

Desarrollo temprano en metazoarios II



Gonzalo Aparicio
Gaparicio@fcien.edu.uy

Clivaje (segmentación)

Blástula

Gastrulación

Embrión trilaminar:

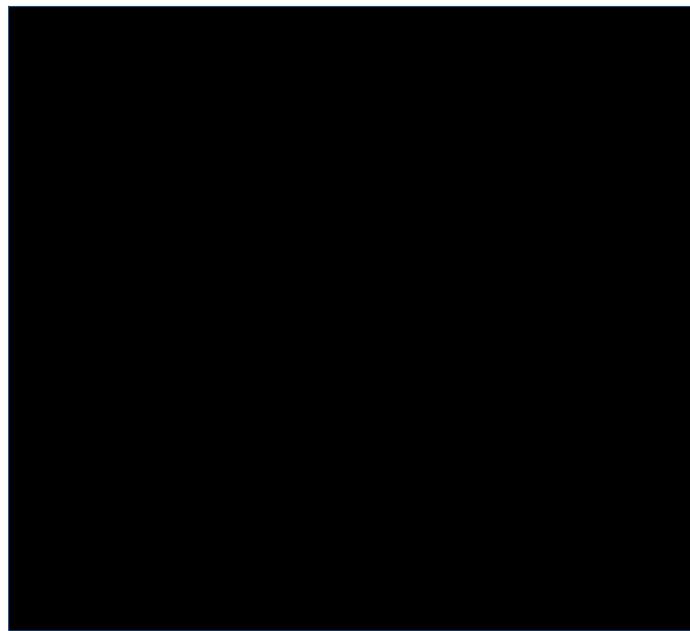
Endodermo

Mesodermo

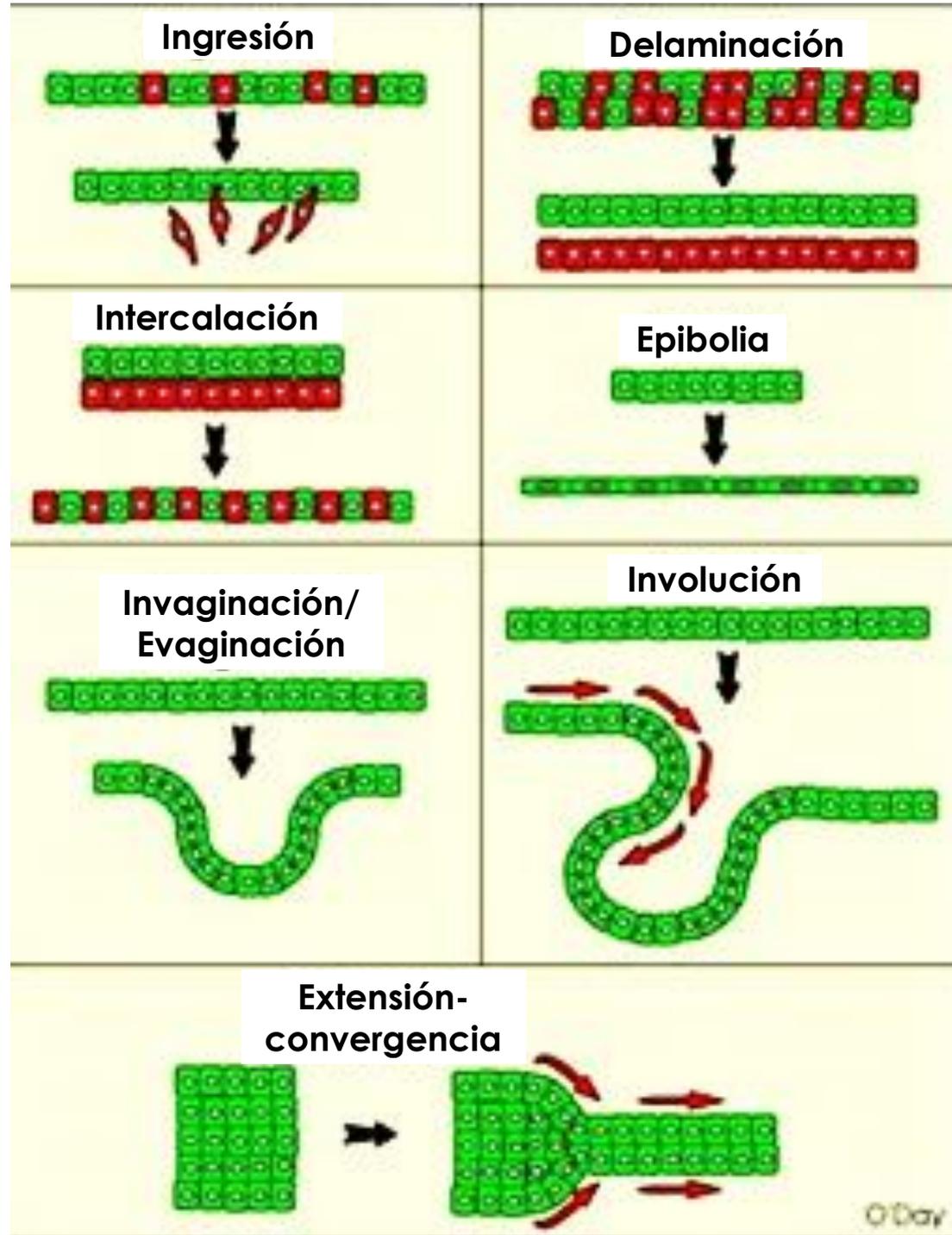
Ectodermo

Neurulación

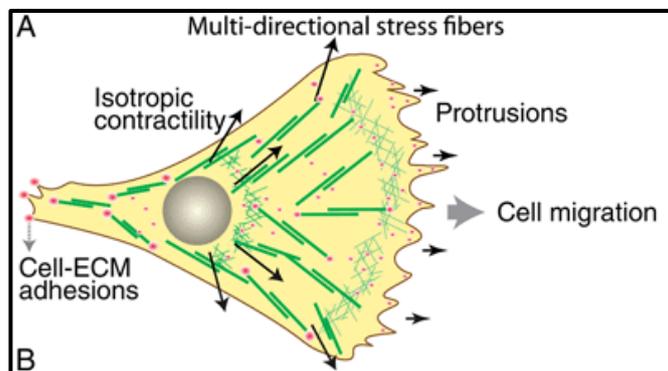
Sistema nervioso



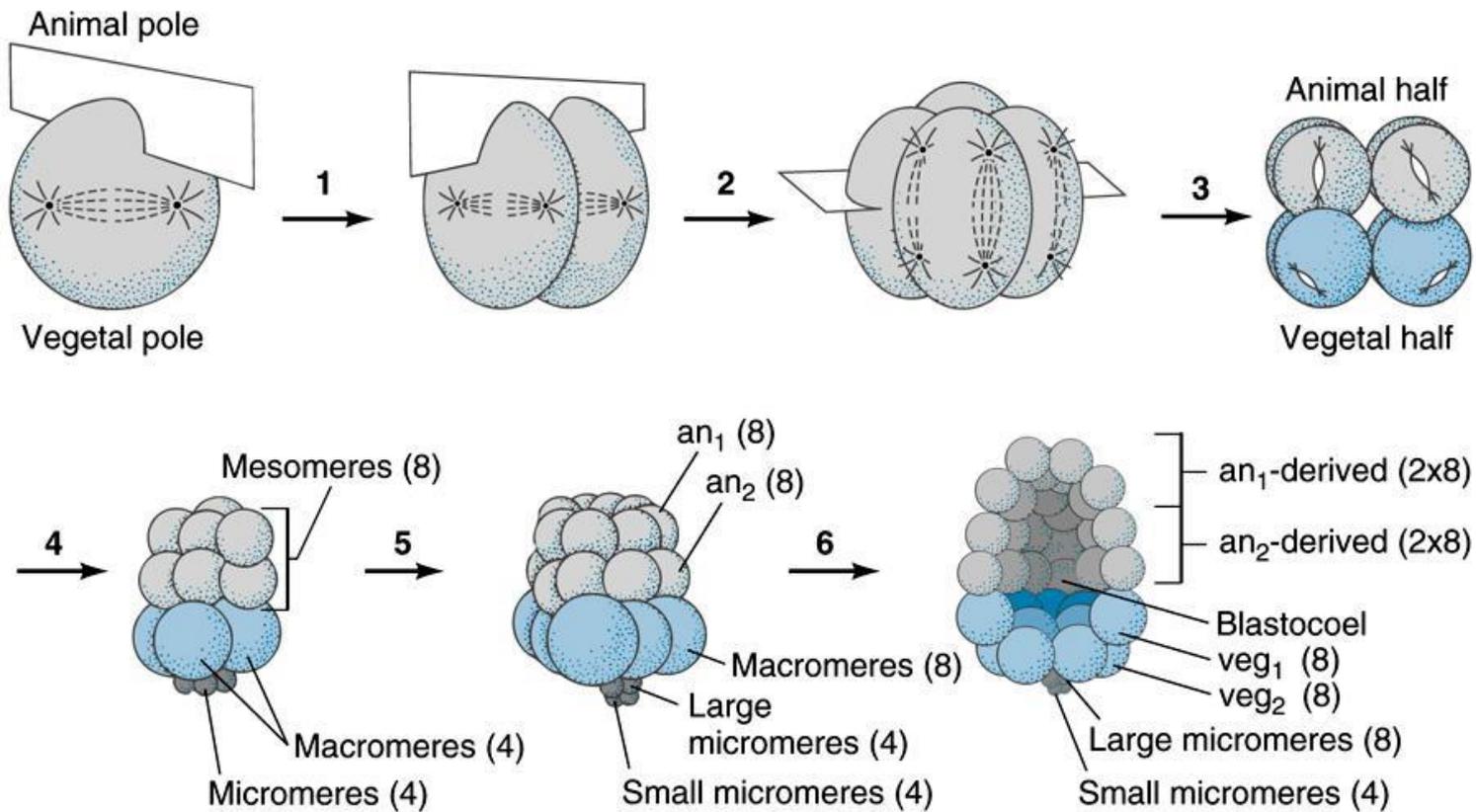
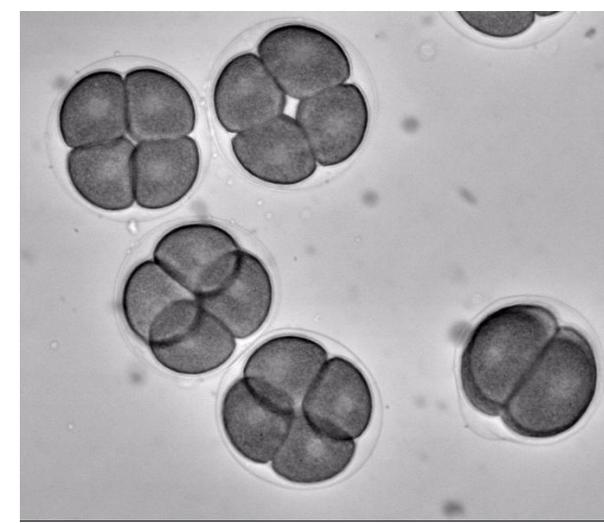
Movimientos morfogénéticos

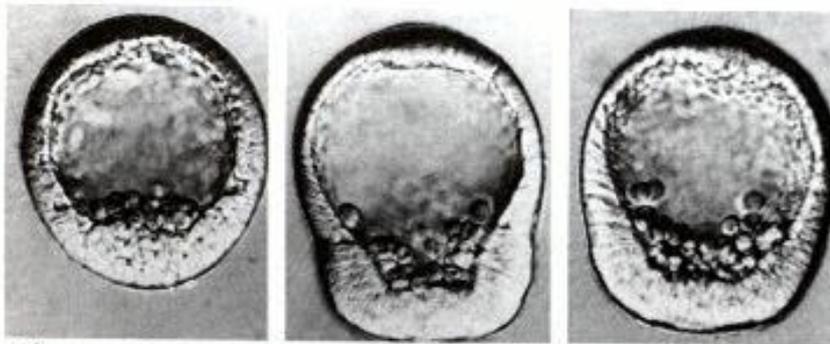


Migración celular



Clivaje holoblástico radial: equinodermos

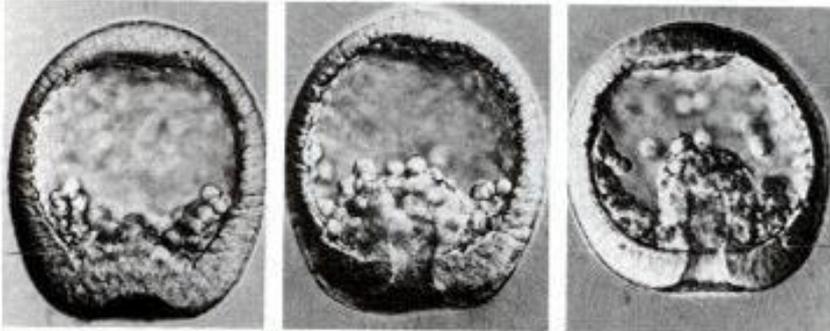




9 hrs.

9.5 hrs.

10 hrs.



10.5 hrs.

11 hrs.

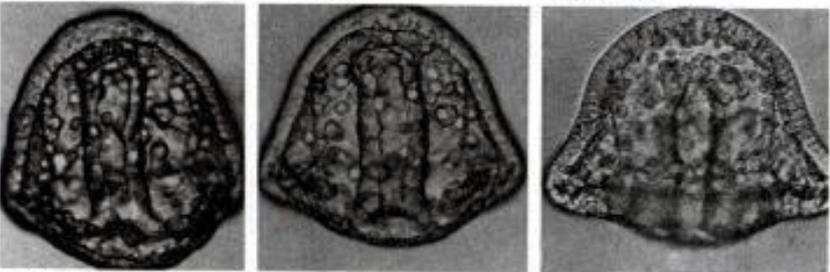
11.5 hrs.



12 hrs.

13 hrs.

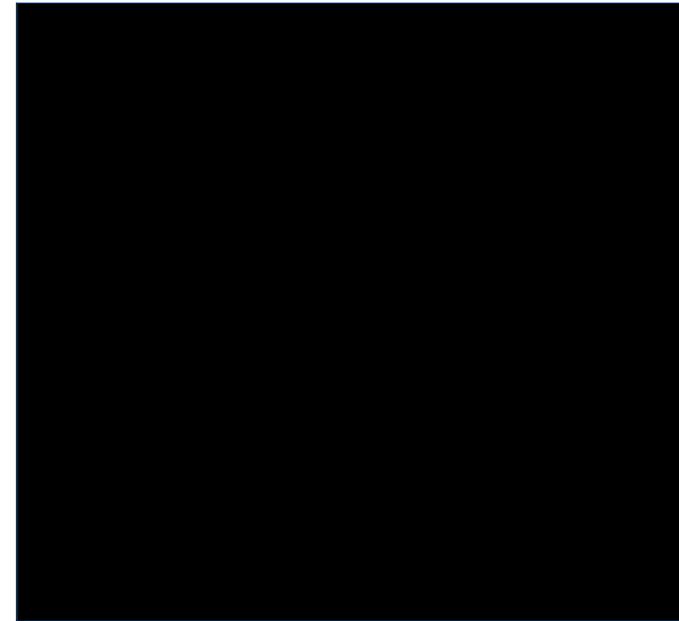
13.5 hrs.



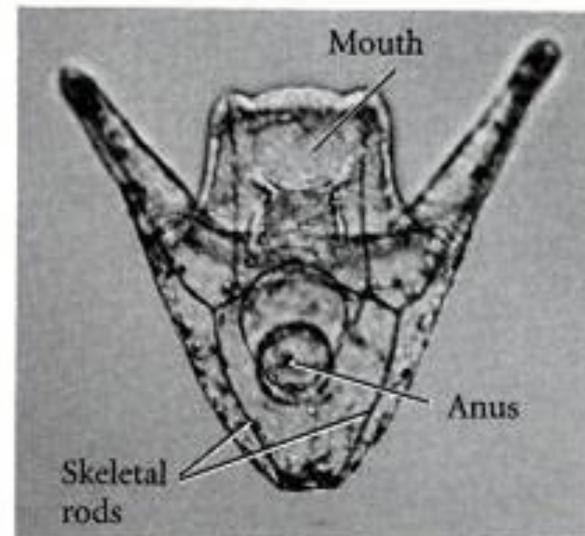
15 hrs.

17 hrs.

18 hrs.

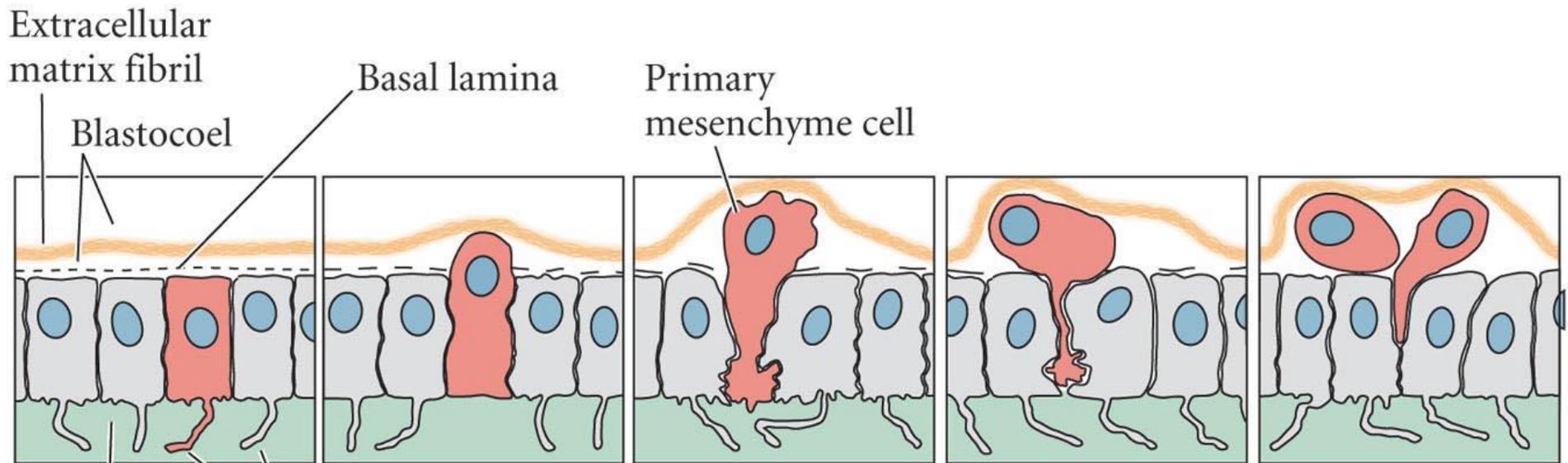


Comienzo gastrulación:
Polo vegetal

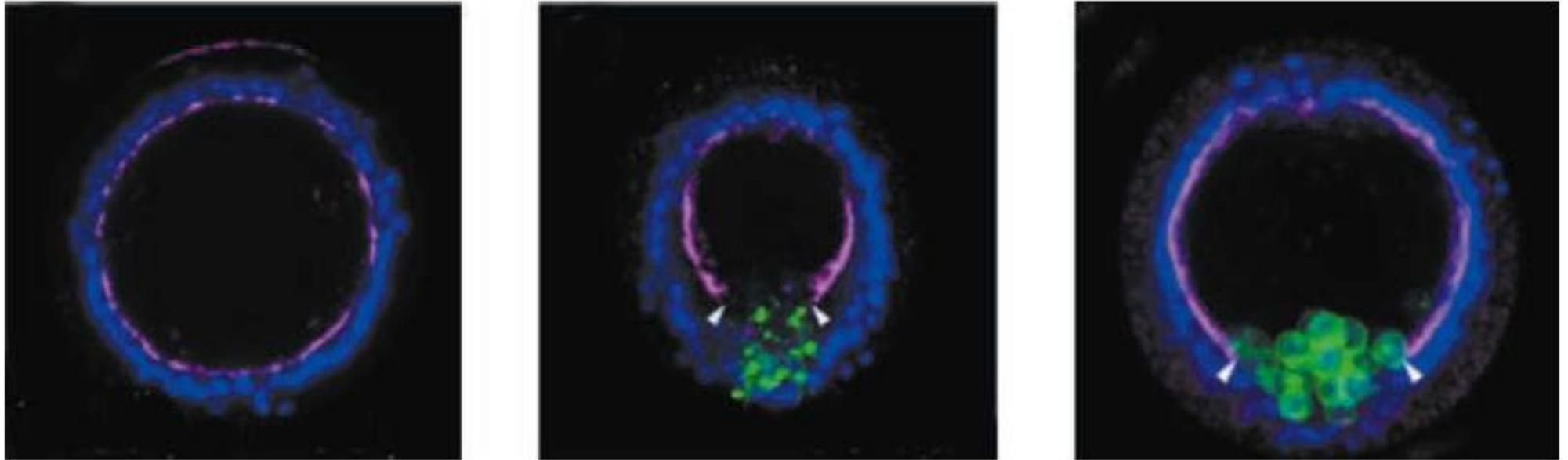


Transición epitelio-mesénquima

- 1 Polaridad ápico-basal
- 2 Constricción apical
- 3 Remodelación de la lámina basal
- 4 Pérdida de adhesión celular
- 5 Movilidad celular



Transición epitelio-mesénquima: degradación de la matriz extracelular



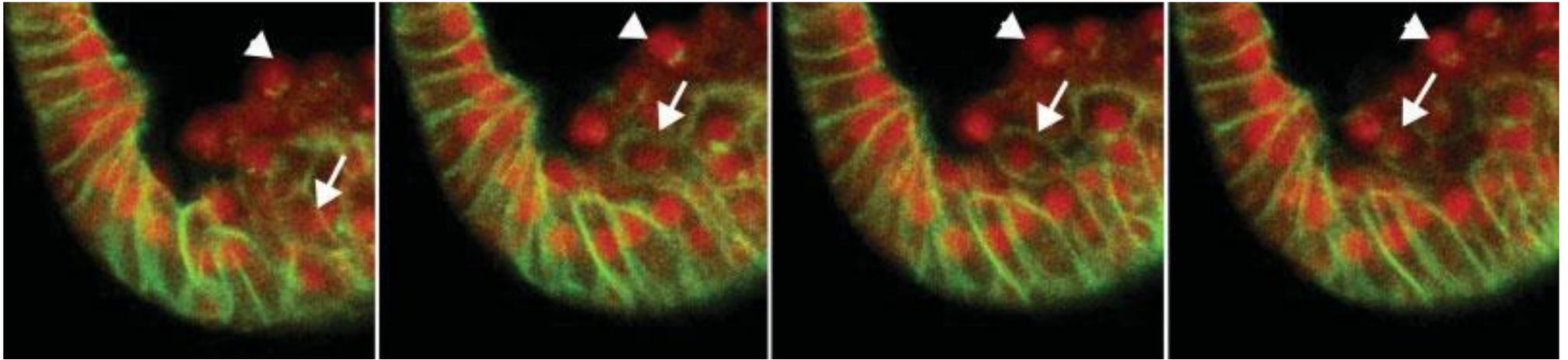
Azul - ADN

Magenta - Matriz extracelular

Verde - células mesenquimales

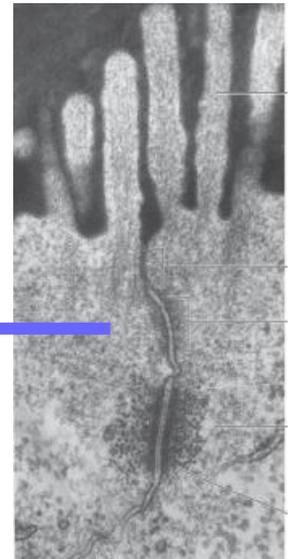
Ingression of Primary Mesenchyme Cells of the Sea Urchin Embryo: A Precisely Timed Epithelial Mesenchymal Transition

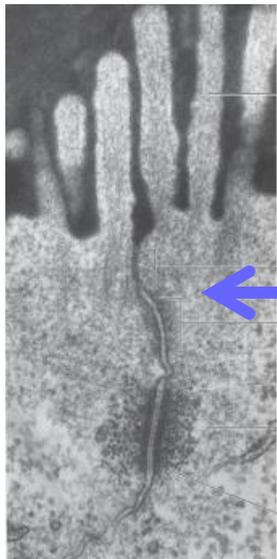
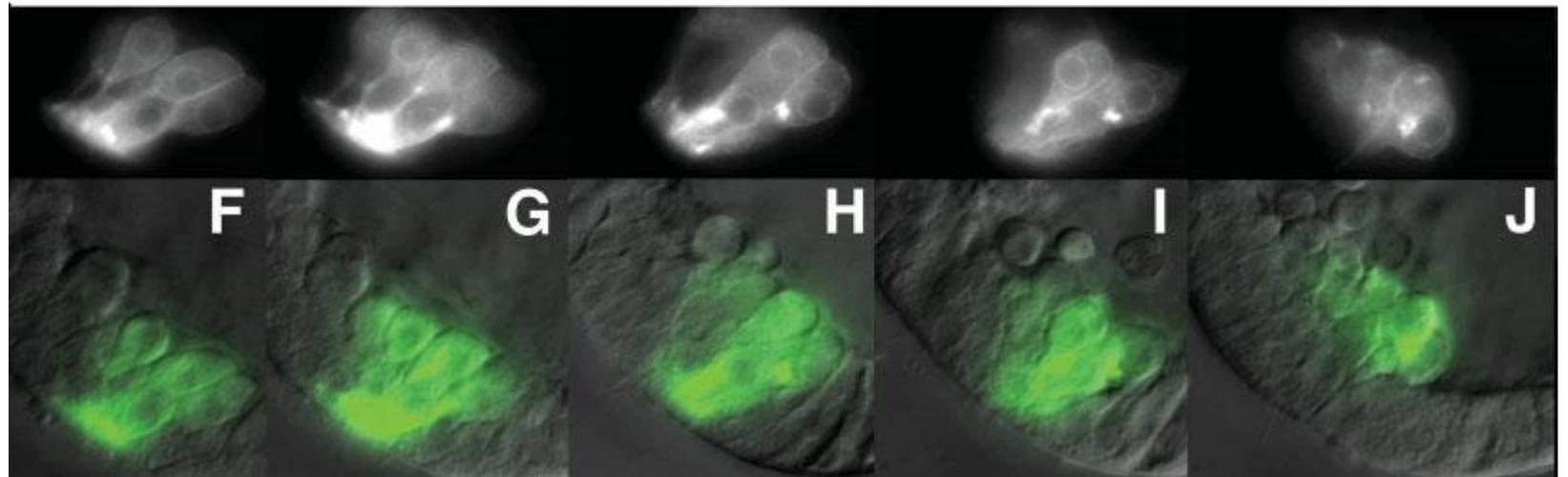
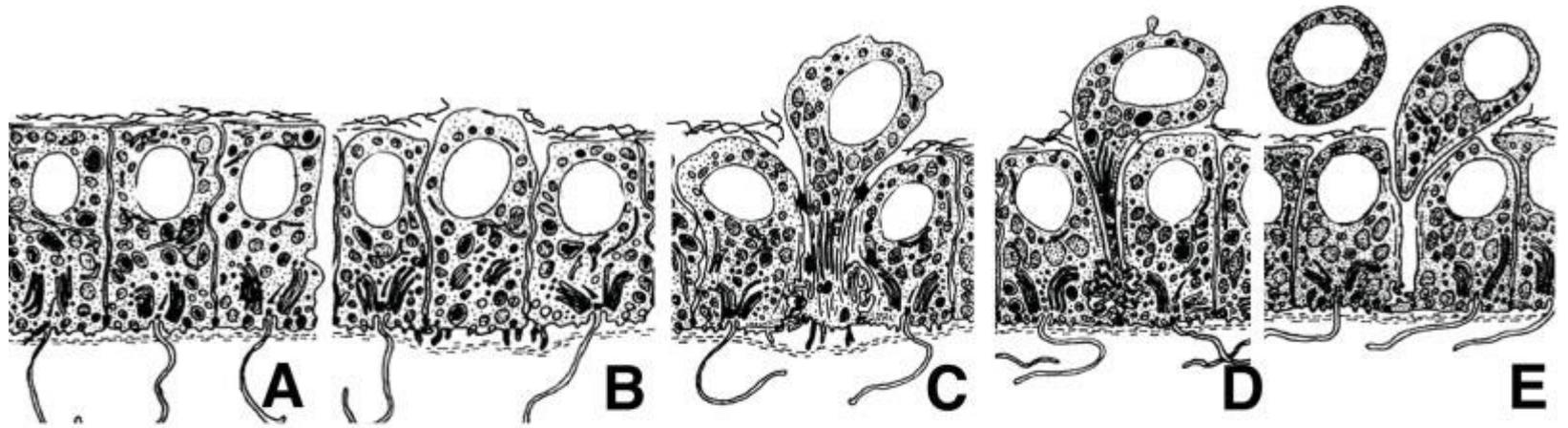
Shu-Yu Wu, Michael Ferkowicz and David R. McClay*



Cadherina-GFP

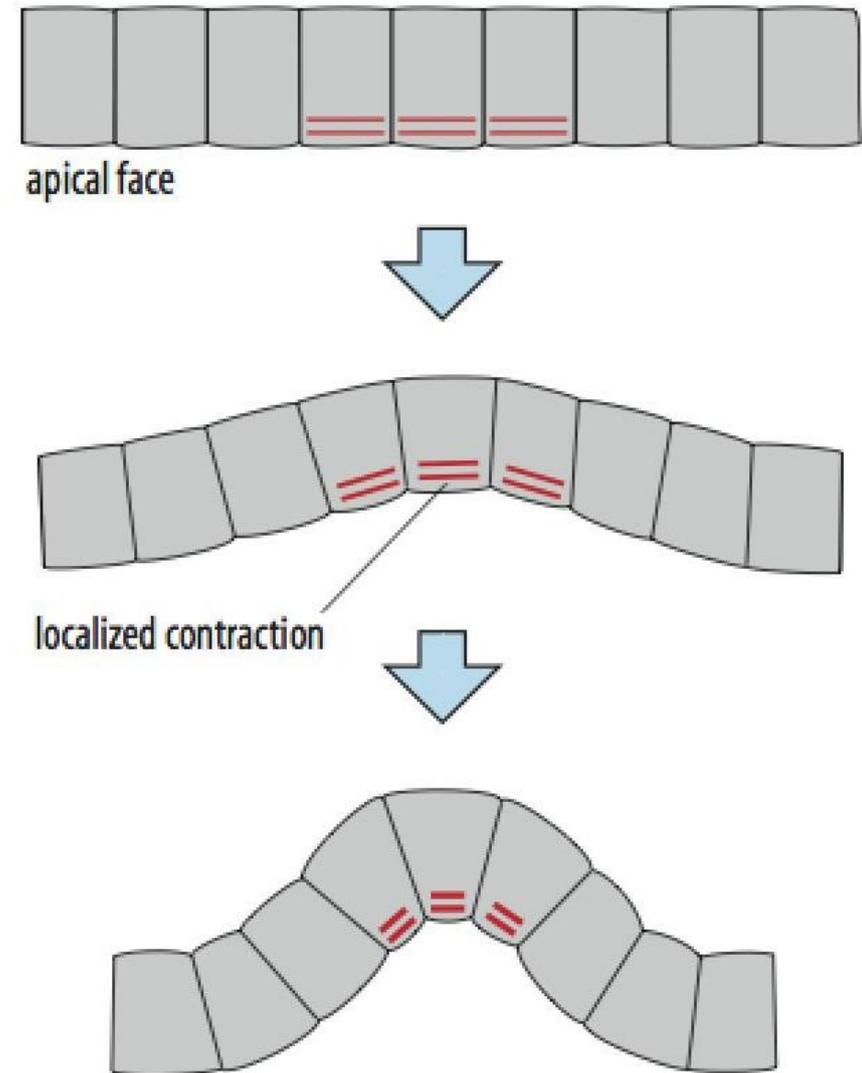
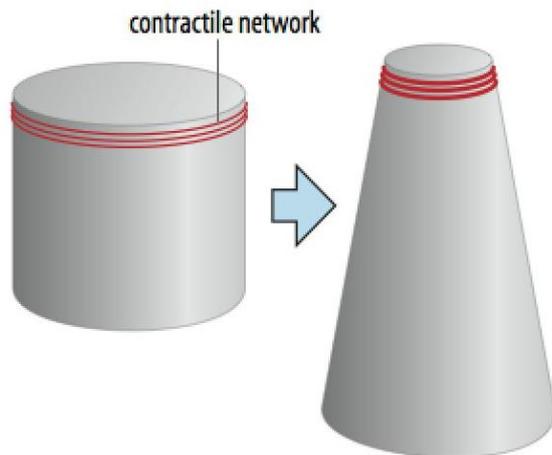
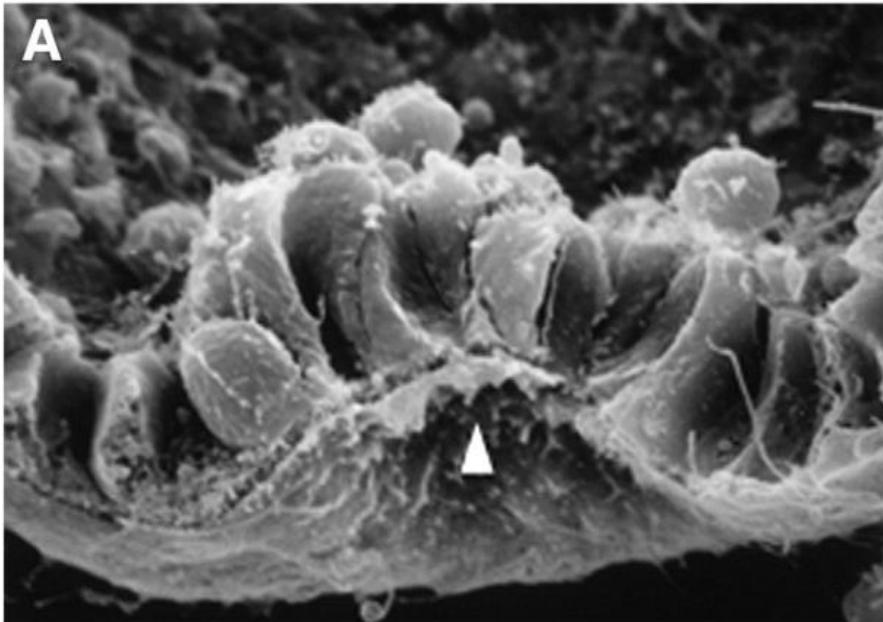
Cinturón de adhesión





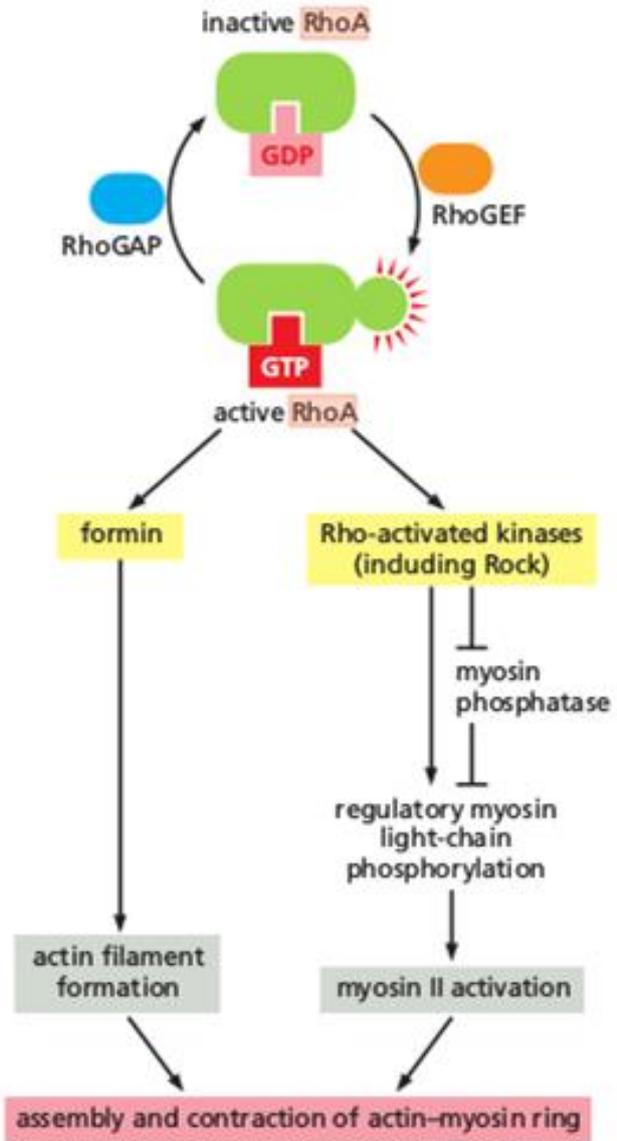
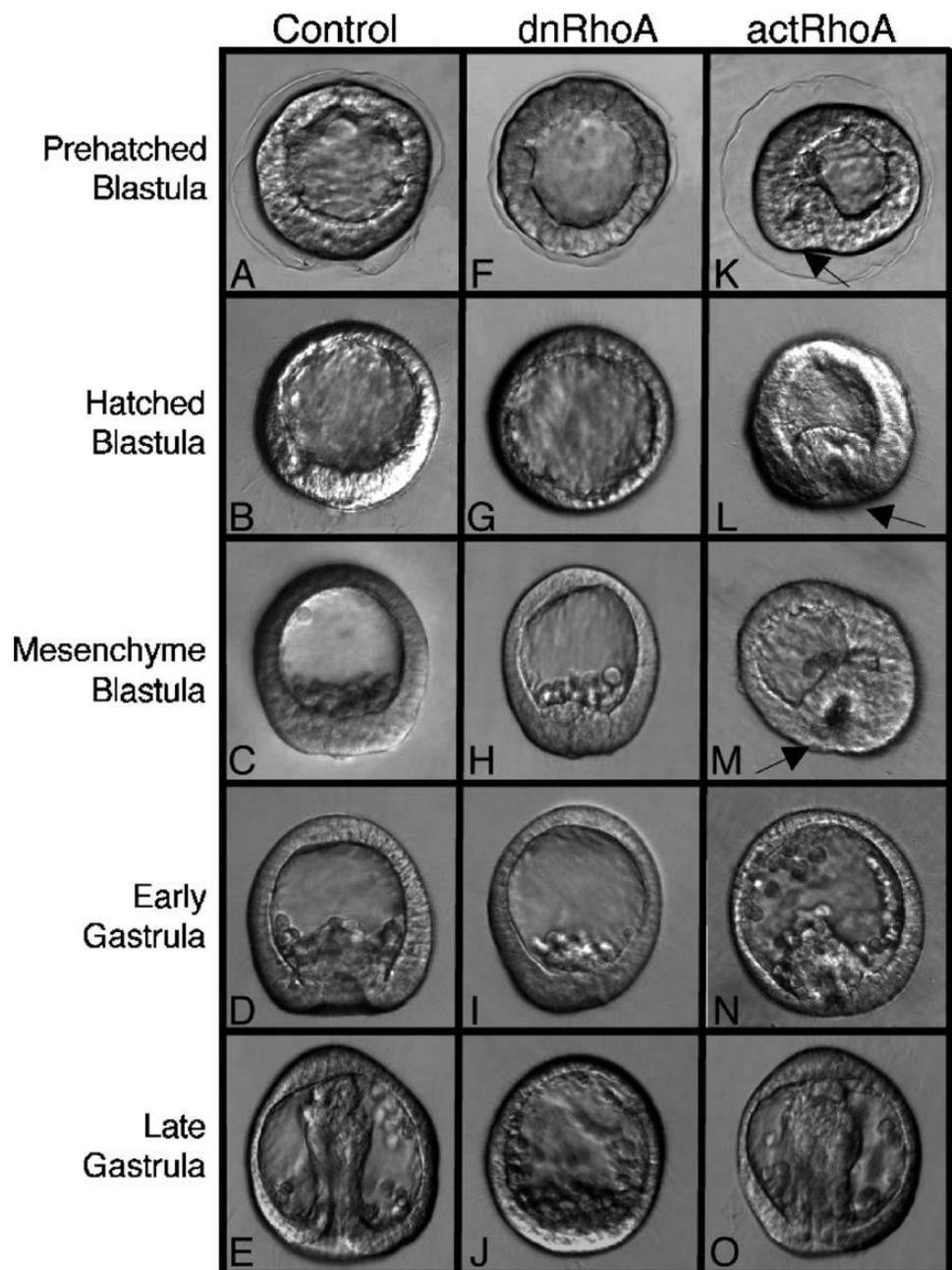
← Cinturón de adhesión

Constricción apical

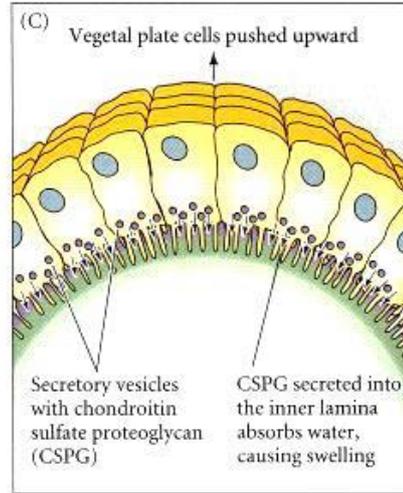
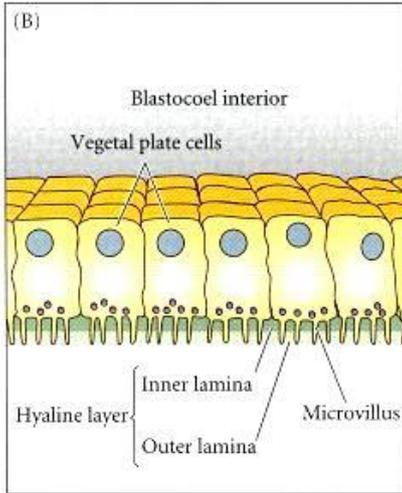
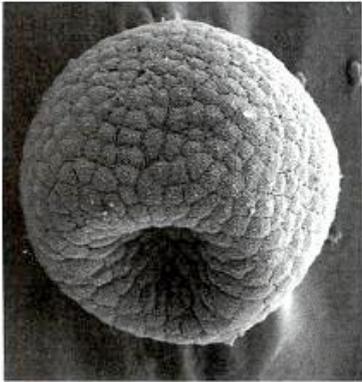


RhoA regulates initiation of invagination, but not convergent extension, during sea urchin gastrulation

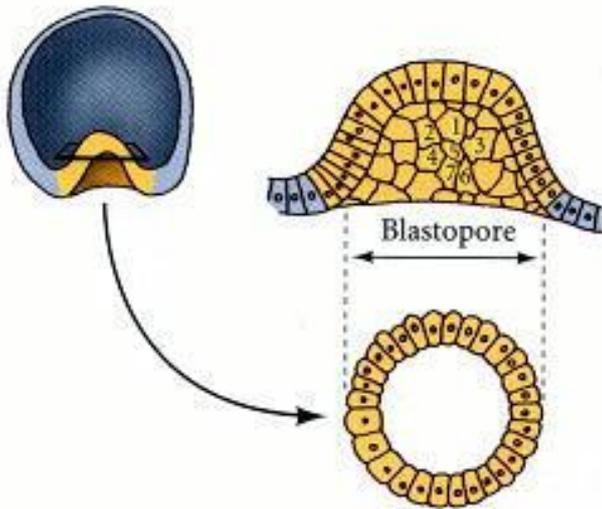
Wendy S. Beane^{a,*}, Jeffrey M. Gross^b, David R. McClay^a



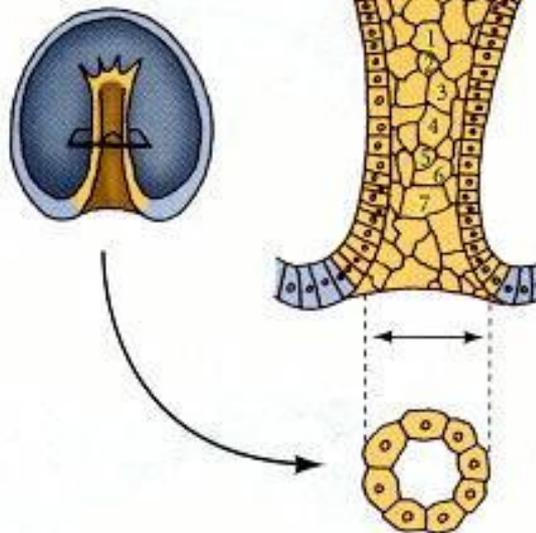
(A)



EARLY GASTRULATION

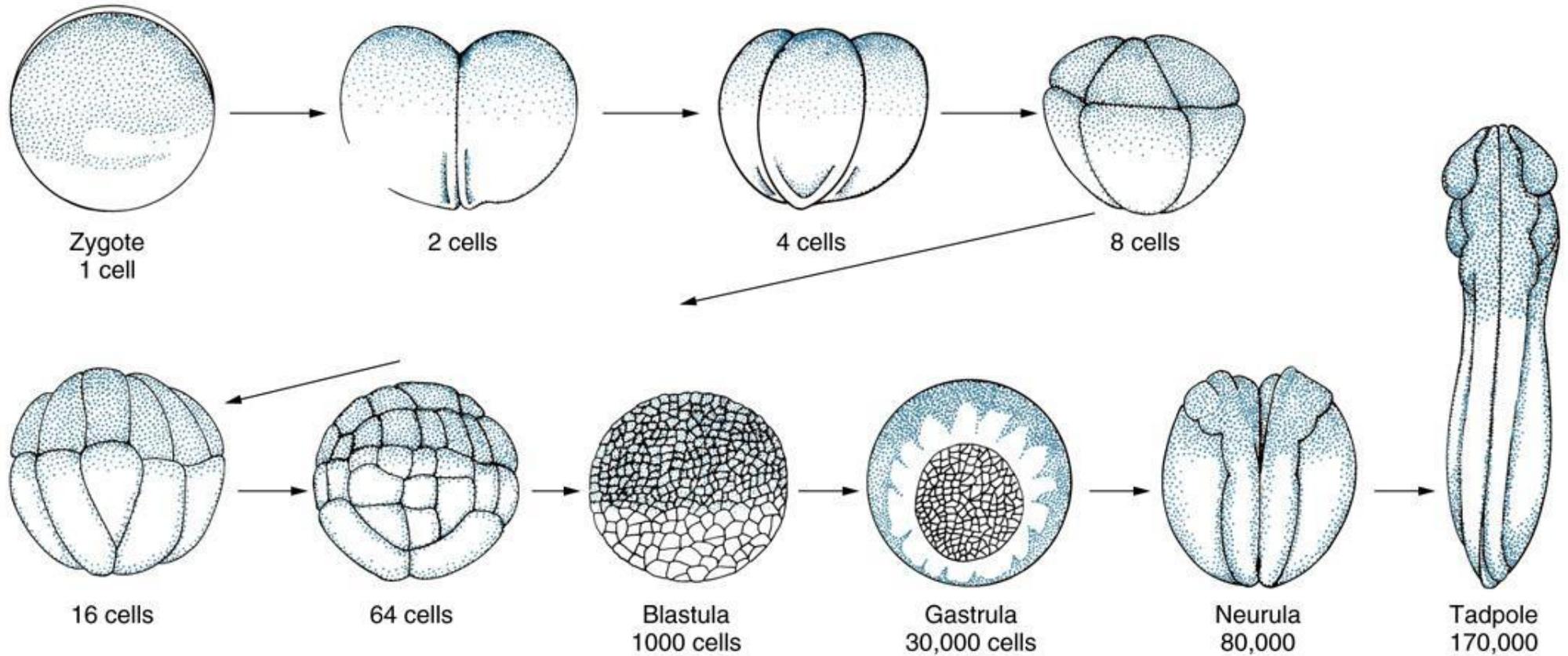


LATER GASTRULATION

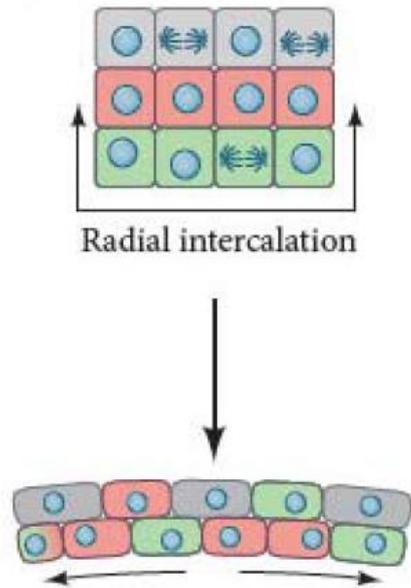


Gastrulación

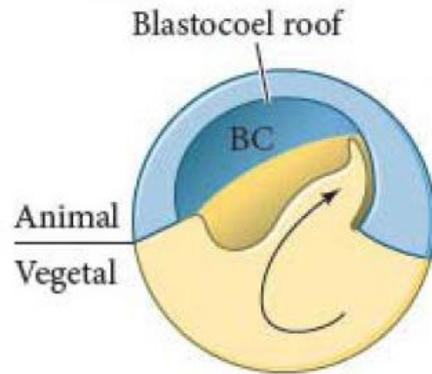
Embriones con clivaje holoblásticos: Anfibios



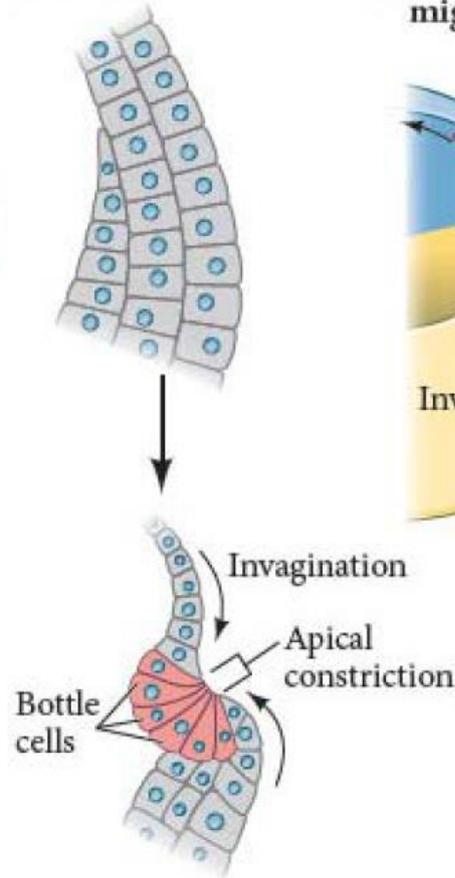
1 Epiboly



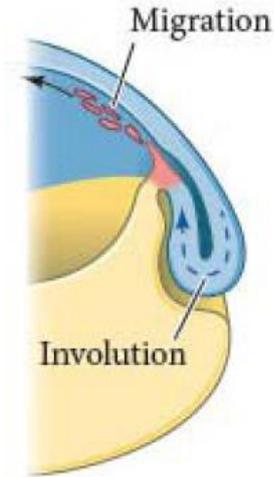
2 Vegetal rotation



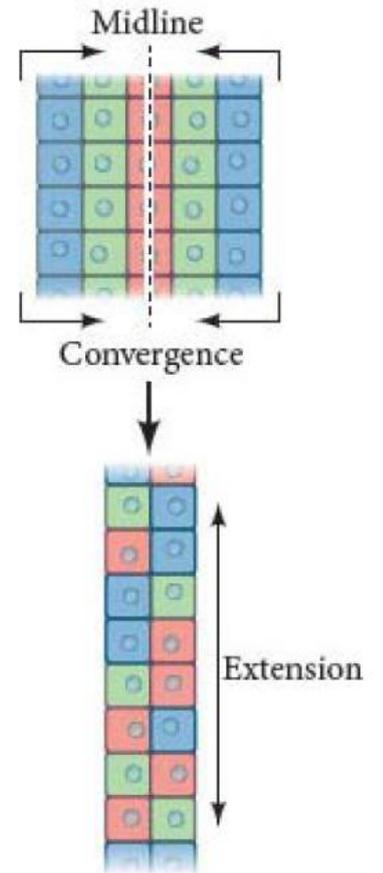
3 Invagination

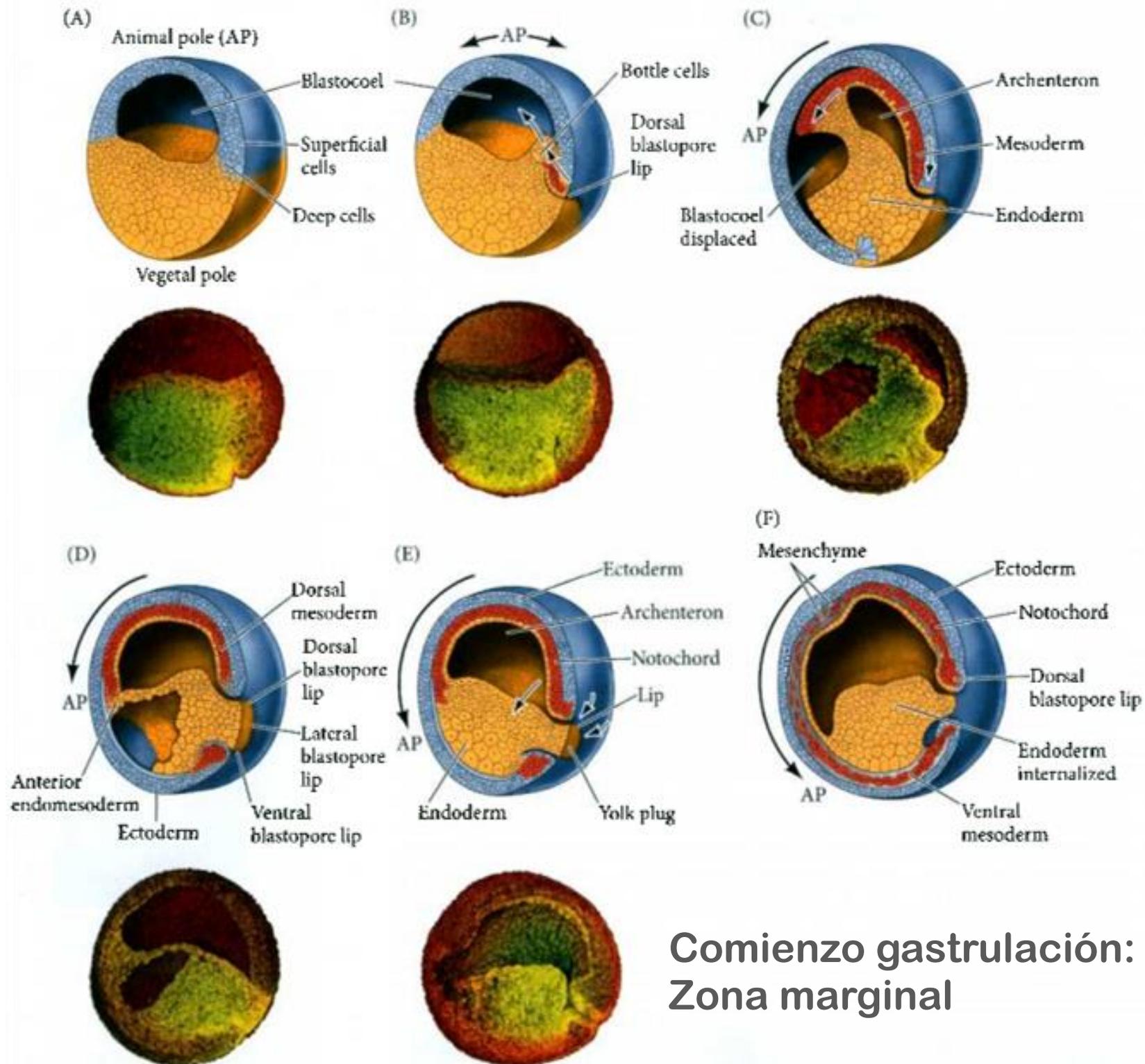


4 Involution and migration



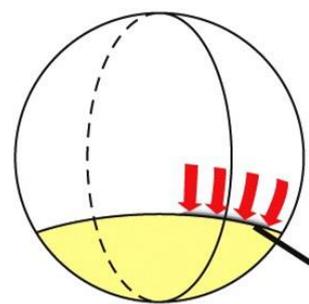
5 Convergent extension





Comienzo gastrulación:
Zona marginal

ANIMAL POLE

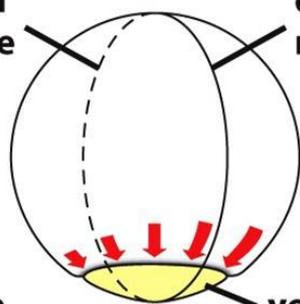


VEGETAL POLE

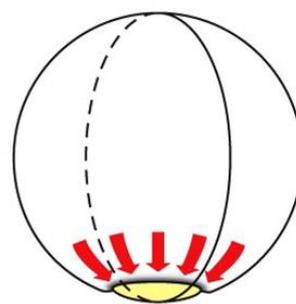
dorsal lip
of blastopore

ventral
midline

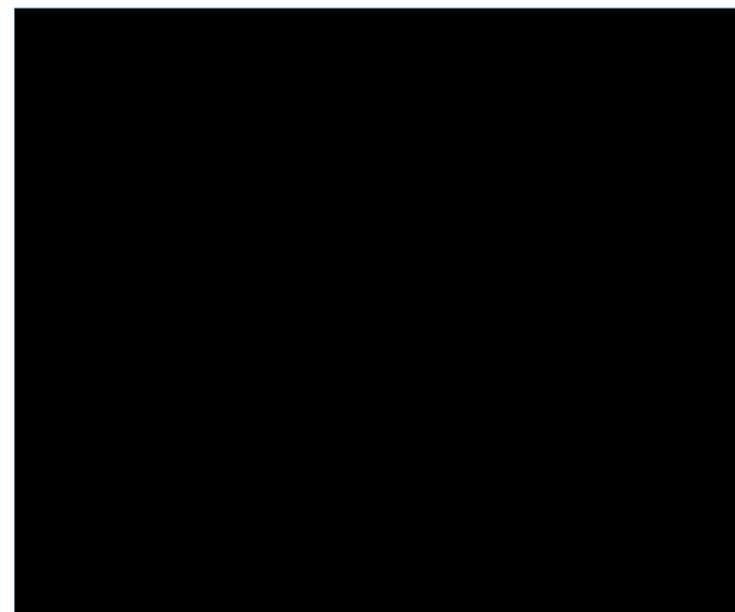
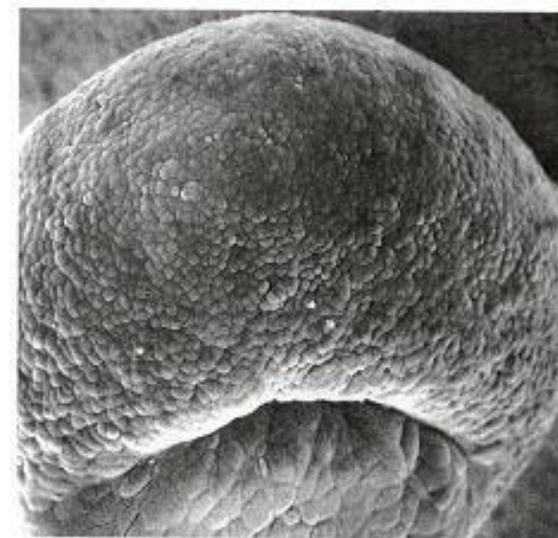
dorsal
midline

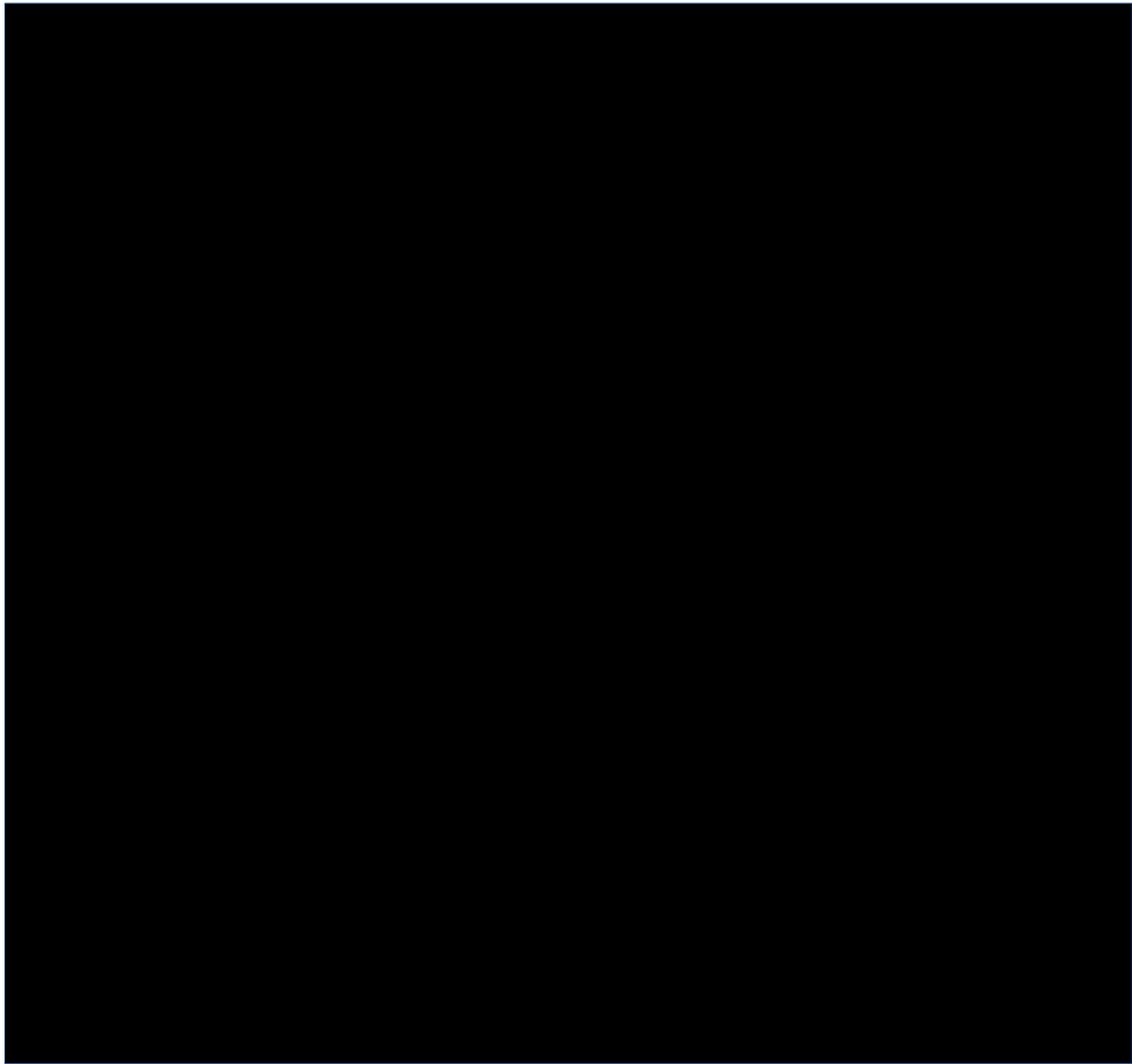


yolk plug



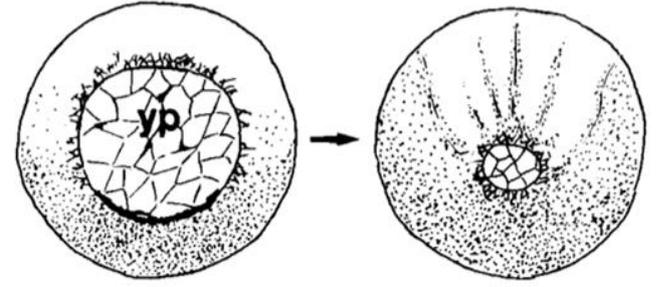
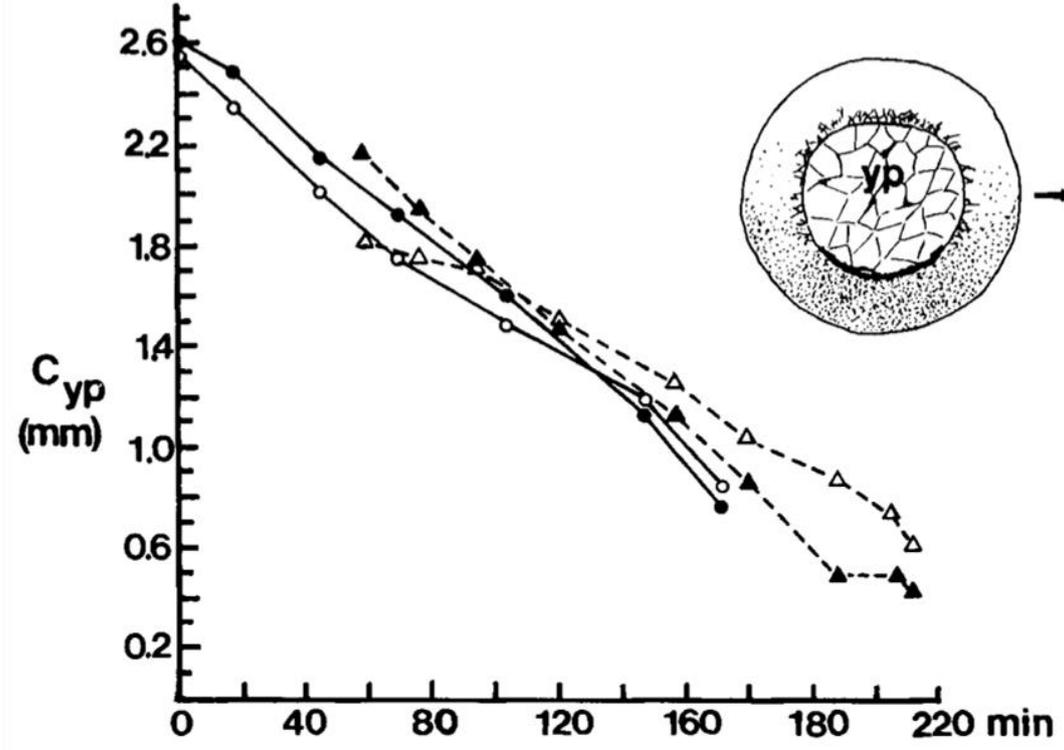
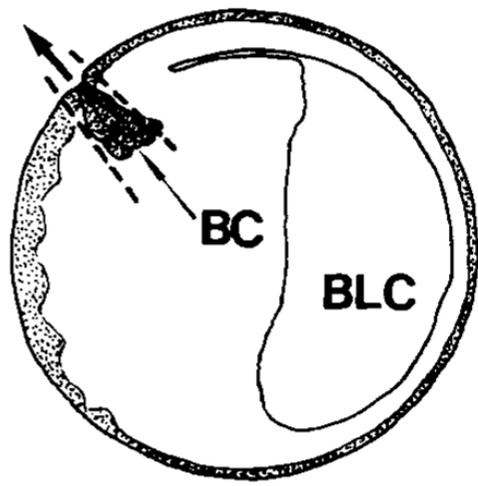
external views



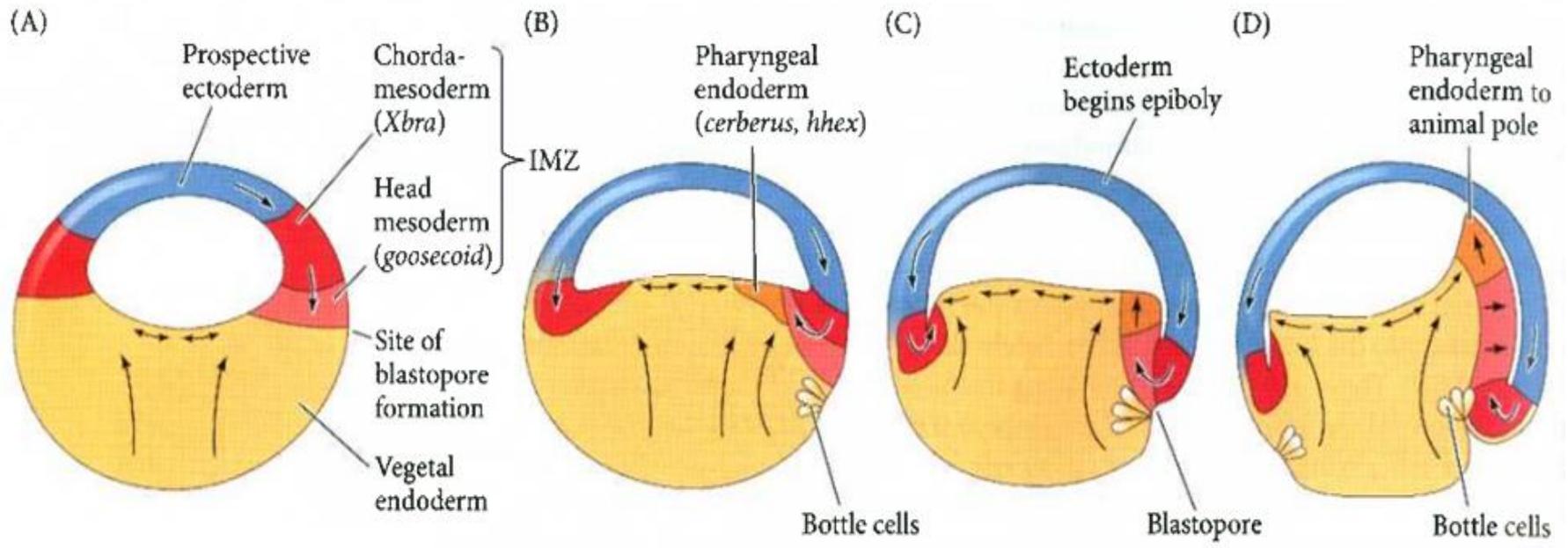


An Experimental Analysis of the Role of Bottle Cells and the Deep Marginal Zone in Gastrulation of *Xenopus laevis*

R.E. KELLER
Department of Biology, Indiana University, Bloomington, Indiana 47401
and Department of Biology, Yale University, New Haven, Connecticut 06520

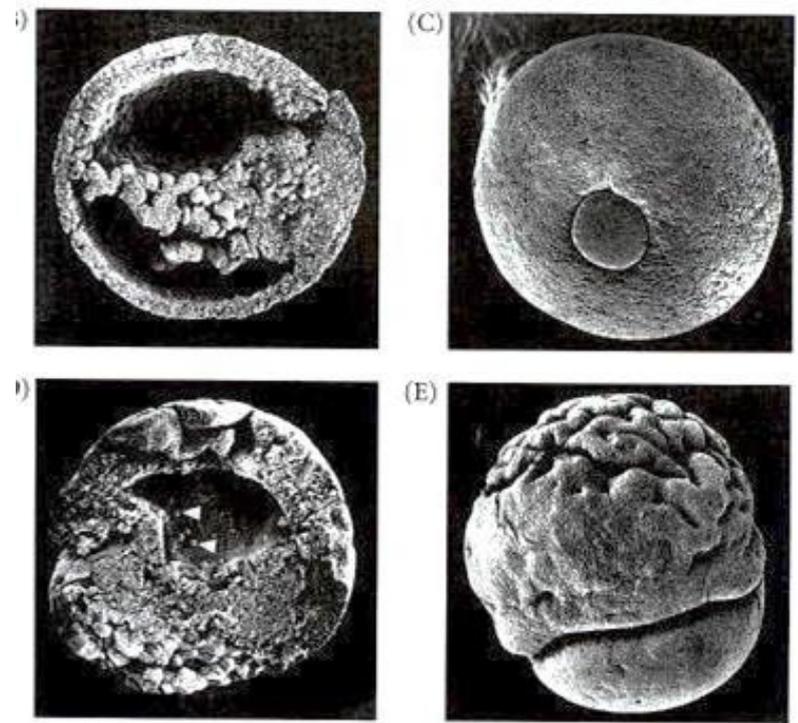


Rotación vegetal

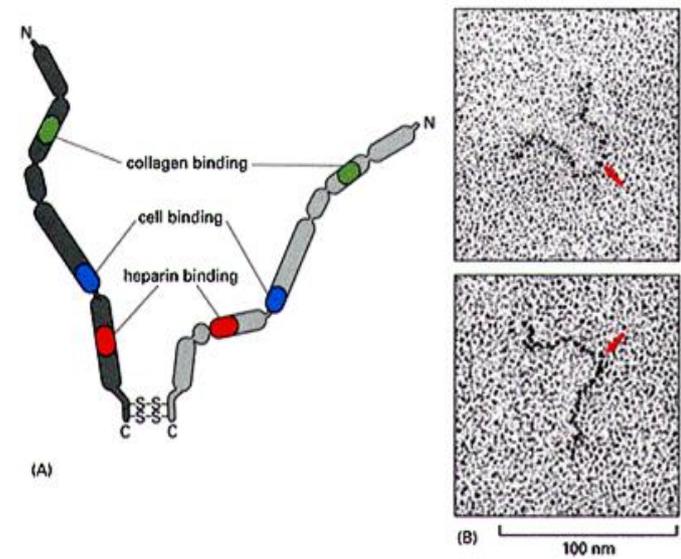
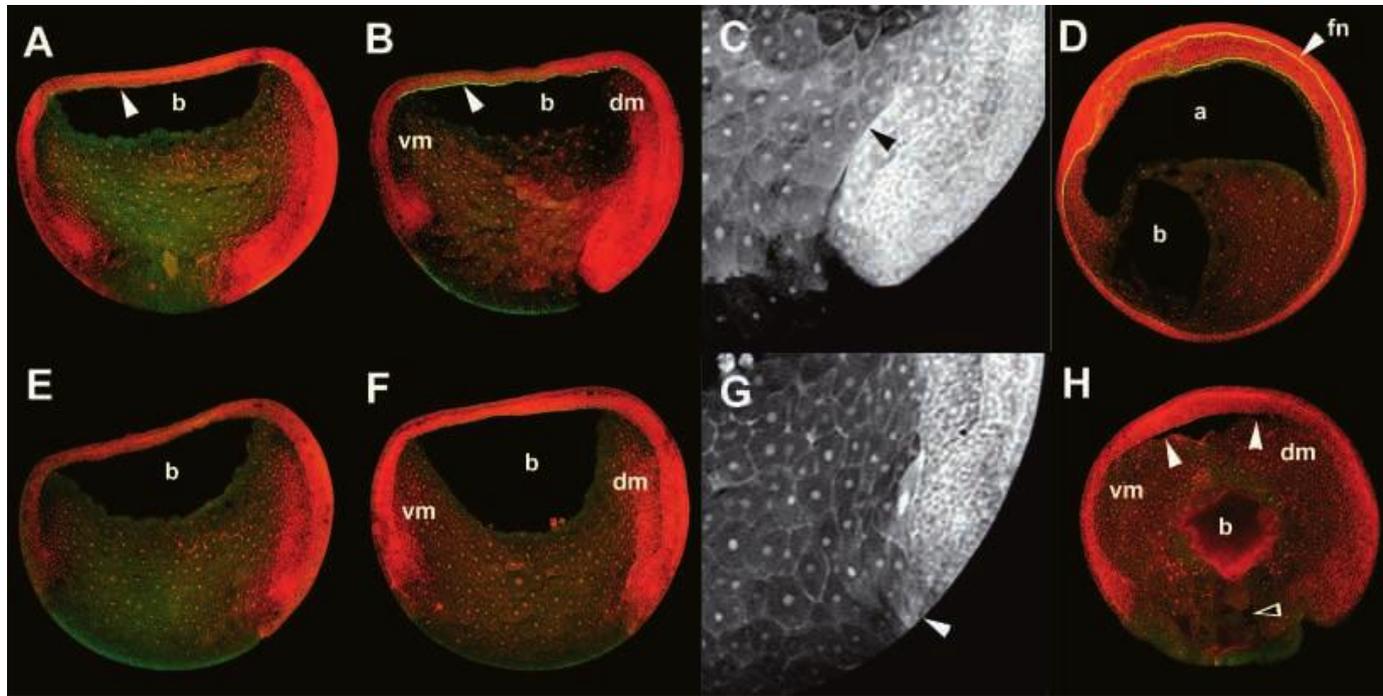


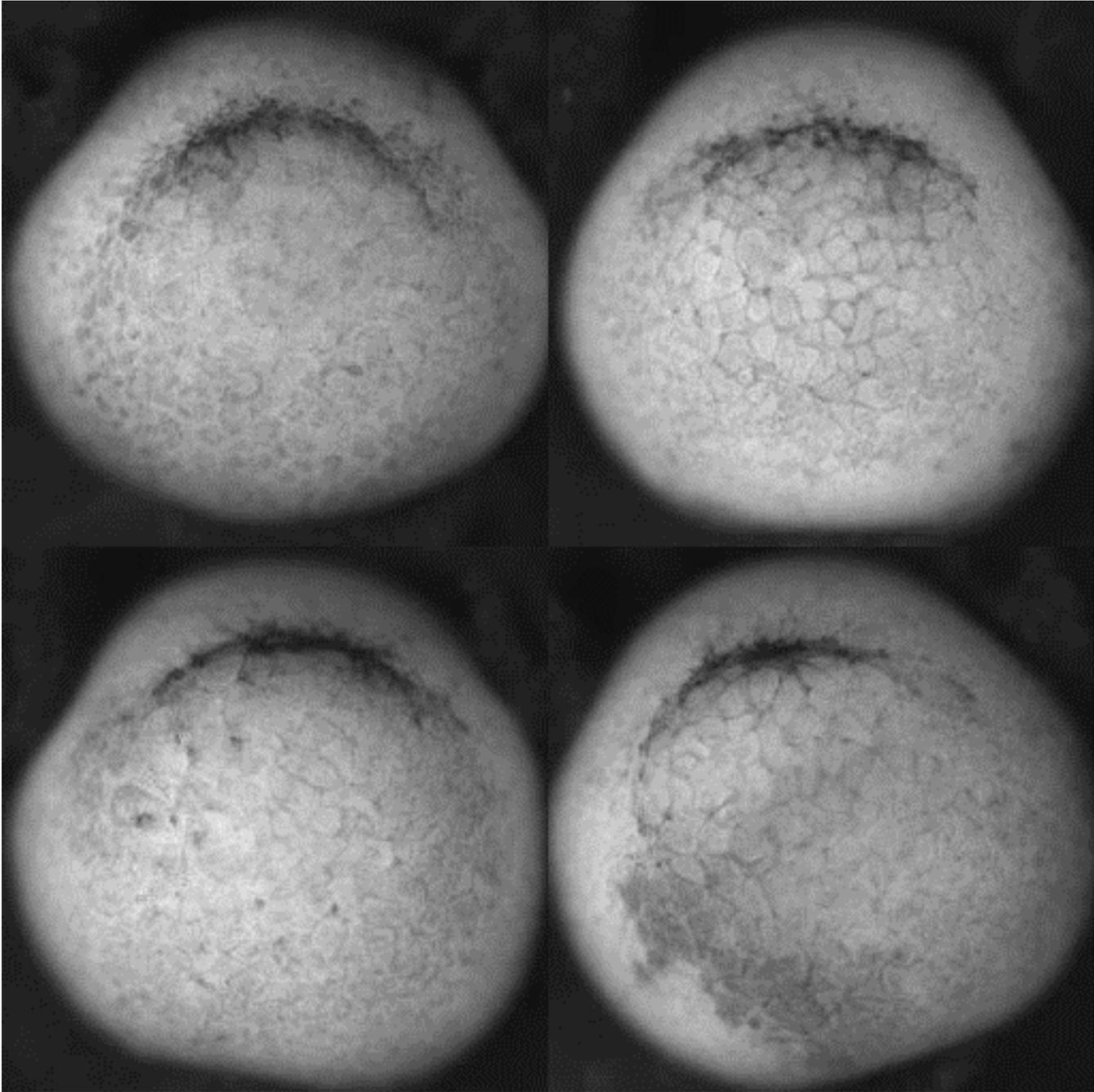
Coloca al endodermo faríngeo adyacente al blastocele, migrando hacia la futura región anterior del embrión

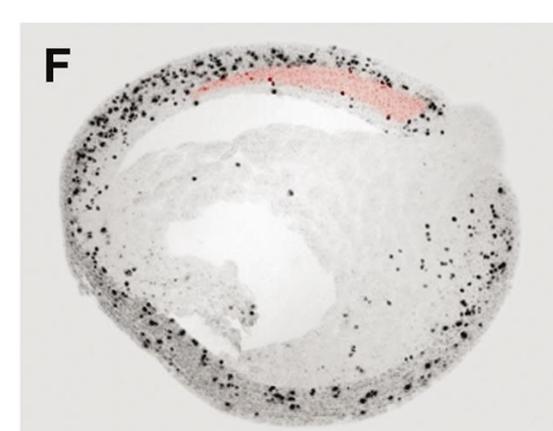
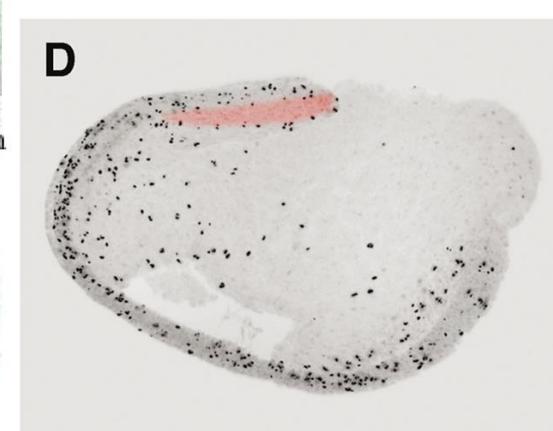
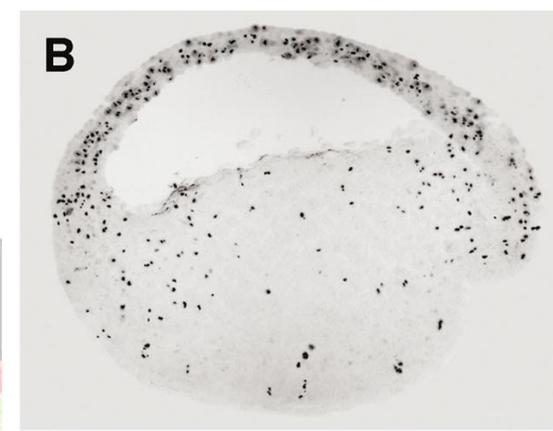
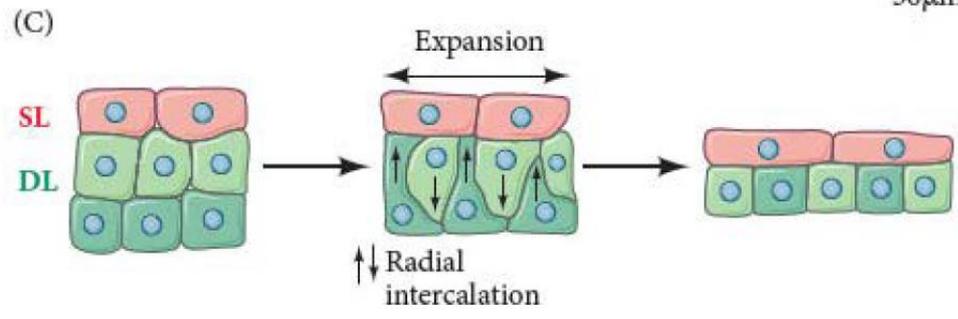
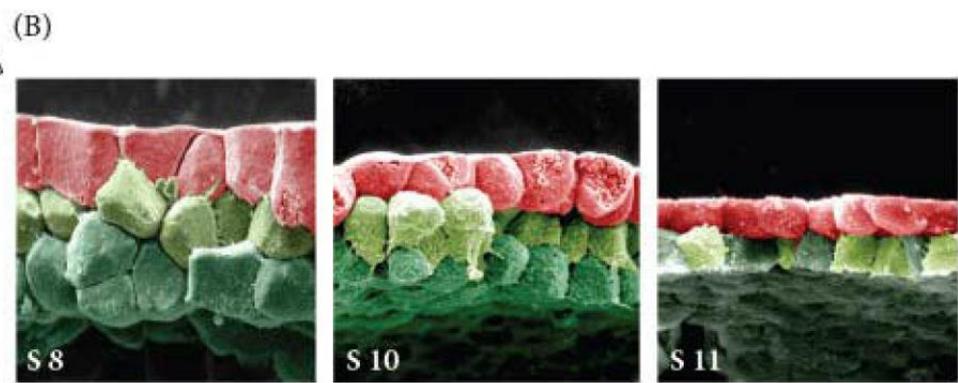
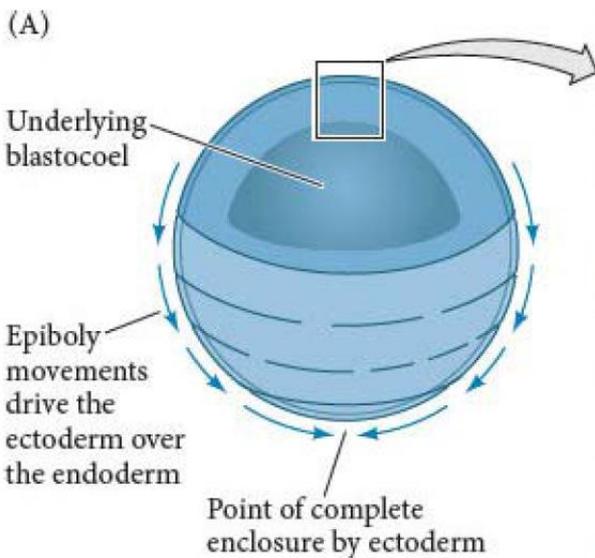
Rol de la fibronectina en la gastrulación de anfibios



Bloqueo funcional con mAb



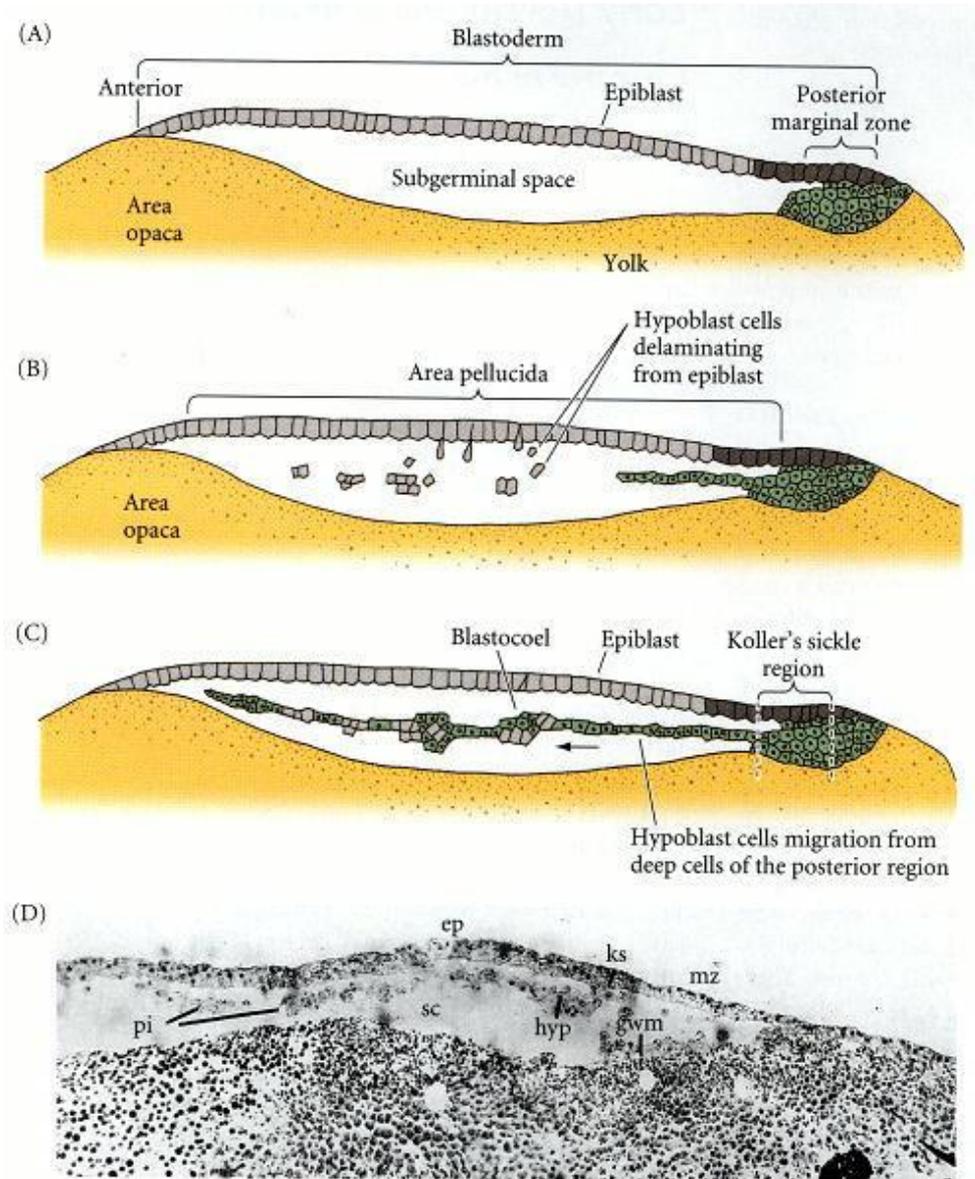
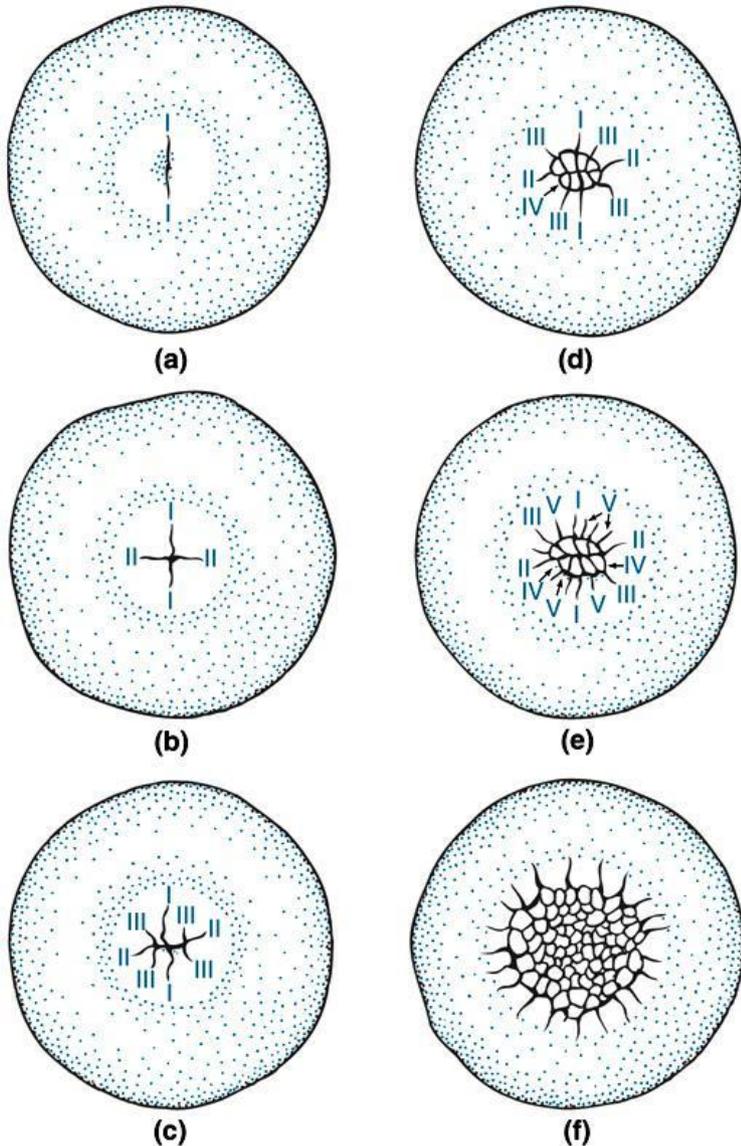


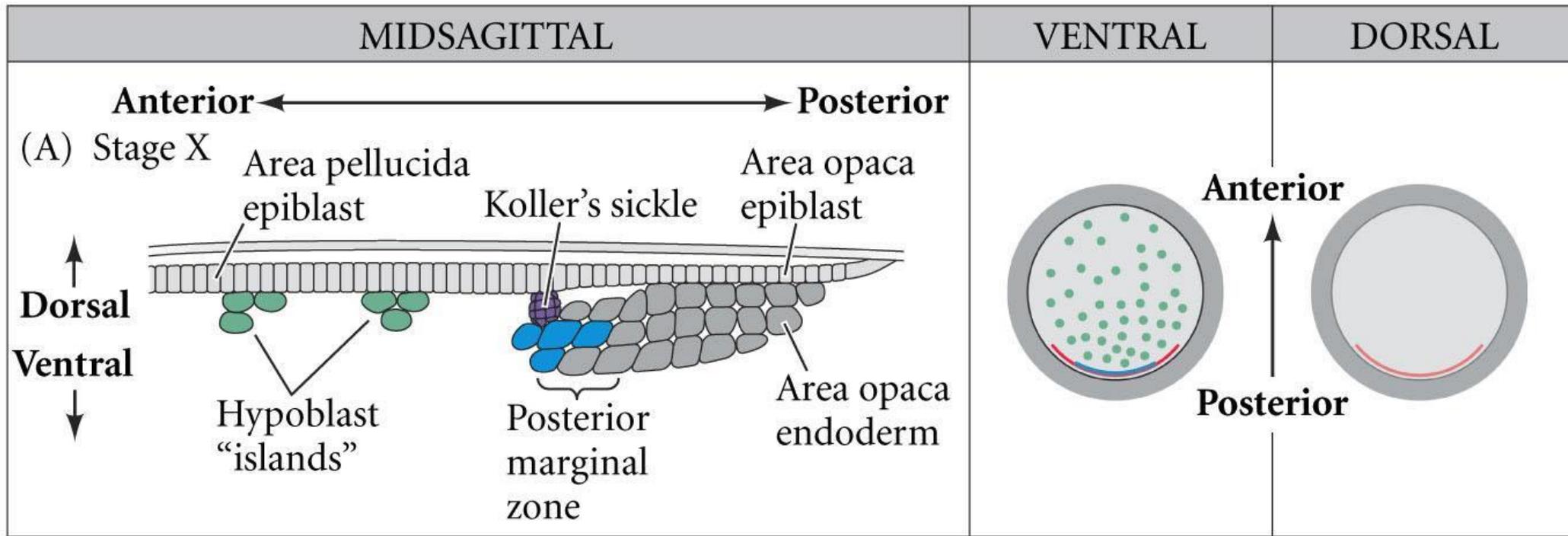


La epibolia del ectodermo es acompañada por aumento de la divisiones e intercalamientos celulares

Gastrulación

Embriones con clivaje meroblástico: aves



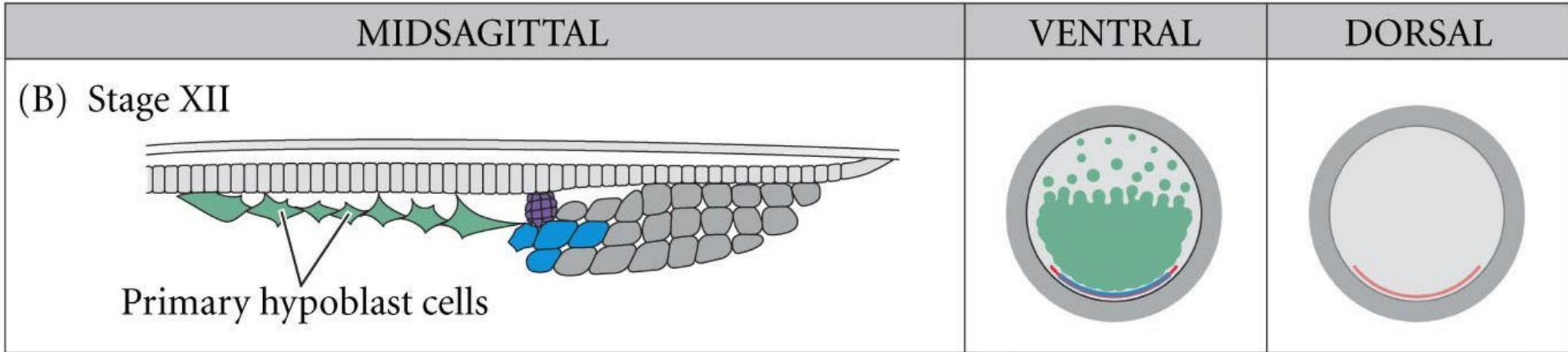


Entre 5-6 capas de células del blastodisco se sueltan y mueren

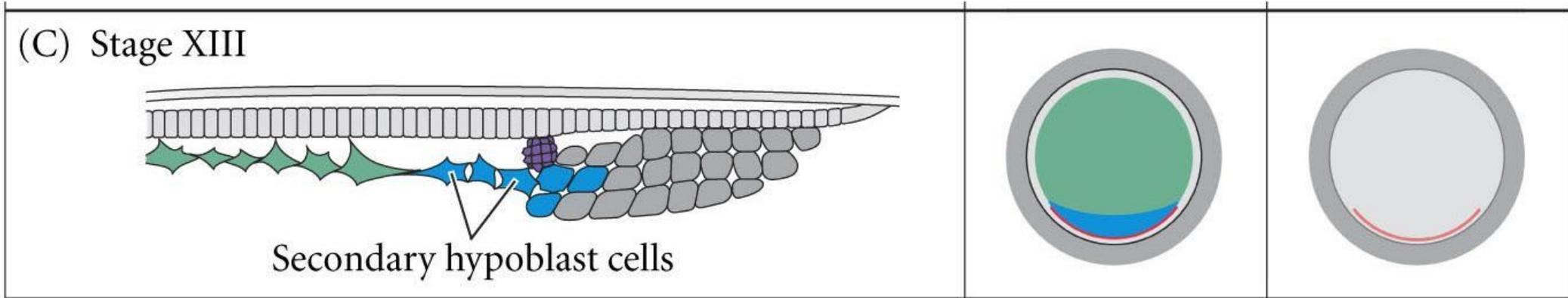
Se mantiene una única capa: **área pelúcida (epiblasto)**

Bordes: **área opaca**

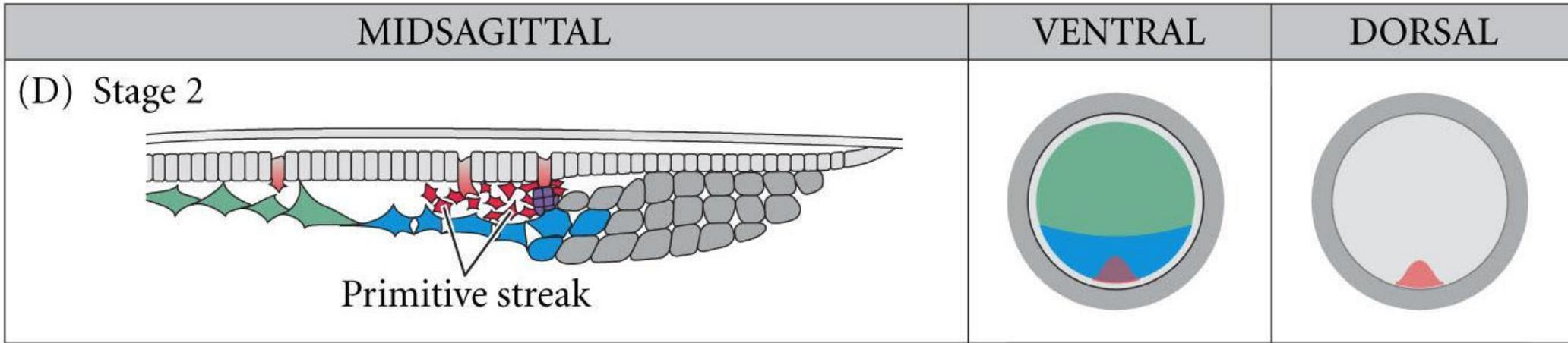
Algunas células del área pelúcida se sueltan: **islas de poli-invaginación**



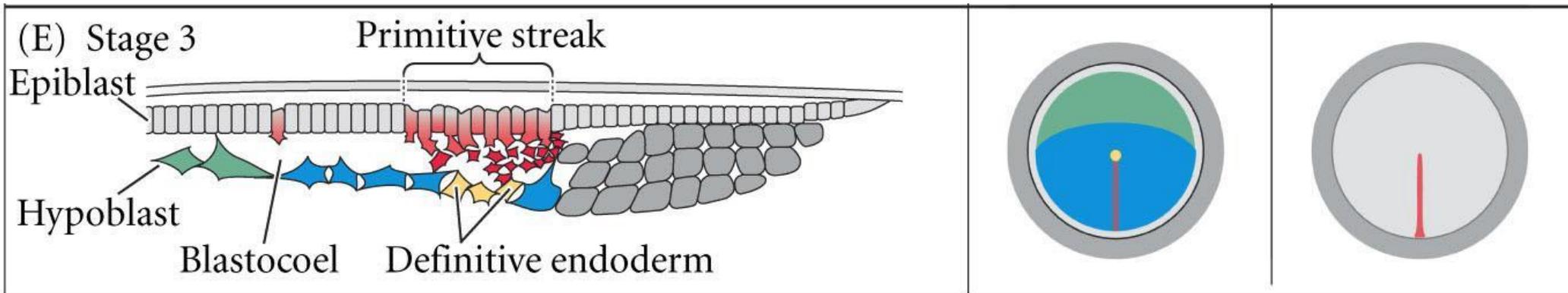
Las islas de poli-invaginación se unen: **hipoblasto primario**



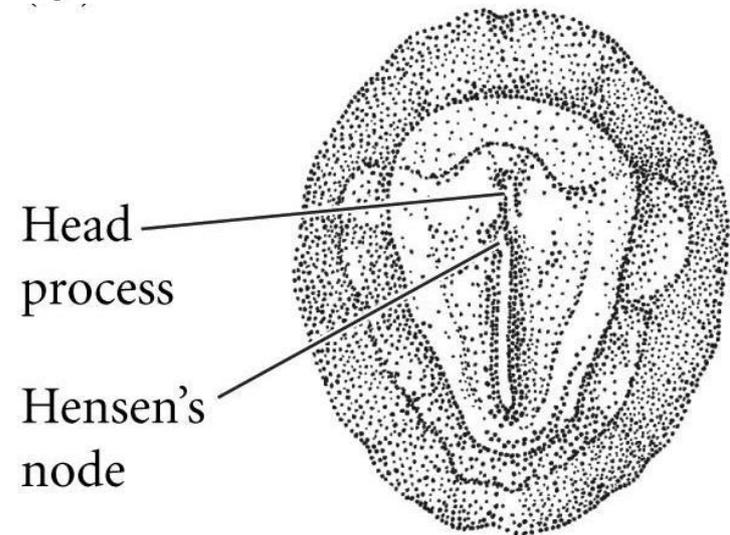
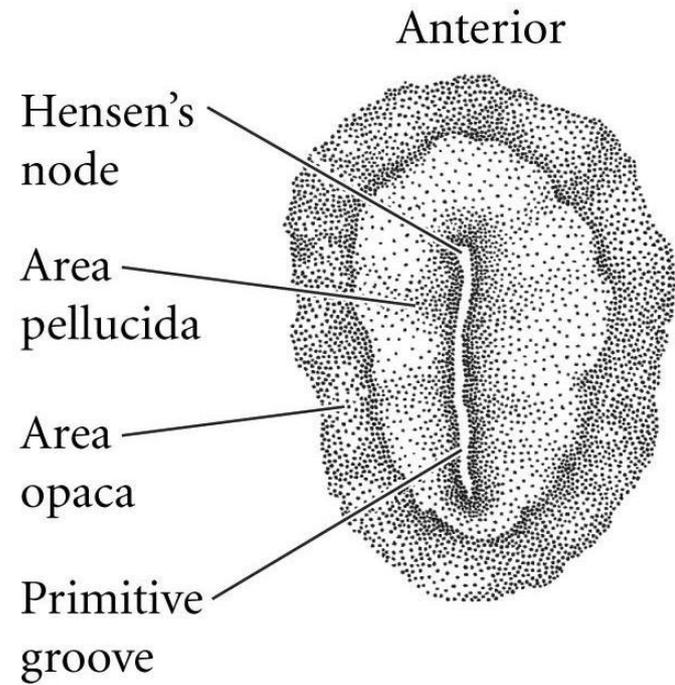
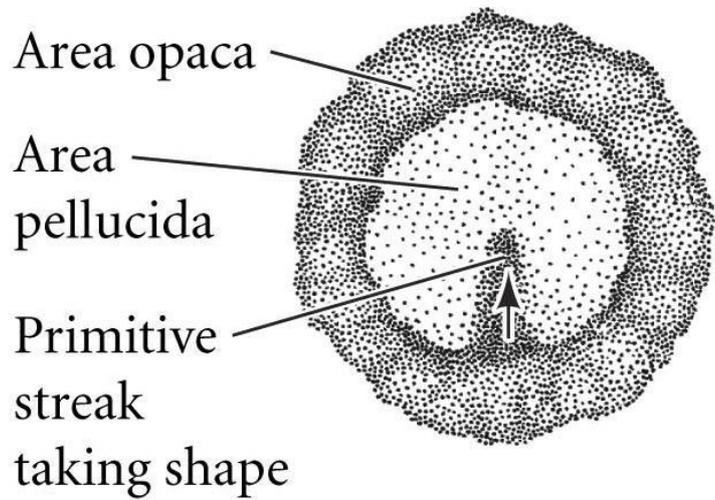
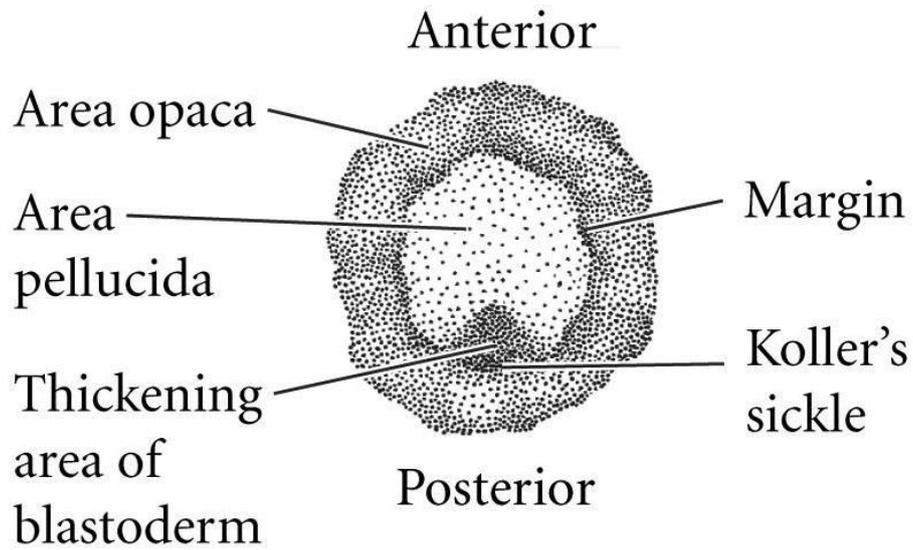
Desde la **Hoz de Koller** migra una capa de células formando el **hipoblasto secundario**

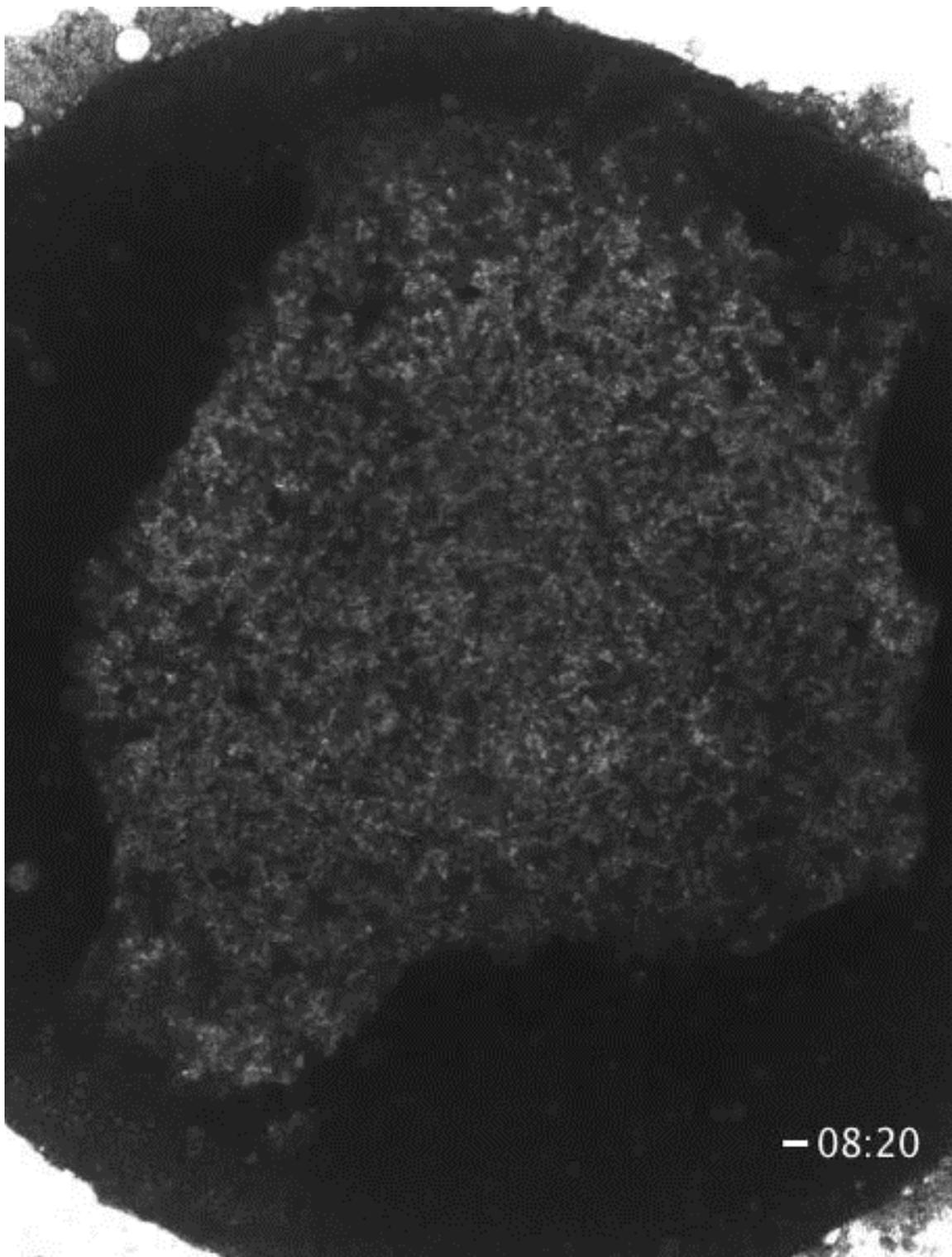


Células del centro del epiblasto se engrosan formando la **línea primitiva**

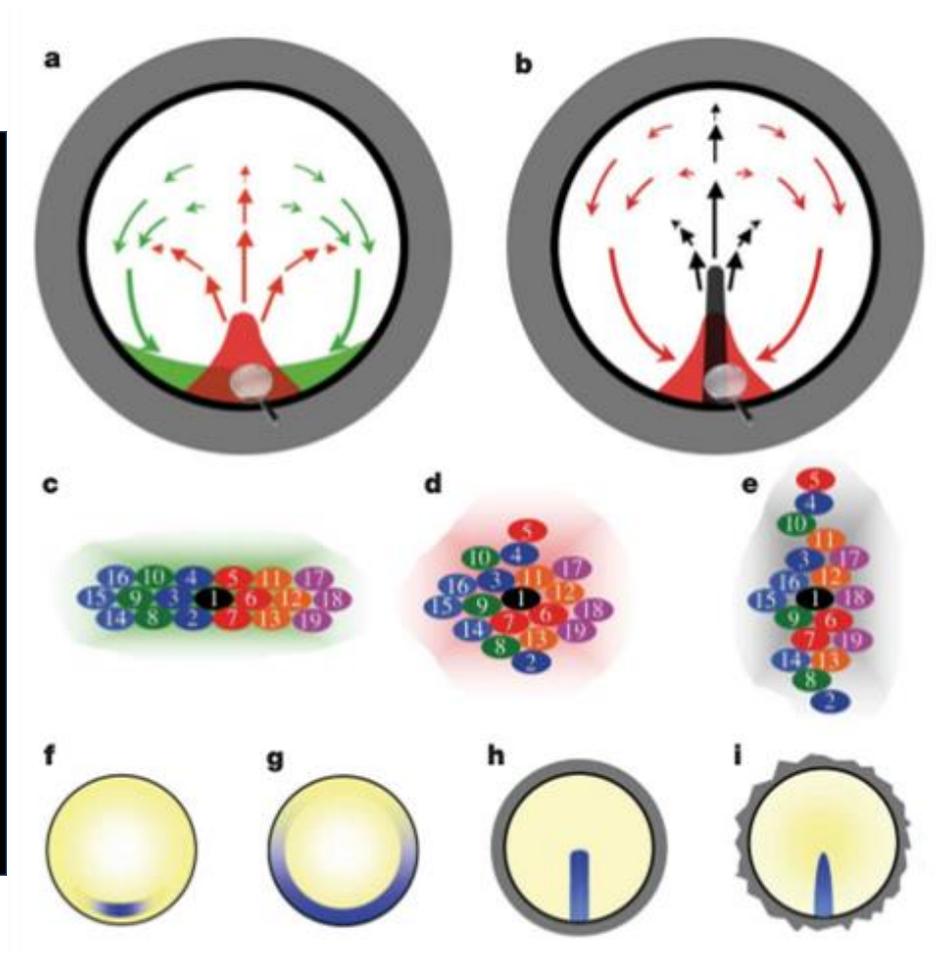


Depresión formada en la línea primitiva: **surco primitivo**
 Células ingresan a través del surco primitivo



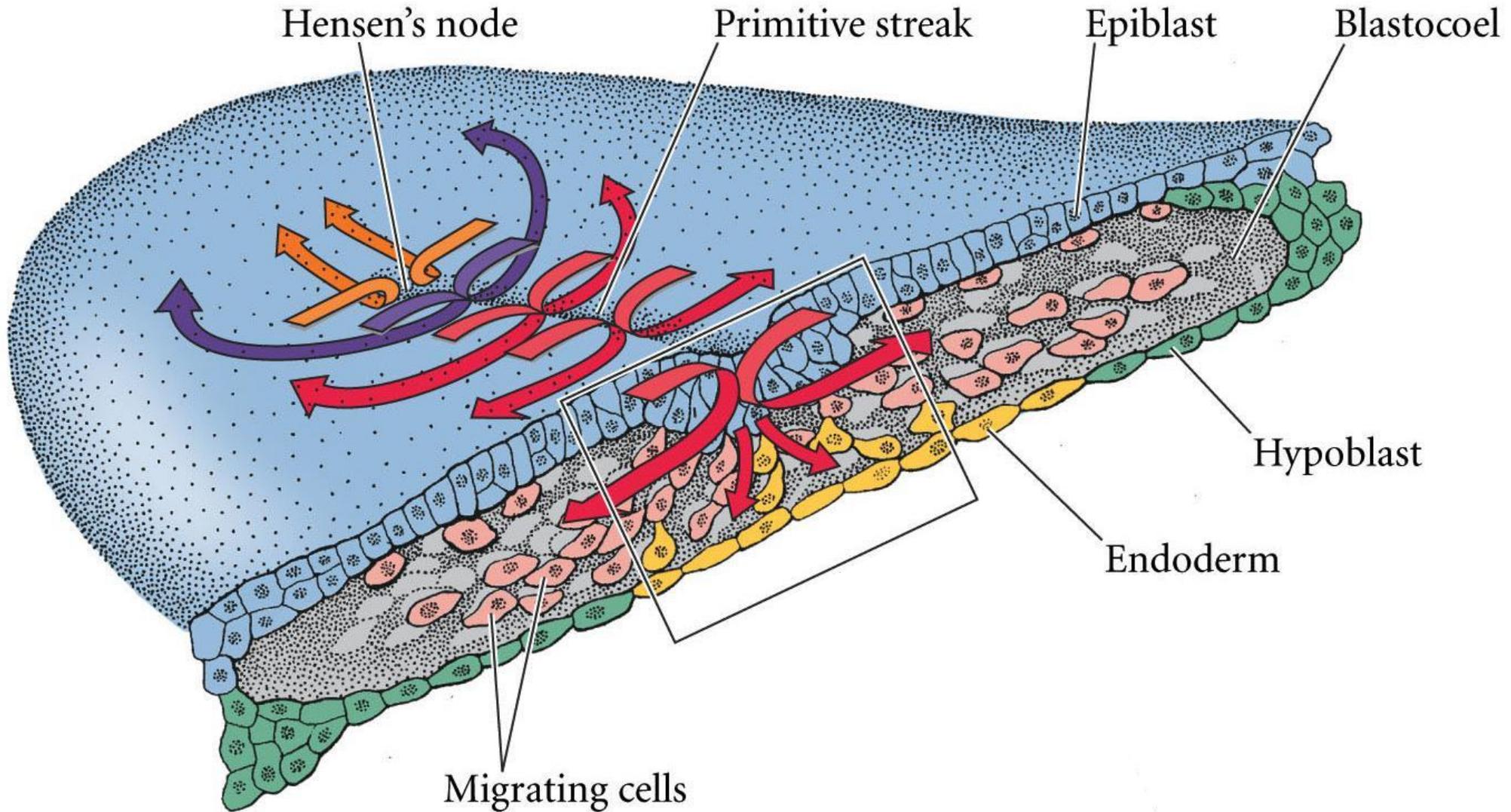


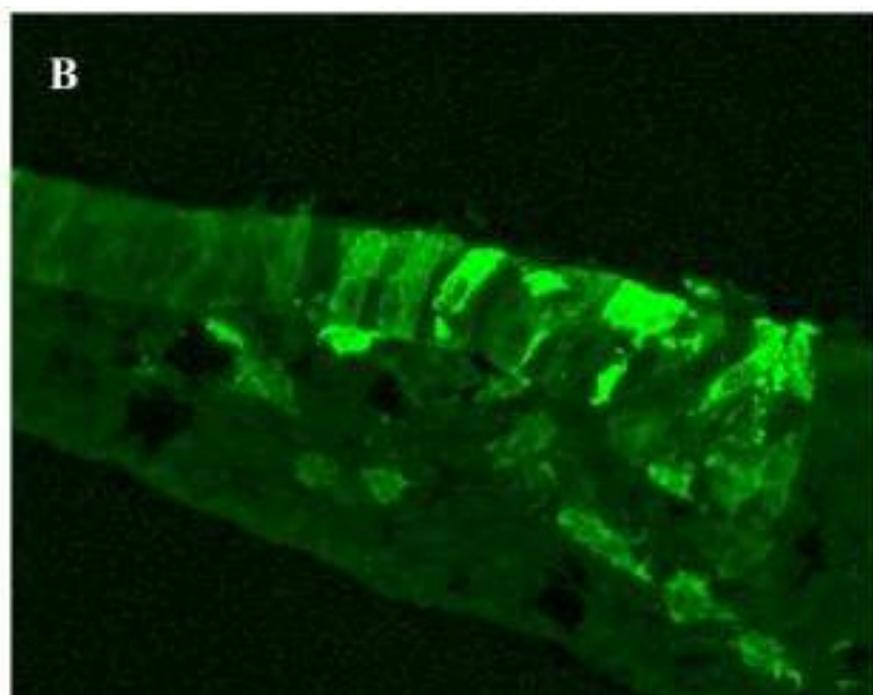
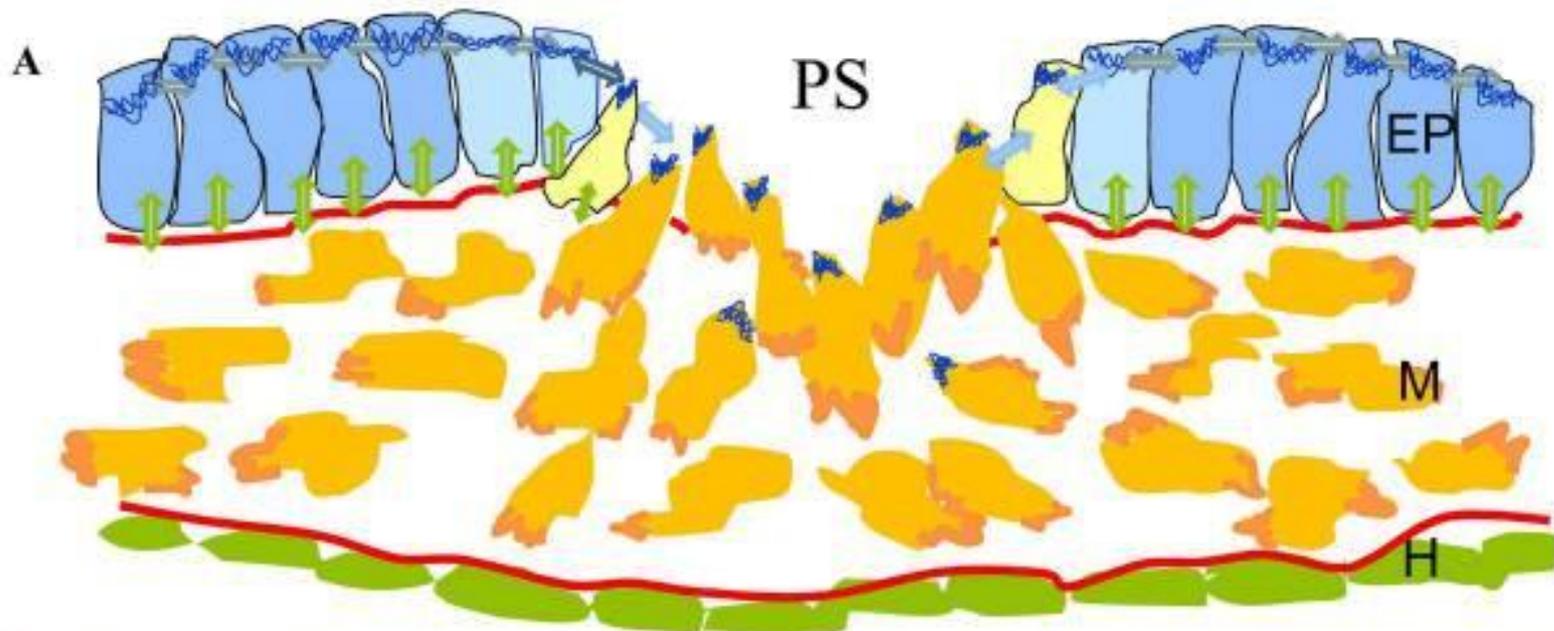
-08:20



Extensión de la línea primitiva: intercalación celular

Migración a través de la línea primitiva

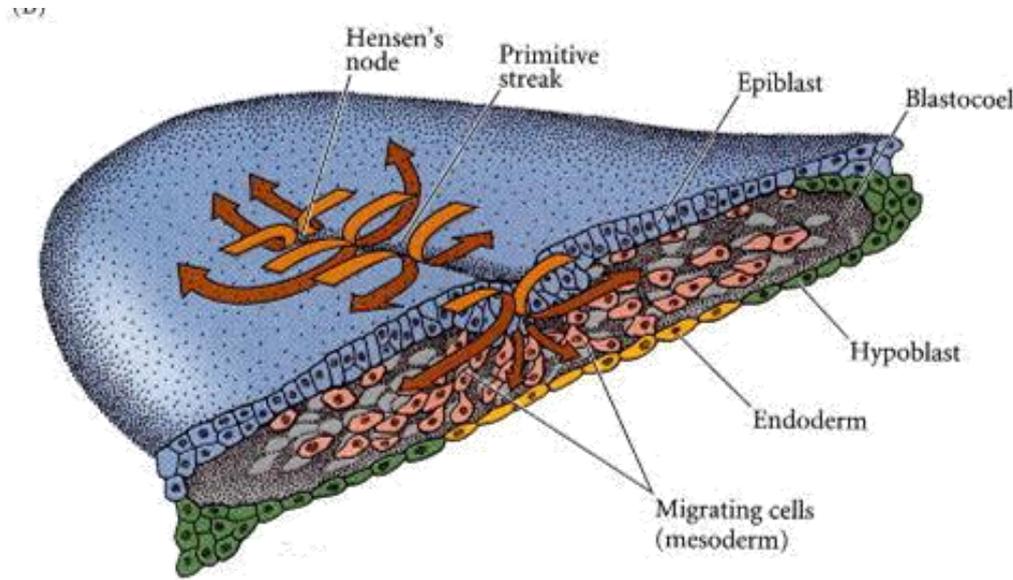




GFP

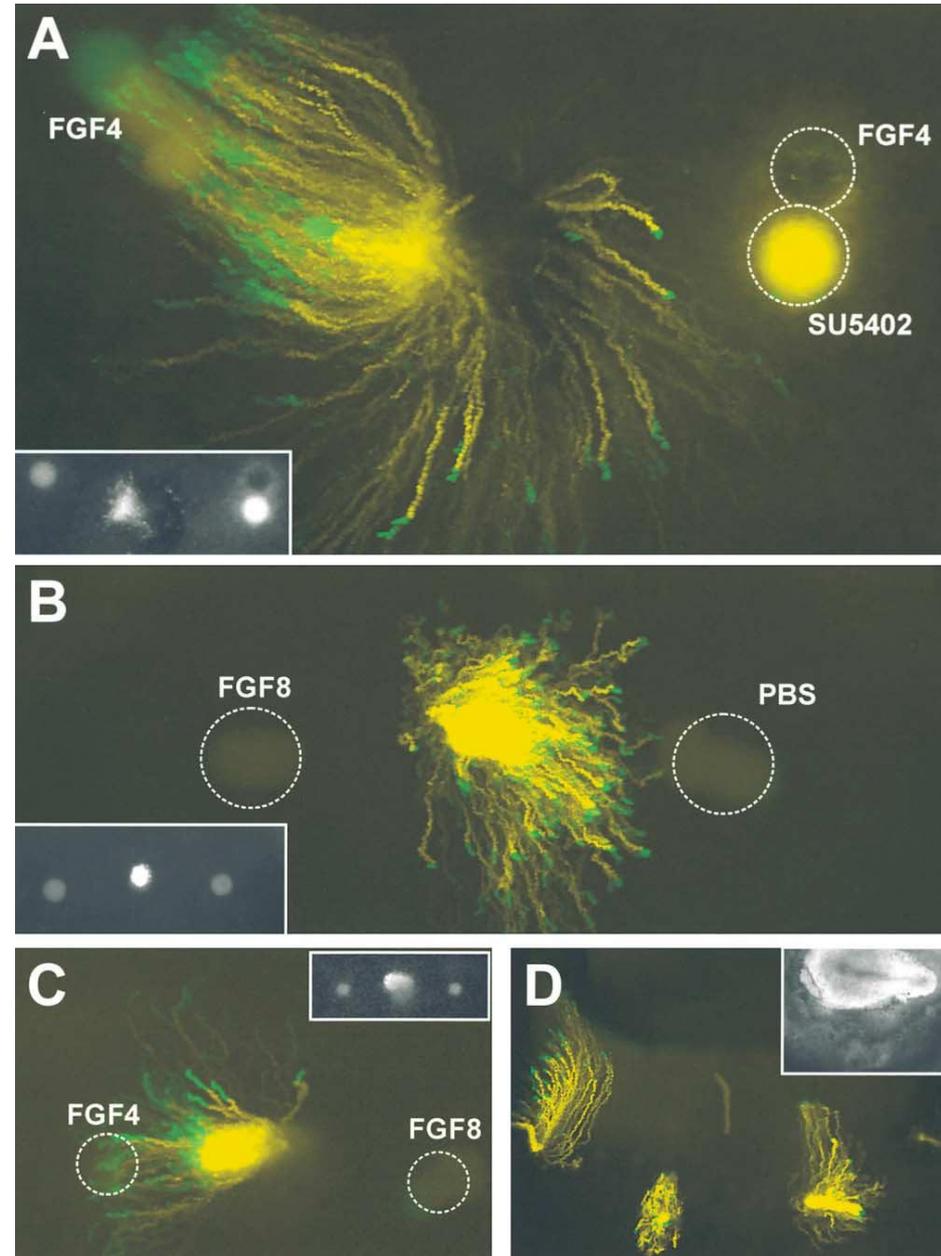
Cell Movement Patterns during Gastrulation in the Chick Are Controlled by Positive and Negative Chemotaxis Mediated by FGF4 and FGF8

Xuesong Yang, Dirk Dormann,
Andrea E. Münsterberg,² and Cornelis J. Weijer¹

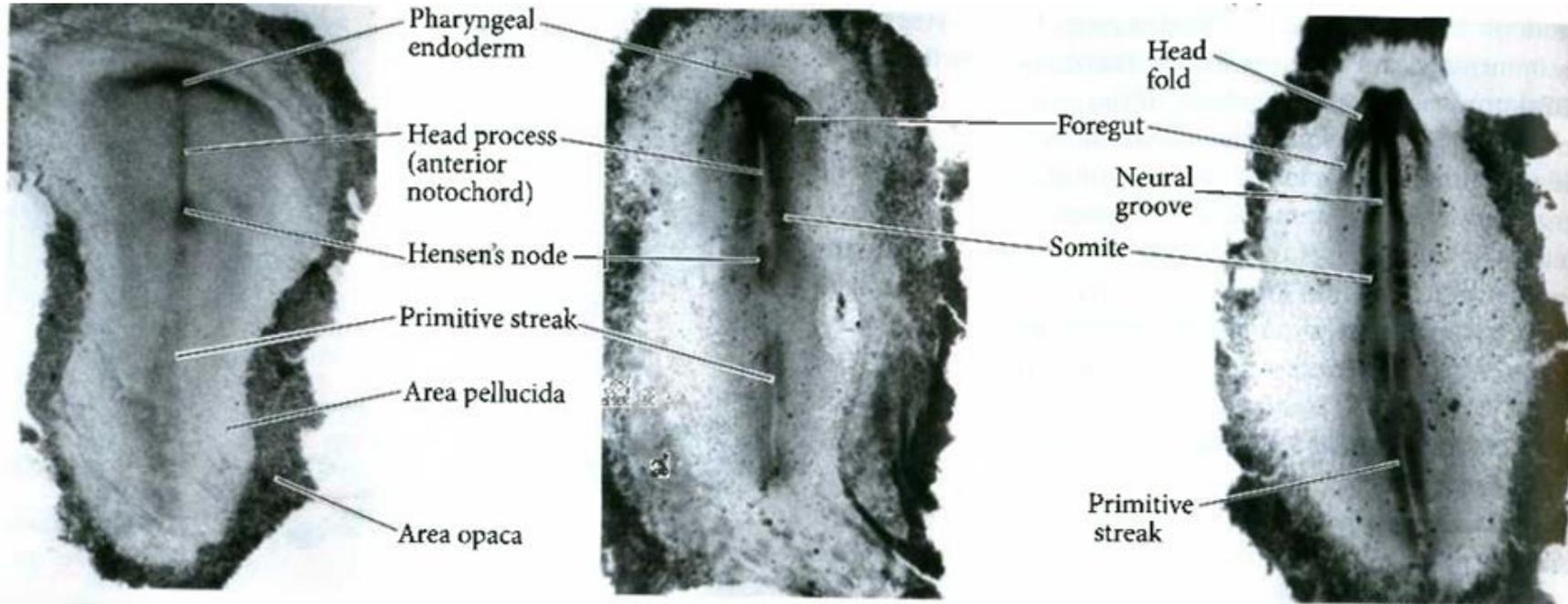
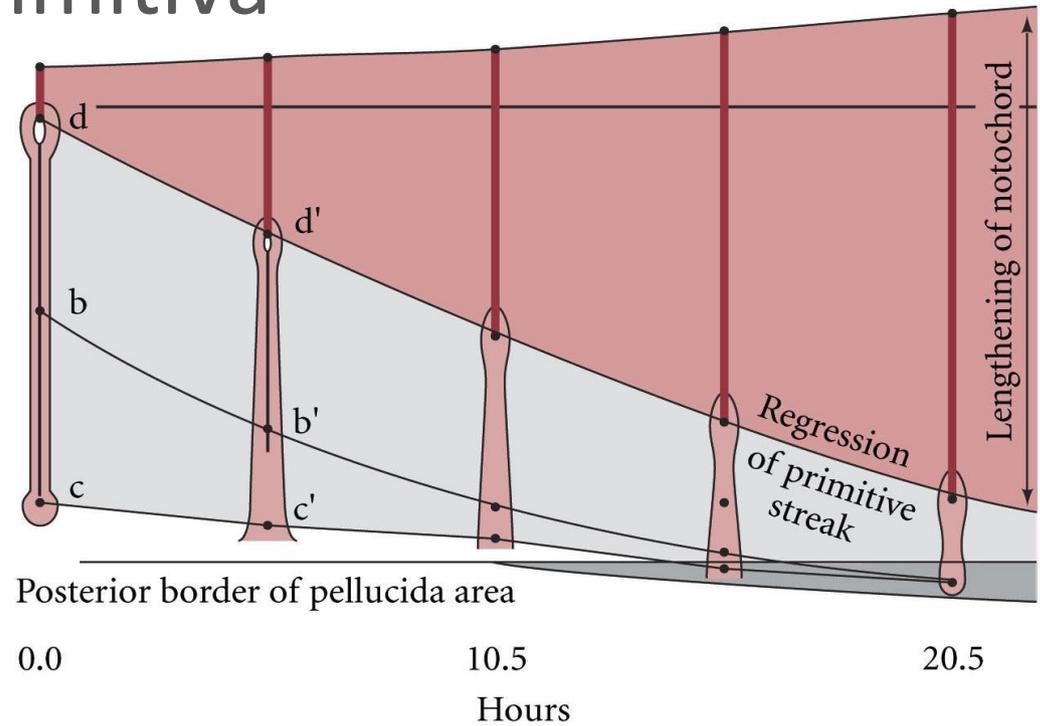


FGF8 se expresa en la línea primitiva
repele las células migratorias

FGF4 producida por el cordamesodermo
atrae células migratorias

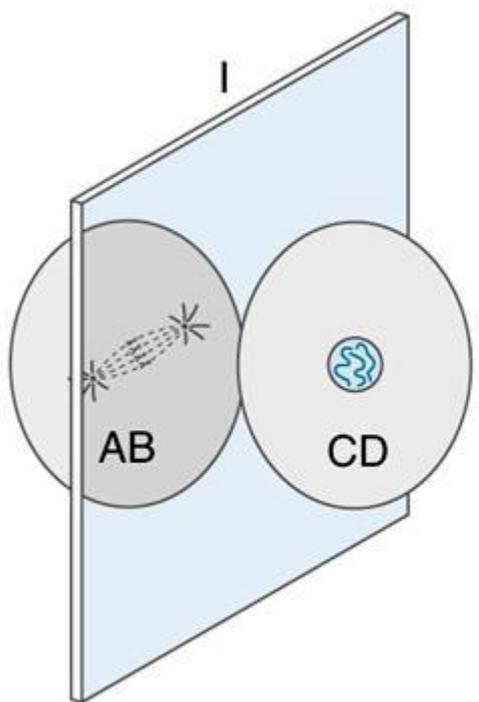


Regresión de la línea primitiva

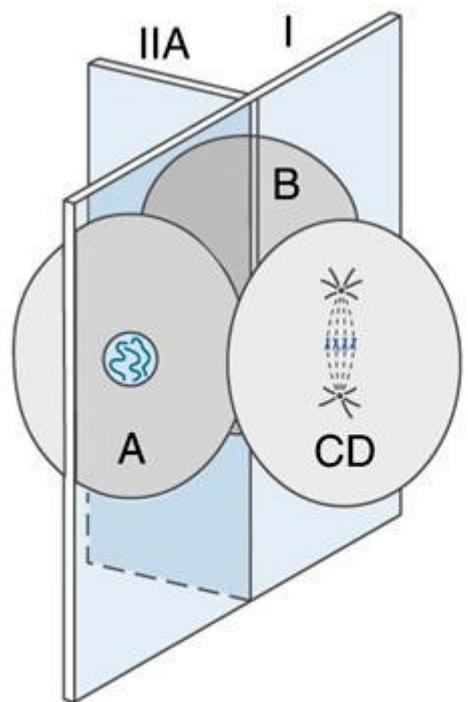


Gastrulación

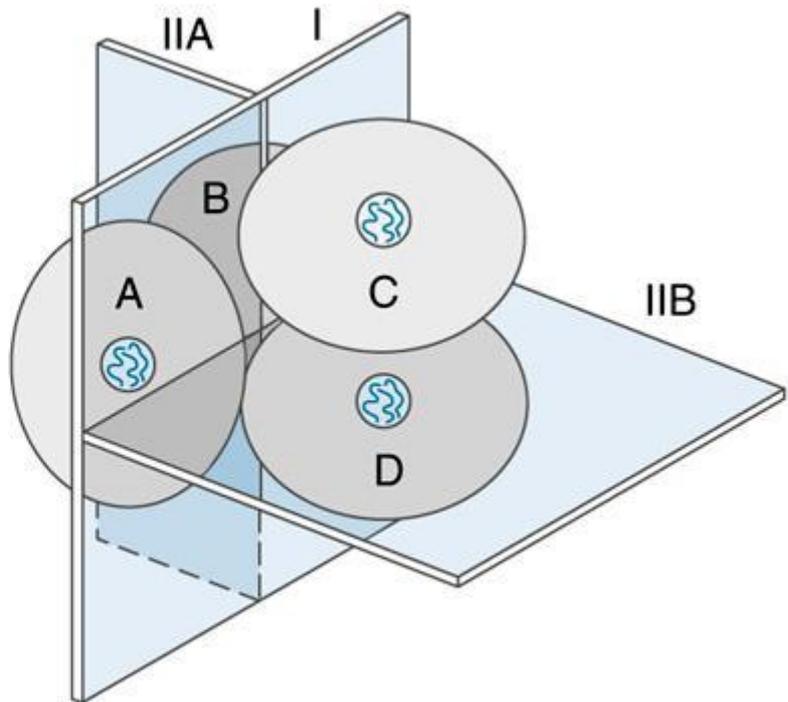
Embriones con clivaje holoblástico: mamíferos



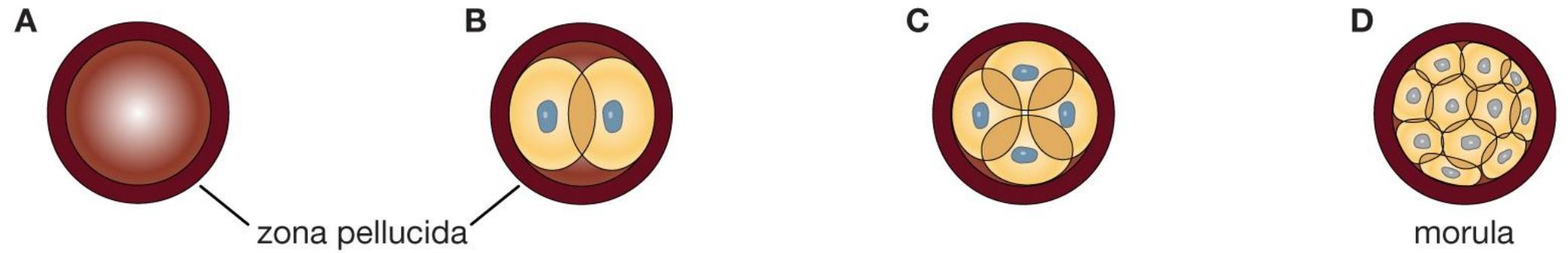
(a)



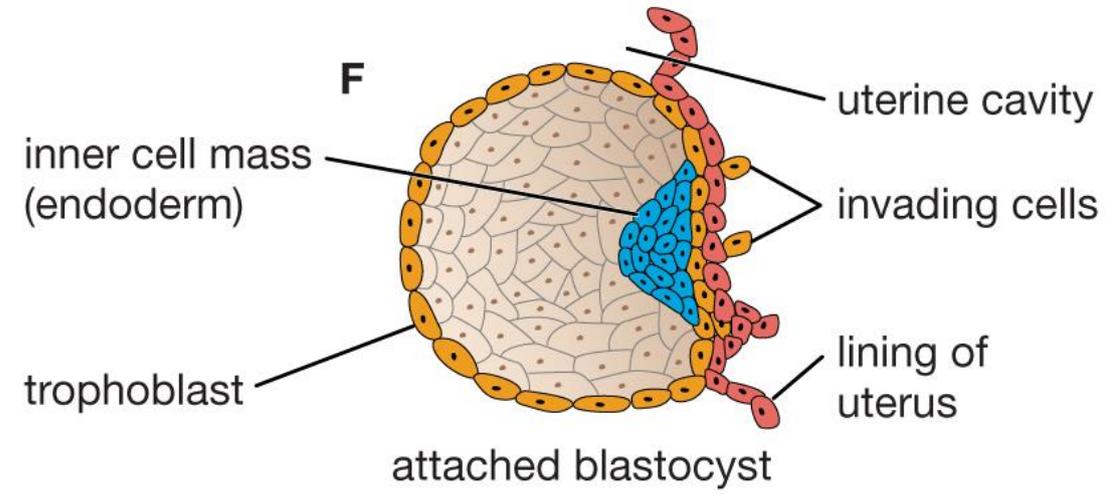
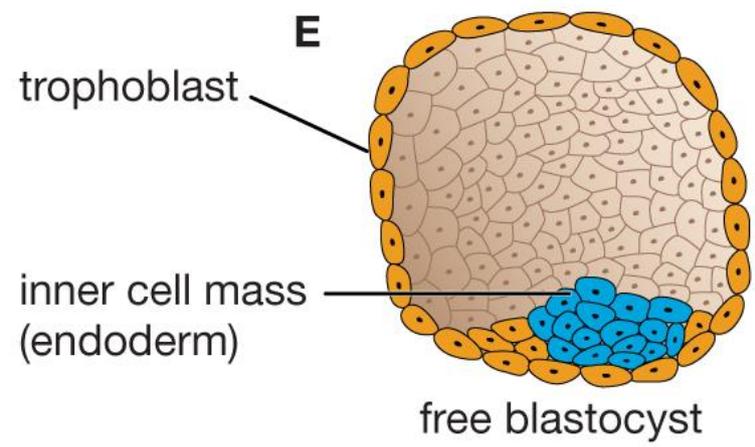
(b)

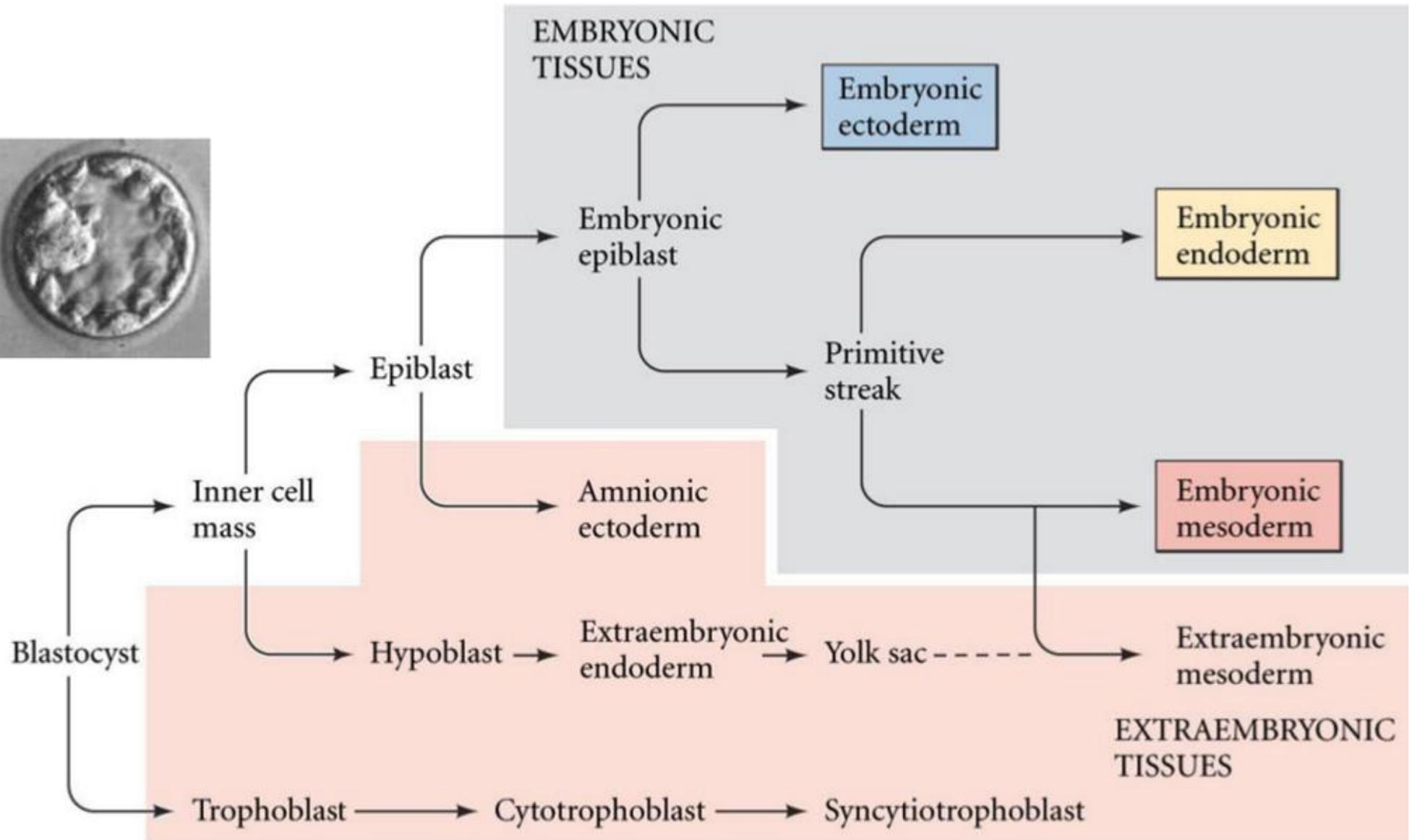


(c)

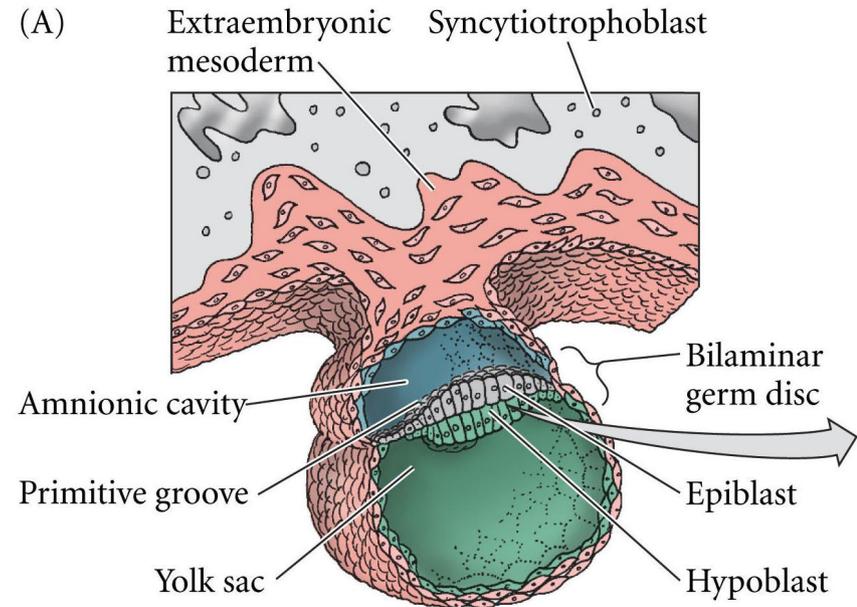
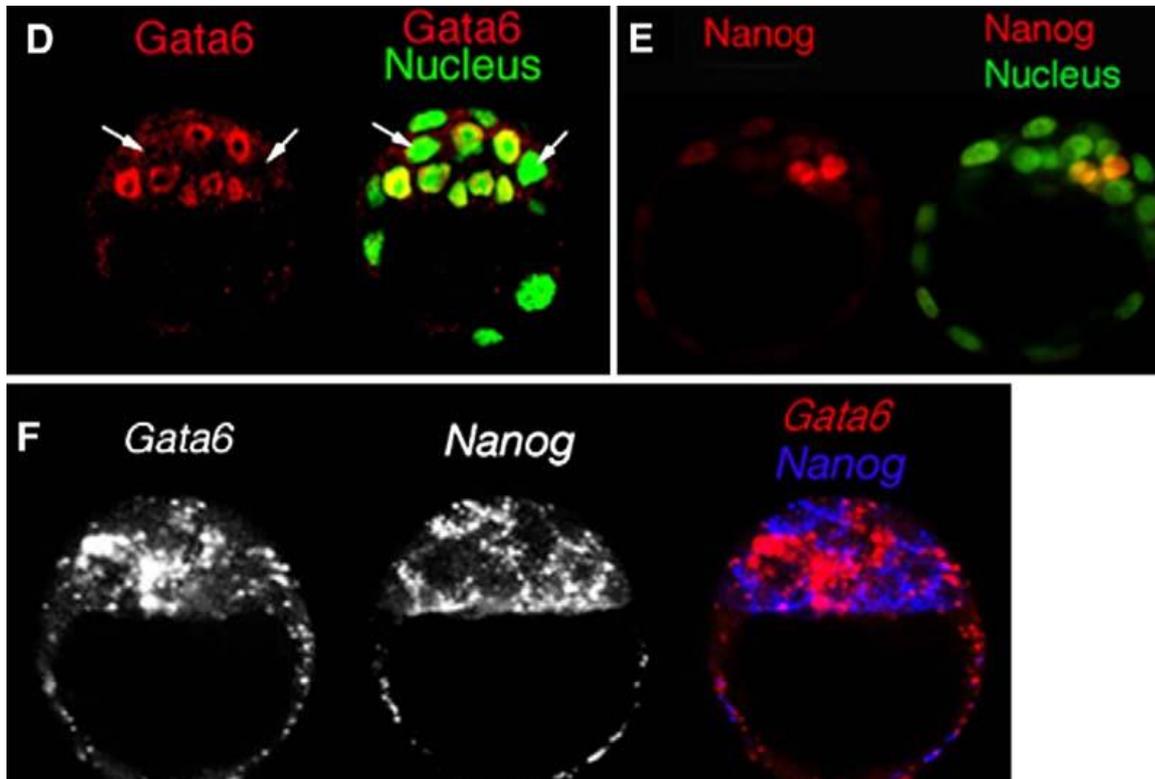


Blastocyst development

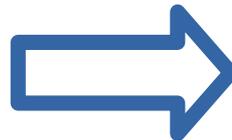




El endodermo primitivo: hipoblasto de mamíferos



Gata6 endodermo primitivo
Nanog epiblasto



Disco bilaminar germinal

