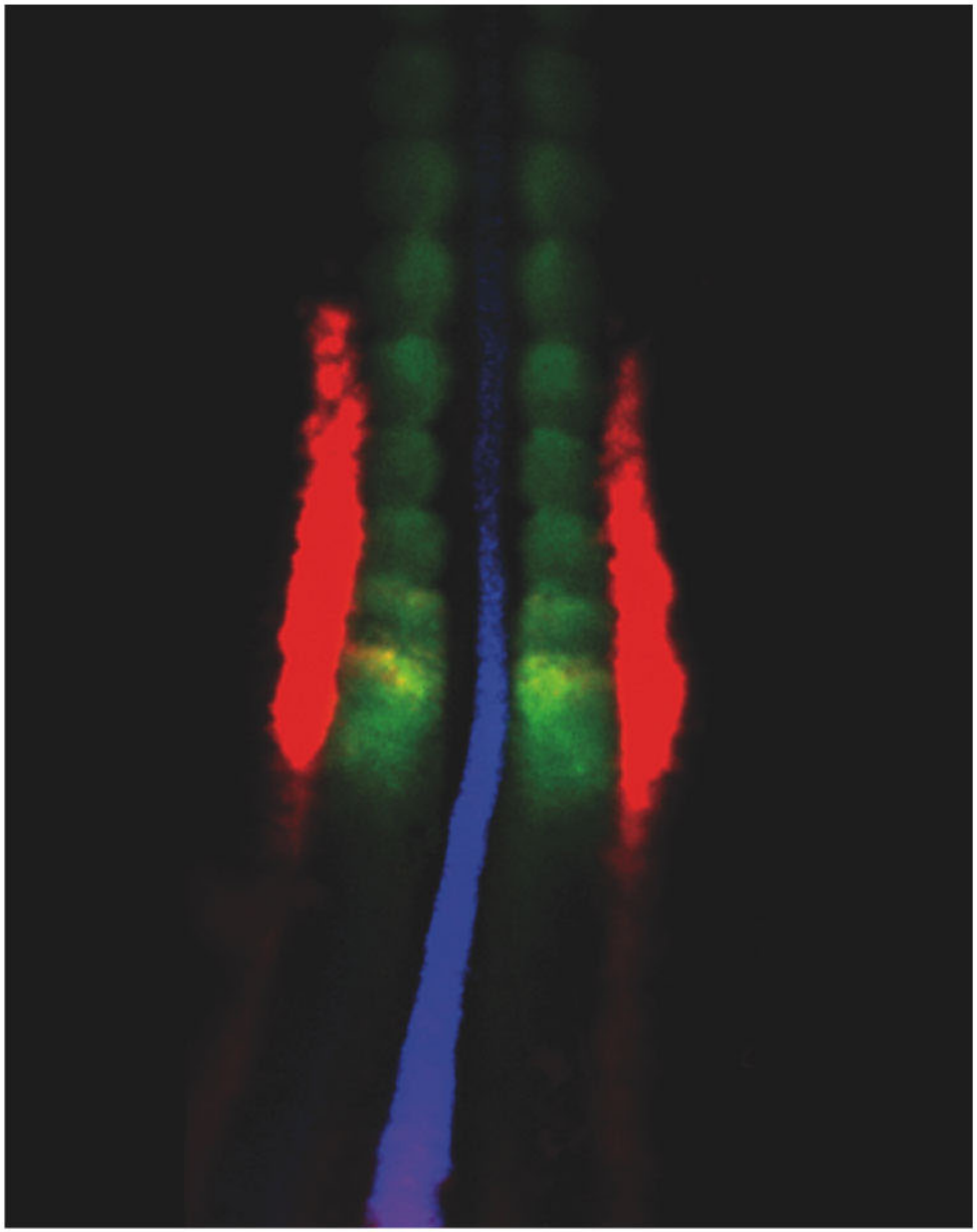
# Paraxial and Intermediate mesoderm

Gilbert Ch 17 539-580
Paraxial mesoderm

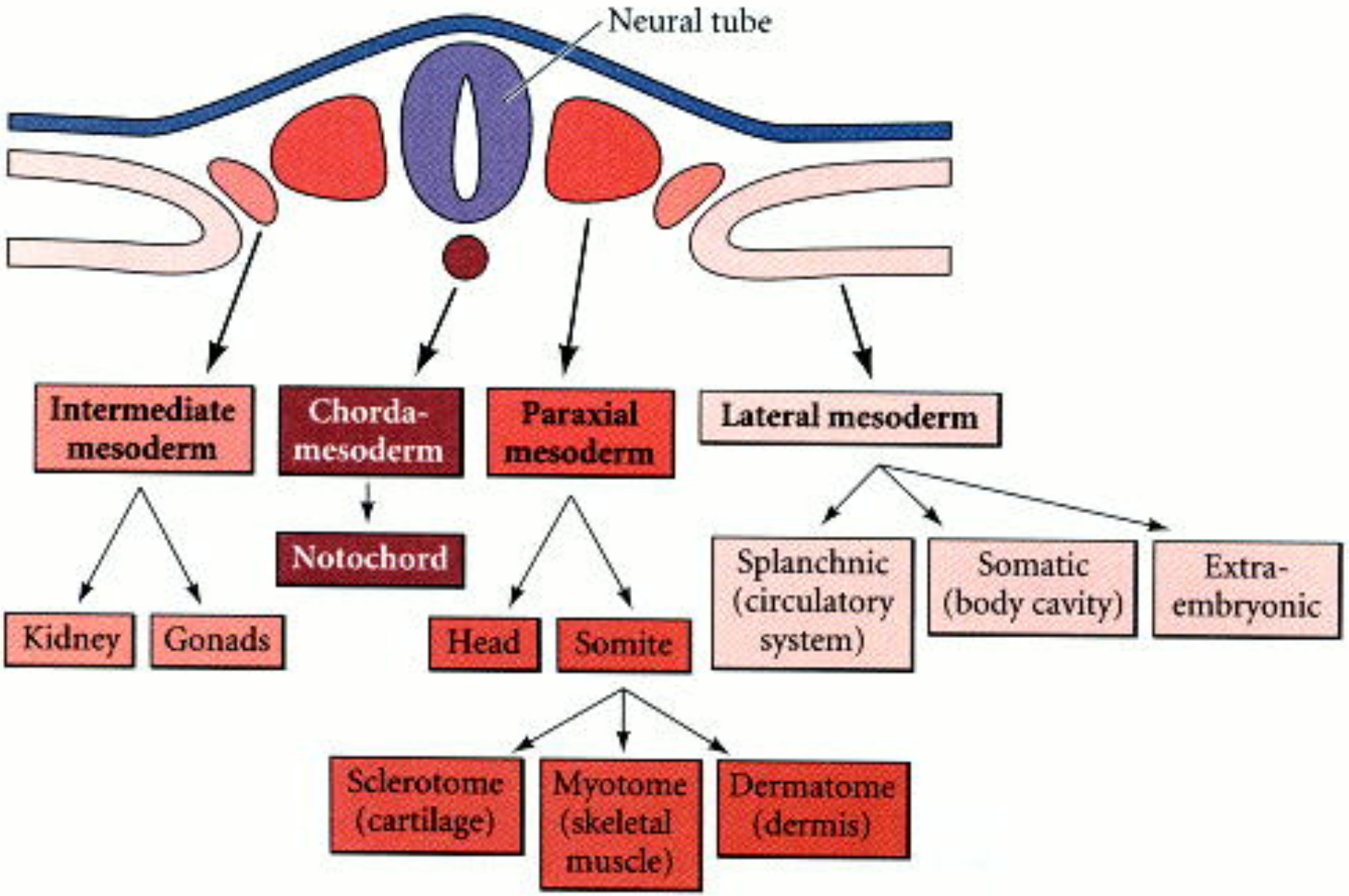
Gilbert  Ch 12:
Paraxial and intermediate mesoderm
P415-432

# Chick 12 somite (33 hrs)

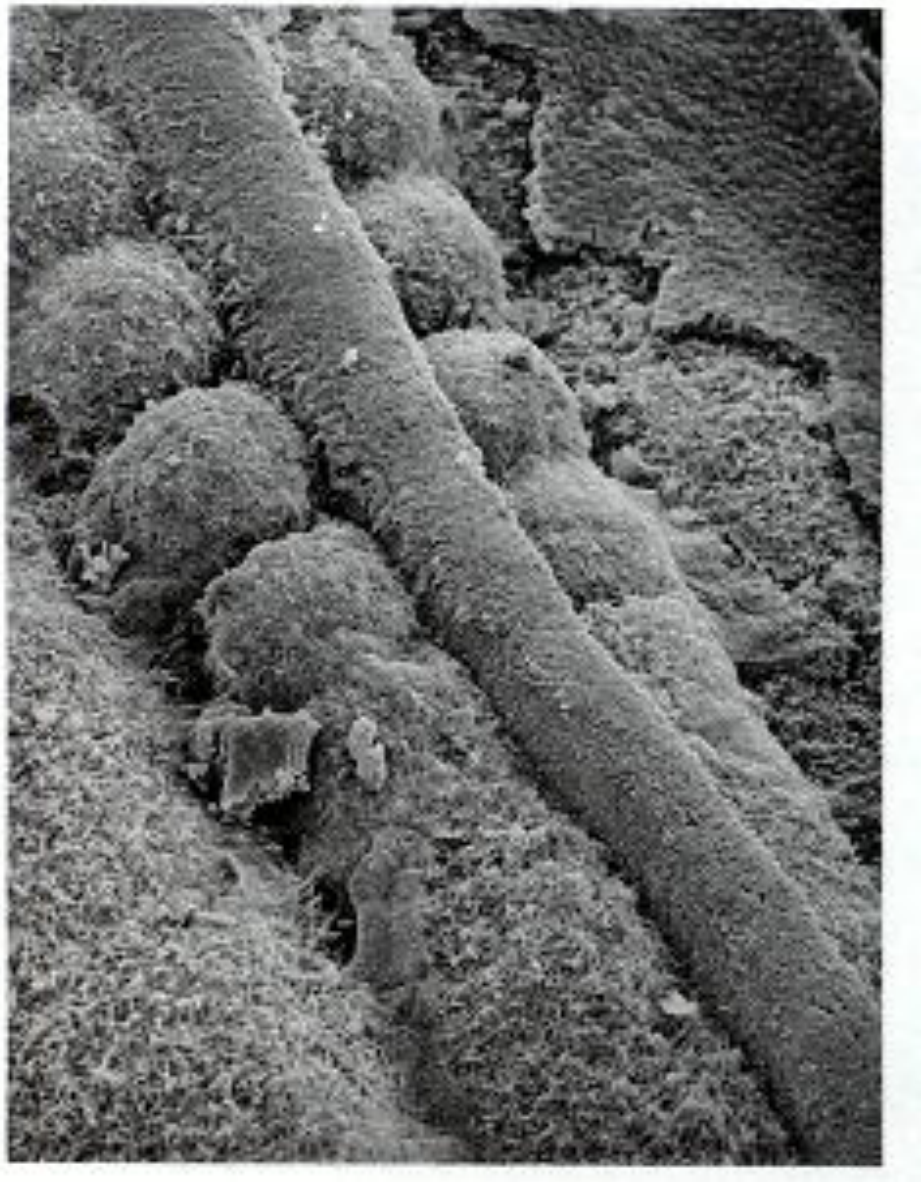


Chordin Blue (NC)
Paraxis Green (Som)
Pax2 Red (Int Mes)

# Lineages of the mesoderm

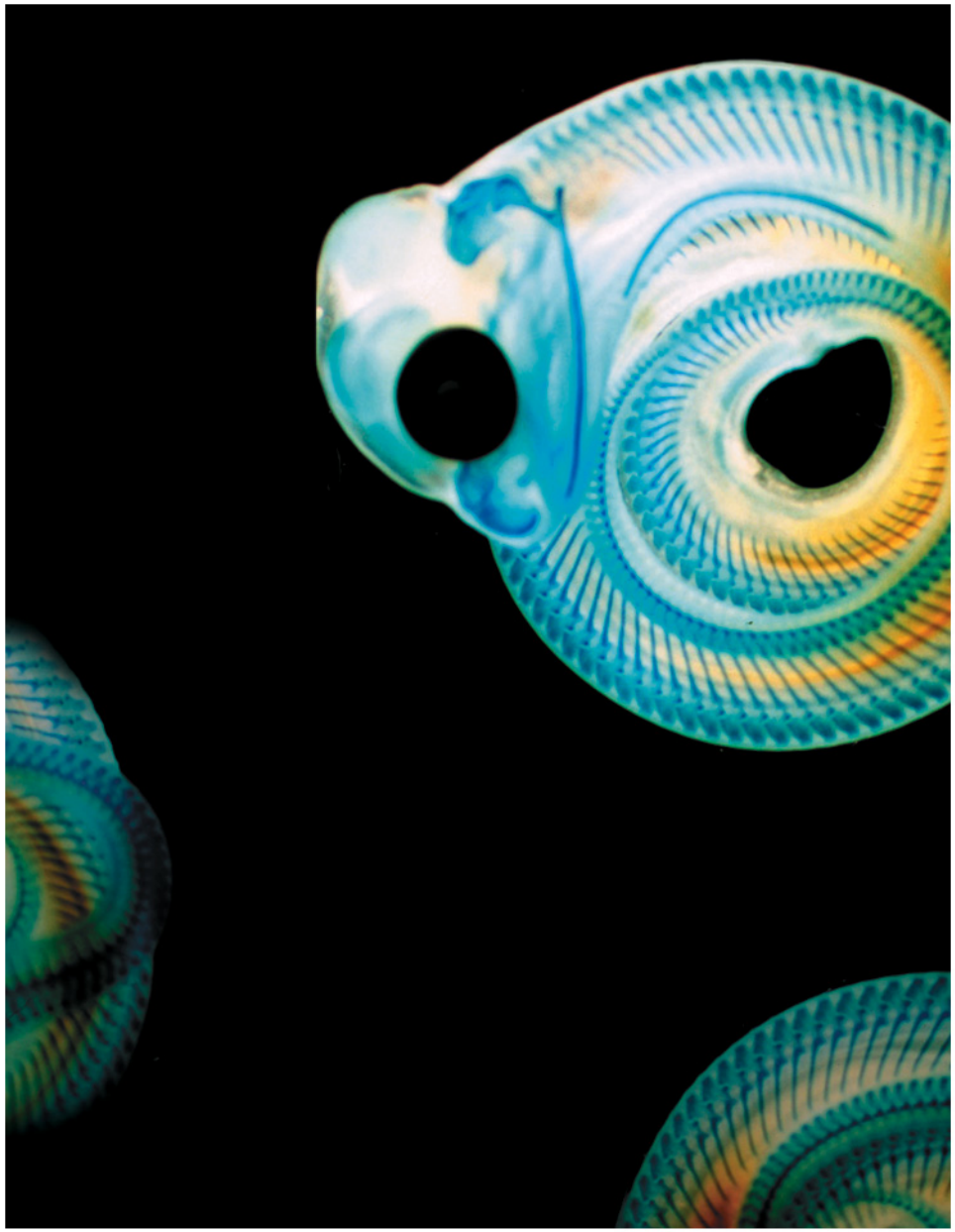


# Neural tube and somites

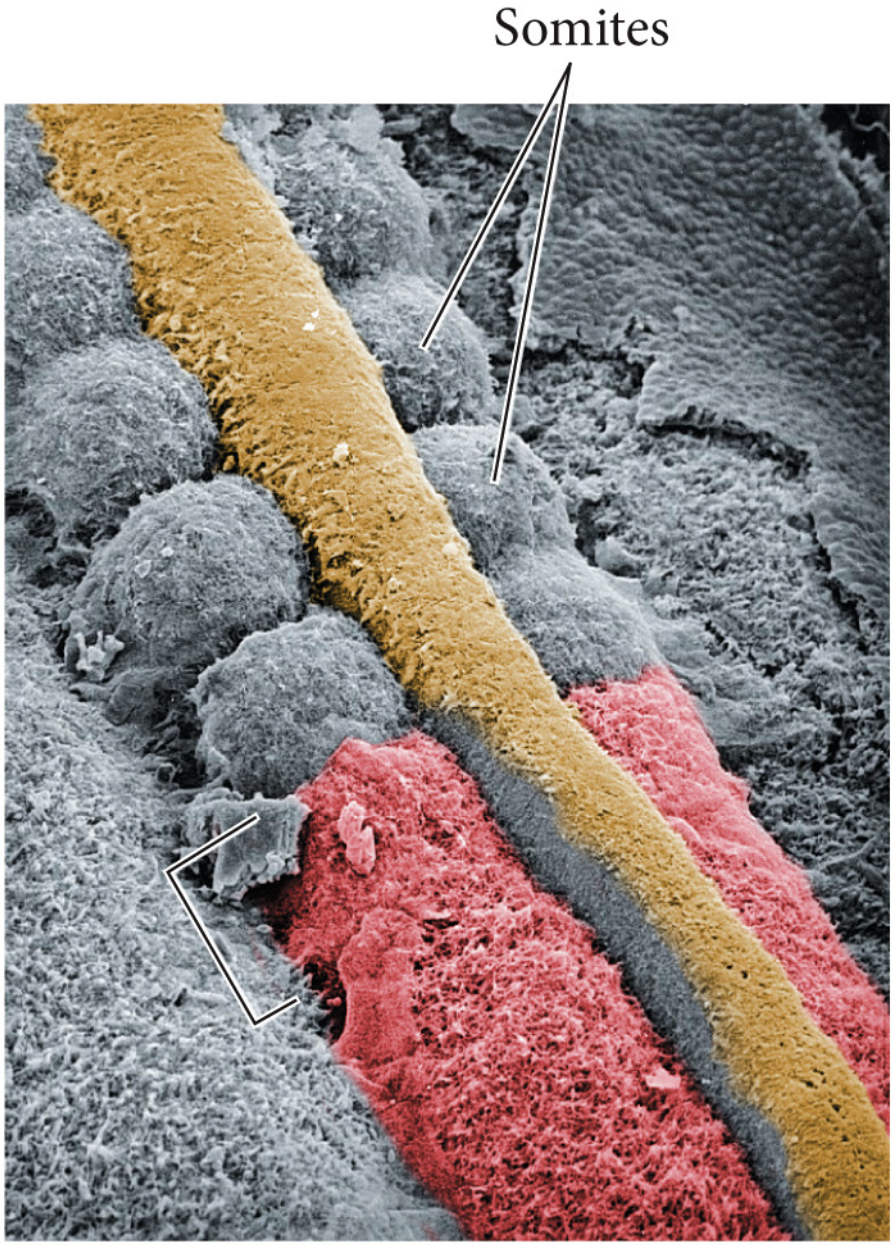


# 14.3 Specification of somites

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

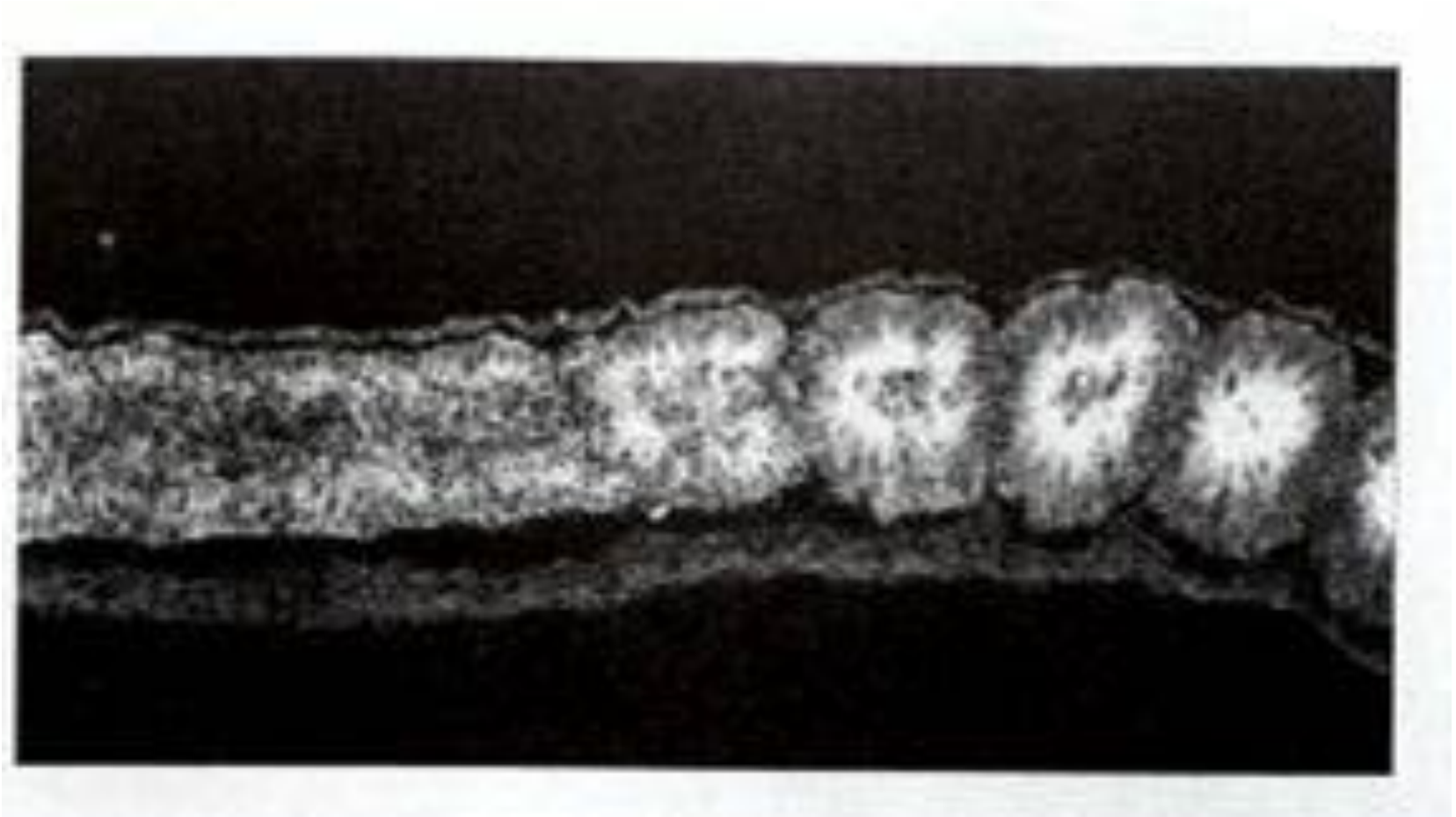


*DEVELOPMENTAL BIOLOGY 11e*, Chapter 17 Opener



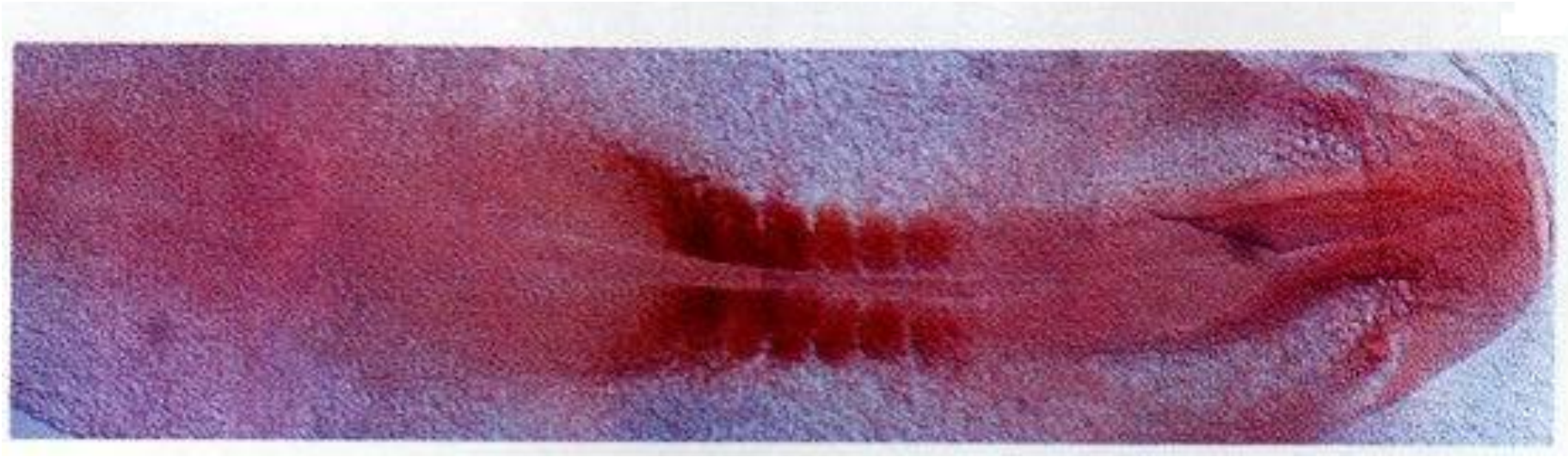

*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.9

# Mesenchymal to Epithelial Transition from somitomere to somite



N- Cadherin staining (white)

# Transition from somitomere to somite

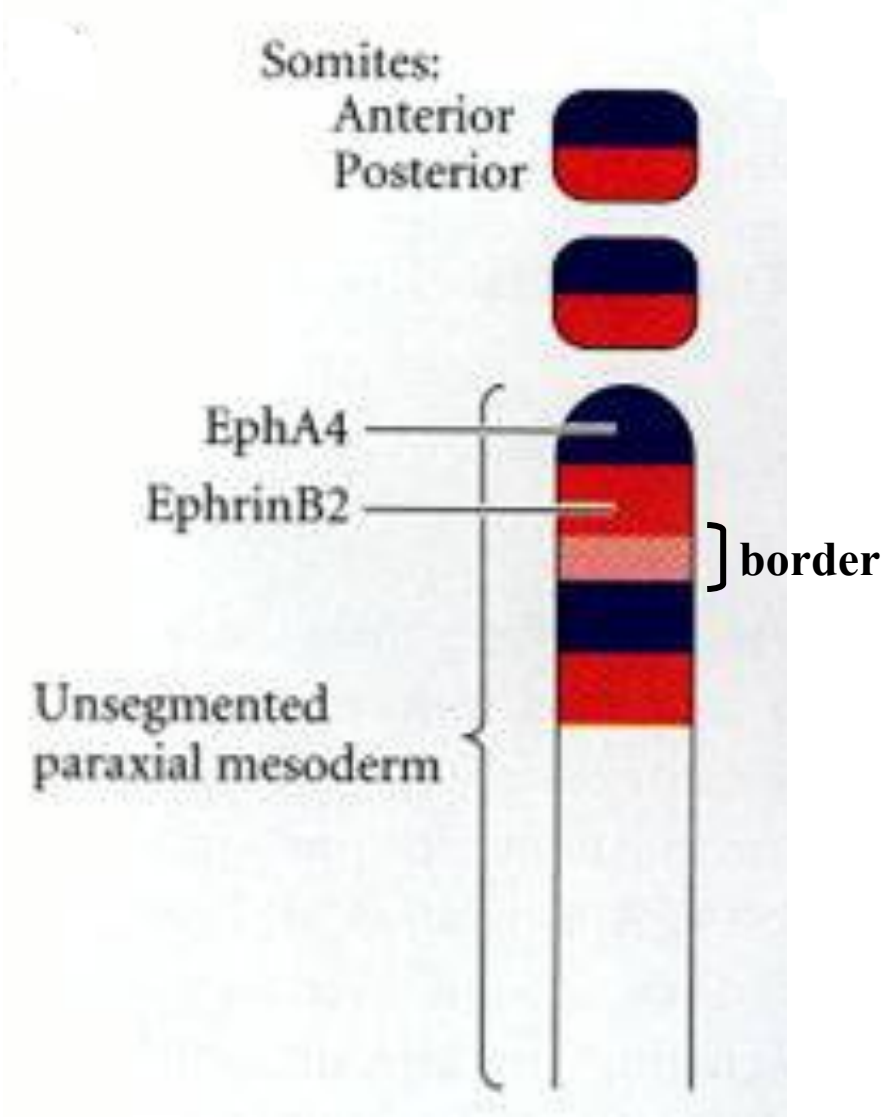


Paraxis staining in red

# Transition from somitomere to somite

EphA4:
RTK

Ephrin B2 :
Ligand



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

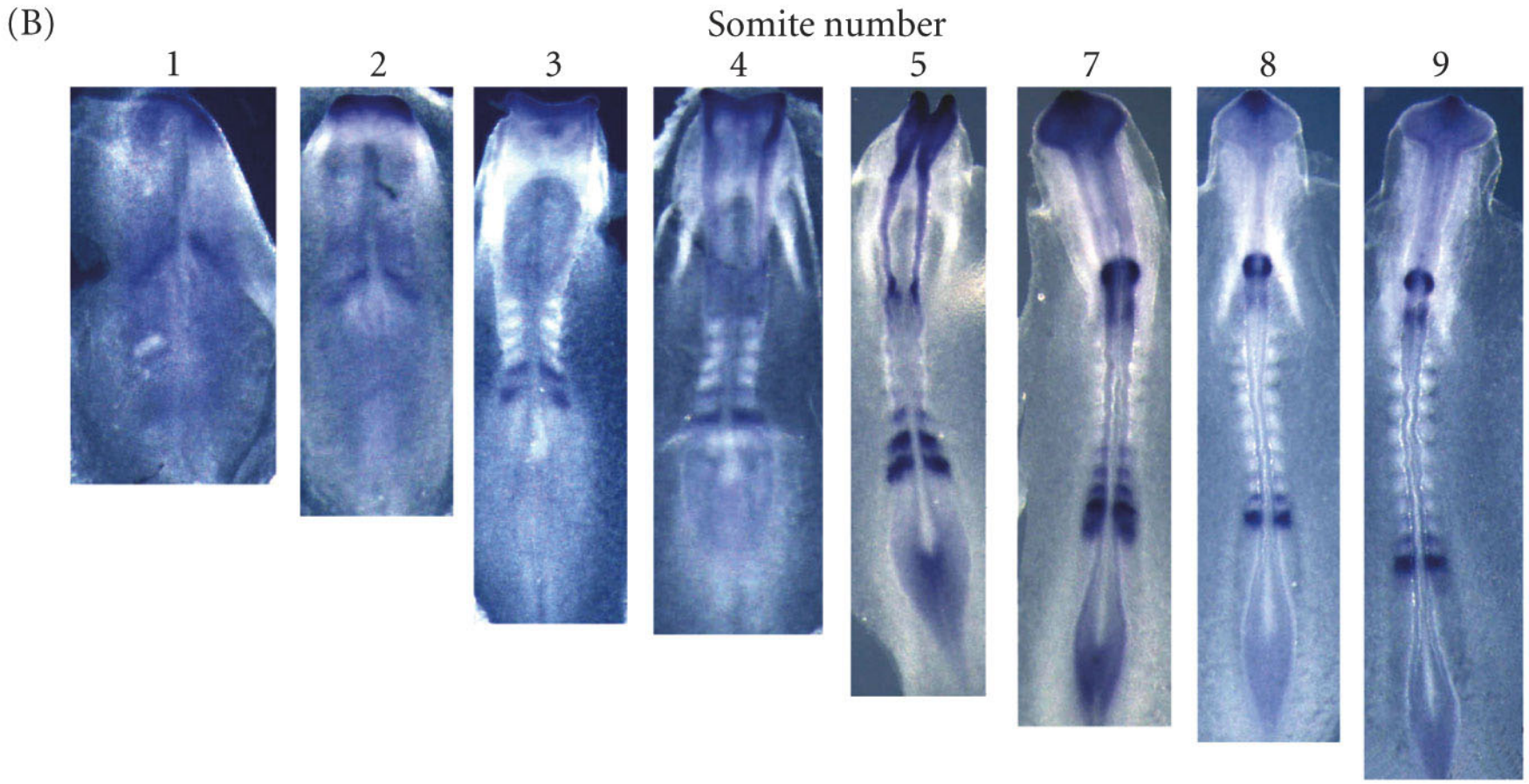
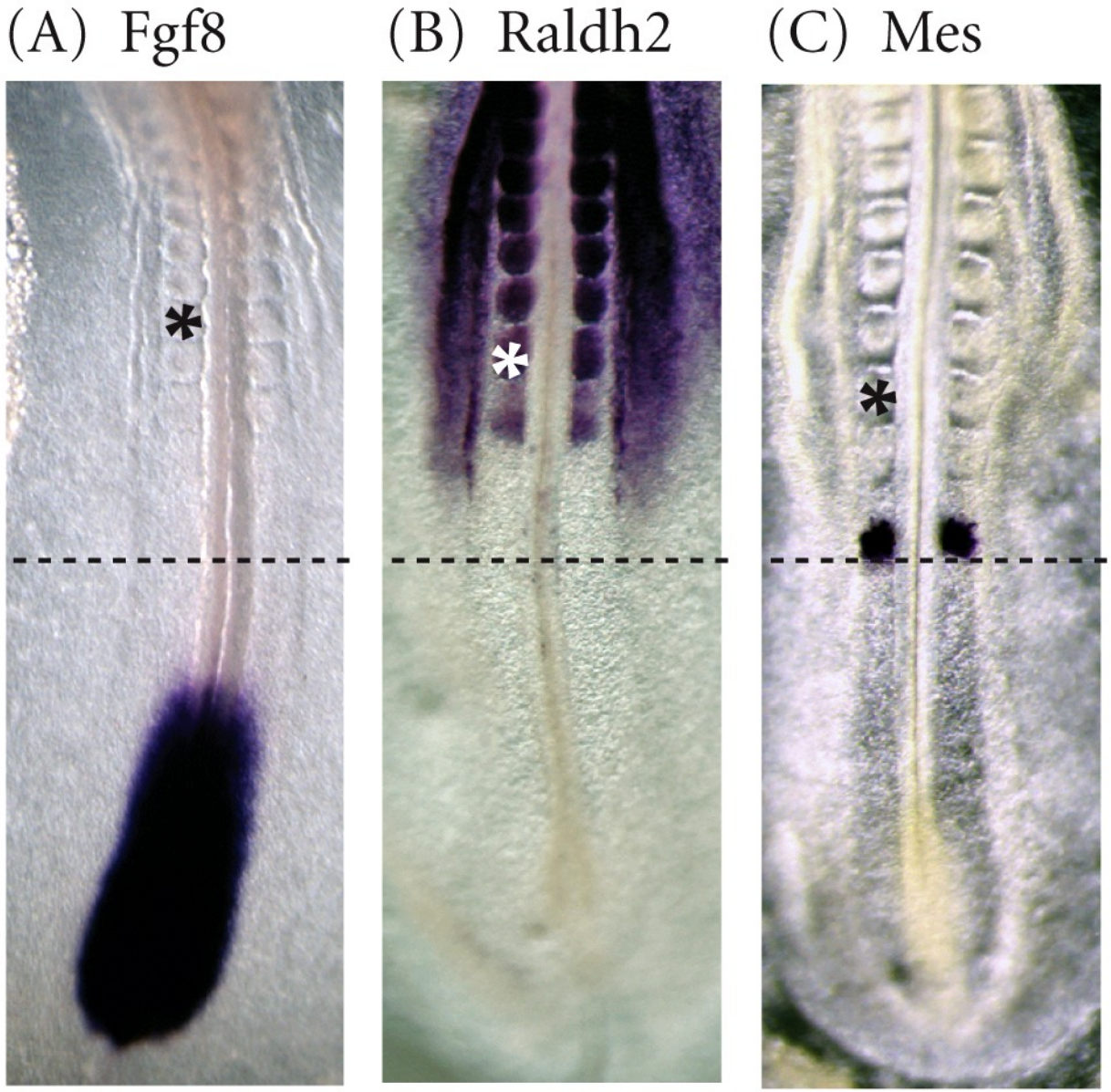
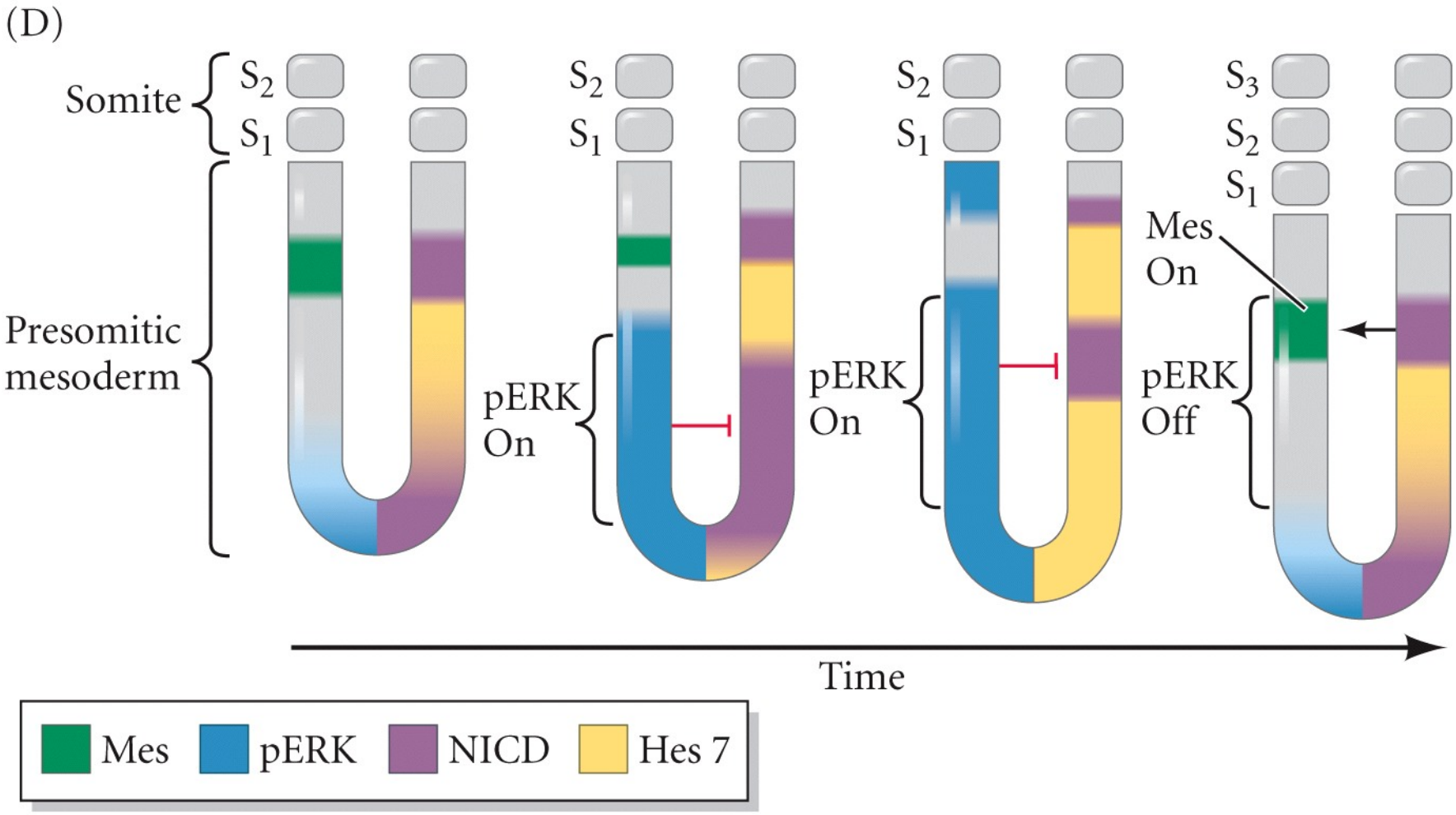


Figure 12.9 Possible model of "clock and wavefront" somite specification



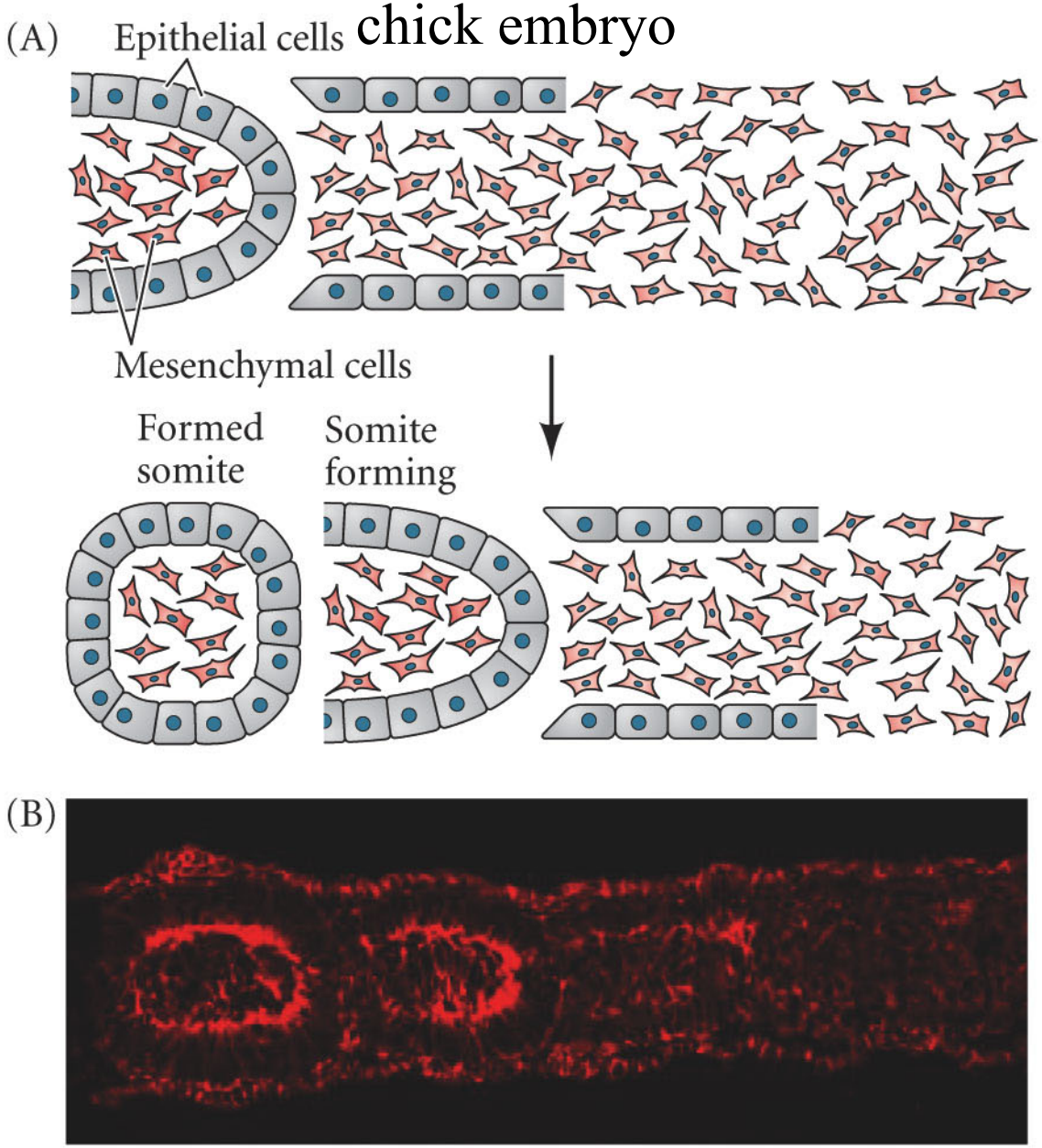

***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.9 (Part 1)**

Figure 12.9 Possible model of "clock and wavefront" somite specification



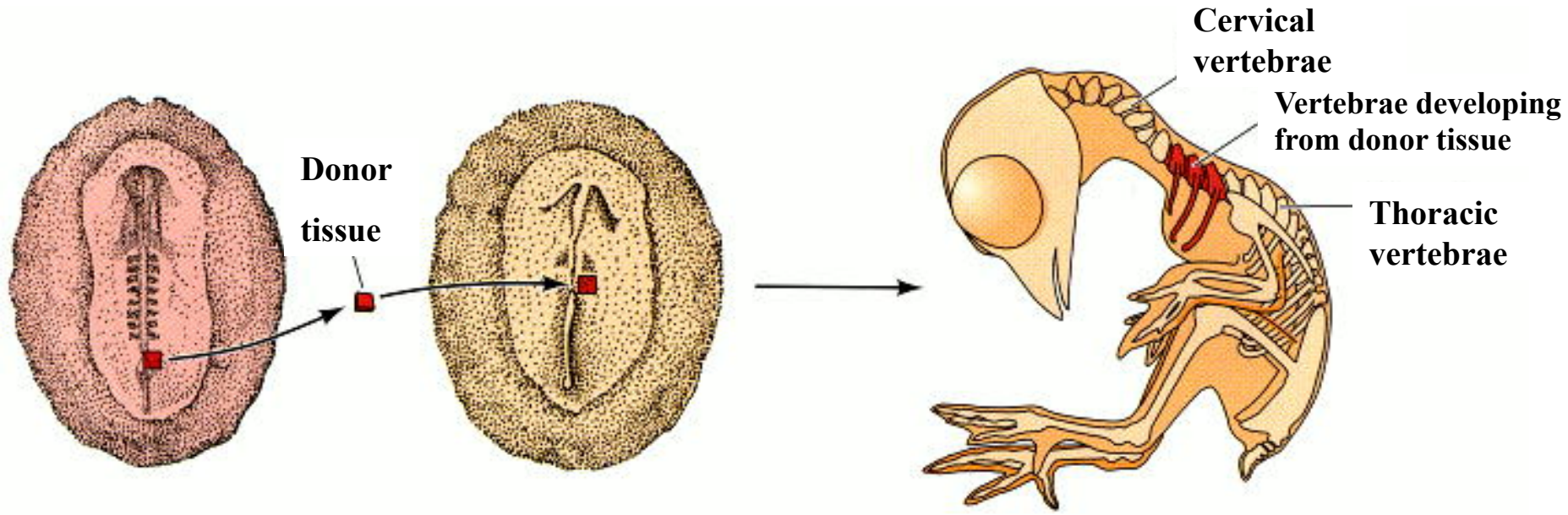

***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.9 (Part 2)**

# 14.9 Epithelialization and de-epithelialization in somites of a chick embryo




F-Actin

# The segmental plate mesoderm



(B)

Wild-type

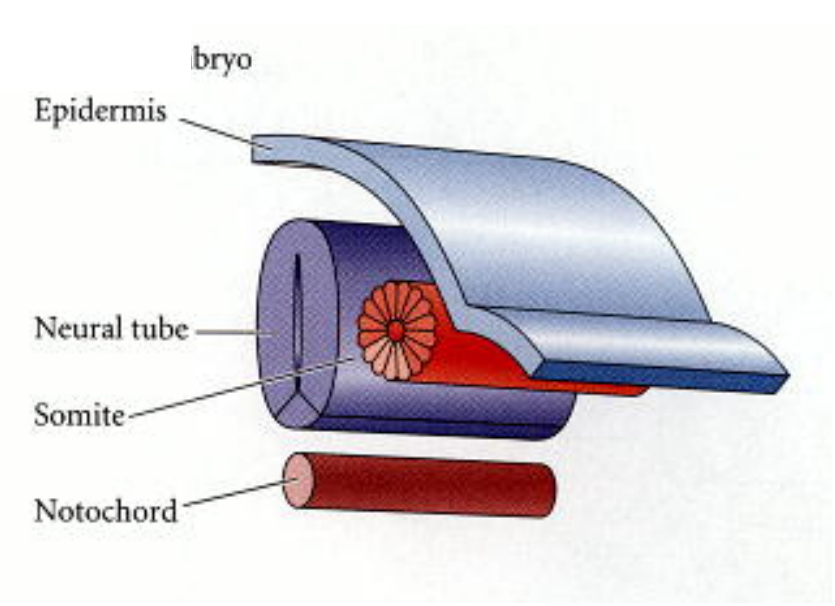
Misexpression of *Hoxa10*

*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.7 (Part 2)

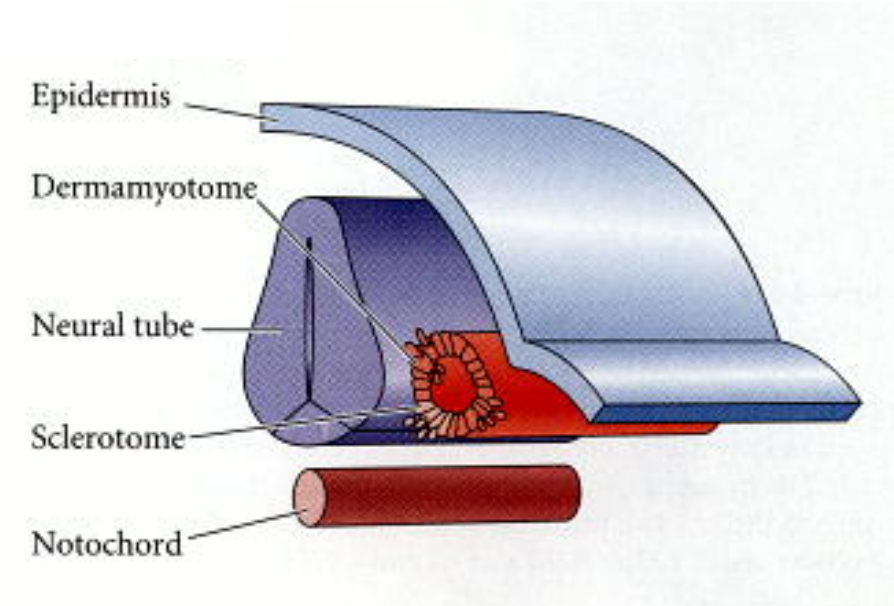
(C) Misexpression of *Hoxb6*

*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.7 (Part 3)

# Diagram of a transverse section through the trunk of a chick embryo

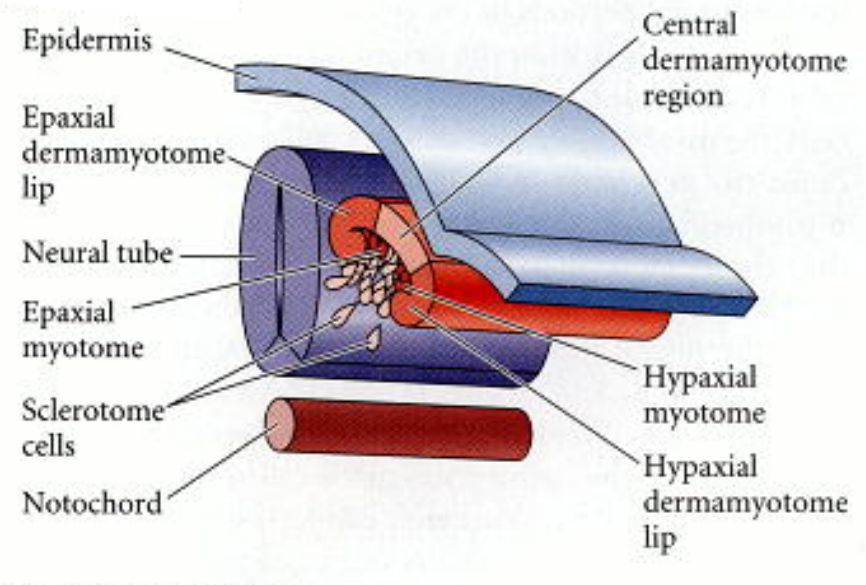



**2-day embryo**

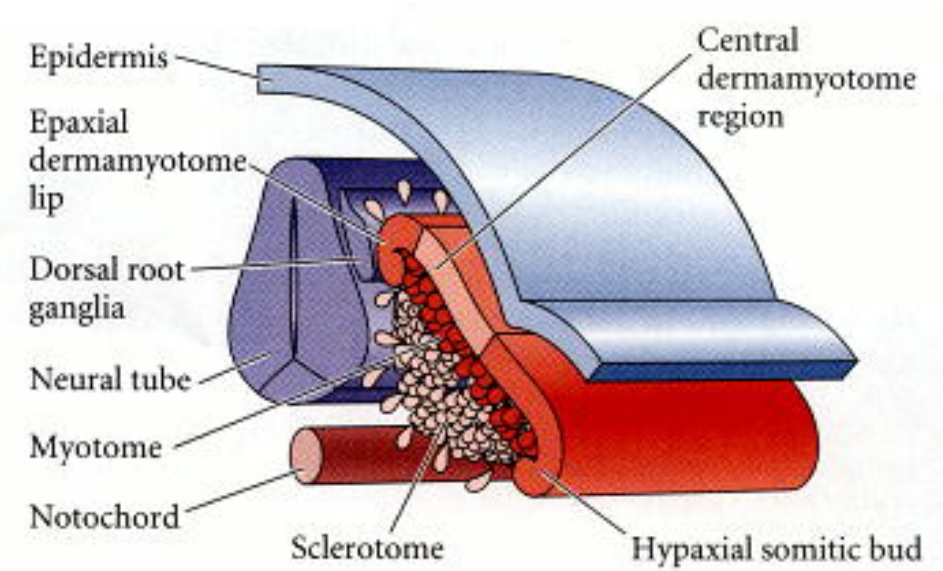



**3-day embryo**

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



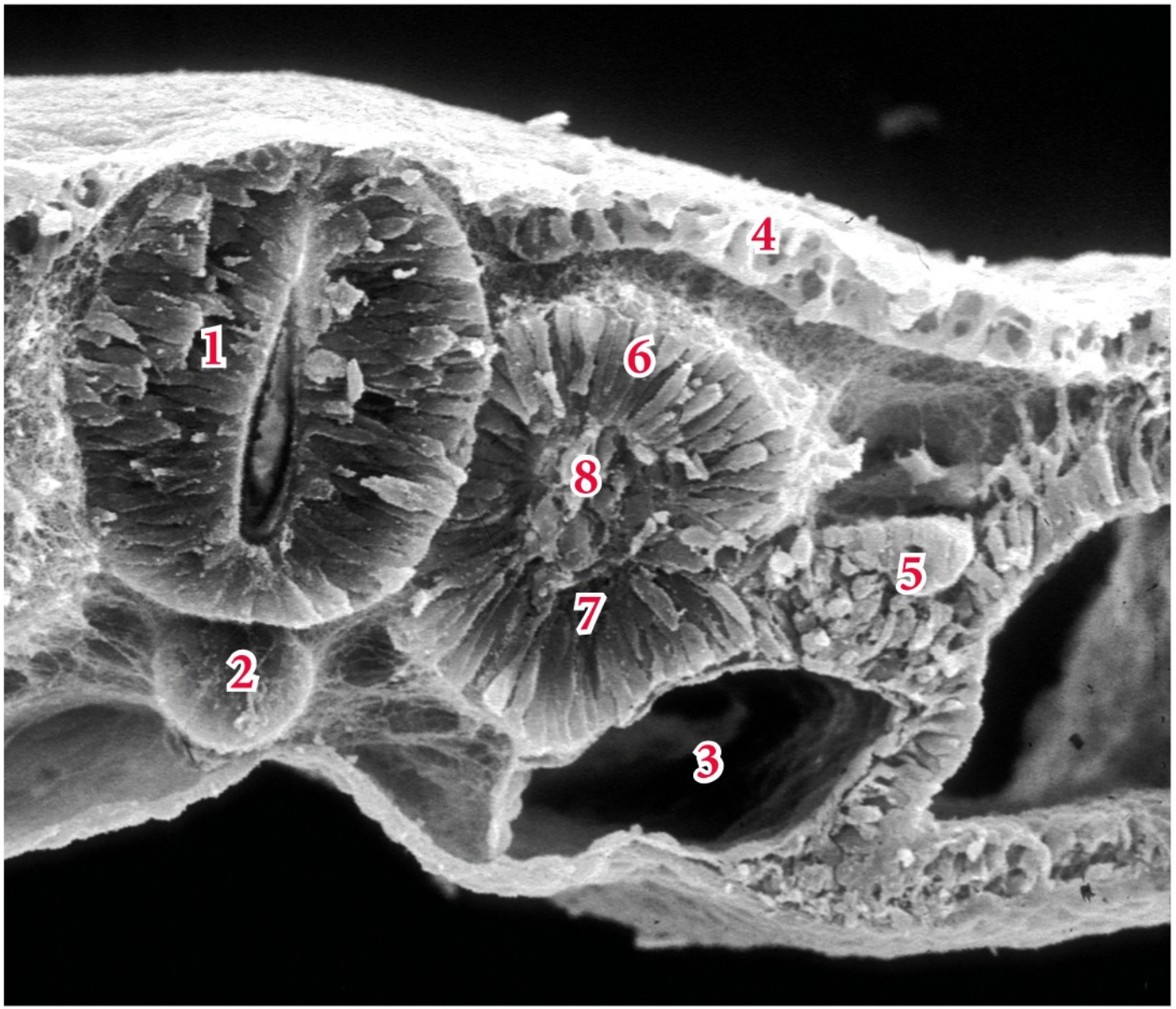

**4-day embryo**




**Late 4-day embryo**

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

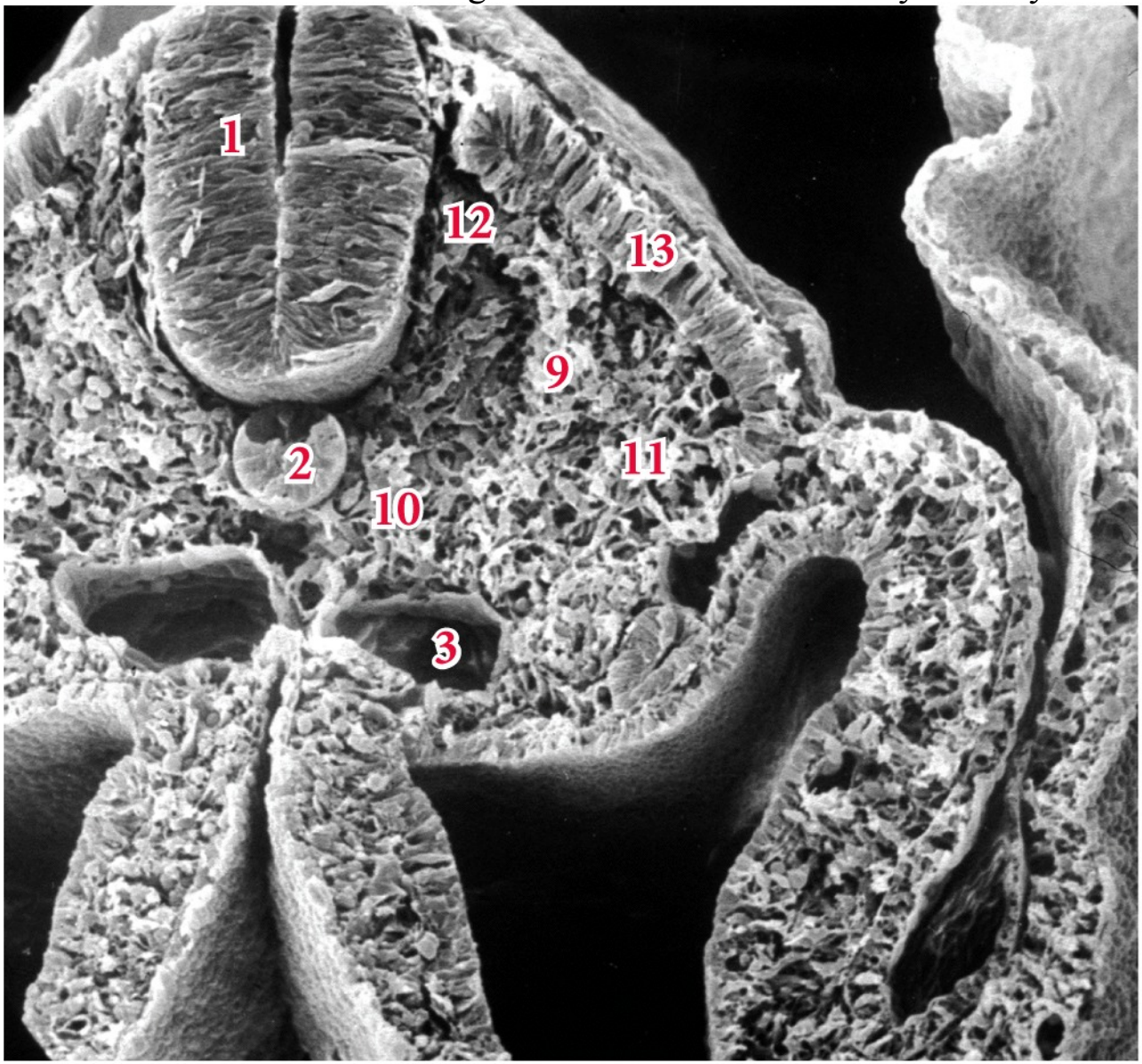
(E)




***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.12 (Part 5)**

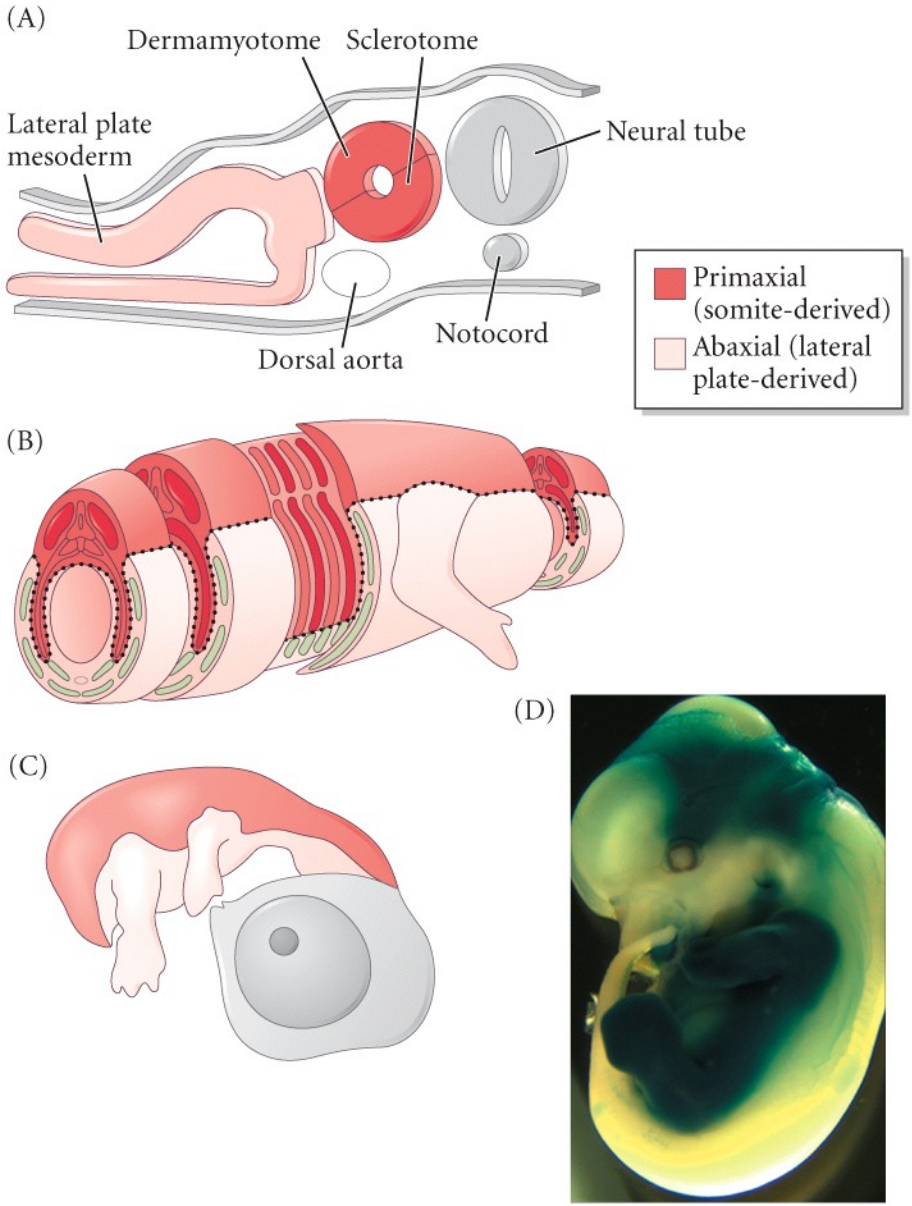
Figure 12.12 Transverse section through the trunk of a chick embryo on days 2–4

(F)




***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.12 (Part 6)**

Figure 12.13 Primaxial and abaxial domains of vertebrate mesoderm

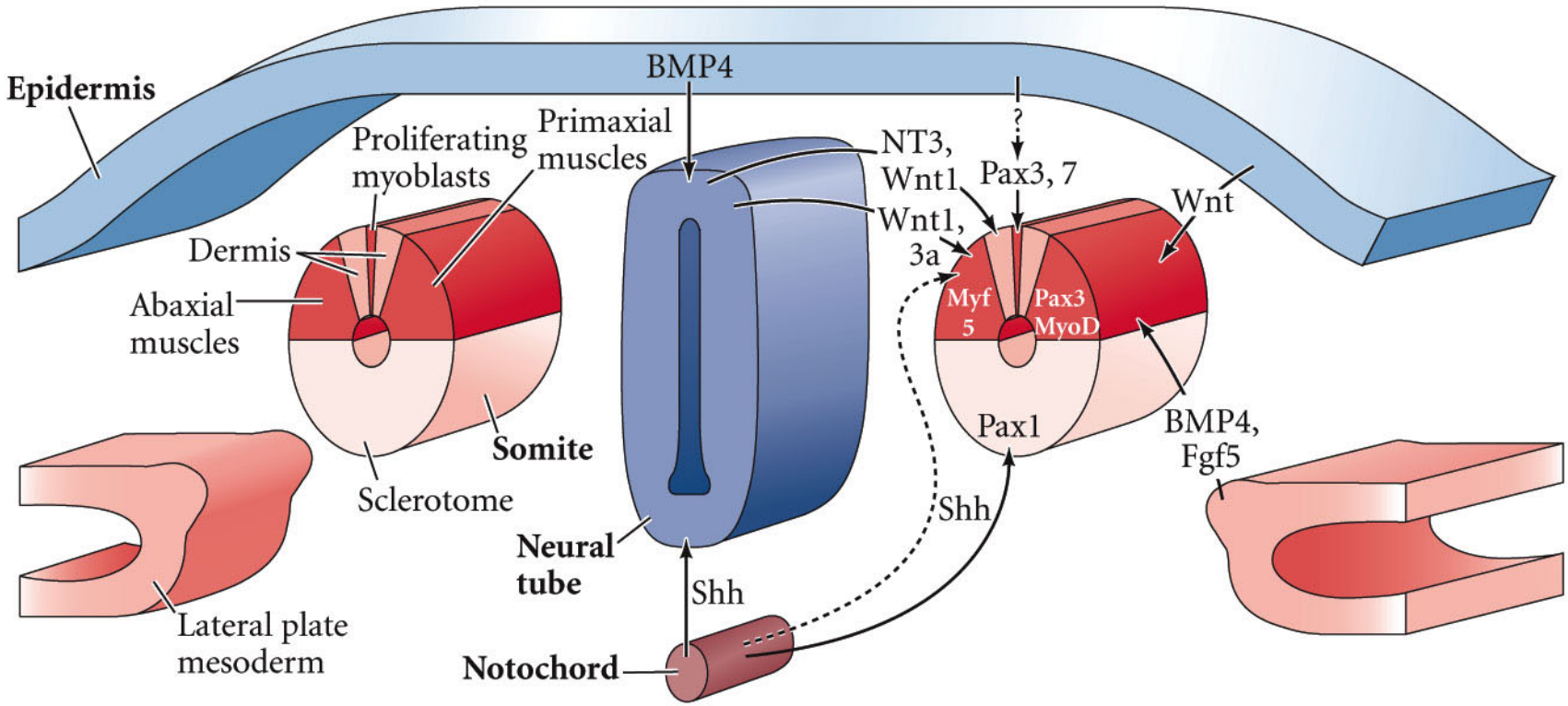



***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.13**

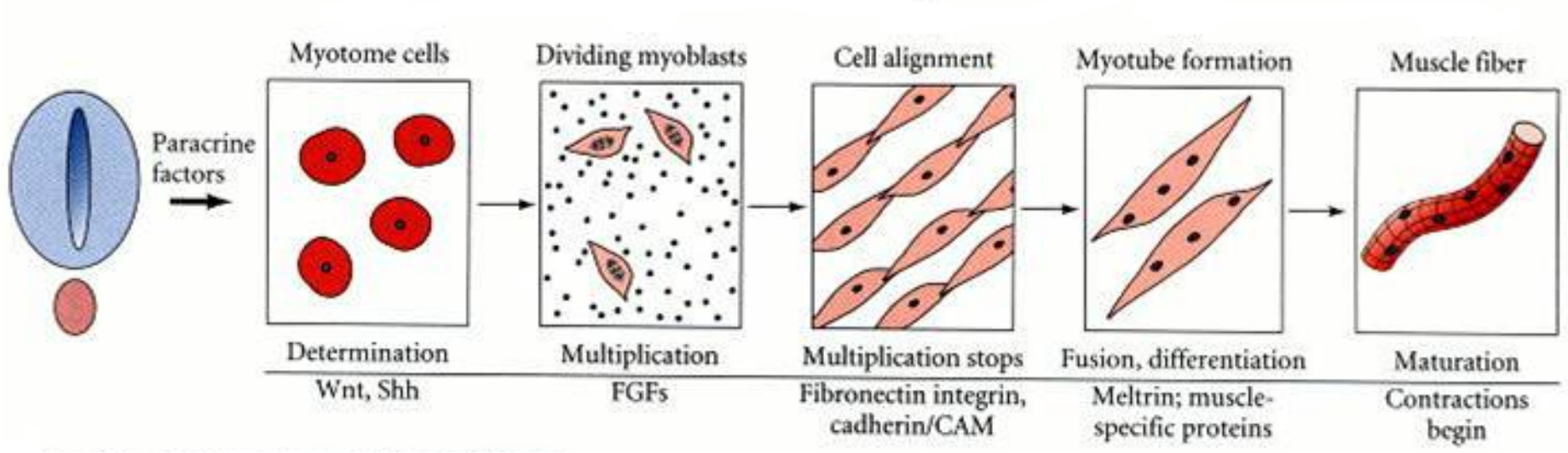
## TABLE 12.1 Derivatives of the somite

| Traditional view | Current view |
|---|---|
| **DERMAMYOTOME** | |
| 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 |
| **SCLEROTOME** | |
| 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 |

***DEVELOPMENTAL BIOLOGY 10e*, Table 12.1**



# Conversion of myoblasts into muscles in culture



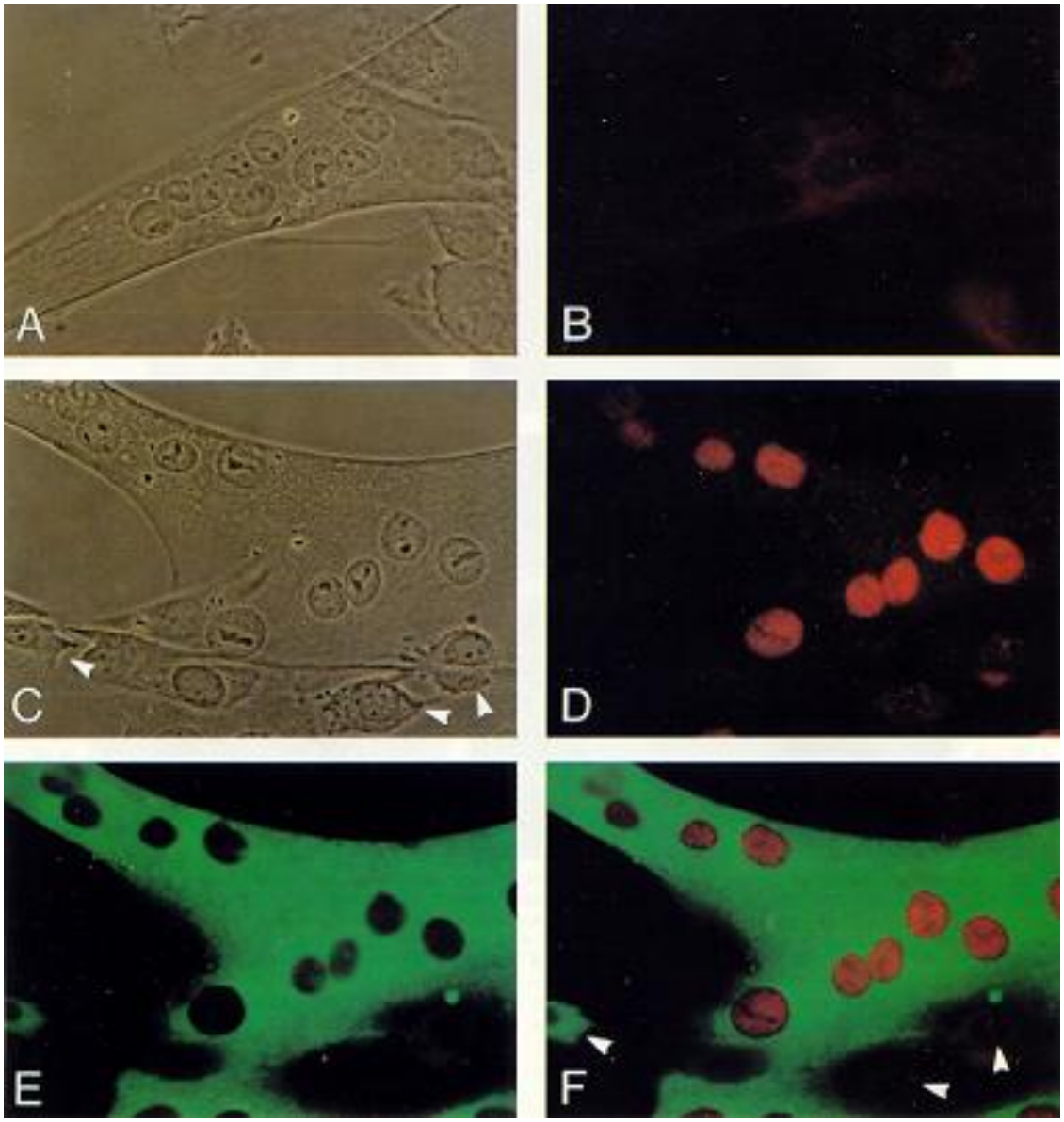
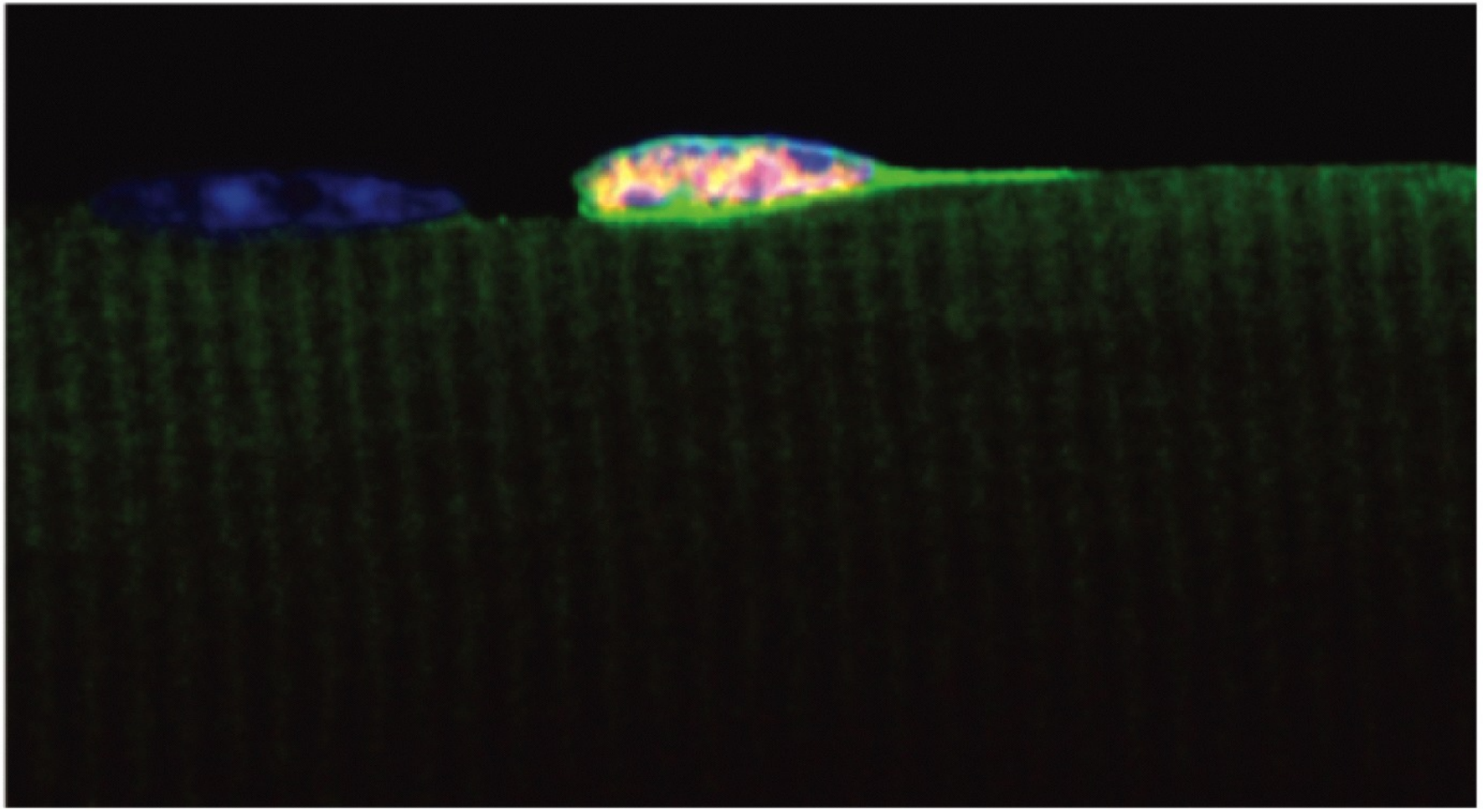

A
B
C
D
E
F

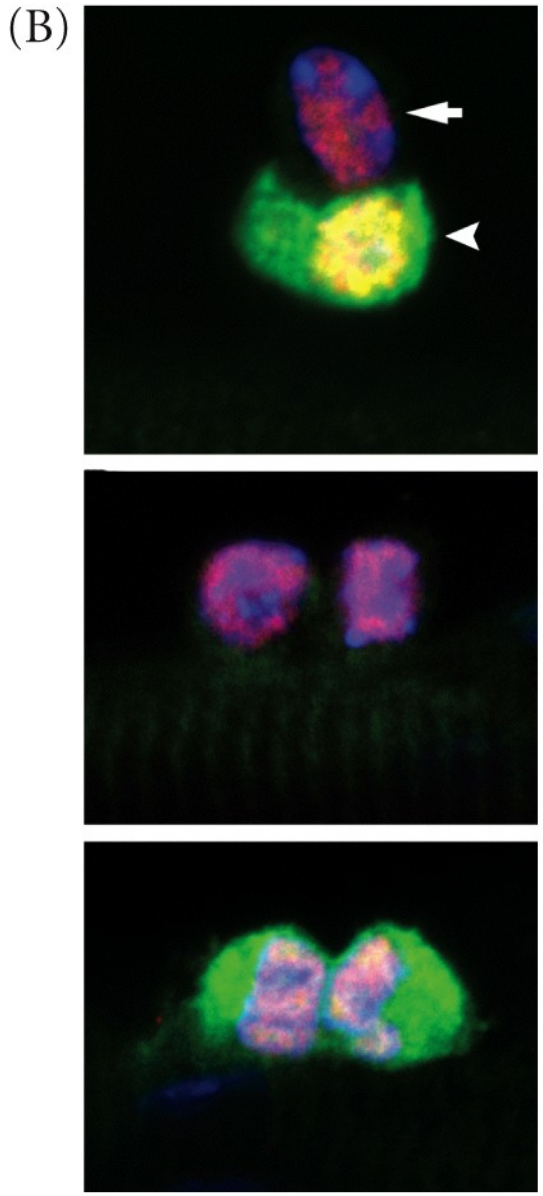
Figure 12.18 Satellite cells and muscle growth

(A)



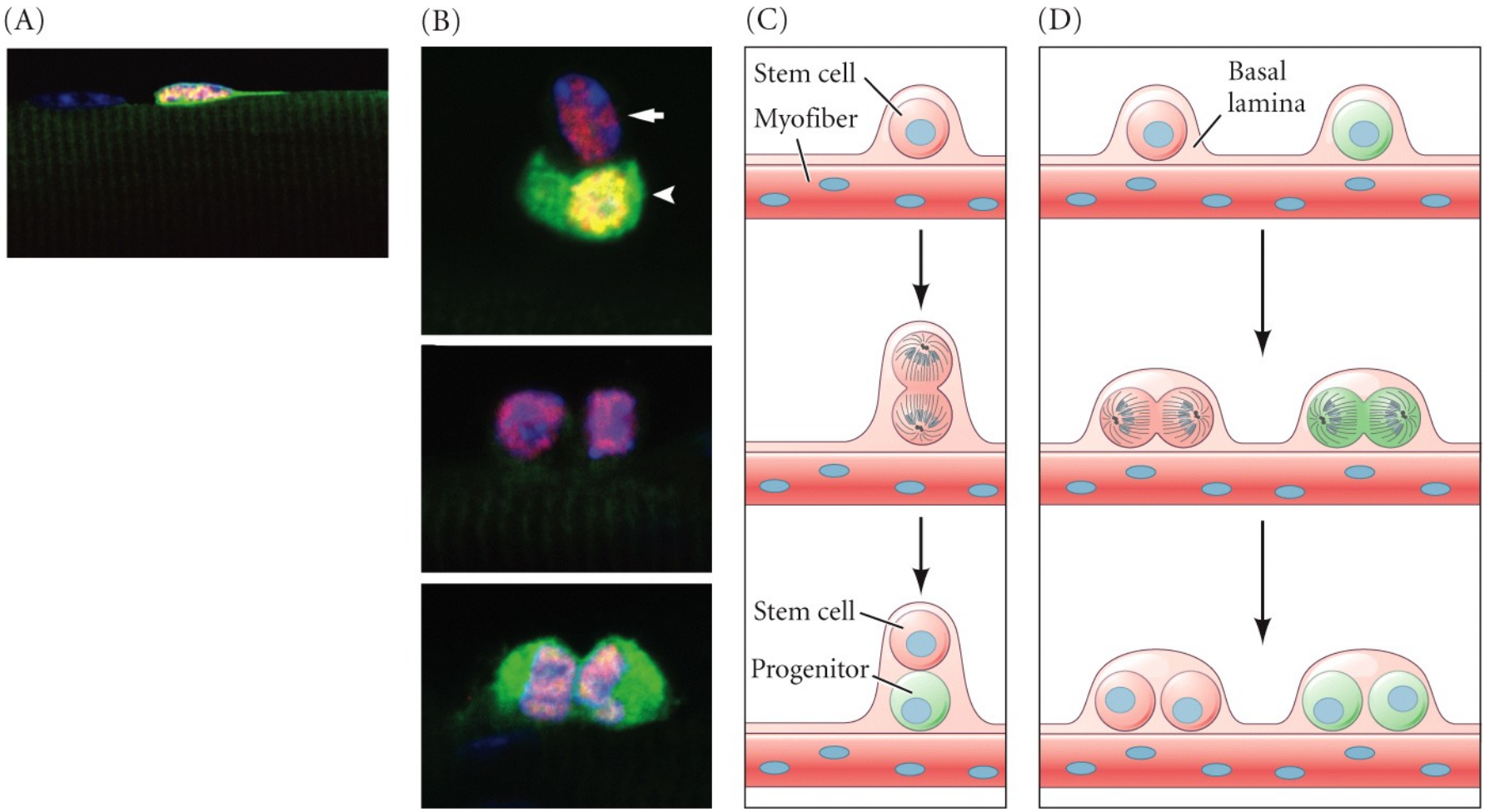
***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.18 (Part 1)**

Figure 12.18 Satellite cells and muscle growth




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

Figure 12.18 Satellite cells and muscle growth




***DEVELOPMENTAL BIOLOGY 10e*, Figure 12.18**

# Myotome derivatives of the mouse embryo

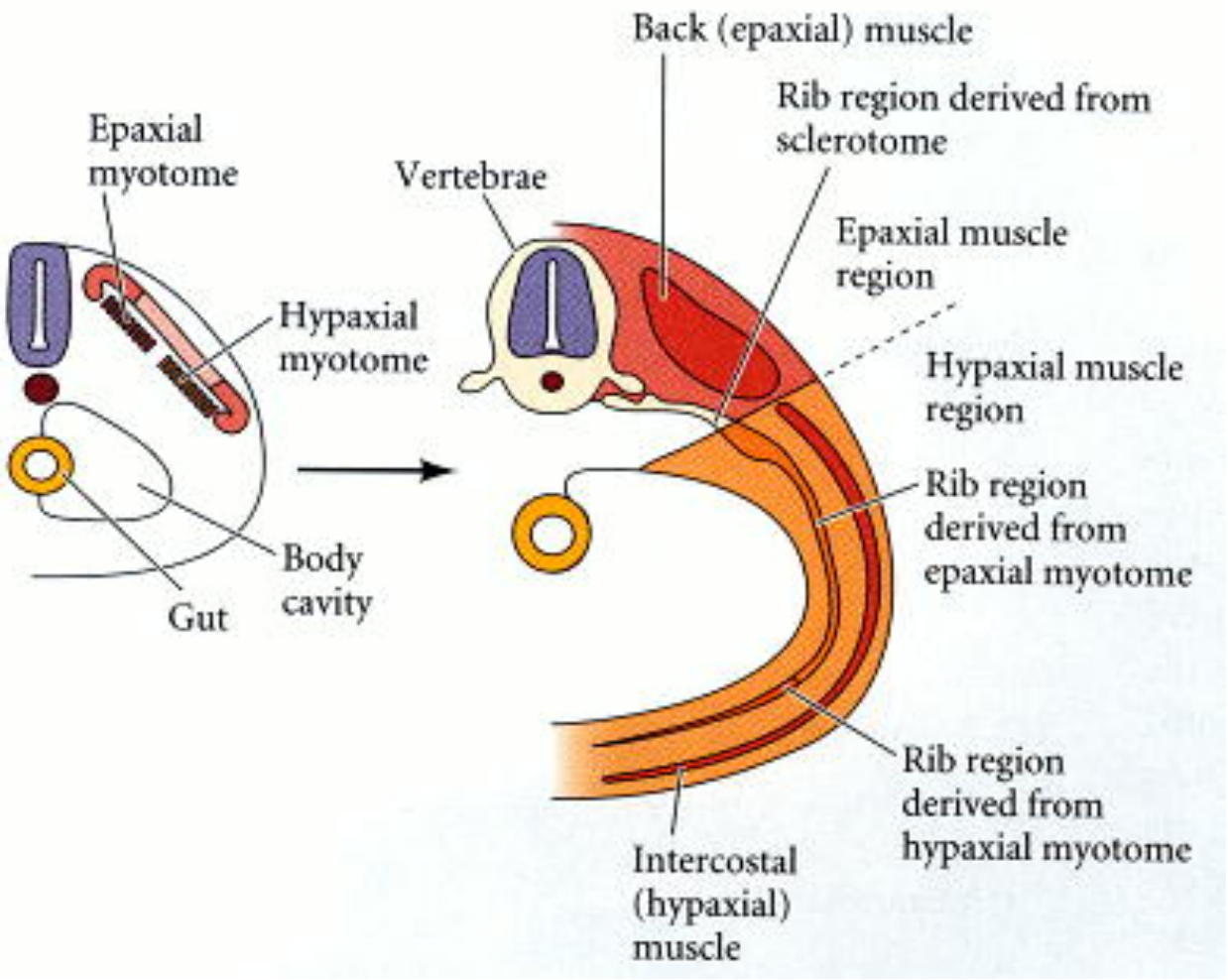
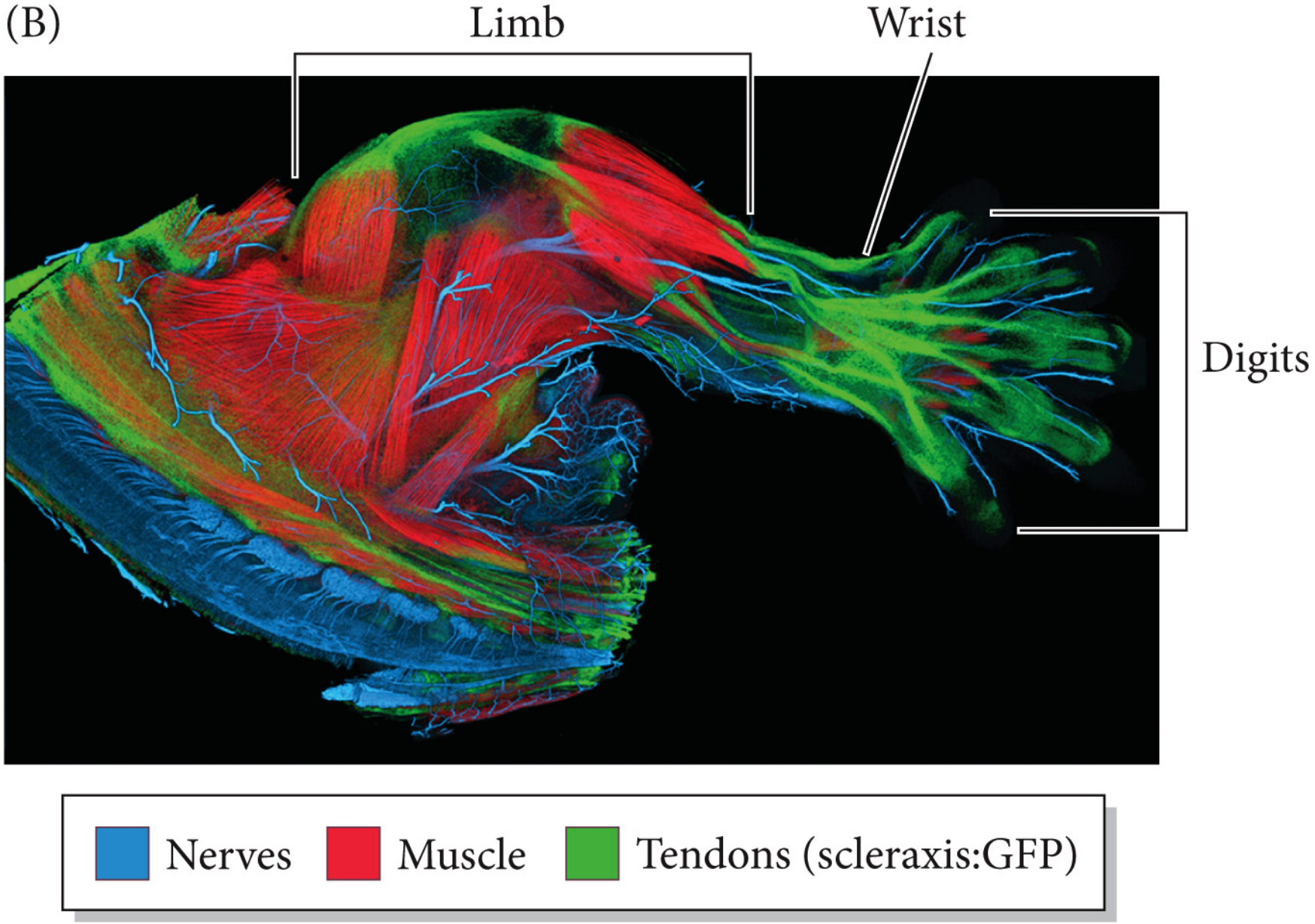
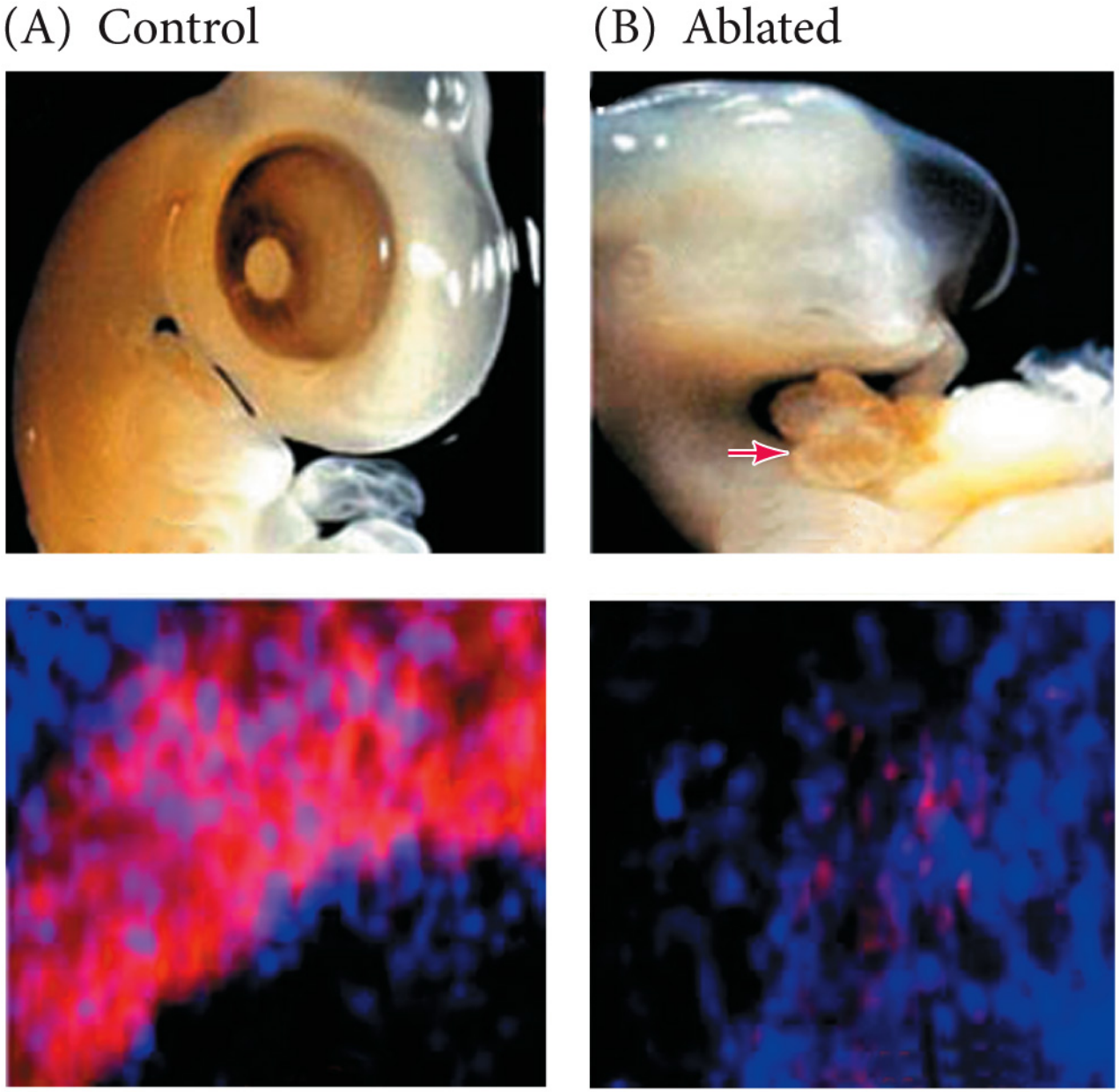


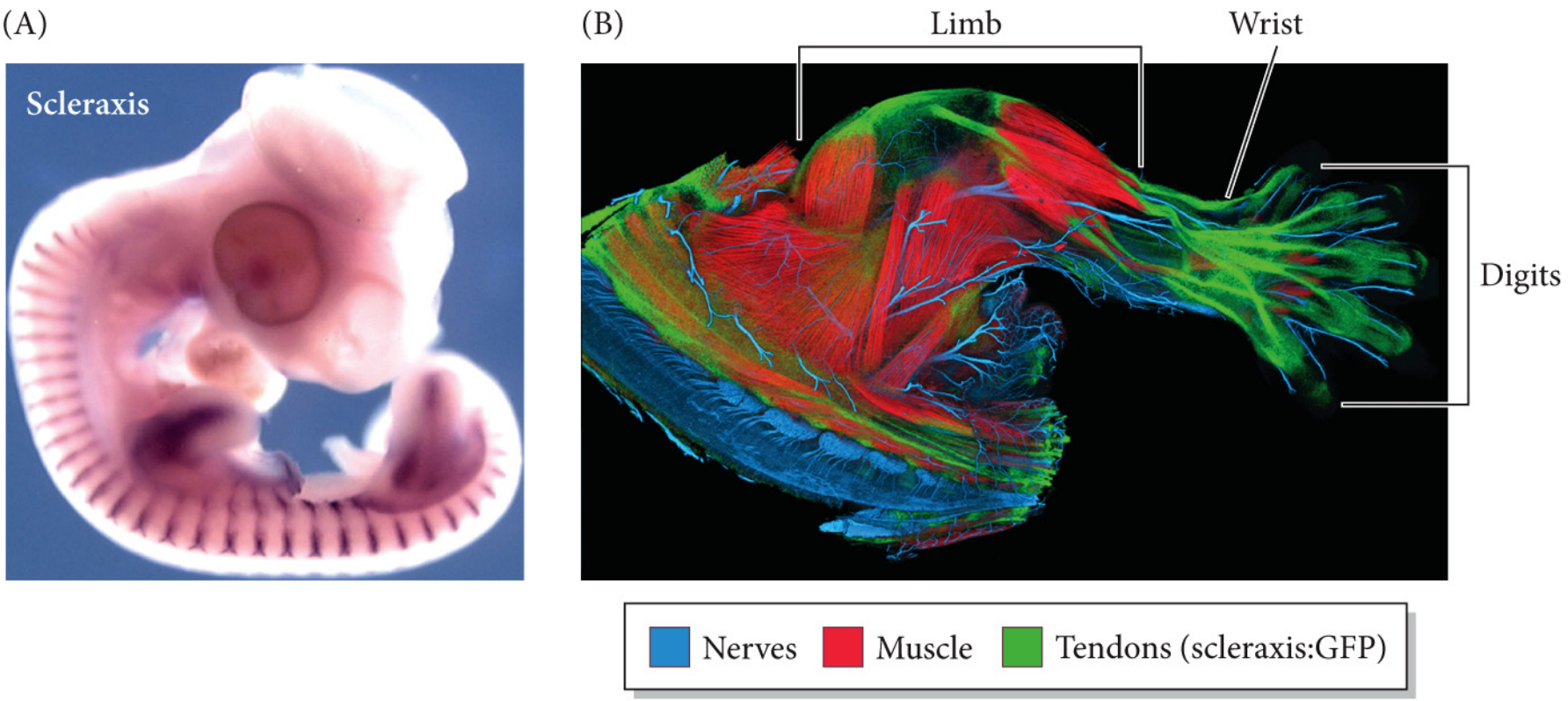
Figure 17.24 Scleraxis is expressed in the progenitors of the tendons




*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.24 (Part 2)

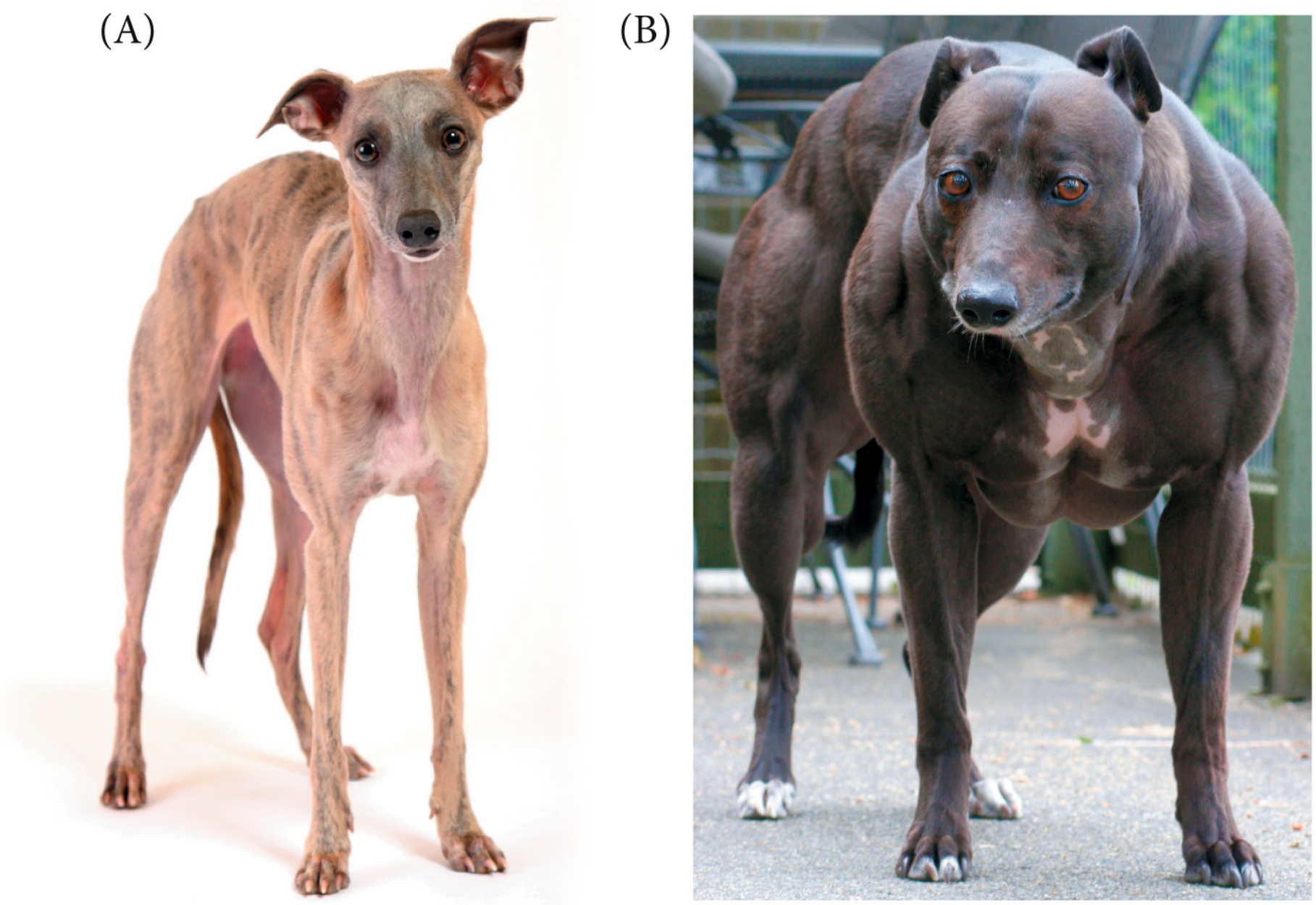



*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.28




*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.24

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




*DEVELOPMENTAL BIOLOGY 11e*, Figure 17.34

# Conversion of myoblasts into muscles in culture