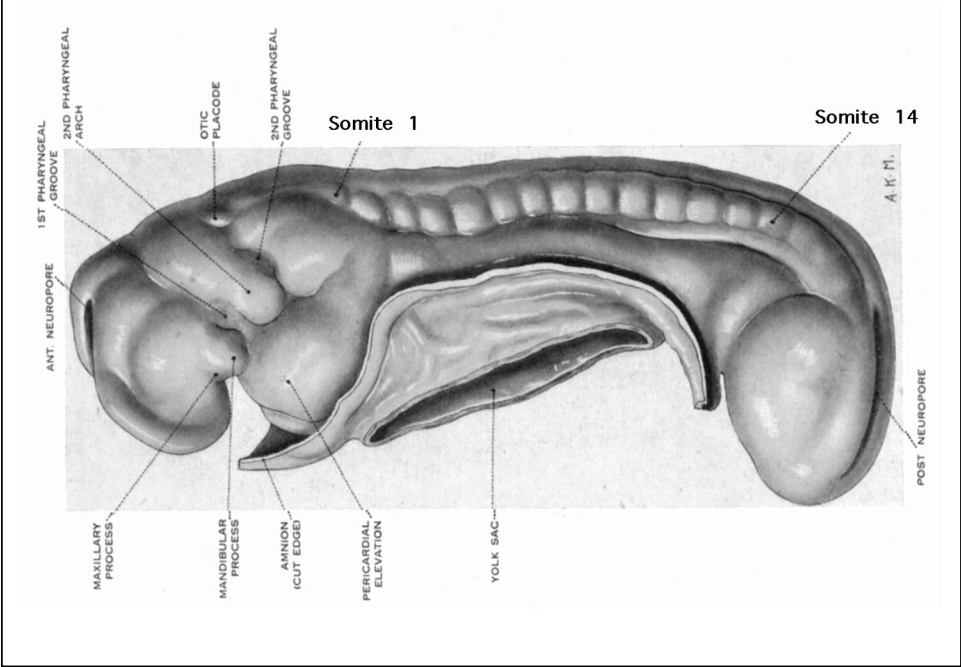
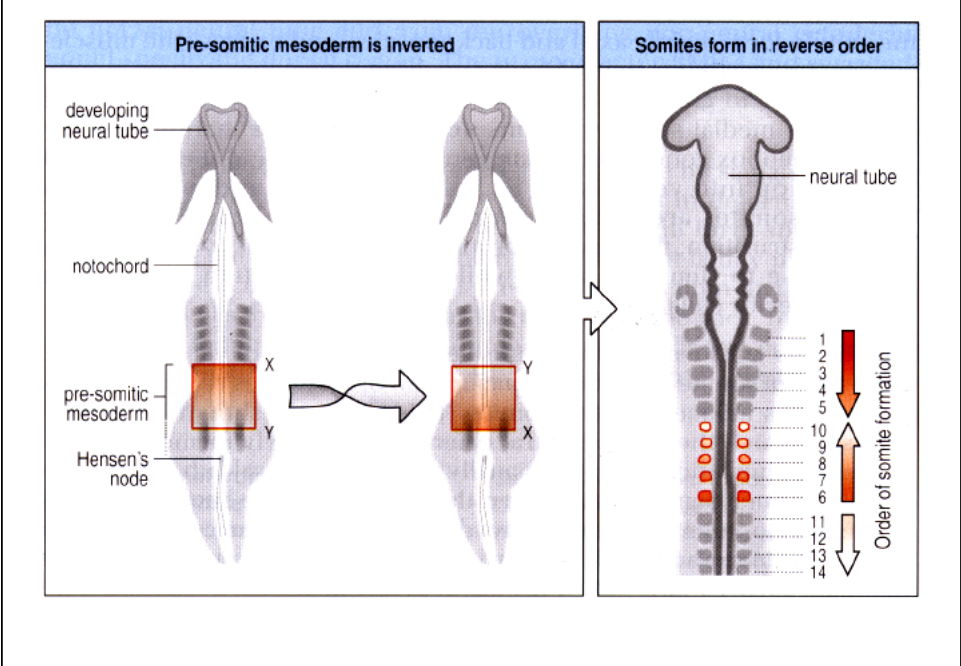
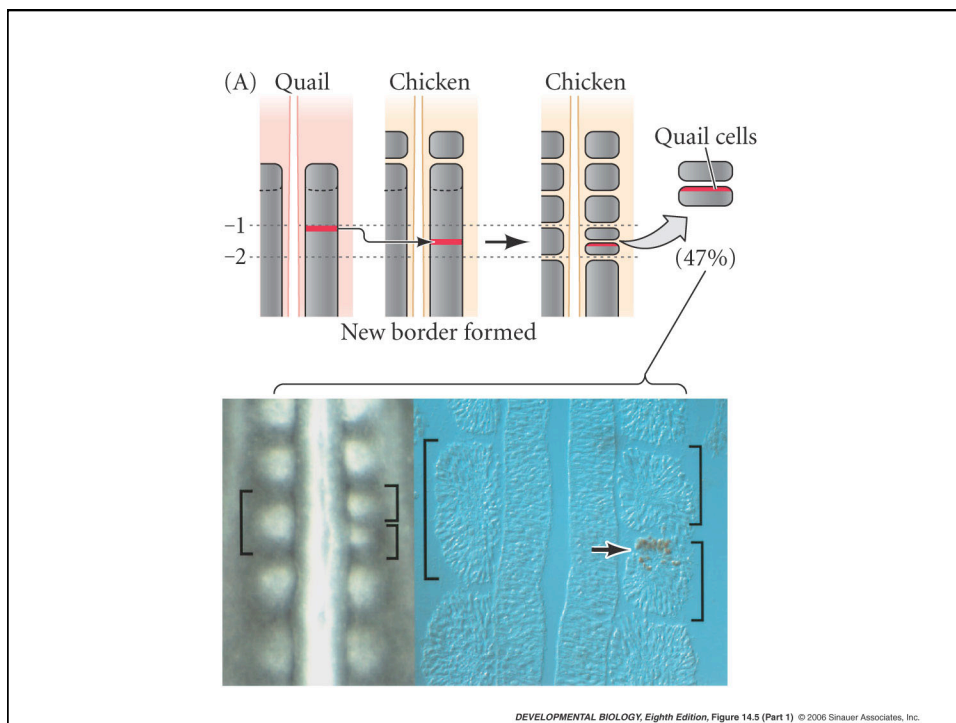
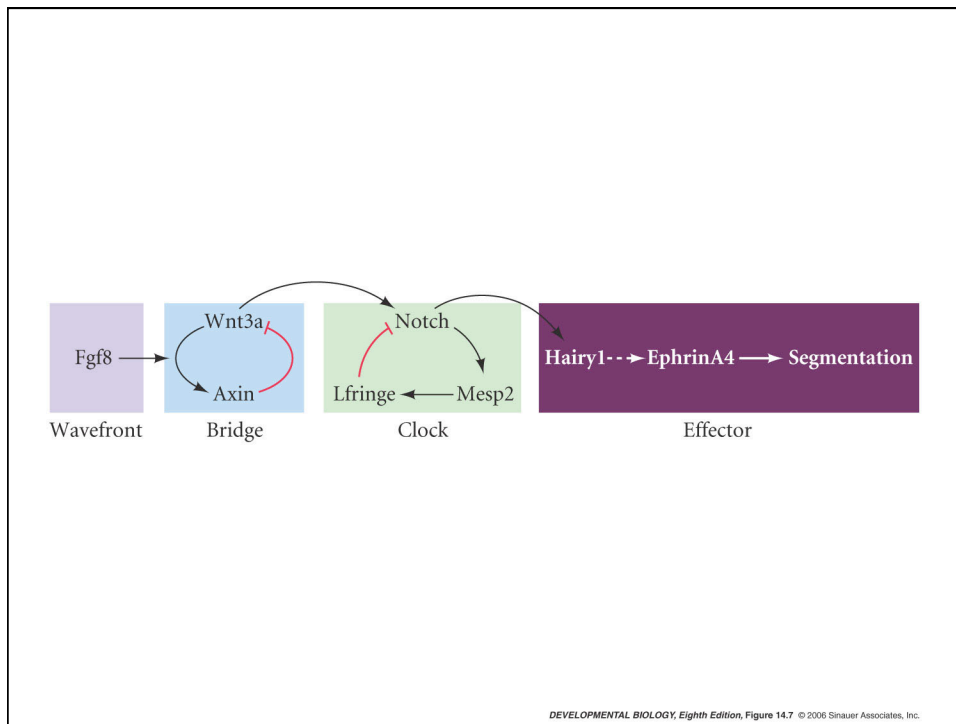


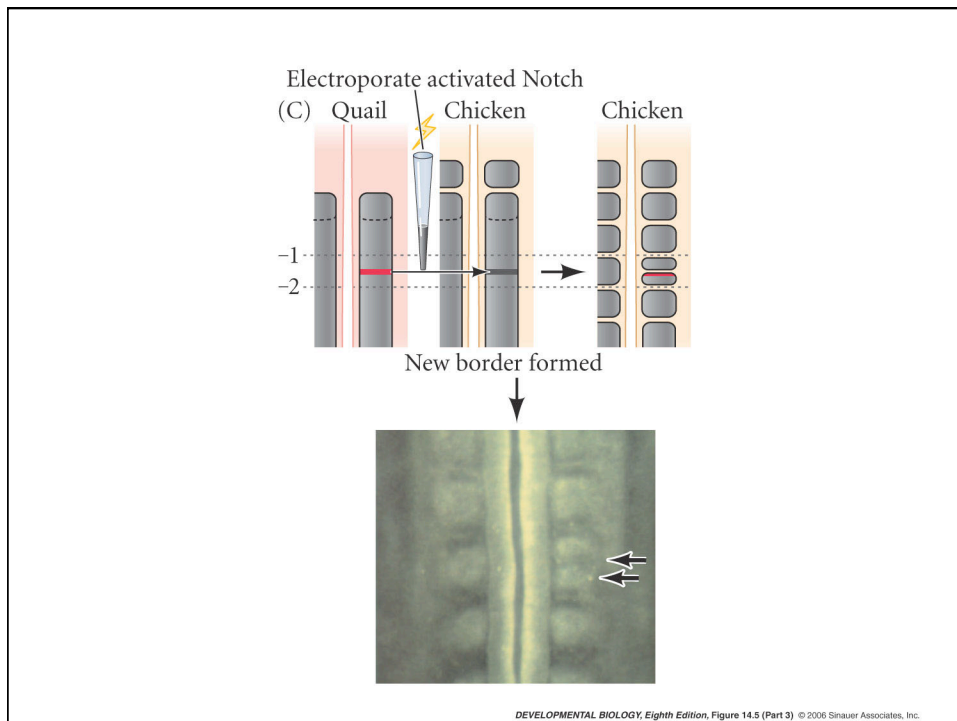
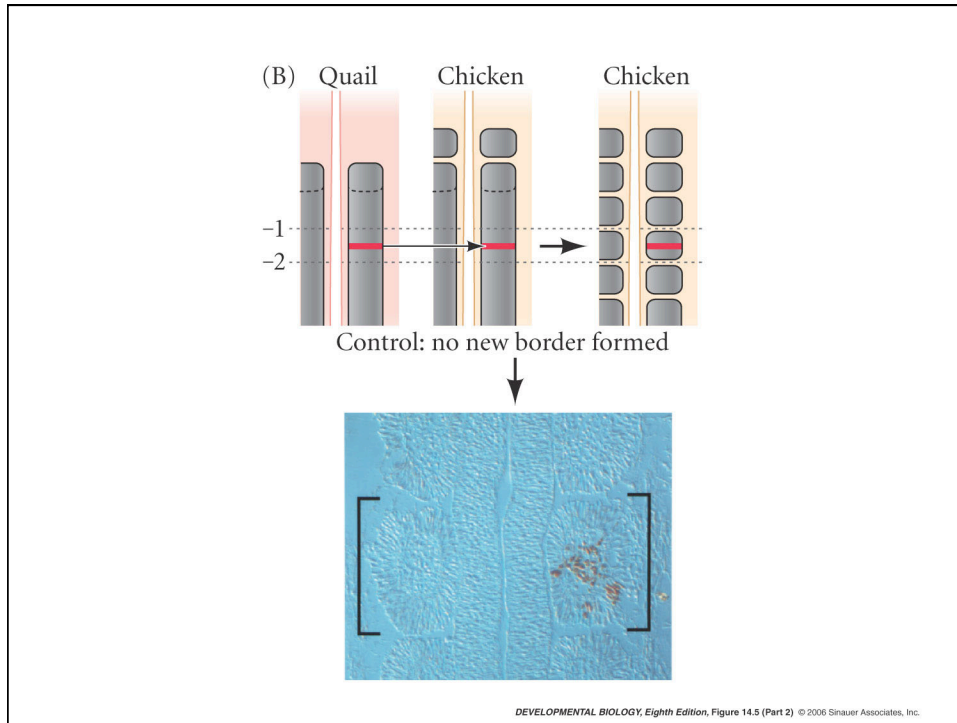
Human somitogenesis

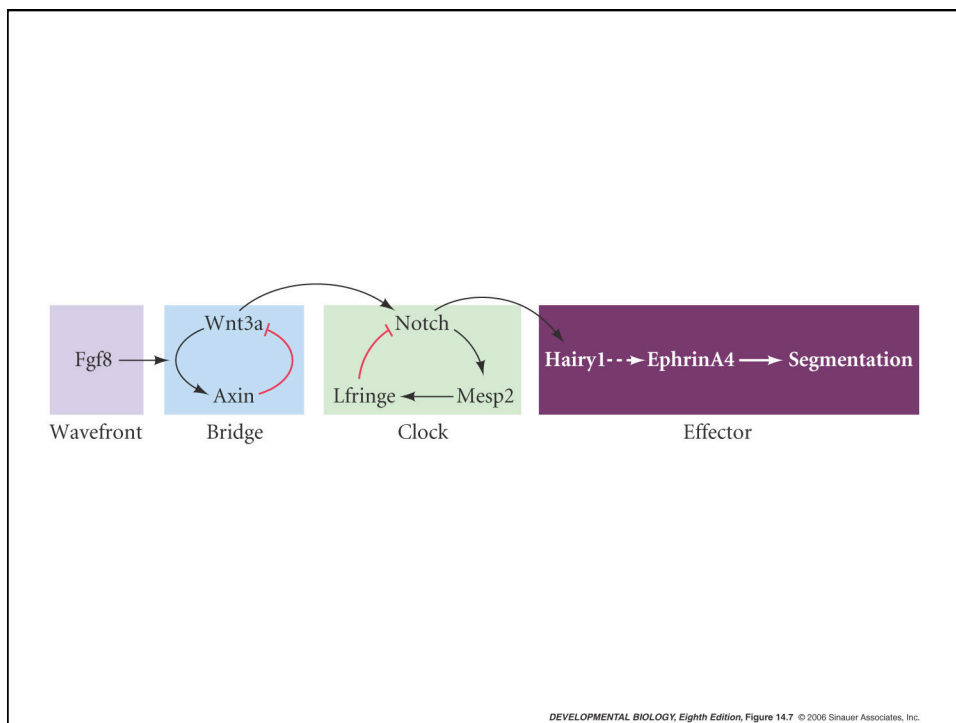
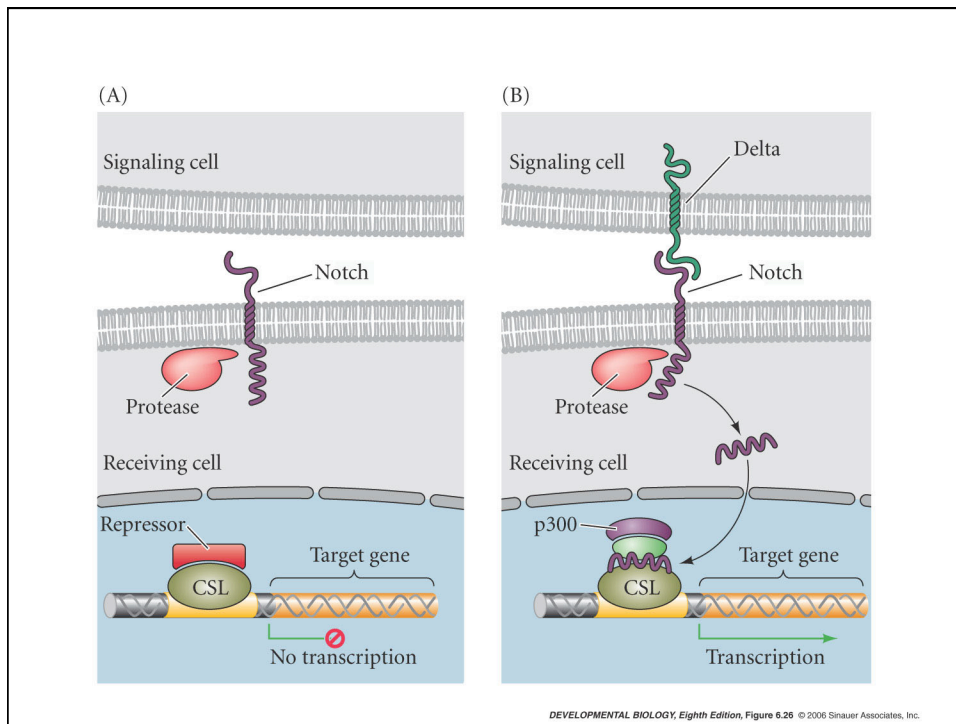


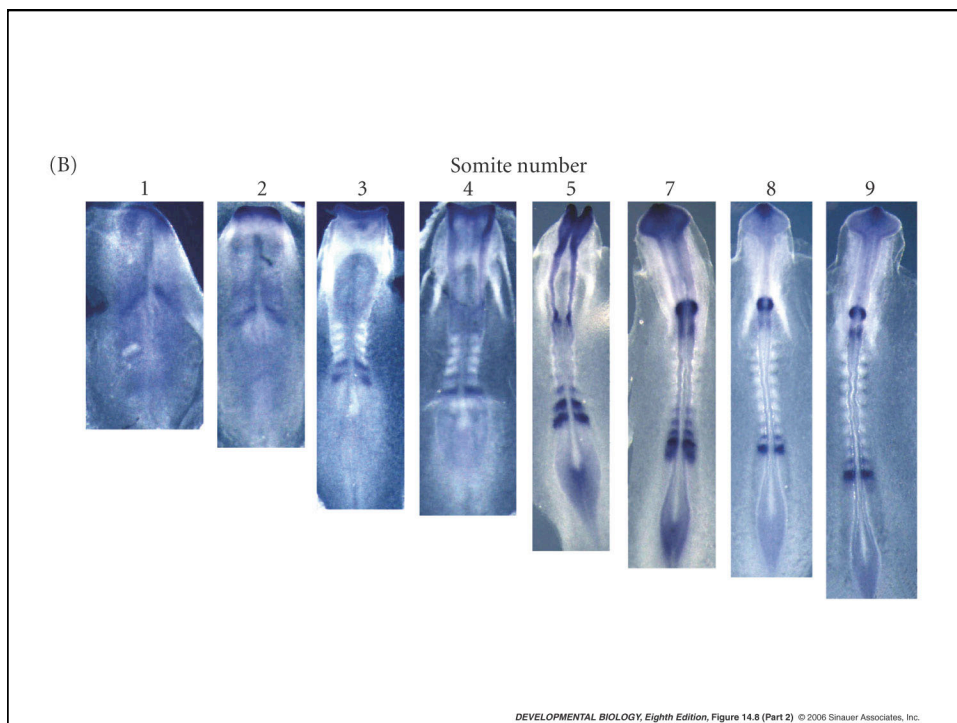
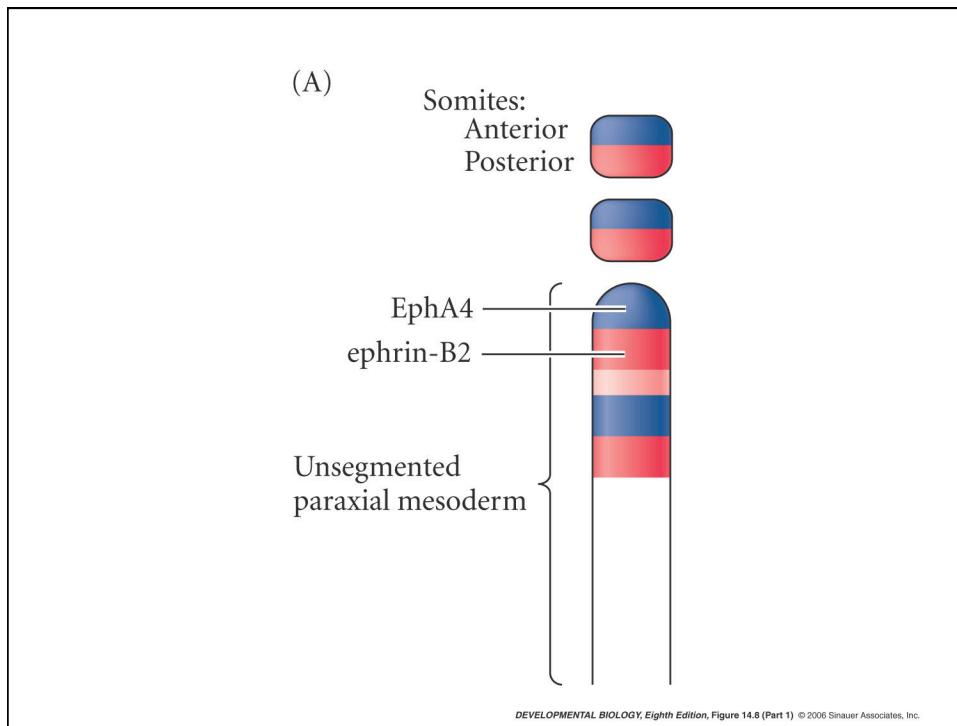
magic

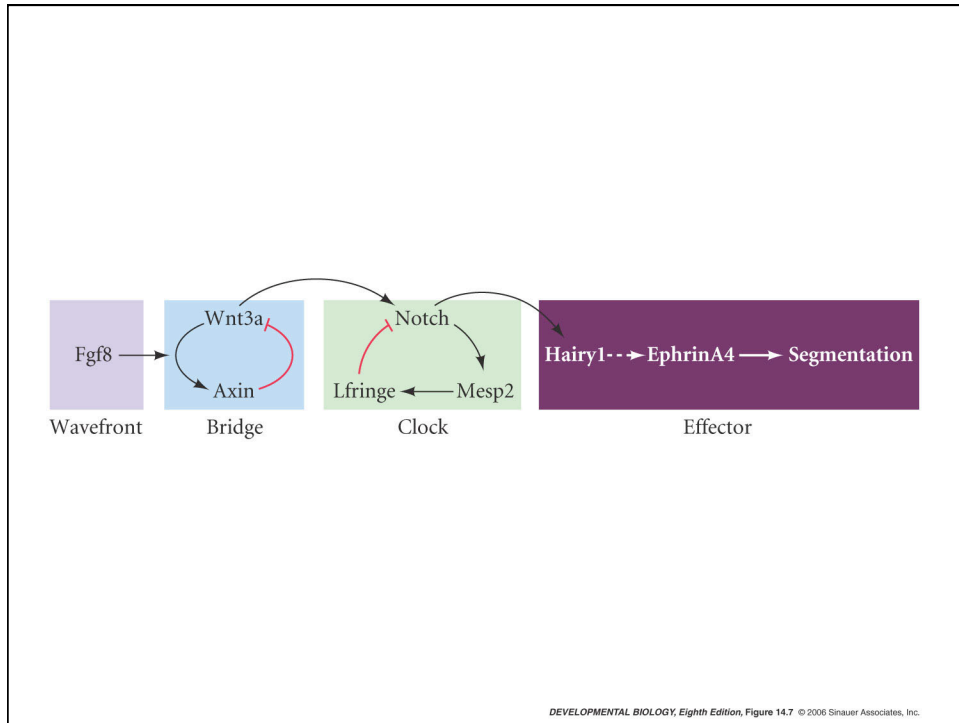








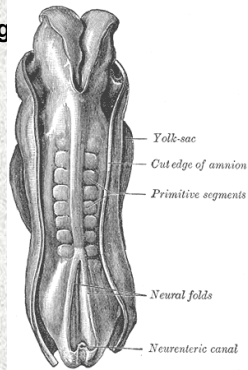




Avian *hairy* Gene Expression Identifies a Molecular Clock Linked to Vertebrate Segmentation and Somitogenesis

(Isabel Palmeirim, Doming

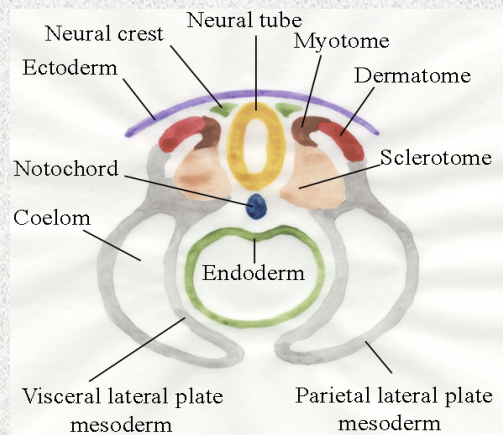
h-Horowicz, & Olivier



By Claire Maguire and Meherazade Sumariwalla

What is a Somite?

Mesodermal tissue adjacent to the notochord that becomes segmented and is the precursor to dermatome (dermis), myotome (skeletal muscle) and sclerotome (vertebrae).

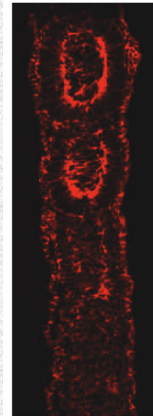
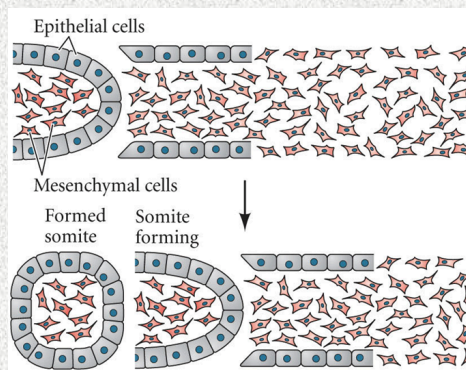


(http://www.aps.uoguelph.ca/ANSC*2340/LEC5/LEC5.html)

How does a Somite form?

Somites are formed through a Clock and Wave mechanism.

The clock is the oscillating signal of Notch and Wnt pathways and the wave is a gradient that is rostral (anterior) to caudal (posterior). In chick, the formation of one somite takes approximately 90 minutes.



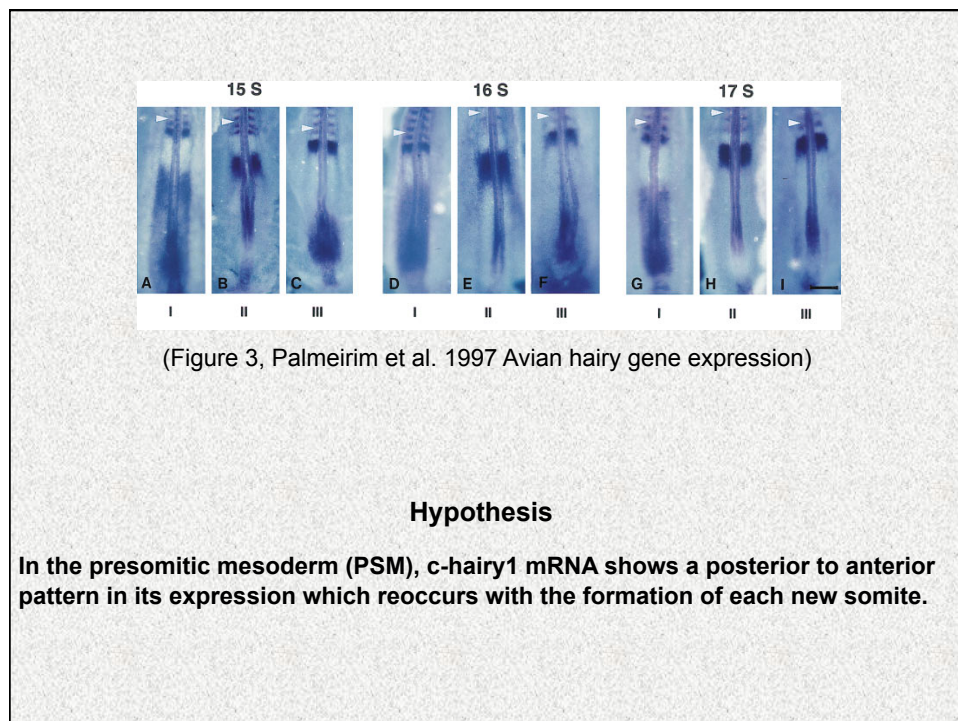
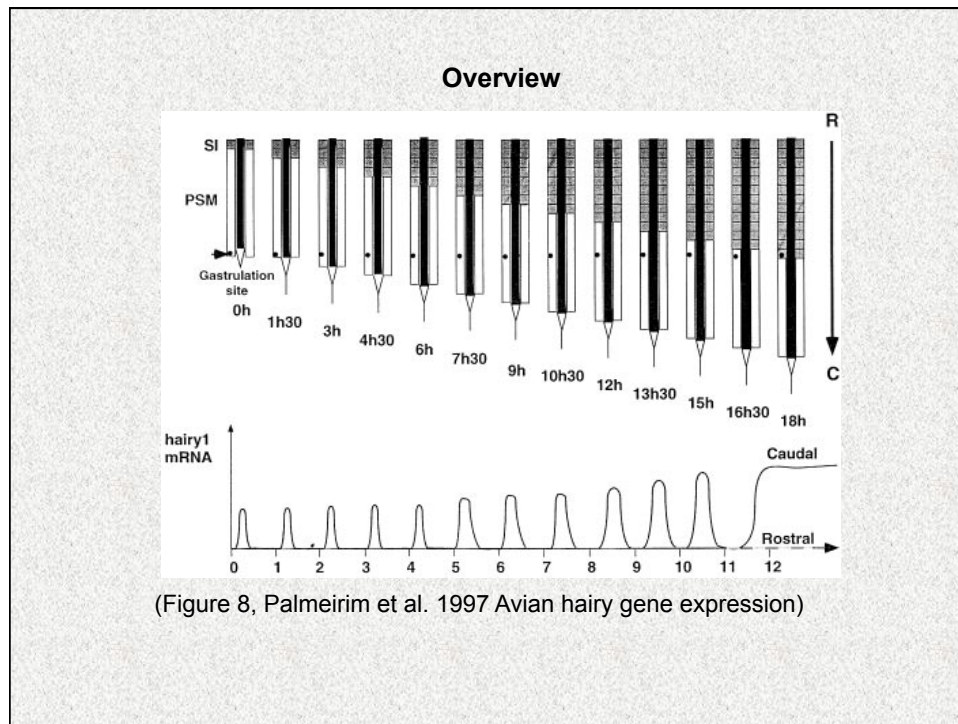
(Developmental Biology, 8th Ed. S.F.Gilbert. Figure 14.9)

What is this paper exploring?

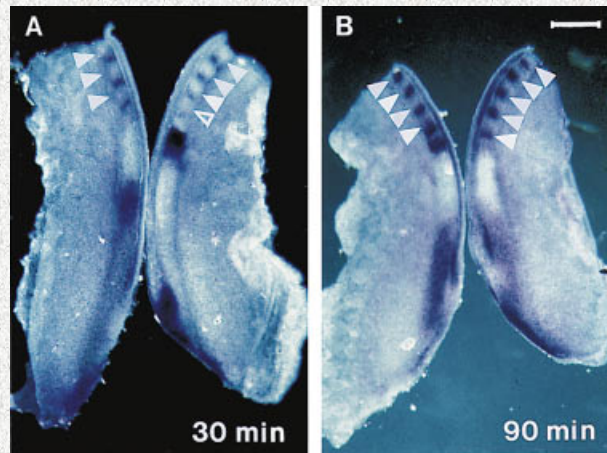
In chick, a gene *c-hairy1* (a homolog of the segmentation gene in *Drosophila*) was identified and characterized. It is strongly expressed in the presomitic mesoderm.

This paper explores how –

- the mRNA of *c-hairy1* is expressed in cyclic waves (of 90 minutes)
- the movement of these waves is due to gene expression and not cell movement along the anterior-posterior axis or a signaling cascade.
- the rhythmic expression of *c-hairy1* is an autonomous property of the presomitic mesoderm.
- the periodic oscillations of *c-hairy1* are independent of protein synthesis.

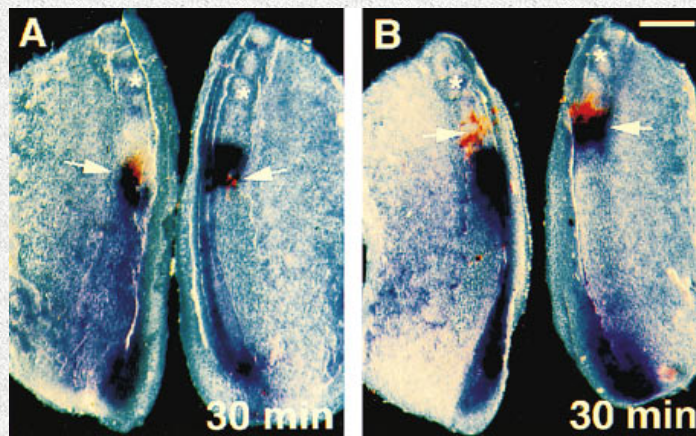


**Cyclic Expression of *c-hairy1* mRNA in the PSM
Correlates with Somite Formation**



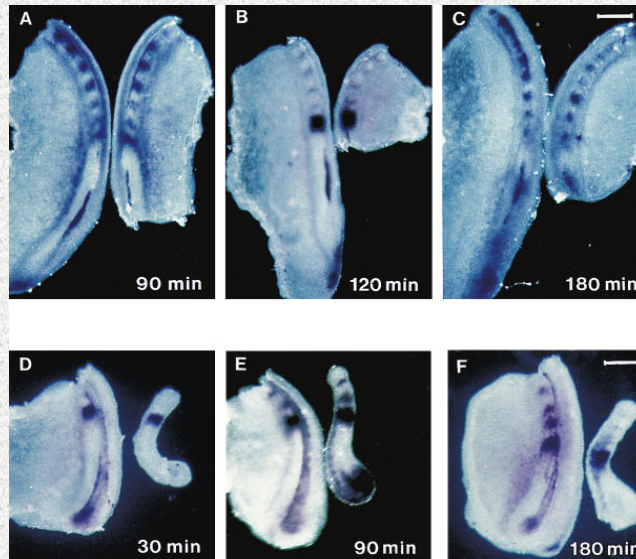
(Figure 4, Palmeirim et al. 1997 Avian hairy gene expression)

Cell Movements Do Not Account for *c-hairy1* Expression Kinetics

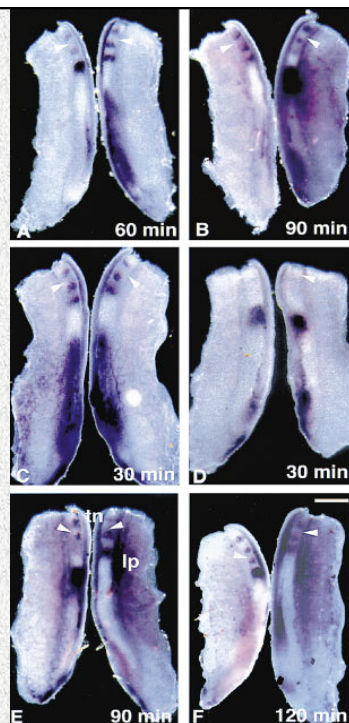


(Figure 5, Palmeirim et al. 1997 Avian hairy gene expression)

Cyclic expression of the *c-hairy1* gene is an autonomous property of the PSM independent of the anterior-posterior integrity of the tissue

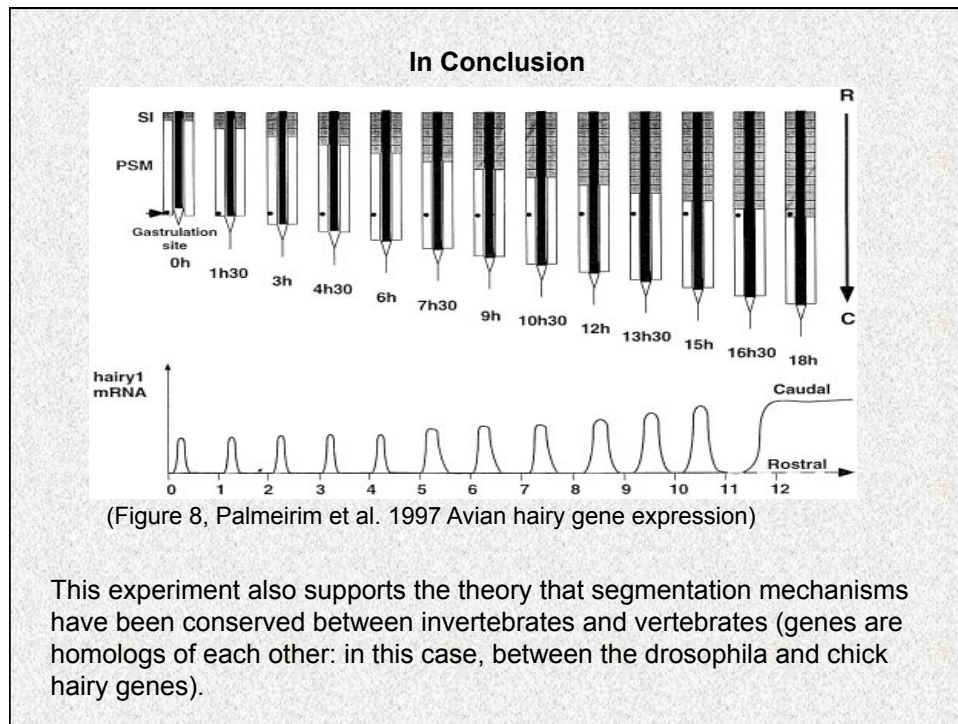


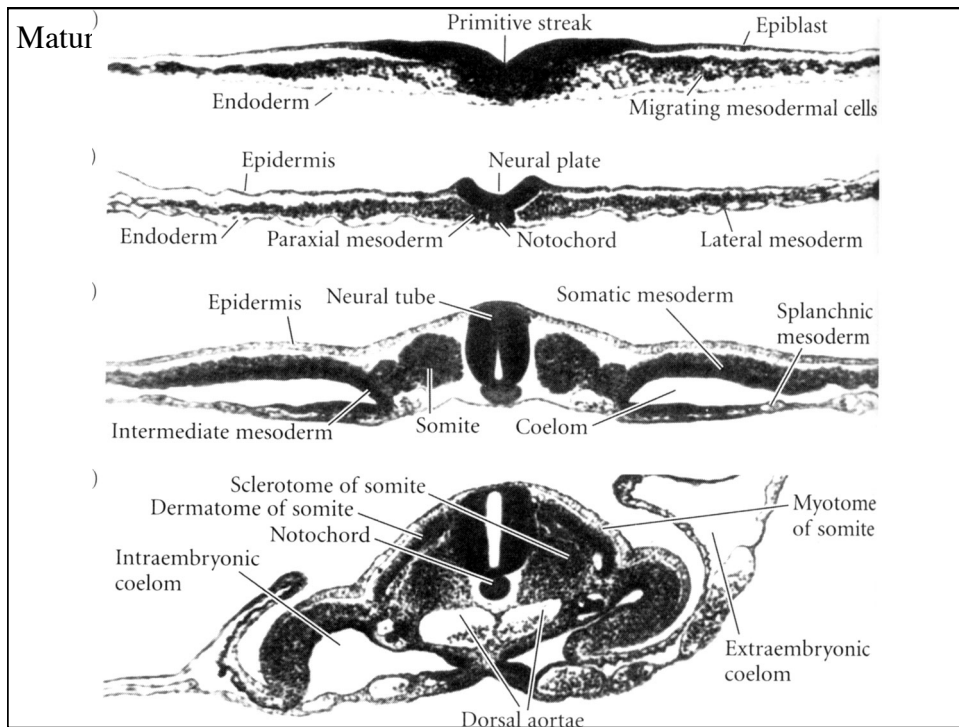
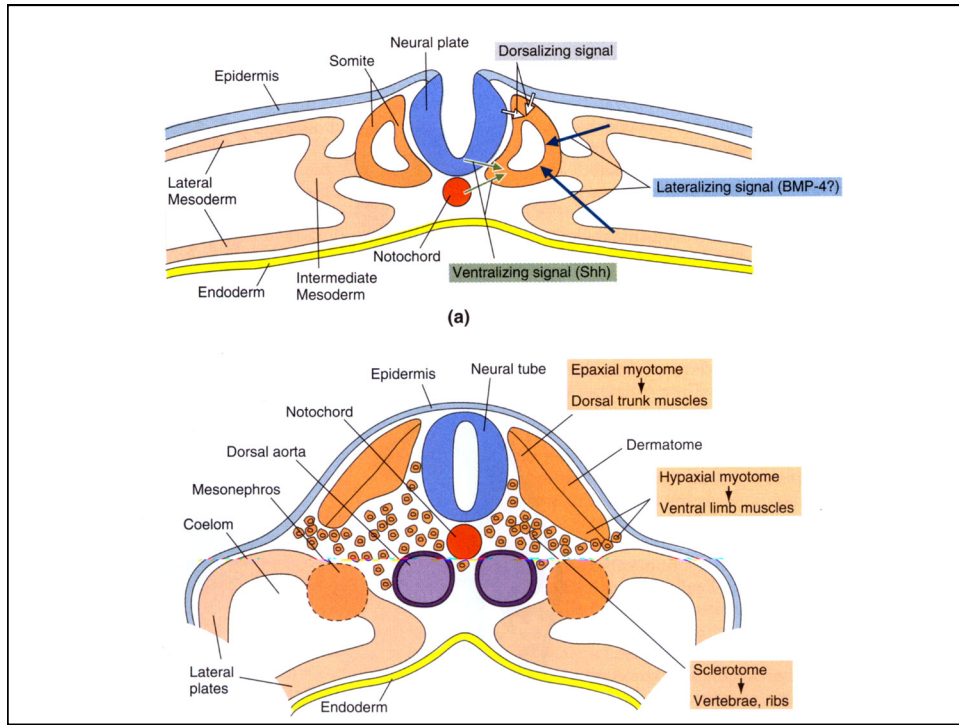
(Figure 6, Palmeirim et al. 1997 Avian hairy gene expression)



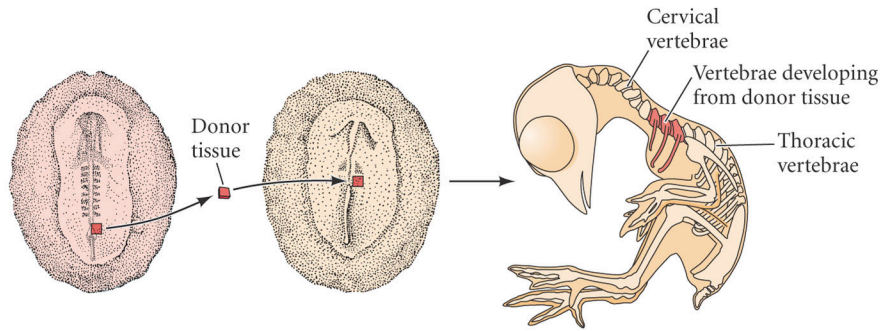
Blocking protein synthesis using Cycloheximide treatment does not block the *c-hairy1* wave progression

(Figure 7, Palmeirim et al. 1997 Avian hairy gene expression)



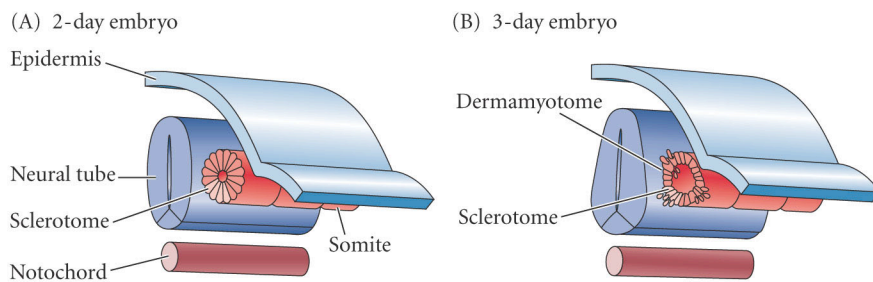


14.10 Segmental plate mesoderm transplanted into a different region in a younger embryo differentiates according to its original position



DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 14.10 © 2006 Sinauer Associates, Inc.

through the trunk of a chick embryo on days 2–4 (Part 1)

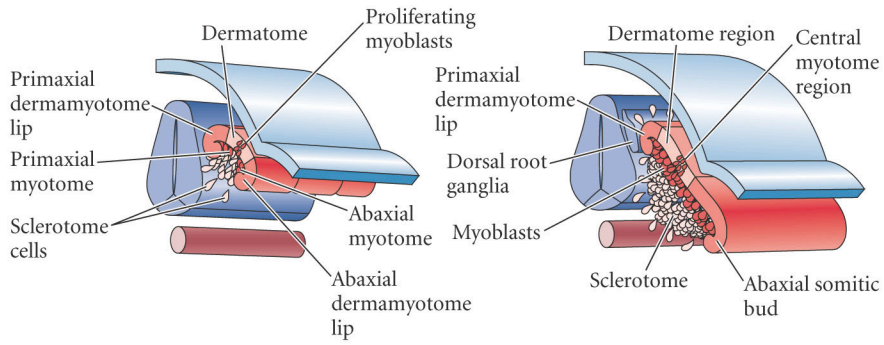


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14.11 Diagram of a transverse section through the trunk of a chick embryo on days 2–4 (Part 2)

(C) 4-day embryo

(D) Late 4-day embryo

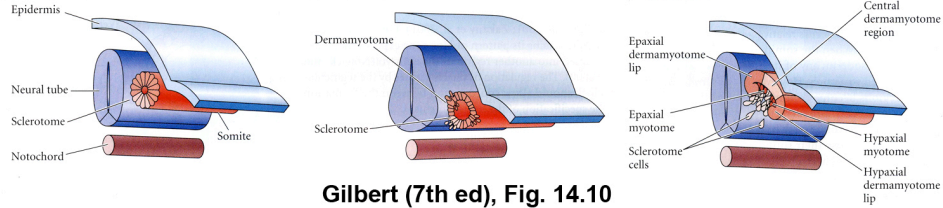


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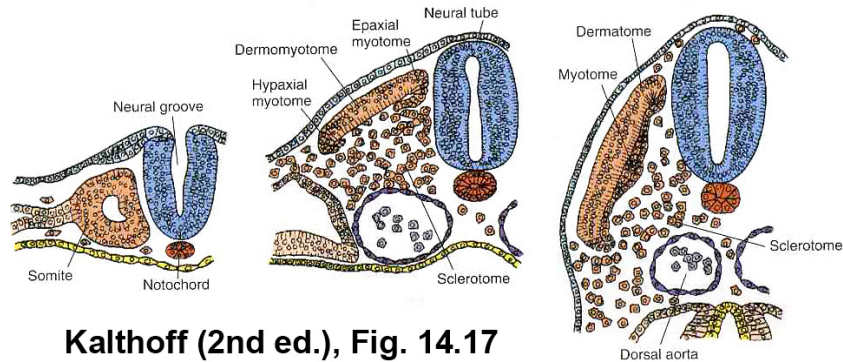
(A) 2-day embryo

(B) 3-day embryo

(C) 4-day embryo



Gilbert (7th ed), Fig. 14.10



Kalthoff (2nd ed.), Fig. 14.17