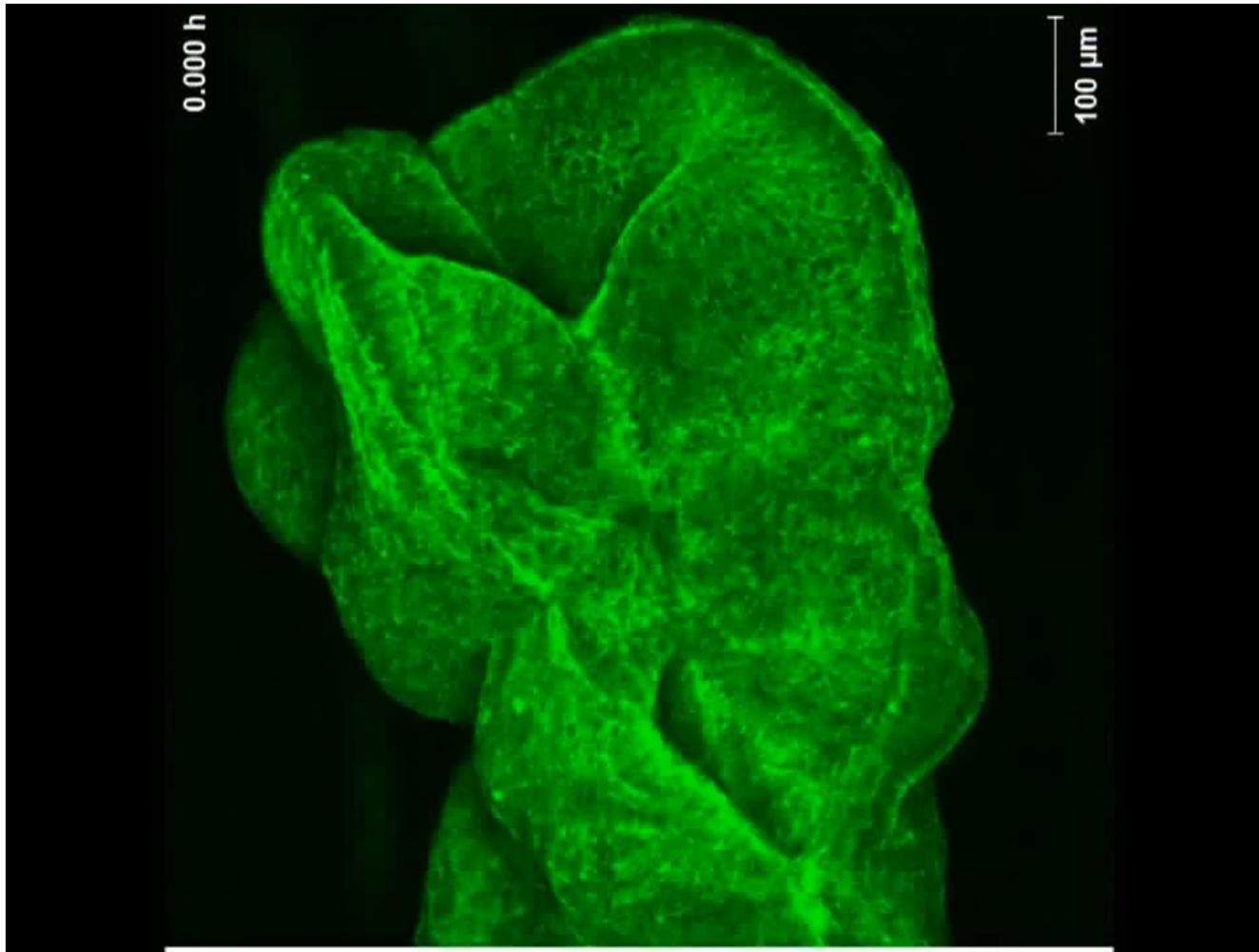


Desarrollo temprano en metazoarios III



Gonzalo Aparicio

Clivaje (o segmentación)

Blástula

Gastrulación

Embrión trilaminar

Endodermo

Mesodermo

Ectodermo

Neurulación

Sistema nervioso

Establecimiento de ejes embrionarios

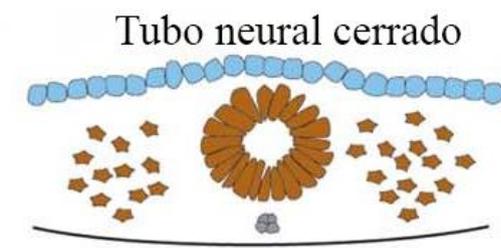
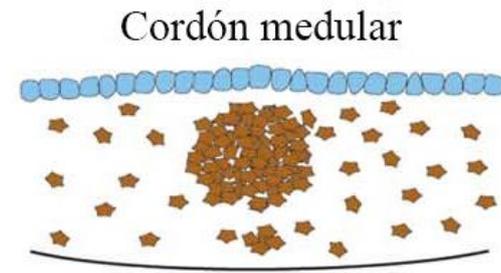
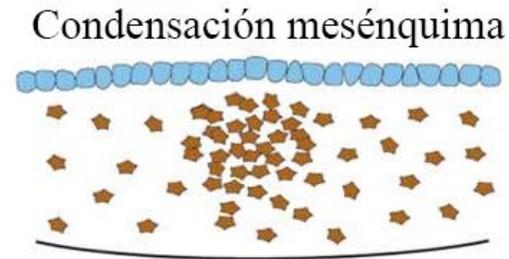
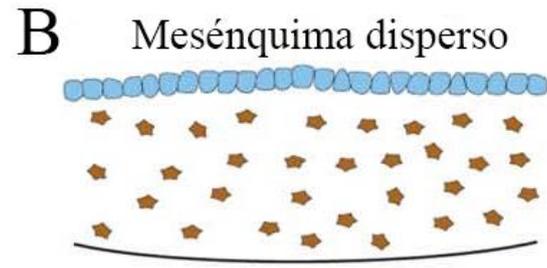
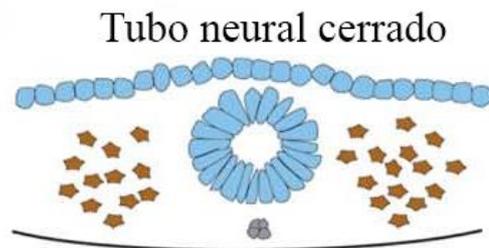
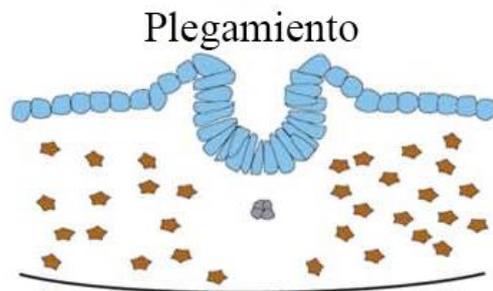
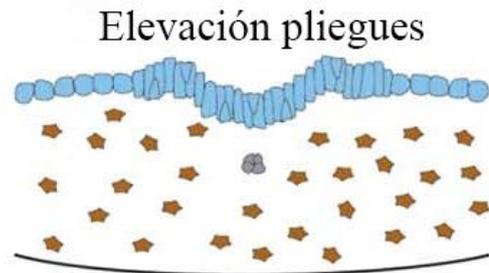
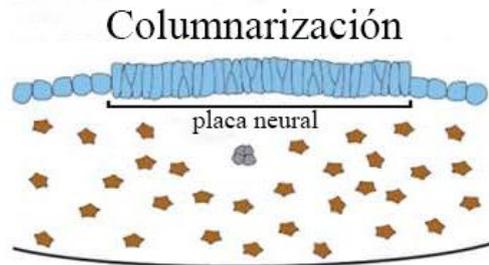
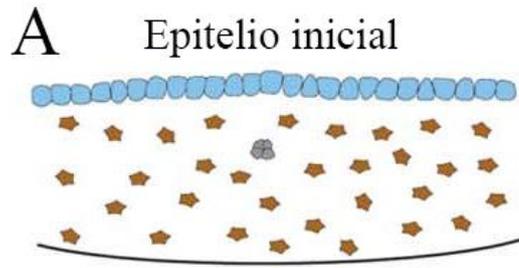
Neurulación: cierre del tubo neural



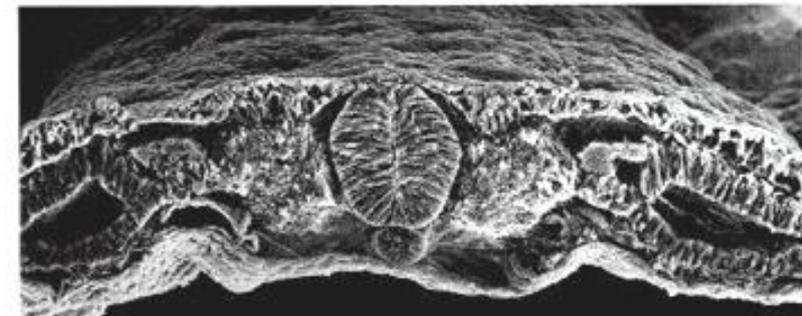
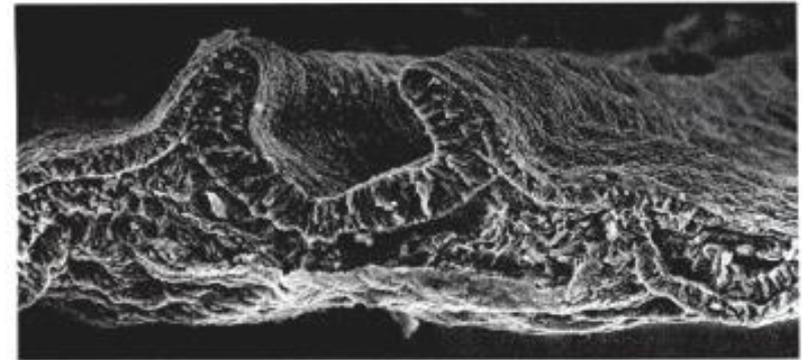
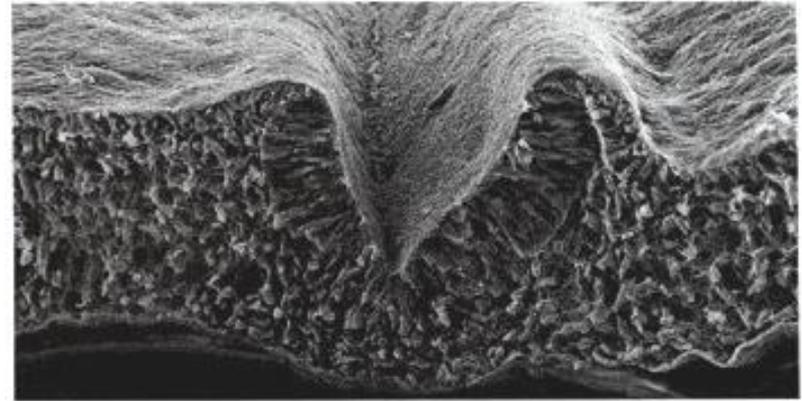
Xenopus



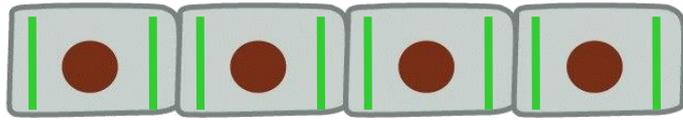
Pollo



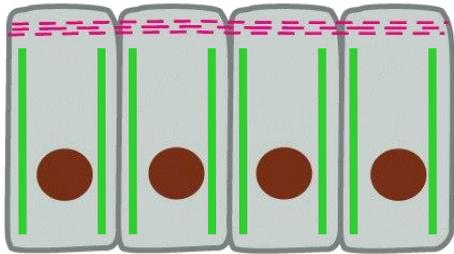
Cierre del tubo neural: Neurulación primaria



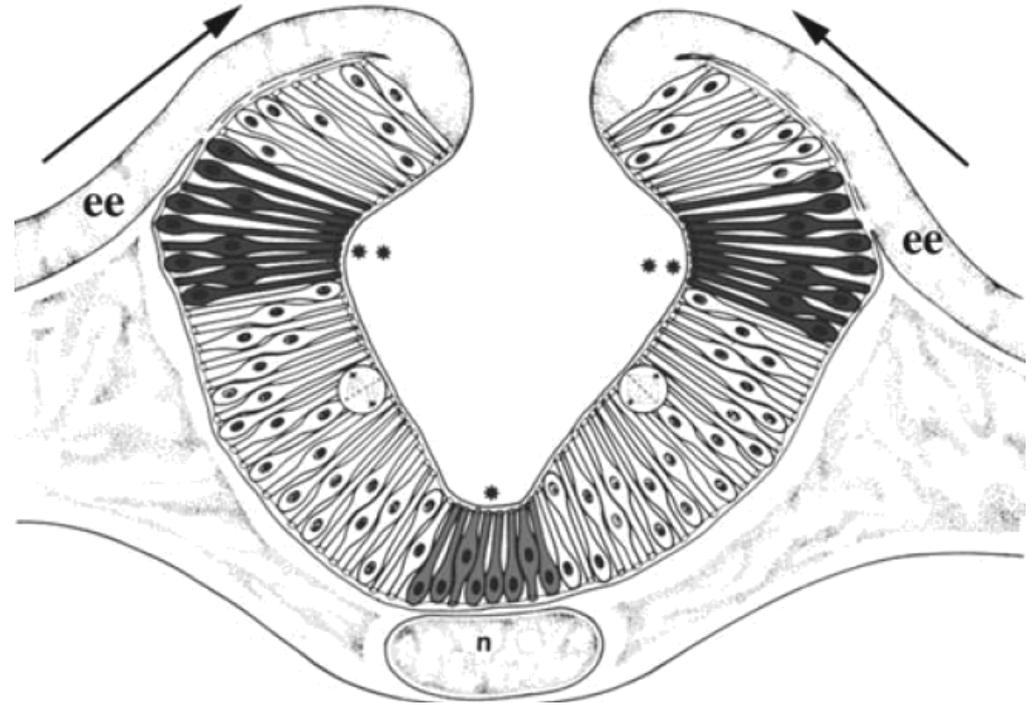
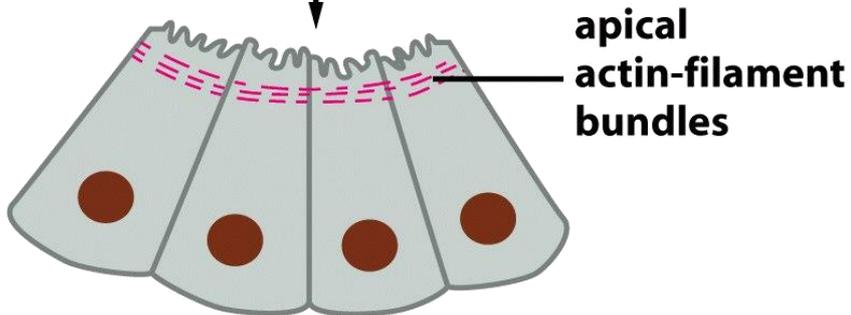
Fuerzas intrínsecas/extrínsecas a la placa neural



microtubules elongate, causing cells to become columnar

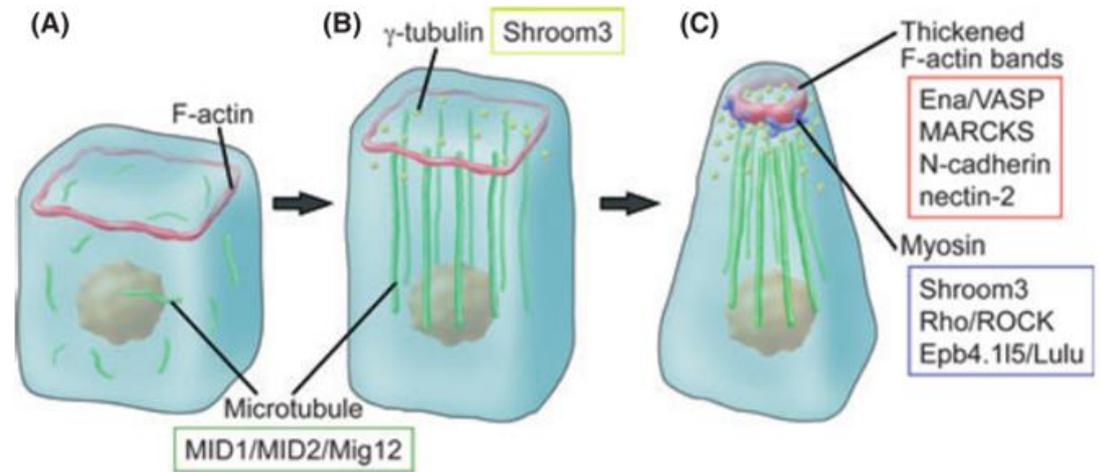


apical actin-filament bundles contract, narrowing the cells at their apices

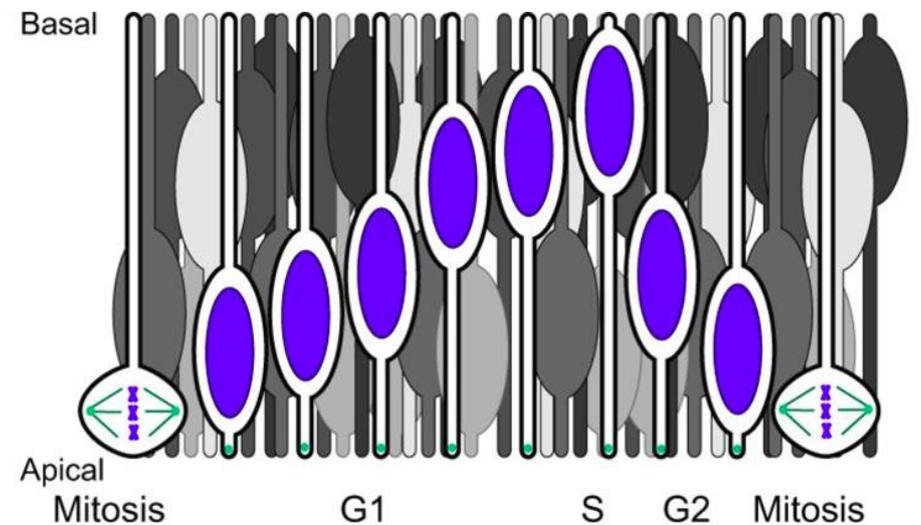


Formación de puntos de bisagra

Constricción apical

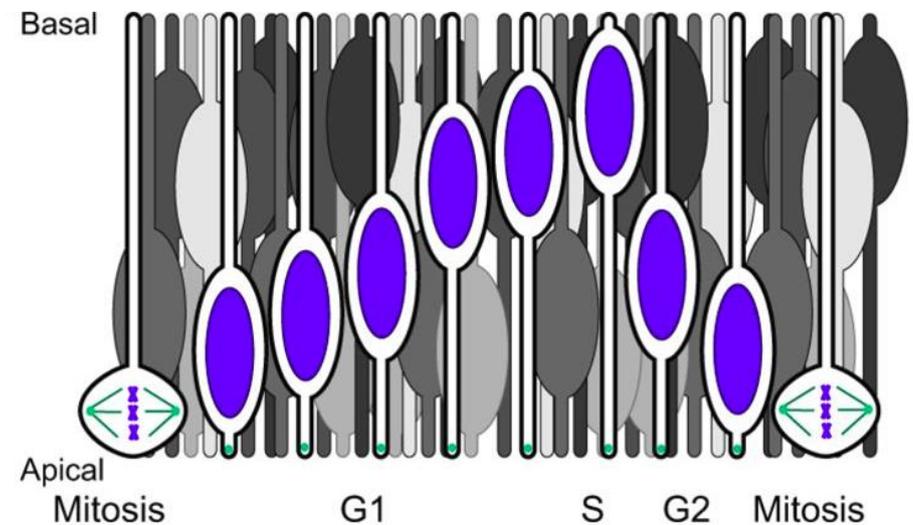
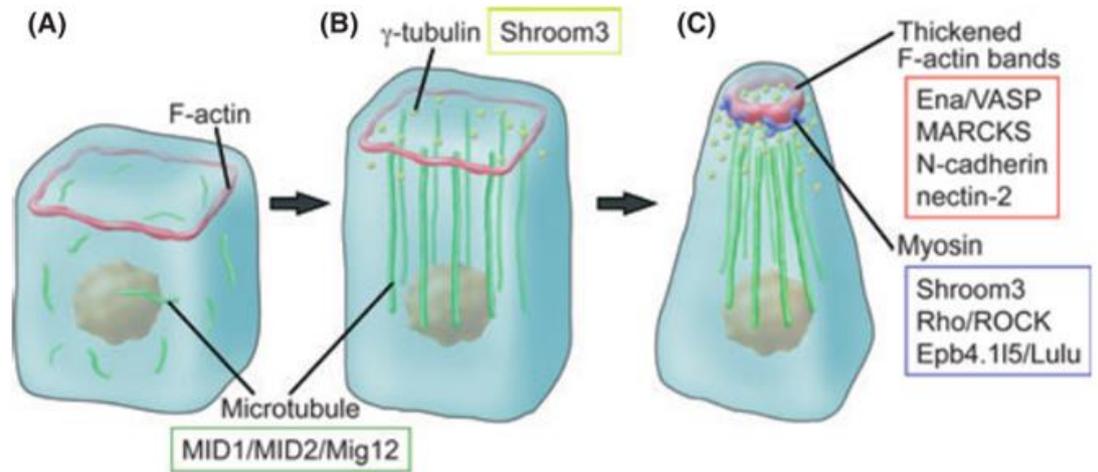
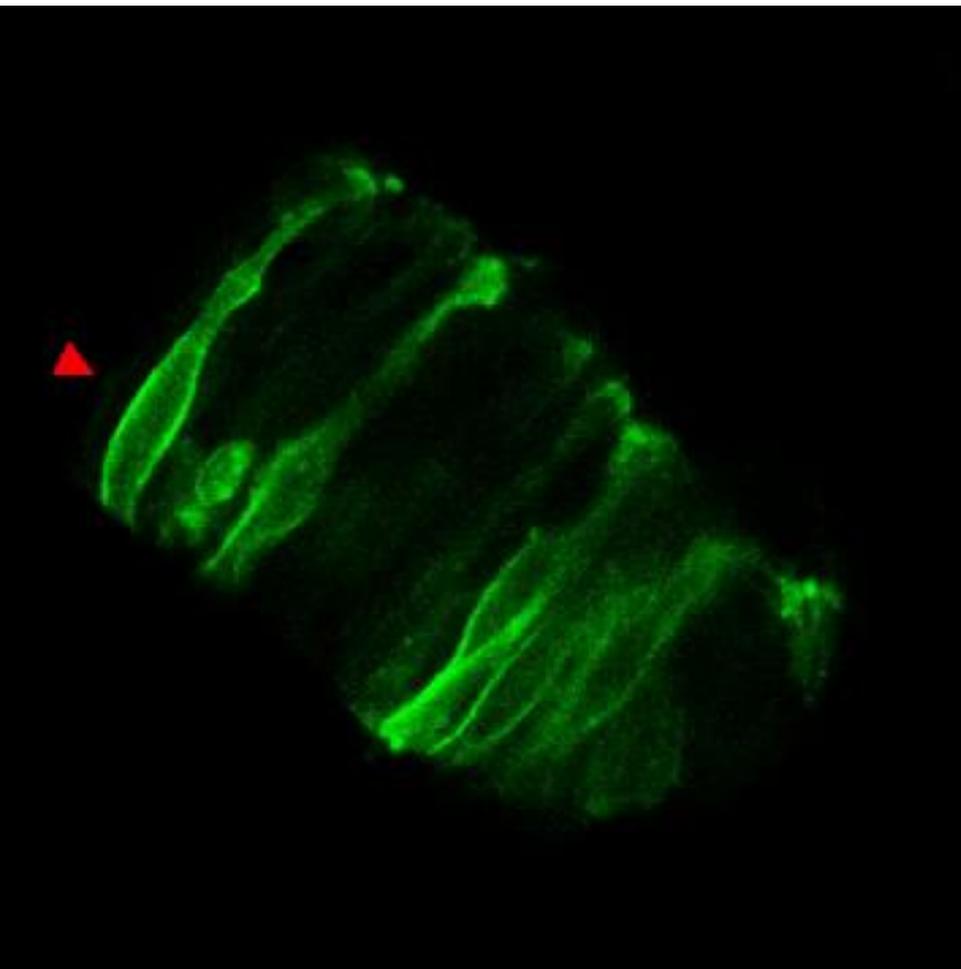


Ensanchamiento basal



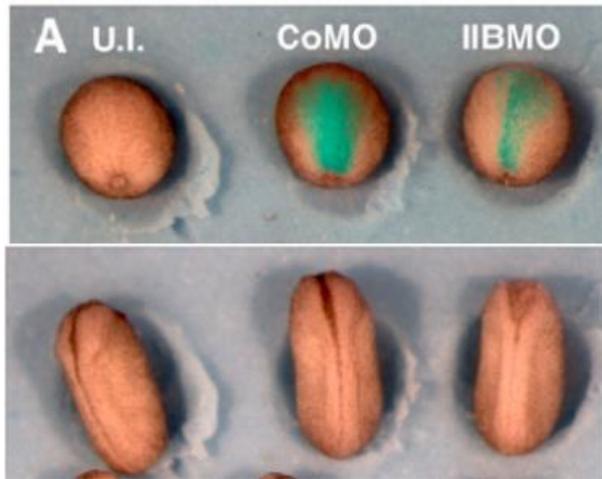
Migración nuclear intercinética

Formación de puntos de bisagra

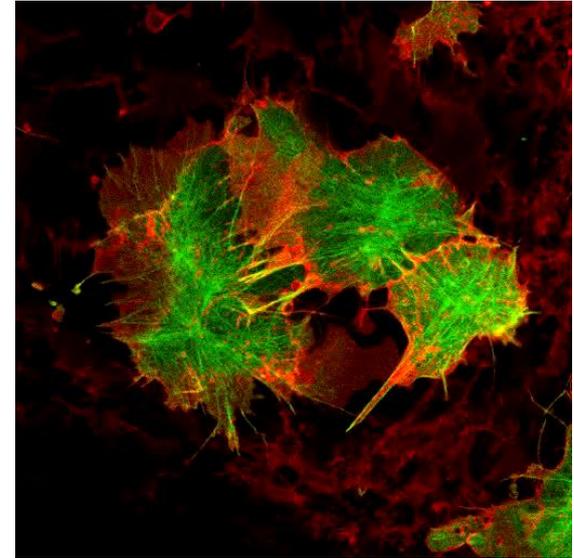


Migración nuclear intercinética

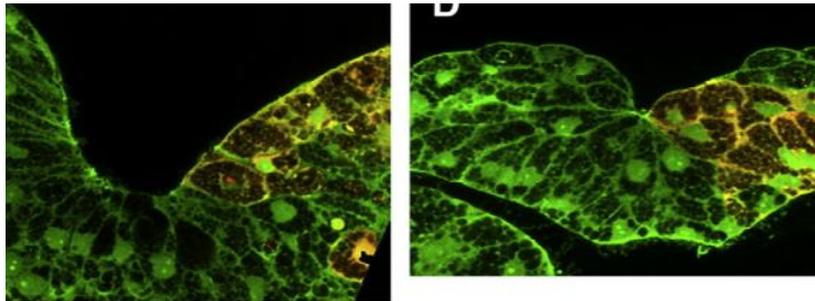
Cierre del tubo neural: movimientos celulares y citoesqueleto de actina



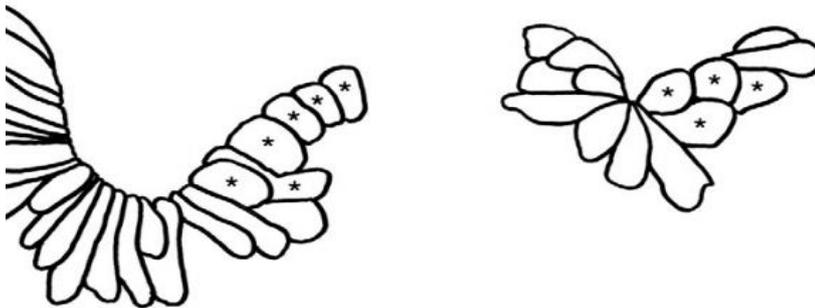
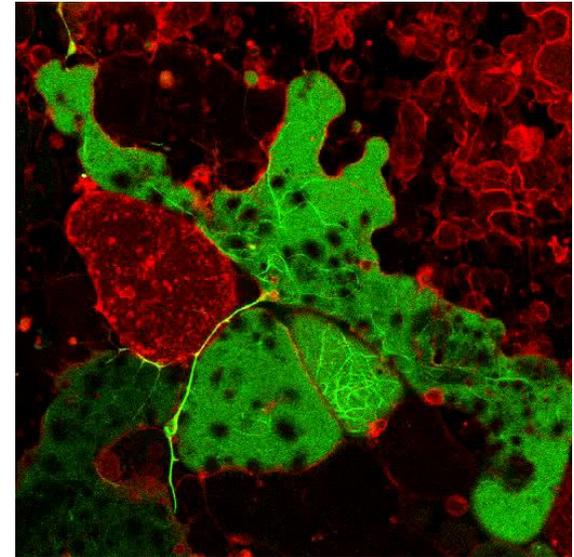
Control



Miosina IIB

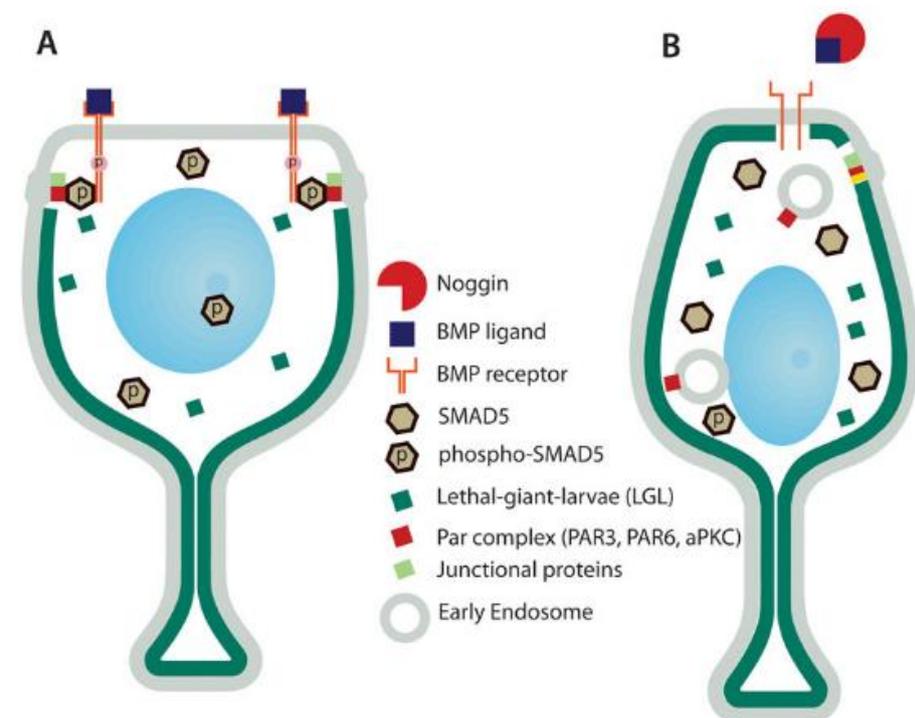
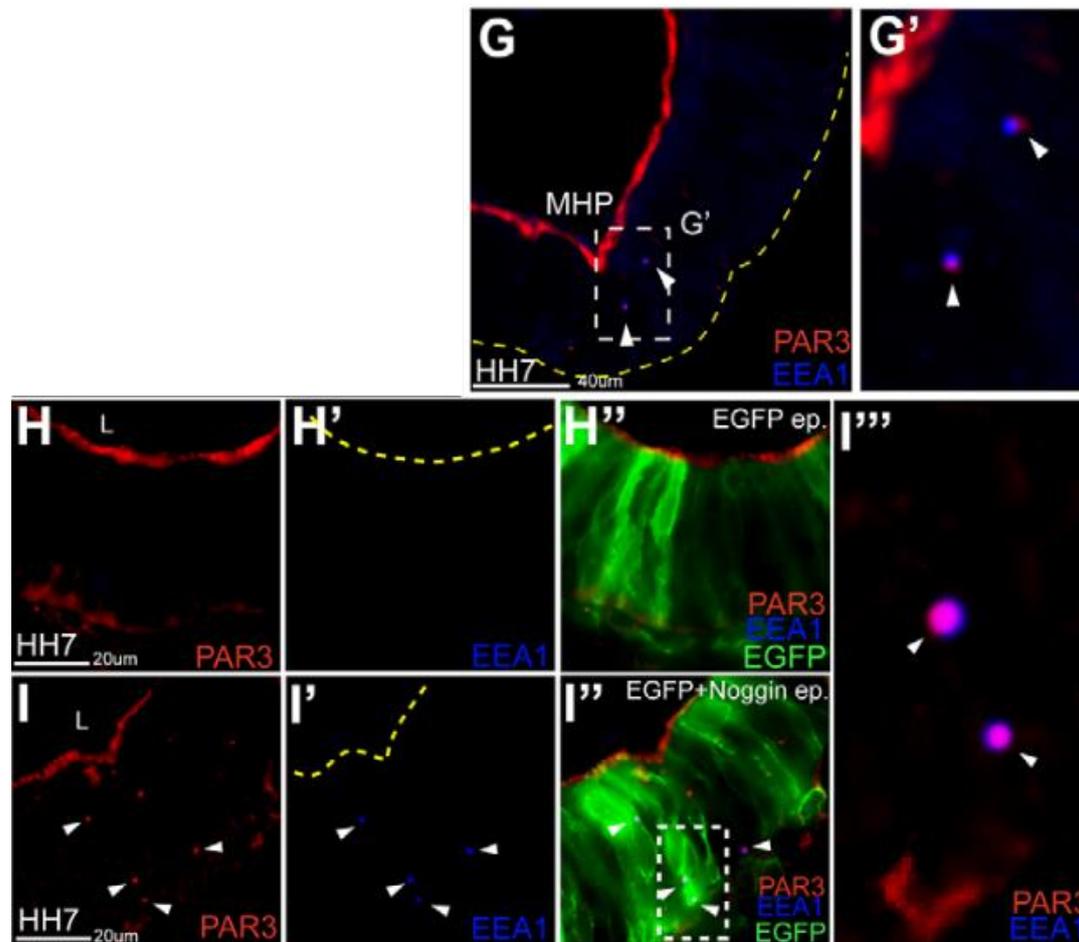


Morfolino

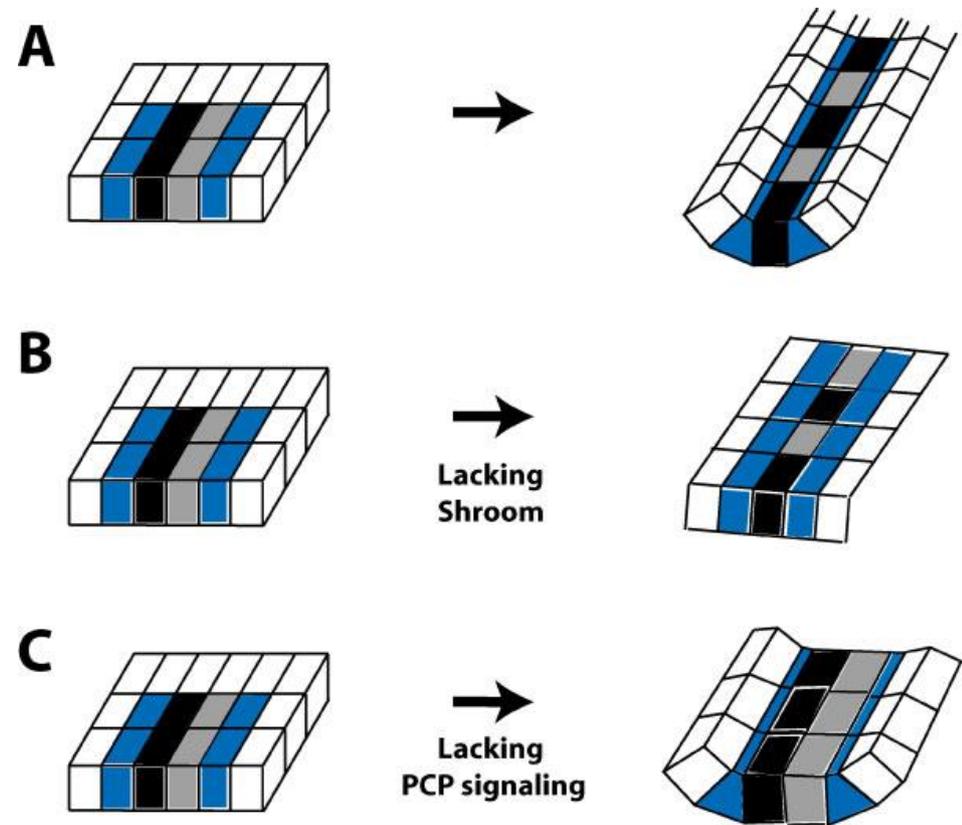
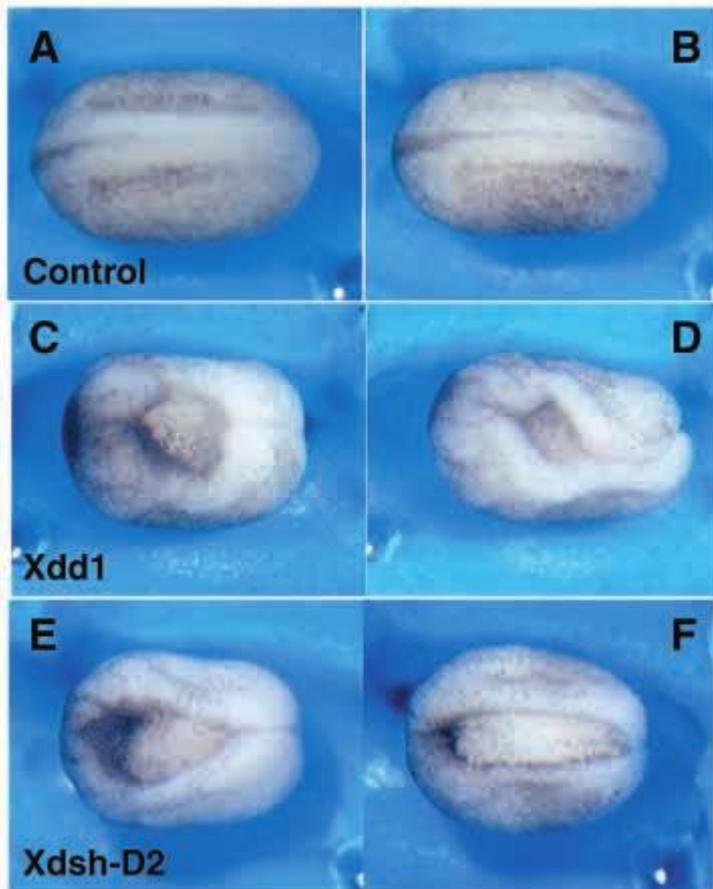
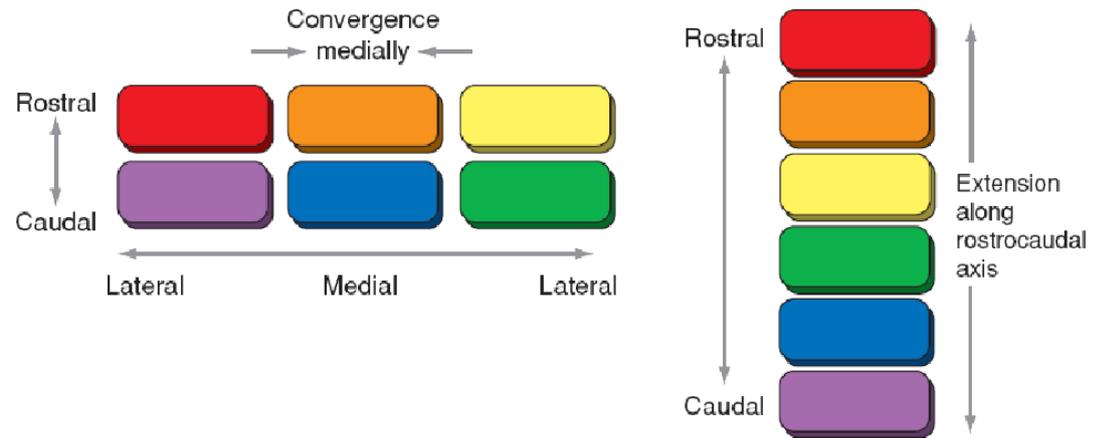


Bone morphogenetic proteins regulate neural tube closure by interacting with the apicobasal polarity pathway

Dae Seok Eom^{1,2,*}, Smita Amarnath², Jennifer L. Fogel^{3,†} and Seema Agarwala^{1,2,3,‡}



Cierre del tubo neural: extensión-convergencia y polaridad planar

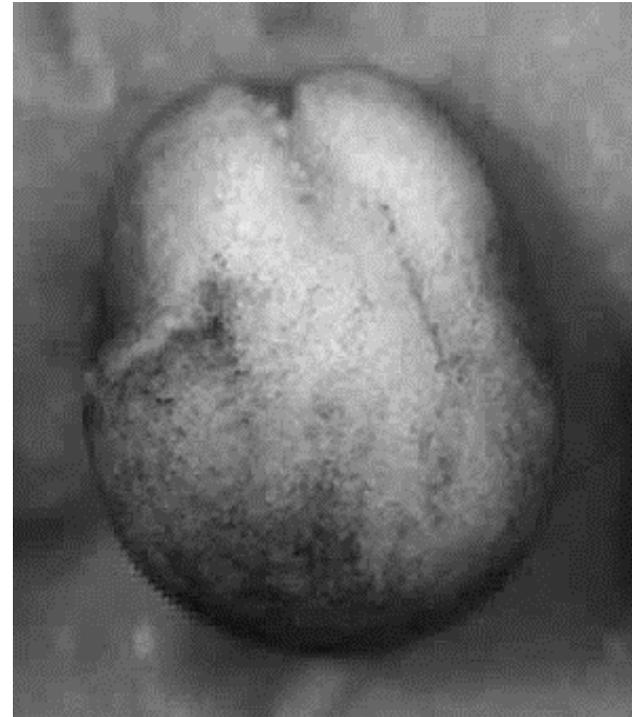


Neural tube closure requires Dishevelled-dependent convergent extension of the midline

John B. Wallingford* and Richard M. Harland



Control



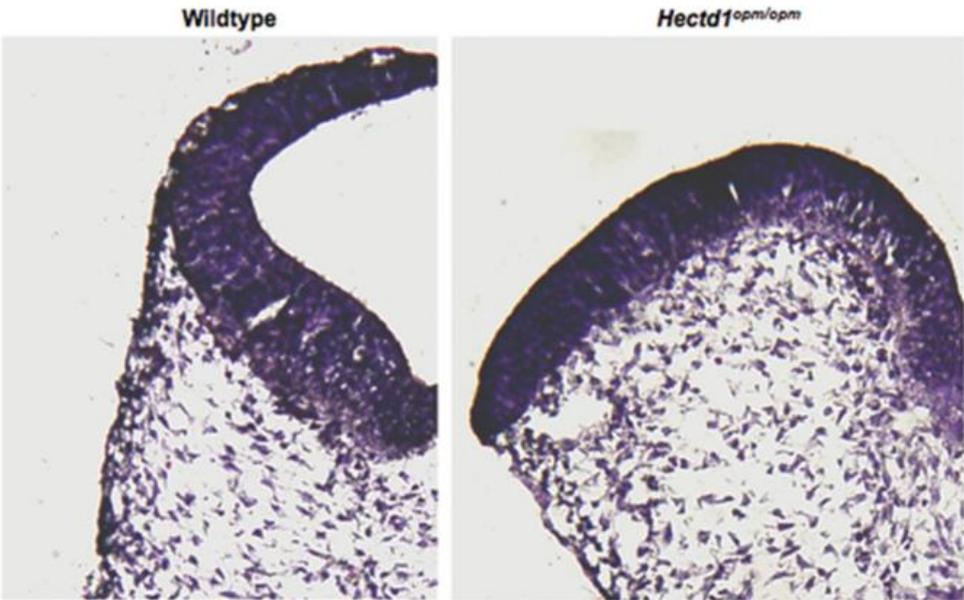
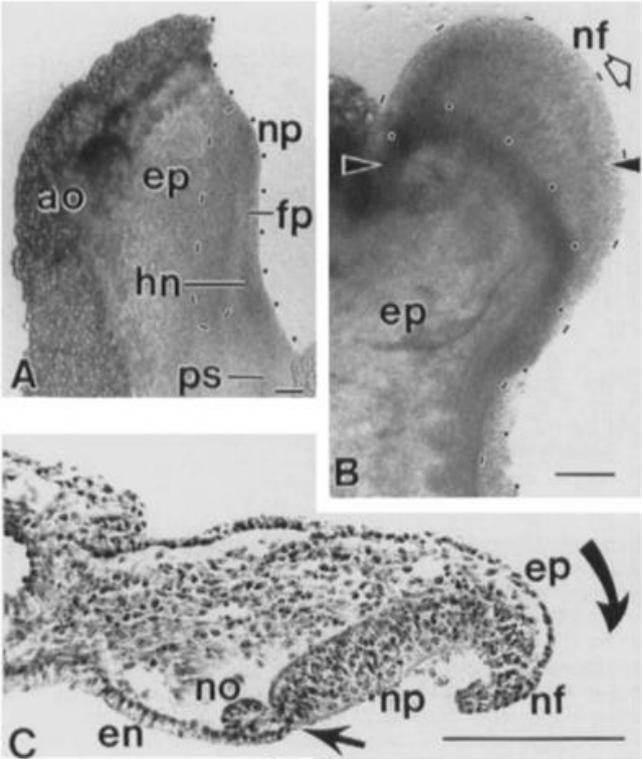
MO Xdsh

Cooperative Model of Epithelial Shaping and Bending During Avian Neurulation: Autonomous Movements of the Neural Plate, Autonomous Movements of the Epidermis, and Interactions in the Neural Plate/Epidermis Transition Zone

J. DAVID MOURY AND GARY C. SCHOENWOLF

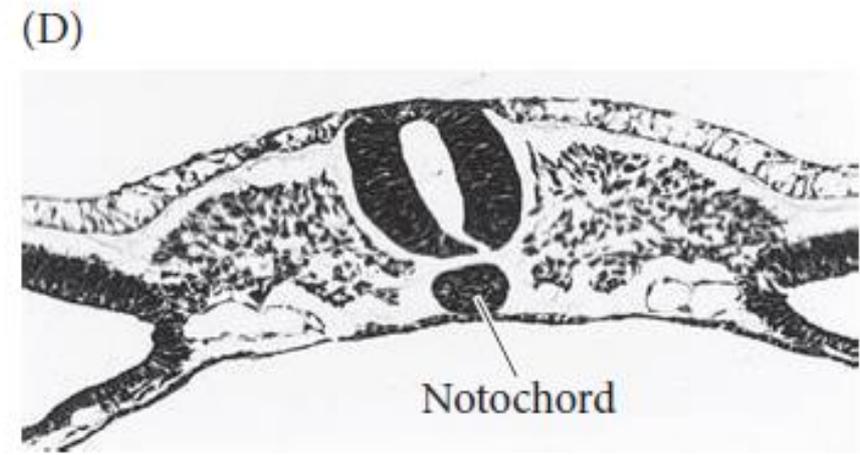
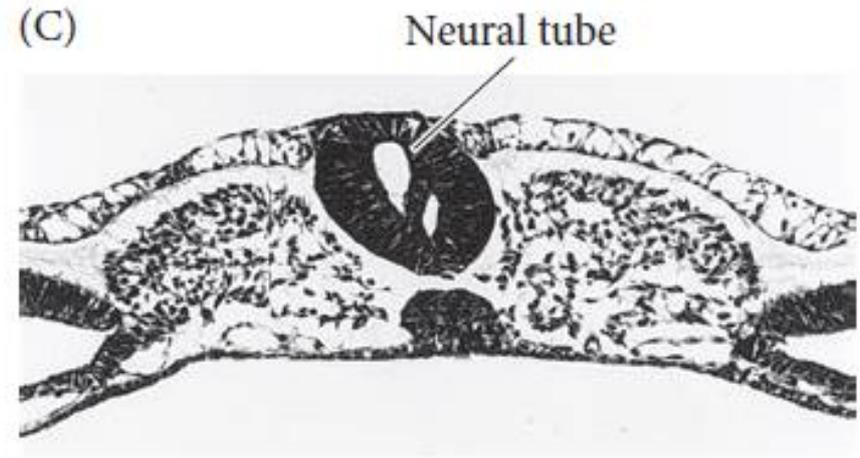
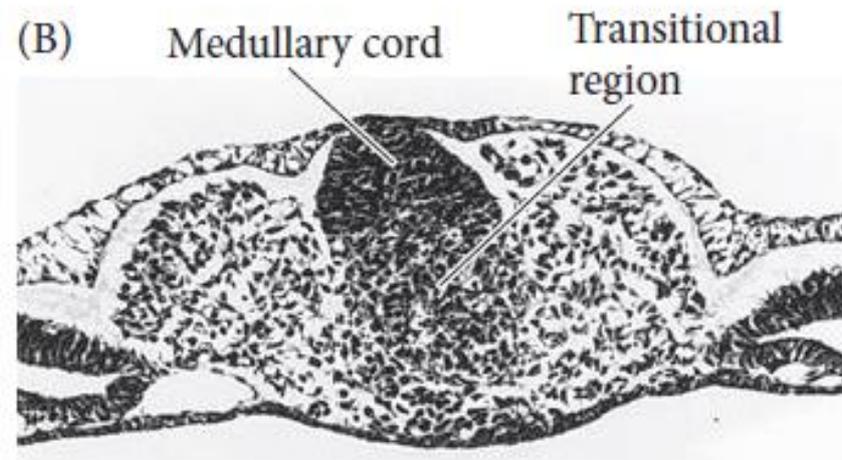
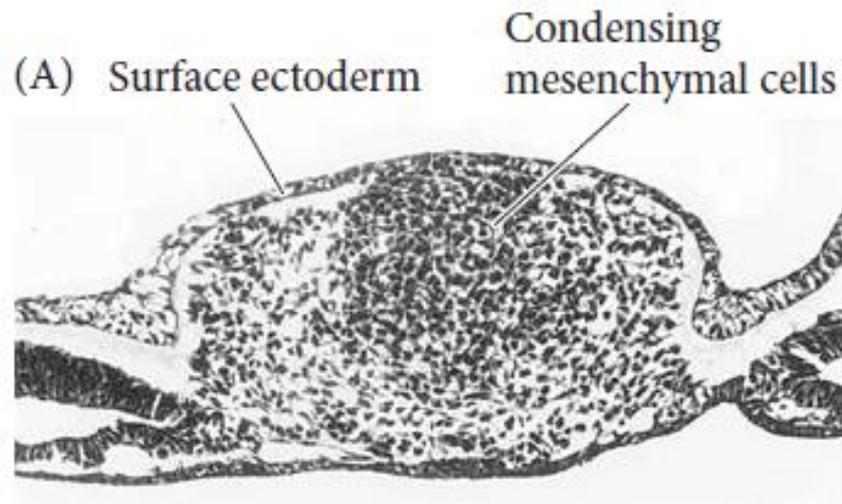
Does the Cranial Mesenchyme Contribute to Neural Fold Elevation During Neurulation?

Irene E. Zohn* and Anjali A. Sarkar



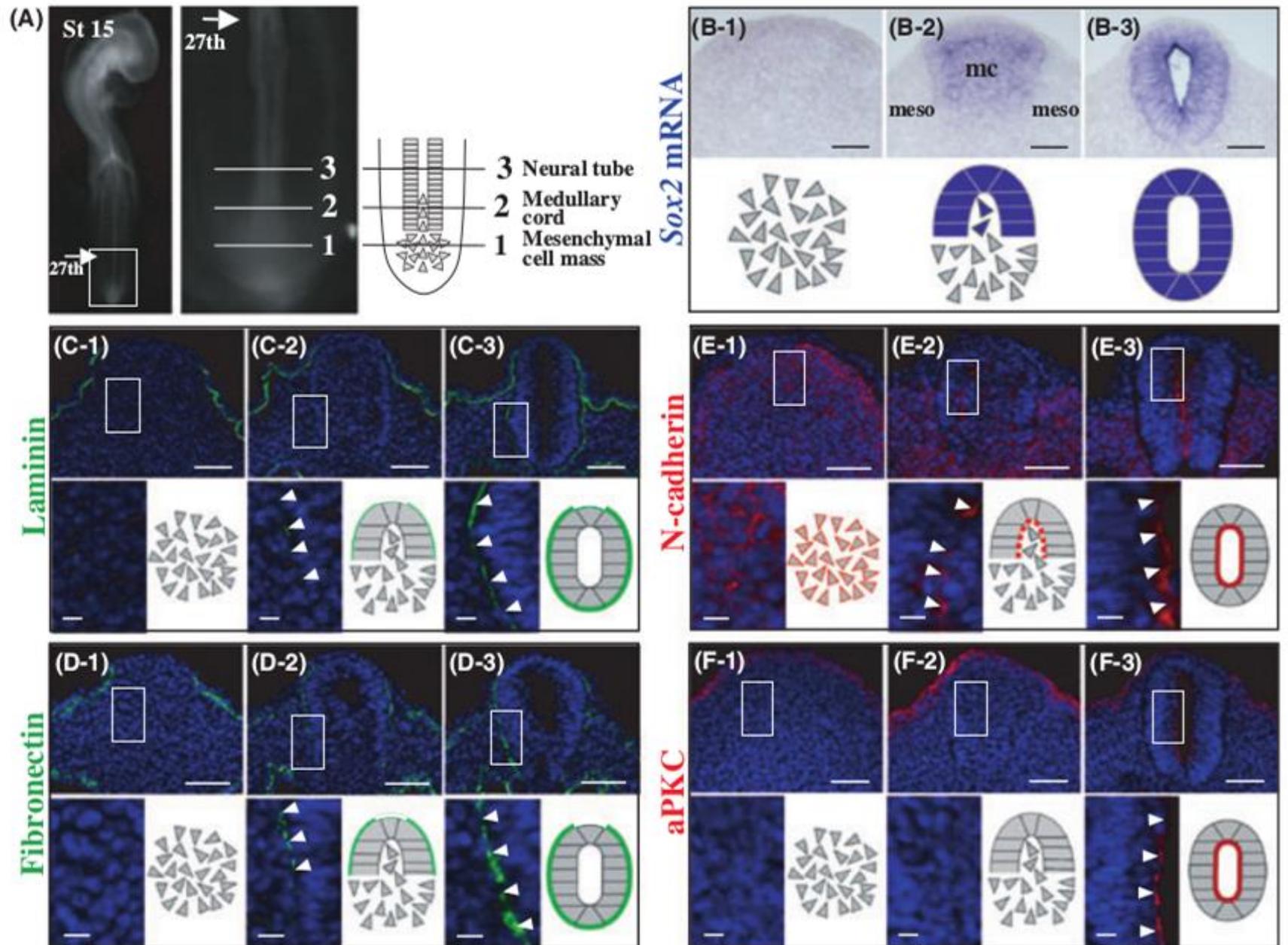
Fuerzas extrínsecas: ectodermo no neural mesénquima de la cabeza

Cierre del tubo neural: Neurulación secundaria

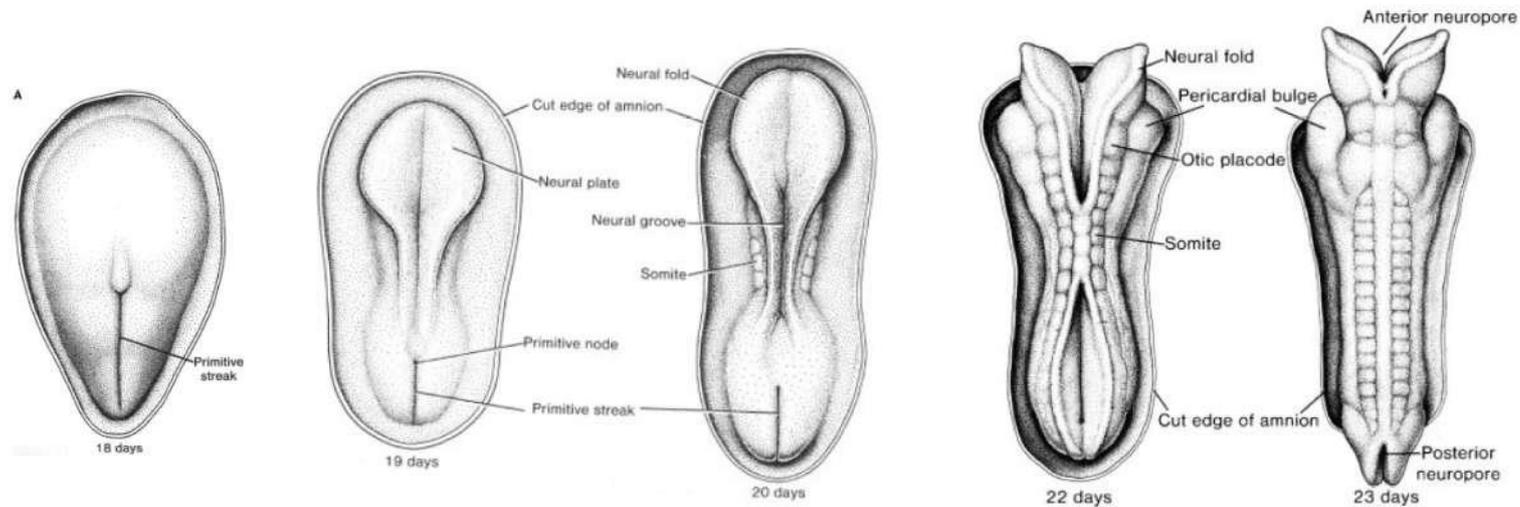


Transición mesénquima-epitelio

Adquisición de polaridad epitelial

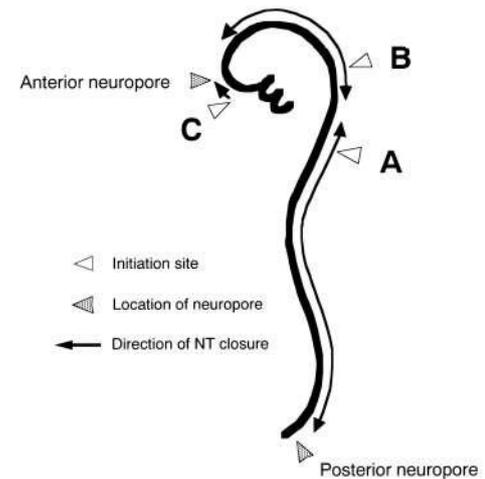
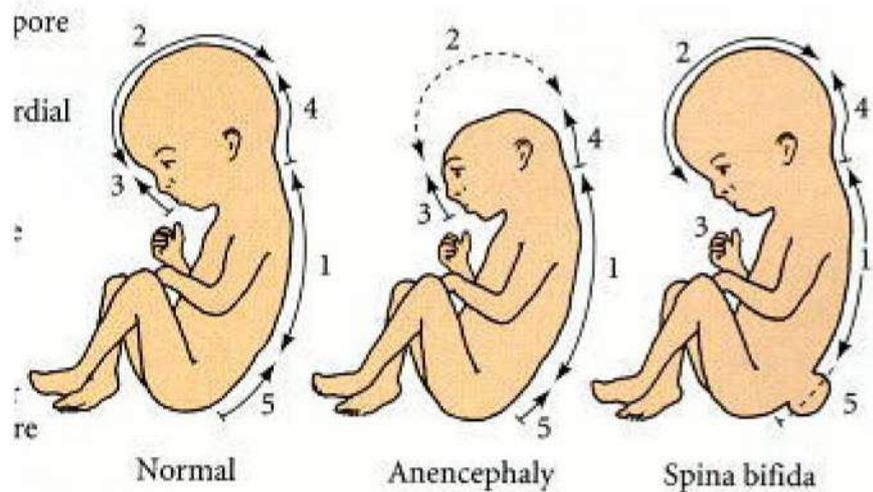


Cierre del tubo neural en mamíferos



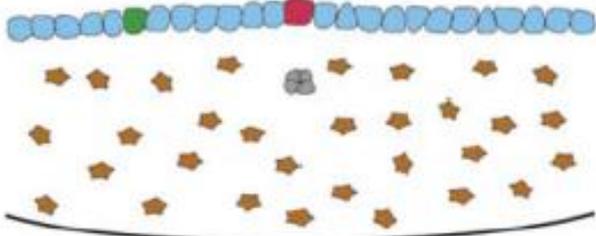
Tomoko Nakatsu · Chigako Uwabe · Kohei Shiota

Neural tube closure in humans initiates at multiple sites: evidence from human embryos and implications for the pathogenesis of neural tube defects

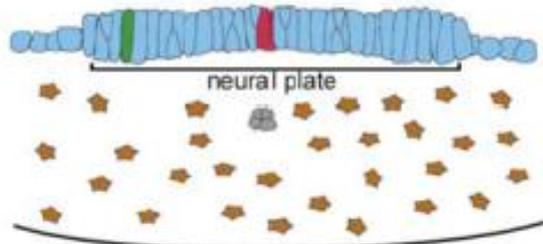


Neurulación en peces

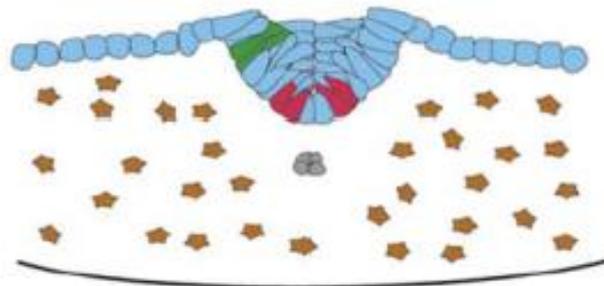
1. Initial epithelium



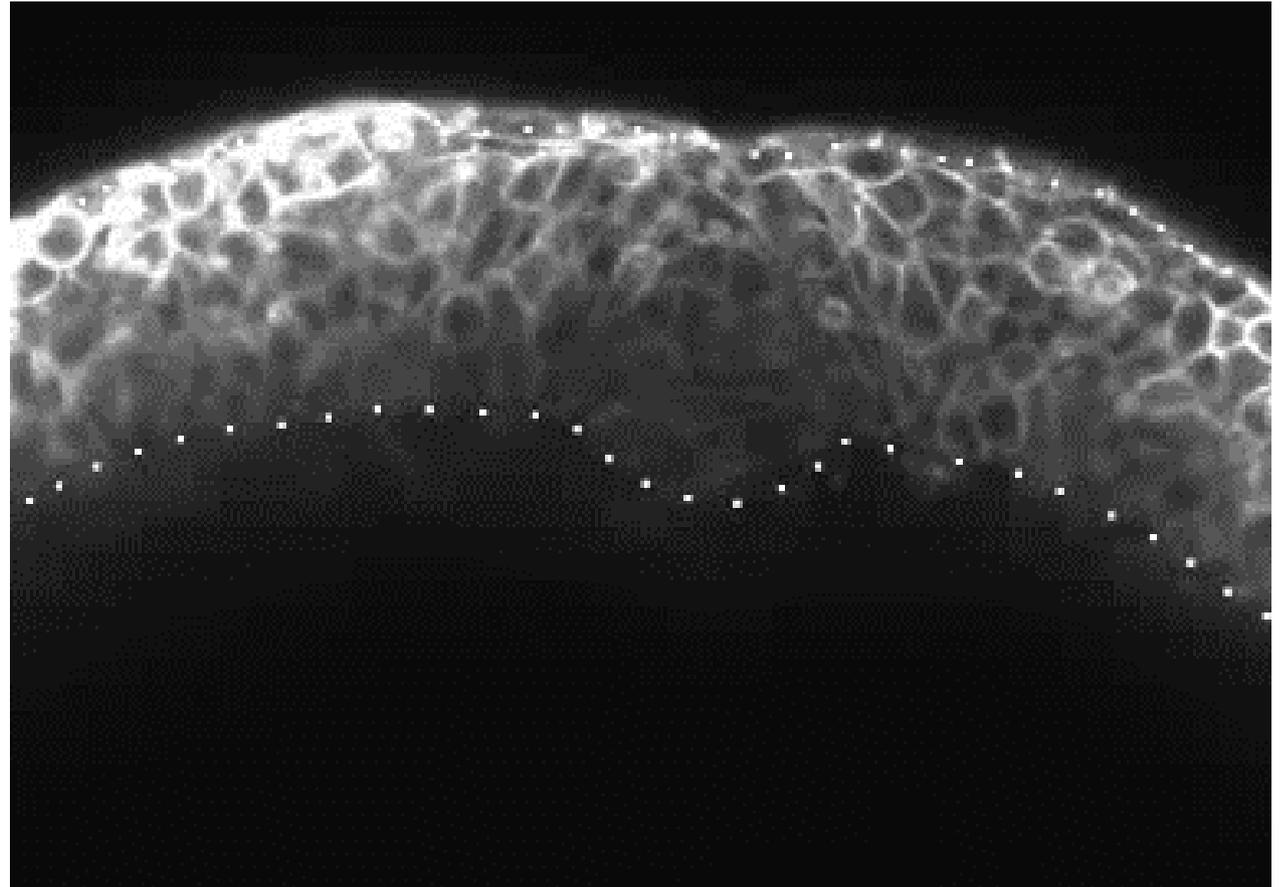
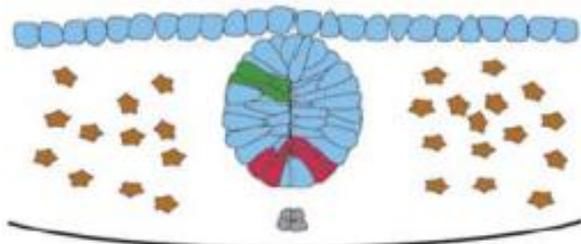
2. Columnnarization



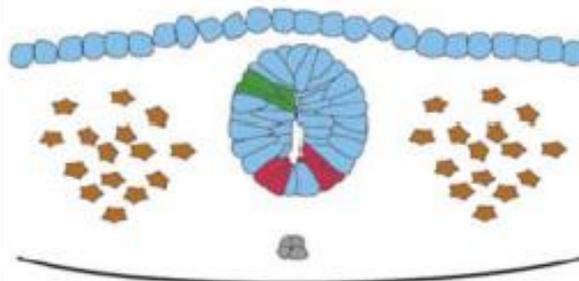
3. Neural keel formation



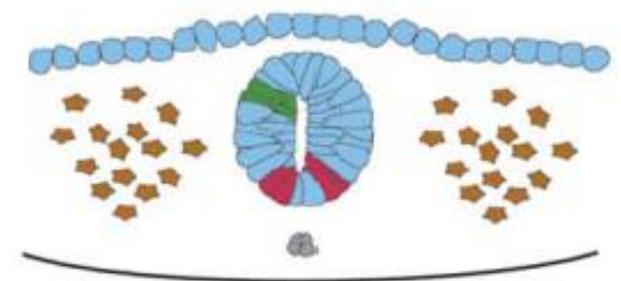
4. Neural rod formation



5. Lumen opening

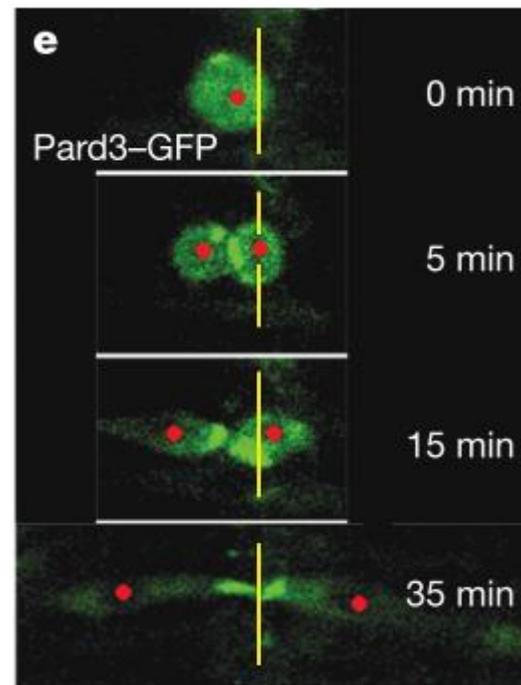
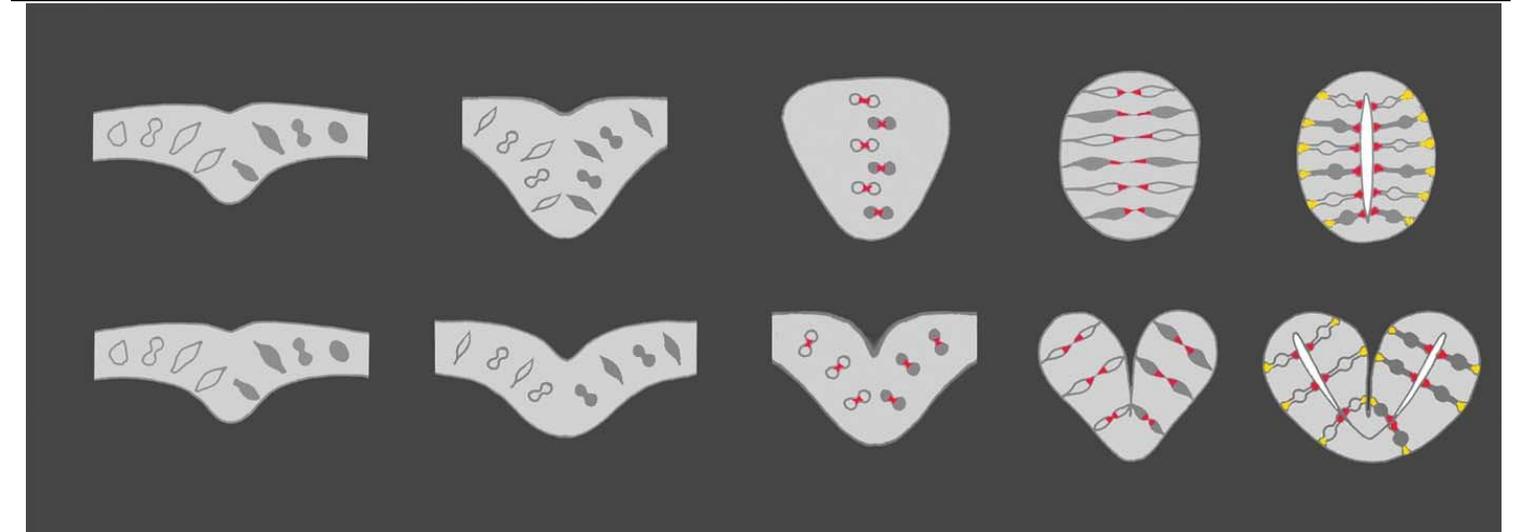
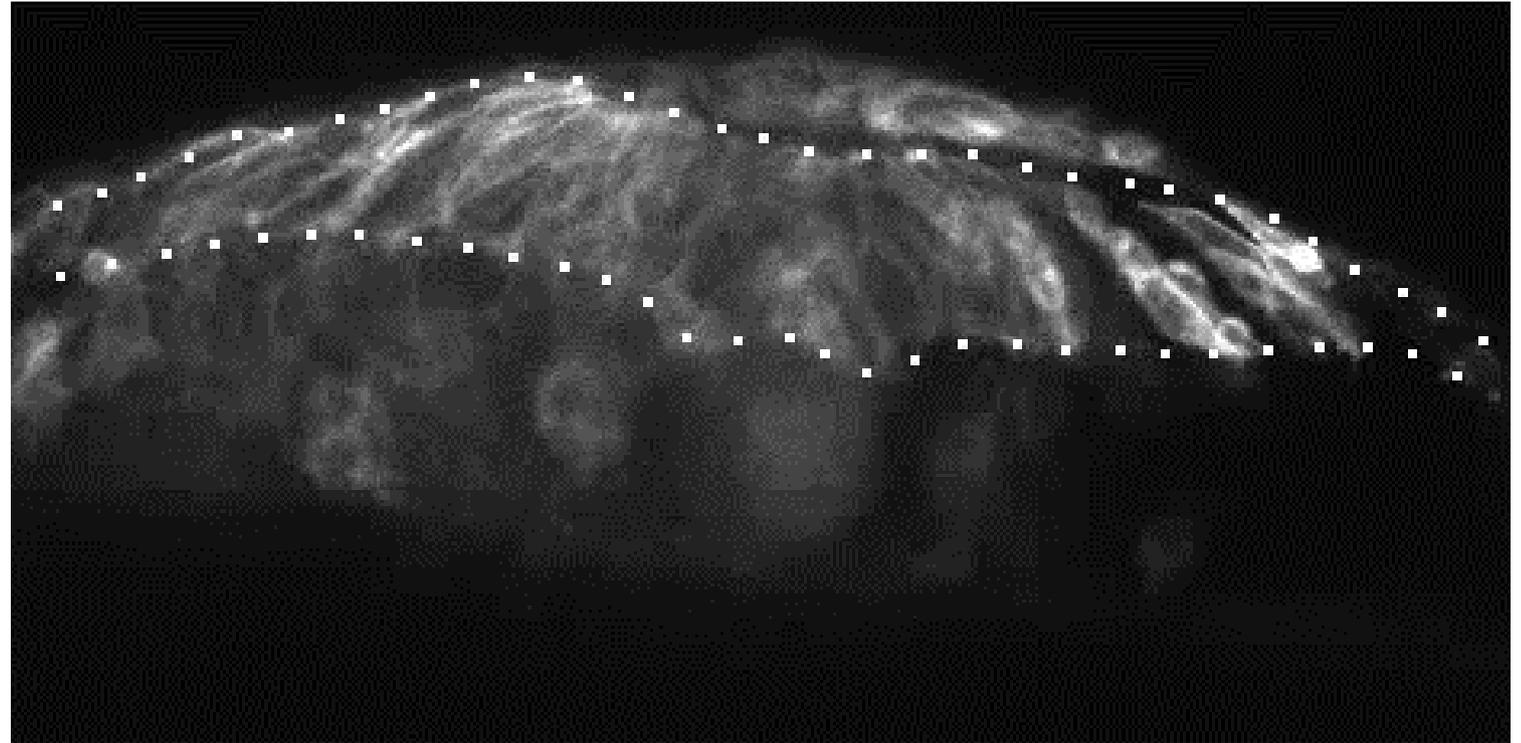


6. Neural tube complete



A mirror-symmetric cell division that orchestrates neuroepithelial morphogenesis

Marcel Tawk¹, Claudio Araya¹, Dave A. Lyons^{1†}, Alexander M. Reugels², Gemma C. Girdler¹, Philippa R. Bayley^{1†}, David R. Hyde³, Masazumi Tada¹ & Jonathan D. W. Clarke¹

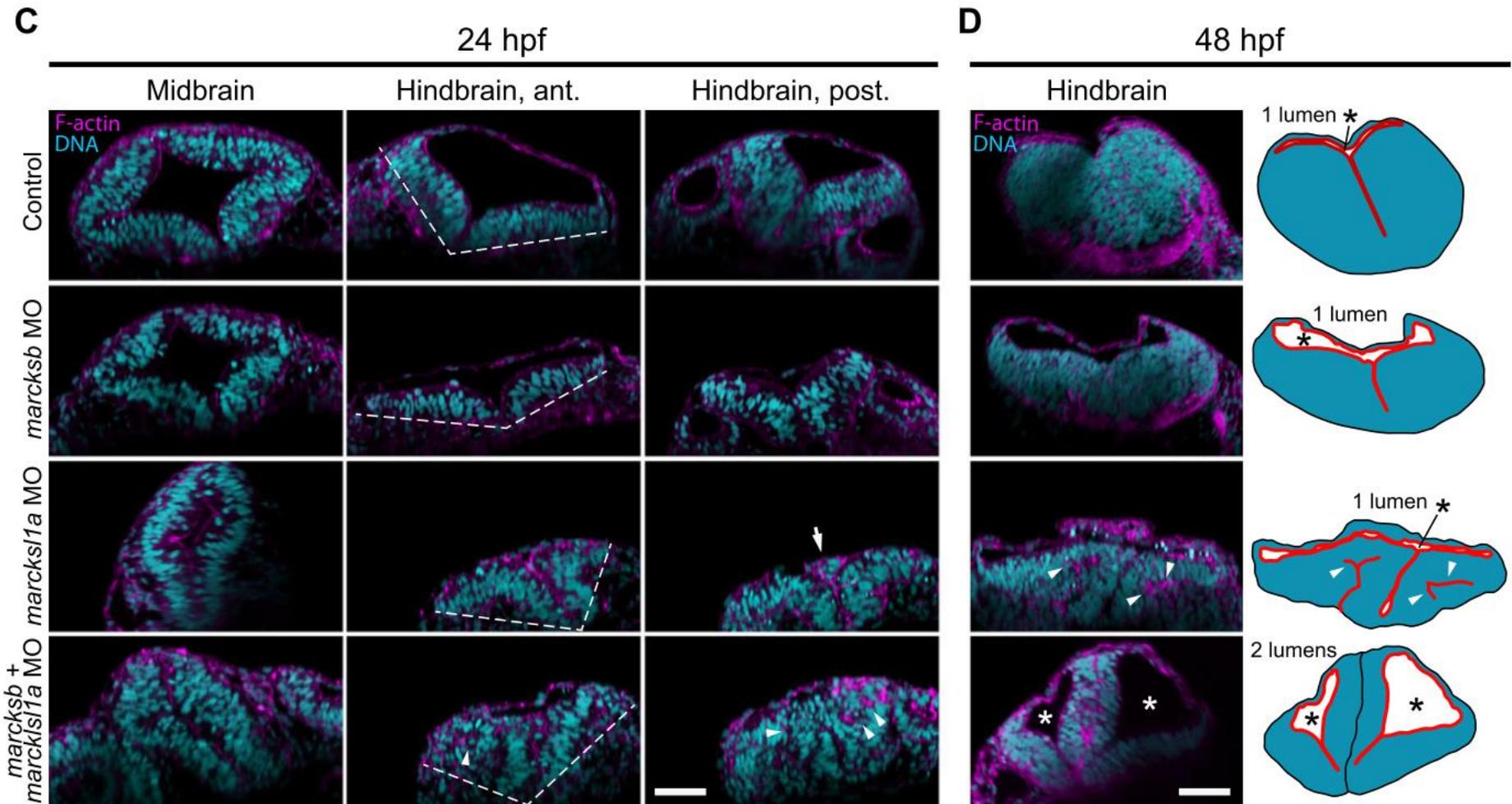


Functional Diversification of the Four MARCKS Family Members in Zebrafish Neural Development

DANIEL PRIETO¹ AND FLAVIO R. ZOLESSI^{1,2*}

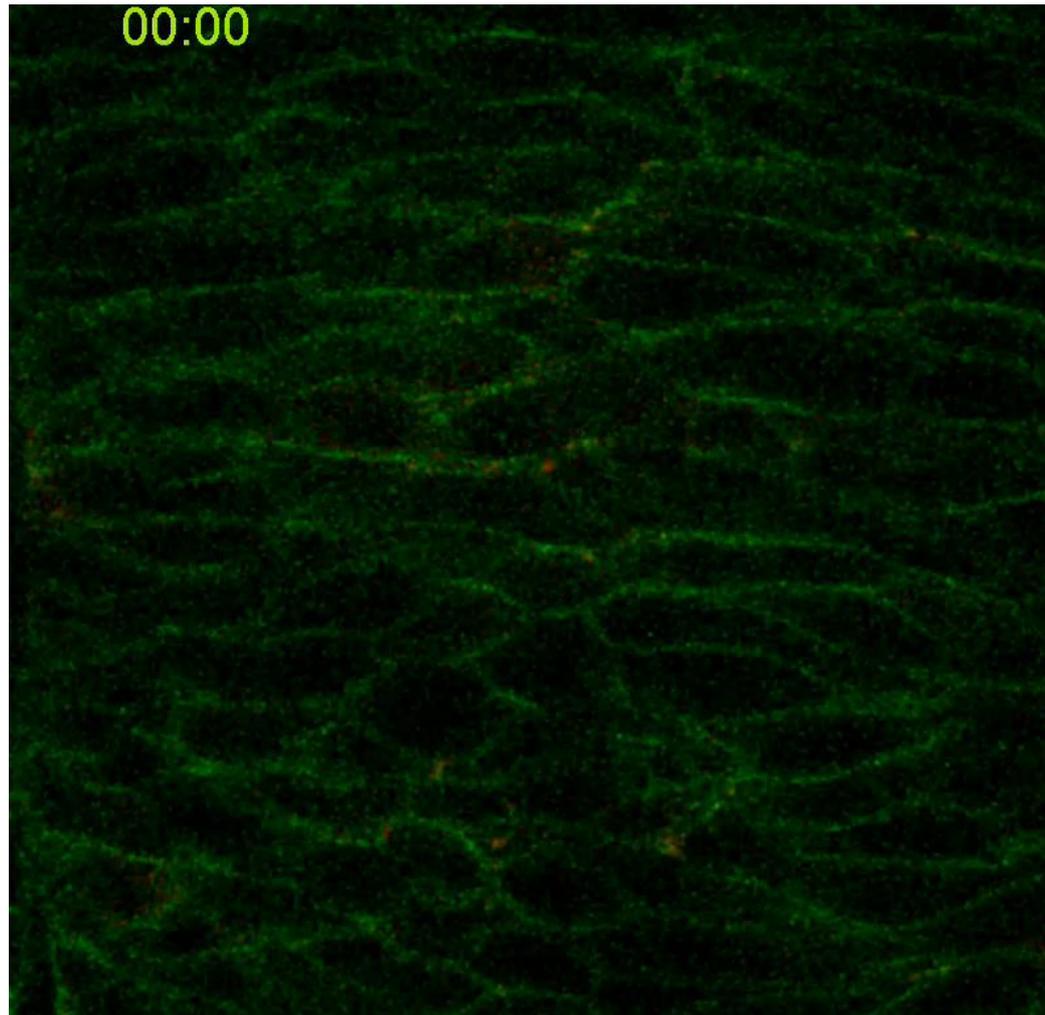
¹Facultad de Ciencias, Sección Biología Celular, Universidad de la República, Montevideo, Uruguay

²Cell Biology of Neural Development Lab, Institut Pasteur de Montevideo, Montevideo, Uruguay



Apical Cell-Cell Adhesions Reconcile Symmetry and Asymmetry in Zebrafish Neurulation

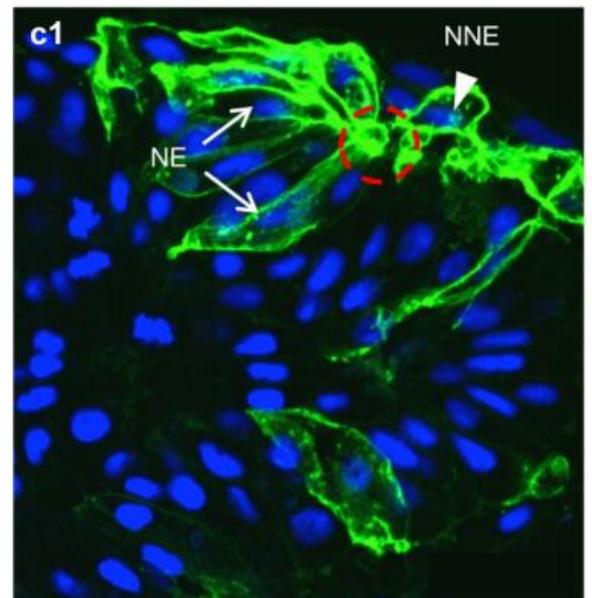
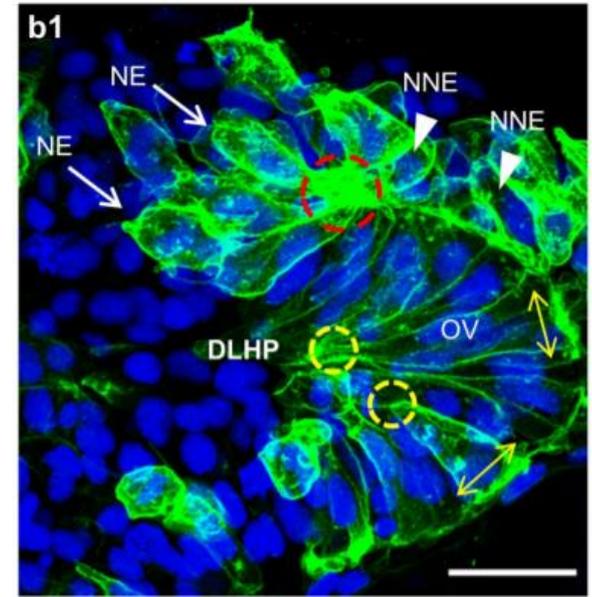
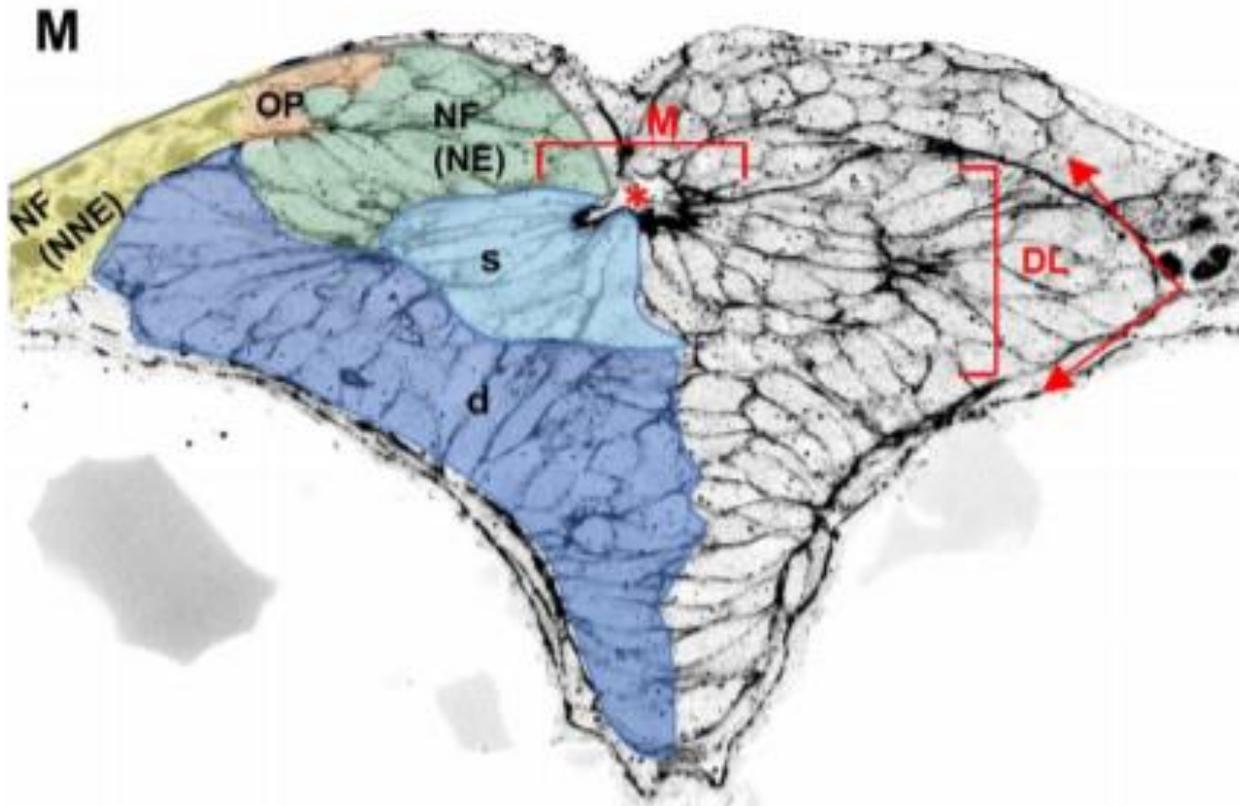
Chuanyu Guo,¹ Jian Zou,¹ Yi Wen,¹ Wei Fang,¹ Donna Beer Stolz,² Ming Sun,² and Xiangyun Wei^{1,3,4,5,*}



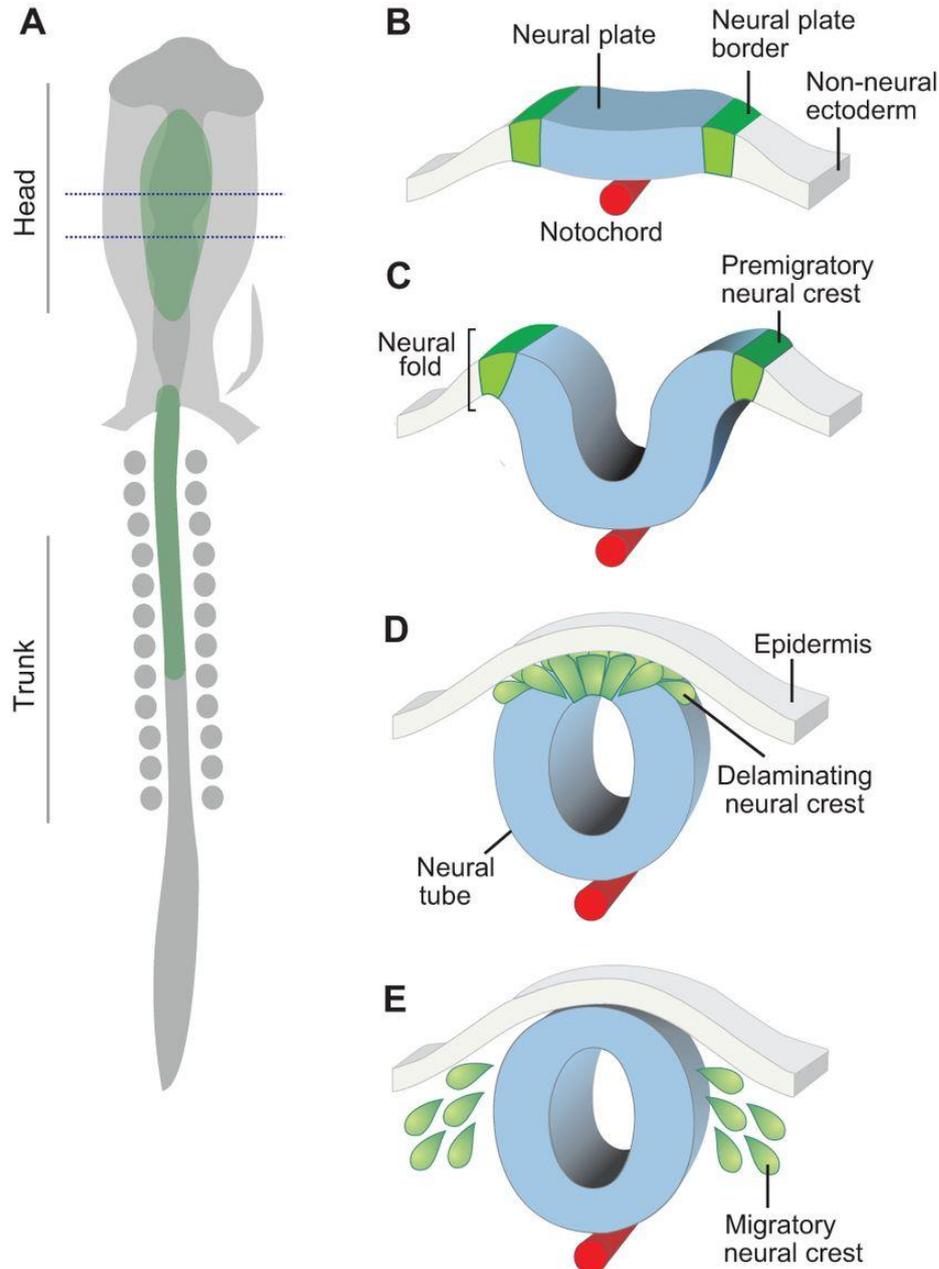
N-Cad-GFP
ZO-1-mCherry

**Hingepoints and neural folds reveal conserved
features of primary neurulation in the zebrafish forebrain**

Jonathan M. Werner^{1*}, Maraki Y. Negesse^{1*}, Dominique L. Brooks¹, Allyson R. Caldwell¹,
Jafira M. Johnson¹ and Rachel M. Brewster¹



La cuarta hoja embrionaria: la cresta neural



F Neural crest derivatives

Mesenchymal cells

- Chondroblasts/chondrocytes
- Osteoblasts/osteocytes
- Fibroblasts
- Odontoblasts
- Cardiac mesenchyme
- Myoblasts
- Adipocytes

Neuronal cells

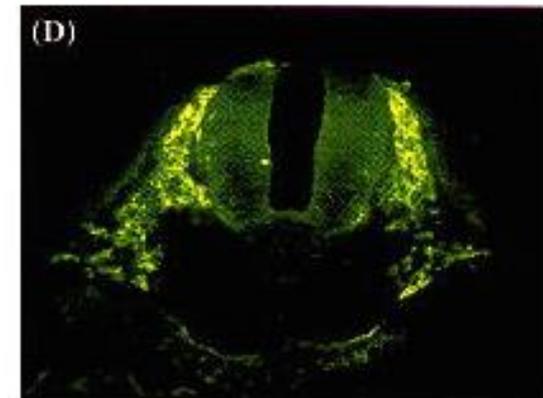
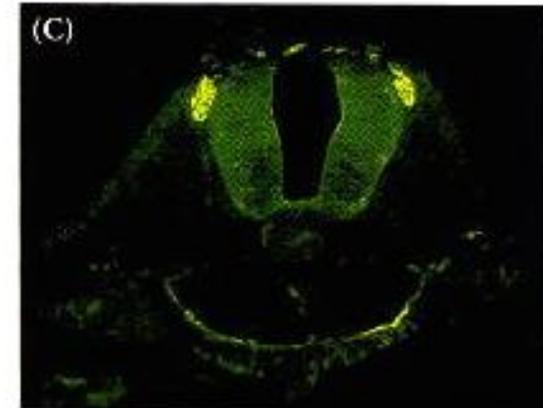
- Sensory neurons
- Cholinergic neurons
- Adrenergic neurons
- Satellite cells
- Schwann cells
- Glia cells

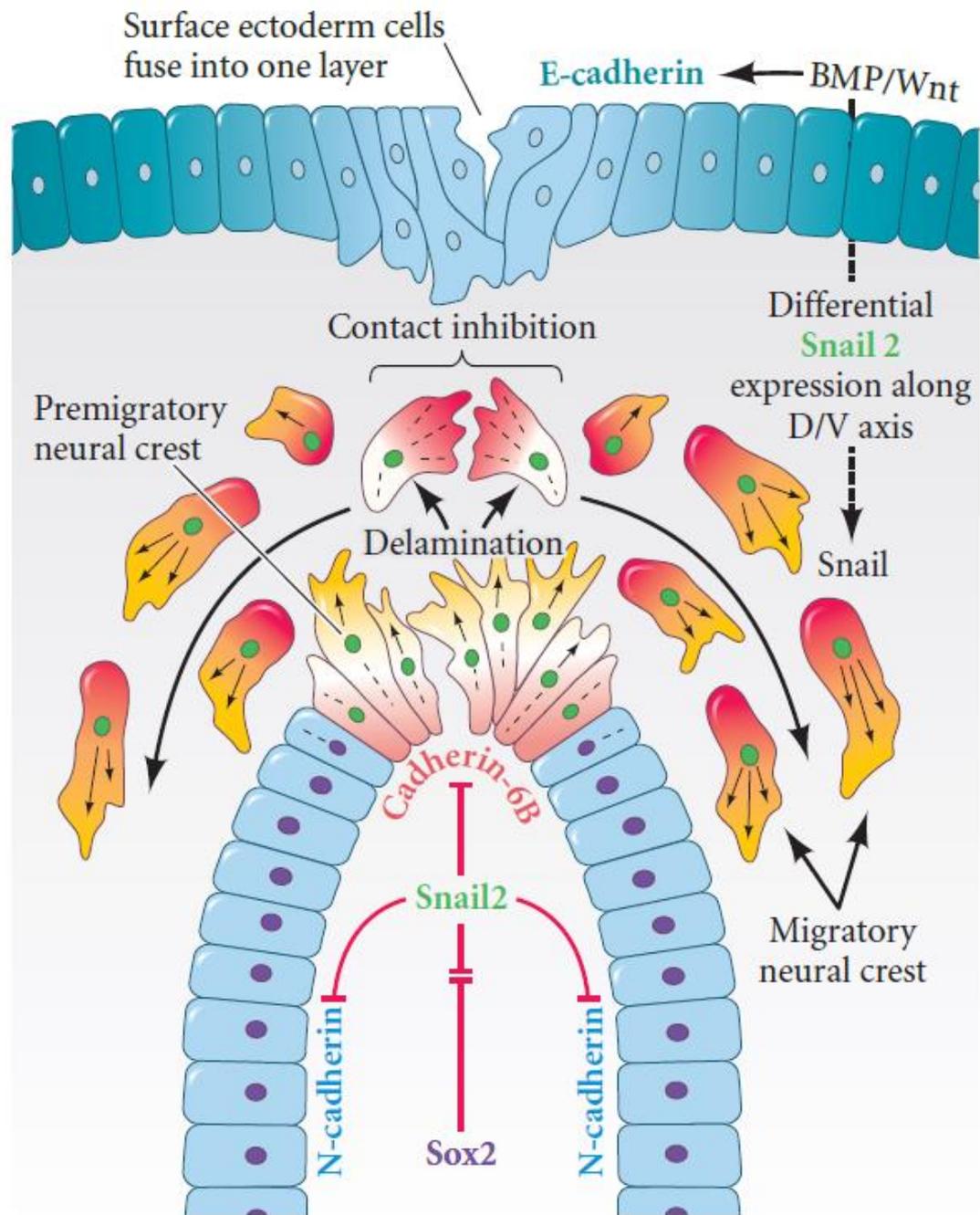
Secretory cells

- Chromaffin cells
- Parafollicular cells
- Calcitonin-producing cells

Pigmented cells

- Melanocytes





Retraction

Actomyosin stress fibers

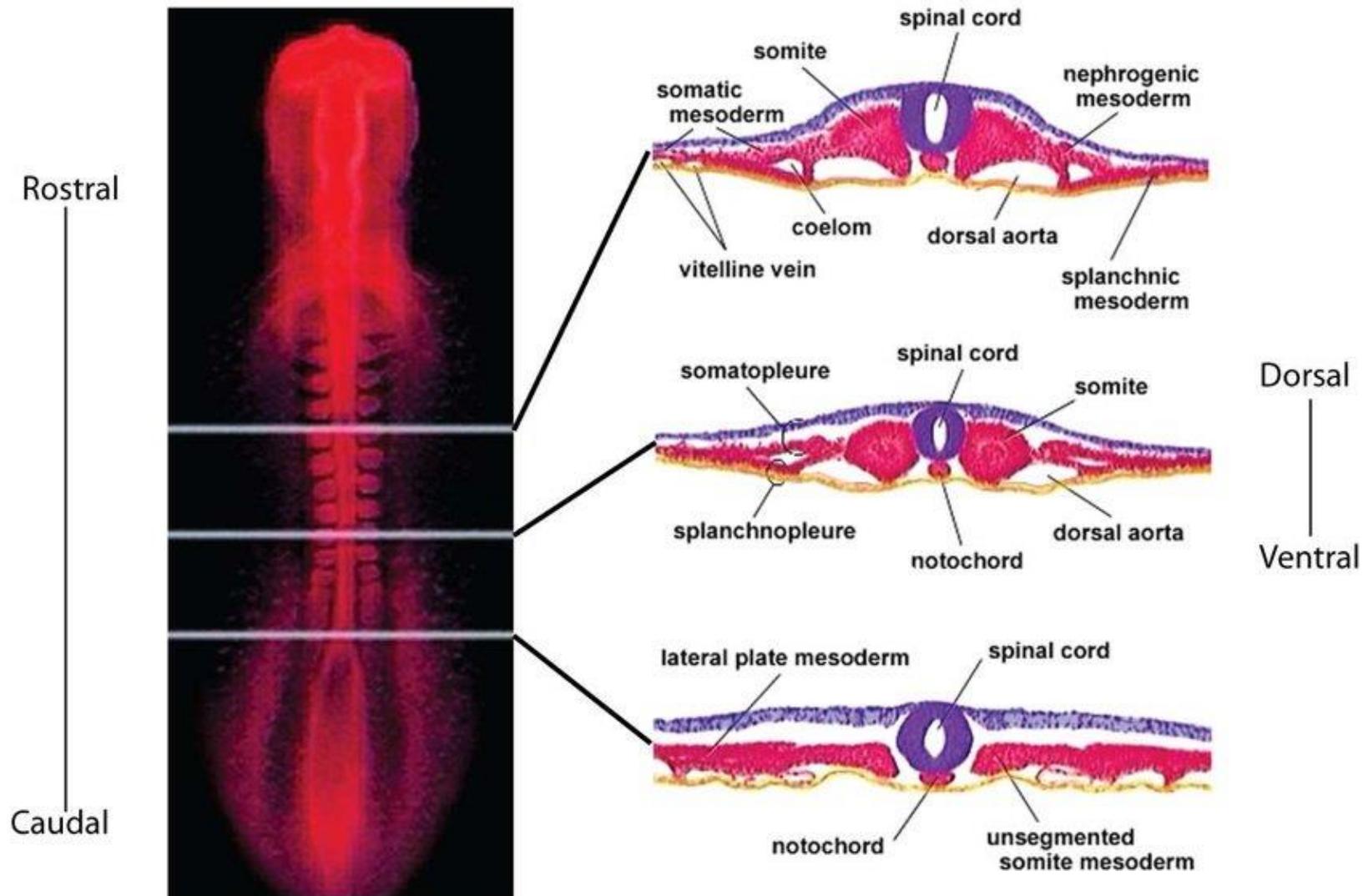
RhoA

Rac1

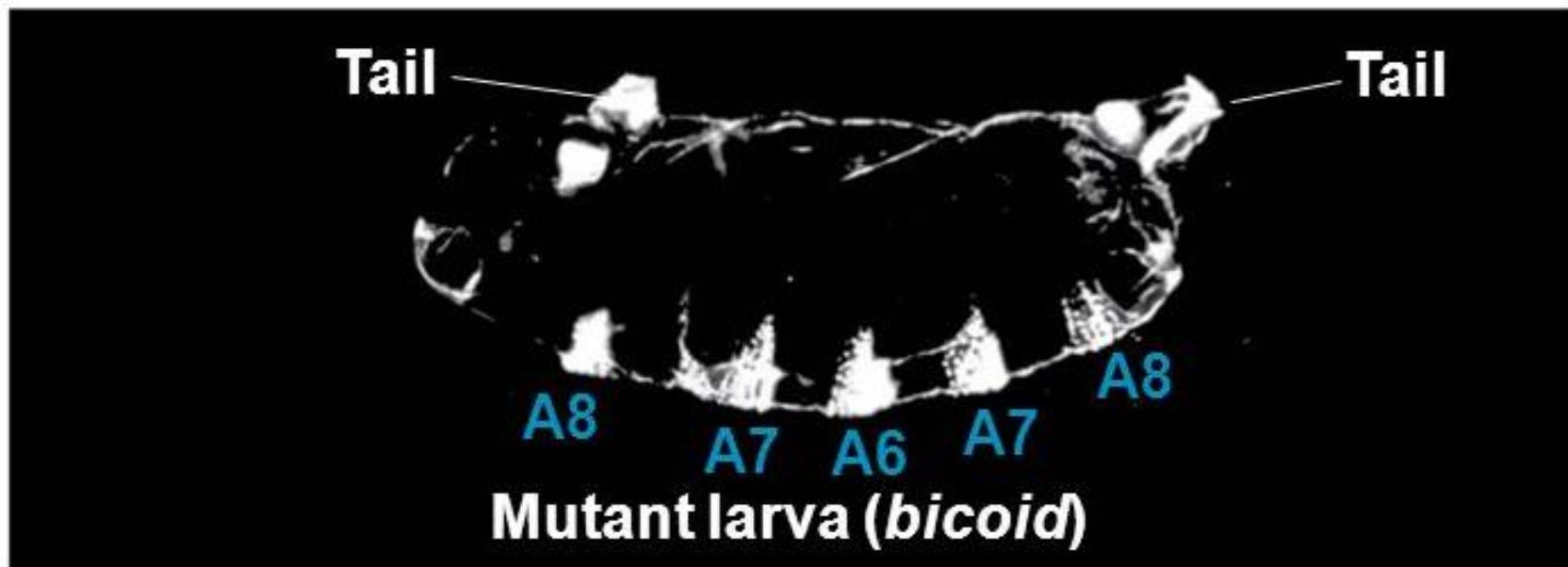
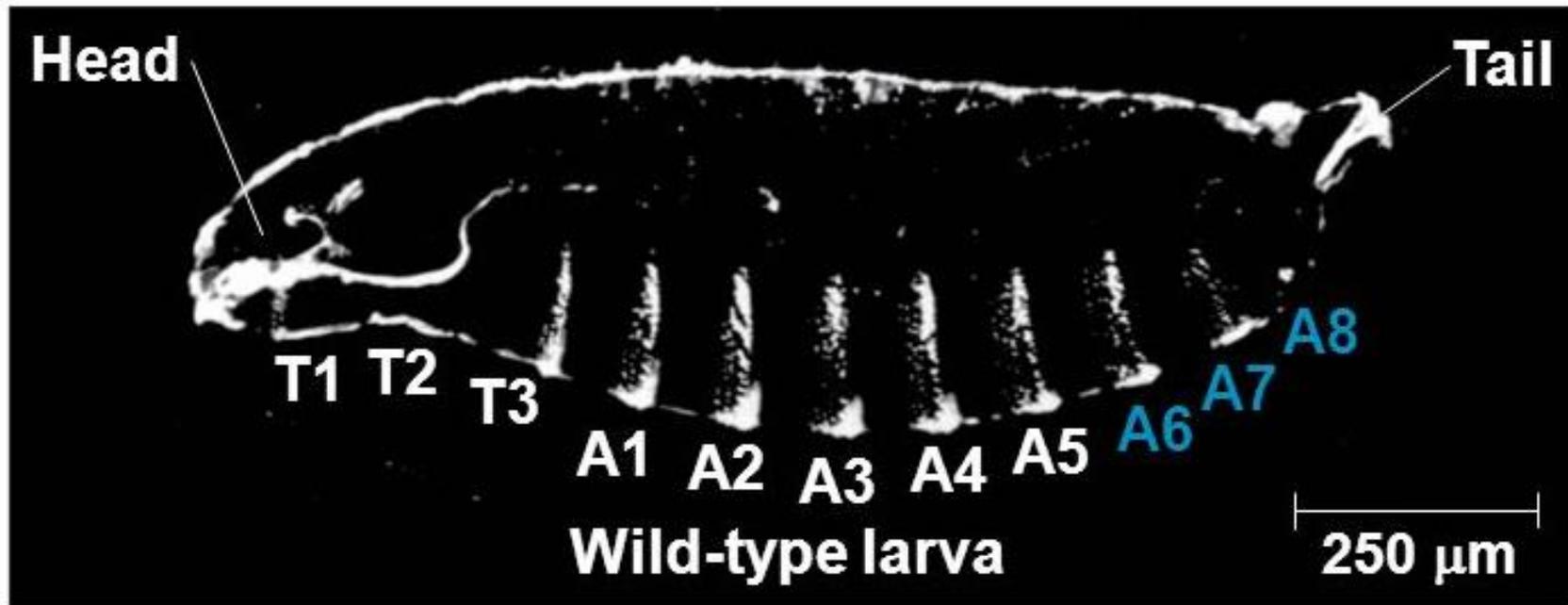
Directed growth

Lamellipodia/filopodia focal adhesions

Las capas germinales en el embrión



Problema:



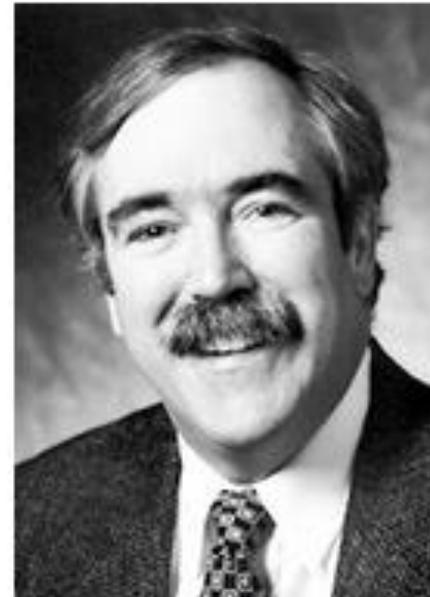
The Nobel Prize in Physiology or Medicine 1995



Edward B. Lewis
Prize share: 1/3



Christiane Nüsslein-
Volhard
Prize share: 1/3



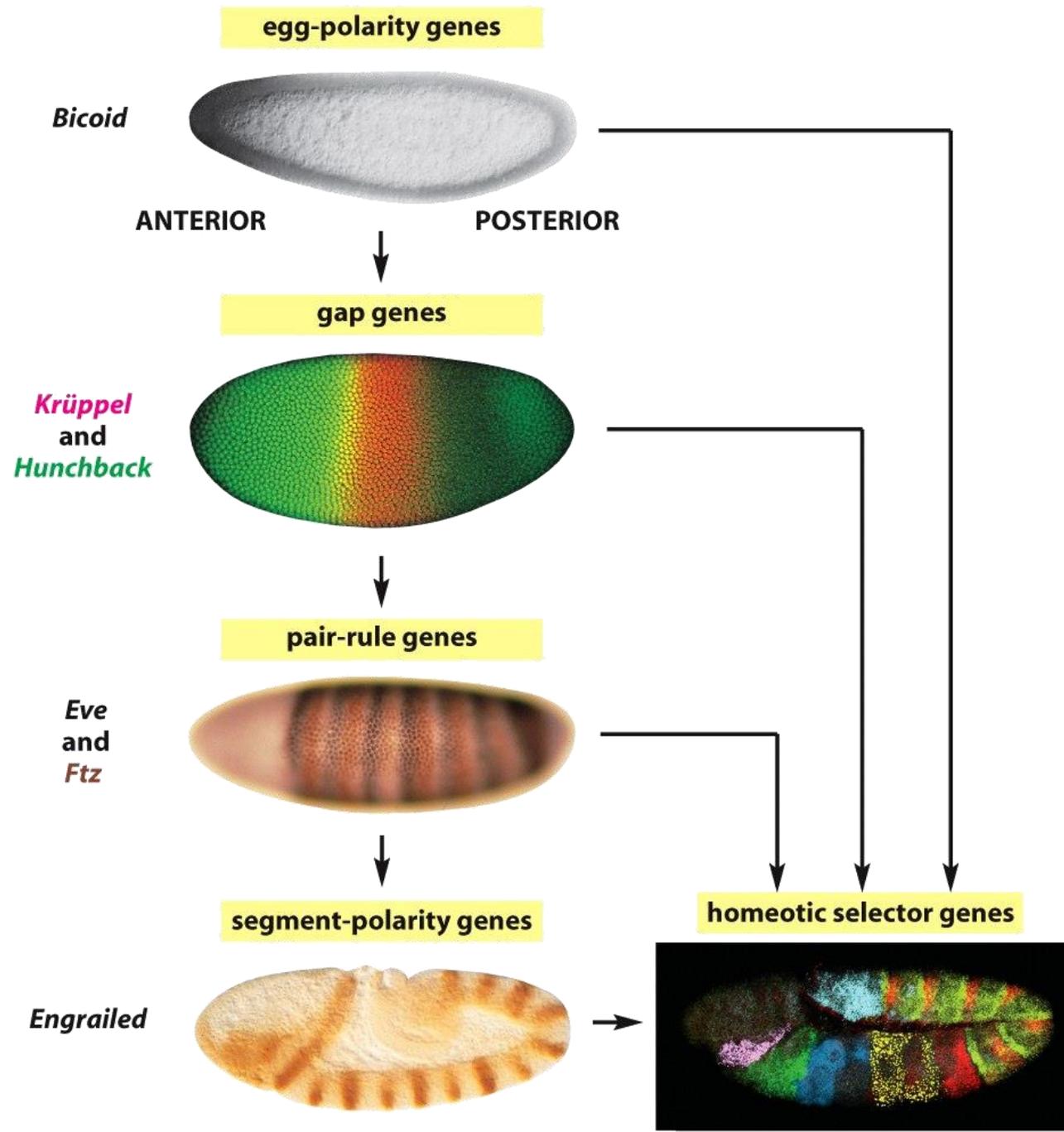
Eric F. Wieschaus
Prize share: 1/3

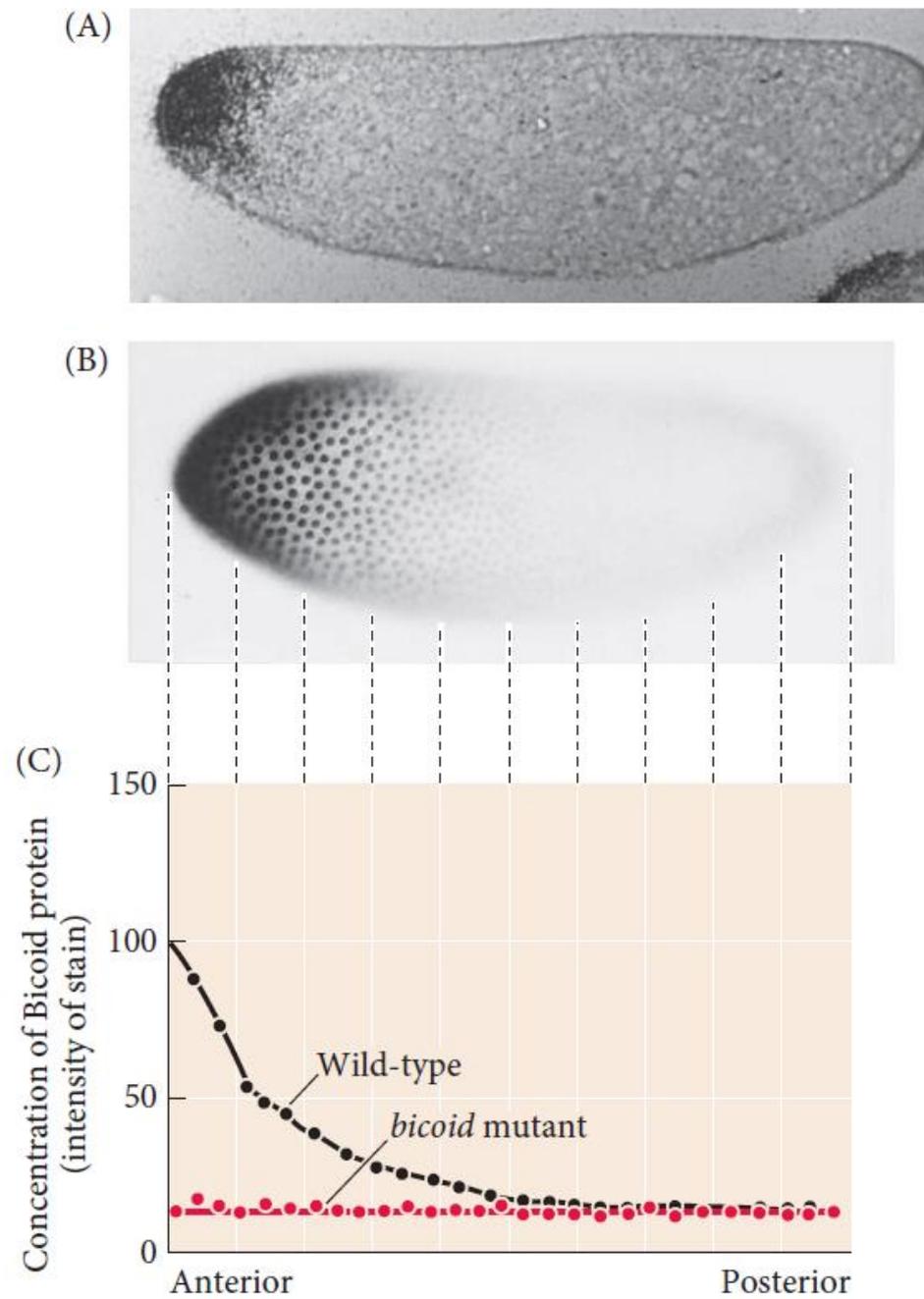
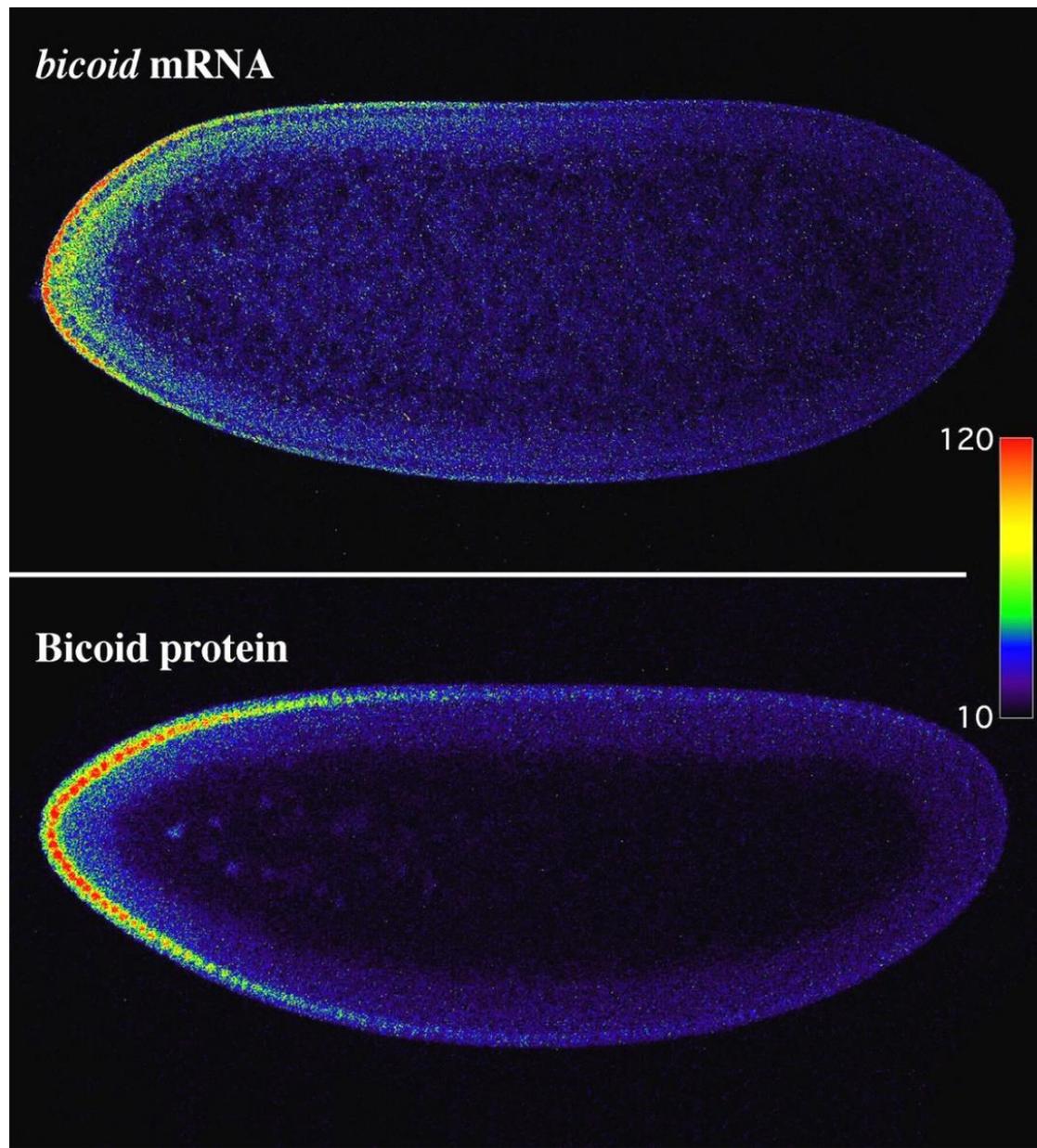
The Nobel Prize in Physiology or Medicine 1995 was awarded jointly to Edward B. Lewis, Christiane Nüsslein-Volhard and Eric F. Wieschaus *"for their discoveries concerning the genetic control of early embryonic development"*.

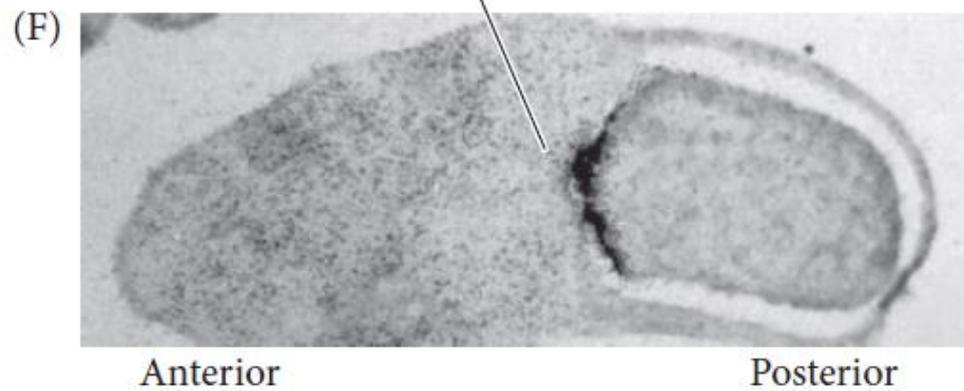
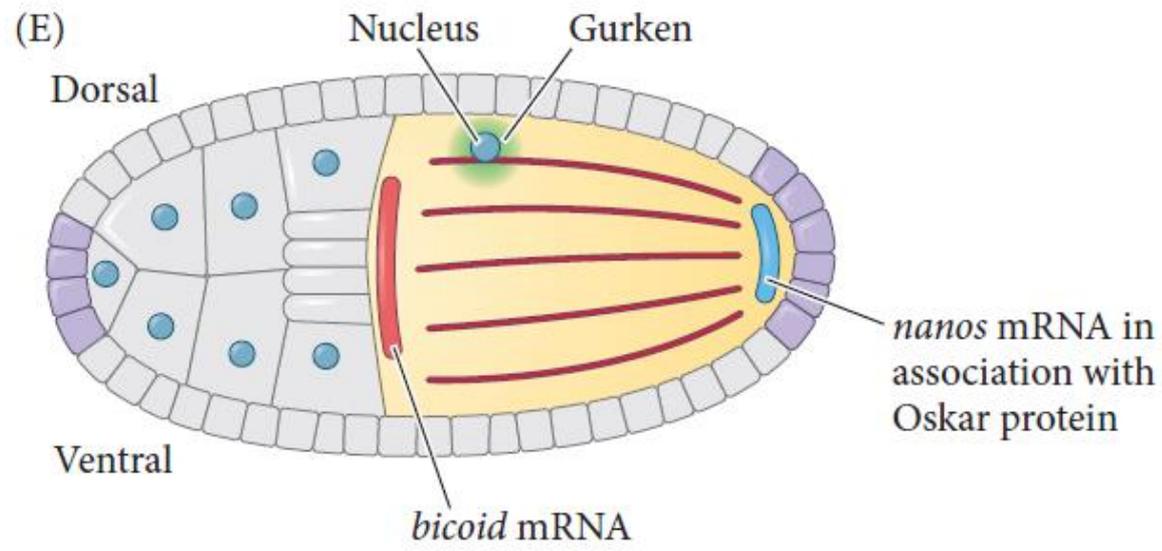
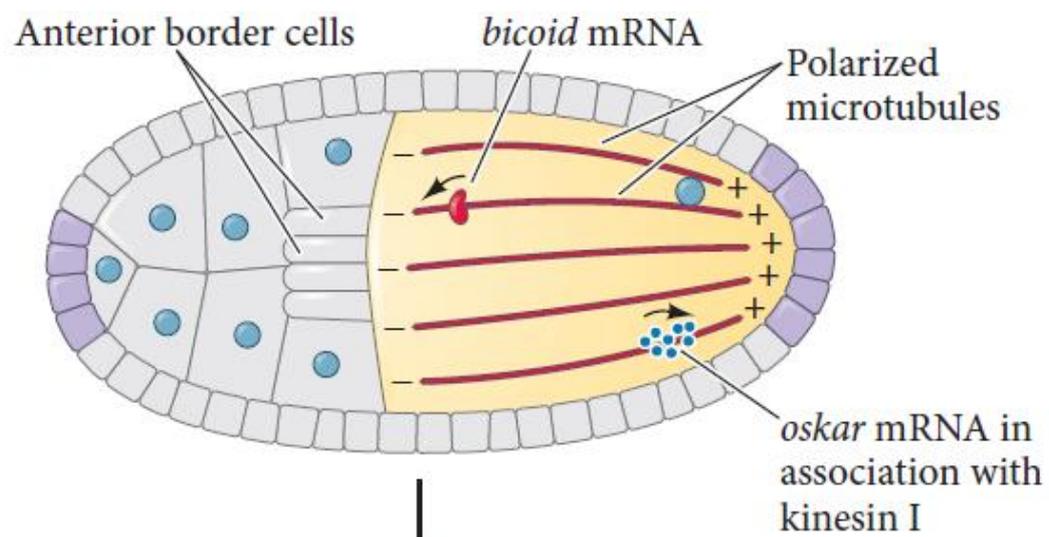
Clivaje superficial

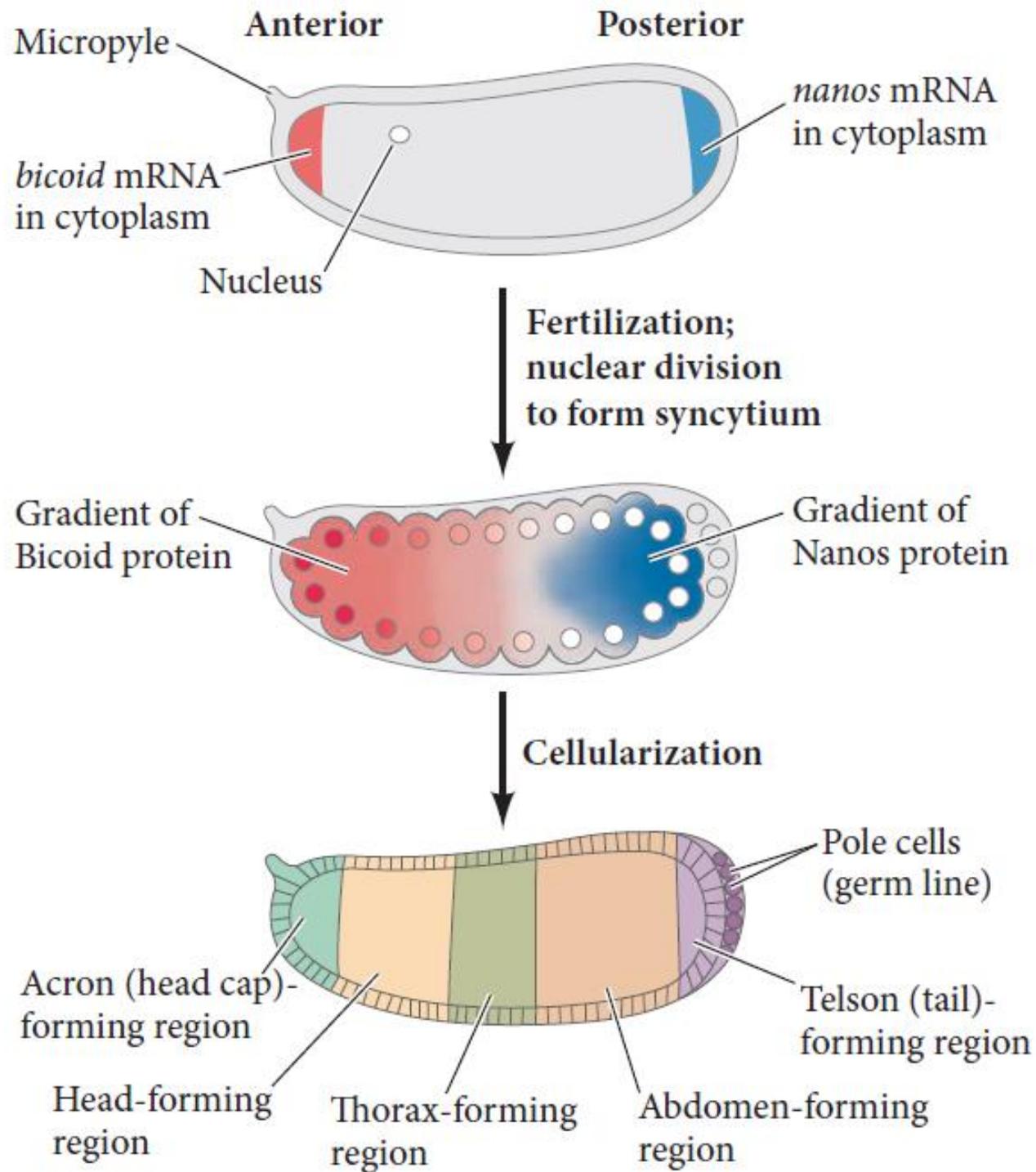


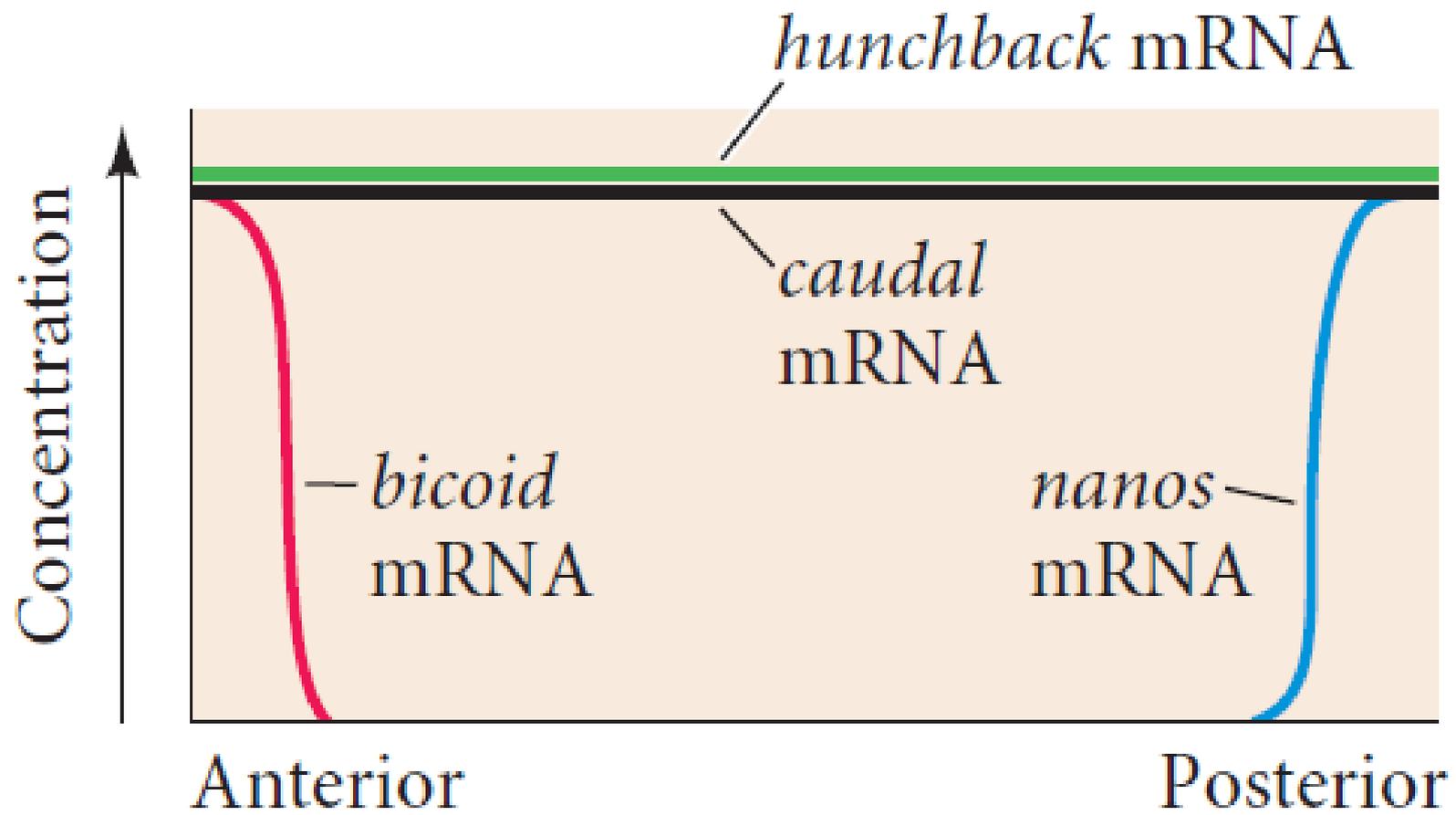
Definición del eje céfalo-caudal en *Drosophila*

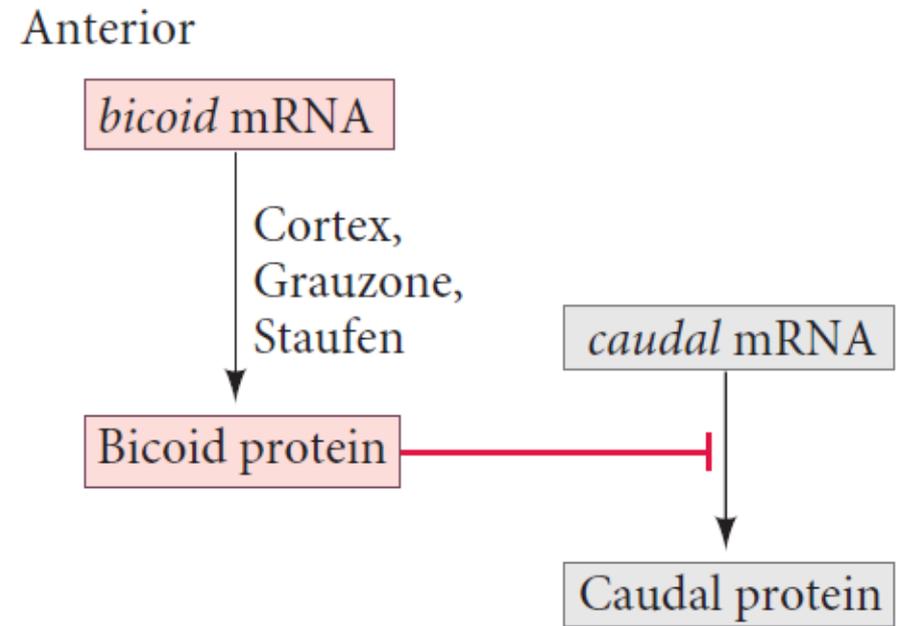
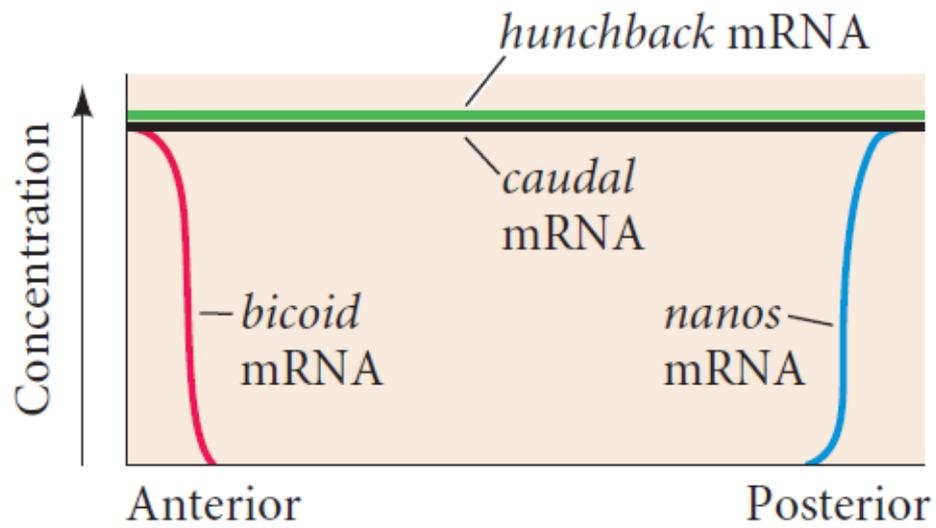












(B) Early cleavage embryo proteins

