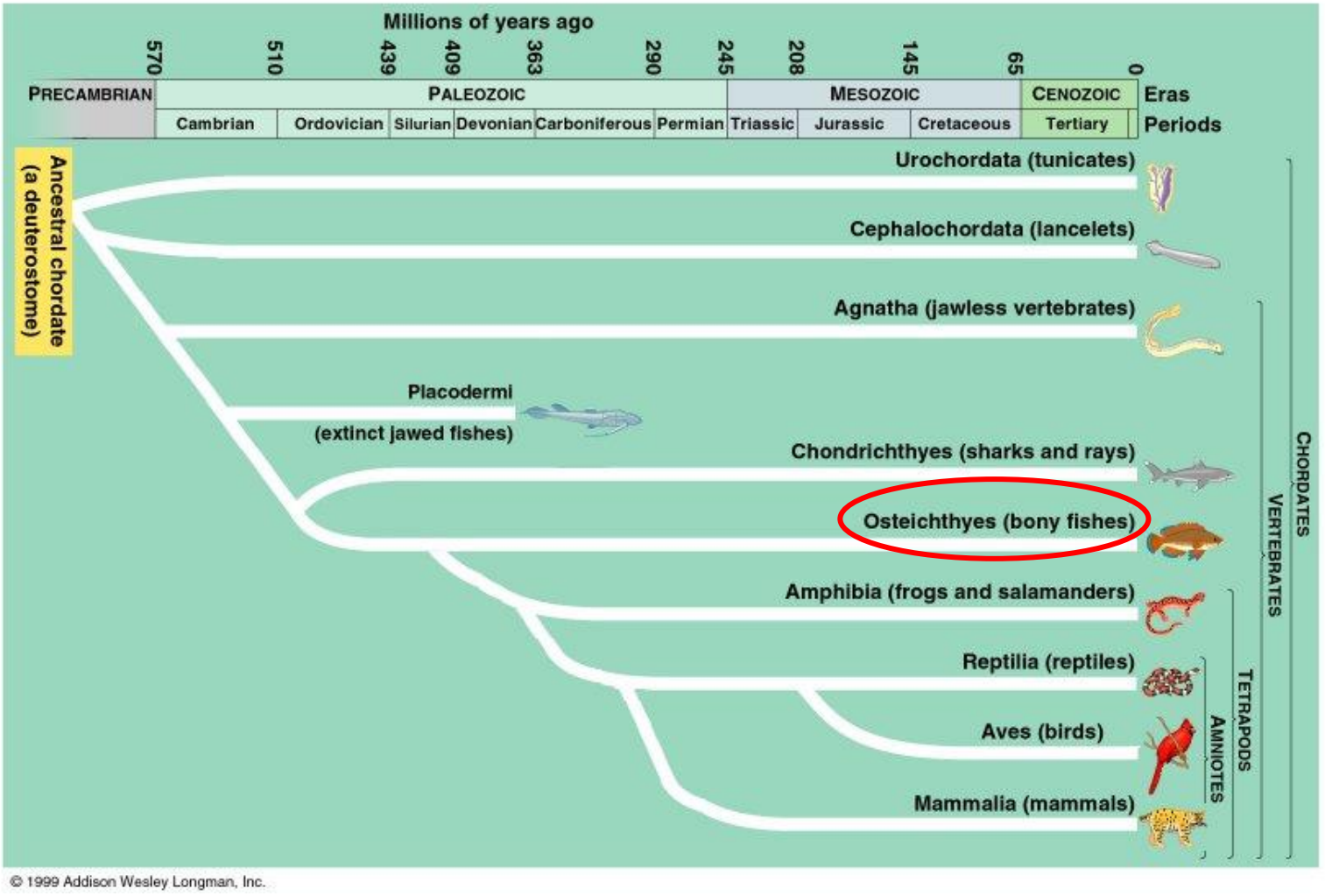
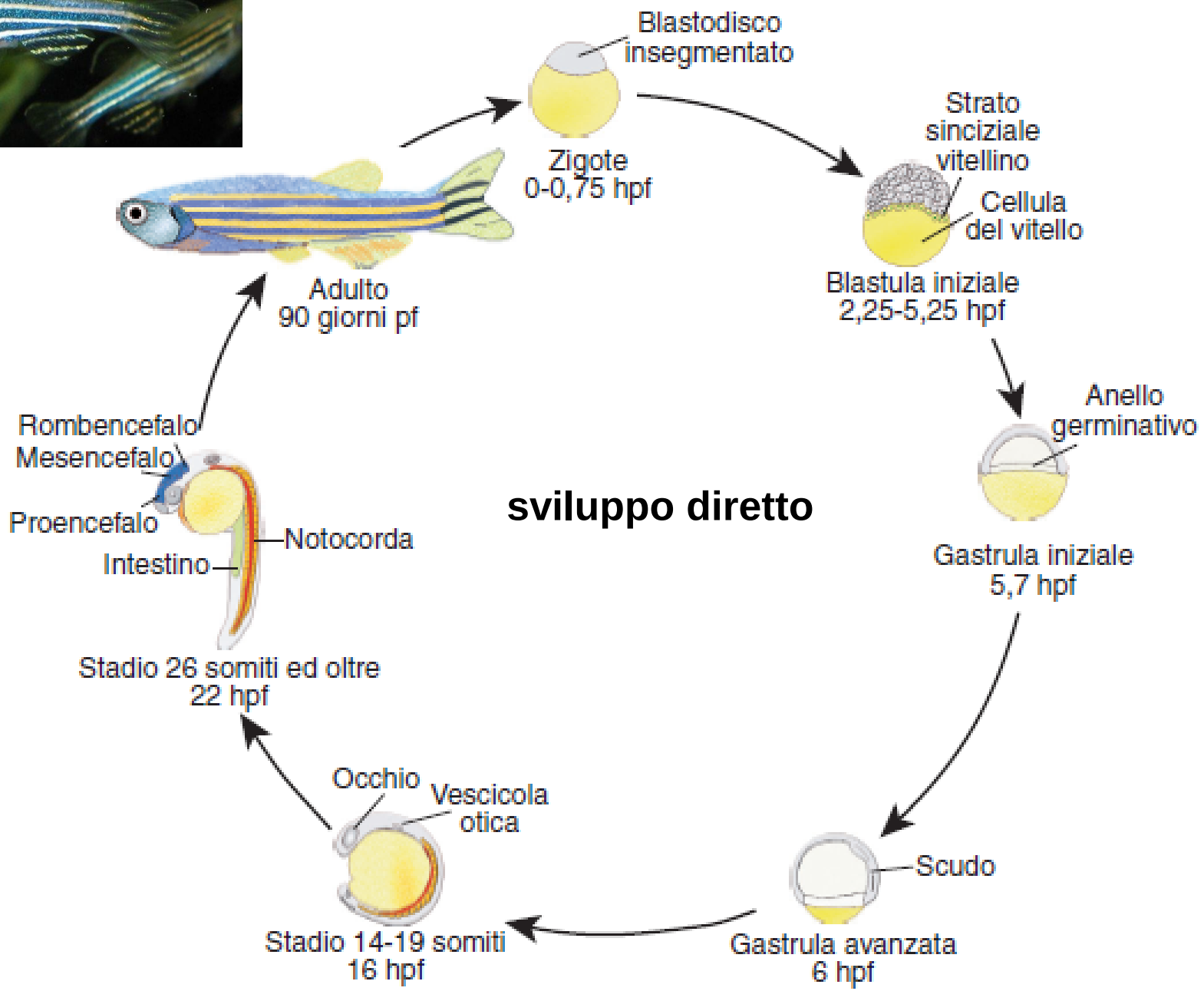
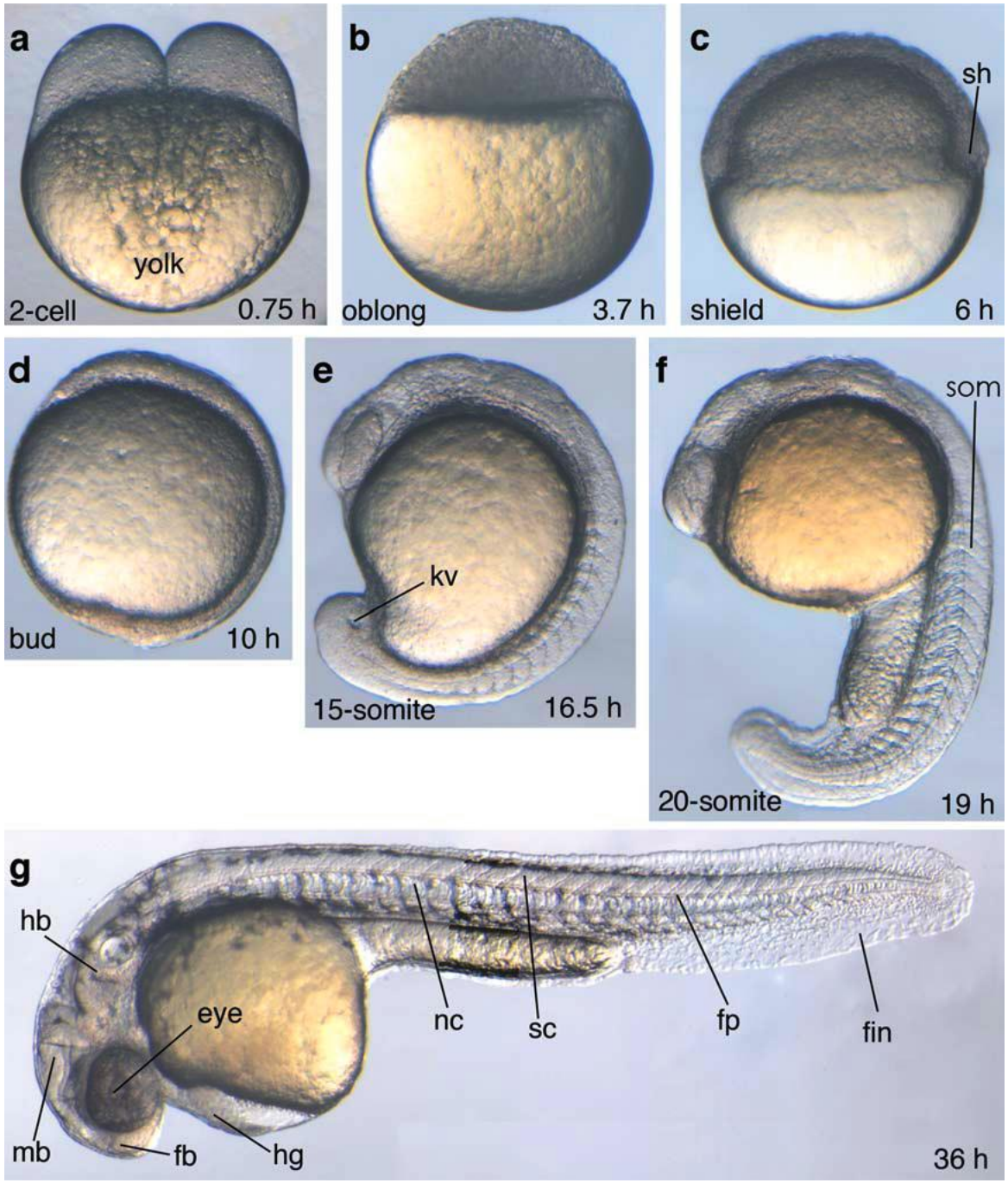
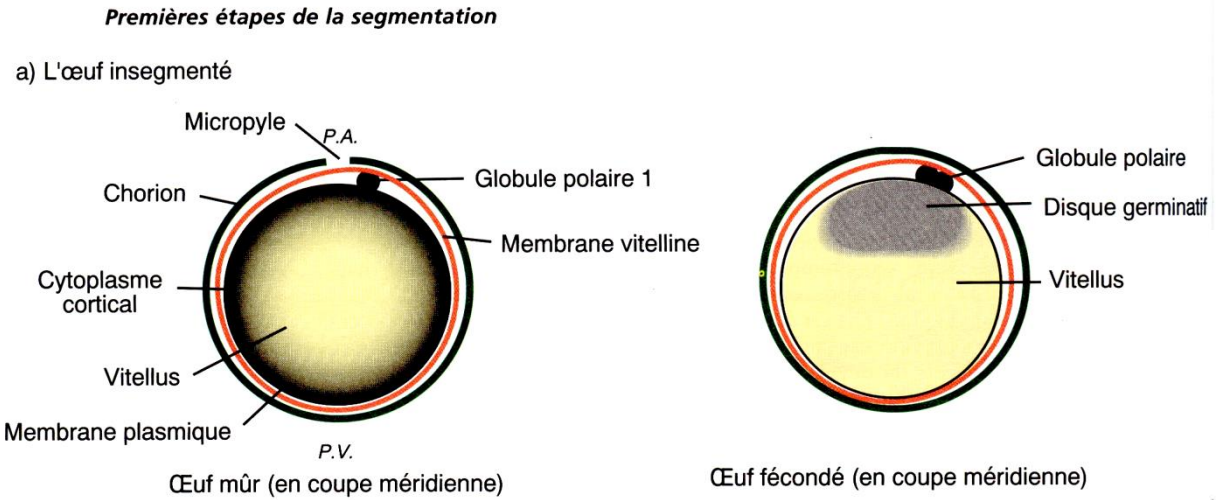
FILOGENESI DEI CORDATI



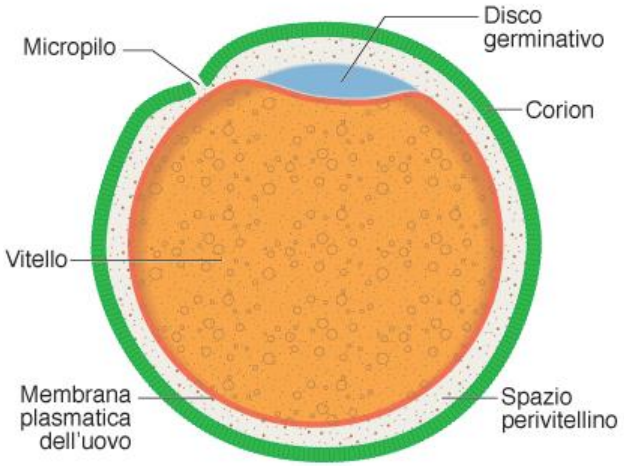
ZEBRAFISH (*Danio rerio*)




a
yolk
2-cell
0.75 h
b
oblong
3.7 h
c
sh
shield
6 h
d
bud
10 h
e
kv
15-somite
16.5 h
f
som
20-somite
19 h
g
hb
eye
nc
sc
fp
fin
mb
fb
hg
36 h

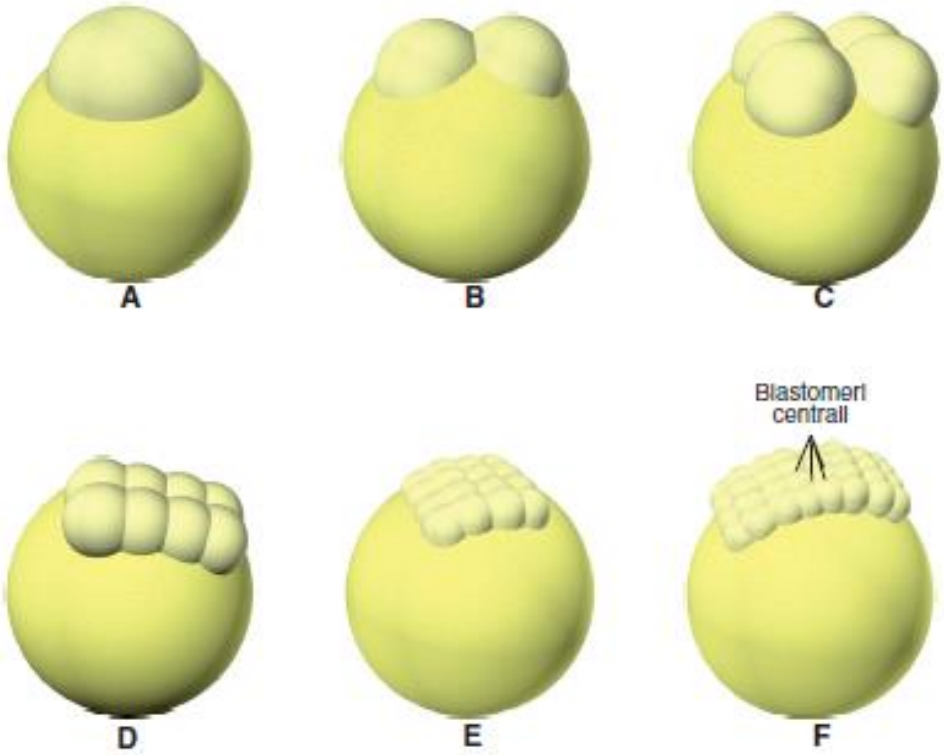


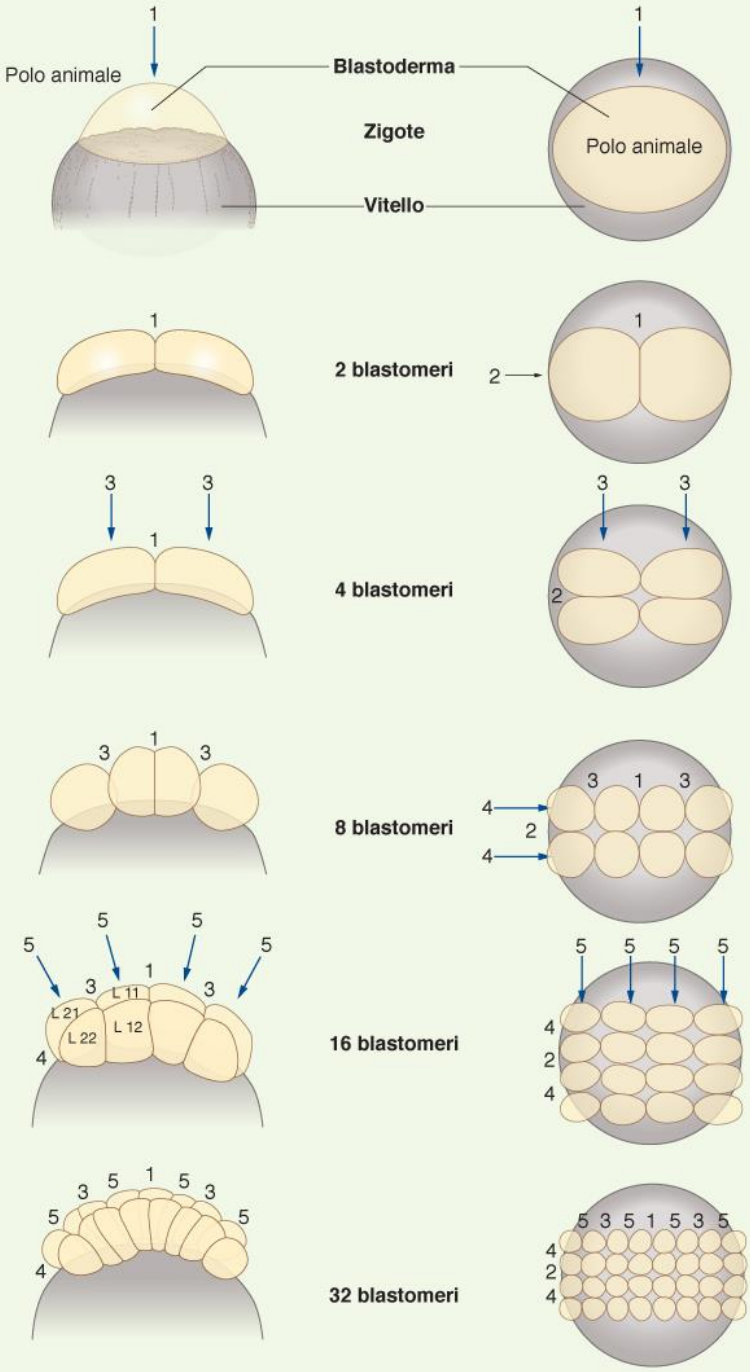
Uovo telolecitico

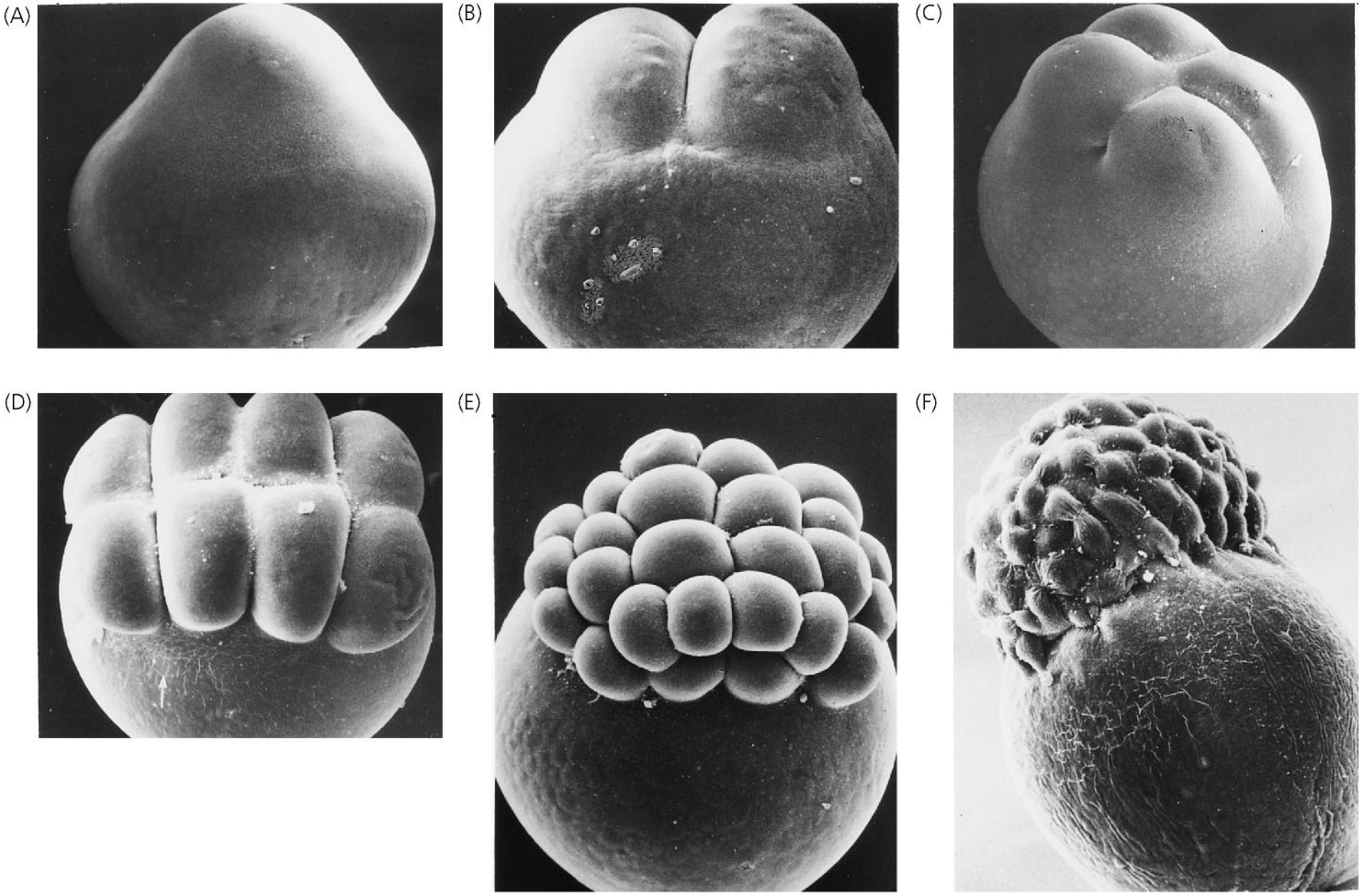


Segmentazione meroblastica discoidale

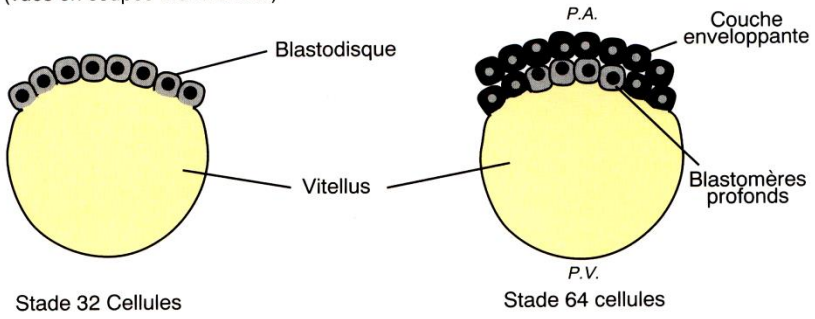
SEGMENTAZIONE MEROBLASTICA DISCOIDALE





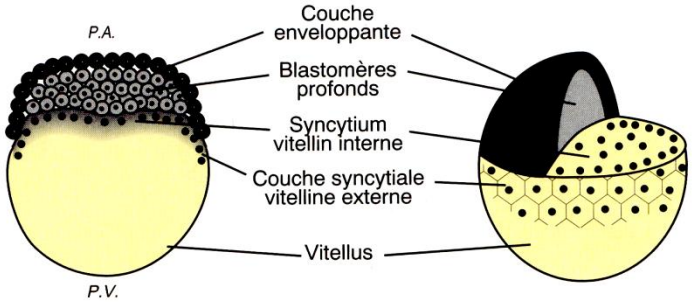

(A)
(B)
(C)
(D)
(E)
(F)

La segmentation (vues en coupes méridiennes)

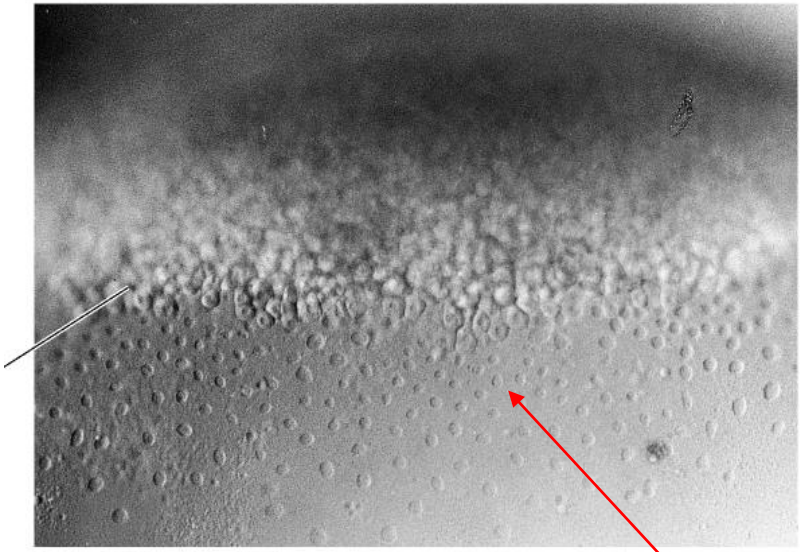


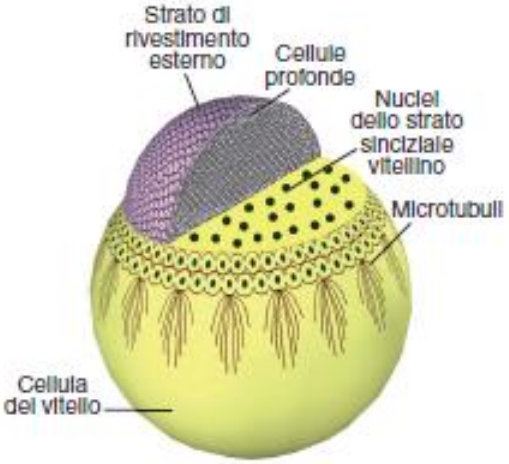
Stade 32 Cellules

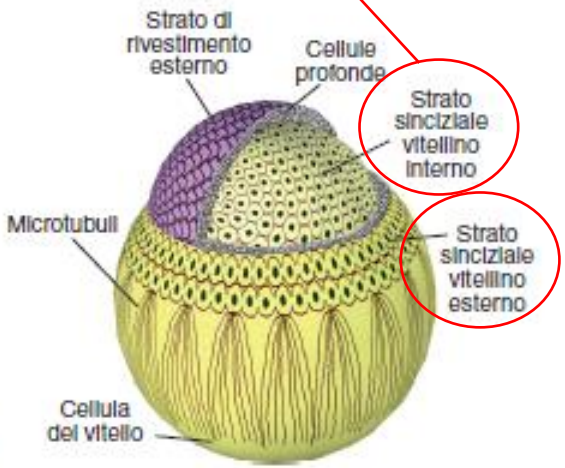
Stade 64 cellules



Blastula (256-512 cel

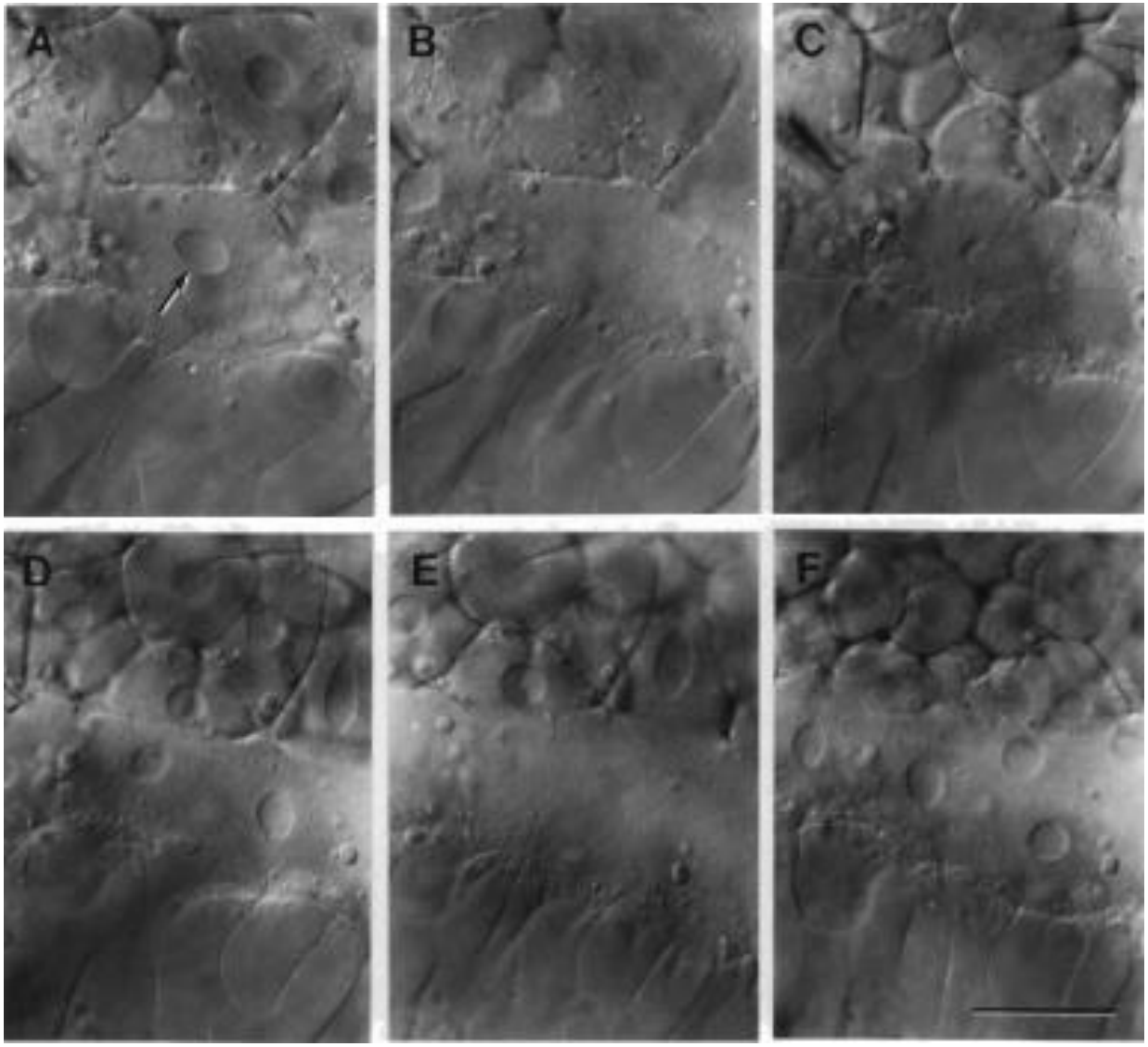




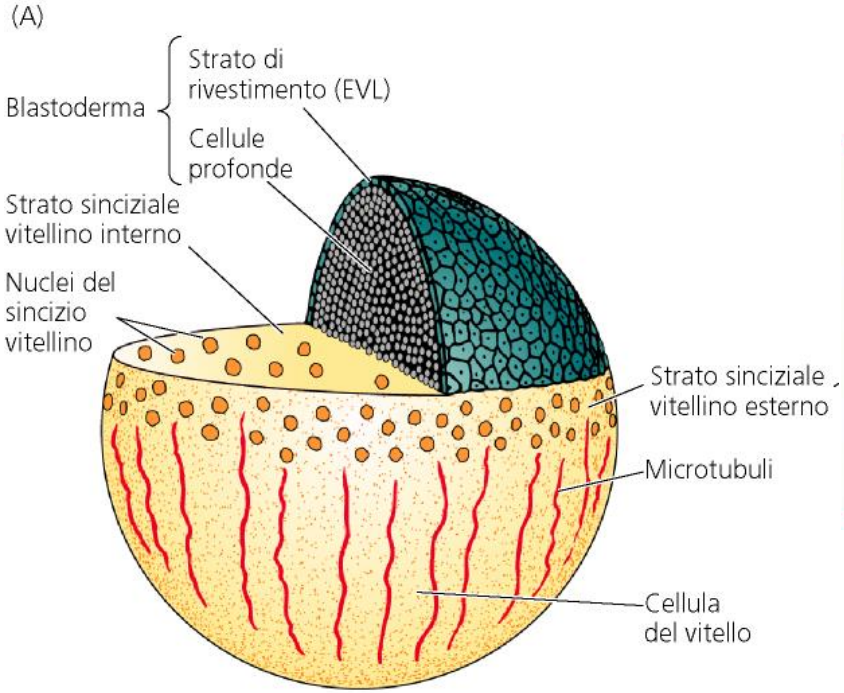


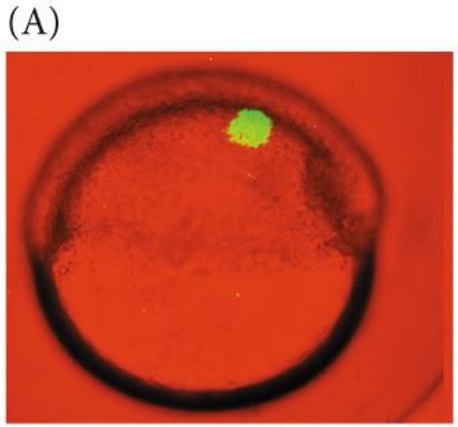
1. Rivestimento esterno: **periderma**
2. **Blastomeri profondi**: formano l'embrione
3. **Sincizio vitellino**

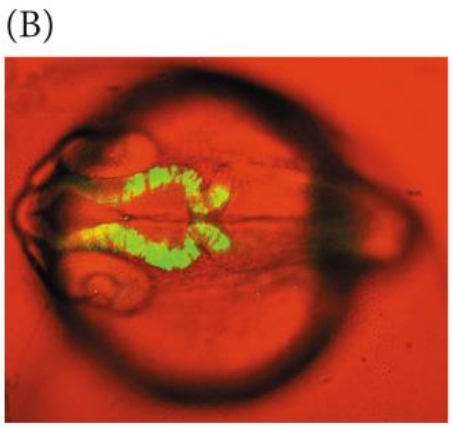
FORMAZIONE DELLO STRATO SINCIZIALE VITELLINO

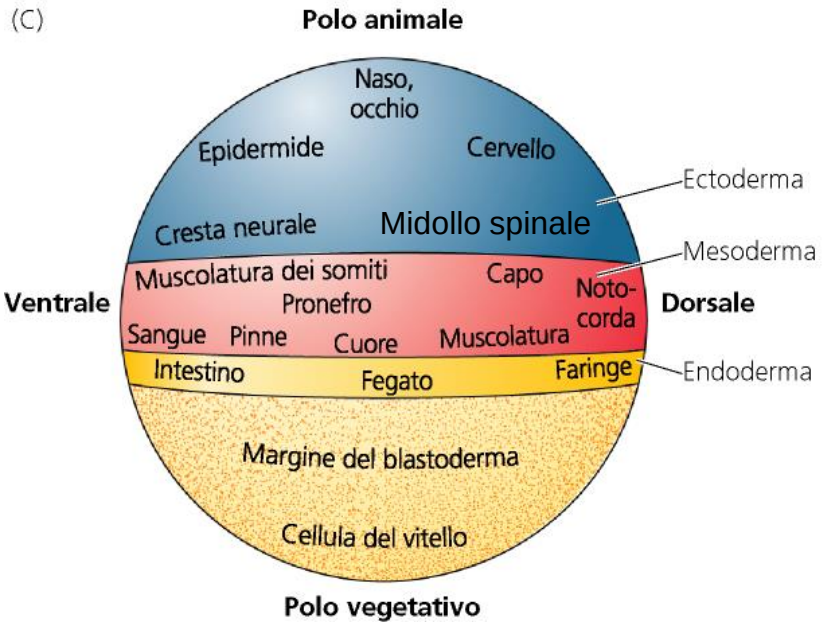


MAPPA DEI TERRITORI PRESUNTIVI NELLA BLASTULA DI ZEBRAFISH





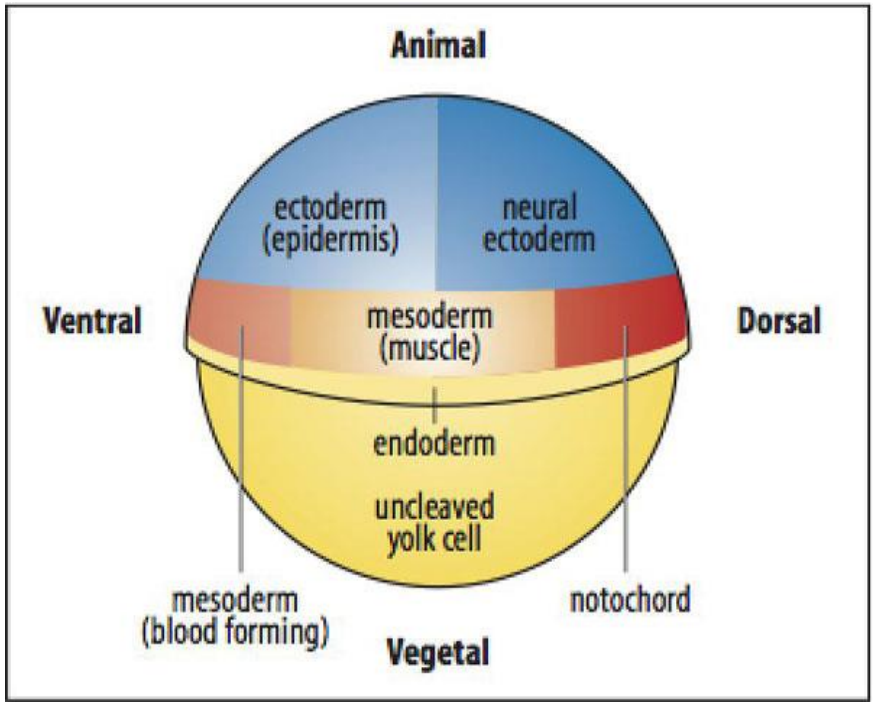




1. Ectoderma, mesoderma ed endoderma presuntivi allineati lungo l'asse animale vegetativo (ma la mappa è «compressa» nell'emisfero animale per via della segmentazione meroblastica).

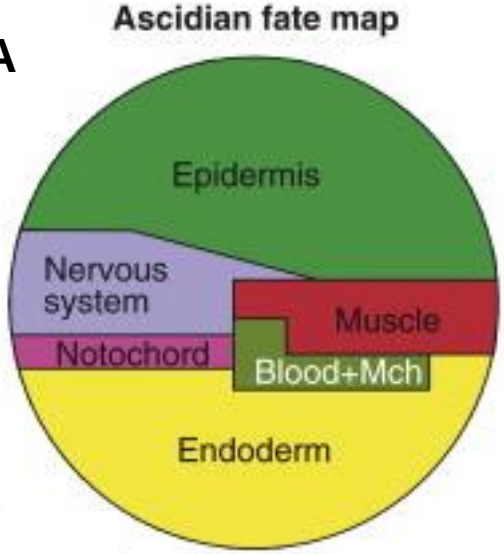
2. Vicinanza dei territori presuntivi del cordomesoderma e del neuroectoderma sul futuro lato dorsale.

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

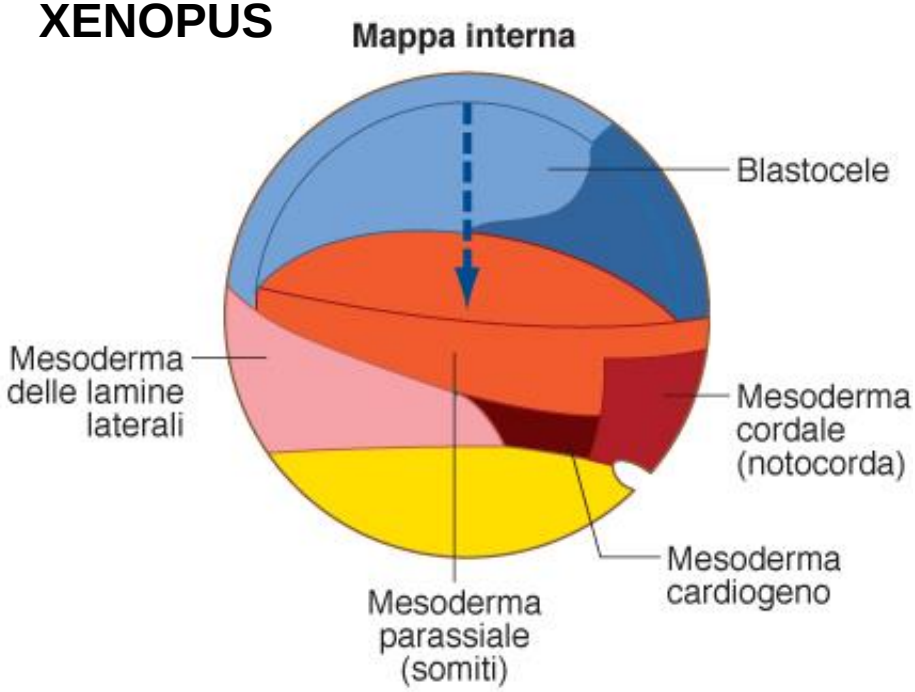


ZEBRAFISH

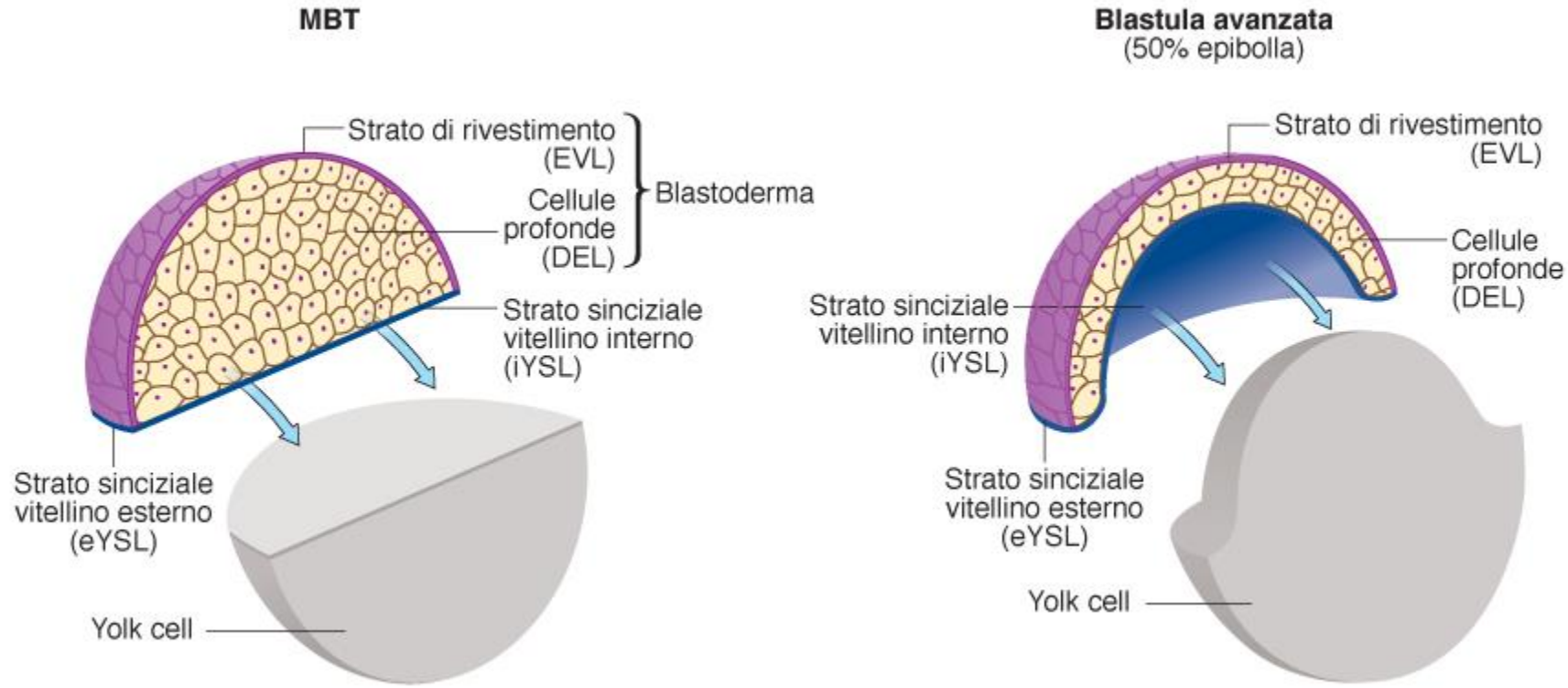
ASCIDIA



XENOPUS

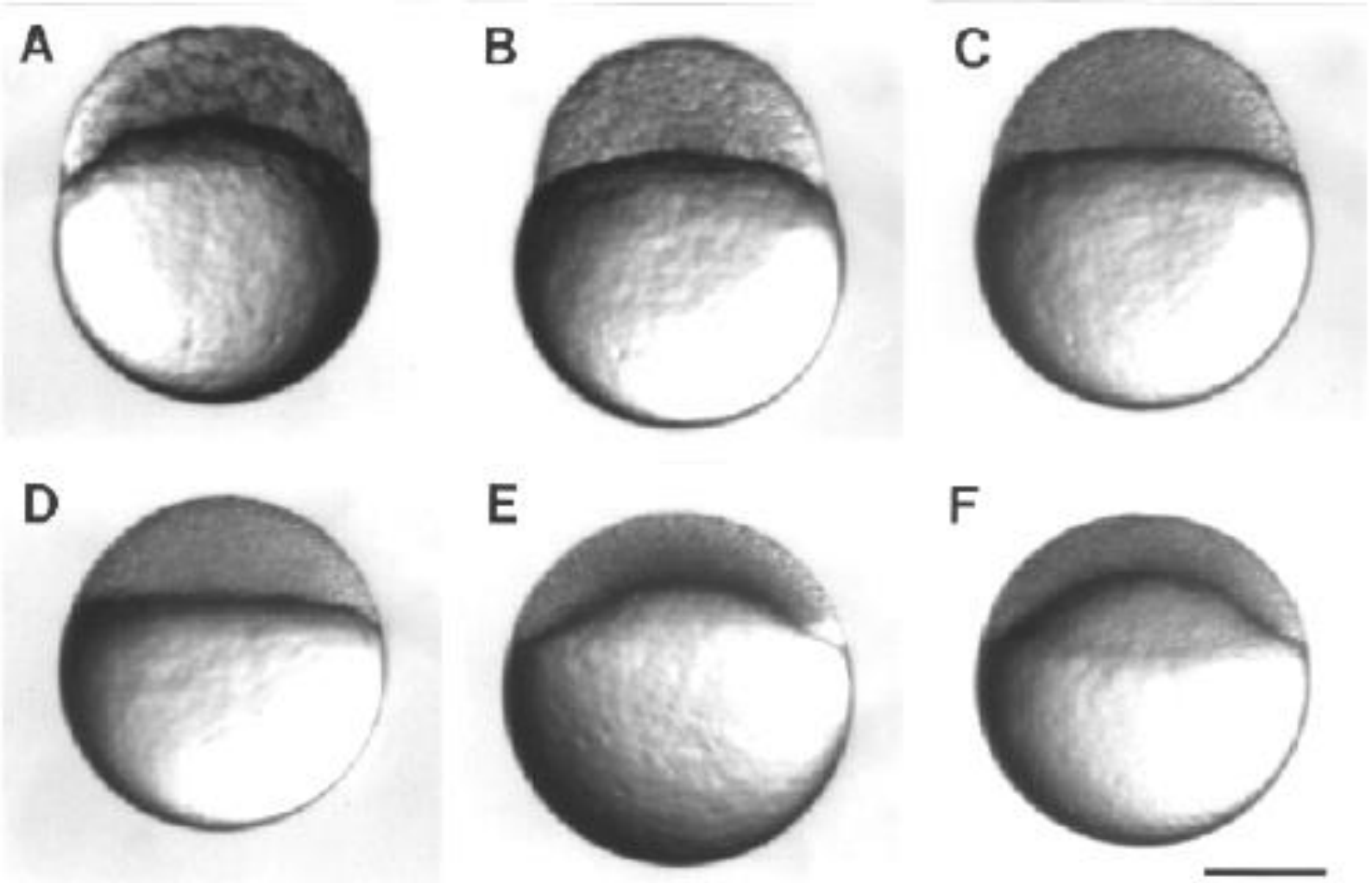


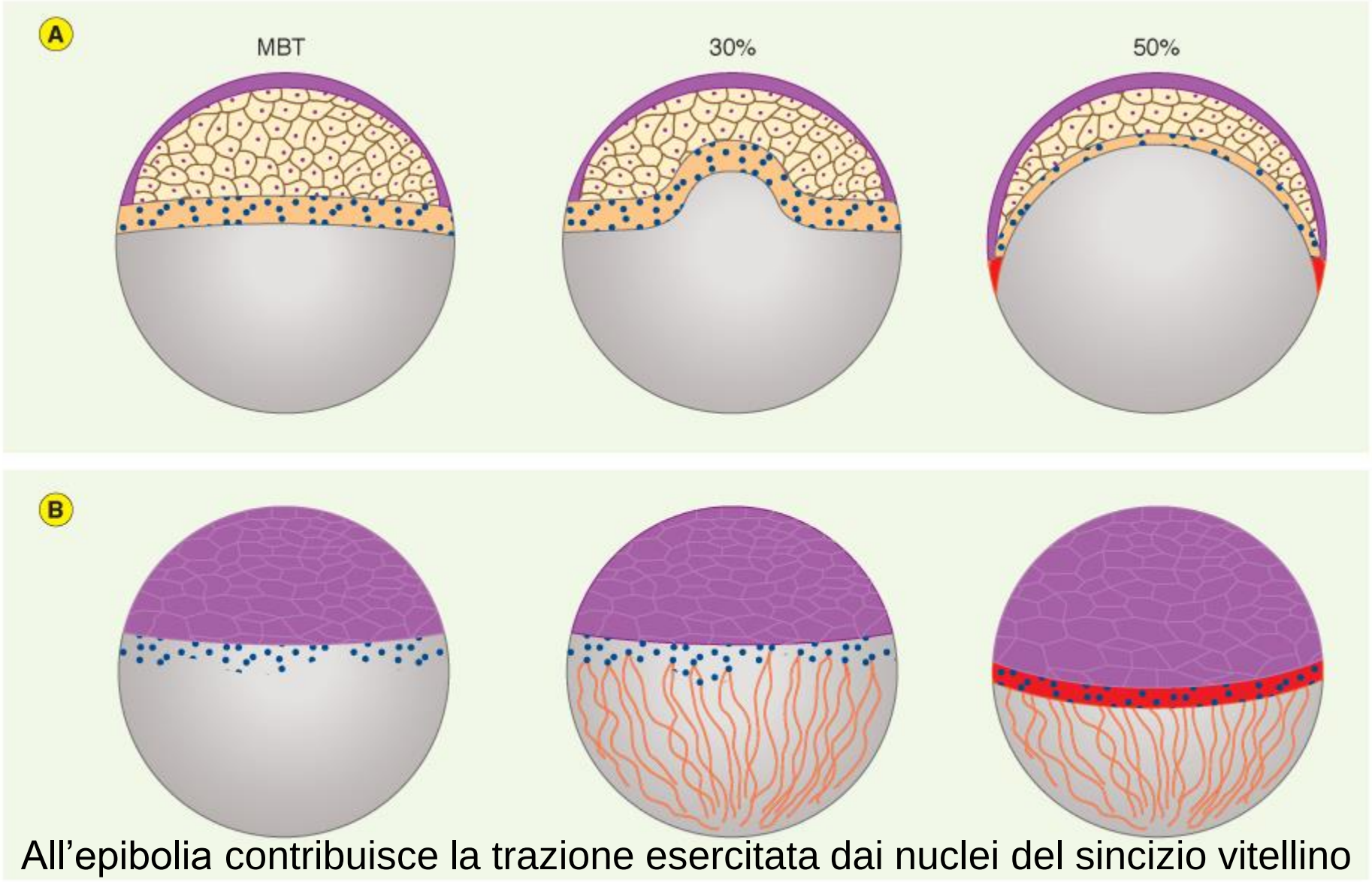
FASI INIZIALI DELL'EPIBOLIA NELLA BLASTULA DI ZEBRAFISH



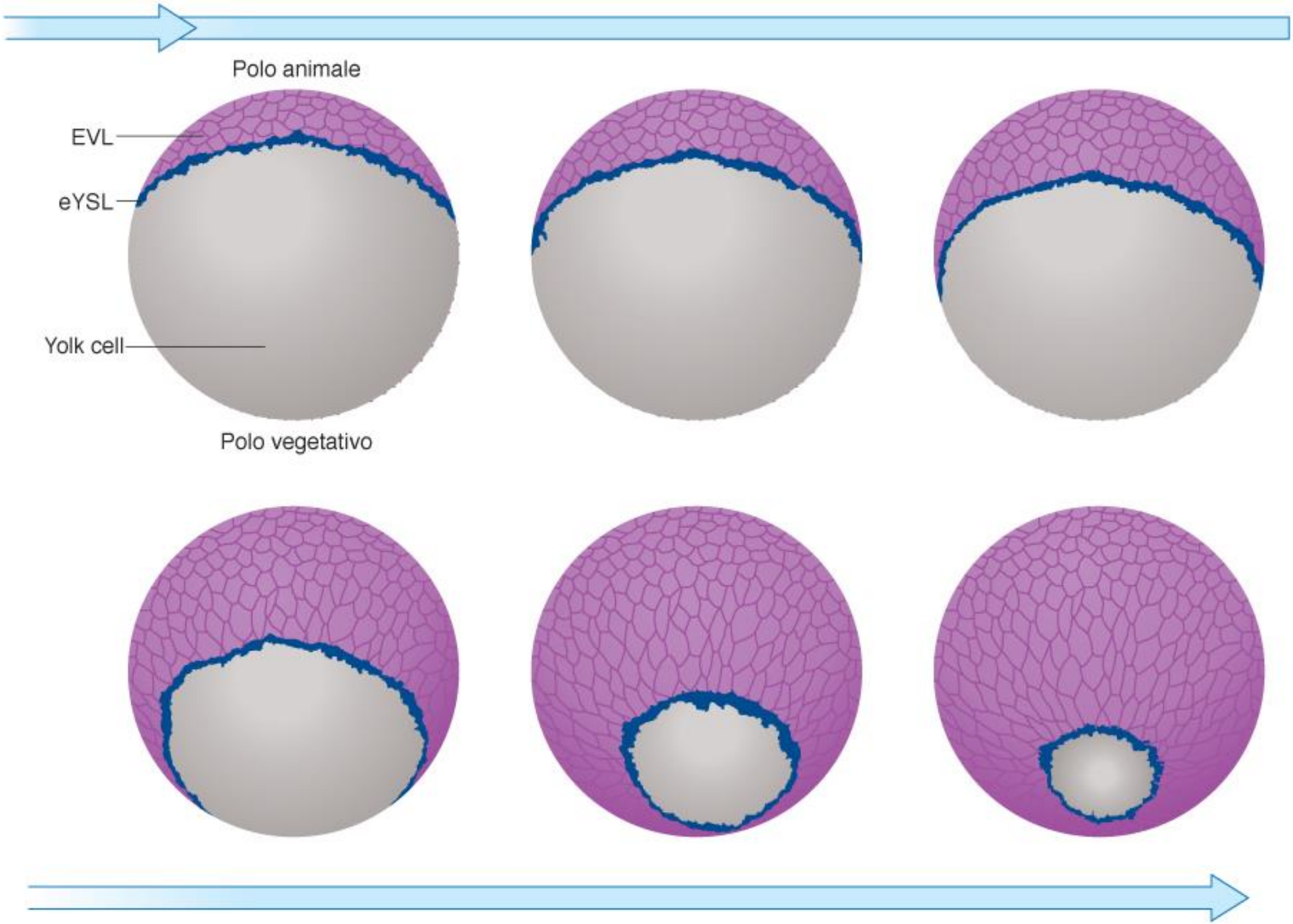
IL BLASTODISCO SI ASSOTTIGLIA PER EFFETTO DI MOVIMENTI DI INTERCALAZIONE RADIALE DELLE CELLULE DEGLI STRATI PIU' INTERNI

Si riduce il numero di strati ed aumenta la superficie

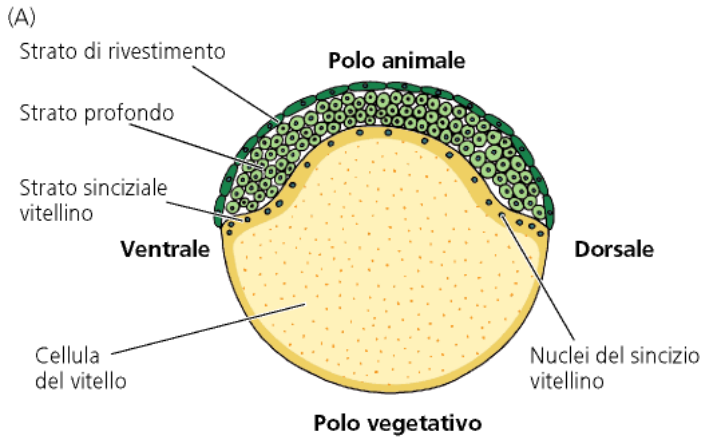

A
B
C
D
E
F

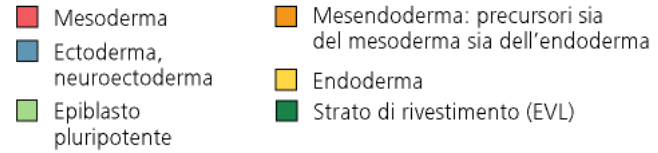


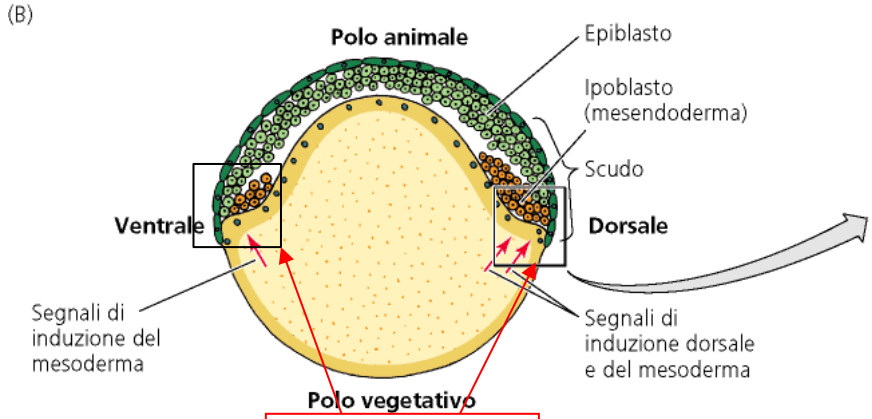
All’epibolia contribuisce la trazione esercitata dai nuclei del sincizio vitellino

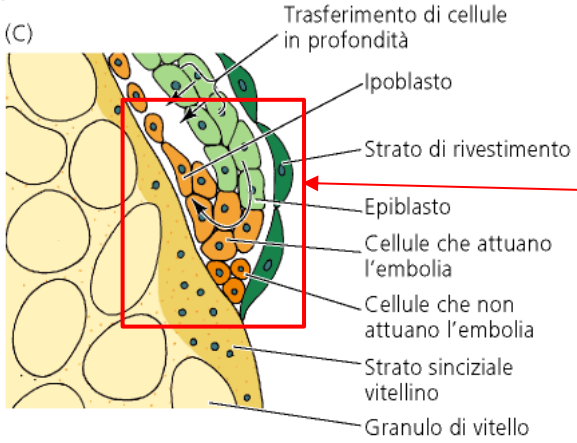

Polo animale
EVL
eYSL
Yolk cell
Polo vegetativo

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



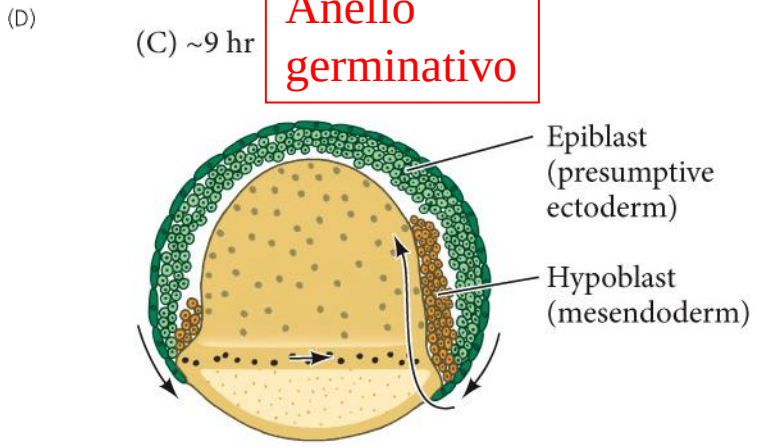


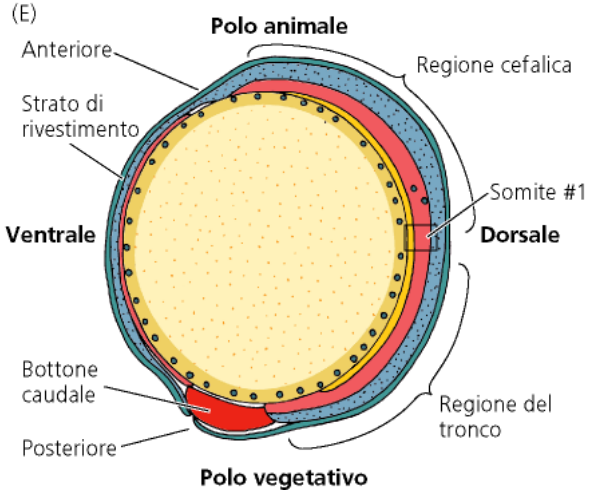


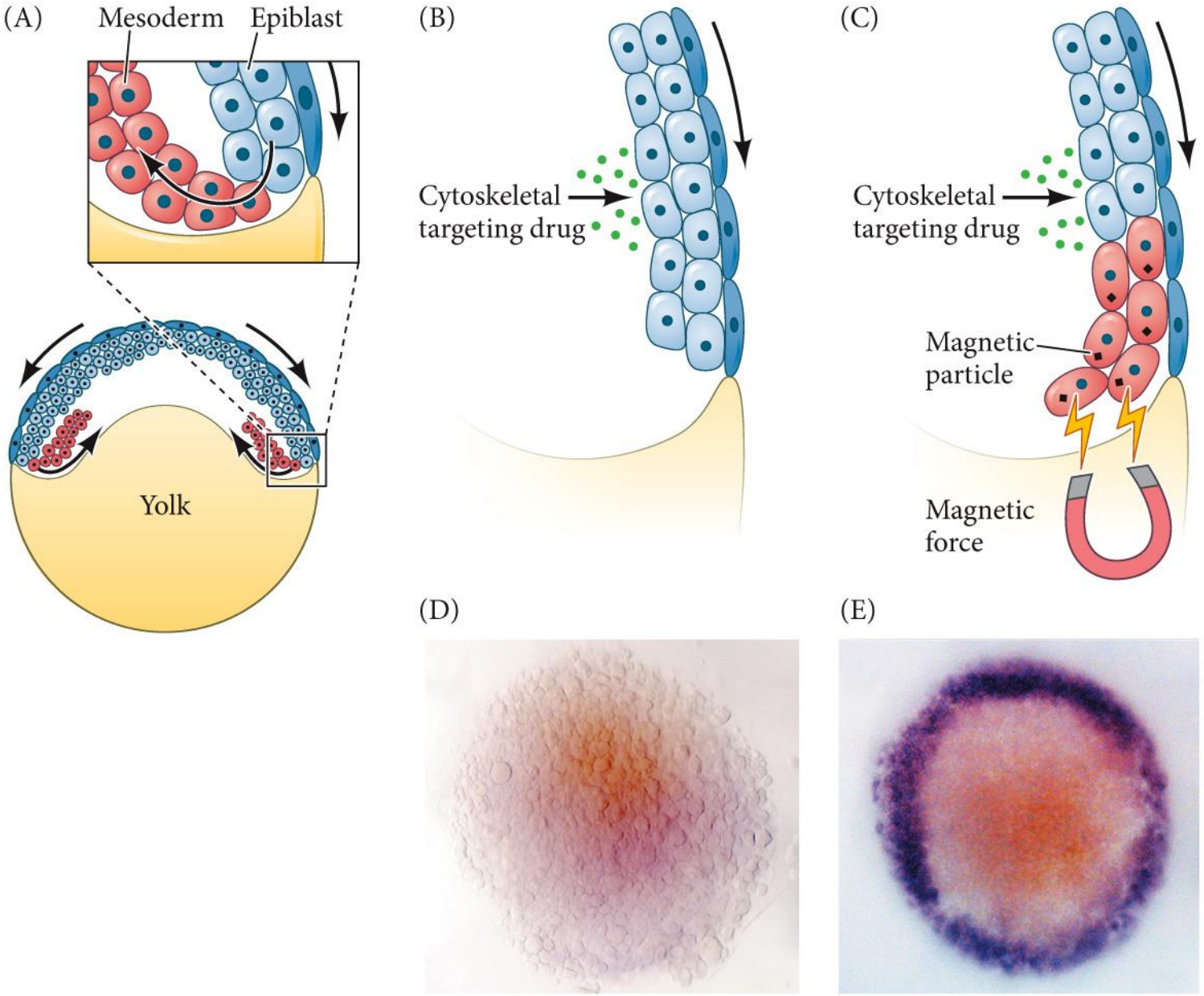


Anello germinativo

Anello germinativo

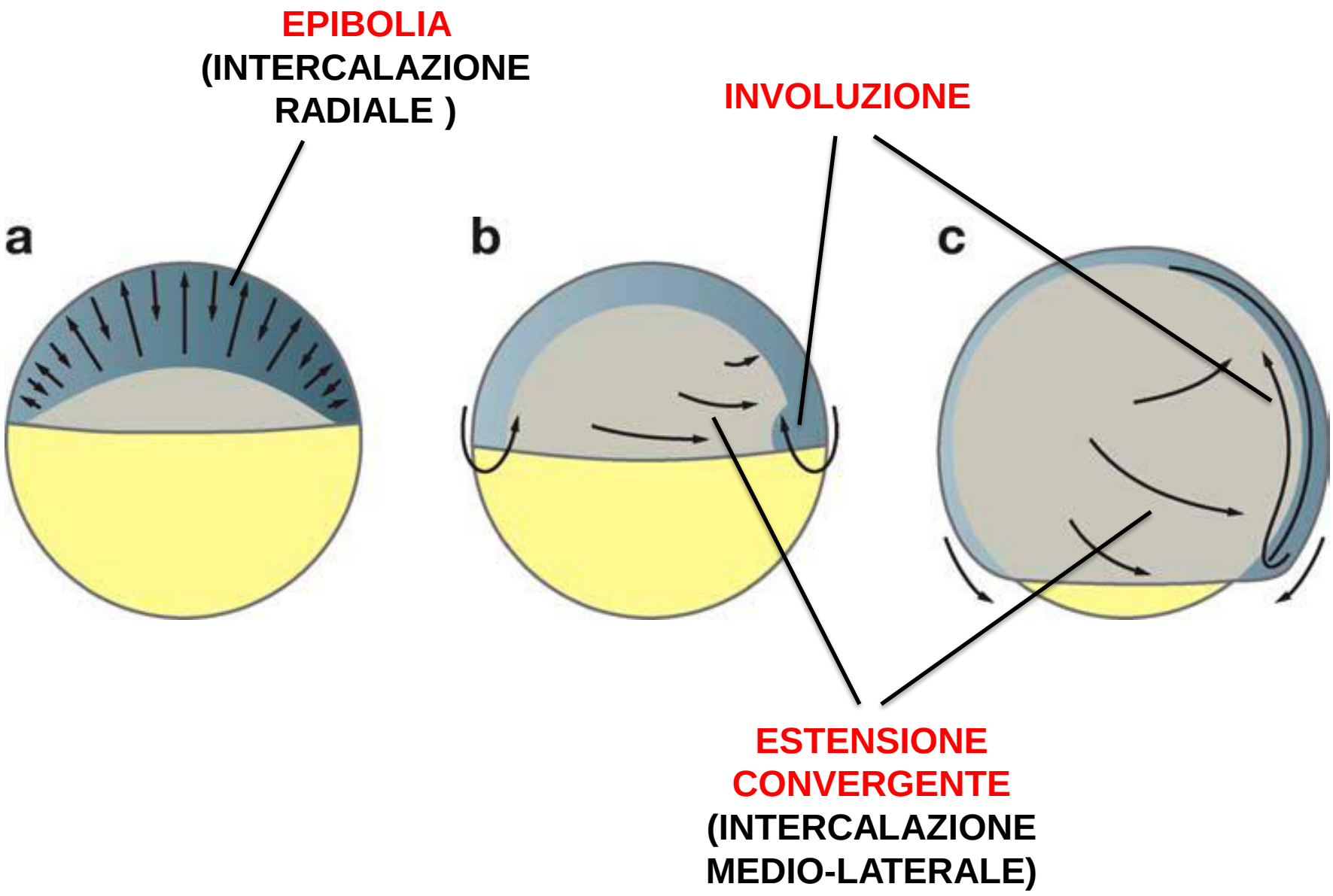


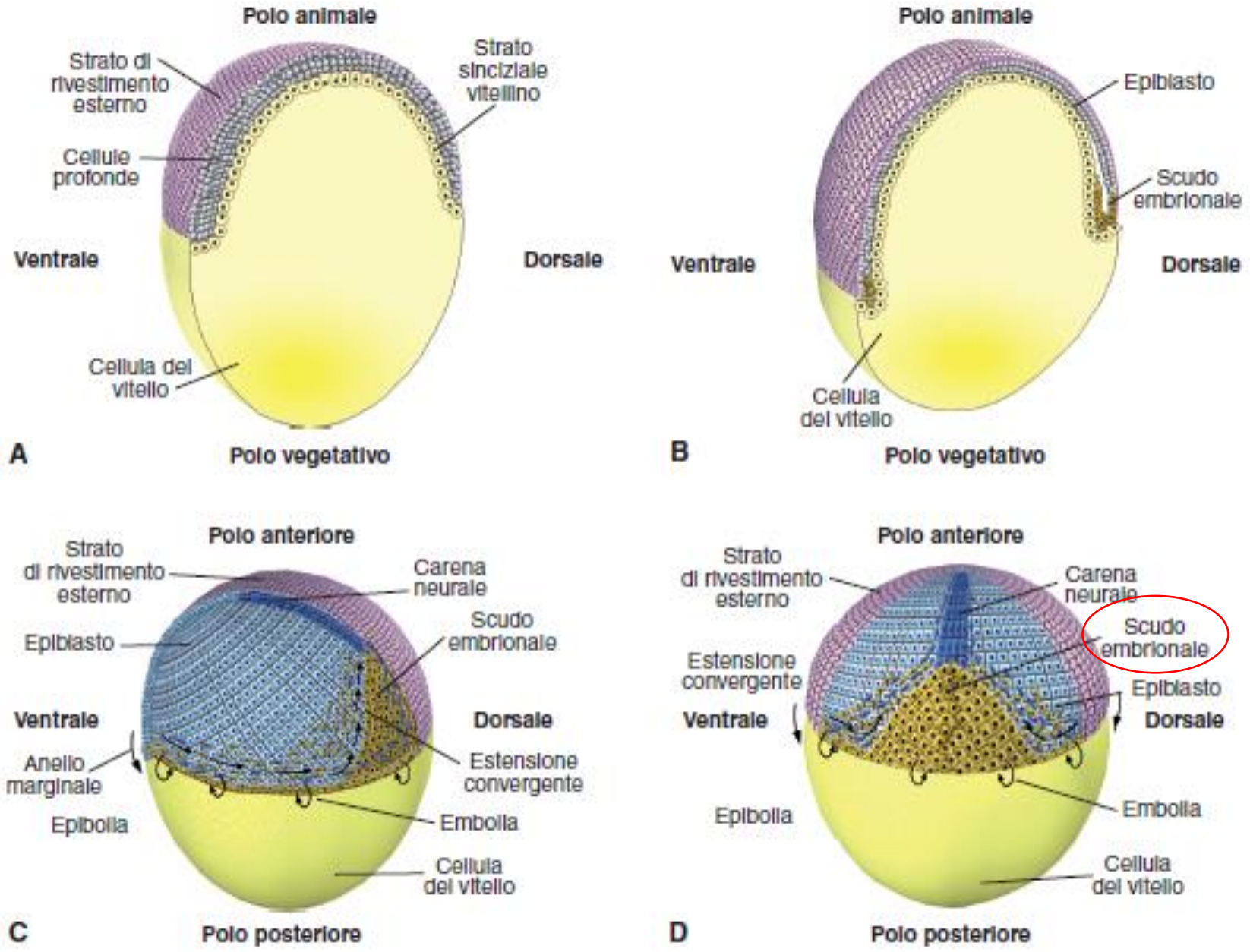


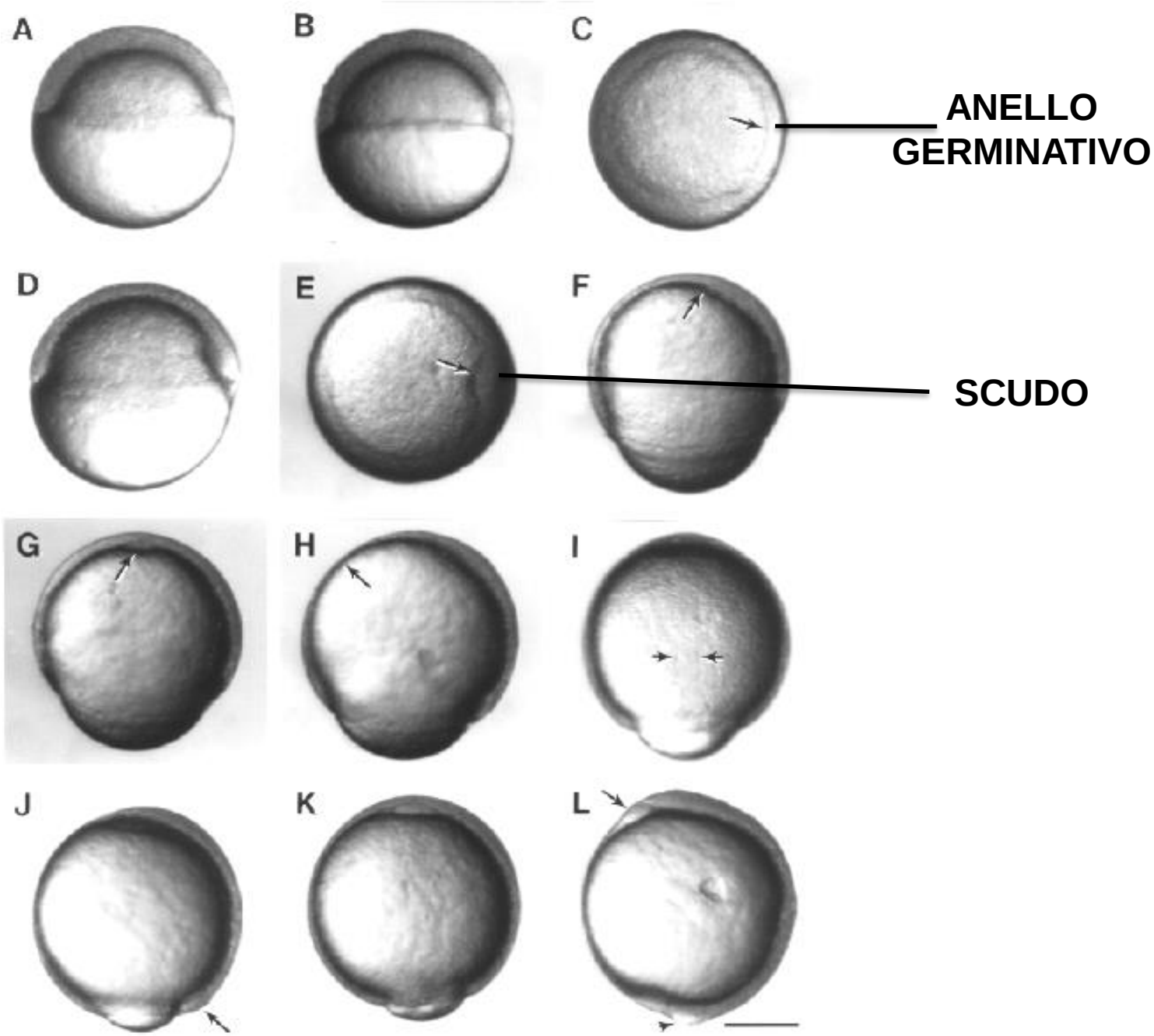


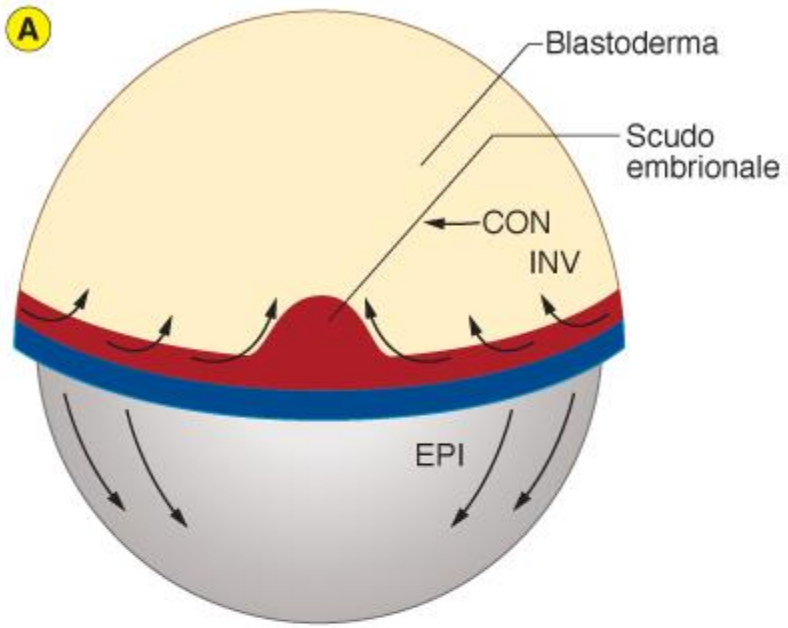
DEVELOPMENTAL BIOLOGY 11e, Figure 11.38

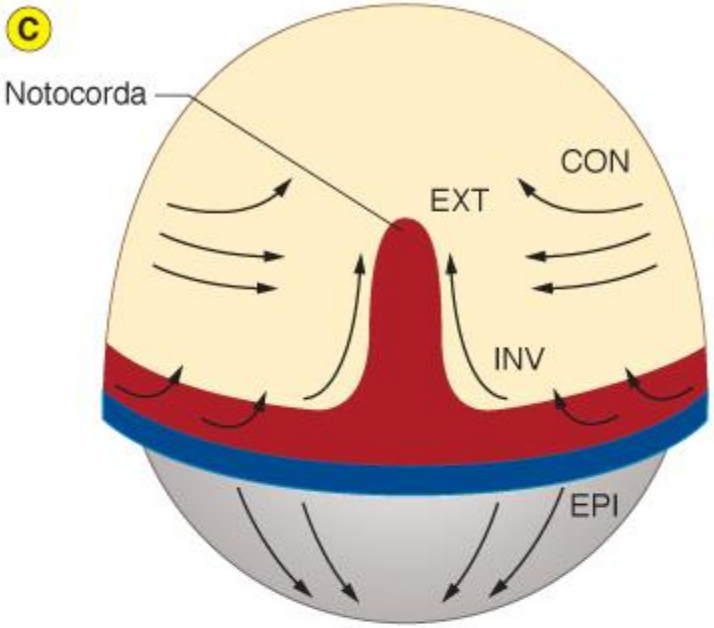
MOVIMENTI CELLULARI DURANTE LA GASTRULAZIONE IN ZEBRAFISH

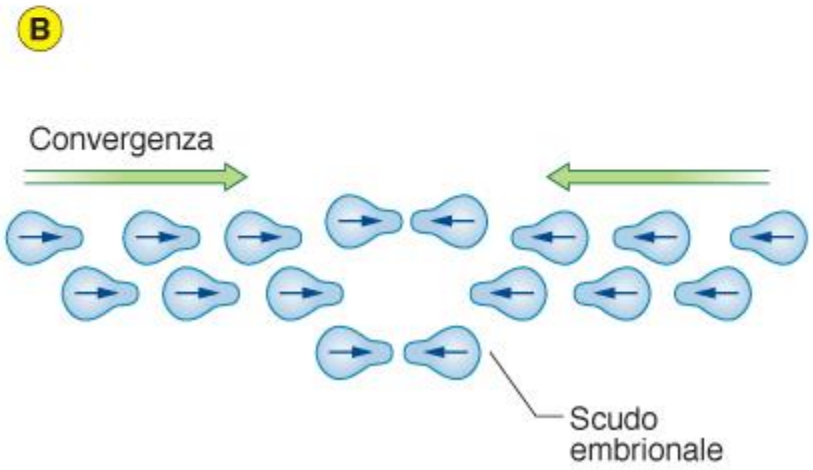


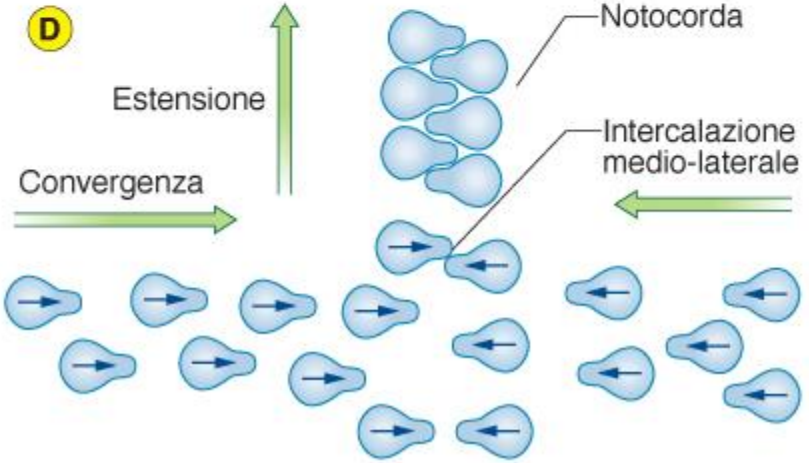

Polo animale
Strato di rivestimento esterno
Strato sinciziale vitellino
Cellule profonde
Ventrale
Dorsale
Cellula del vitello
A
Polo vegetativo
Polo animale
Epiblasto
Scudo embrionale
Ventrale
Dorsale
Cellula del vitello
B
Polo vegetativo
Polo anteriore
Strato di rivestimento esterno
Carena neurale
Epiblasto
Scudo embrionale
Ventrale
Dorsale
Anello marginale
Estensione convergente
Epibolia
Embolia
Cellula del vitello
C
Polo posteriore
Polo anteriore
Strato di rivestimento esterno
Carena neurale
Scudo embrionale
Estensione convergente
Epiblasto
Ventrale
Dorsale
Epibolia
Embolia
Cellula del vitello
D
Polo posteriore


A
B
C
ANELLO GERMINATIVO
D
E
F
SCUDO
G
H
I
J
K
L



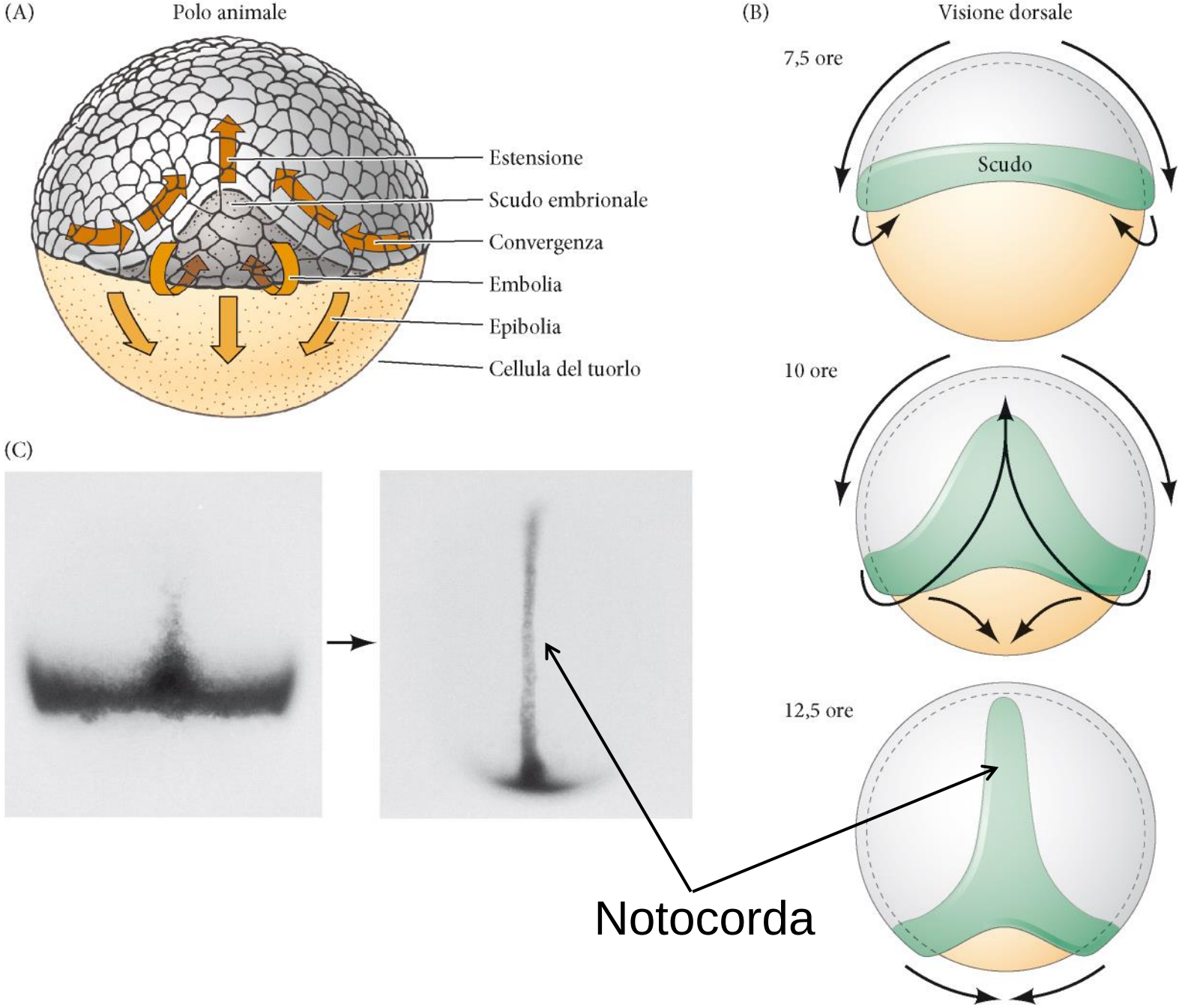


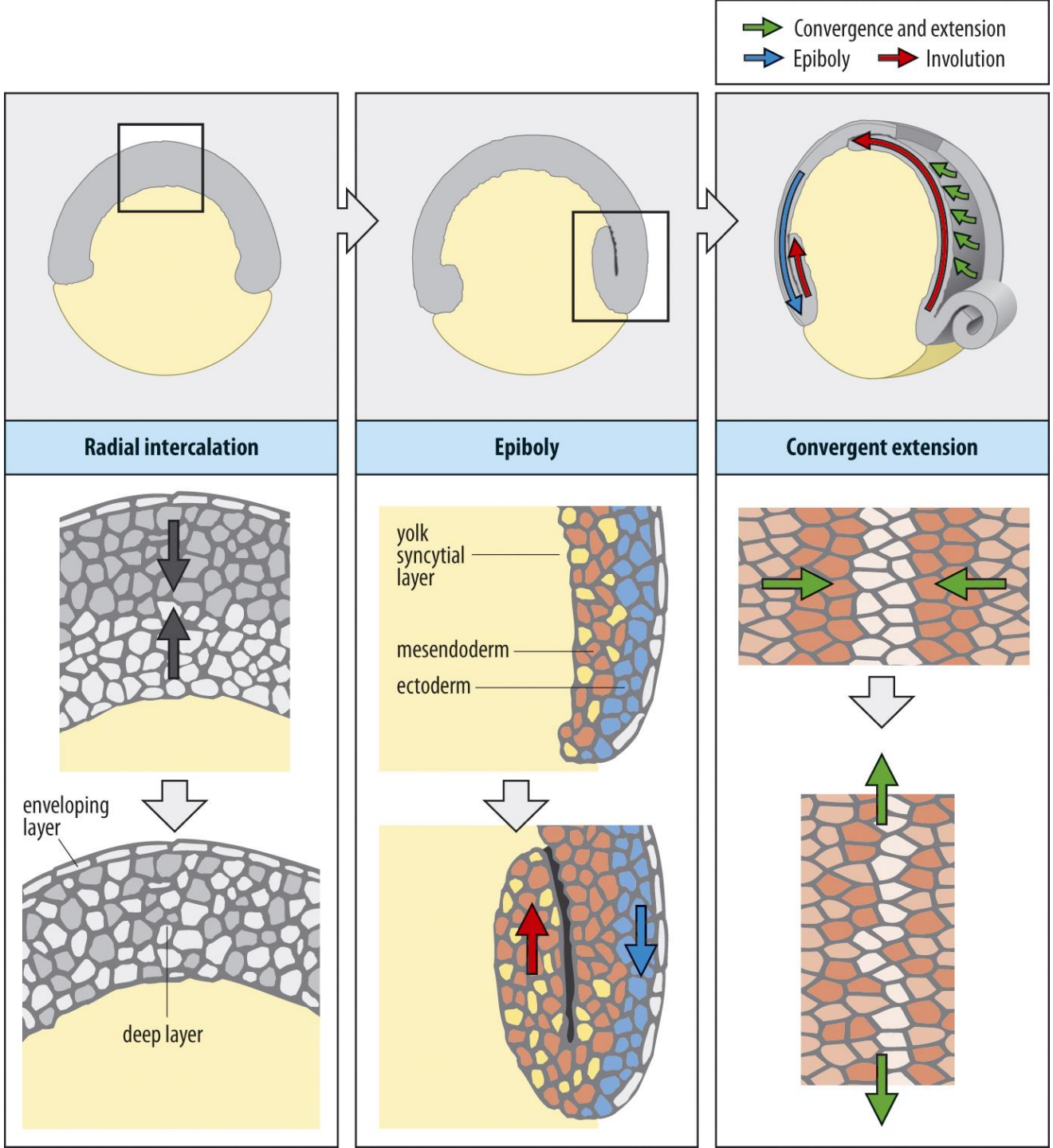


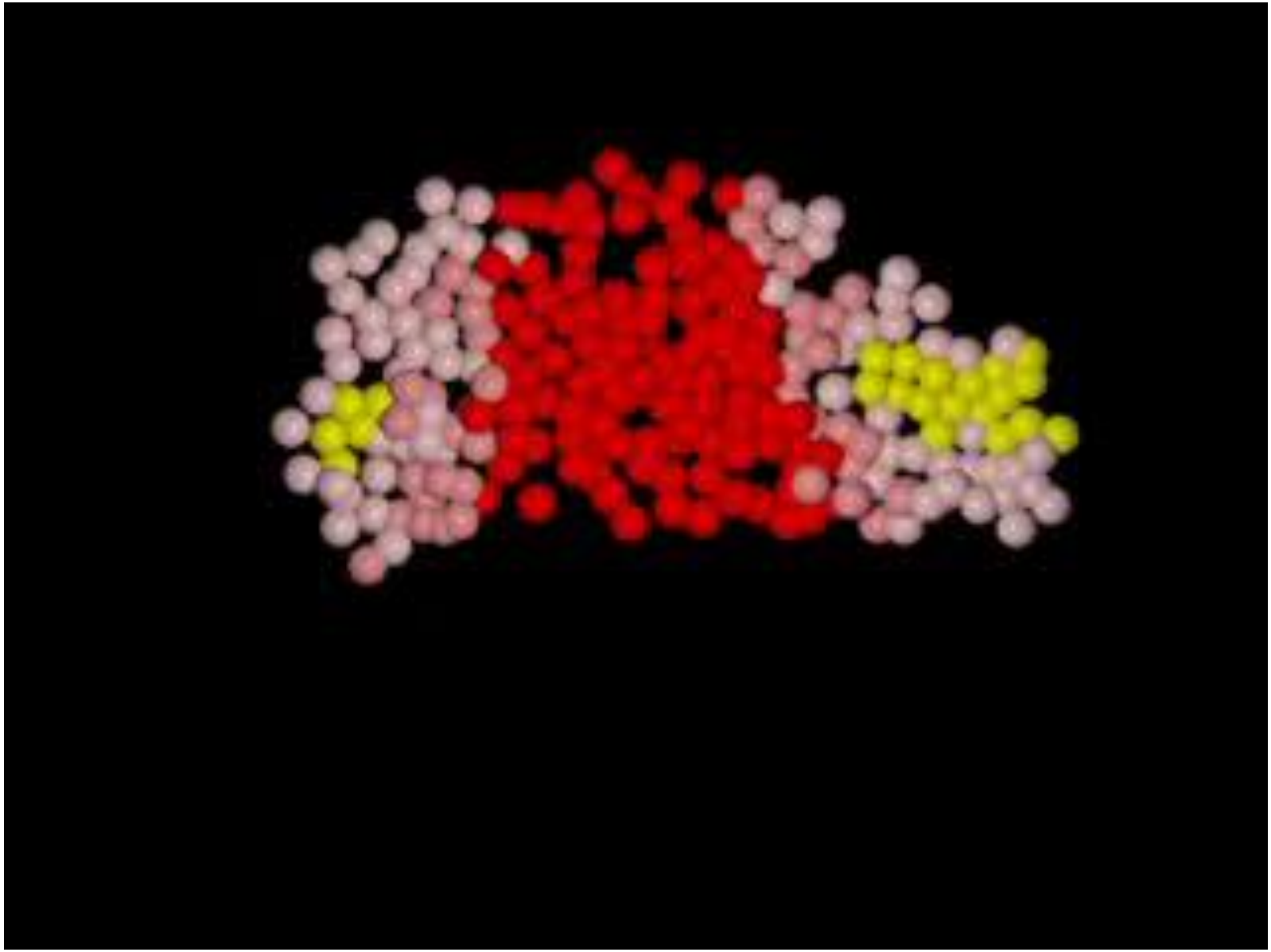


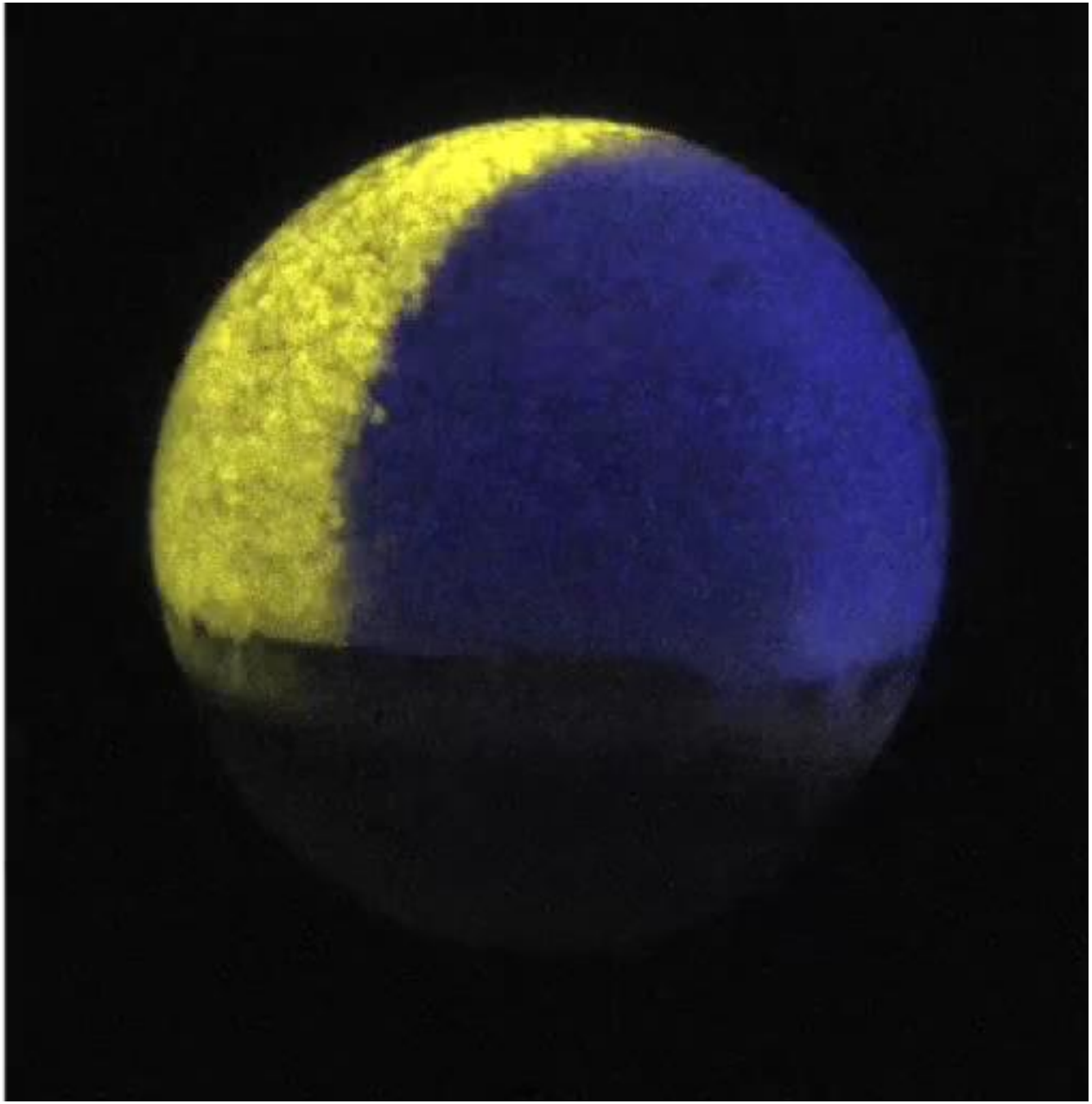
LE STRUTTURE ASSIALI SI ALLUNGANO PER EFFETTO DI MOVIMENTI DI INTERCALAZIONE MEDIO-LATERALE DELLE CELLULE DORSALI

Si riduce il numero di file ed aumenta la lunghezza

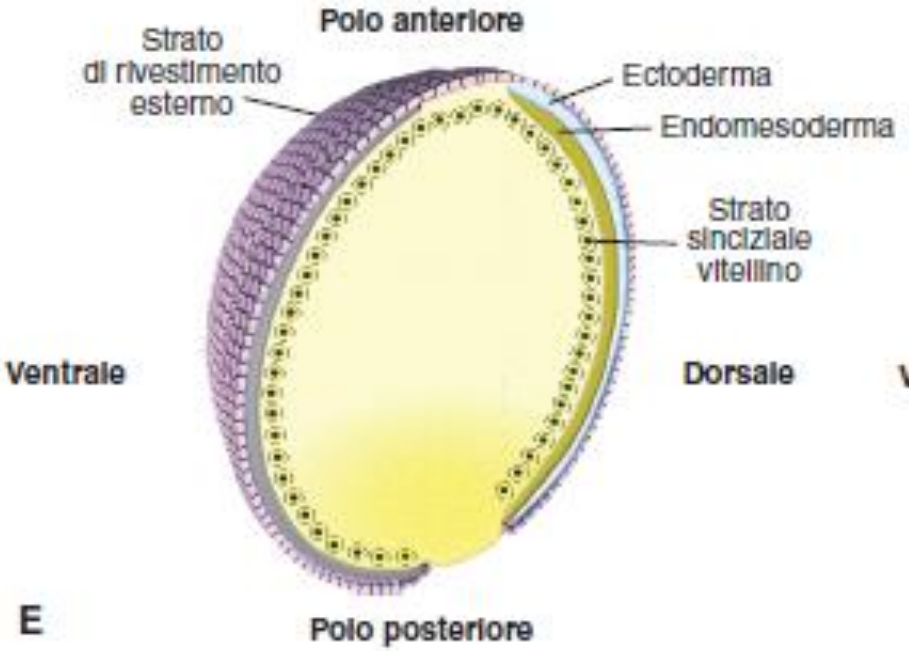

(A)
Polo animale
Estensione
Scudo embrionale
Convergenza
Embolia
Epibolia
Cellula del tuorlo
(B)
Visione dorsale
7,5 ore
Scudo
10 ore
12,5 ore
(C)
Notocorda

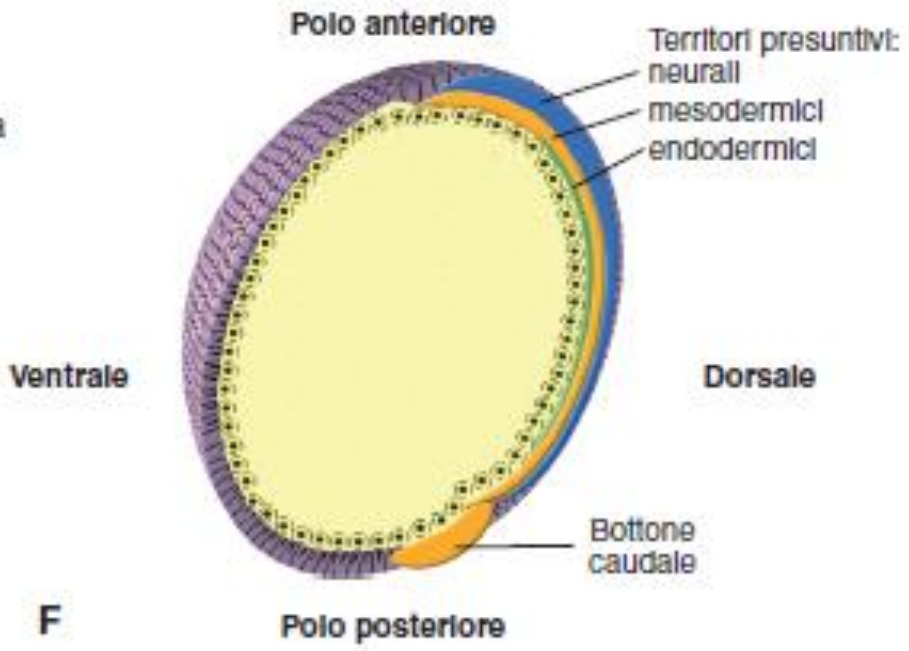

Convergence and extension
Epiboly
Involution
Radial intercalation
Epiboly
Convergent extension
yolk
syncytial
layer
mesendoderm
ectoderm
enveloping
layer
deep layer

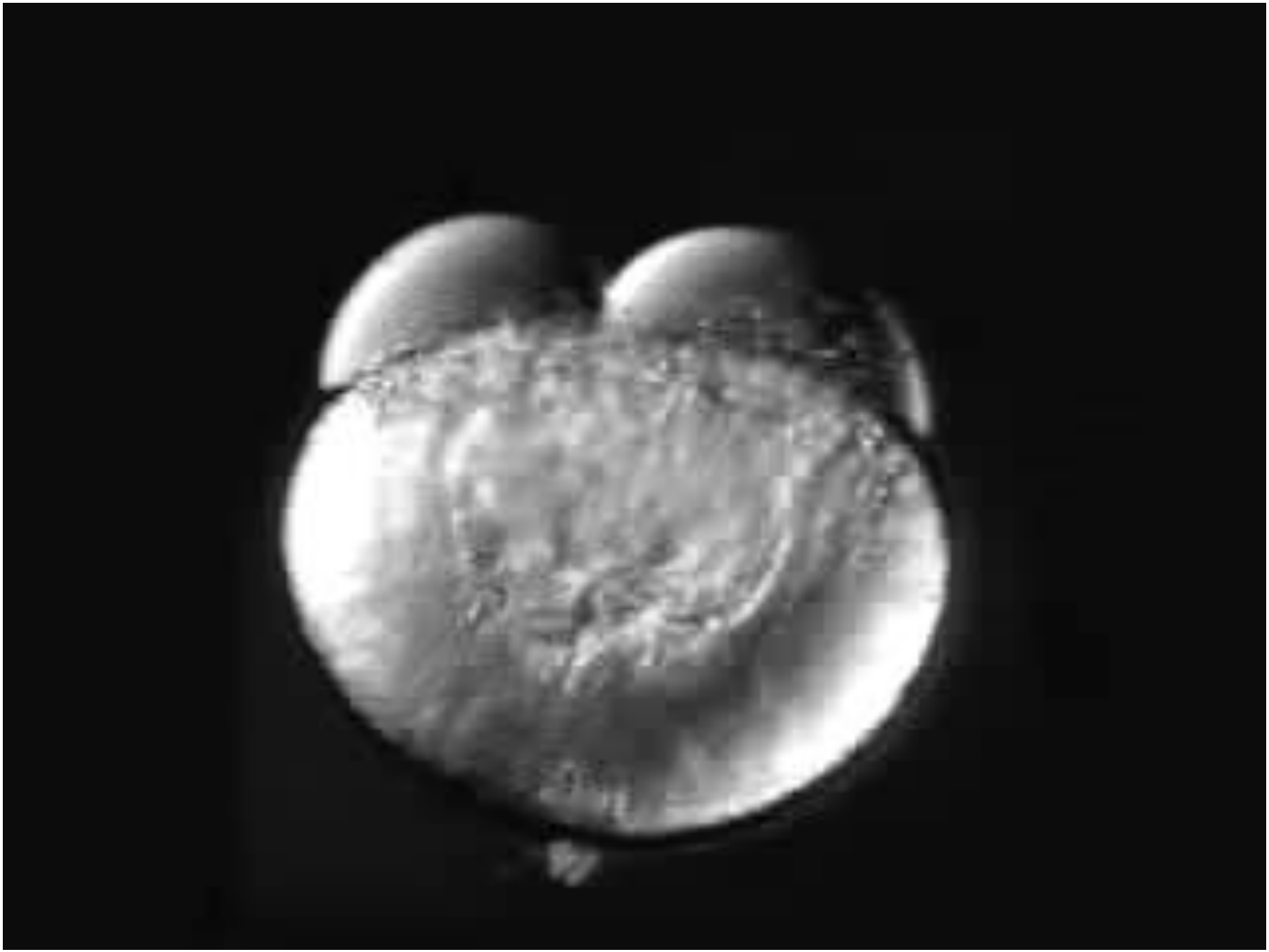




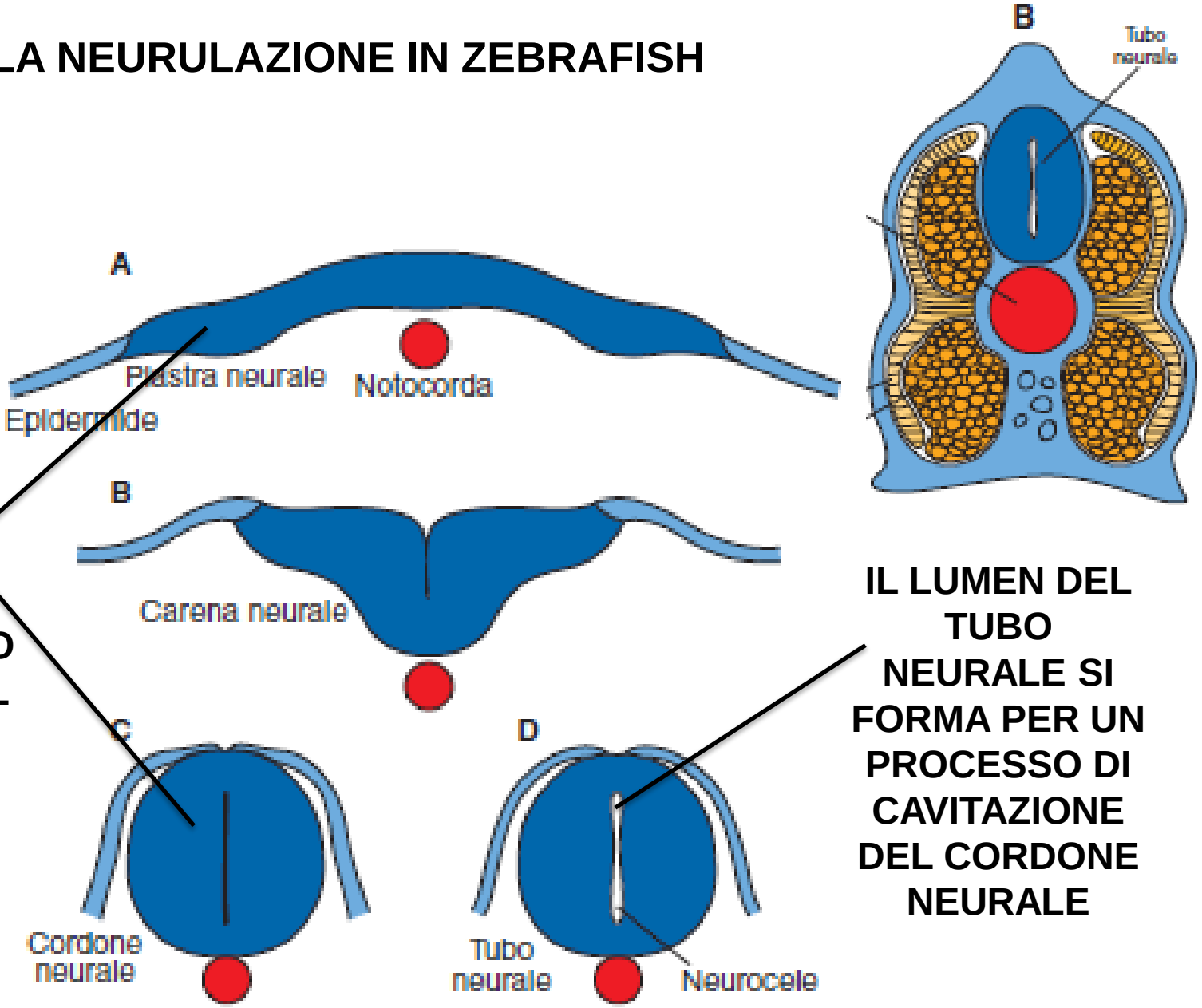
Dopo la gastrulazione l'ipoblasto si separa nei foglietti mesodermico ed endodermico e si forma il tubo digerente







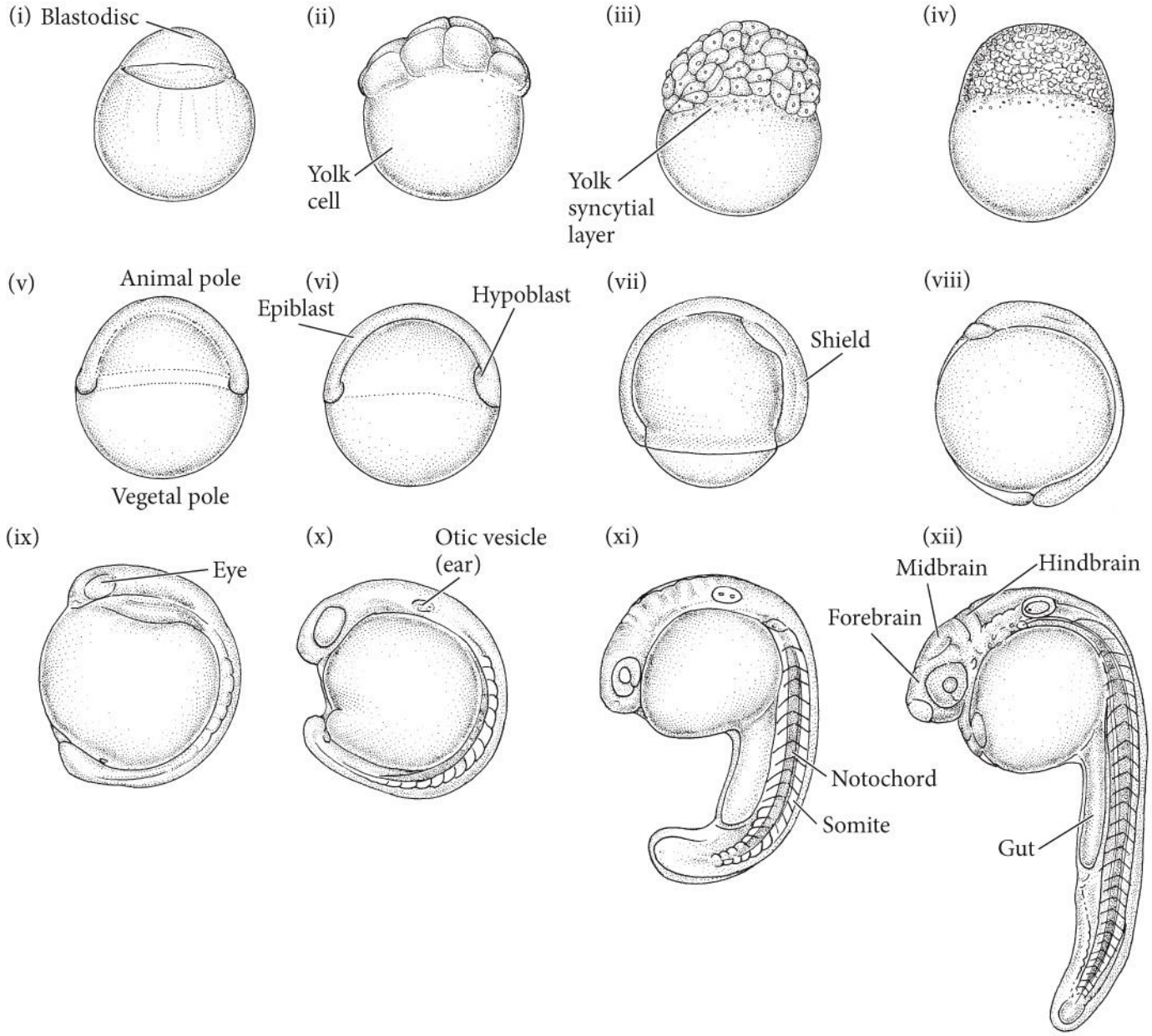
FASI DELLA NEURULAZIONE IN ZEBRAFISH



LE CELLULE DELLA PIASTRA NEURALE CONVERGONO FORMANDO IL CORDONE NEURALE

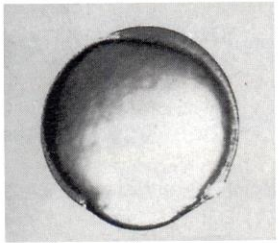
IL LUMEN DEL TUBO NEURALE SI FORMA PER UN PROCESSO DI CAVITAZIONE DEL CORDONE NEURALE

Figura 8

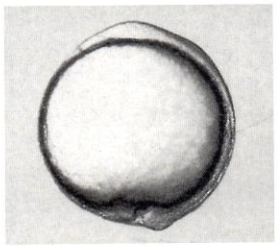


DEVELOPMENTAL BIOLOGY 11e, Figure 11.32

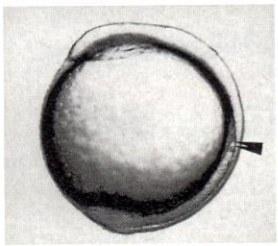
a) Formation du jeune bourgeon caudal et somitogenèse



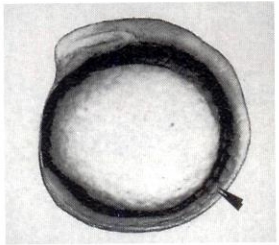
80% épibolie



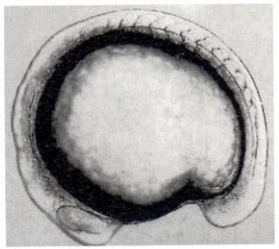
Bourgeon caudal



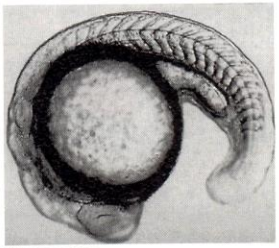
1 somite



5 somites

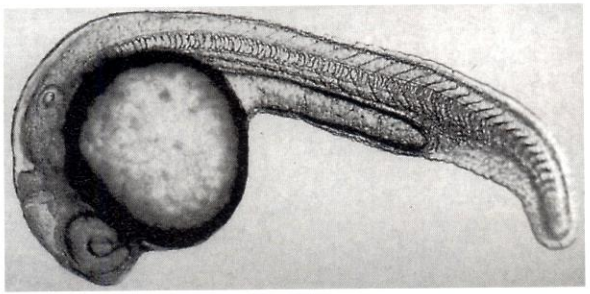


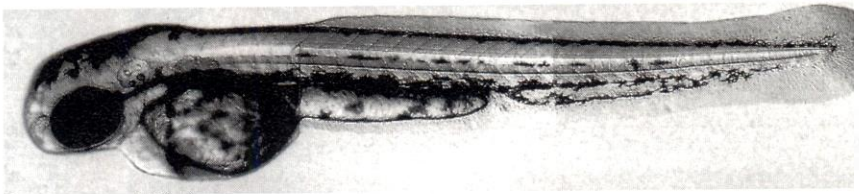
15 somites



20 somites

b) Redressement du bourgeon caudal



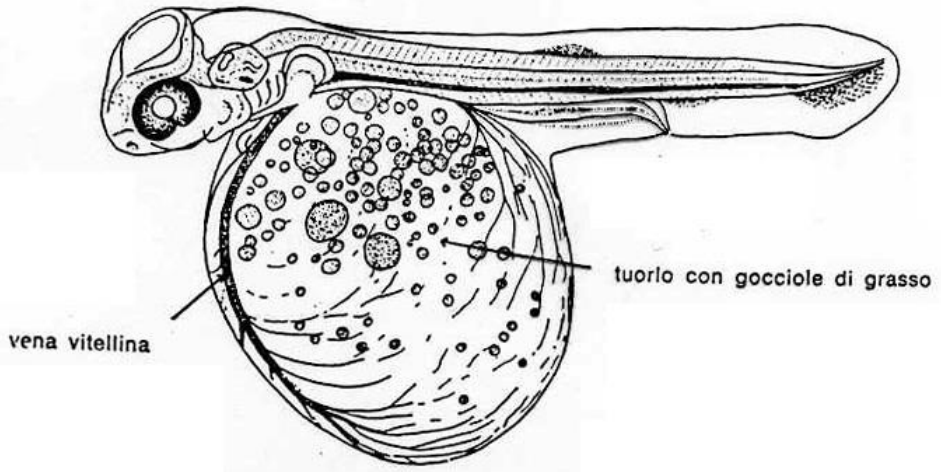


Bourgeon caudal âgé

c) Formation de la larve nageuse

(*d'après* Boulekbache, 1998)

BOTTONE CAUDALE



Sacco del tuorlo