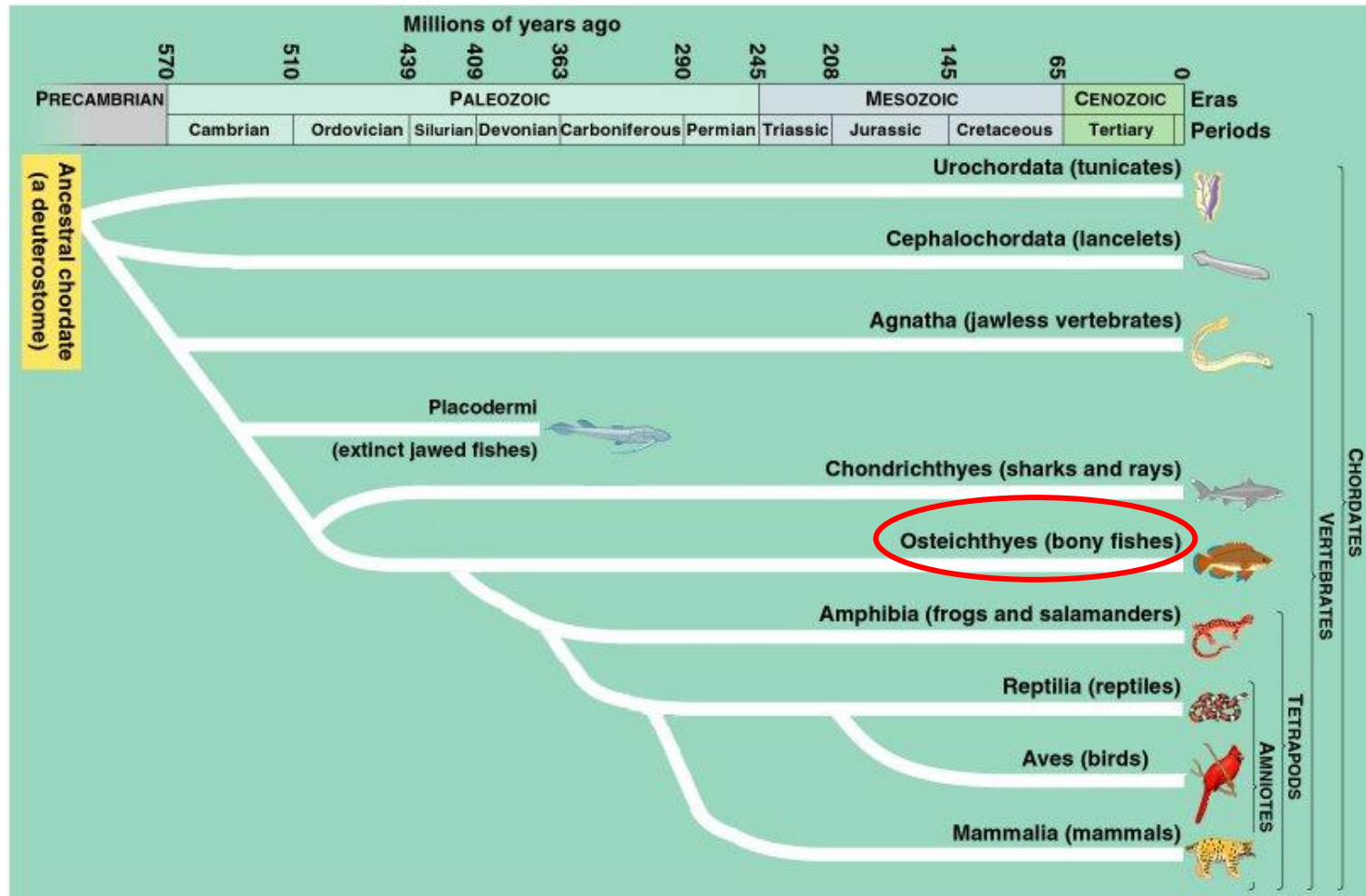
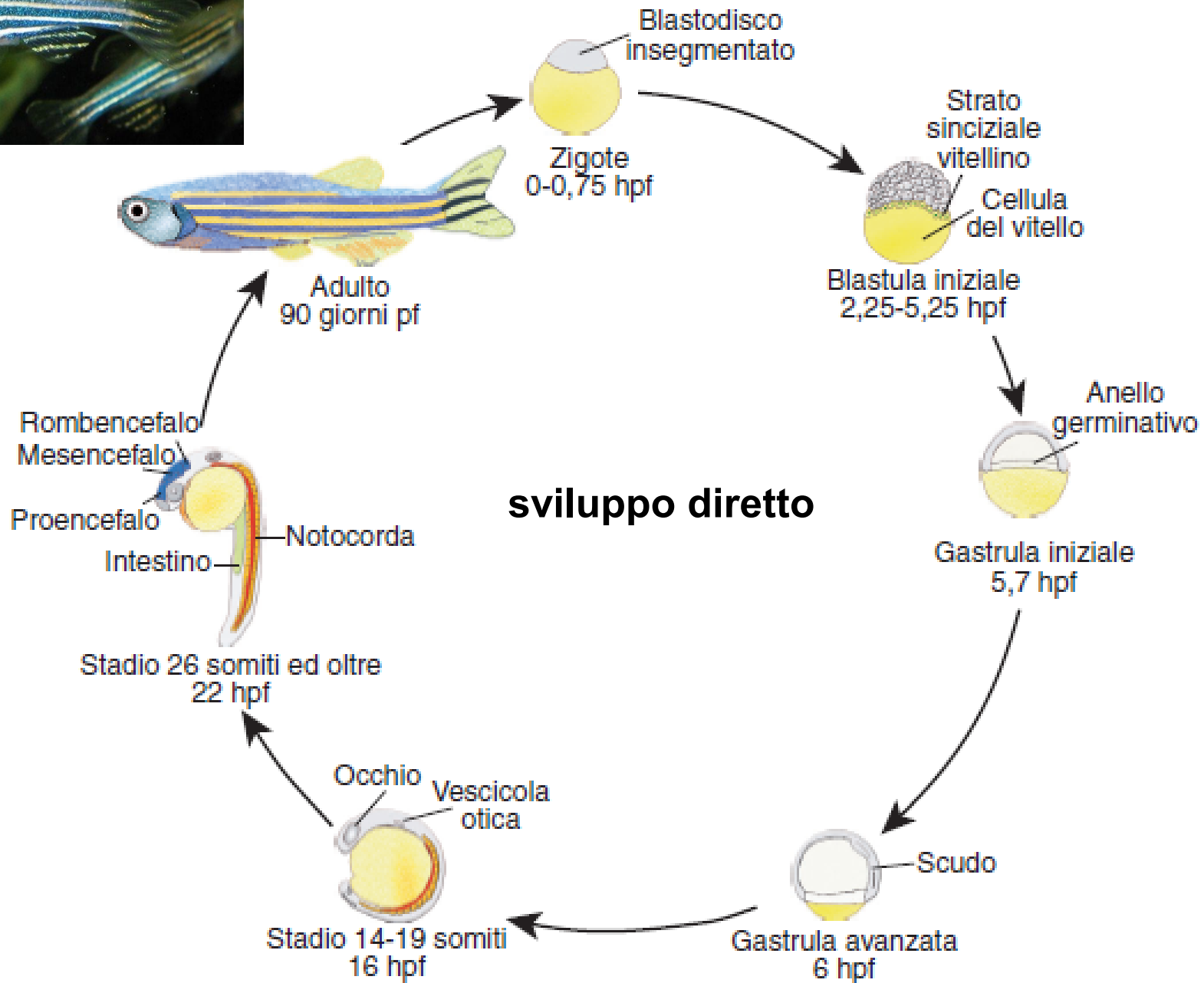
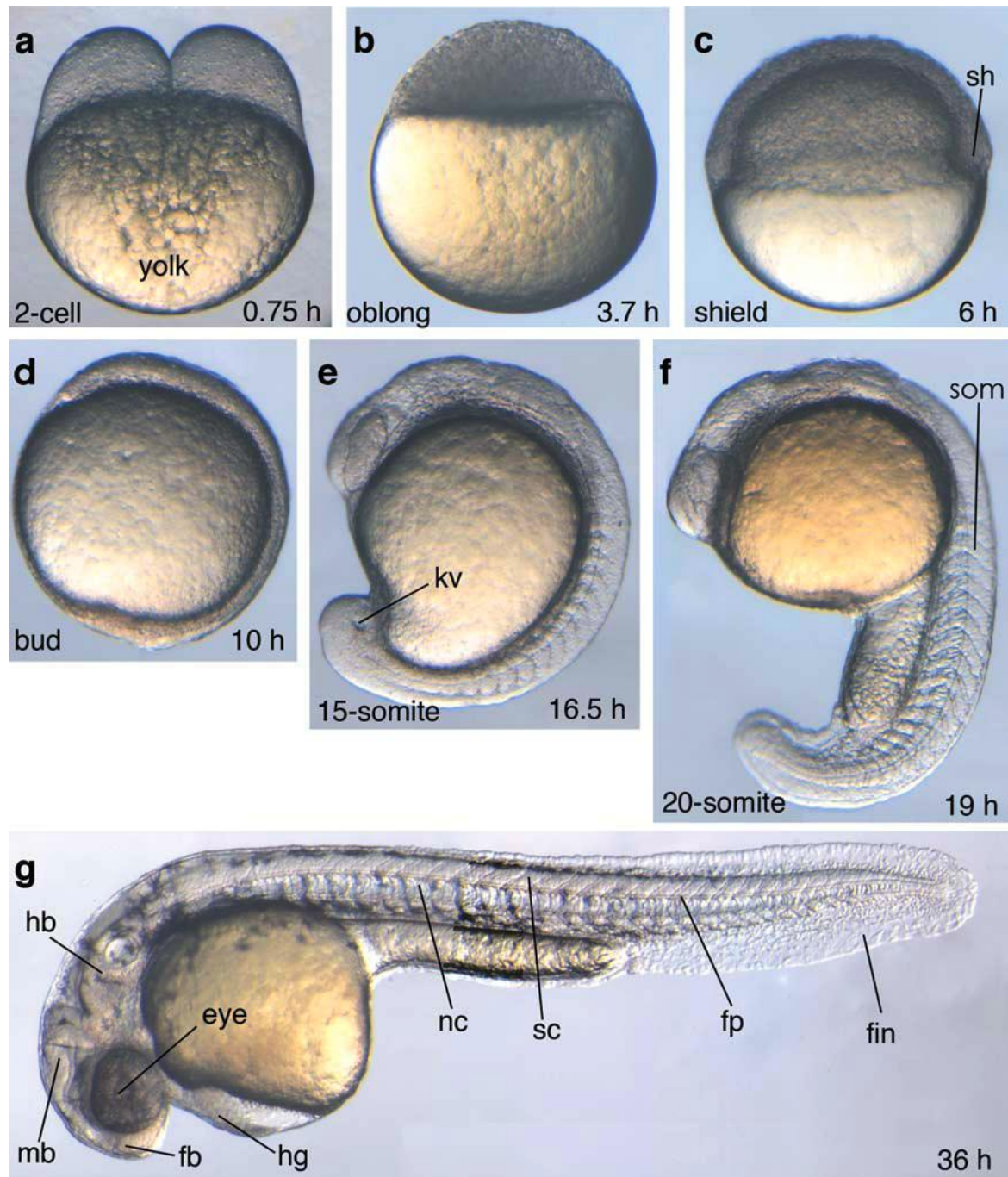


FILOGENESI DEI CORDATI



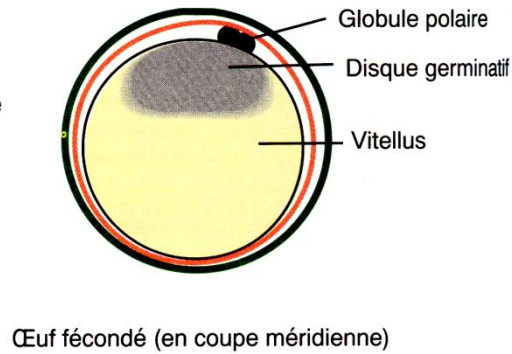
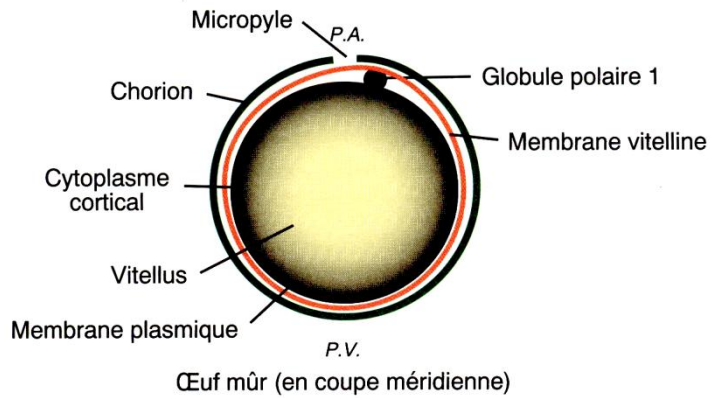
ZEBRAFISH (*Danio rerio*)



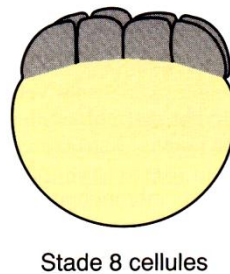
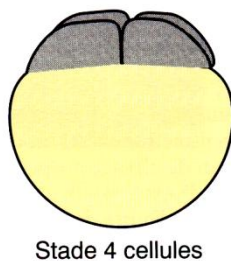
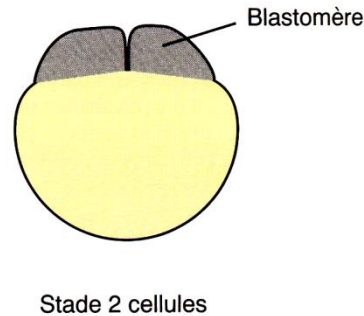
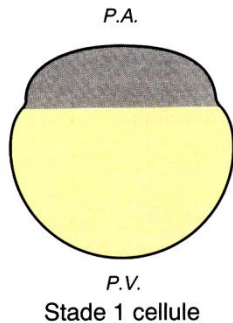


Premières étapes de la segmentation

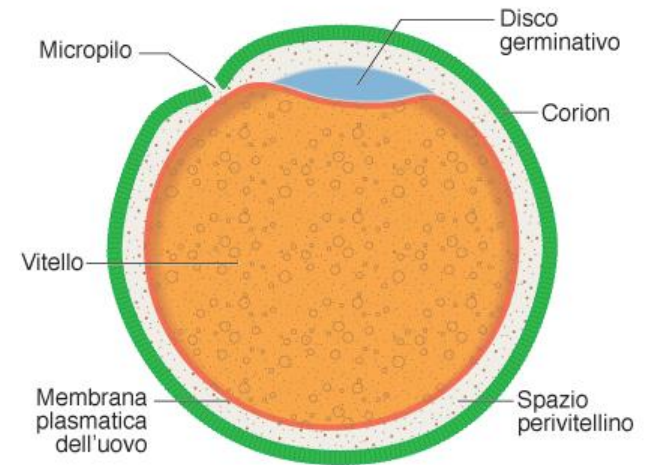
a) L'œuf insegmenté



b) La segmentation : premiers stades (vues latérales externes)

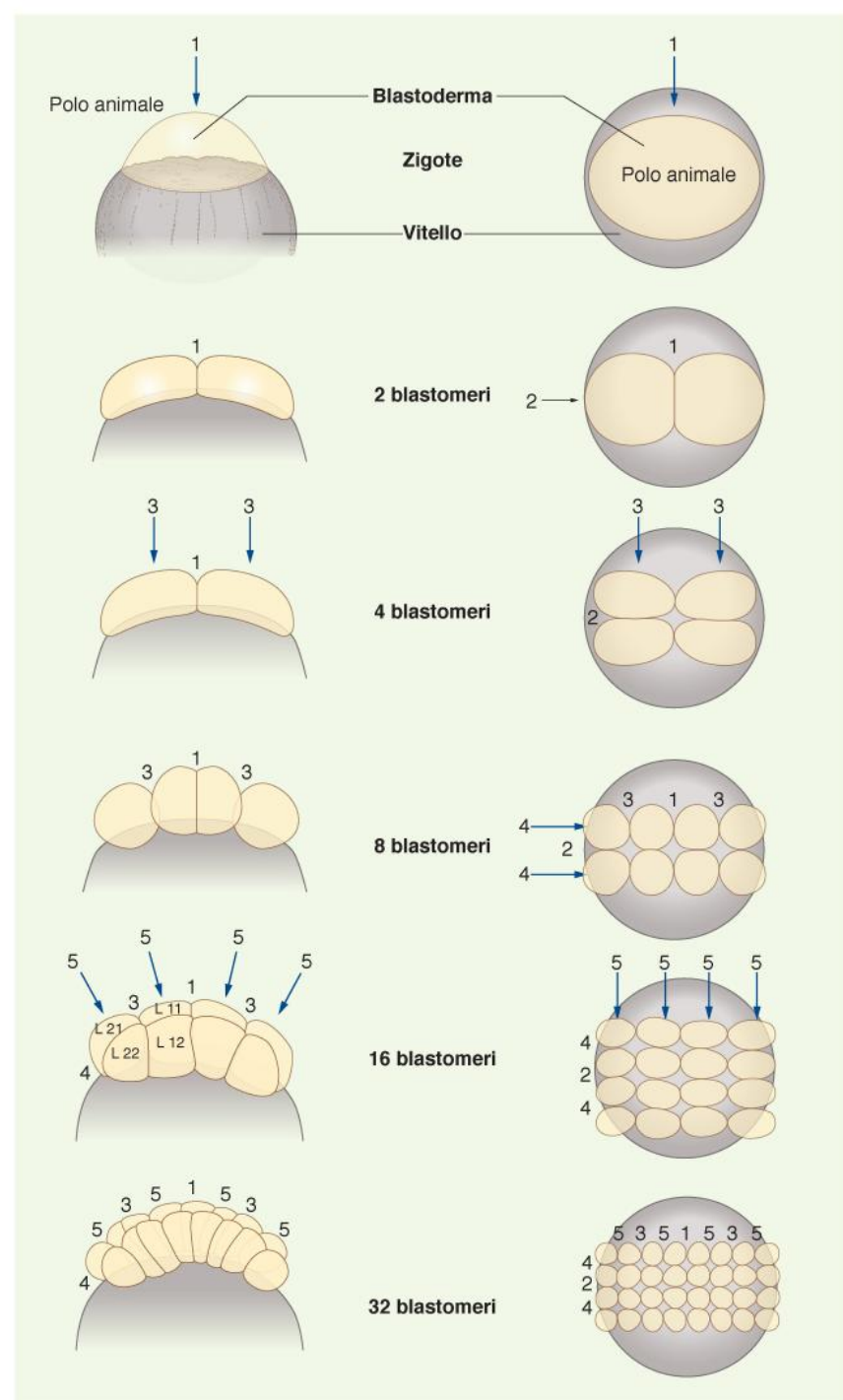
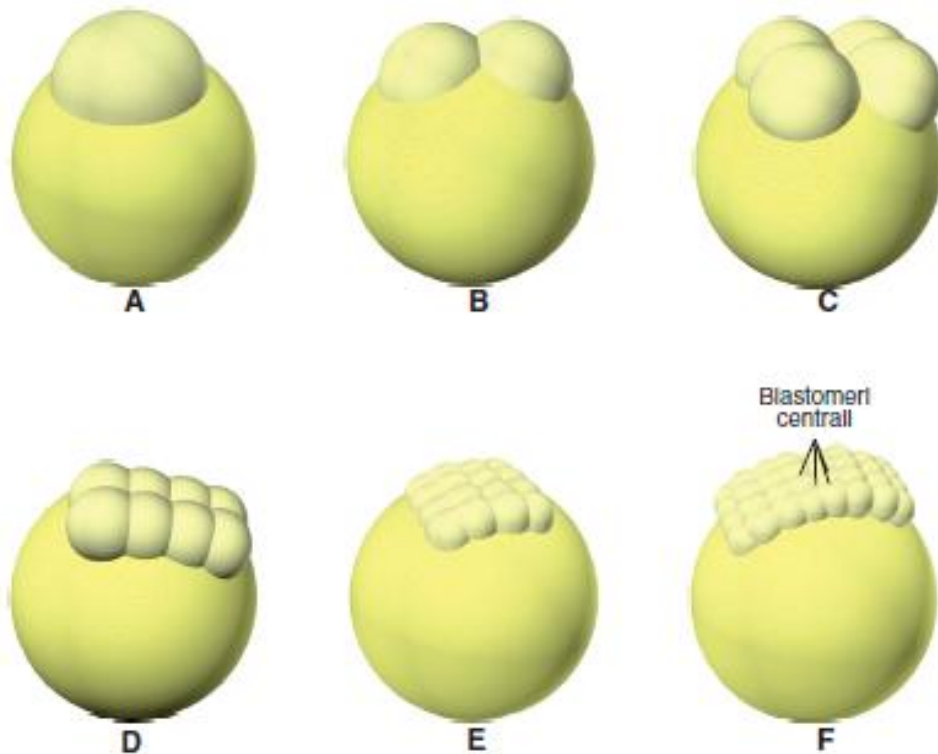


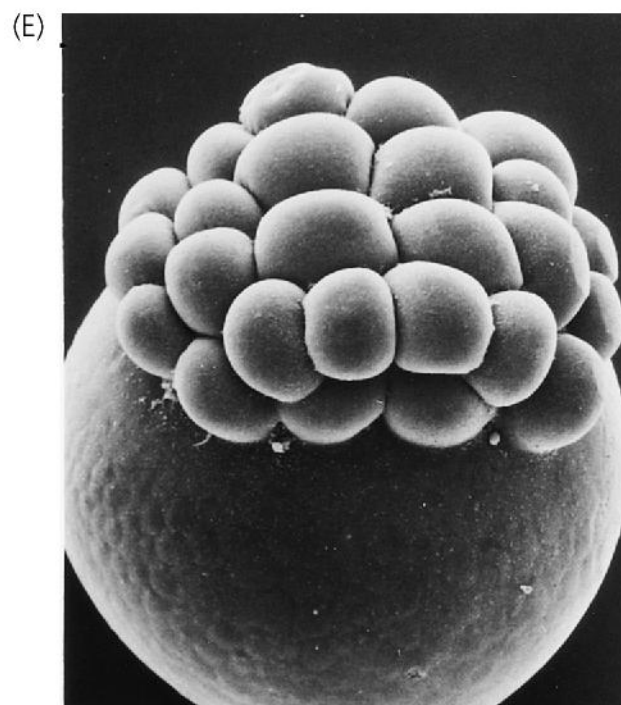
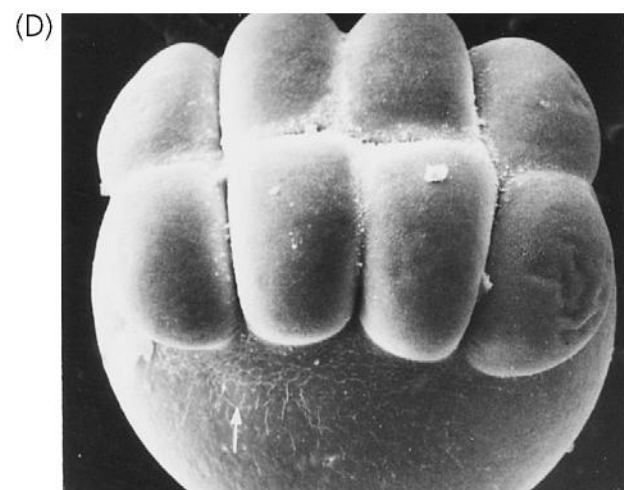
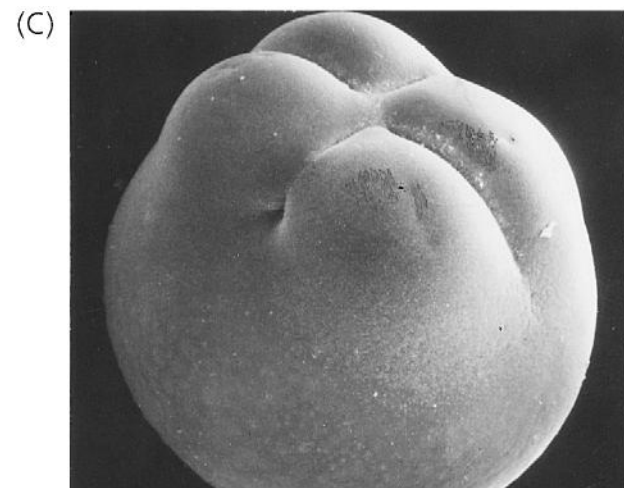
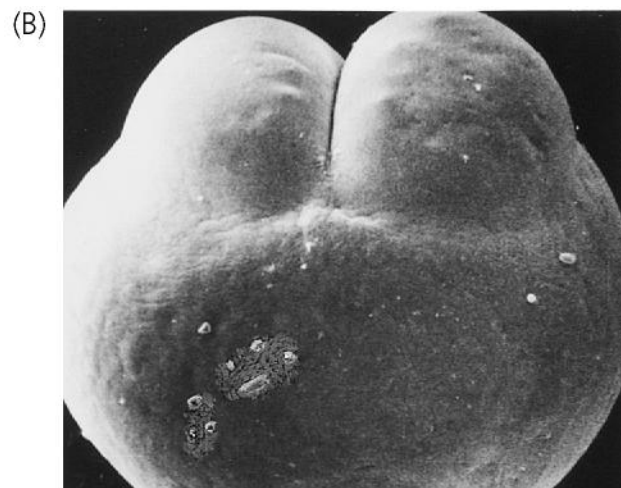
Uovo telolecitico

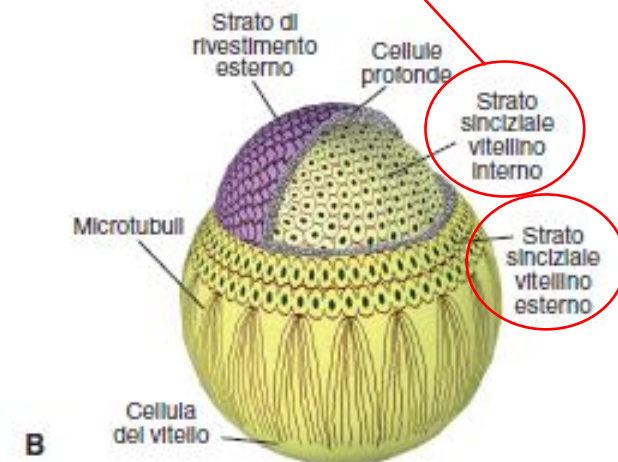
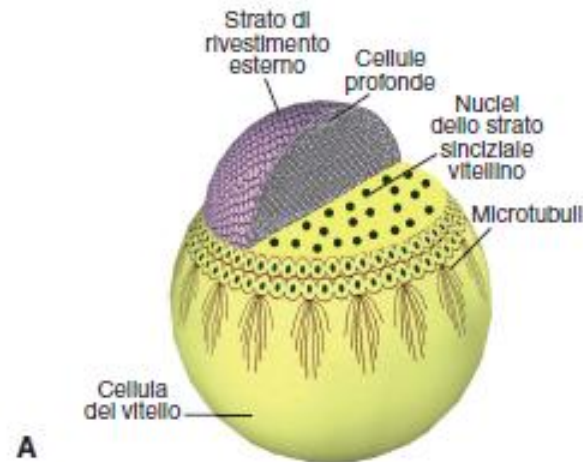
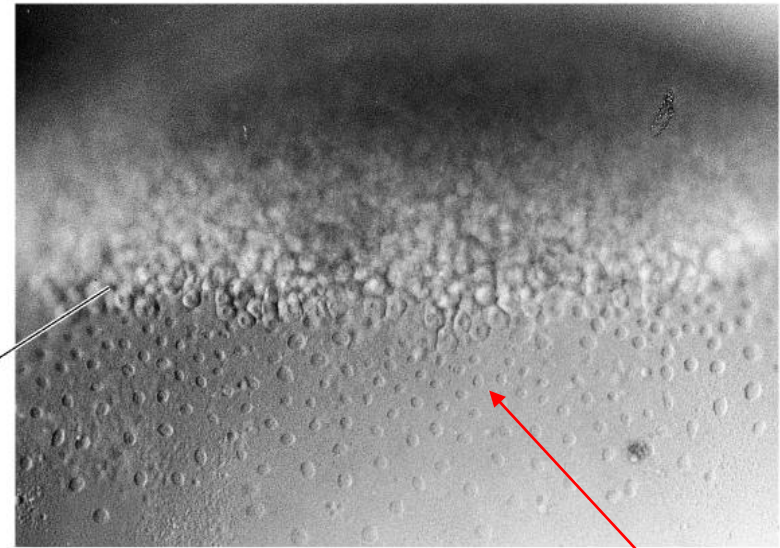
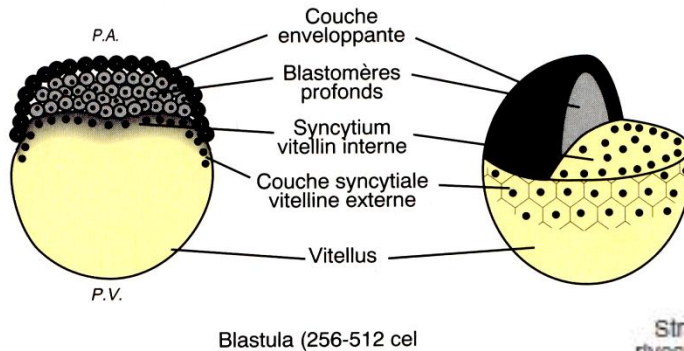
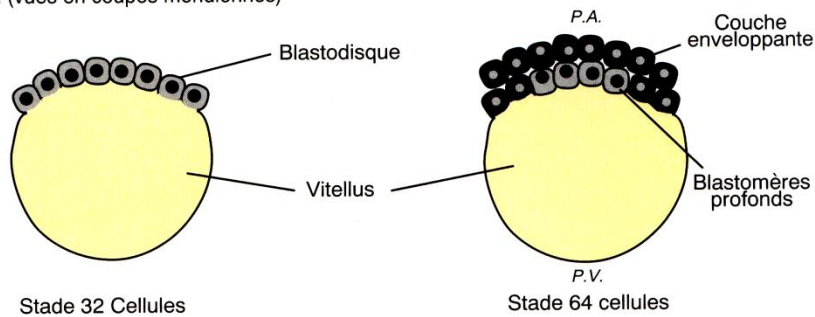


Segmentazione meroblastica discoidale

SEGMENTAZIONE MEROBLASTICA DISCOIDALE

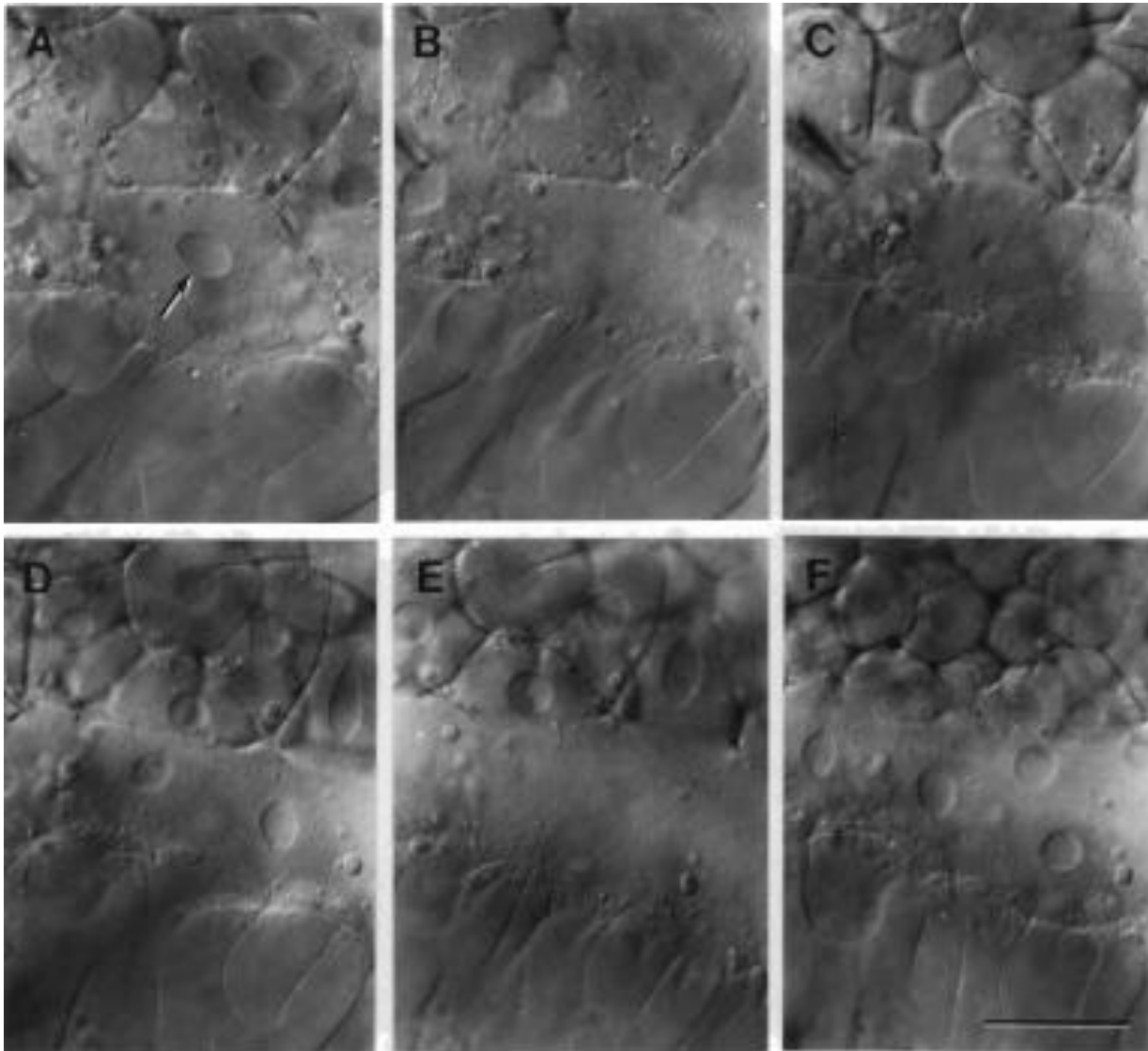






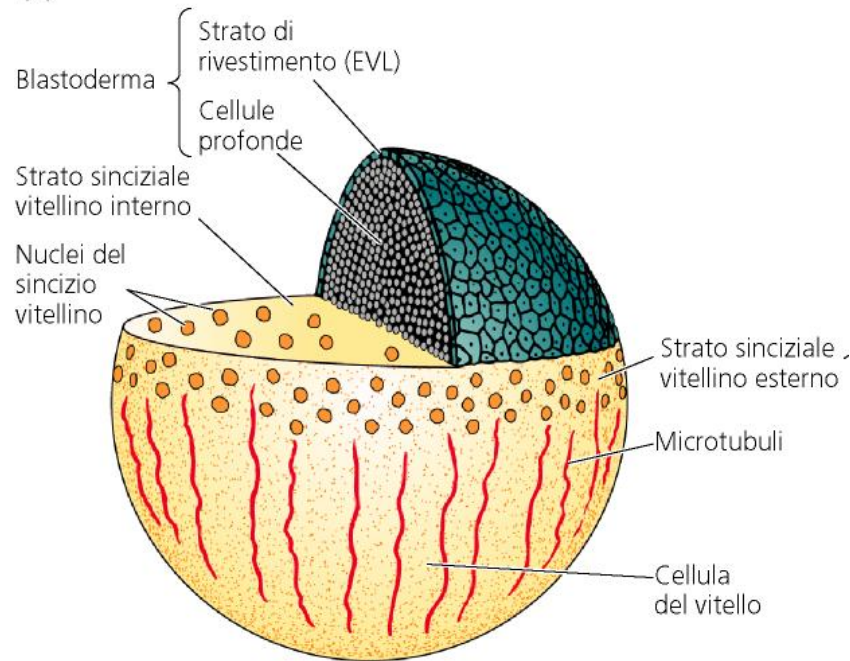
1. Rivestimento esterno: **periderma**
2. **Blastomeri profondi**: formano l'embrione
3. **Sincizio vitellino**

FORMAZIONE DELLO STRATO SINCIZIALE VITELLINO

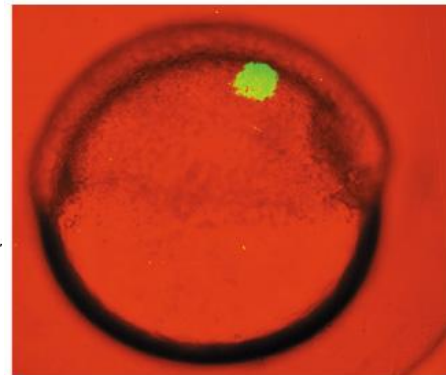


MAPPA DEI TERRITORI PRESUNTIVI NELLA BLASTULA DI ZEBRAFISH

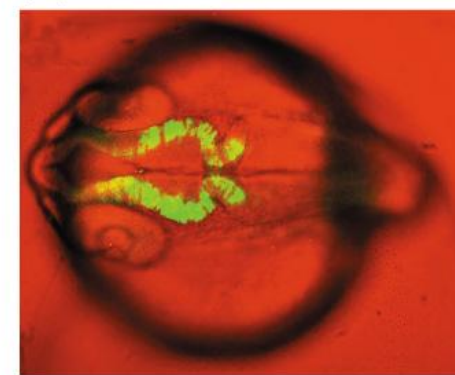
(A)



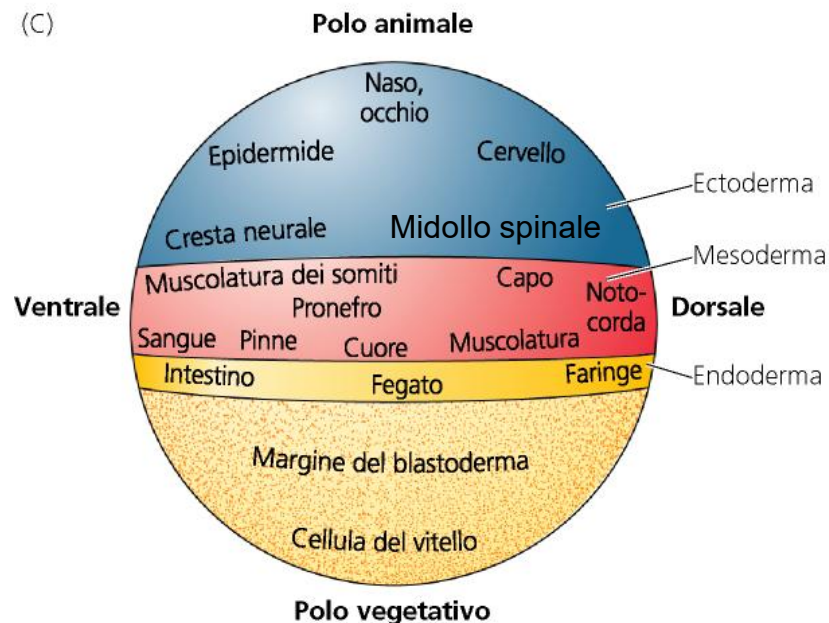
(A)



(B)

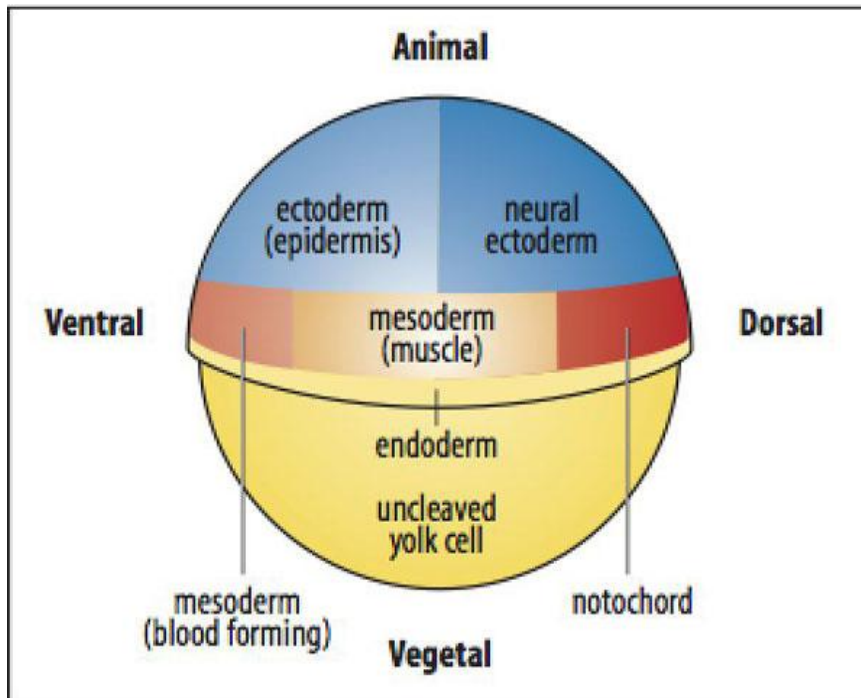


(C)



1. Ectoderma, mesoderma ed endoderma presuntivi allineati lungo l'asse animale vegetativo (ma la mappa è «compressa» nell'emisfero animale per via della segmentazione meroblastica).
2. Vicinanza dei territori presuntivi del cordomesoderma e del neuroectoderma sul futuro lato dorsale.

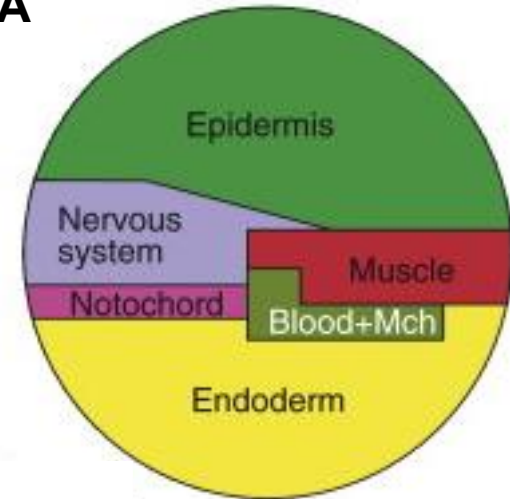
LE MAPPE DEI TERRITORI PRESUNTIVI NELLE BLASTULE DI ZEBRAFISH, XENOPUS E TUNICATI RIVELANO UN PIANO DI ORGANIZZAZIONE CONSERVATO



ZEBRAFISH

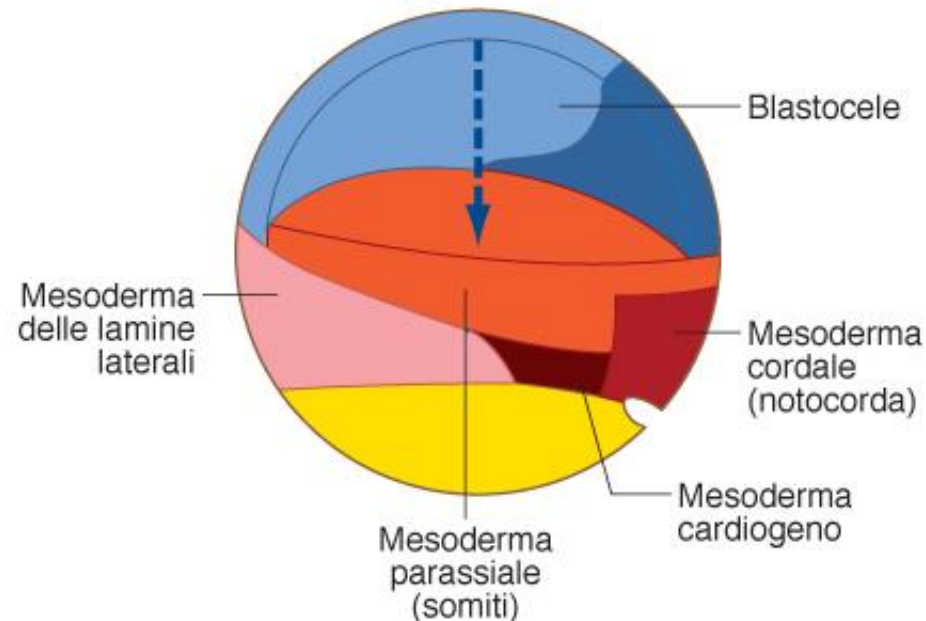
ASCIDIA

Ascidian fate map

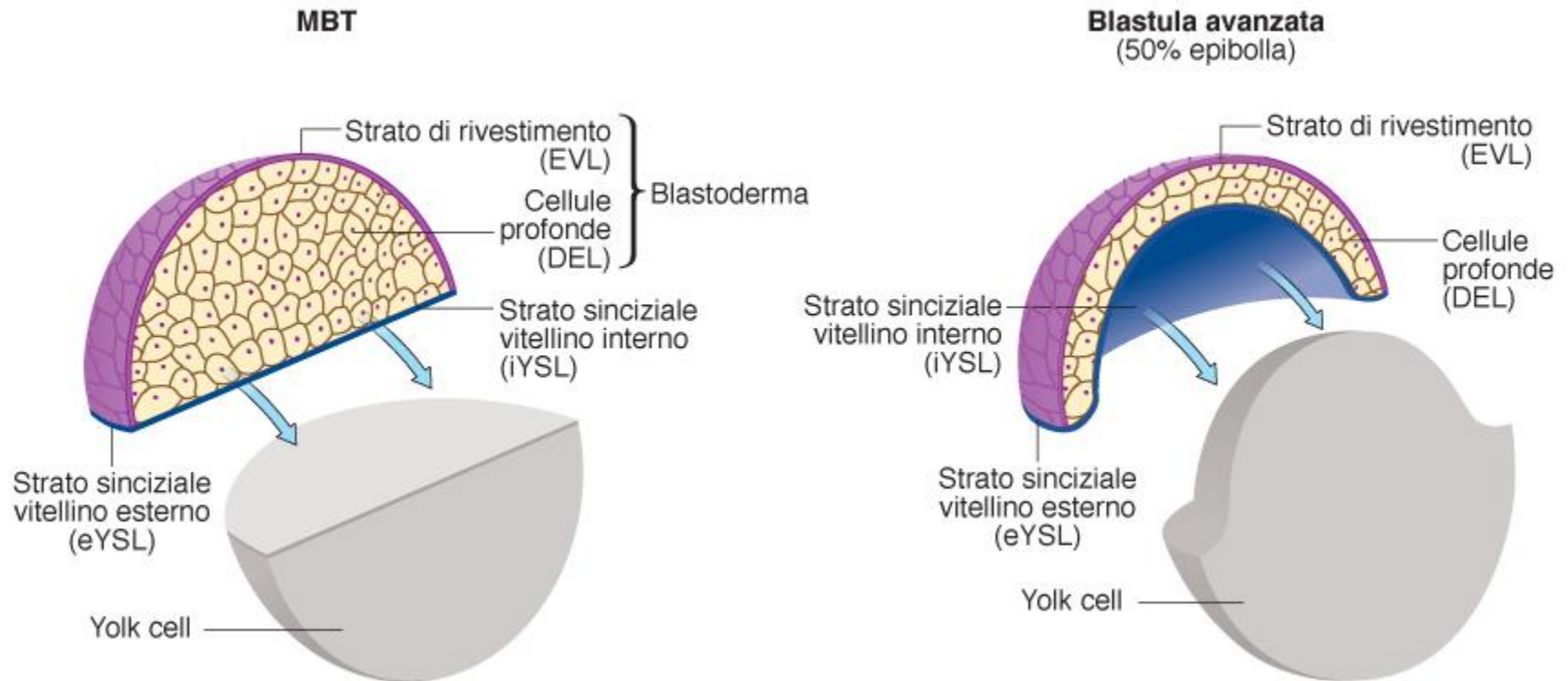


XENOPUS

Mappa interna

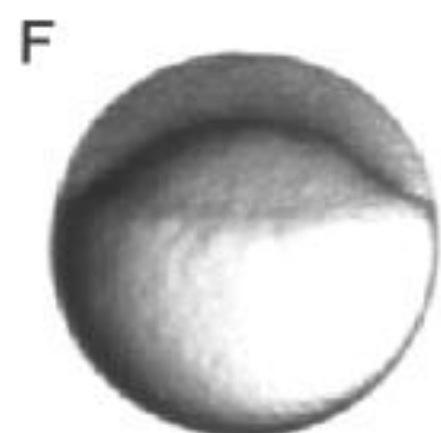
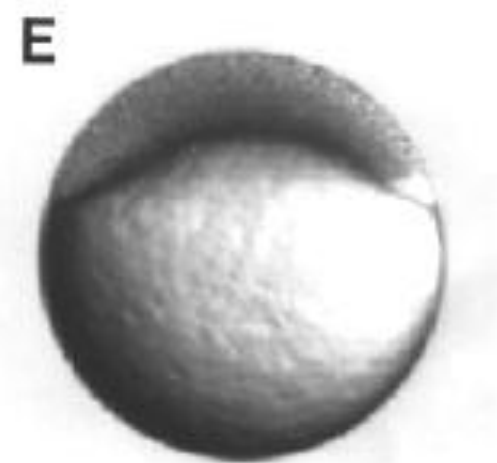
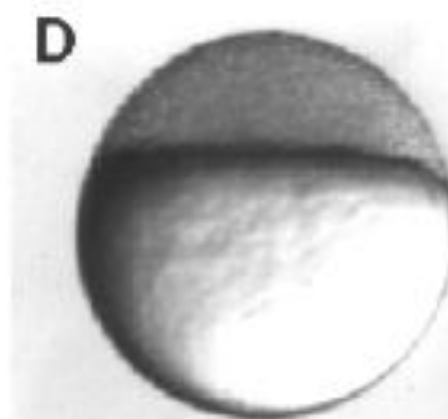
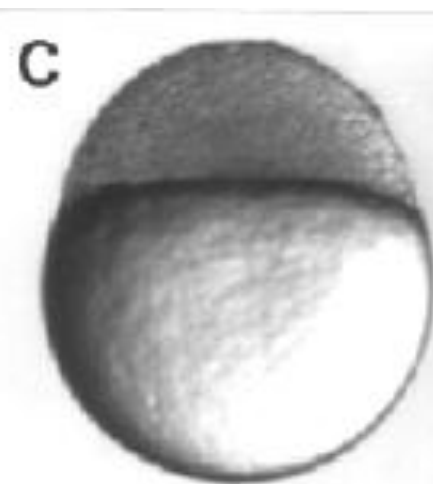
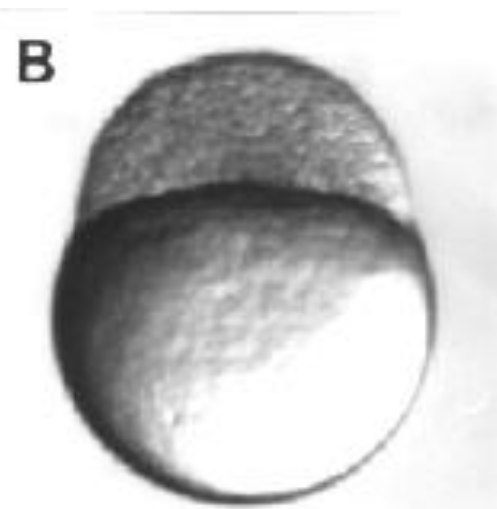
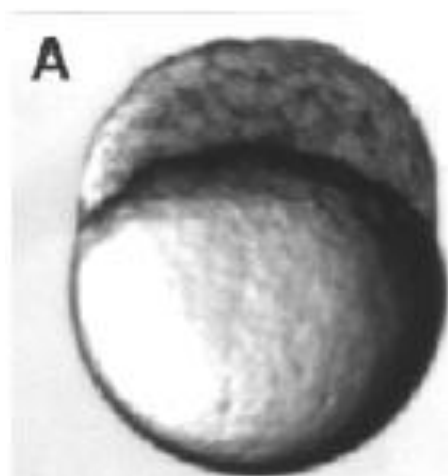


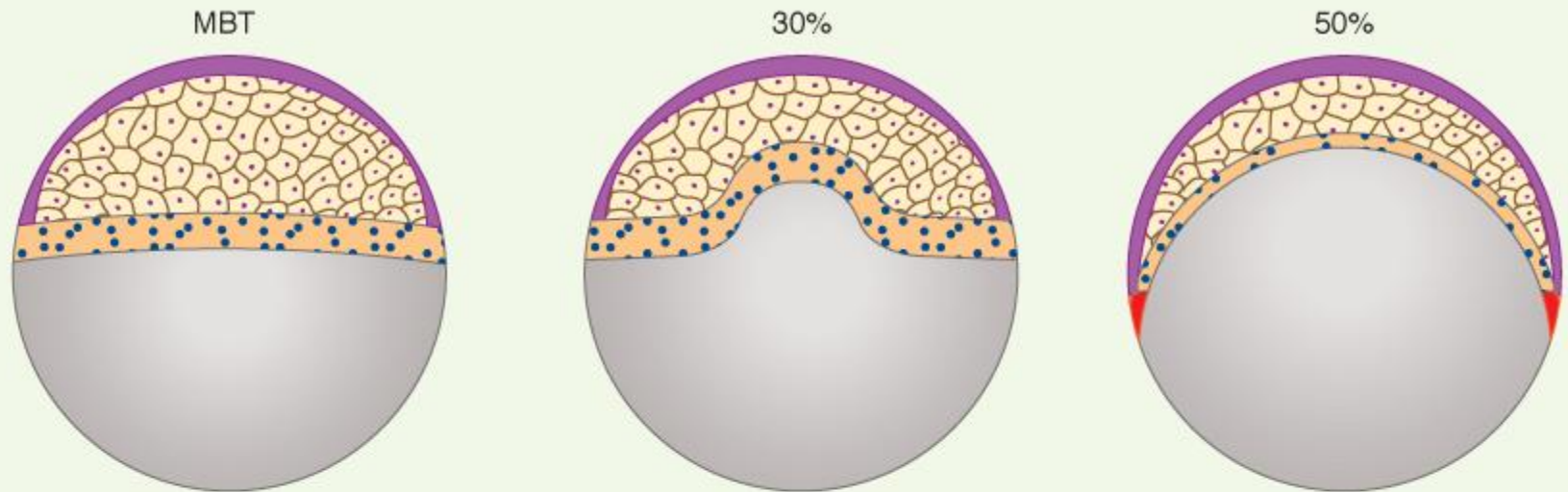
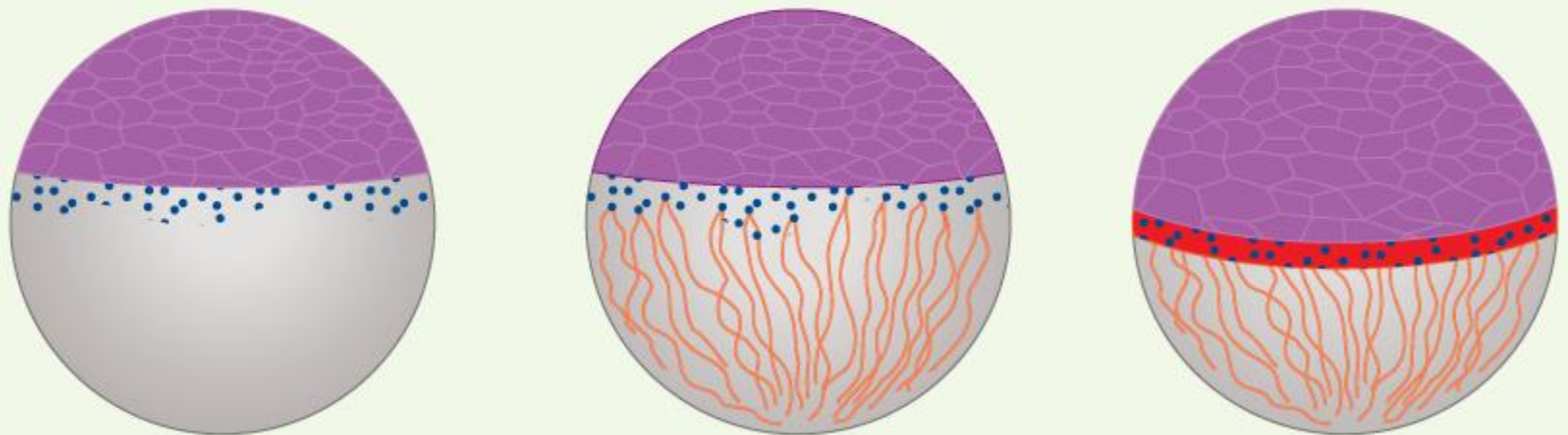
FASI INIZIALI DELL'EPIBOLIA NELLA BLASTULA DI ZEBRAFISH



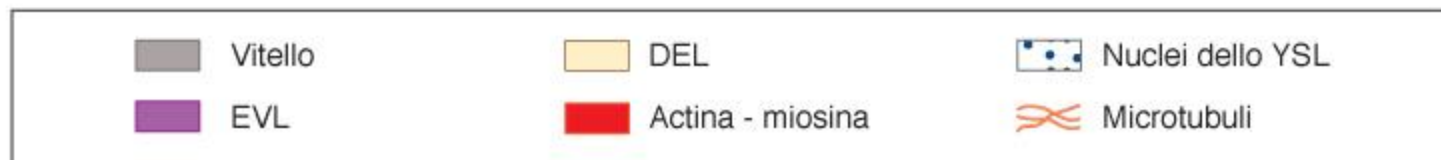
IL BLASTODISCO SI ASSOTTIGLIA PER EFFETTO DI MOVIMENTI DI INTERCALAZIONE RADIALE DELLE CELLULE DEGLI STRATI PIU' INTERNI

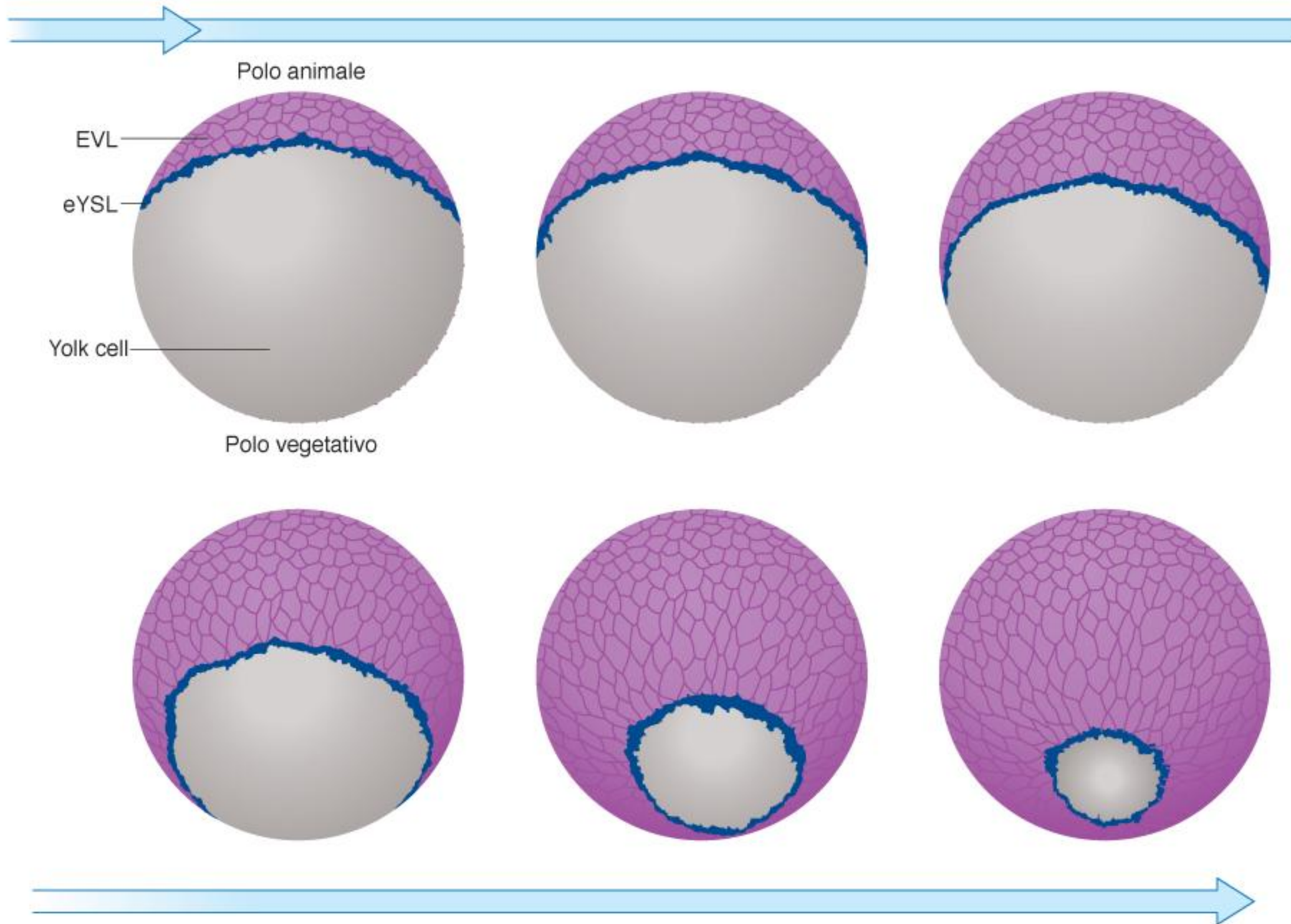
Si riduce il numero di strati ed aumenta la superficie → **epibolia**



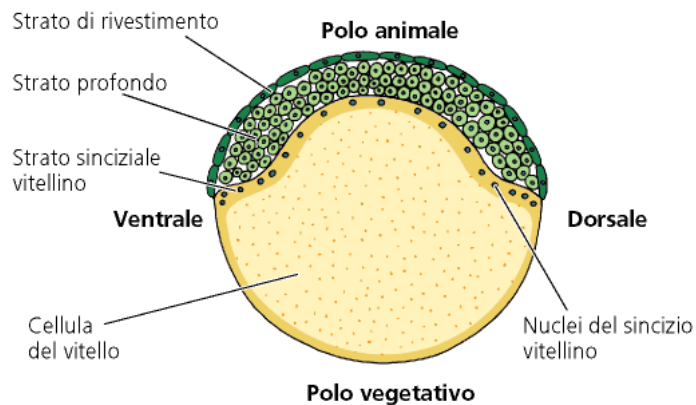
A**B**

All'epibolia contribuisce la trazione esercitata dai nuclei del sincizio vitellino

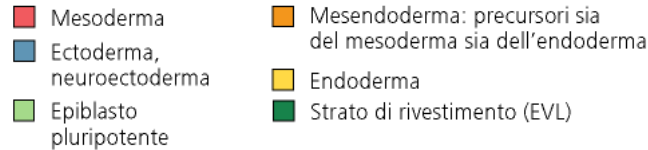




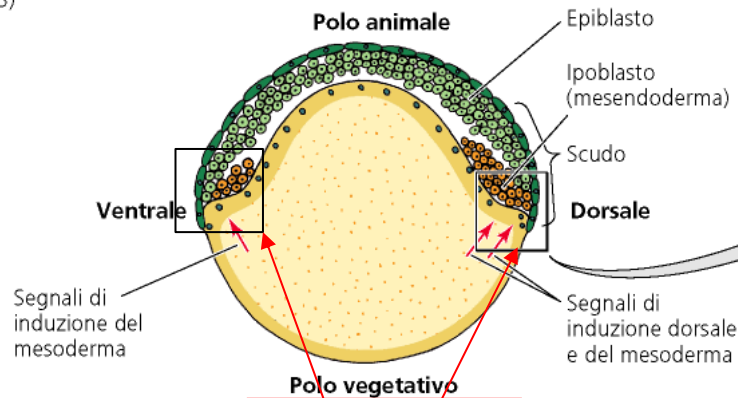
(A)



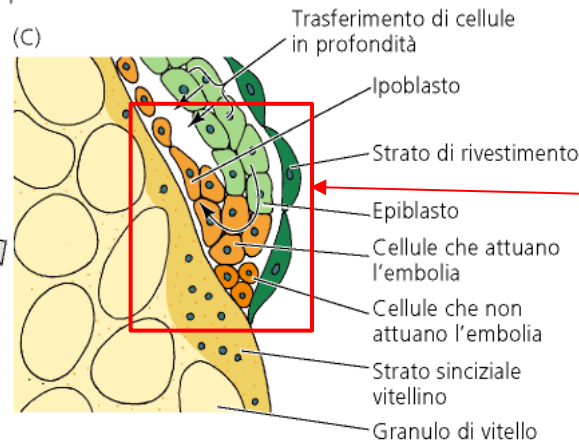
Strato esterno= **periderma** (verde scuro)
Epiblasto= ectoderma (verde)
Ipoblasto= mesoderma (arancio, poi rosso)
 endoderma (arancio, poi giallo)



(B)



(C)

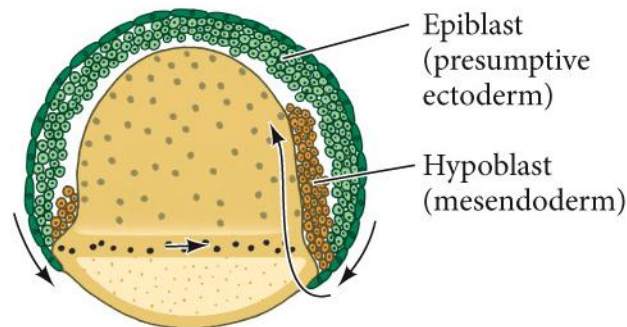


Anello germinativo

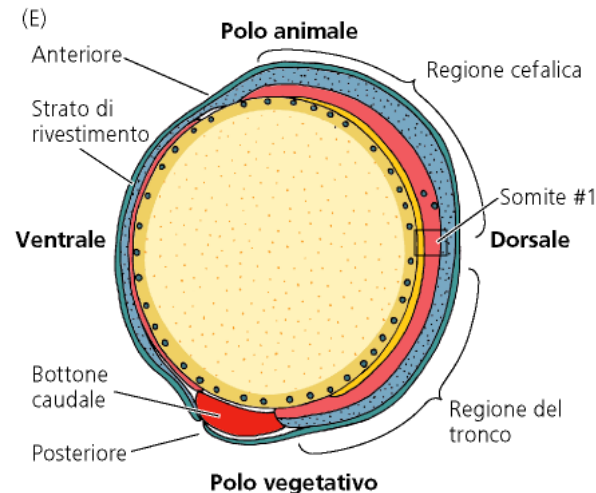
(D)

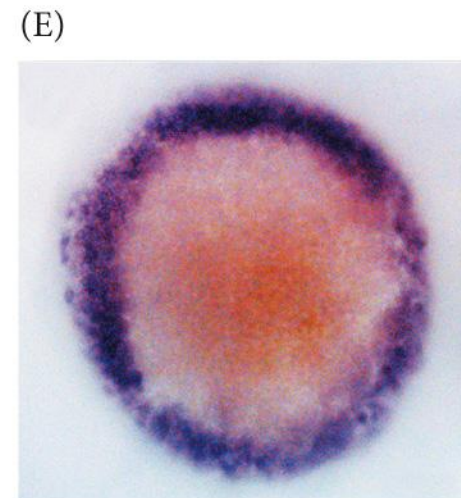
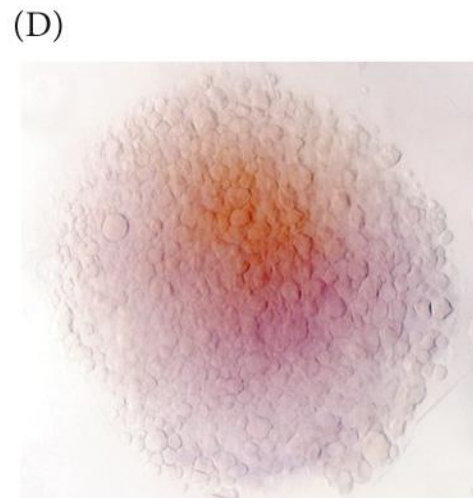
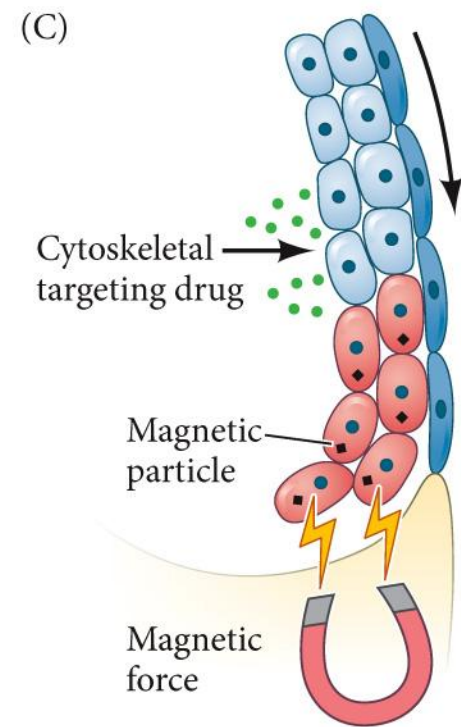
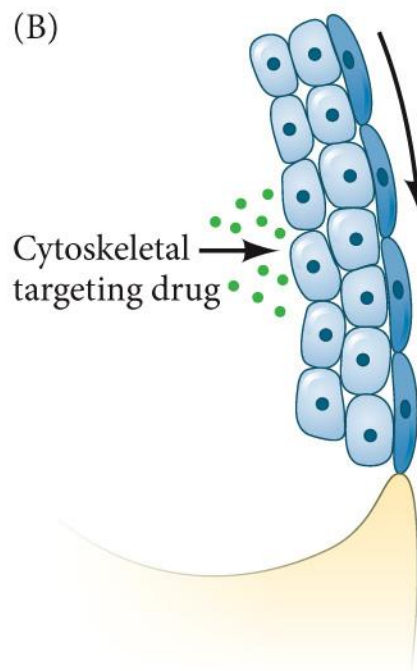
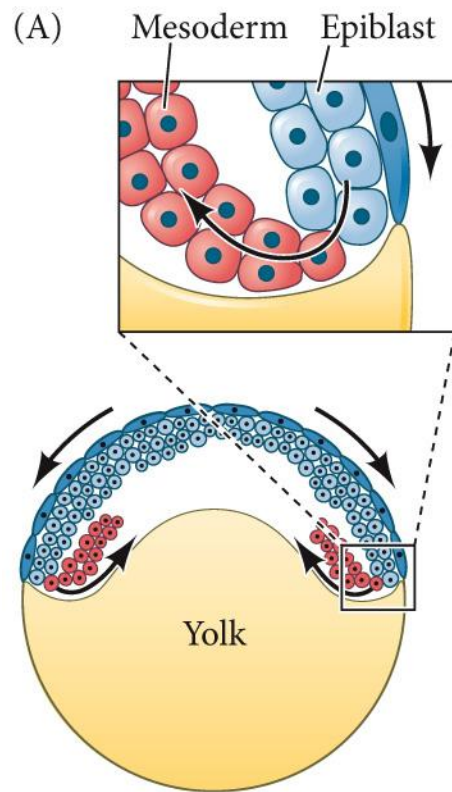
(C) ~9 hr

Anello germinativo

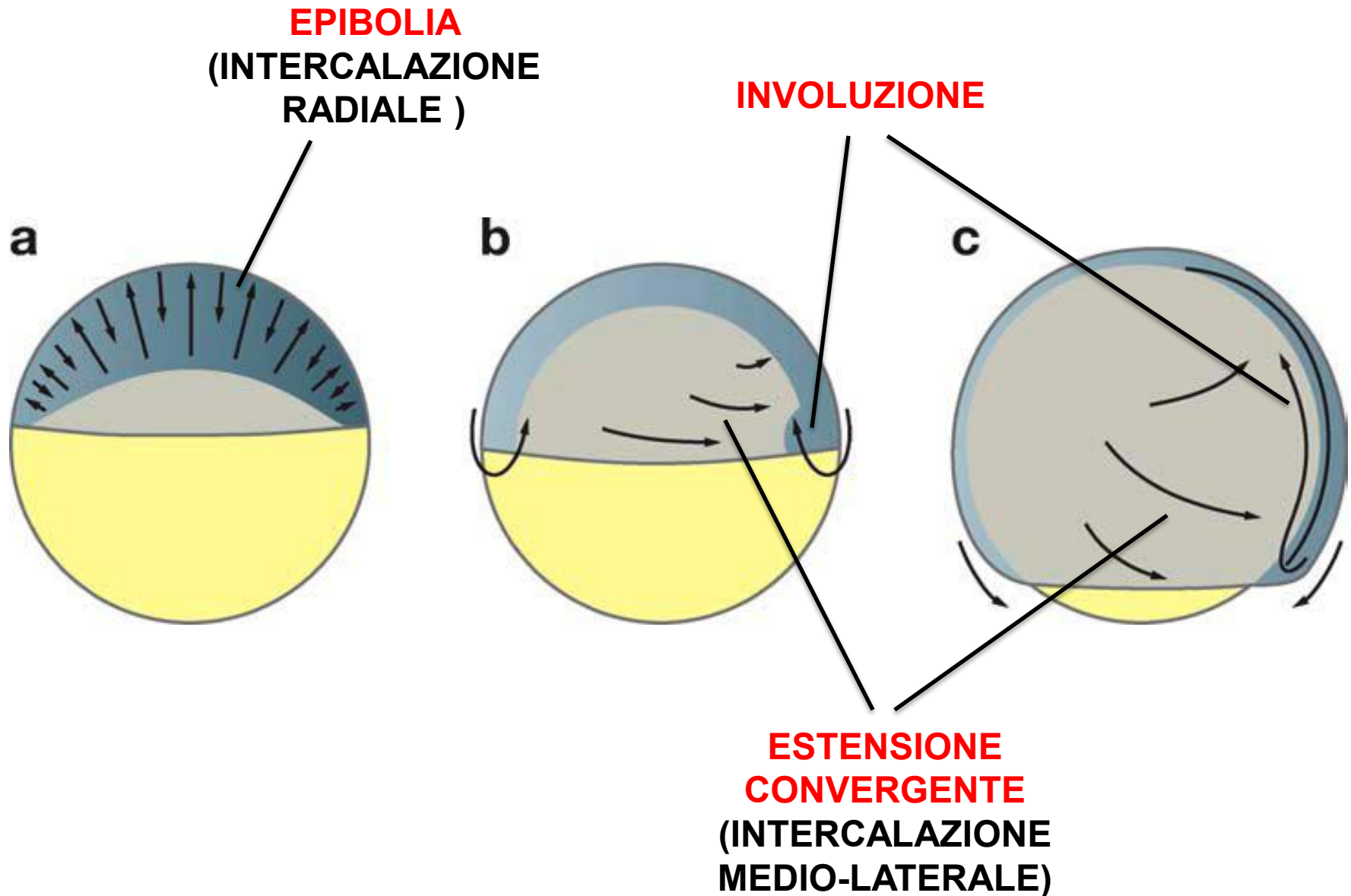


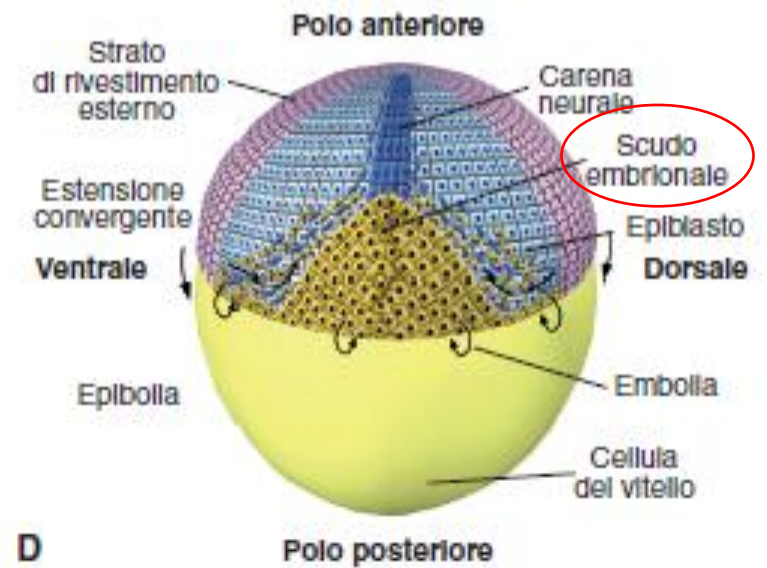
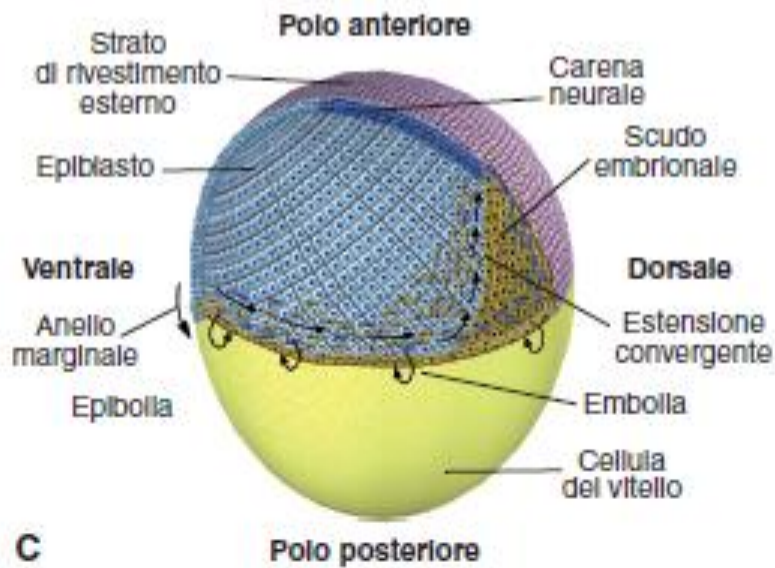
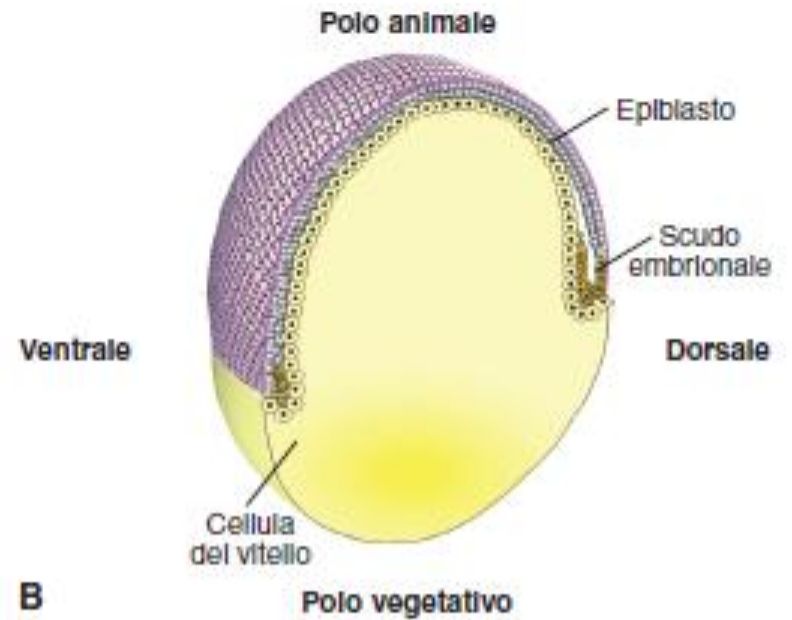
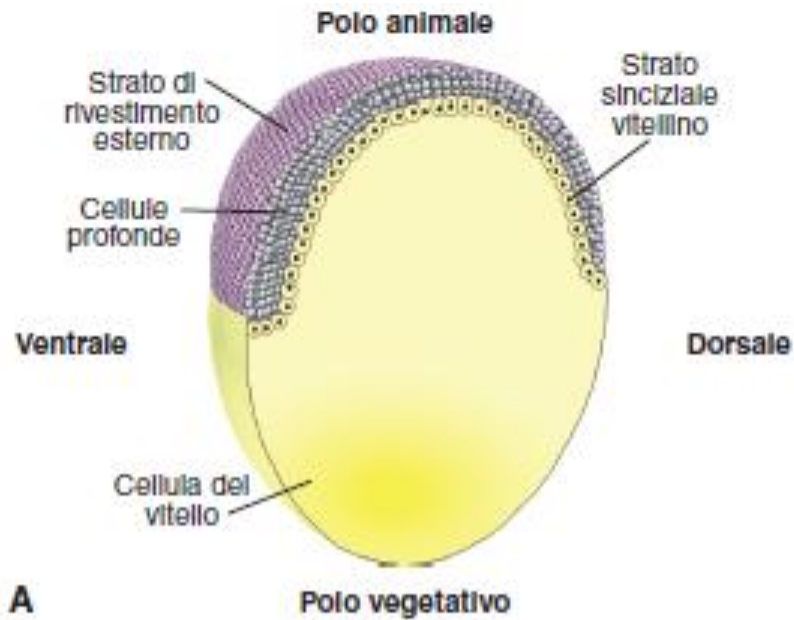
(E)

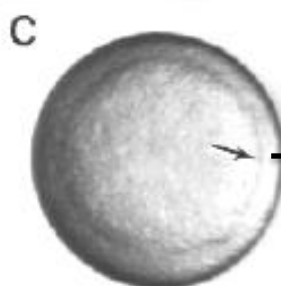
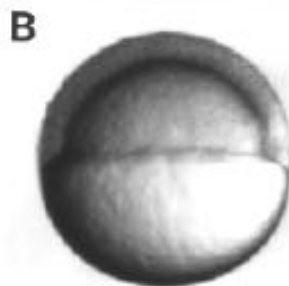
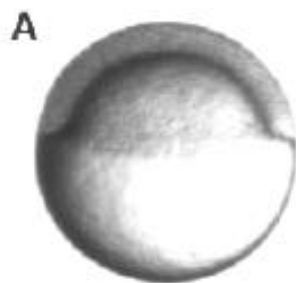




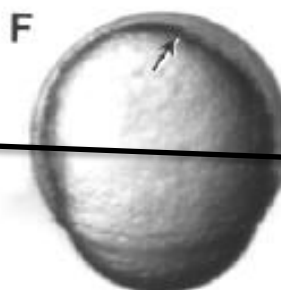
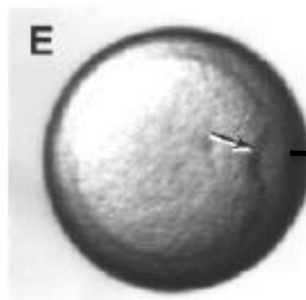
MOVIMENTI CELLULARI DURANTE LA GASTRULAZIONE IN ZEBRAFISH



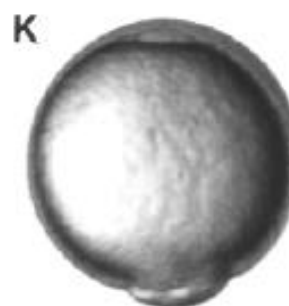
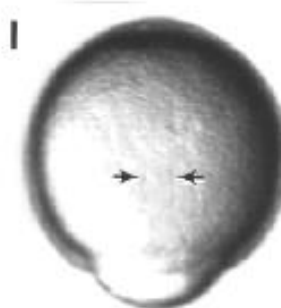
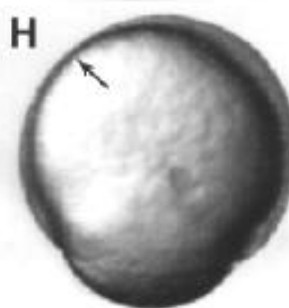
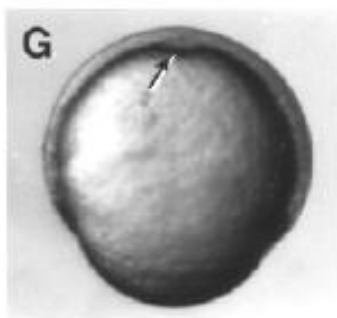


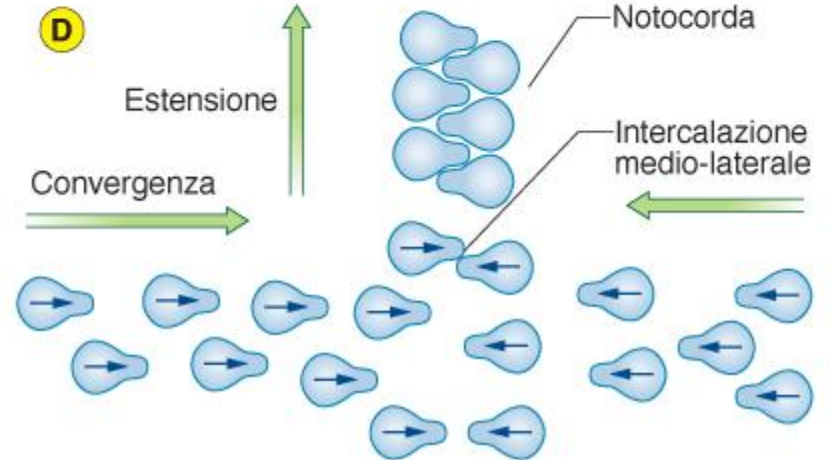
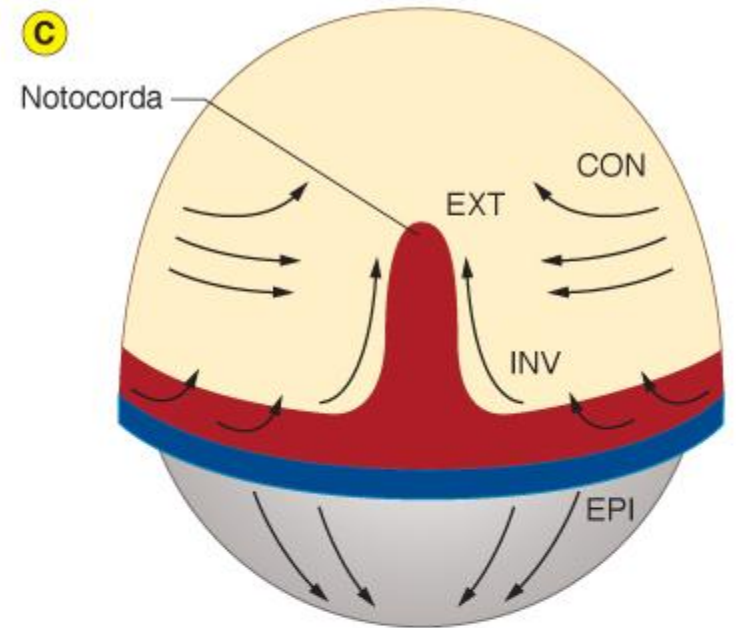
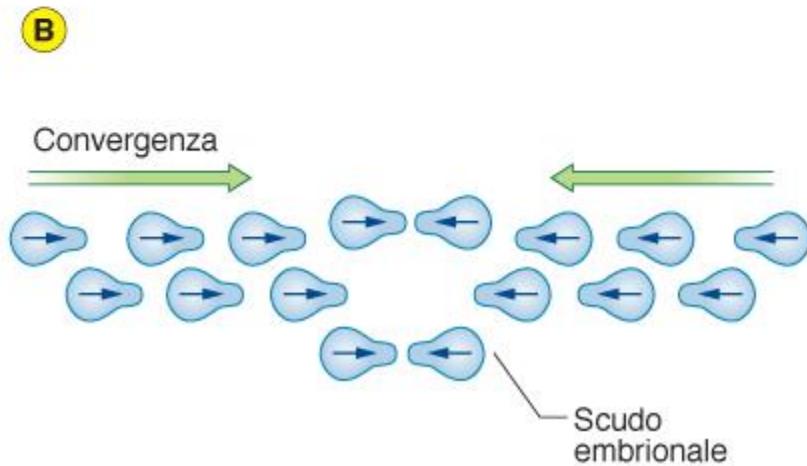
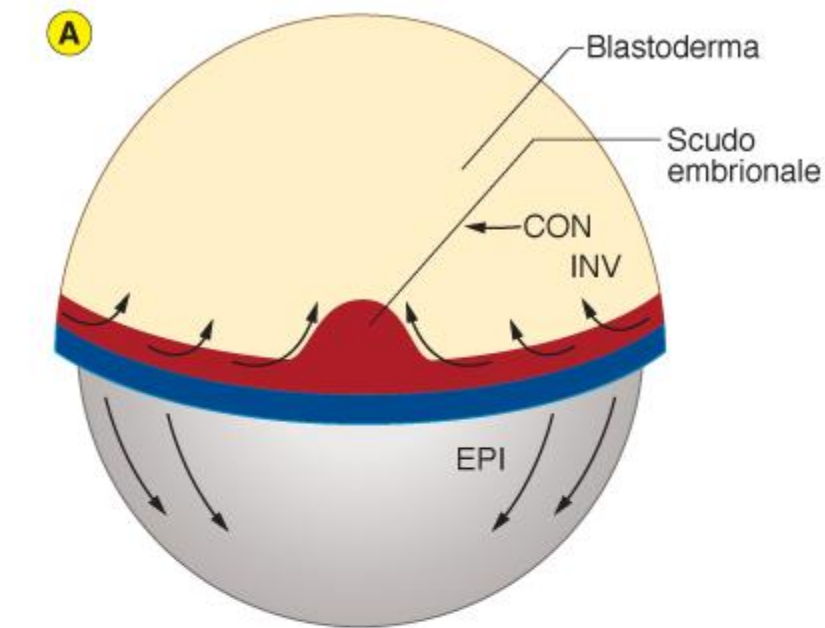


**ANELLO
GERMINATIVO**



SCUDO

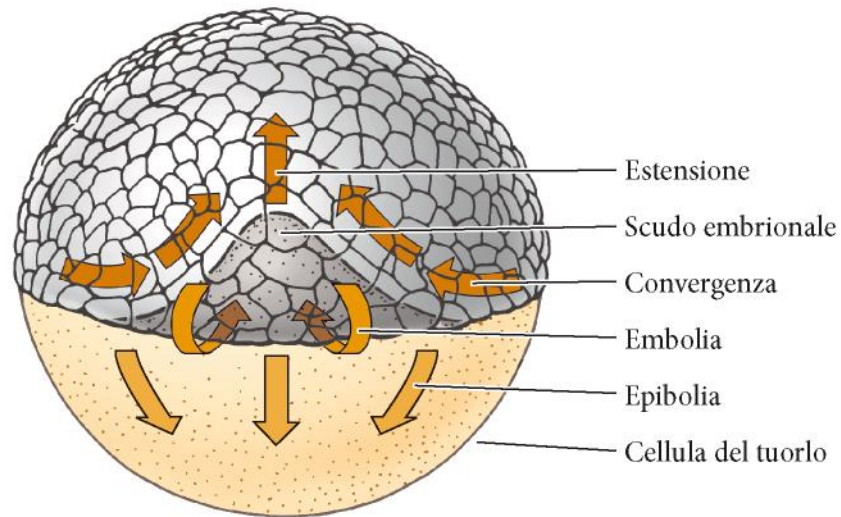




LE STRUTTURE ASSIALI SI ALLUNGANO PER EFFETTO DI MOVIMENTI DI
INTERCALAZIONE MEDIO-LATERALE DELLE CELLULE DORSALI
 Si riduce il numero di file ed aumenta la lunghezza → **estensione convergente**

(A)

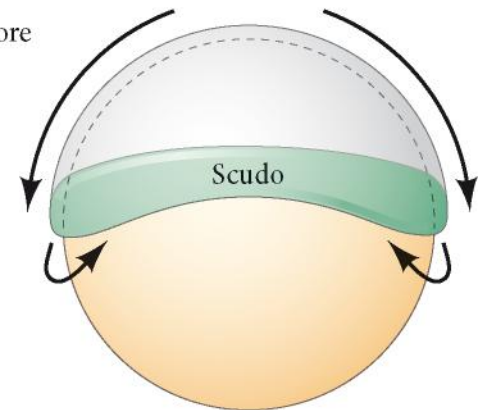
Polo animale



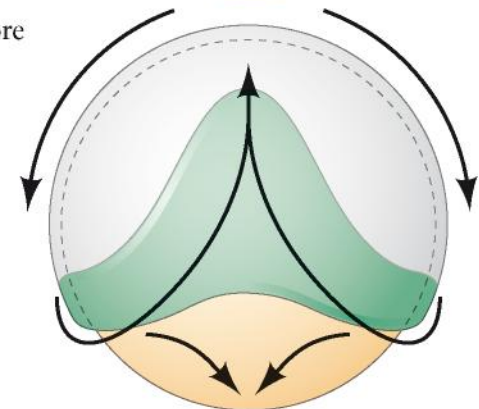
(B)

Visione dorsale

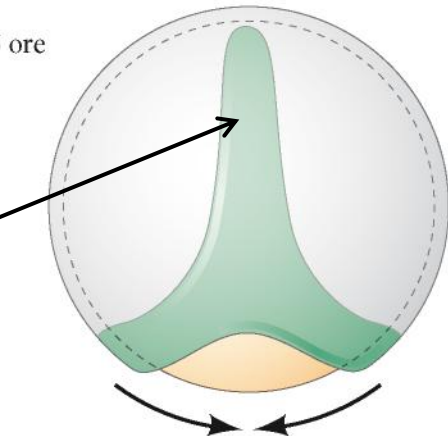
7,5 ore



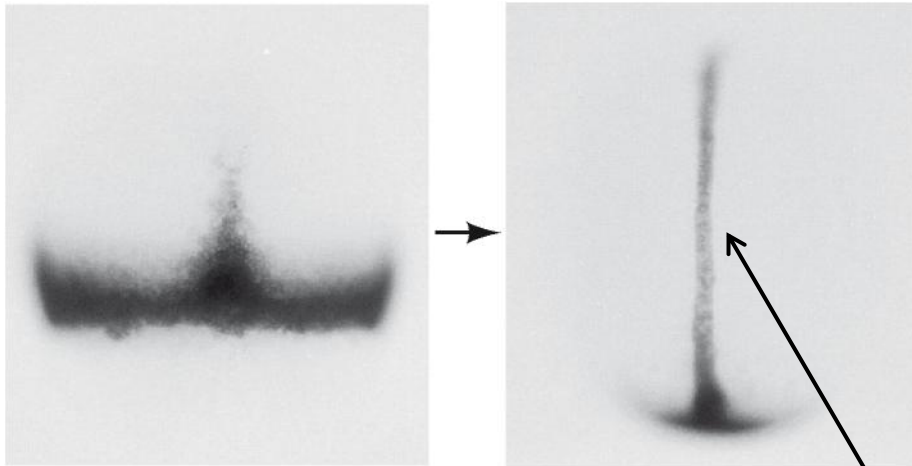
10 ore



12,5 ore

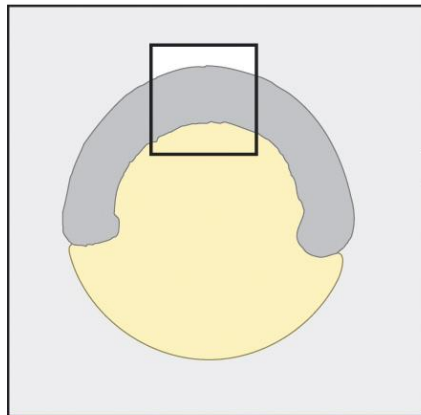


(C)

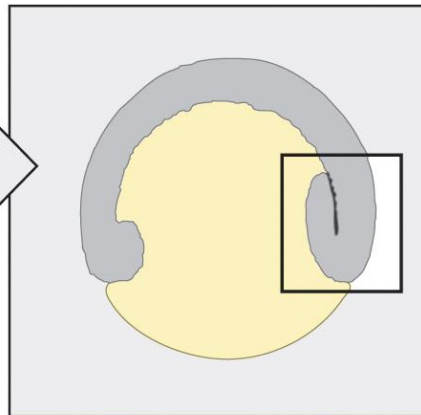
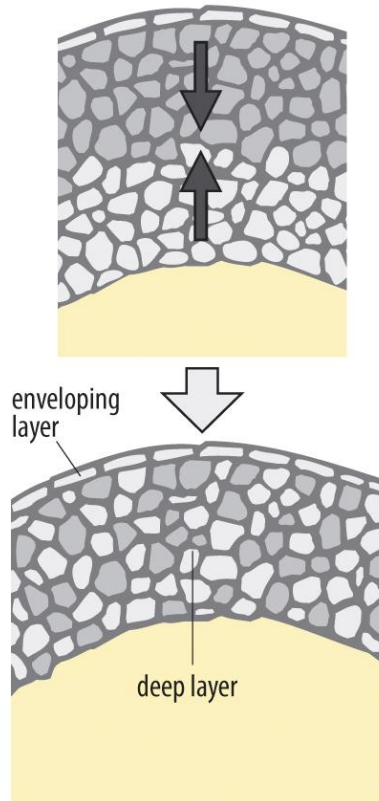


Notocorda

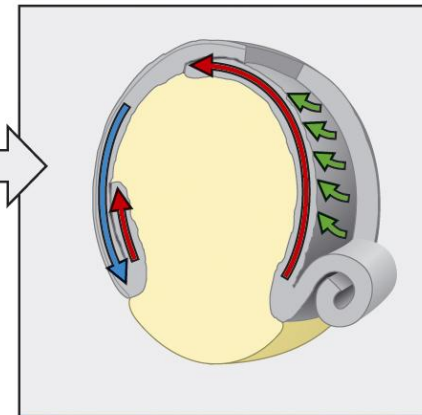
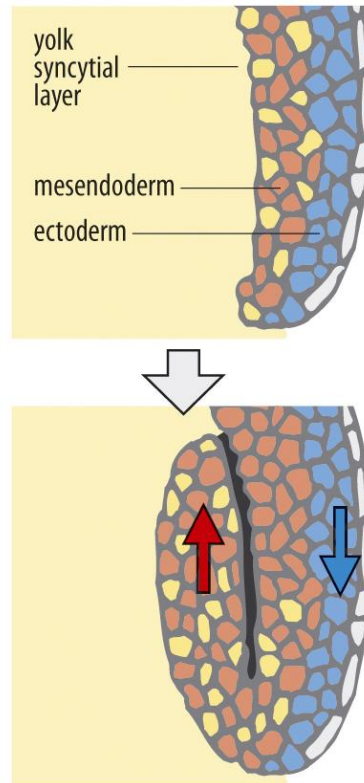
 Convergence and extension
 Epiboly  Involution



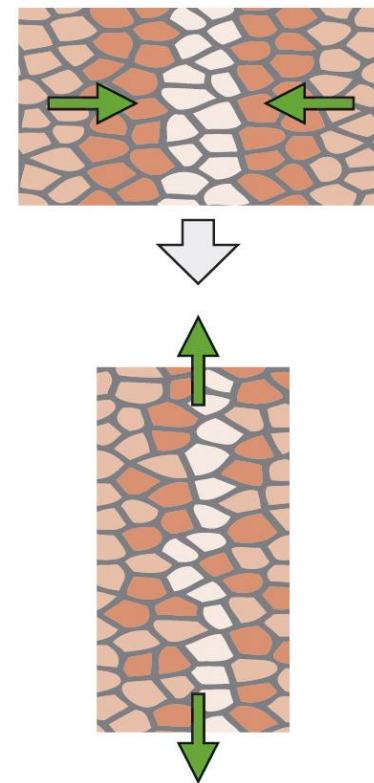
Radial intercalation

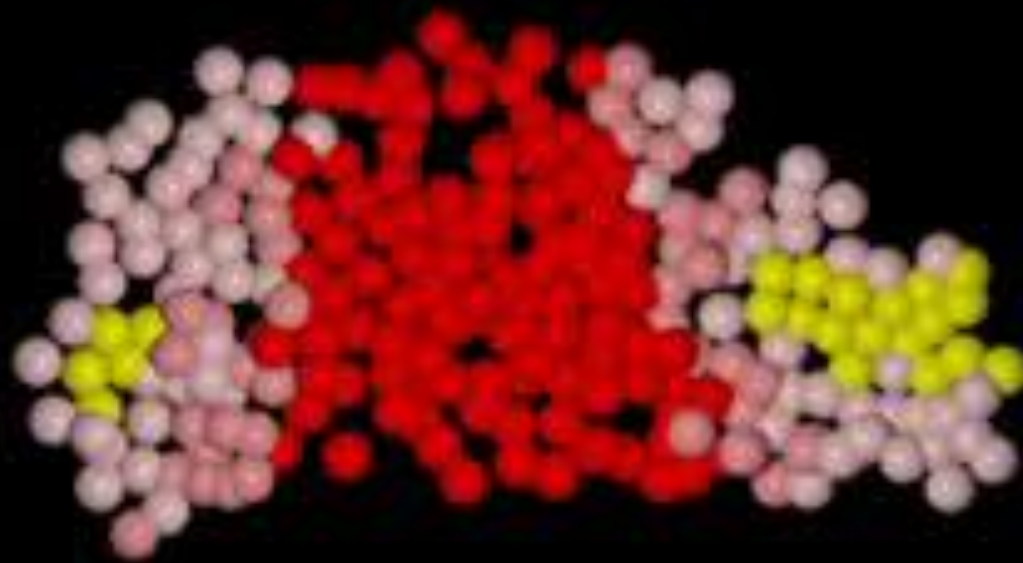


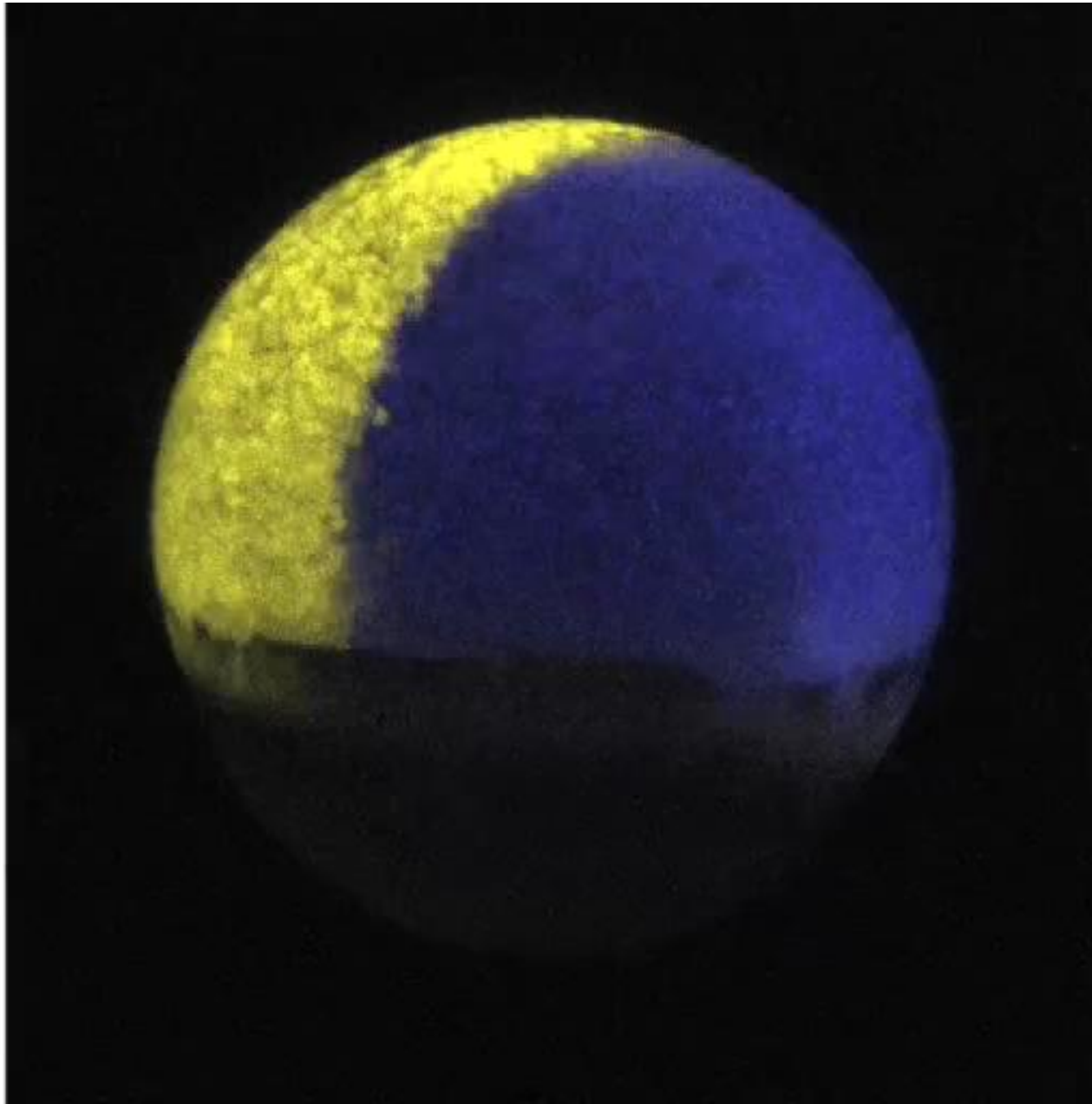
Epiboly



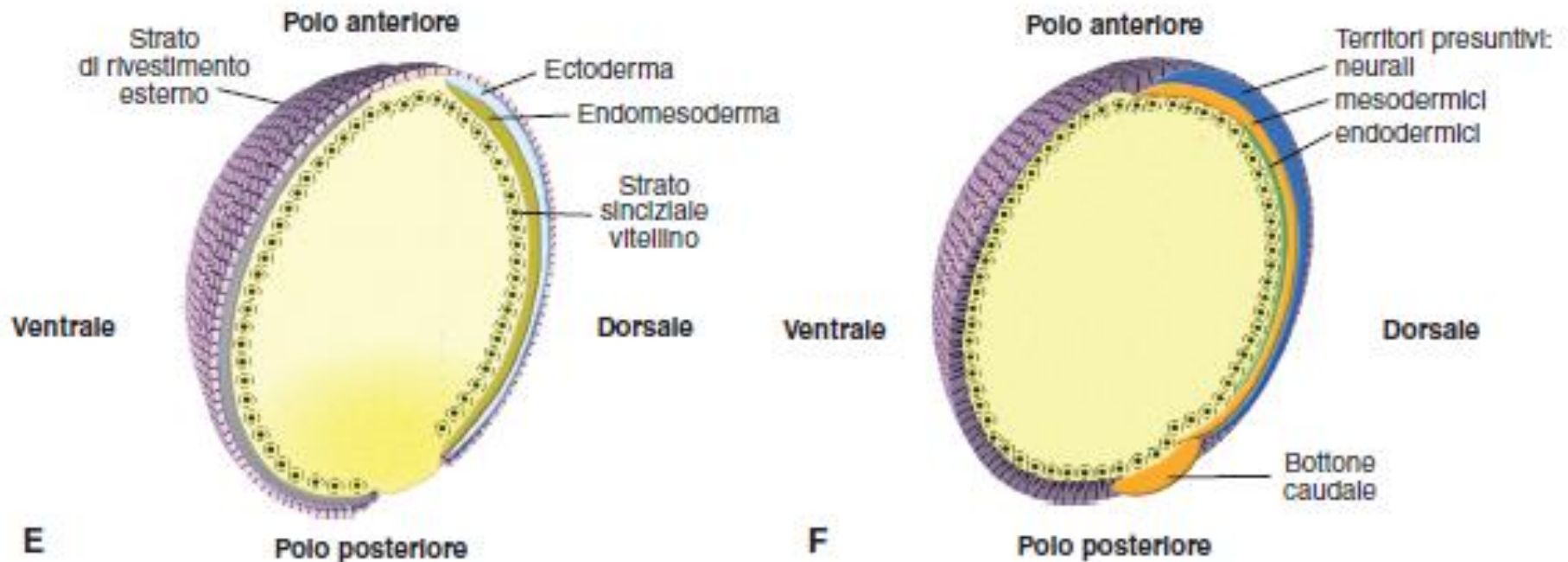
Convergent extension

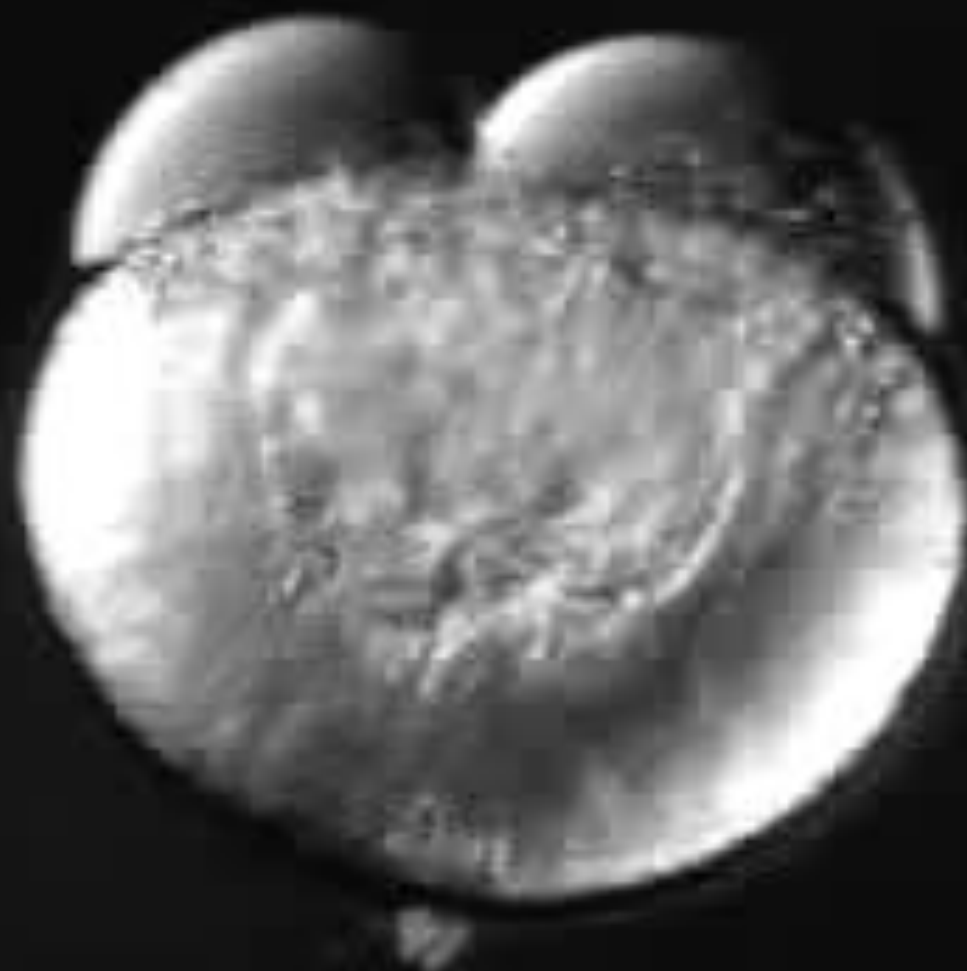






Dopo la gastrulazione l'ipoblasto si separa nei foglietti mesodermico ed endodermico e si forma il tubo digerente





FASI DELLA NEURULAZIONE IN ZEBRAFISH

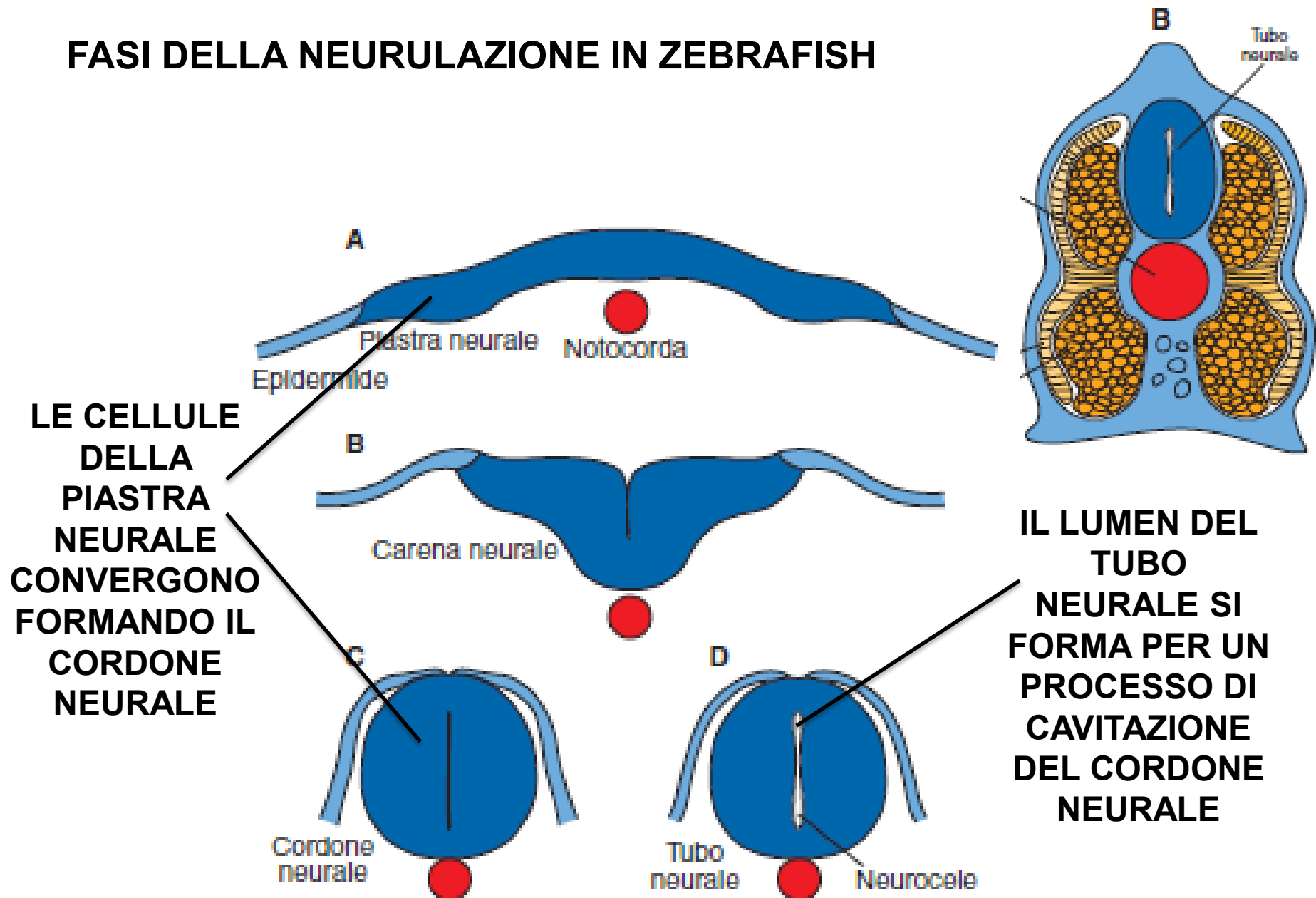
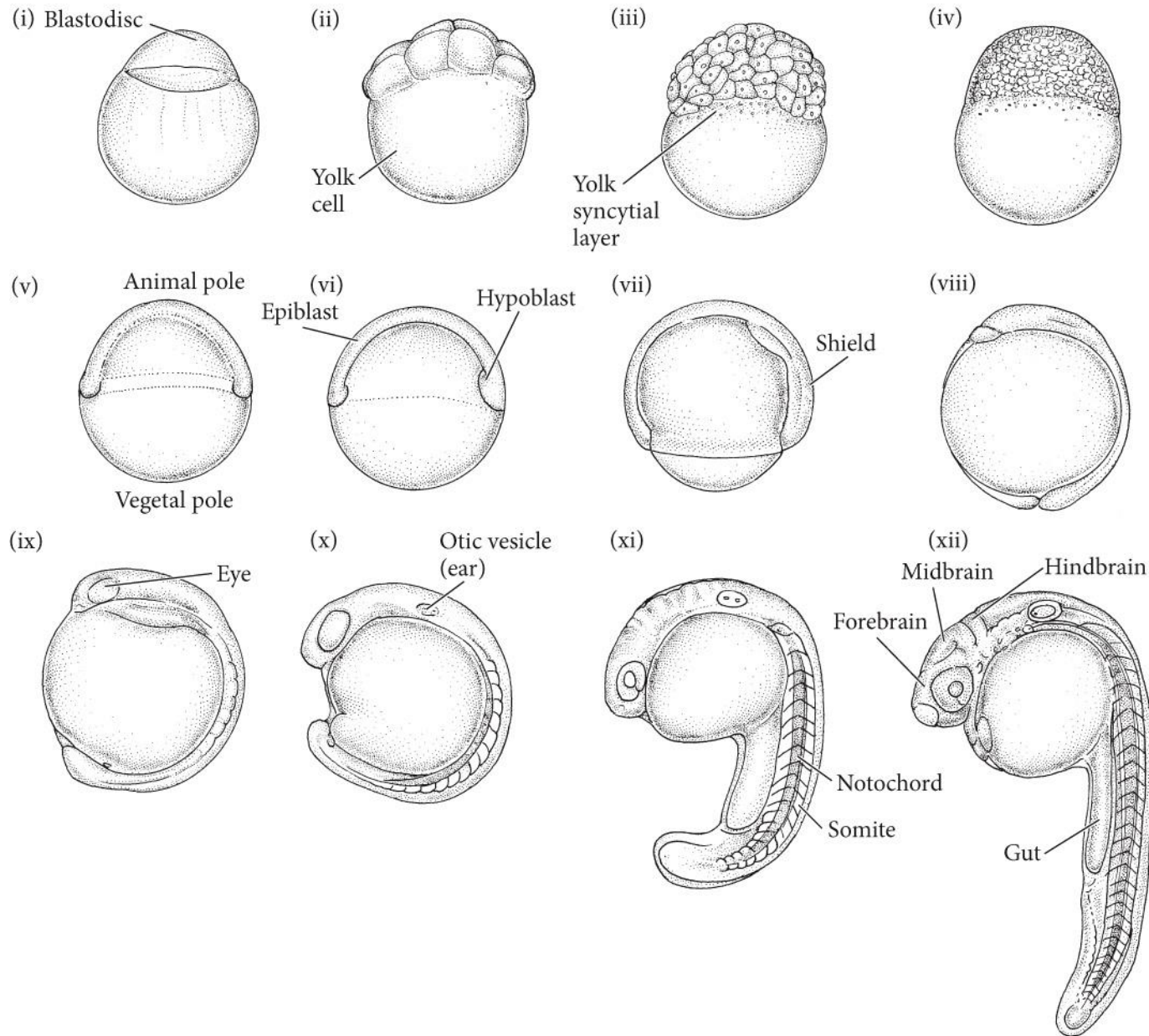
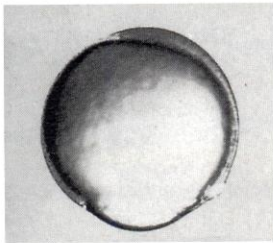


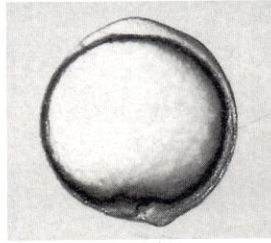
Figura 8



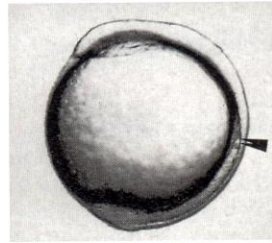
a) Formation du jeune bourgeon caudal et somitogénèse



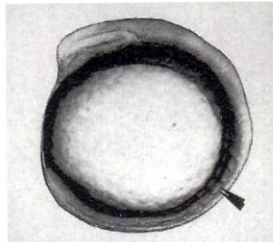
80% épibolie



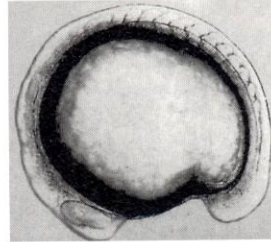
Bourgeon caudal



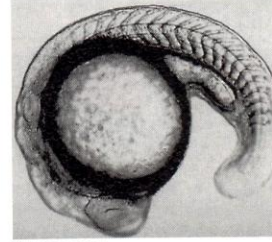
1 somite



5 somites

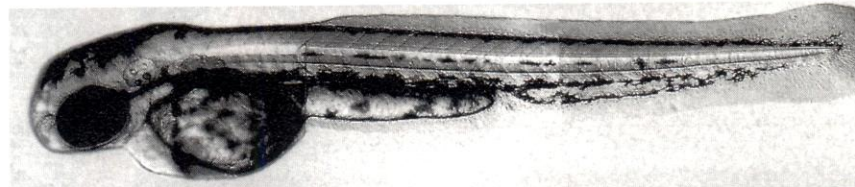
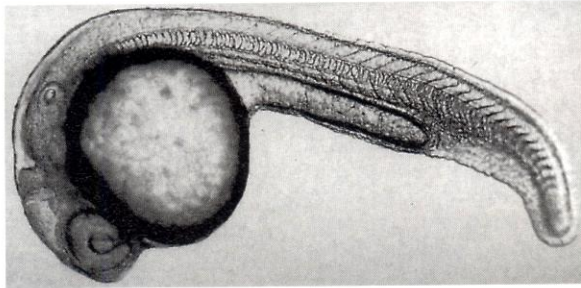


15 somites



20 somites

b) Redressement du bourgeon caudal



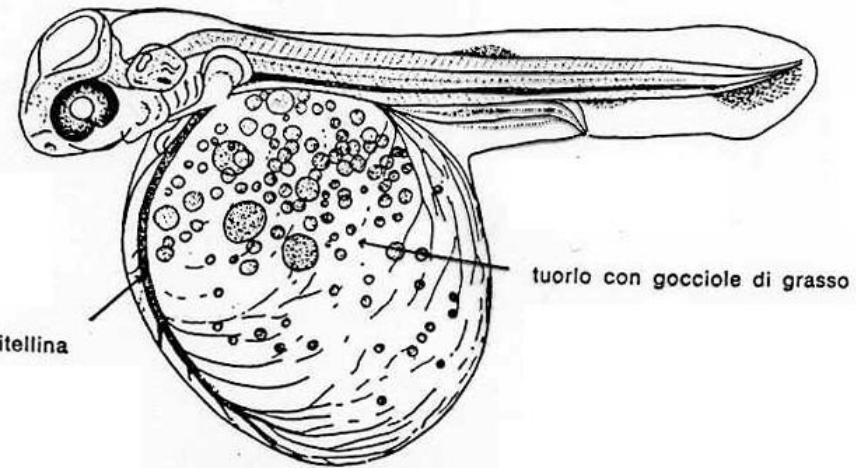
Bourgeon caudal âgé

c) Formation de la larve nageuse



(d'après Boulekbache, 1998)

**BOTTONE
CAUDALE**



Sacco del tuorlo