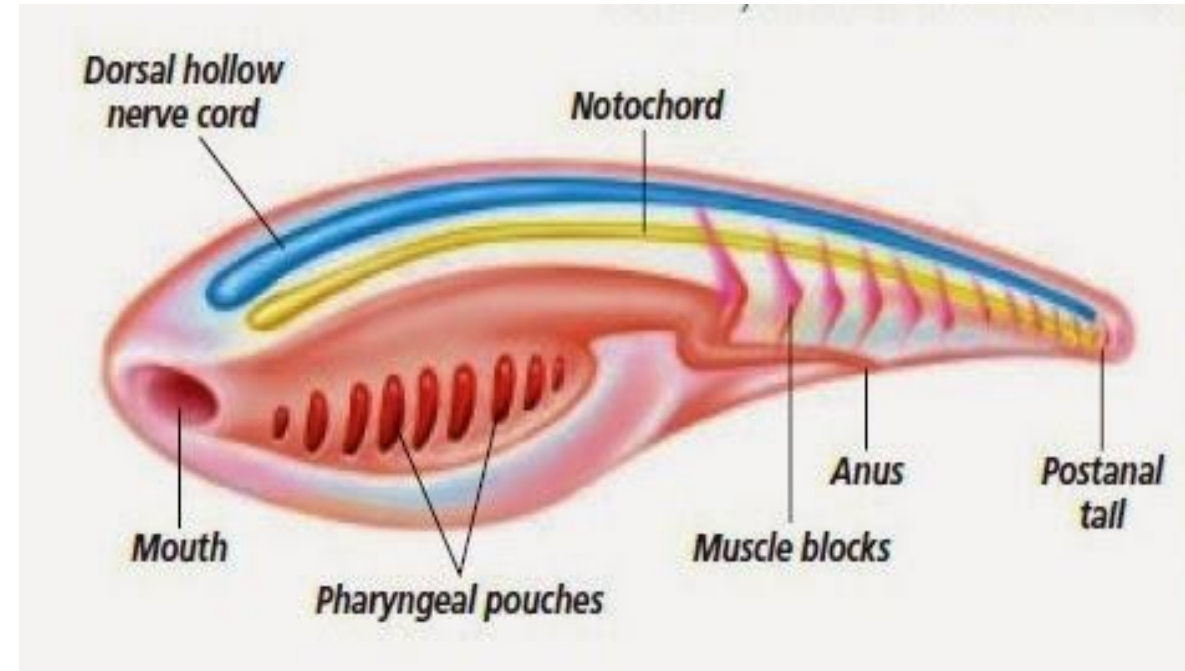


Salient Features of Phylum Chordata

A] Fundamental chordate characters:

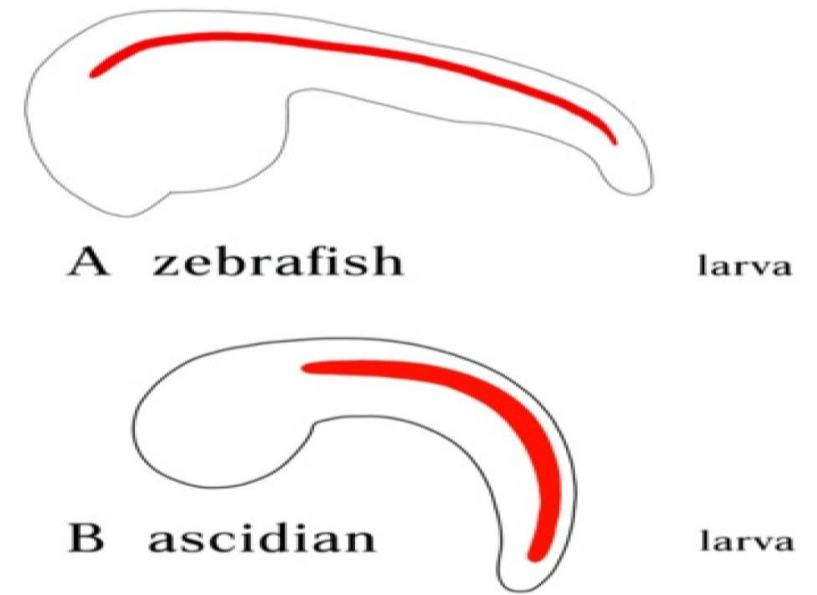
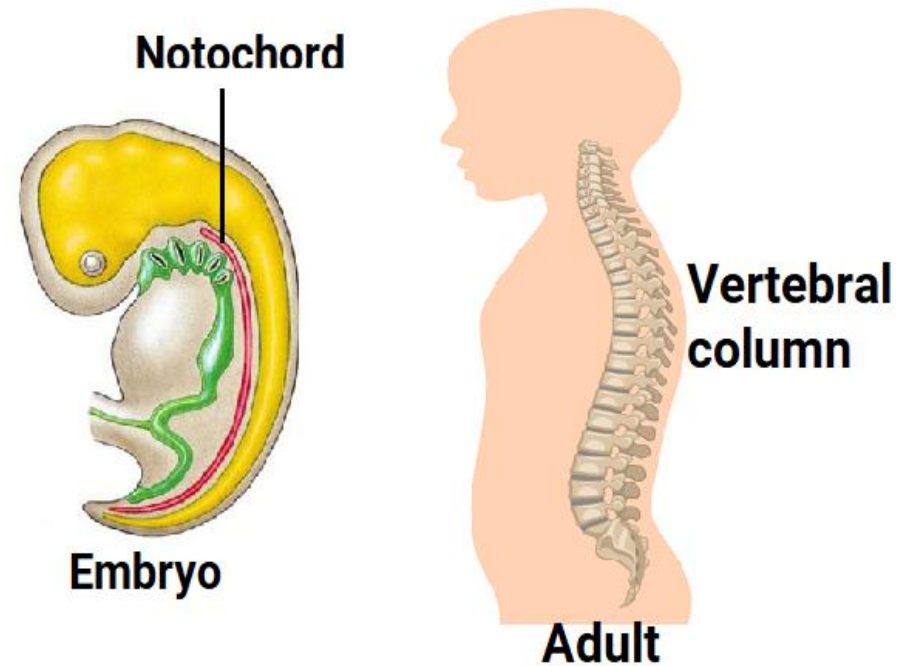
All the chordates possess three common fundamental characteristics at some stage in their life cycle. These three characteristics are unique for phylum Chordata. They are -

1. A notochord
2. A dorsal tubular nerve cord
3. Pharyngeal gill slits



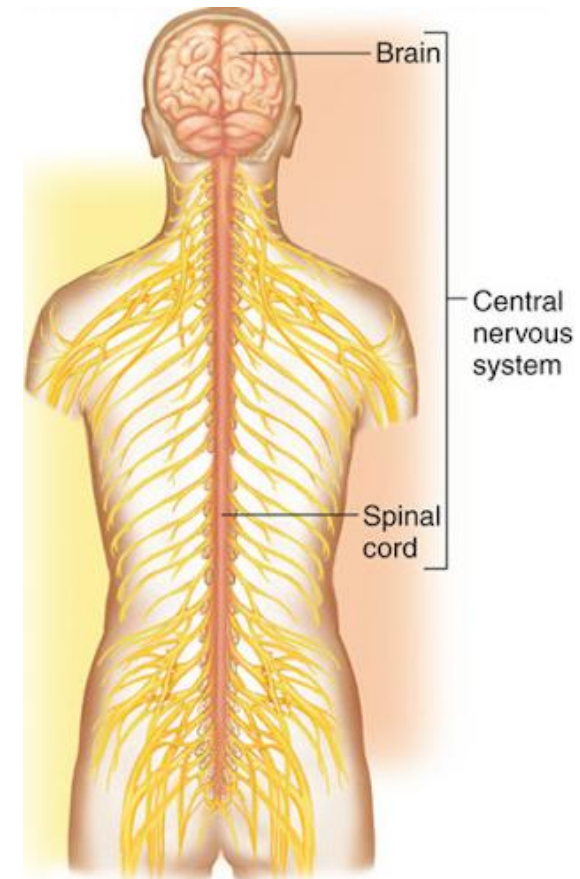
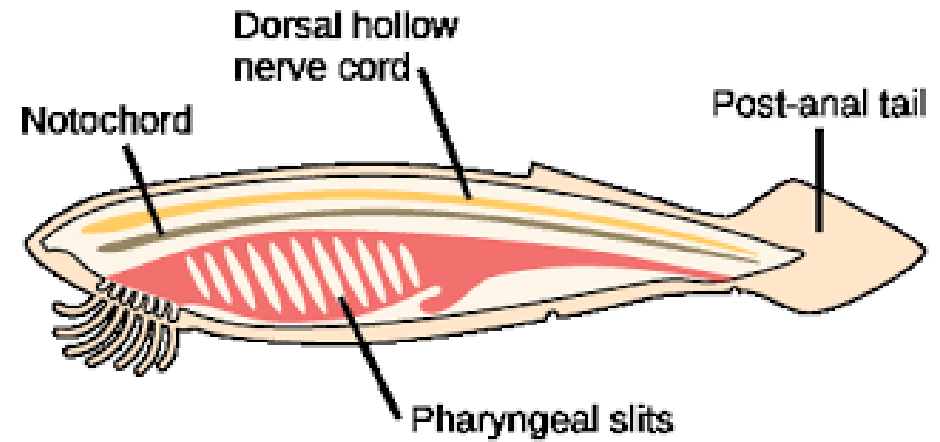
1. Notochord:

- Rod-like, elongated, elastic structure found in embryonic stage of all chordates and in adult stage of many chordates.
- Situated just above the alimentary canal and below the dorsal tubular nerve cord.
- Composed of large notochordal cells.
- Provides skeletal support to the body.
- May persist throughout life (amphioxus) or it may be replaced by vertebral column (backbone) in most adult vertebrates.



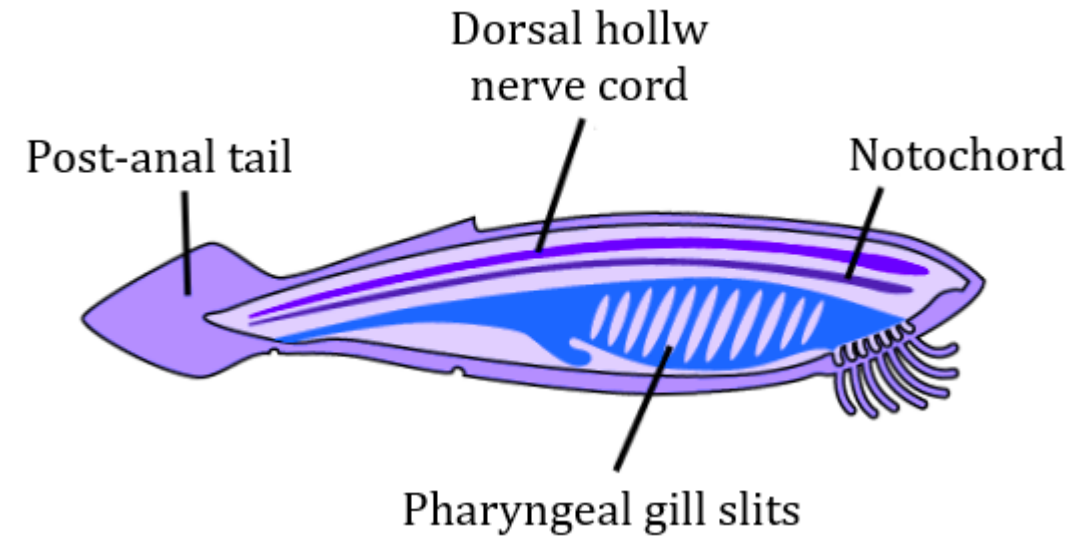
2. Dorsal tubular nerve cord:

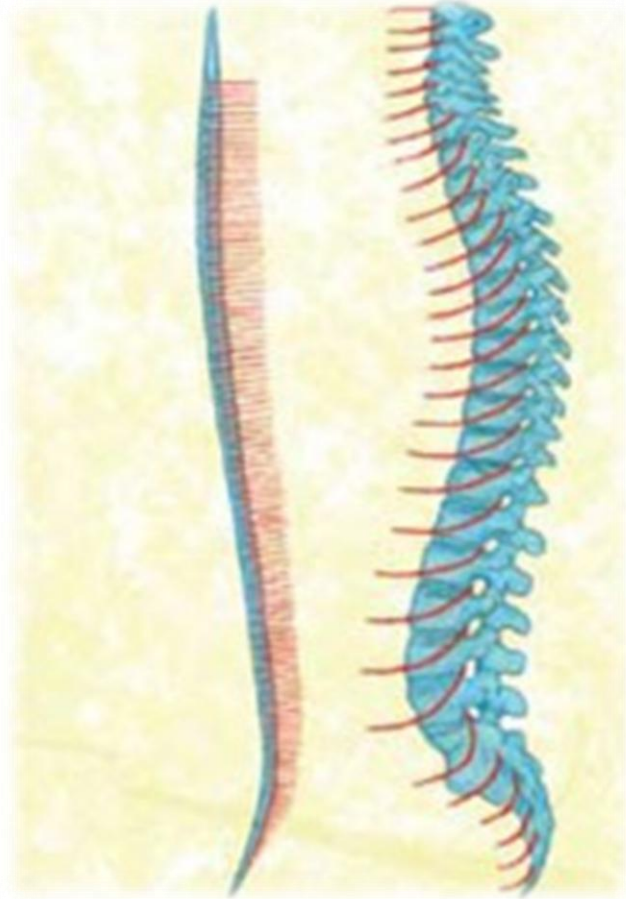
- Dorsal, hollow or tubular fluid-filled nerve cord is present.
- Located dorsal to notochord.
- Nerve cord is also called as neural tube and encloses a hollow cavity called neurocoel.
- In most chordates it develops into brain and spinal cord.
- It persists throughout life in chordates.
- It plays an important role in integration and coordination of body activities.



3. Pharyngeal gill slits:

- Pharyngeal gill slits are the openings of pharynx that open to the exterior.
- In aquatic animals, they allow the exit of water that enter through the mouth.
- In fishes these are modified into gills for respiration.
- In terrestrial chordates, traces of gill slits are present during early development but disappear later in adults.

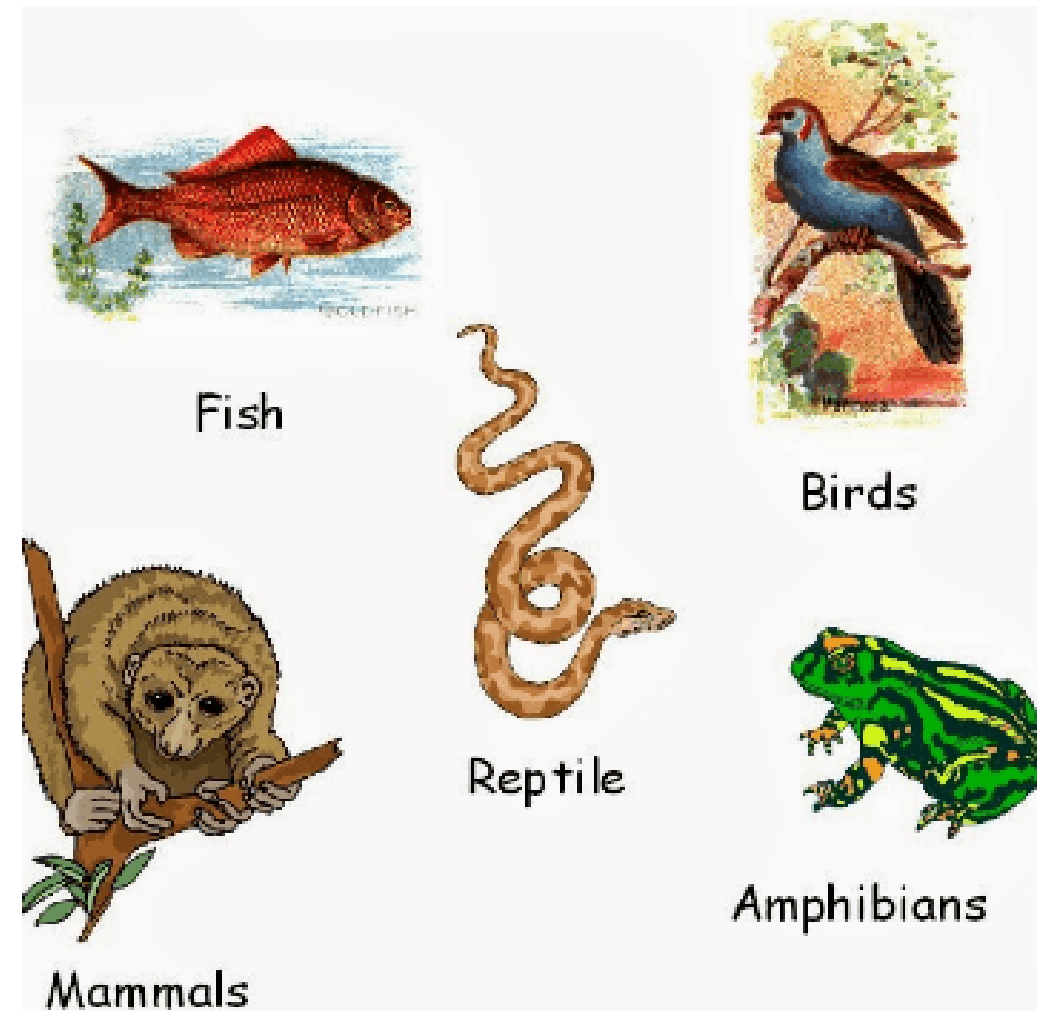




The above three characters appear during early embryonic life of all chordates. But all these three characters rarely persist in the adults. Only one character is found in adults of most chordates i.e. the dorsal tubular nerve cord. The other two characters completely disappear in the adults of most chordates.

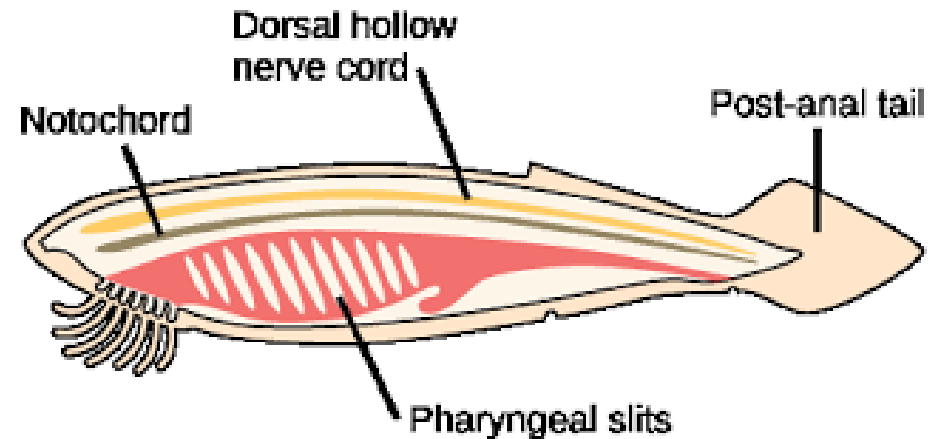
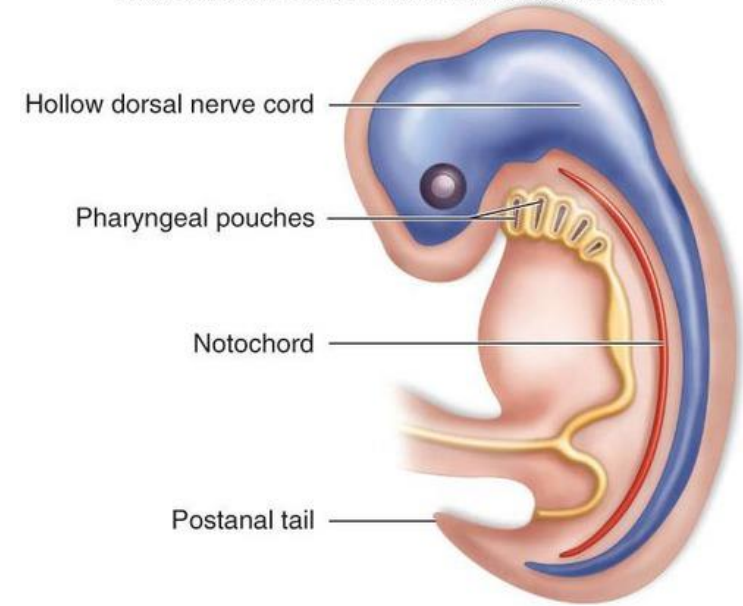
B) General Characters of Phylum Chordata:

1. Chordates are aquatic, terrestrial or aerial. All are free living. No fully parasitic forms.
2. Body is bilaterally segmented and metamERICALLY segmented.
3. A well-developed exoskeleton is present in most vertebrates.
4. Body wall is triploblastic.
5. Coelomate animals i.e. true coelom
6. Complete digestive system with digestive glands.



7. Blood vascular system is closed with ventral heart.
8. Excretion takes places through proto-, meso-, or meta-nephric kidneys.
9. Sexes are separate with rare exceptions.
10. A post anal tail is present at some stage of life and may or may not persist in the adult.

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