

What is a Vertebrate?

What characteristics do chordates share?

What characteristic do all vertebrates have?

**How do vertebrates differ in the way they control
body temperature?**

Characteristics of Chordates

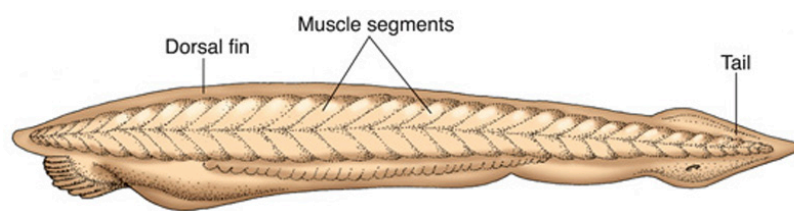
- vertebrates are a subgroup in the phylum Chordata
- members of this phylum are called chordates (examples: fishes, frogs, snakes, birds, mammals)
- most chordates are vertebrates, but a few are invertebrates

**AT SOME POINT IN THEIR LIVES, CHORDATES WILL HAVE A
NOTOCHORD**

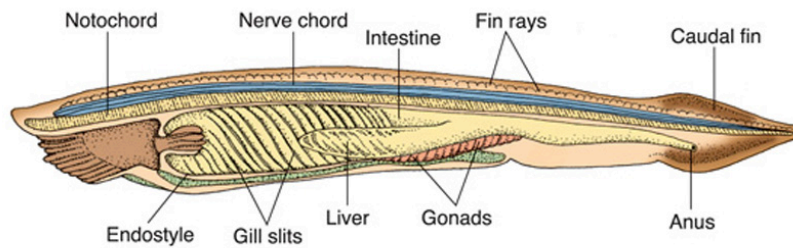
A notochord is a nerve chord that runs down the back of a chordate, and slits in its throat area

Some chordates have notochords for their entire life, however in vertebrates, part or all of the notochord is replaced by a backbone

Nerve cord in back / slits in throat area



A

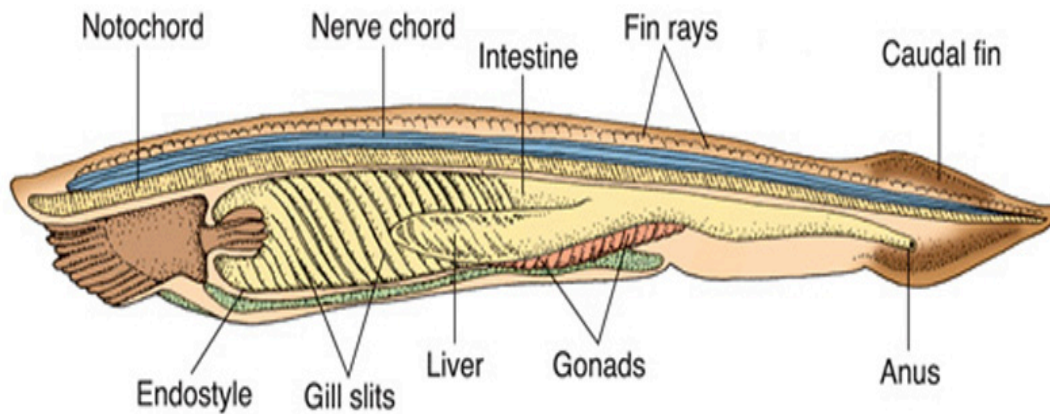


B



A

Nerve cord in back

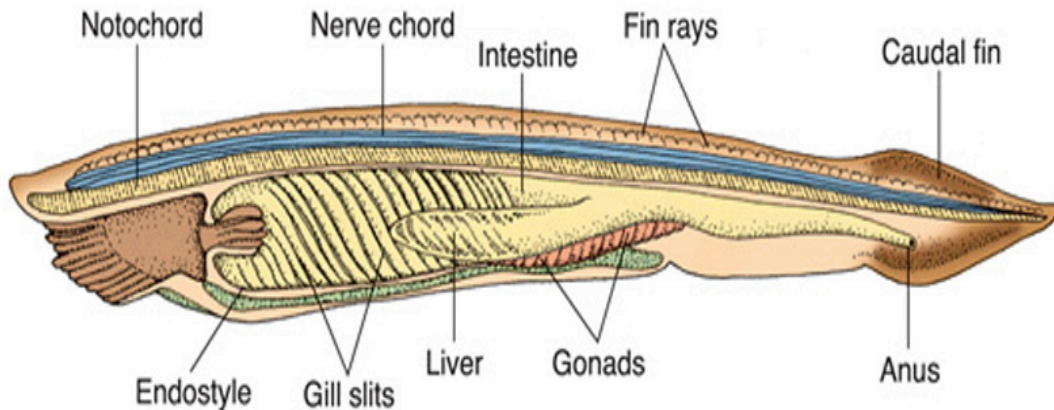


^BThe nerve cord is the connection between the brain and the nerves, where messages travel back and forth.

Animals such as arthropods and segmented worms have a nerve cord BUT it does not run down their backs

A

Slits in throat area



B

At some point in life chordates have slits called pharyngeal (fuh RIN jeeul) or gill slits

Some chordates keep these slits as part of their gills (fishes), but for many the slits disappear before birth



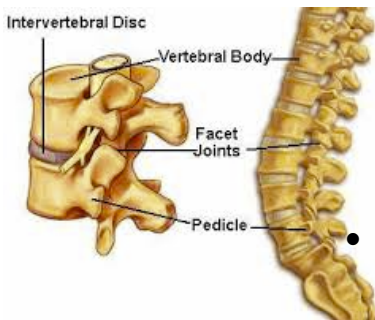
Characteristics of Vertebrates

A vertebrate has a backbone that is part of an internal skeleton (endoskeleton) that supports the body and allows it to move

Backbone



- Also called a spine, runs down the center of a vertebrates back
- Formed by many similar bones called vertebrae
- Vertebrae are lined up in a row and have joints/moveable connections to give the spine flexibility
- Each vertebrae has a hole the allows the spinal chord to pass through it



Internal Skeleton (Endoskeleton)

- Protects internal organs
 - helps give body shape
- gives muscles a place to attach
 - skull protects brain
- ribs attach to vertebrae and protect the heart, lungs and other internal organs



Endoskeleton of a vertebrate

- Endoskeleton does not need to be replaced as the animal grows (unlike arthropod)
- Forms an internal frame that supports the body against downward pull of gravity
- Vertebrates can grow bigger than animals with exoskeletons or no skeletons at all



Keeping Conditions Stable

Different types of vertebrates have different ways of controlling body temperature

Most fishes, amphibians and reptiles have a body temperature that is close to the environment they live in

Birds and mammals have a stable body temperature that is often warmer than their environment

Ectotherms

Fishes, amphibians, reptiles

An ectotherm is an animal that does not produce much internal heat

- **Body temperature changes based on the temperature of the environment**
- **Sometimes called "coldblooded" however, their blood is often warm**

Example: A turtle's body temperature will change as it enters a different environment - laying on a sunny riverbank vs. turtle swimming in cool water

Endotherms

Birds and mammals

An endotherm is an animal whose body regulates its own temperature by controlling the internal heat it produces

- body temperature usually does not change much even when the temperature in the environment does - adaptations allow endotherms to live in a greater variety of environments
- sweat glands, fur and feathers are adaptations for maintaining body temperature

On **HOT** days endotherms **SWEAT** - cools the animal

On **COOL** days fur and feathers keep endotherms warm

