

## *Paraxial and Intermediate mesoderm*



Gilbert e11 Ch 17 pp539-580

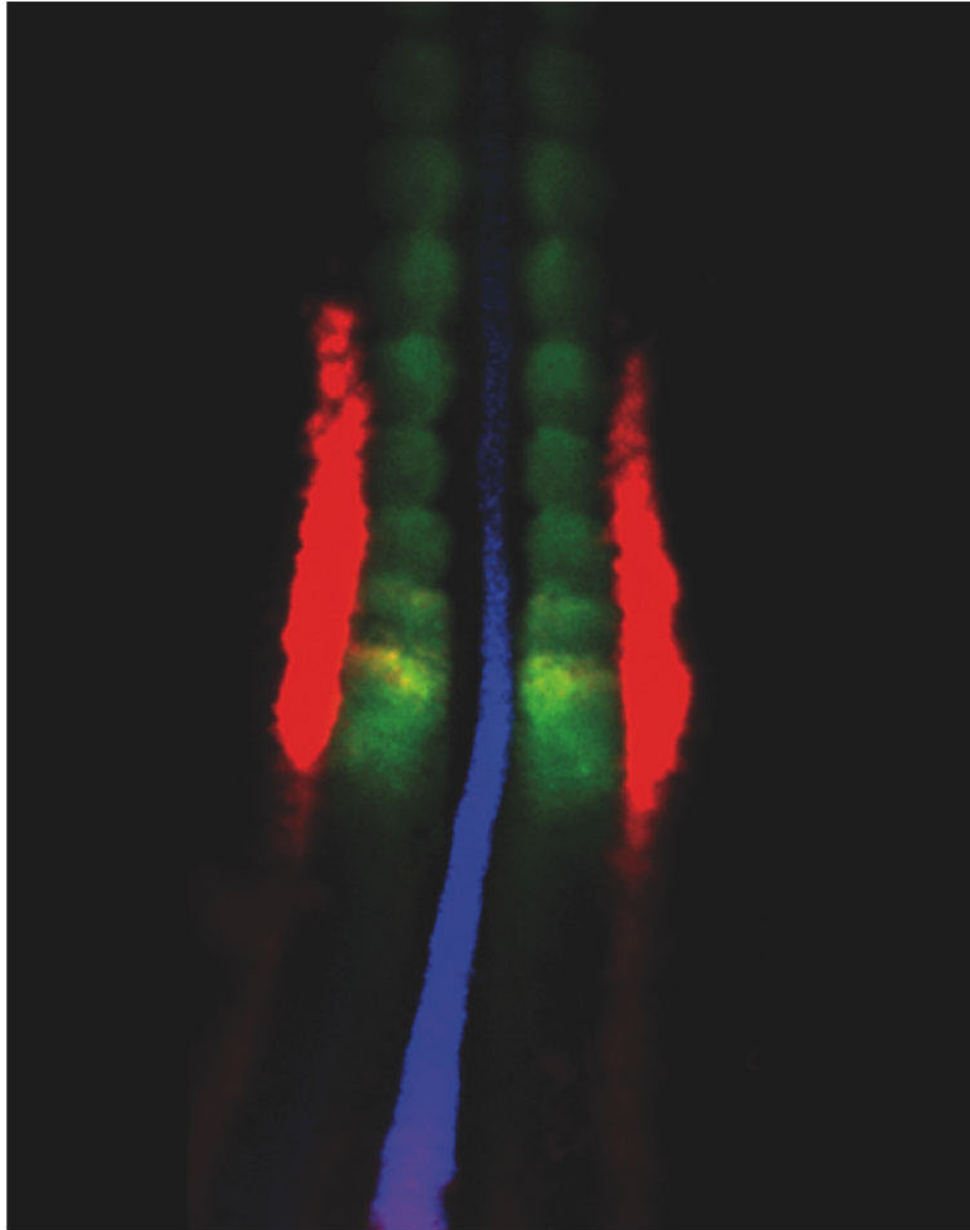
Paraxial mesoderm

Gilbert e10 Ch 12:

Paraxial and intermediate  
mesoderm

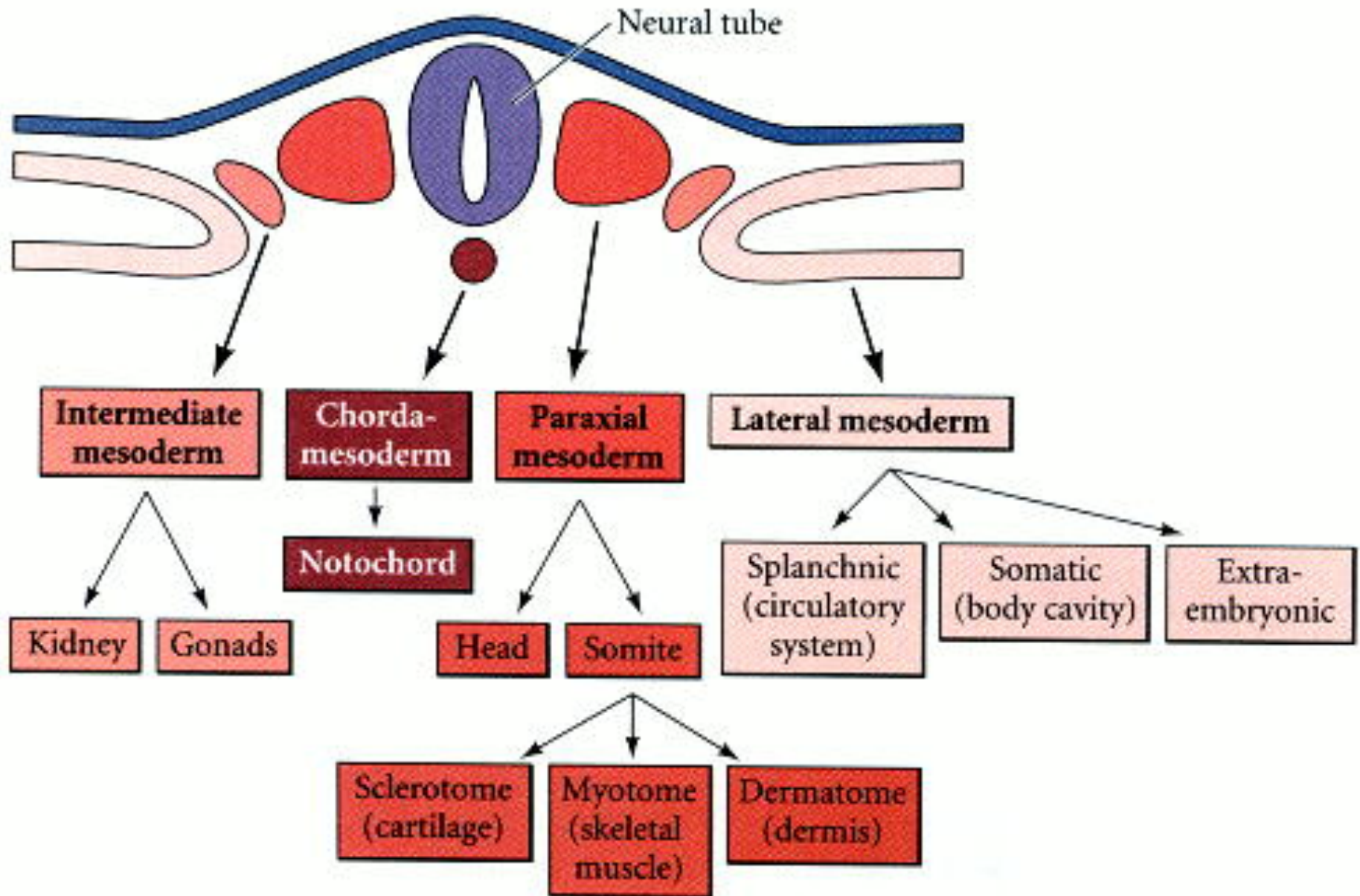
pp415-432

## Chick 12 somite (33 hrs)

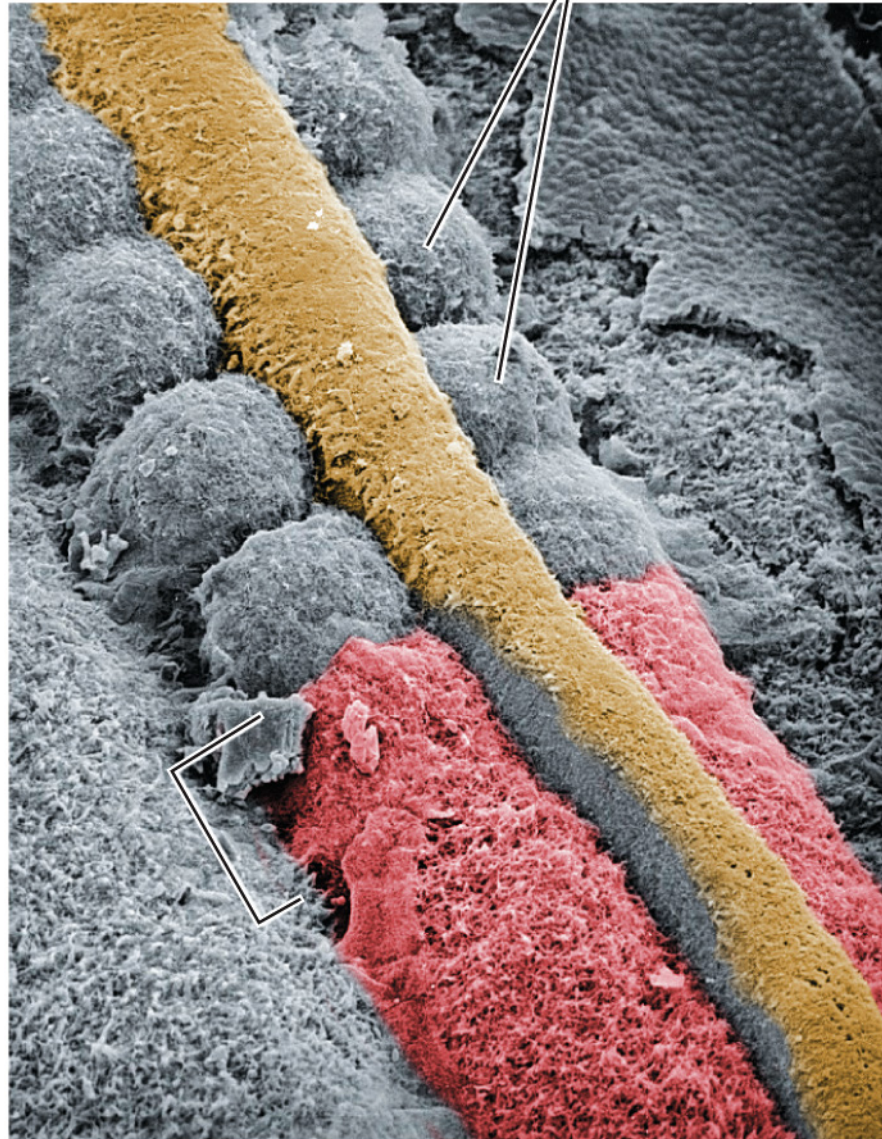


Chordin Blue (NC)  
Paraxis Green (Som)  
Pax2 Red (Int Mes)

# Lineages of the mesoderm



Somites



*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.9  
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### 14.3 Specification of somites



Noggin expressing cells  
In lateral plate meso  
Induces somite like  
Structures (pax3 +)

# Mesenchymal to Epithelial Transition from somitomere to somite



N- Cadherin staining (white)

# Transition from somitomere to somite

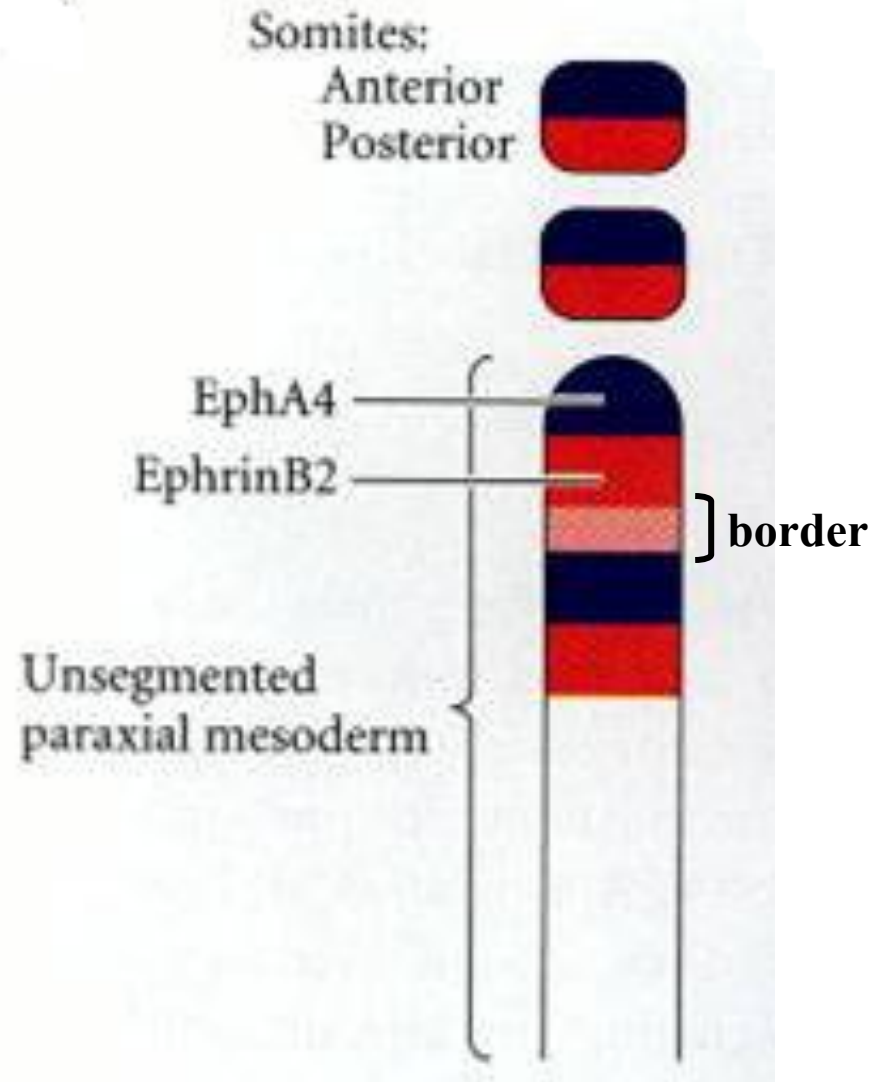


Paraxis staining in red

# Transition from somitomere to somite

EphA4:  
RTK

Ephrin B2 :  
Ligand





# In Situ Ephrin A4 (blue) constitutes a possible cut site for somite formation

(B)

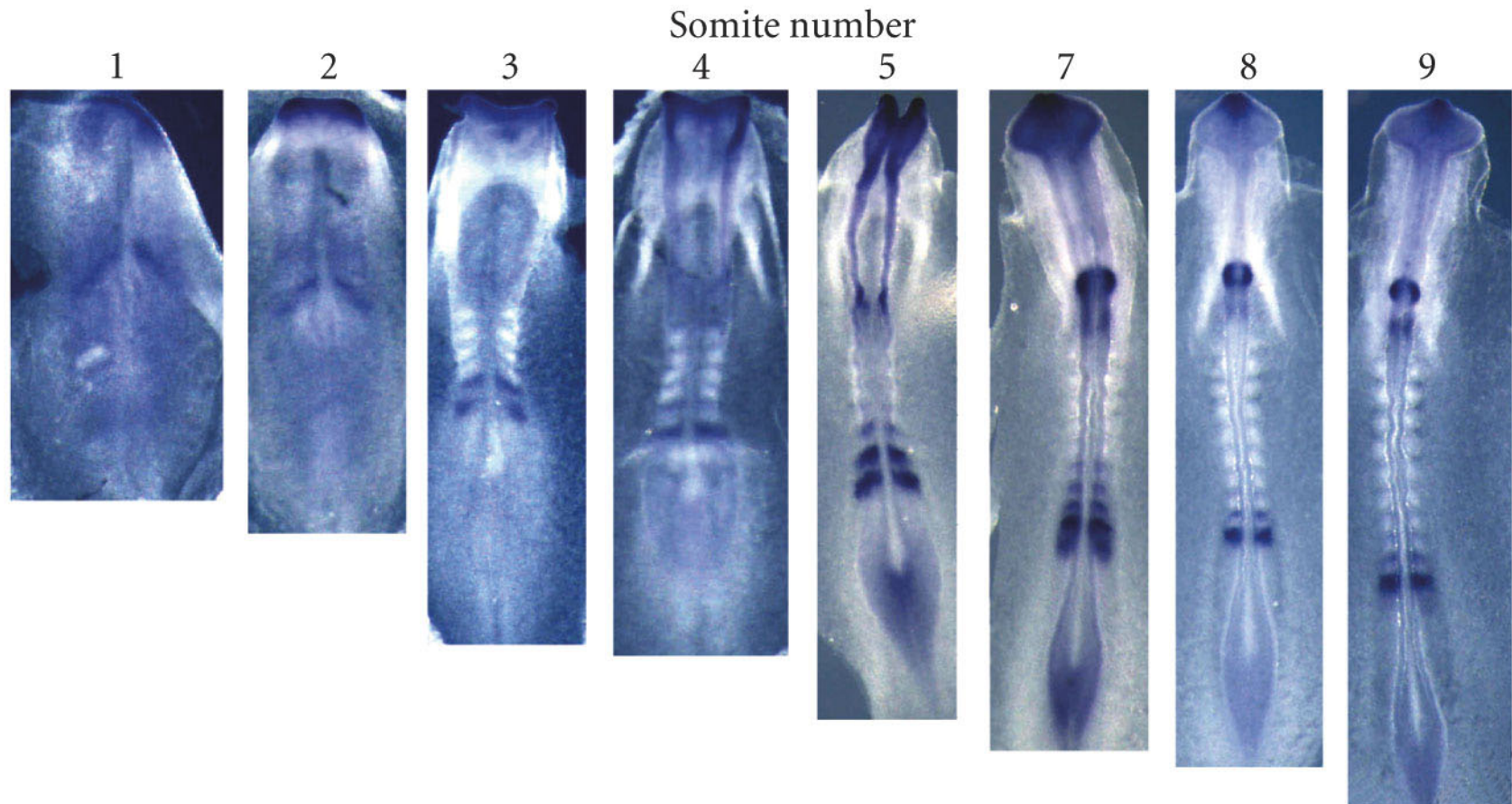
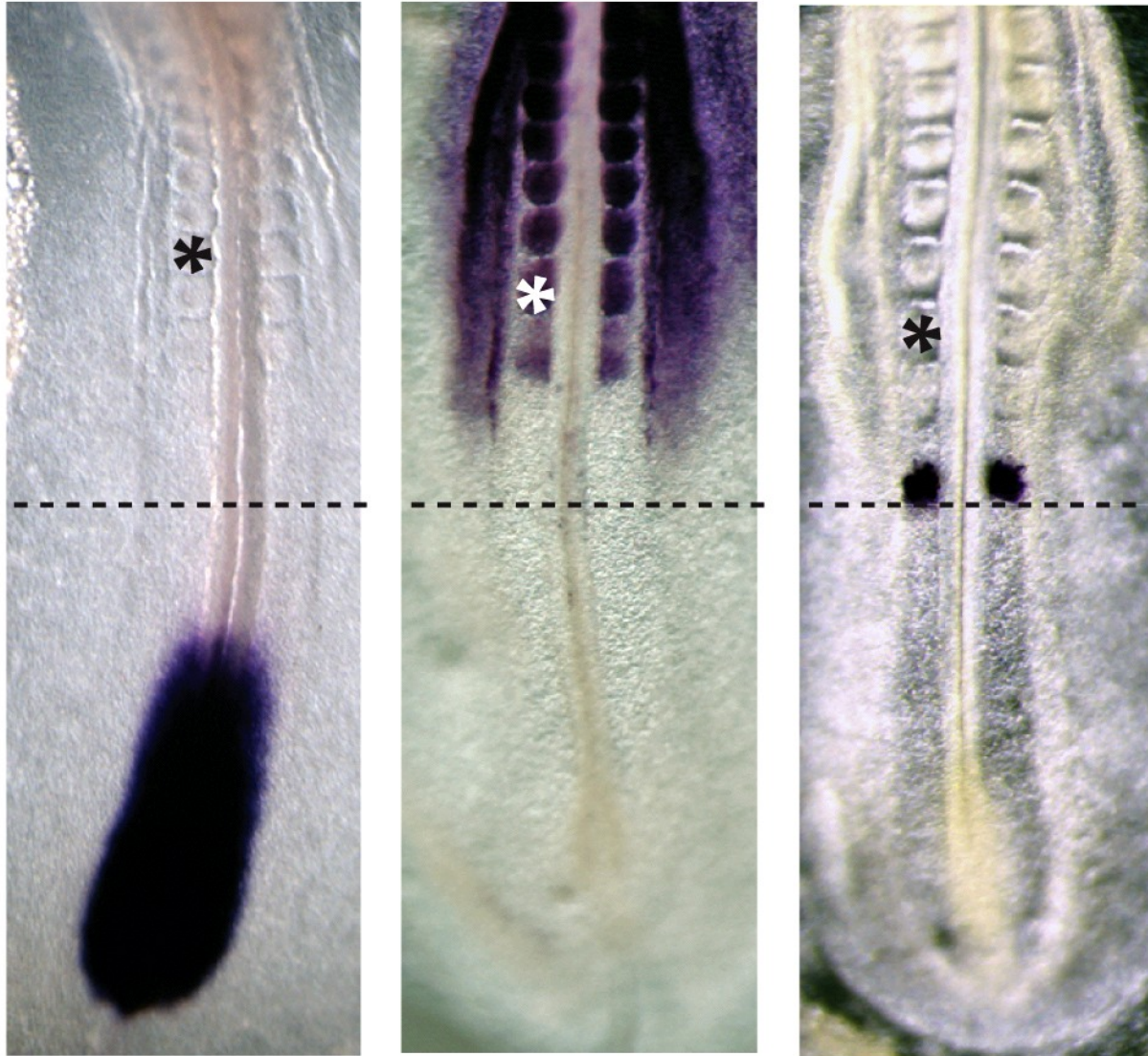


Figure 12.9 Possible model of “clock and wavefront” somite specification

(A) Fgf8

(B) Raldh2

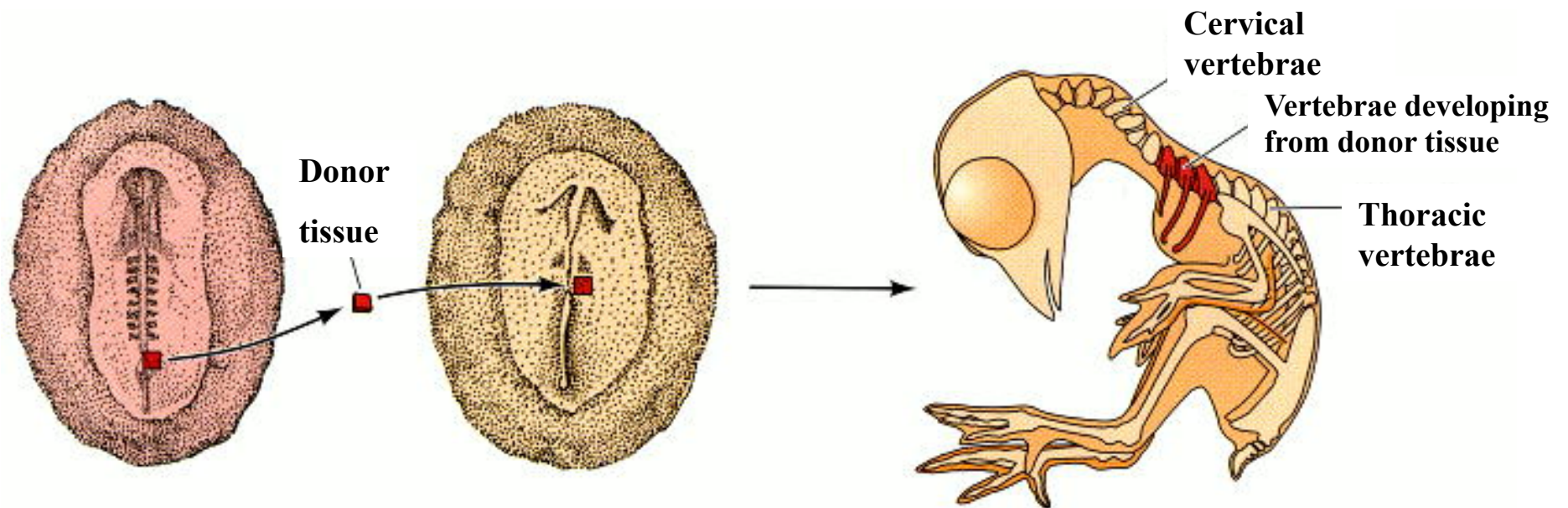
(C) Mes



**DEVELOPMENTAL BIOLOGY 10e, Figure 12.9 (Part 1)**

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# The segmental plate mesoderm



(B)

Wild-type



Misexpression of  
*Hoxa10*

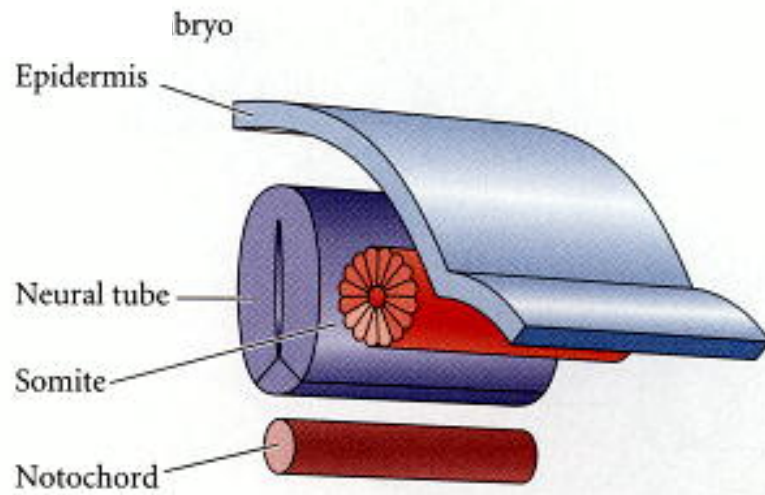


(C) Misexpression of  
*Hoxb6*

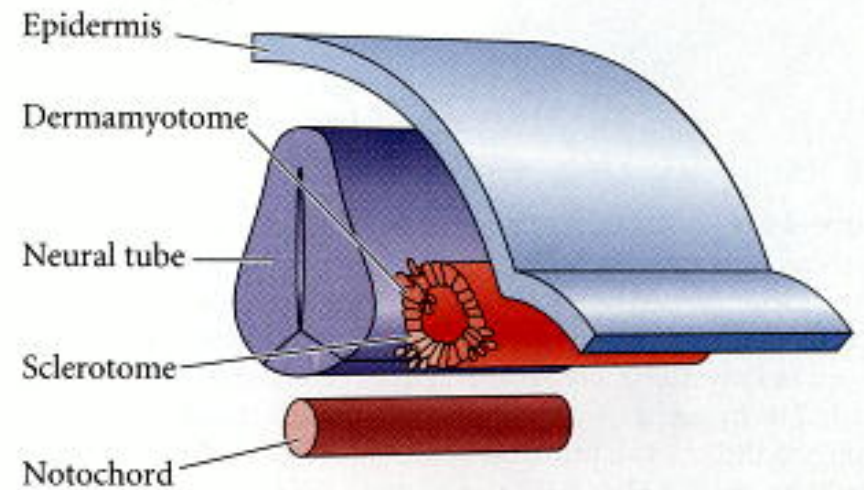


*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.7 (Part 3)  
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# Diagram of a transverse section through the trunk of a chick embryo

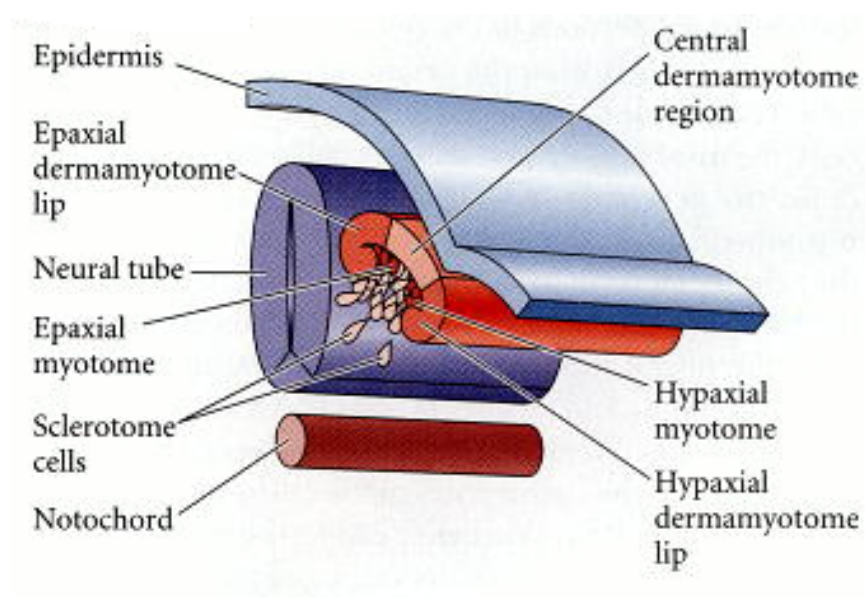


**2-day embryo**

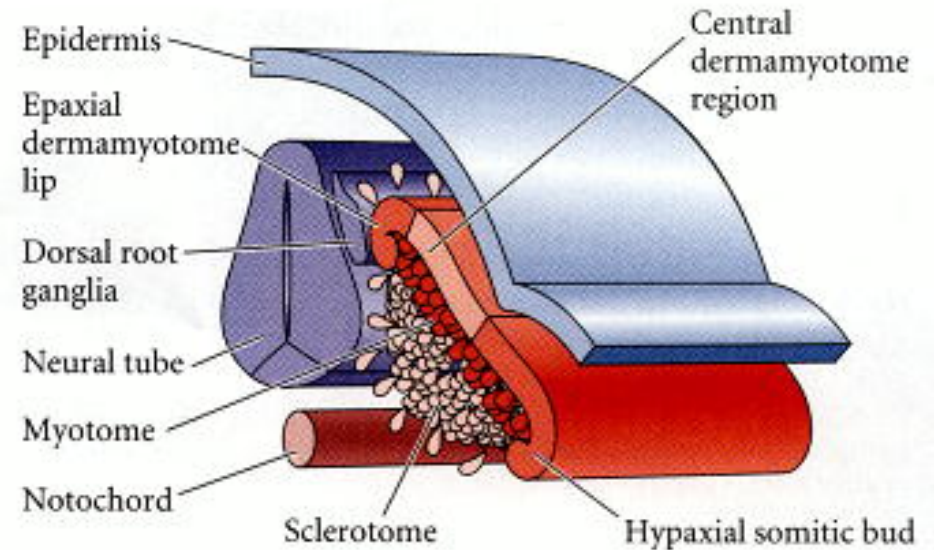


**3-day embryo**

# Diagram of a transverse section through the trunk of a chick embryo on days 24



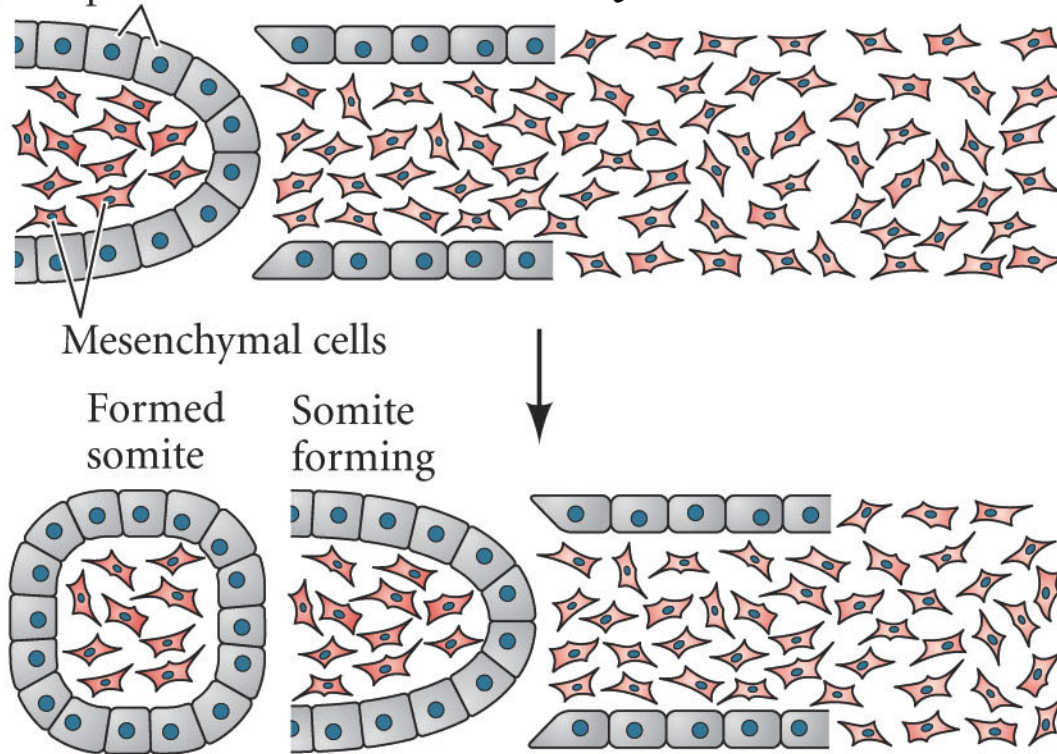
**4-day embryo**



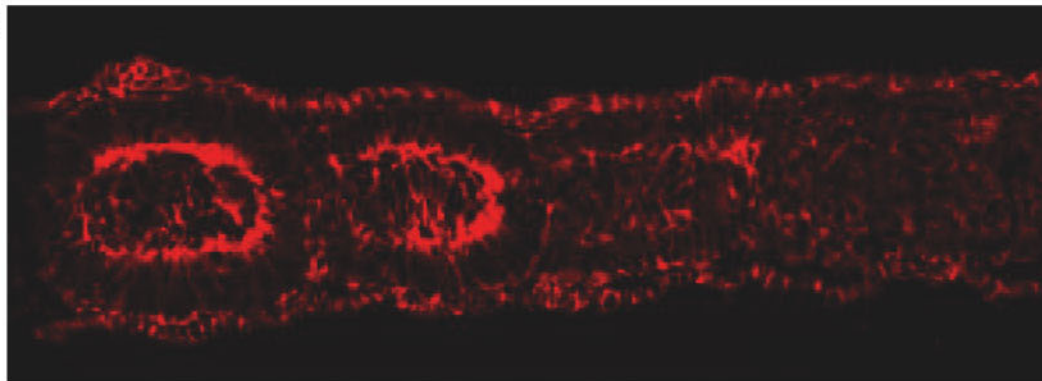
**Late 4-day embryo**

# 14.9 Epithelialization and de-epithelialization in somites of a

(A) chick embryo



(B)

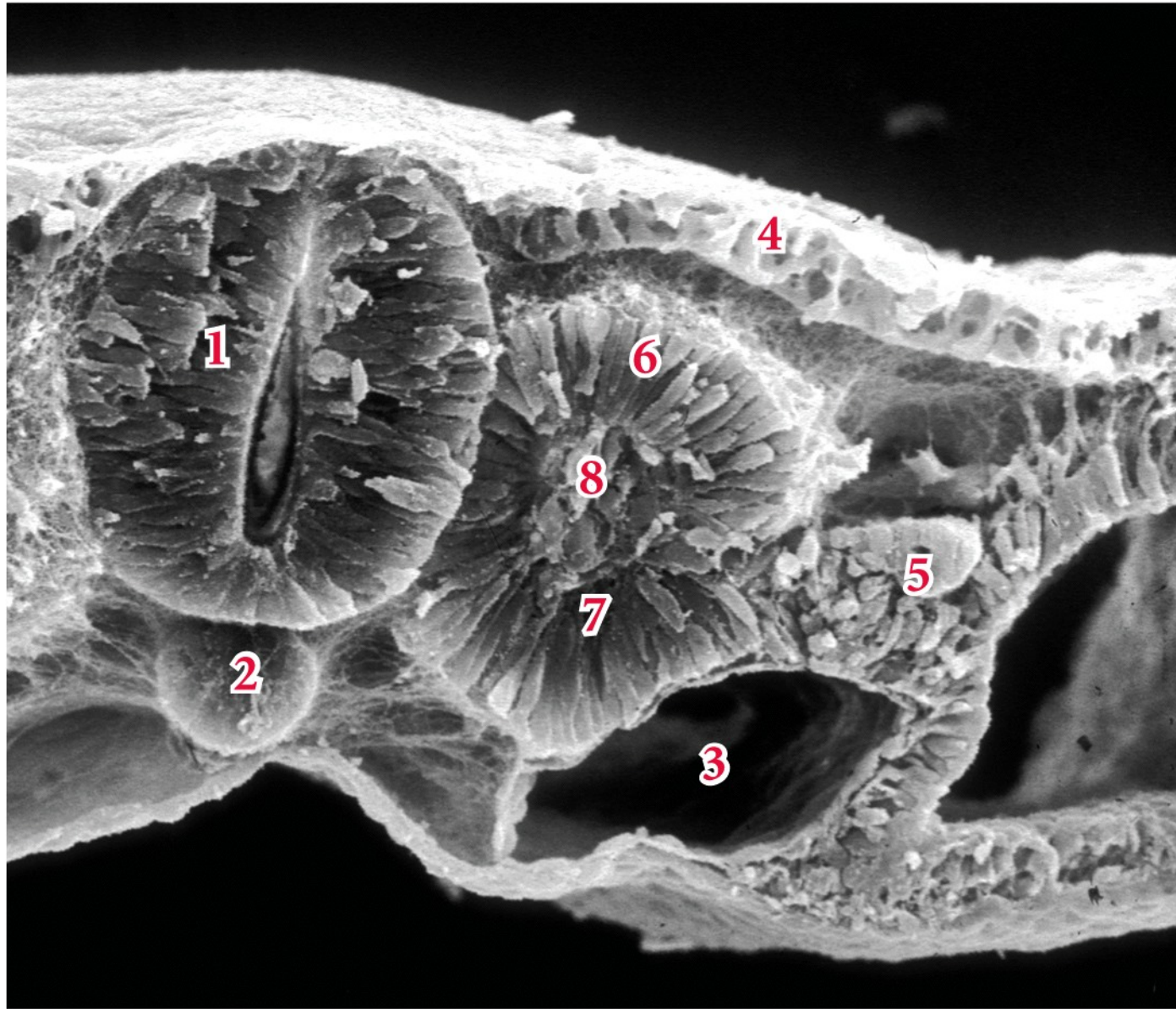


F-Actin



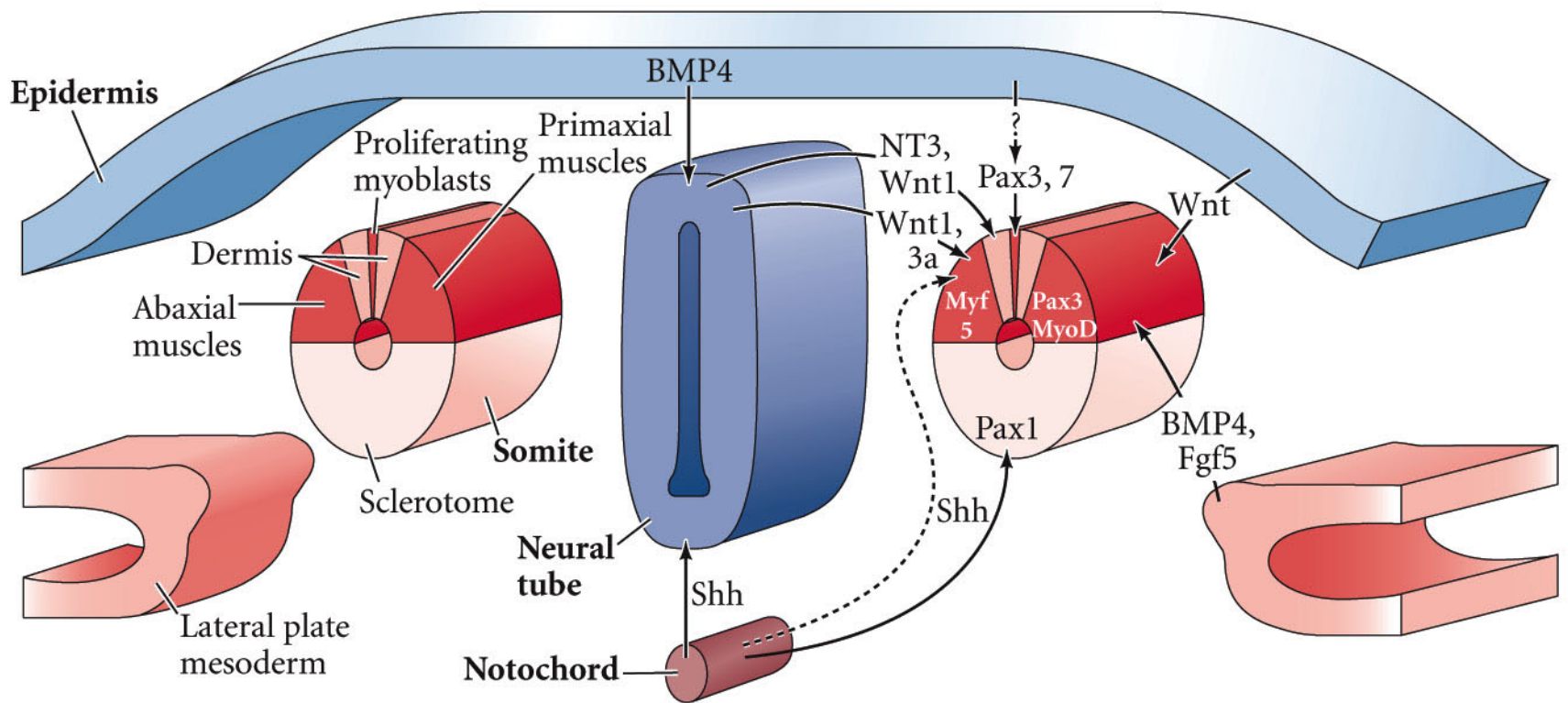
Figure 12.12 Transverse section through the trunk of a chick embryo on days 2–4

(E)

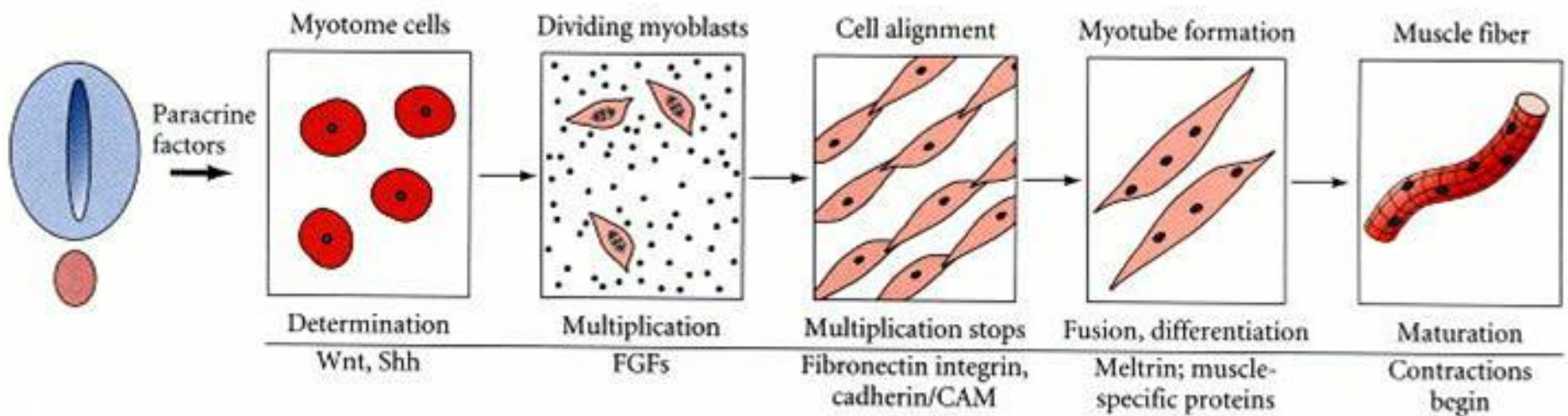


**TABLE 12.1** Derivatives of the somite

Traditional view	Current view
<b>DERMAMYOTOME</b>	
Myotome forms skeletal muscles	Lateral edges generate primary myotome that forms muscle
Dermatome forms back dermis	Central region forms muscle, muscle stem cells, dermis, brown fat cells
<b>SCLEROTOME</b>	
Forms vertebral and rib cartilage	Forms vertebral and rib cartilage
	Dorsal region forms tendons (syndetome)
	Medial region forms blood vessels and meninges
	Central mesenchymal region forms joints (arthrotome)
	Forms smooth muscle cells of dorsal aorta



# Conversion of myoblasts into muscles in culture



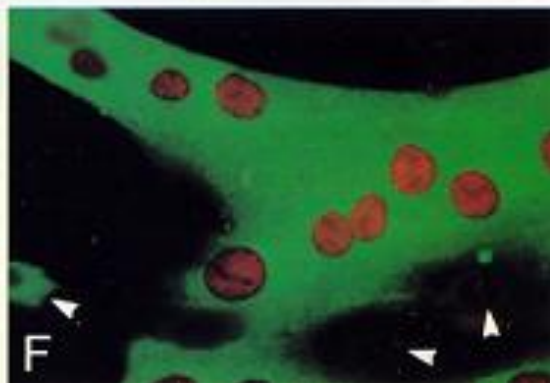
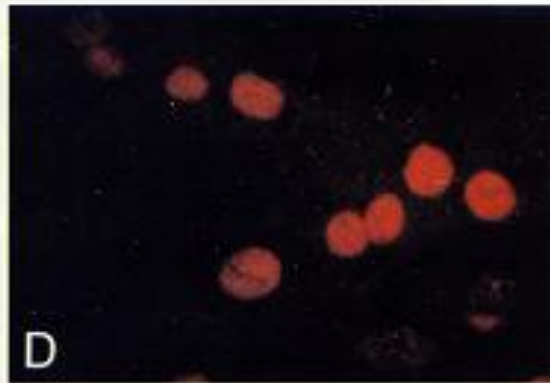


Figure 12.18 Satellite cells and muscle growth

(A)

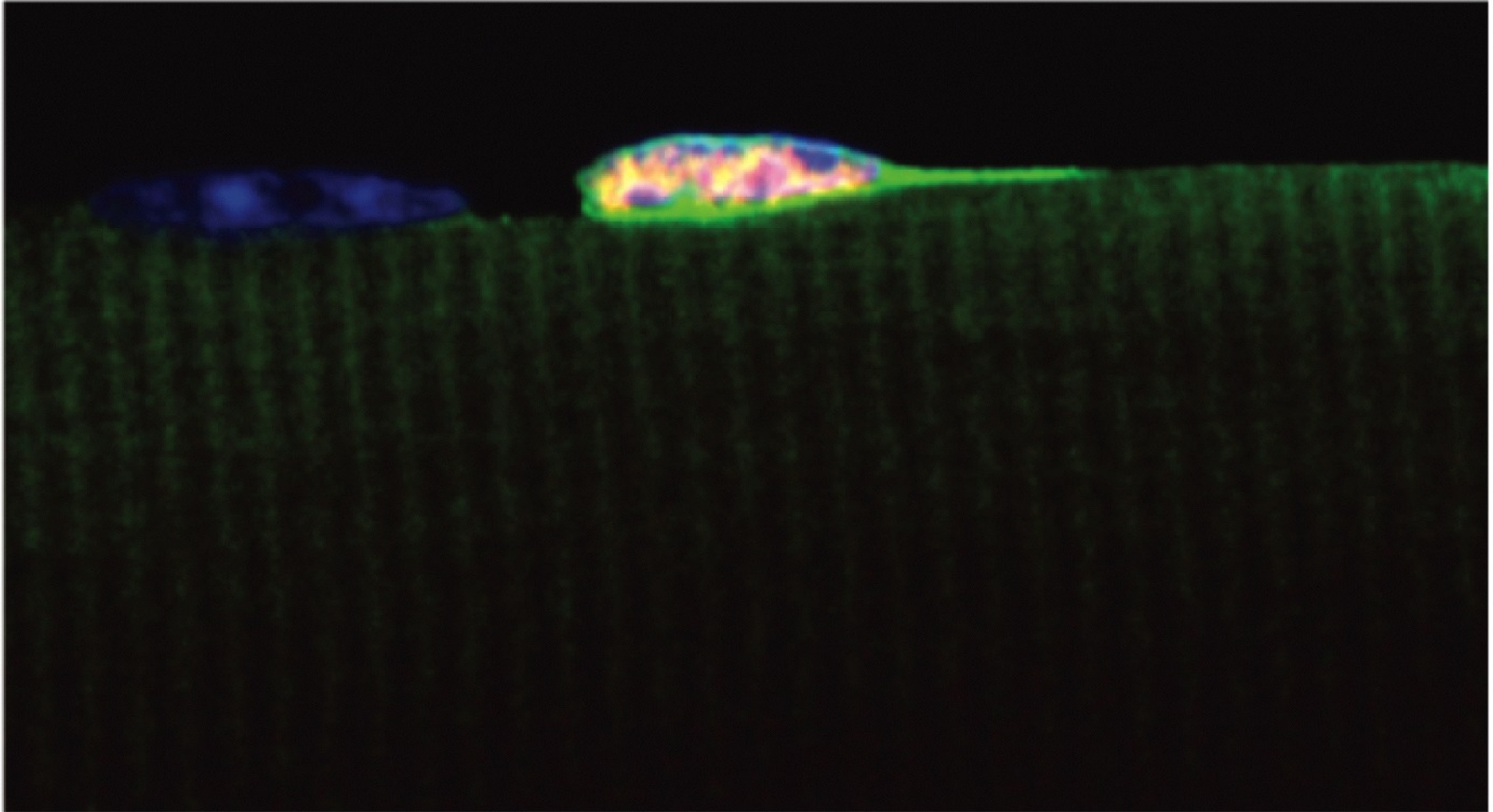
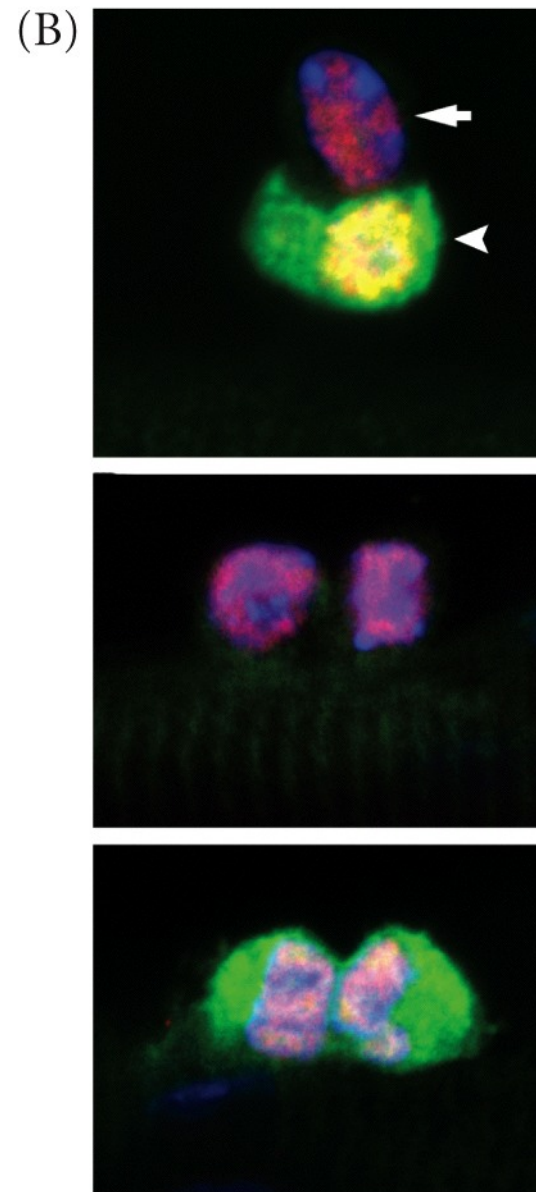


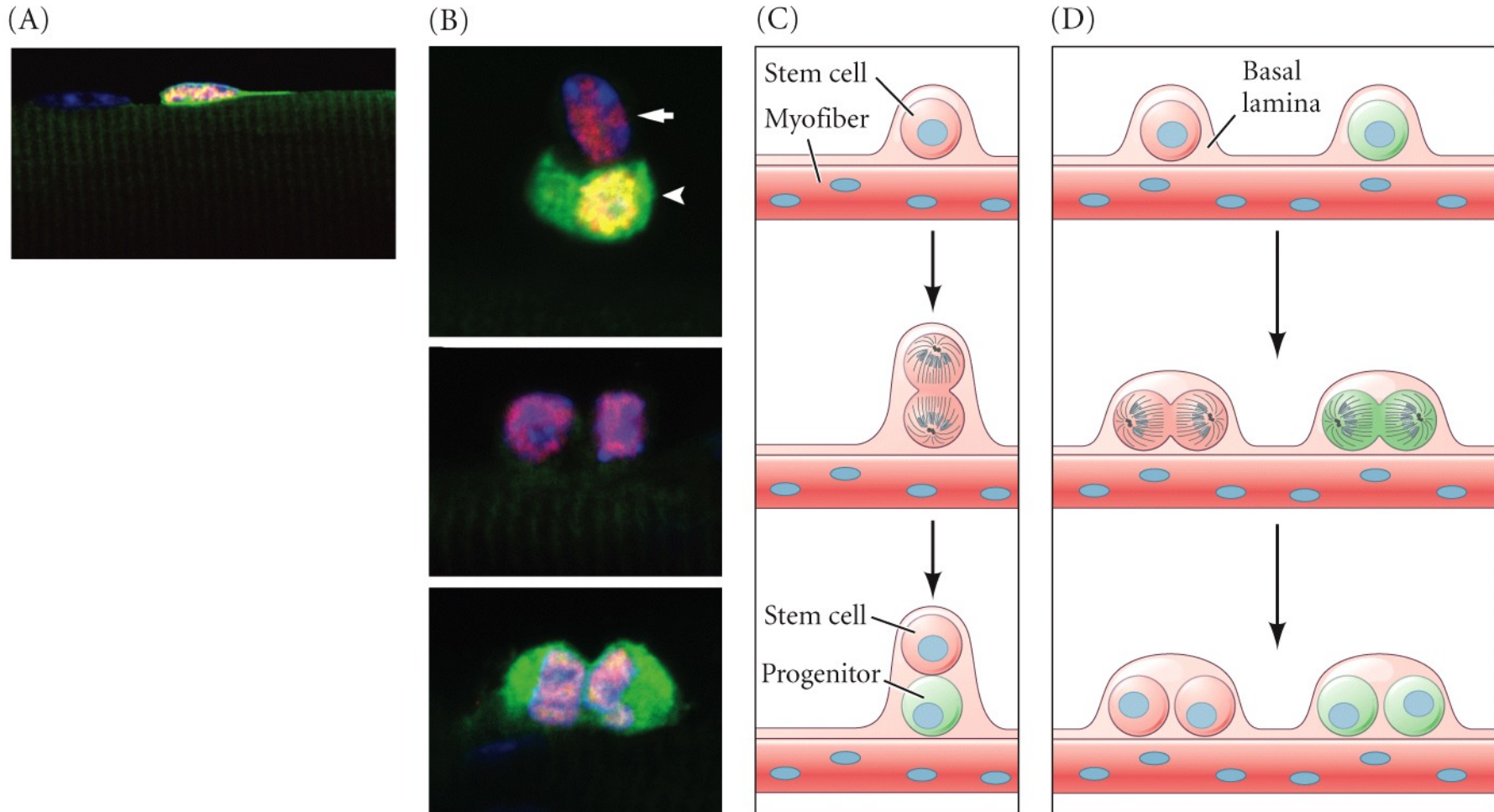
Figure 12.18 Satellite cells and muscle growth



***DEVELOPMENTAL BIOLOGY 10e, Figure 12.18 (Part 2)***

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Figure 12.18 Satellite cells and muscle growth





# Myotome derivatives of the mouse embryo

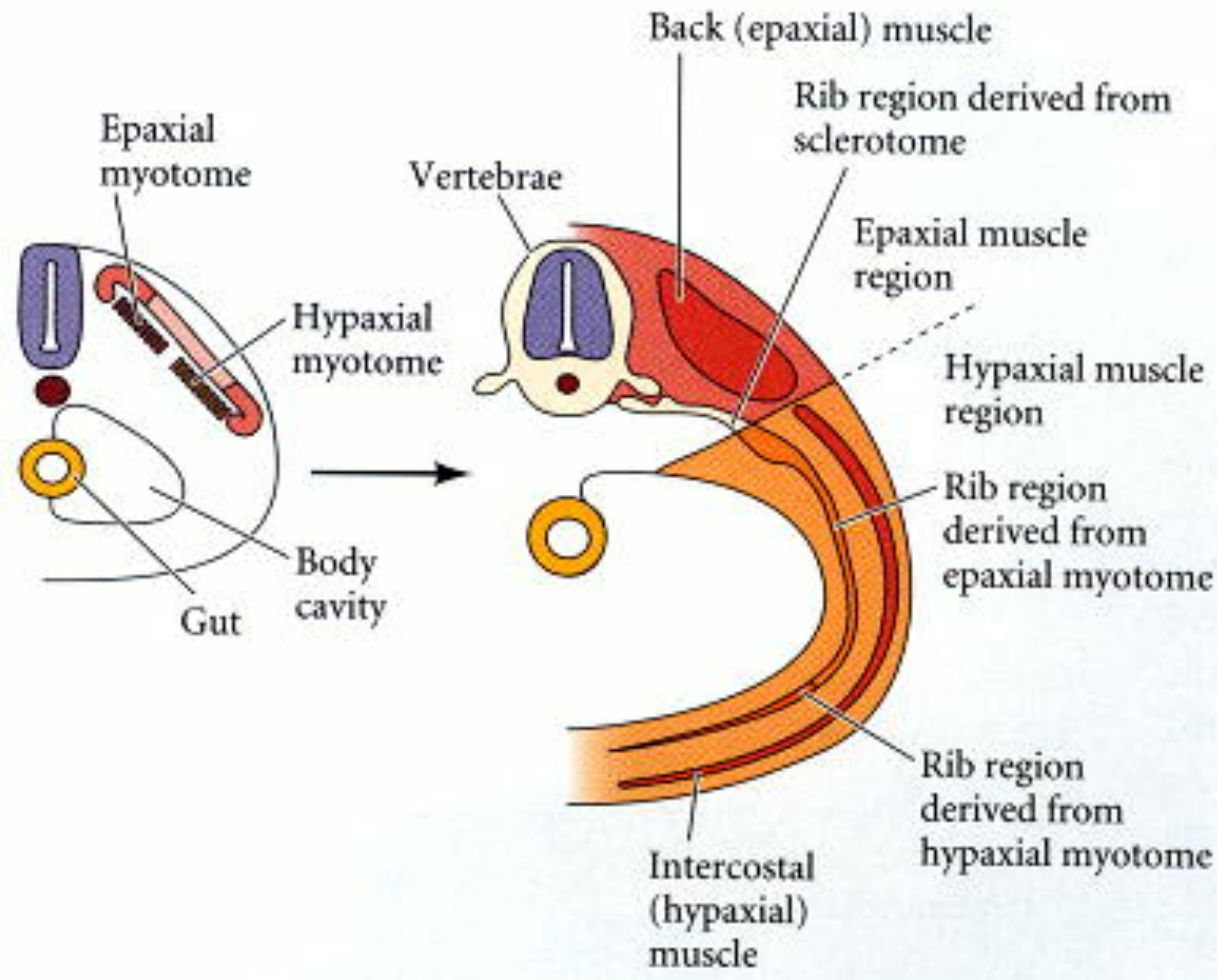
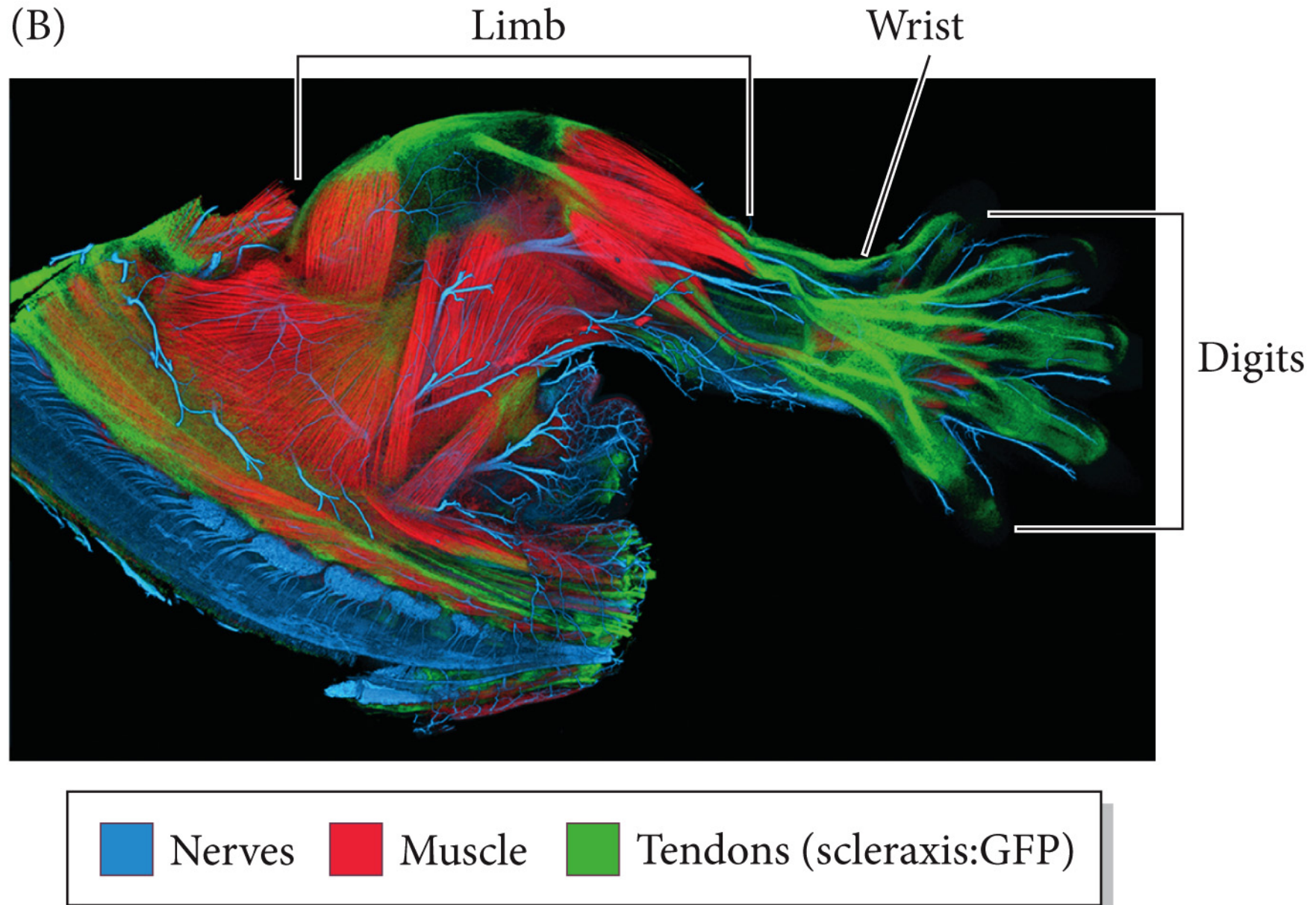


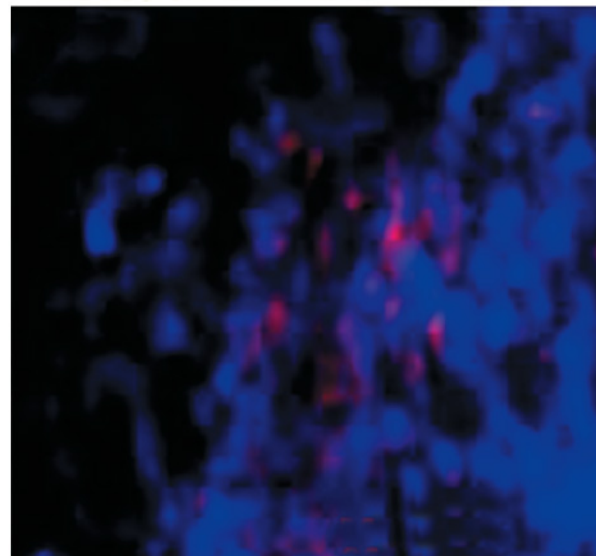
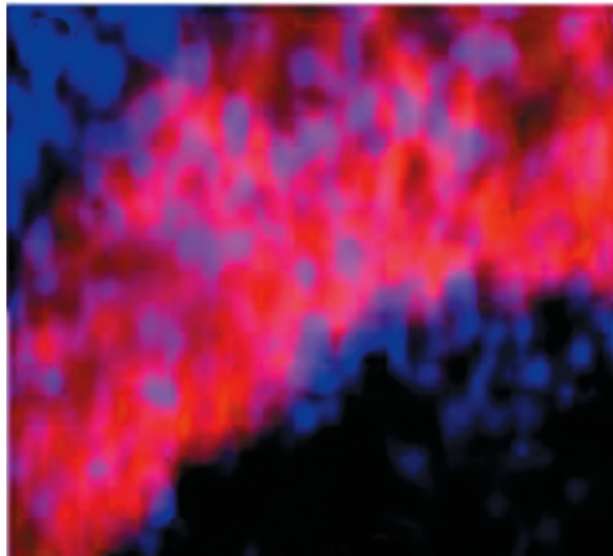
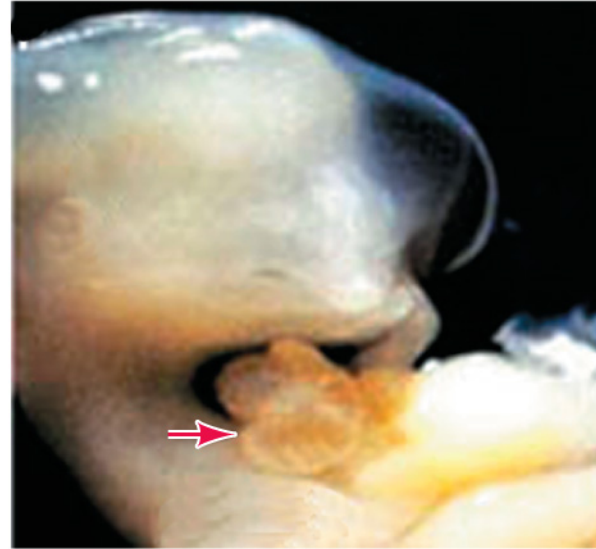
Figure 17.24 Scleraxis is expressed in the progenitors of the tendons



(A) Control



(B) Ablated



(A)



(B)

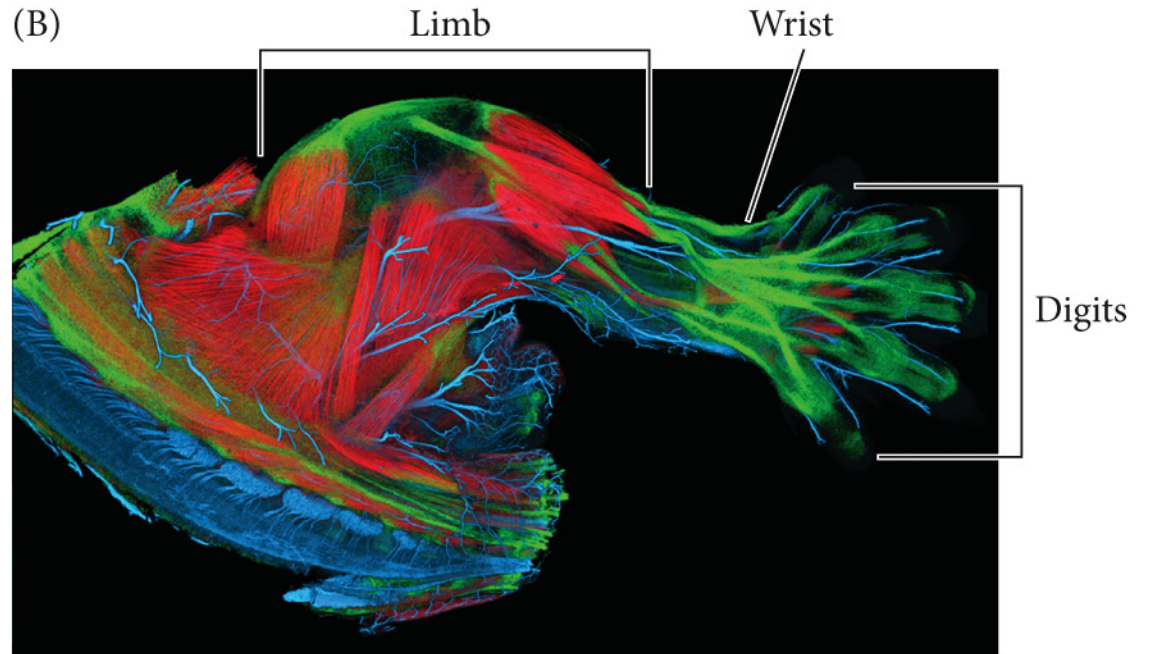


Figure 17.34 A loss-of-function mutation in the *myostatin* gene of whippets

(A)



(B)



# Conversion of myoblasts into muscles in culture

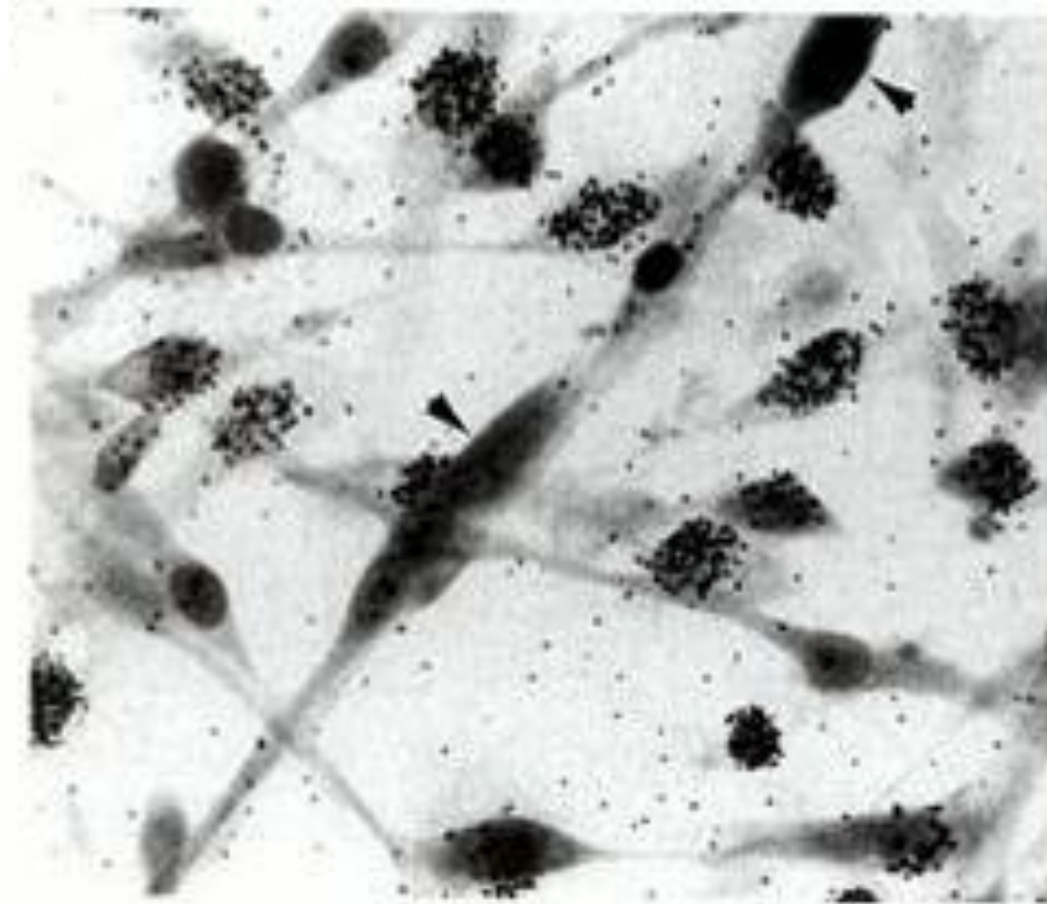


Figure 12.9 Possible model of “clock and wavefront” somite specification

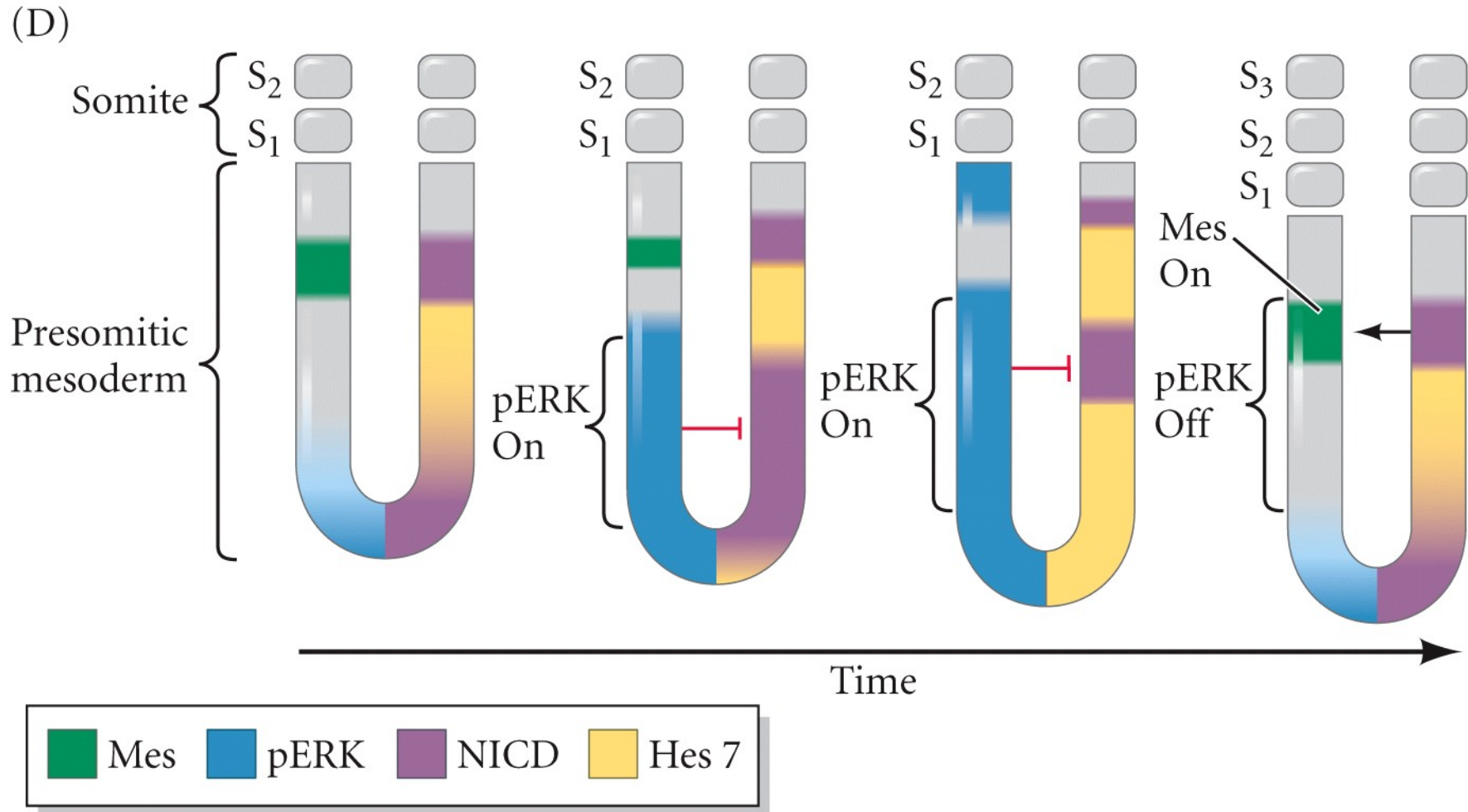


Figure 12.12 Transverse section through the trunk of a chick embryo on days 2–4  
(F)

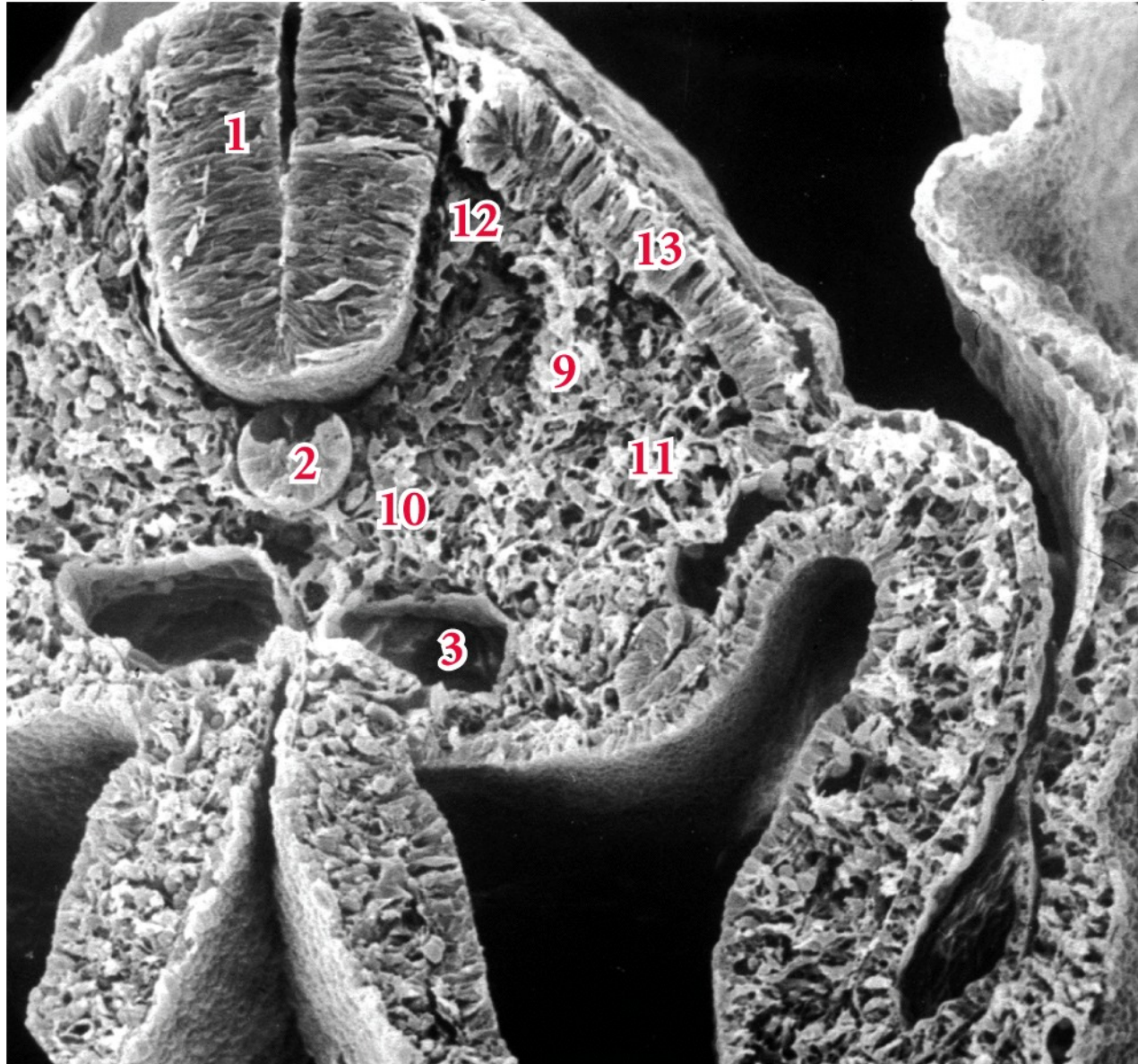




Figure 12.13 Primaxial and abaxial domains of vertebrate mesoderm

