

Chapter 23 Chordata

Subphyla

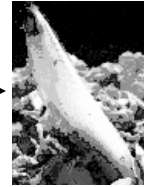


Urochordata

1400 spp

Cephalochordata

29 spp



Vertebrata

48000 spp



Chordate Characteristics

bilateral symmetrical

deuterostome

distinctive characteristics

notochord

dorsal hollow nerve cord

pharyngeal pouches or gill slits

postanal tail

endostyle

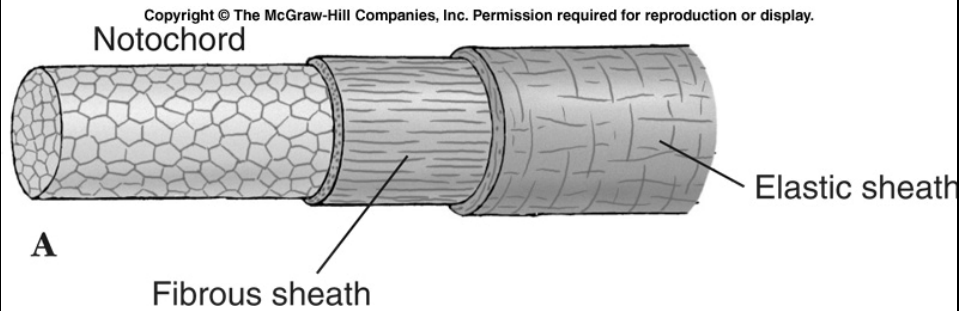
recently recognized

**secretes mucus in
invertebrate chordates/
lamprey larvae**

**becomes the thyroid glands in
adult lamprey/remaining vertebrates**

Vertebrata → Craniata

Figure 23.01a



Subphylum: Urochordata (Gr: tail string)

Class: Ascidiacea 1250 spp

Class: Larvacea 70 spp

Class: Thaliacea 70 spp

Figure 23.06

Class: Ascidiacea (solitary tunicates)

larval stage

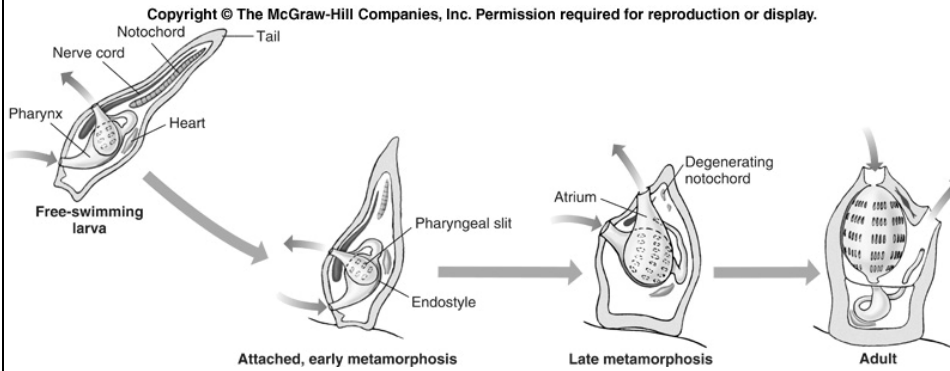


Figure 23.04

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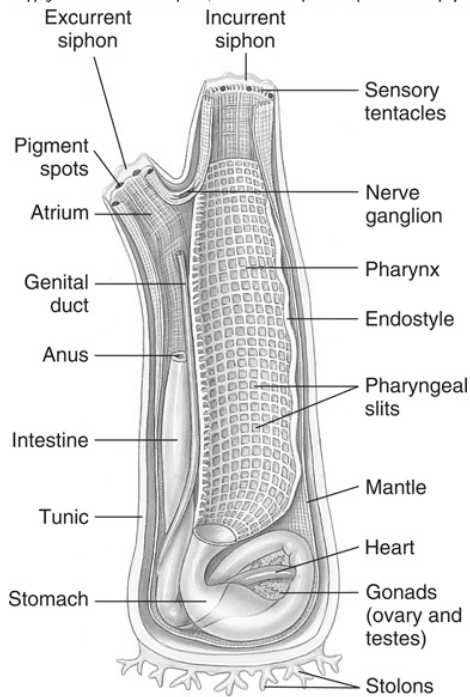
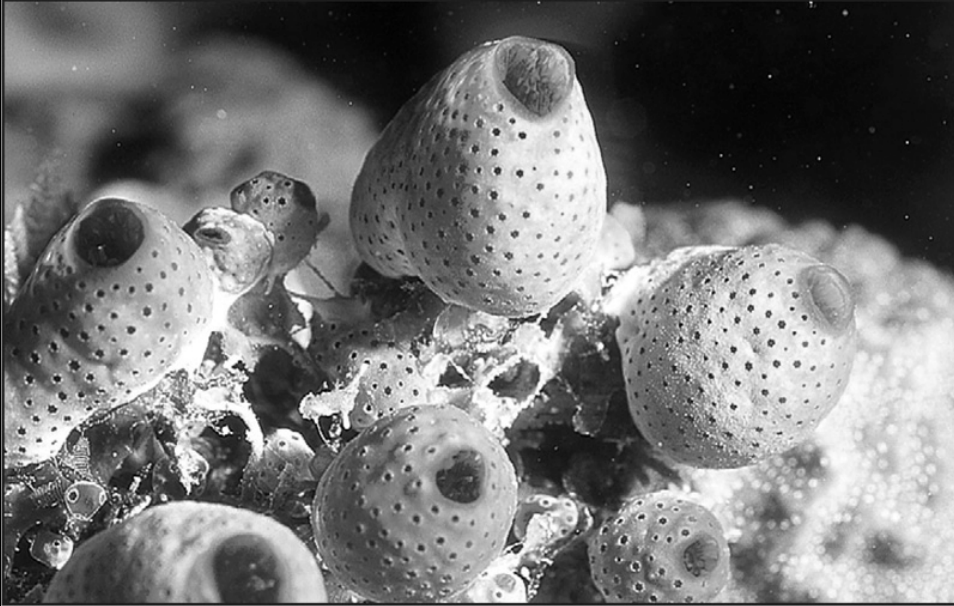
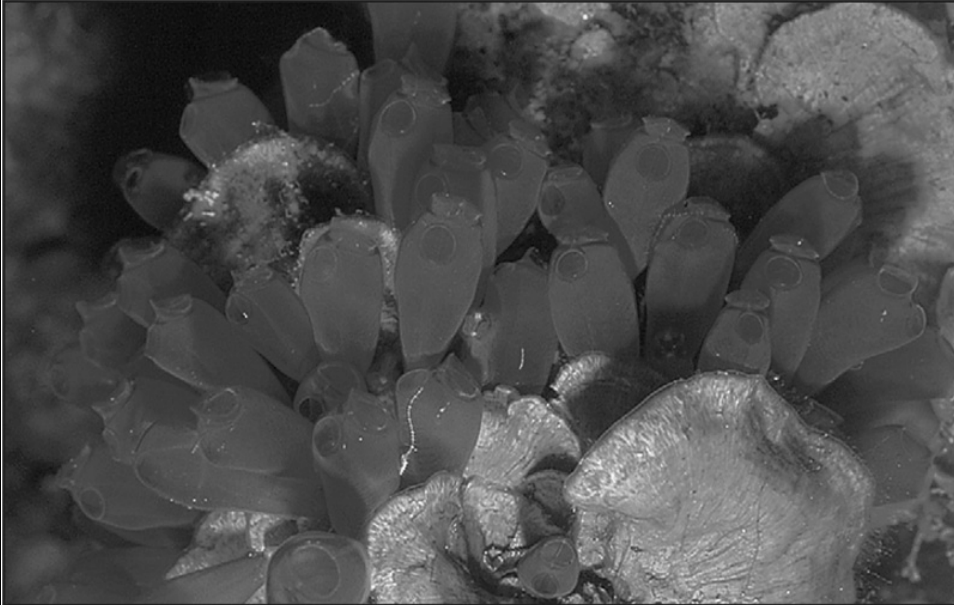


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B

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A

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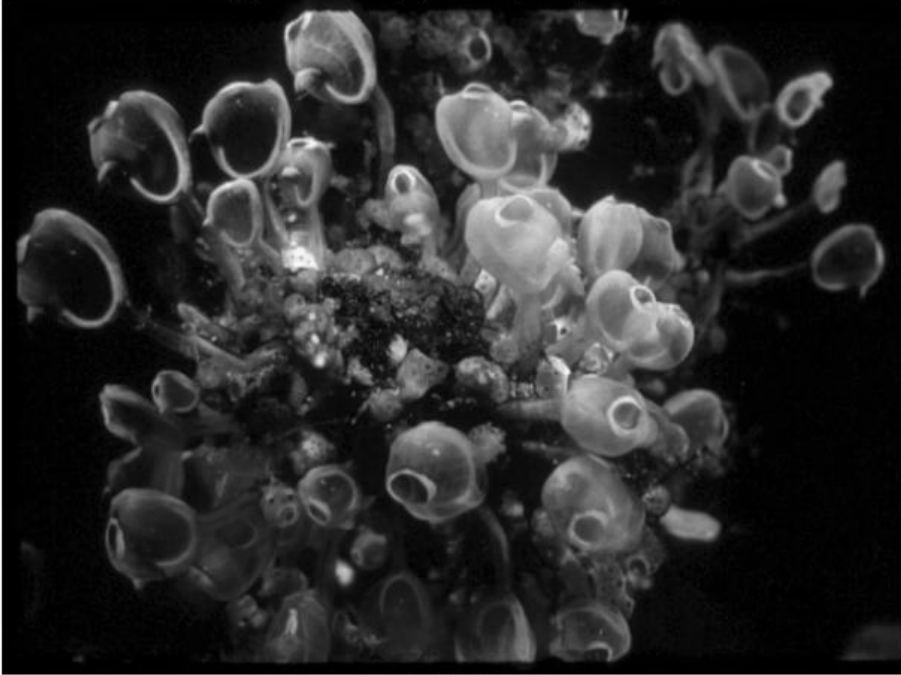


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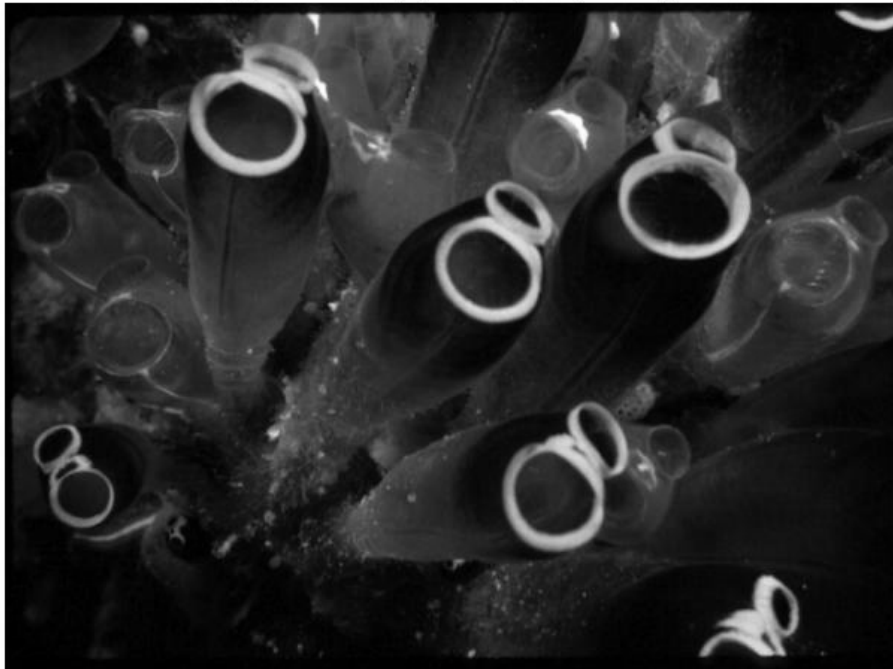


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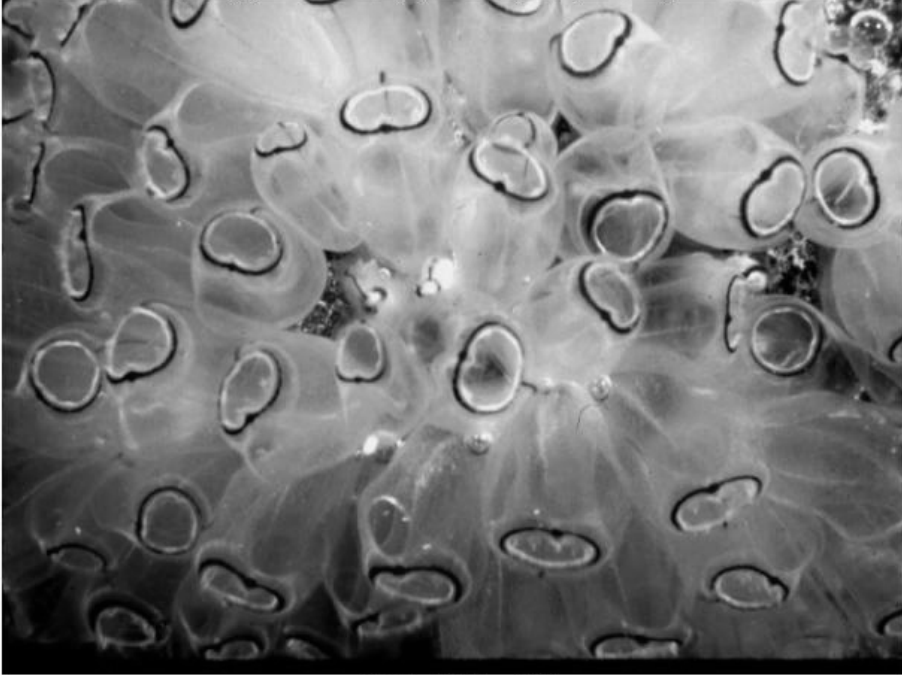


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Class: Larvacea larvalike pelagic, walnut size

1869 tunicate tadpole larva → descendant of an ancient free-swimming chordate ancestor

Paedomorphosis (Gr: child + form)

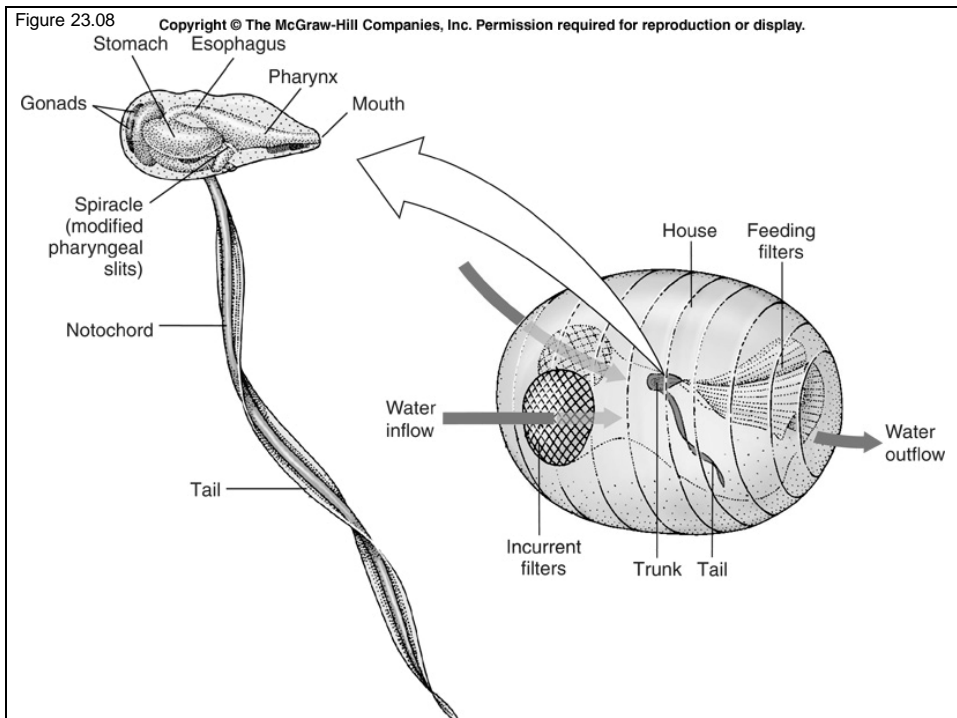
Walter Garstang 1928

sexually mature animals retaining larval characteristics

- 1) neoteny-slow growth rate of body form →
adult form never attained at maturity
- 2) progenesis-precocious maturation of gonads in larval form;
body stops growing → never attains adult form
- 3) postdisplacement: onset of a developmental process delayed
relative to reproductive maturation → adult form is not attained

build gelatinous houses every 4 hrs

food source for fish in pelagic open oceans



Class: Thaliacea

free-living, planktonic

achieve mobility through modification
of adult rather than larval form

buccal & atrial siphons at opposite ends

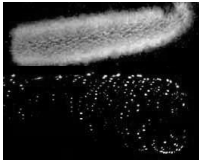
highly developed bands of circular muscles

nearly transparent

avoid detection by predators

avoid detection by prey

100-1000 of individuals/m³



pyrosomes

ciliary activity

drives food through large pharyngeal basket

provides locomotion



salps

pharyngeal basket reduced to bar

cilia compact mucus net & food string

muscular contraction-feeding/locomotion



doliolids

pharyngeal cilia → feeding currents

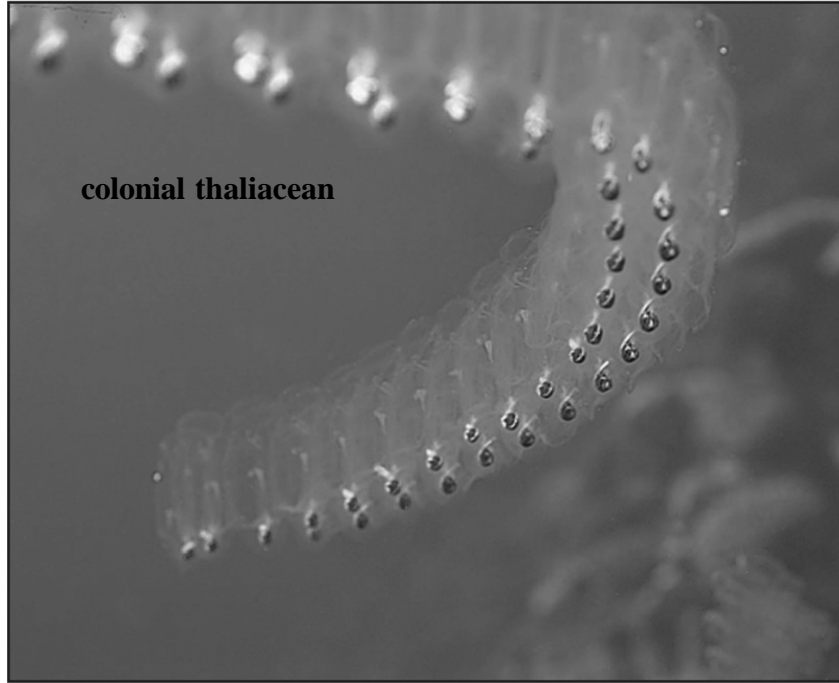
close buccal aperture
contract circular muscles

→ 5 mm individual travel 25 cm/sec



Figure 23.07

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Cephalochordata

small <10 cm length

laterally flattened

notochord extends beyond the nerve cord to anterior end

notochord contractile → V-shaped muscles called myomeres

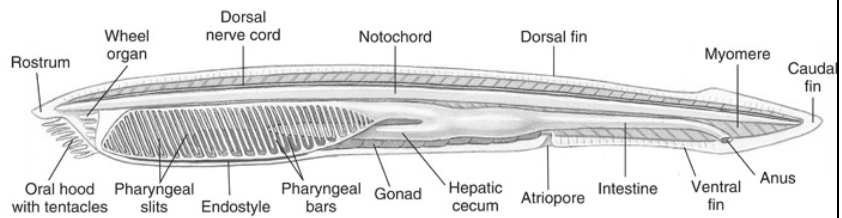
Figure 23.09

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Amphioxus (Gr: both ends sharp)
Branchiostoma (Gr: gill mouth)

A



B

Figure 23.co

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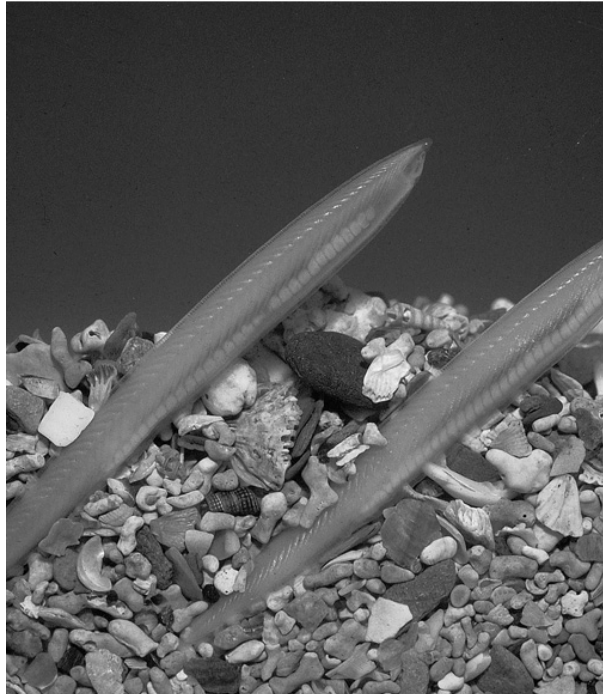
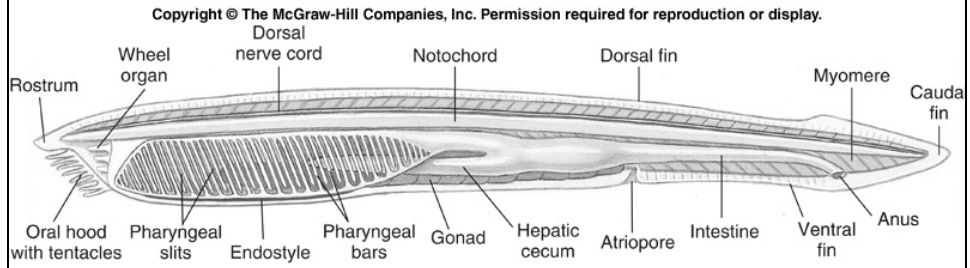


Figure 23.09b



B

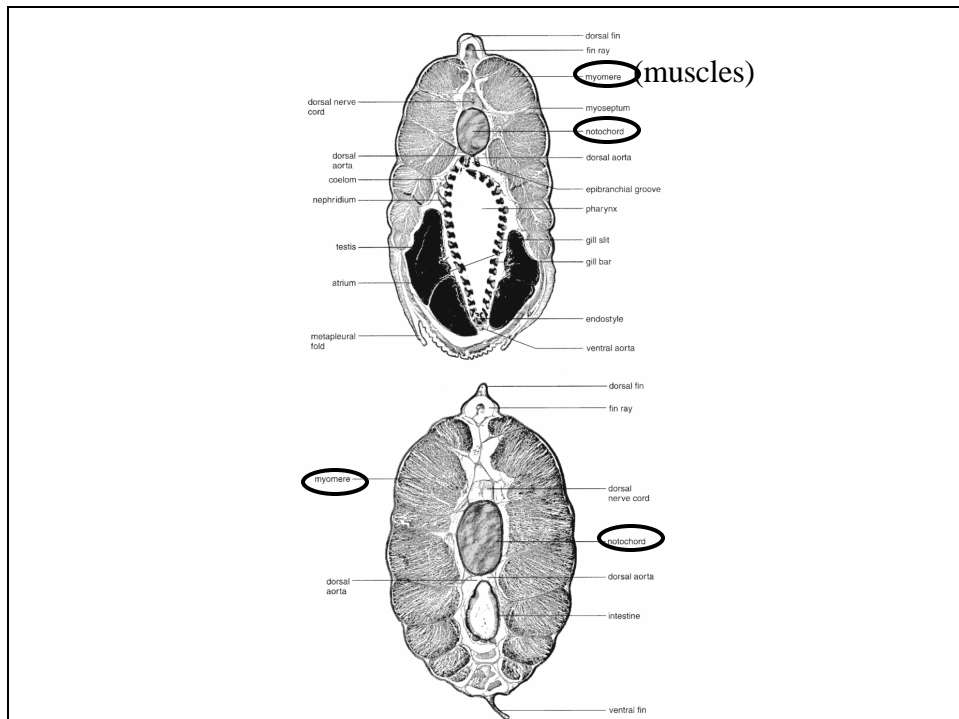


Figure 23.10

***Pikaia* an early chordate (cephalochordate) from Burgess Shale**

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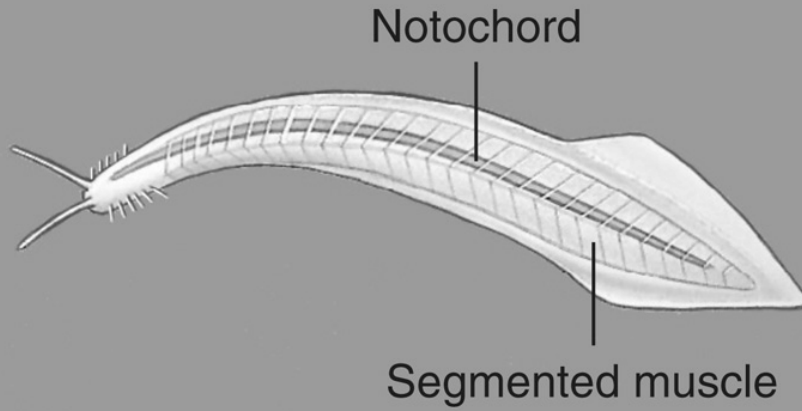
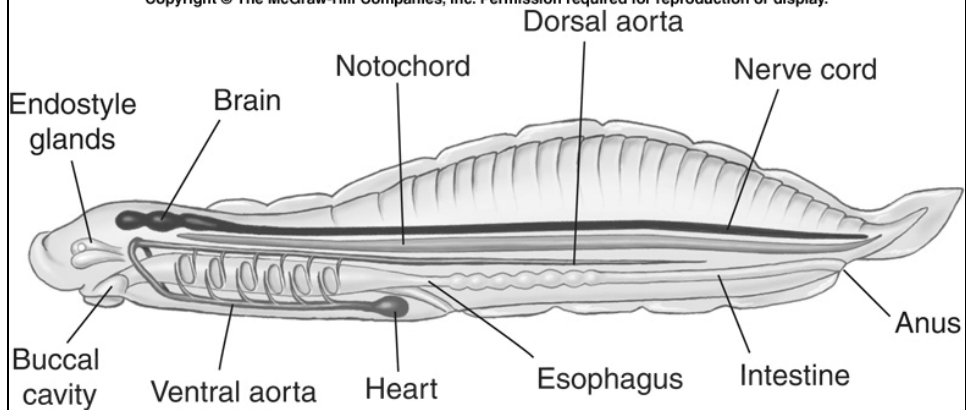


Figure 23.11

***Haikouella*, a chordate from early Cambrian shales of Haikou, China**

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Chordate Larval Stage

Chordata,
Urochordata

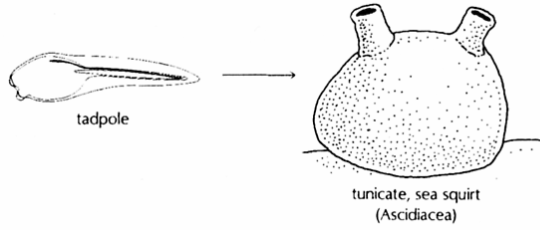


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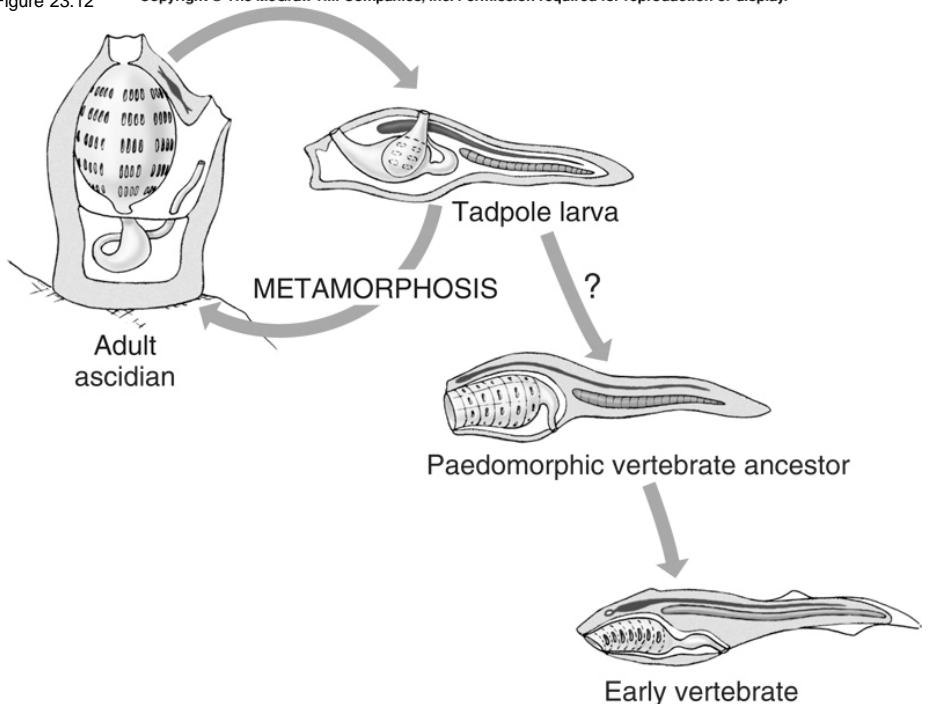


Figure 23.13

larval stage of lamprey

resemble amphioxus except

well-developed brain

paired eyes

pronephric kidney

heart

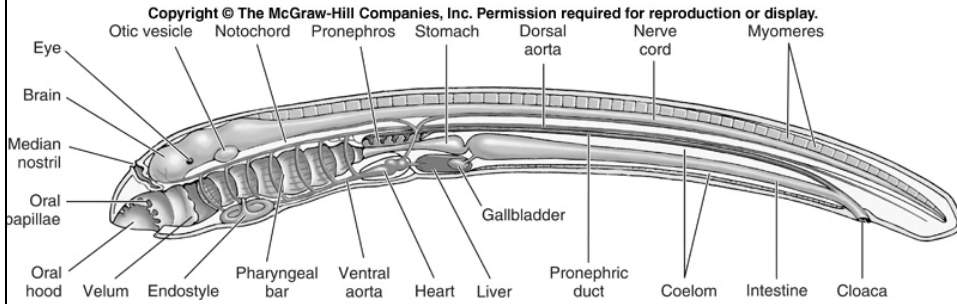


Figure 23.15

Conodont vertebrate ancestor Paleozoic fossils similar to amphioxus

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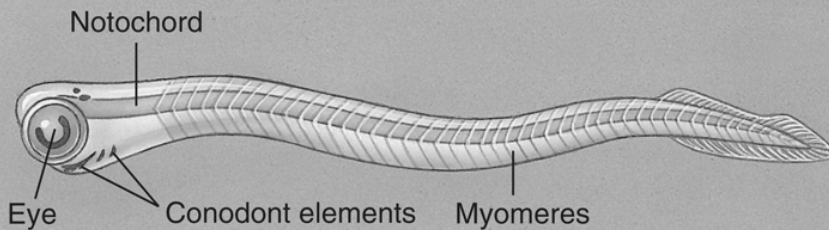


Figure 23.01b

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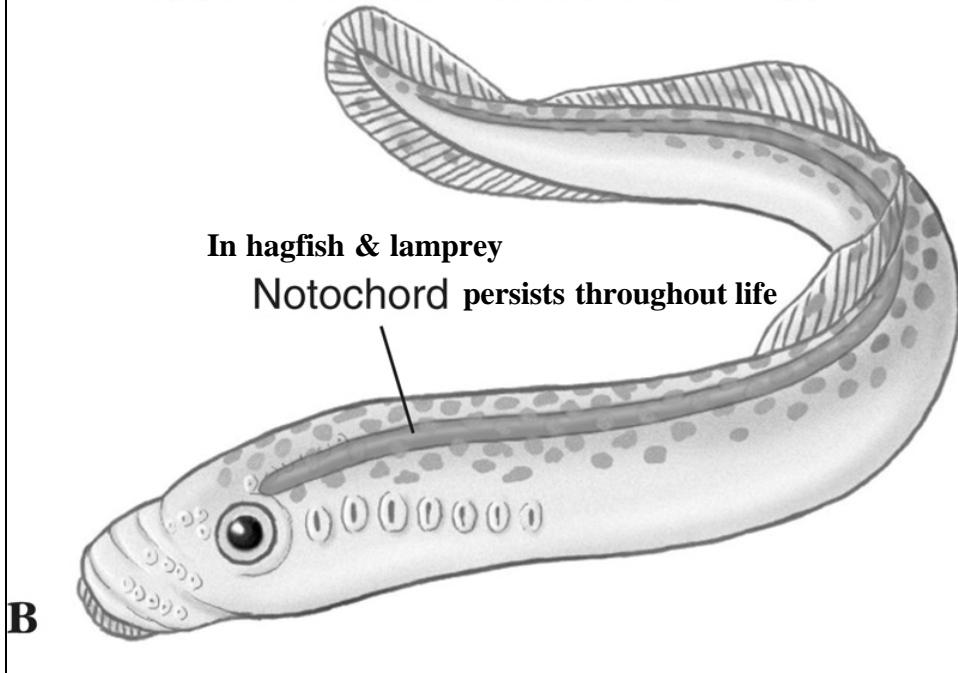


Figure 23.02

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