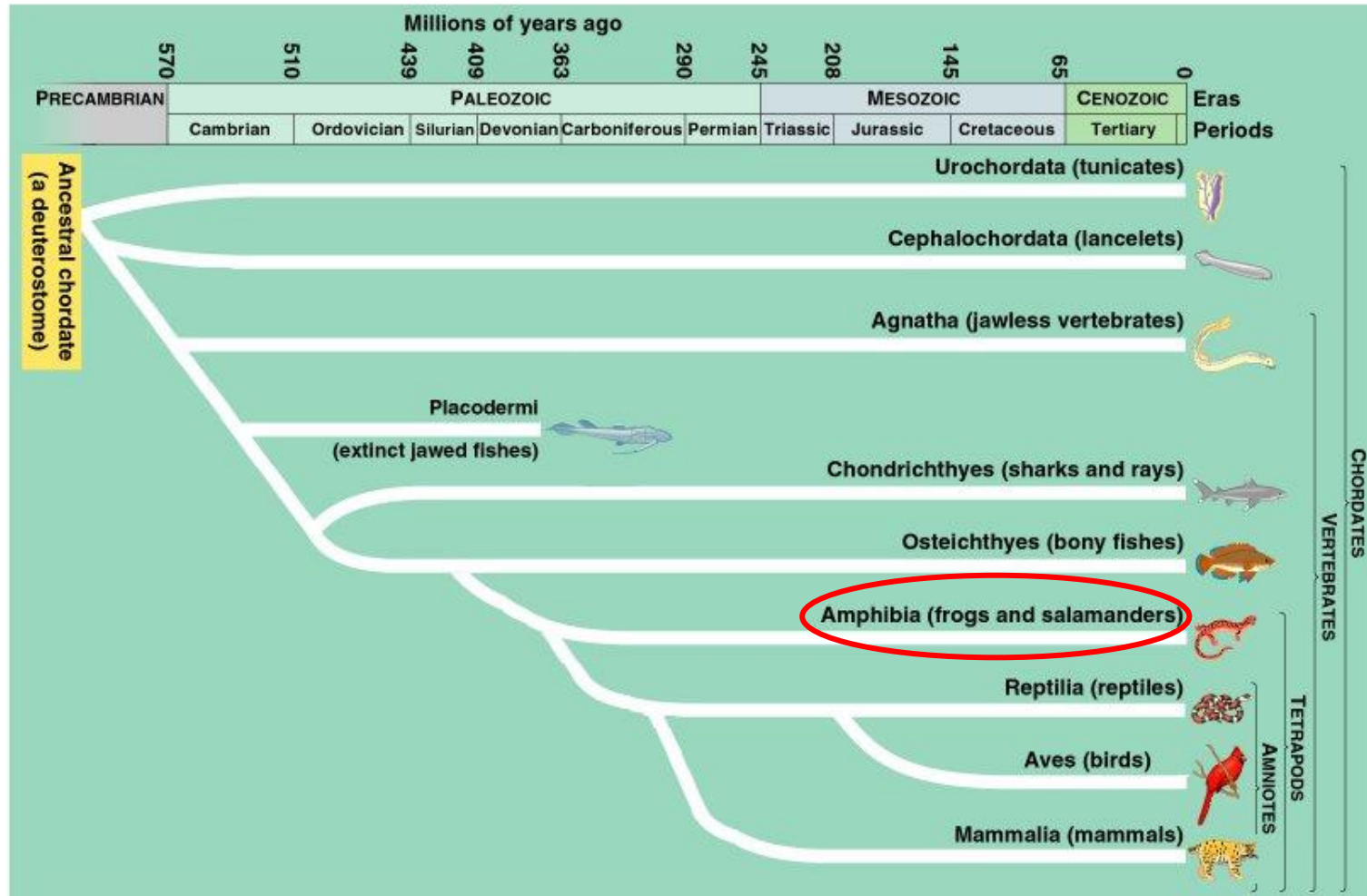
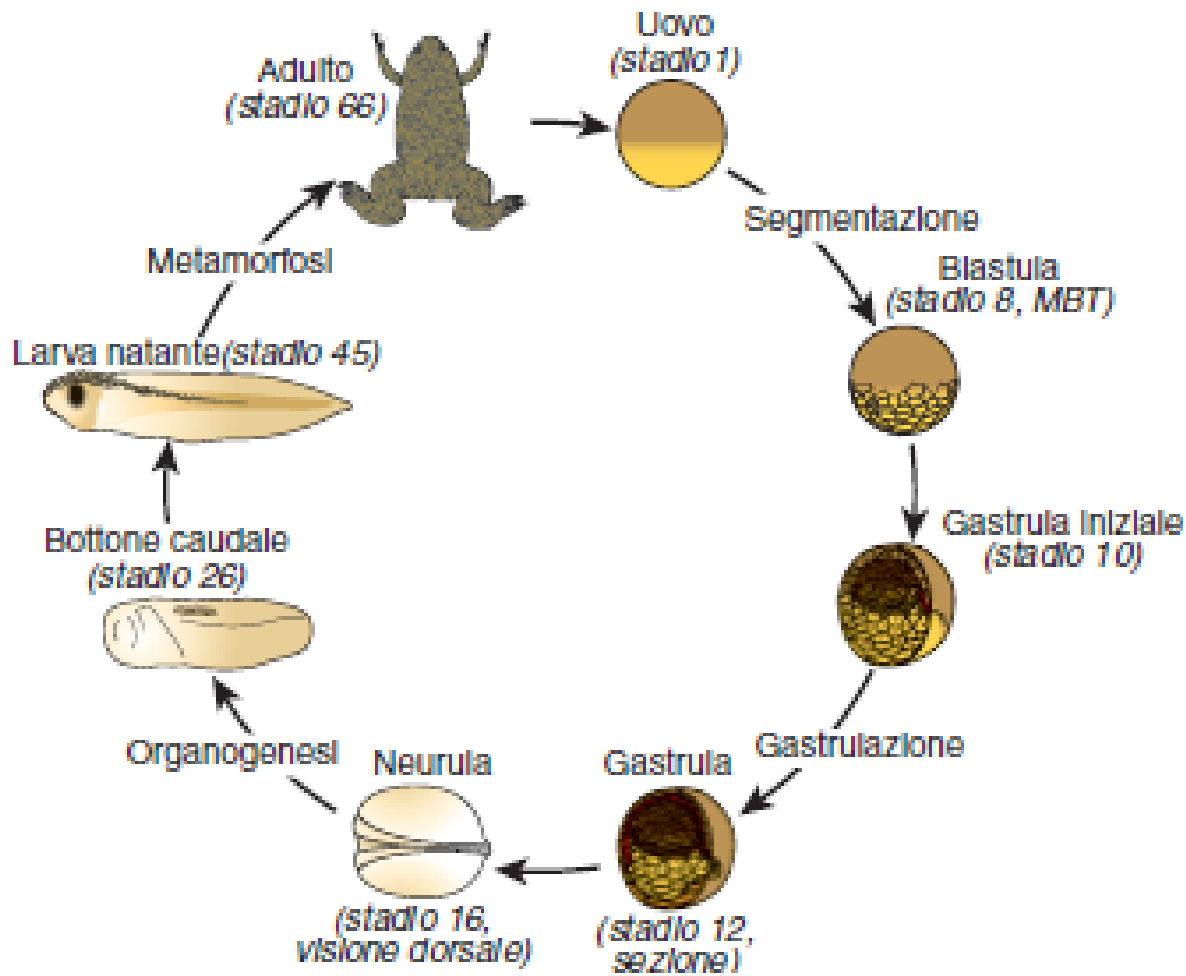
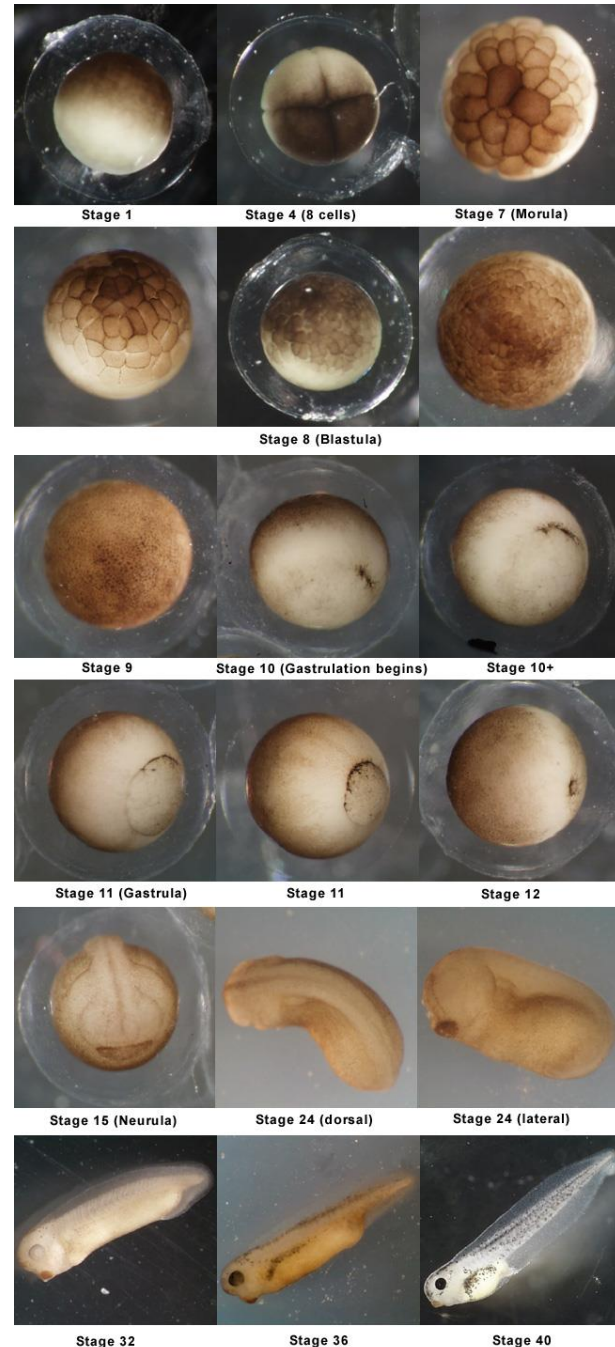
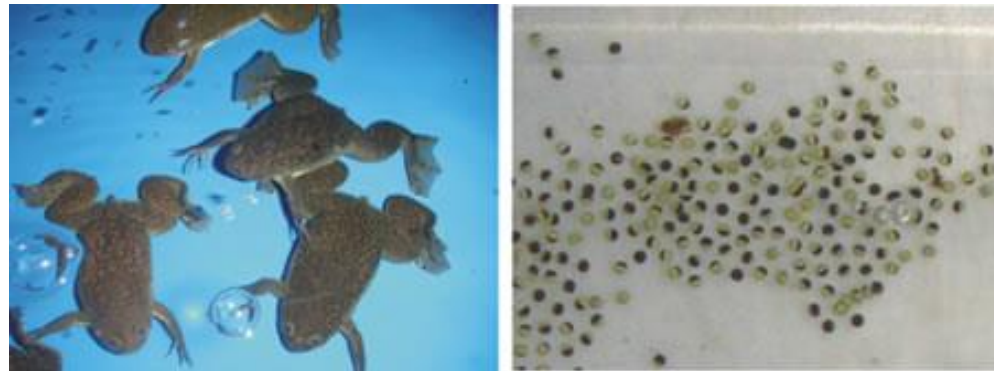


FILOGENESI DEI CORDATI

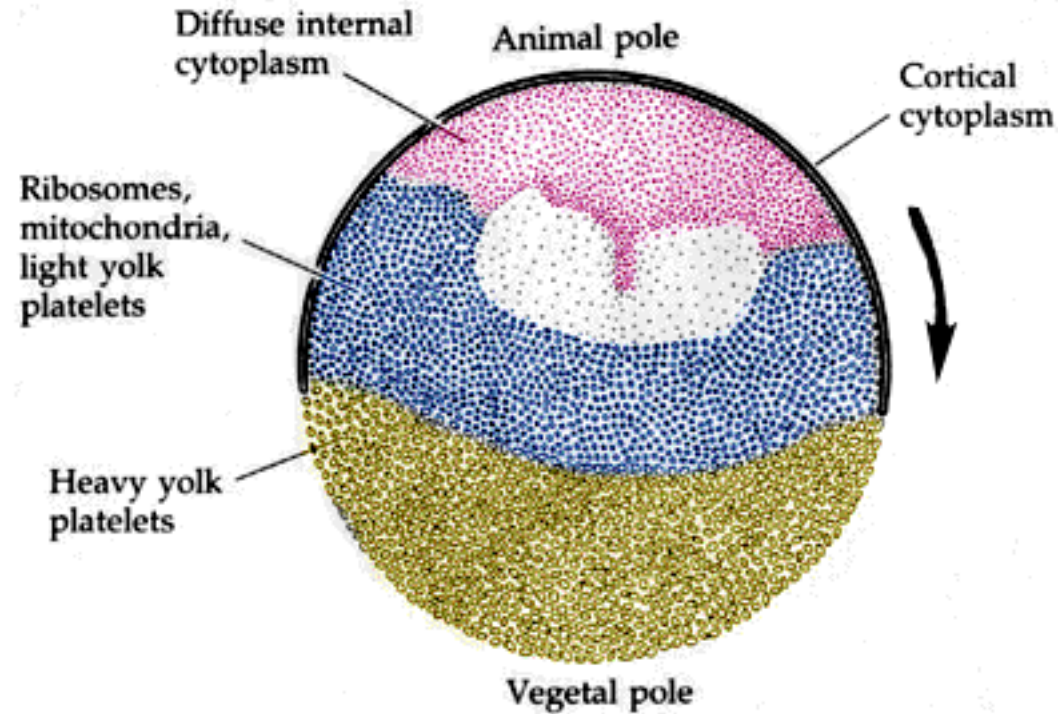
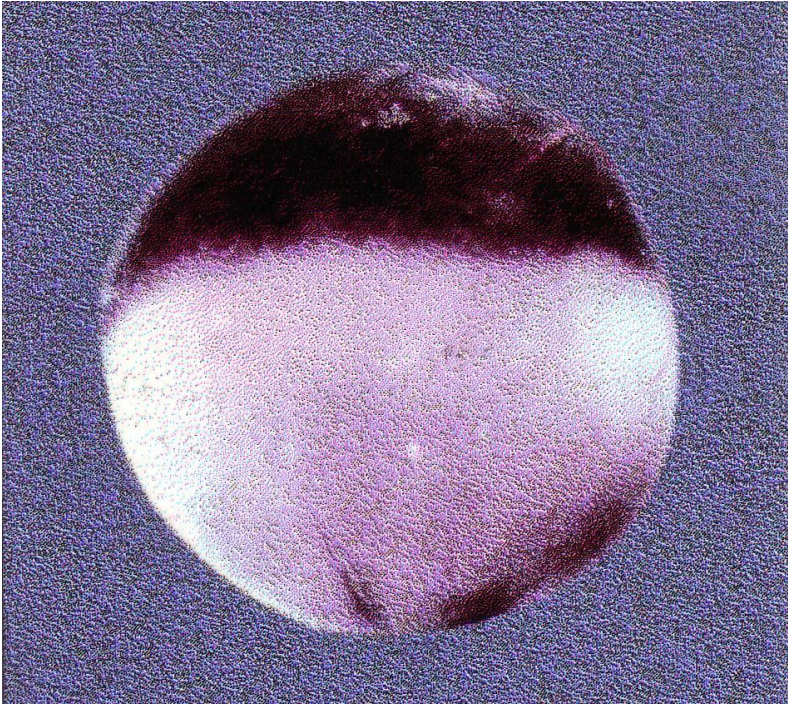


XENOPUS LAEVIS: ANFIBIO ANURO - SVILUPPO INDIRETTO

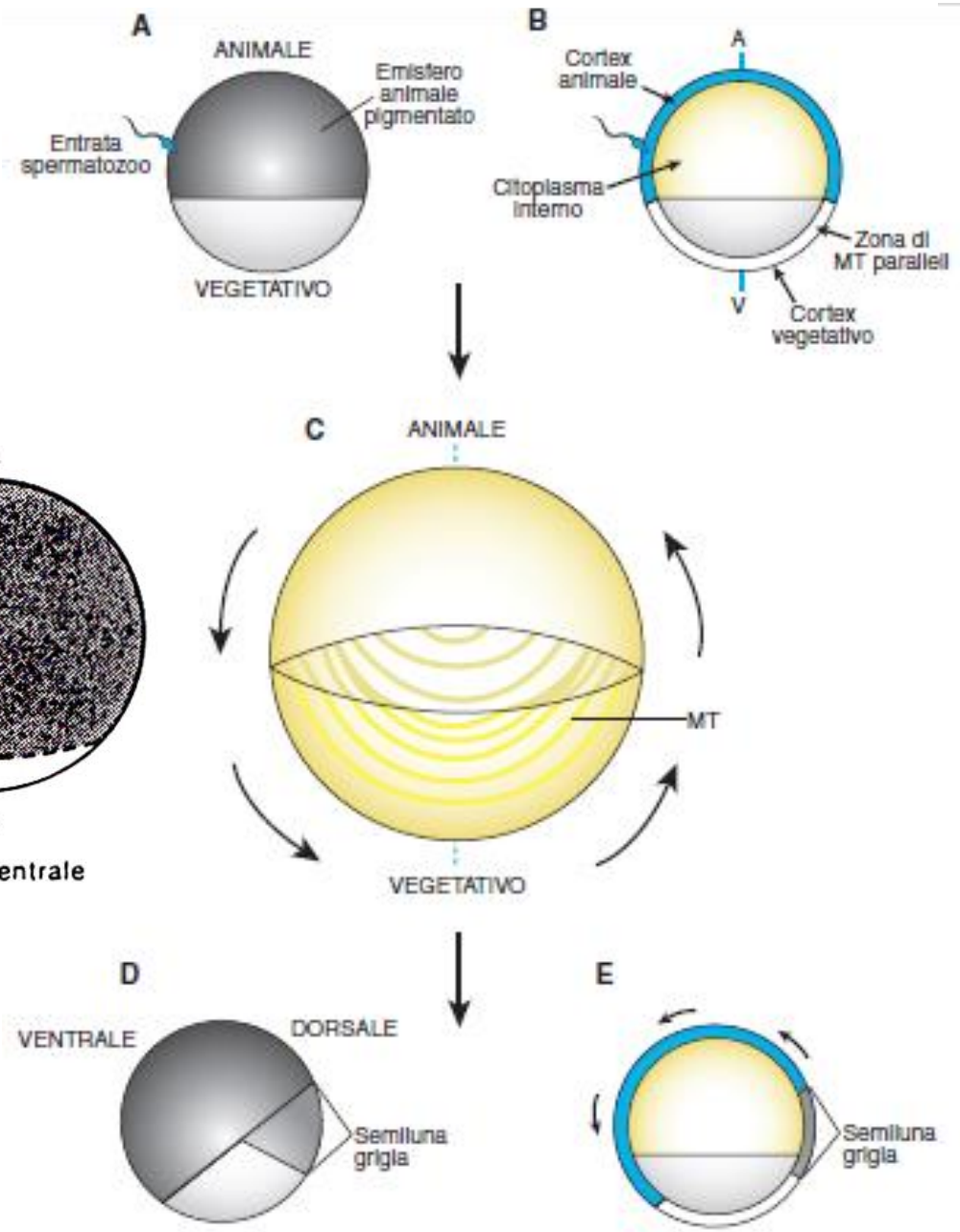
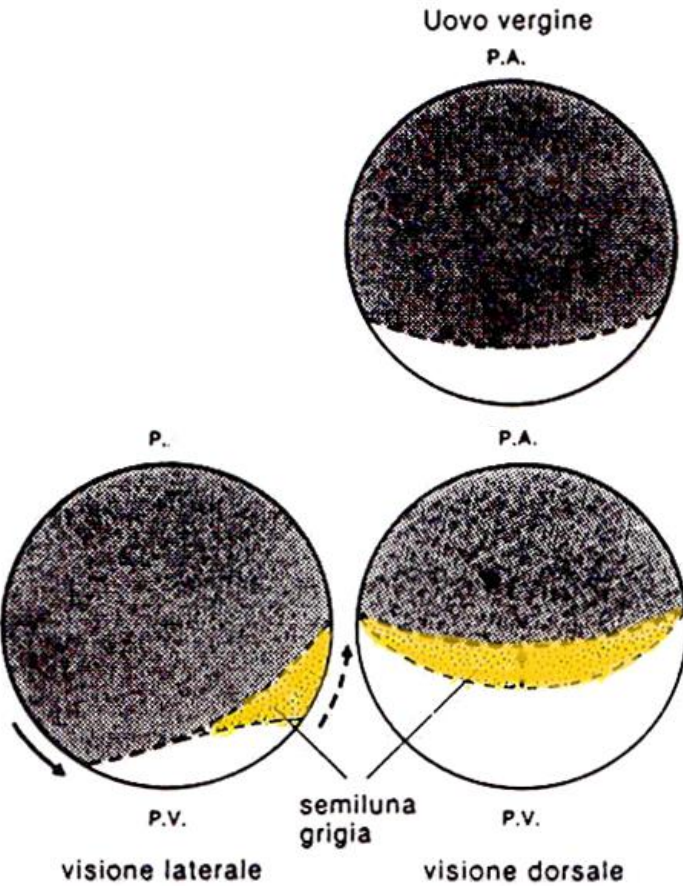


Uovo mesolecitico

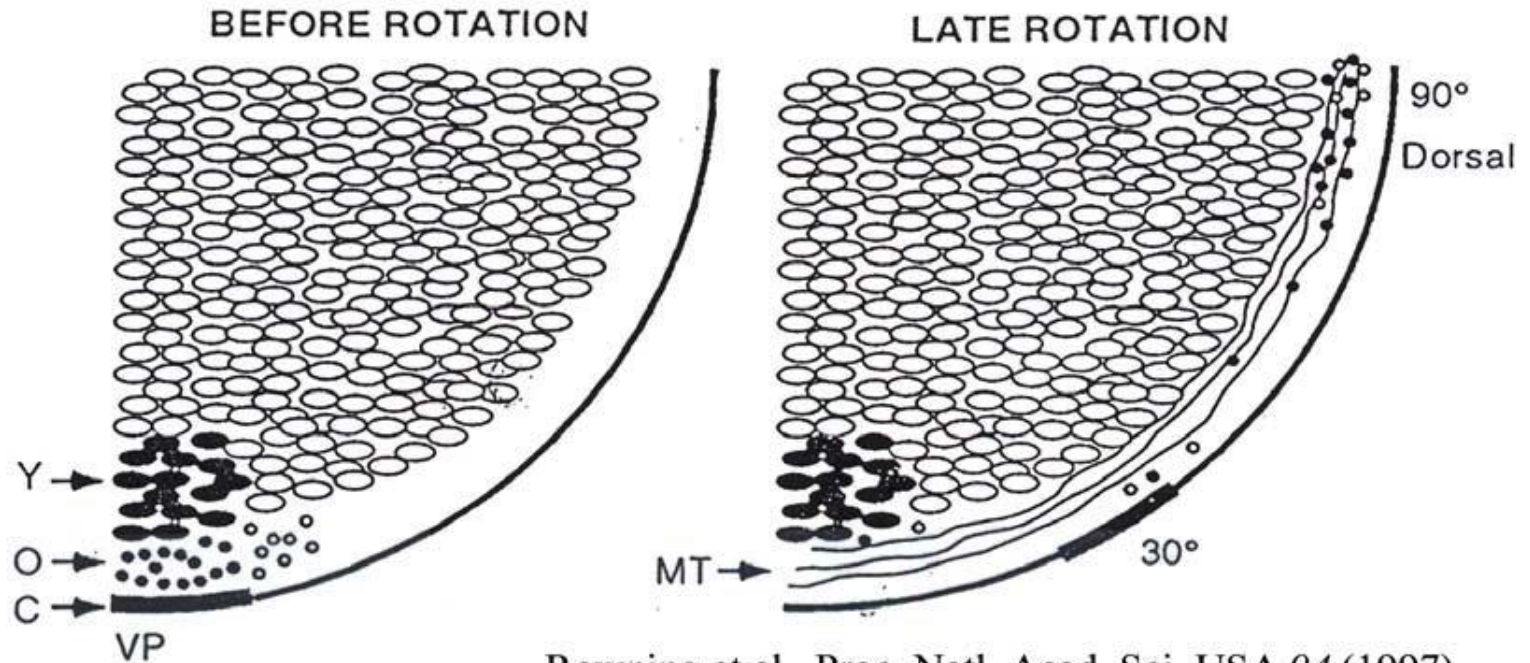
Il vitello e' maggiormente concentrato al polo vegetativo
Il citoplasma corticale animale e' ricco di melanina



LA FECONDAZIONE ATTIVA LA ROTAZIONE CORTICALE

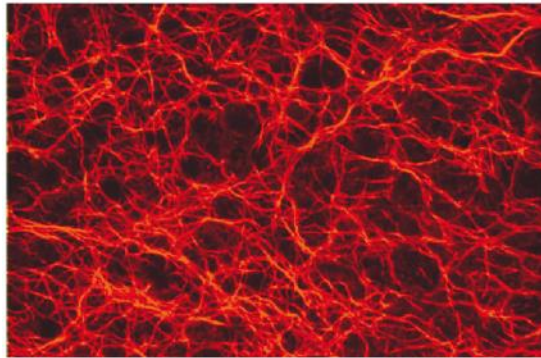


LA ROTAZIONE CORTICALE AVVIENE MEDIANTE UNA RIORGANIZZAZIONE DEI MICROTUBULI

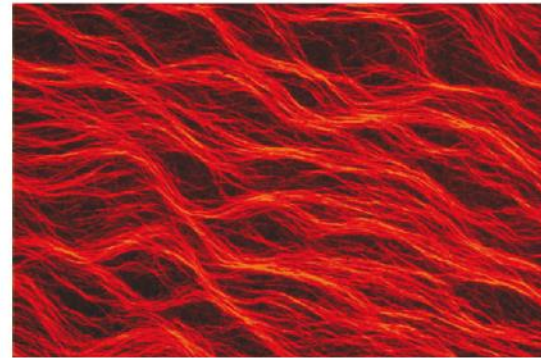


Rowning et al., Proc. Natl. Acad. Sci. USA 94 (1997)

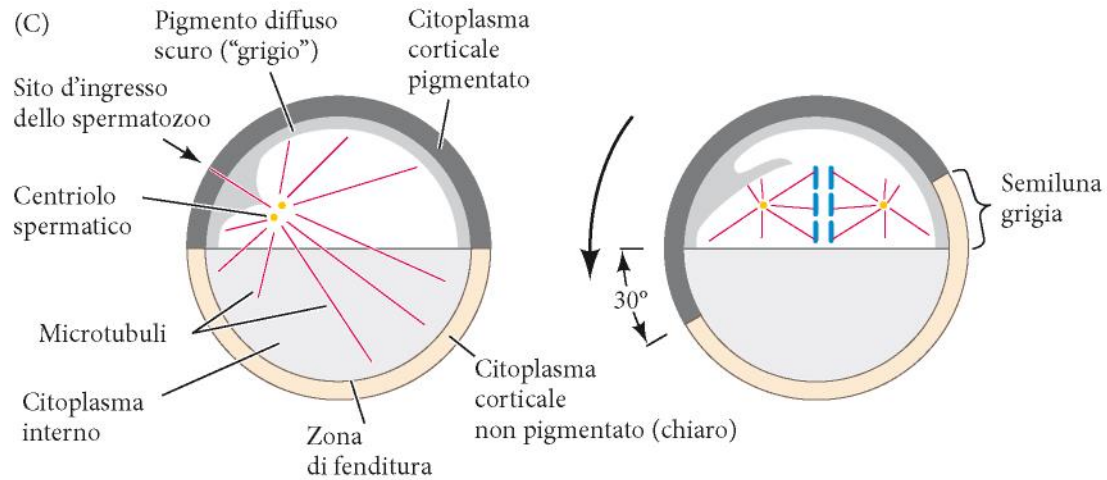
(A) 0,50



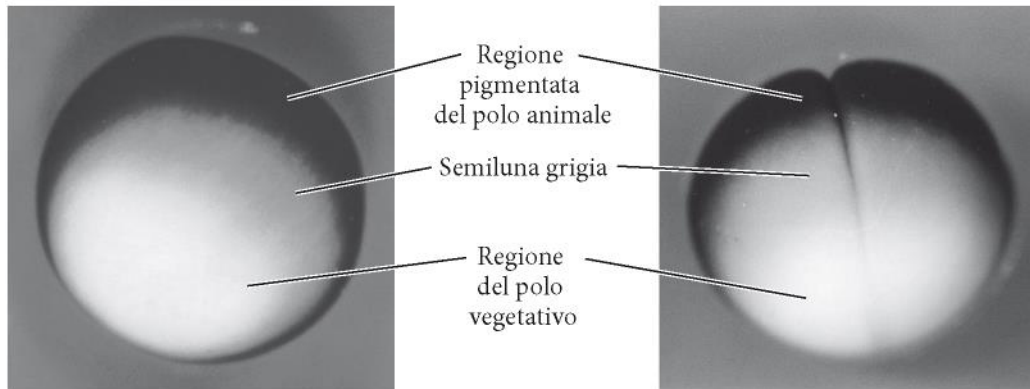
(B) 0,70



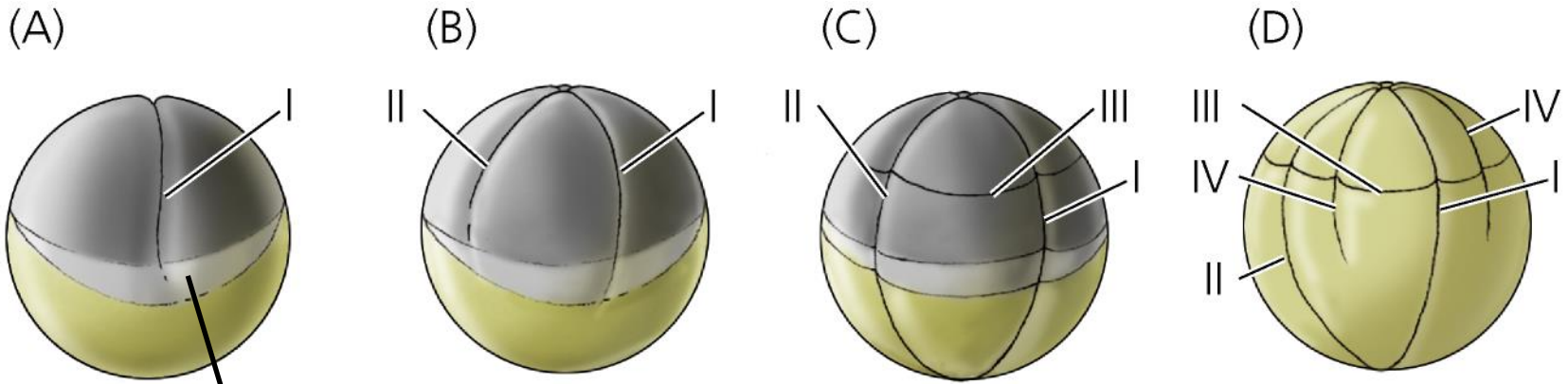
(C)



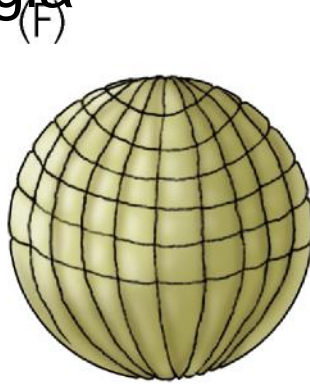
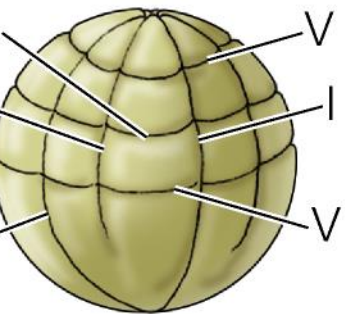
(D)



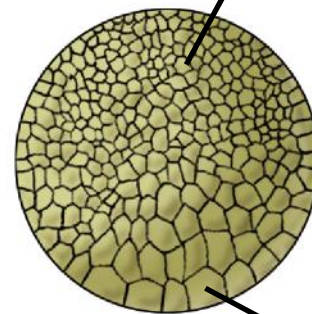
SEGMENTAZIONE OLOBLASTICA RADIALE INEGUALE



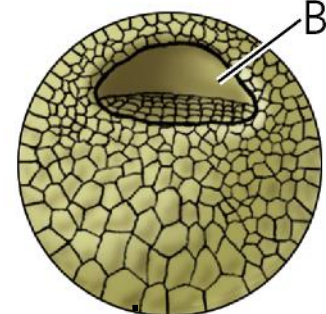
(E) **semiluna grigia**



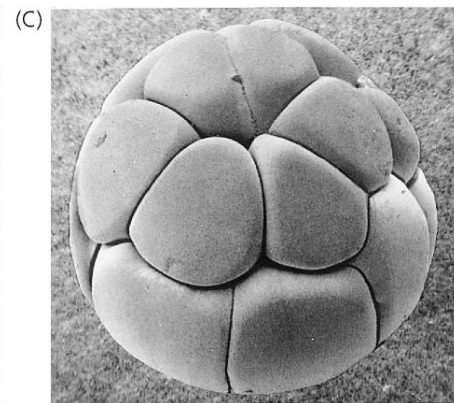
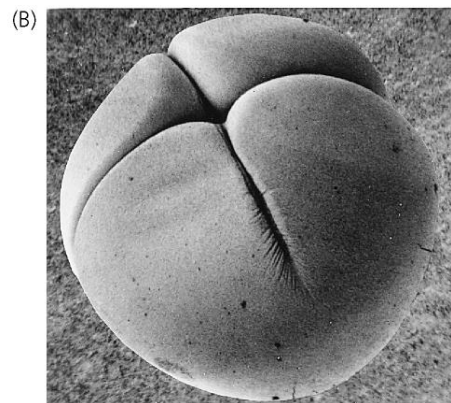
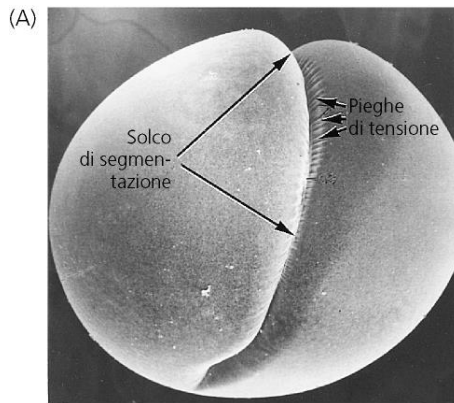
(G) **micromeri**



(H) **Blastocele**

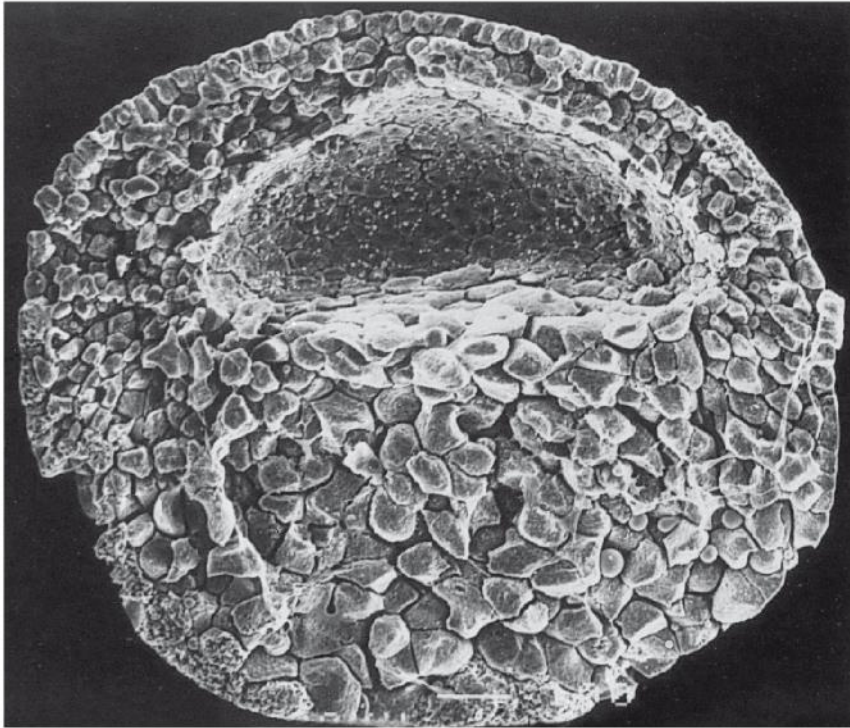


macromeri

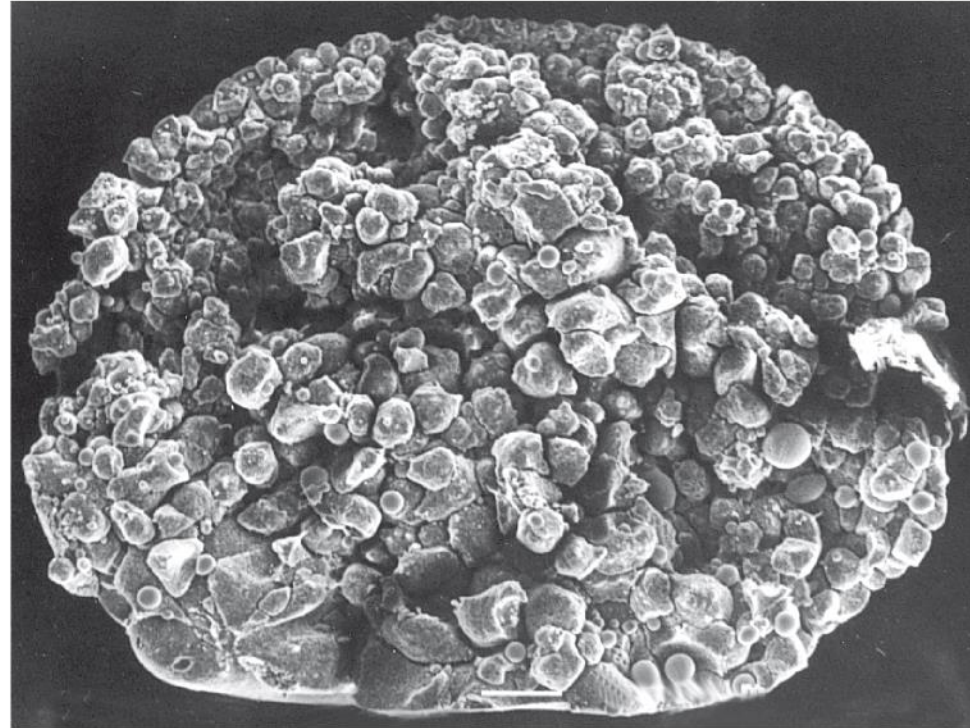


L'interazione fra i blastomeri e' promossa da molecole di adesione (Caderine)

(A)



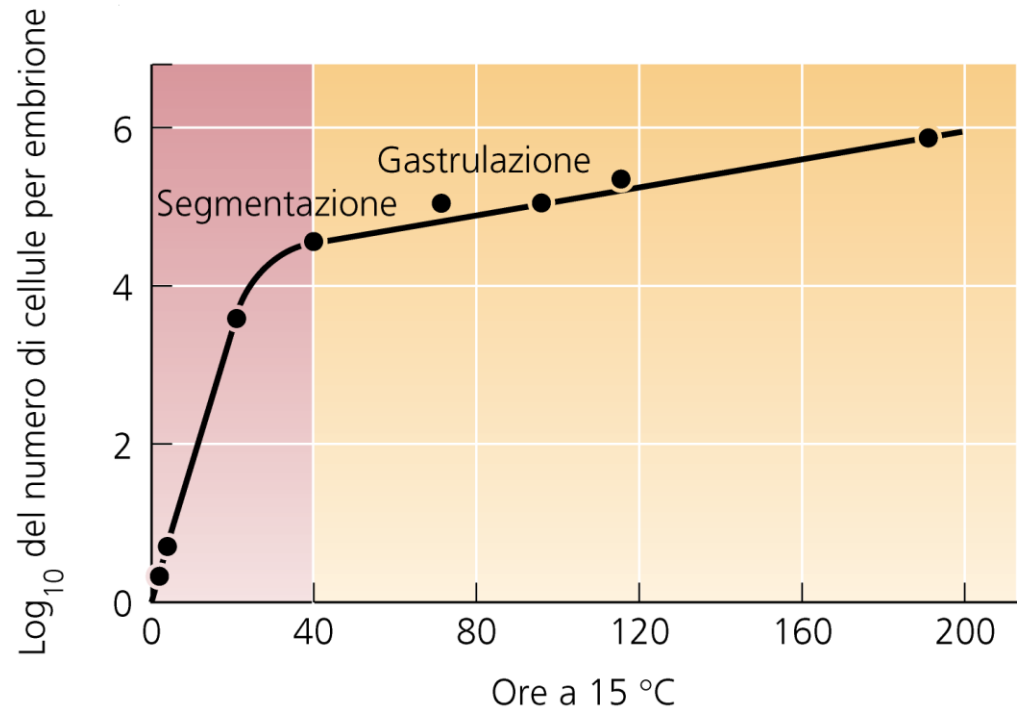
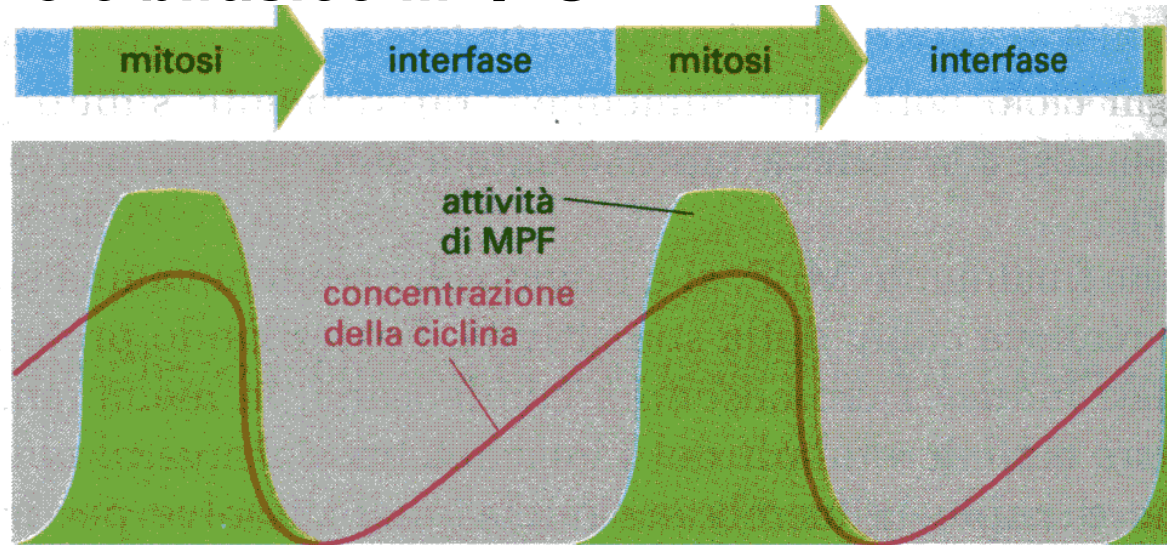
(B)



La segmentazione degli anfibi è caratterizzata da divisioni veloci e sincrone; il ciclo è bifasico M → S

I cicli bifasici durante la segmentazione sono regolati dal fattore MPF. E' costituito dalla ciclina B e una chinasi attivata dalla ciclina B. E' attivo in fase M, ma non in fase S in quanto la ciclina viene degradata.

Le divisioni rallentano poco prima della gastrulazione.

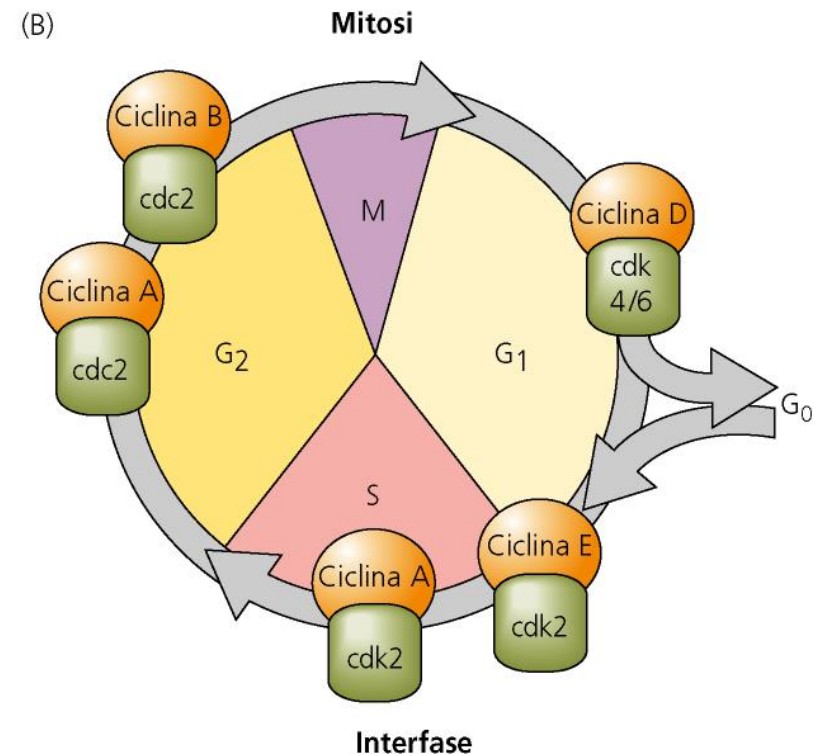
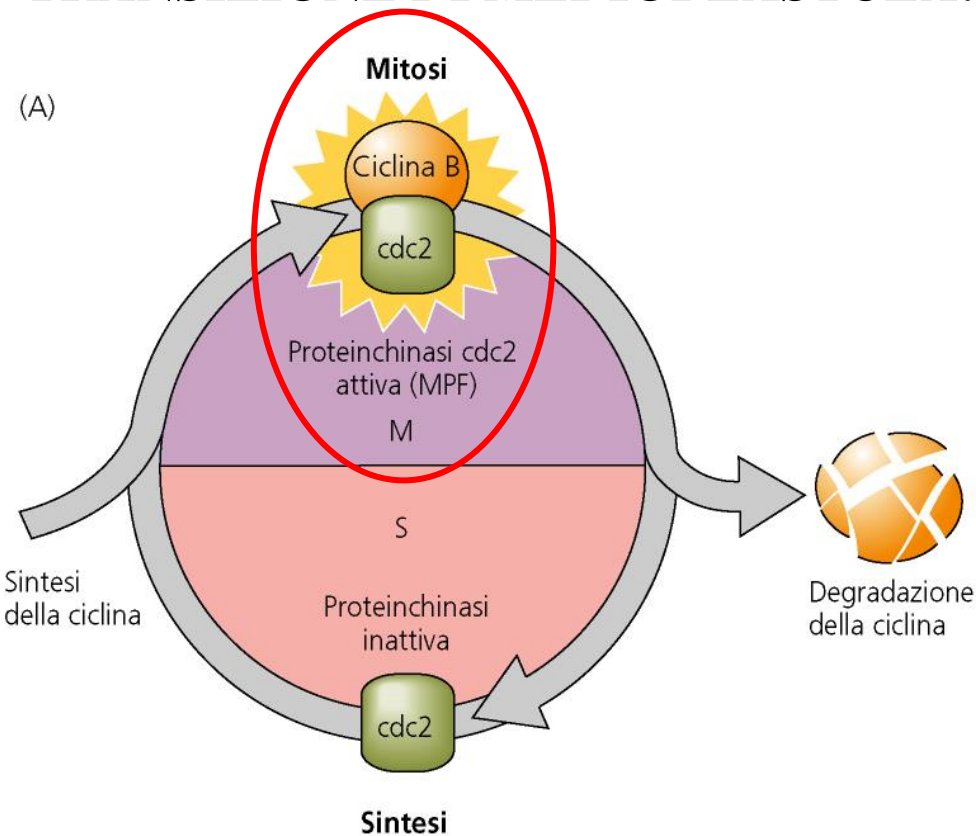


1) La ciclina B si accumula in fase S e si degrada dopo l'entrata in M

2) Il ciclo bifasico utilizza ciclina prodotta a partire da mRNA materni

3) Quando si esauriscono le molecole materne si ha l'attivazione del genoma zigotico, il ciclo rallenta e si normalizza (G1 e G2)

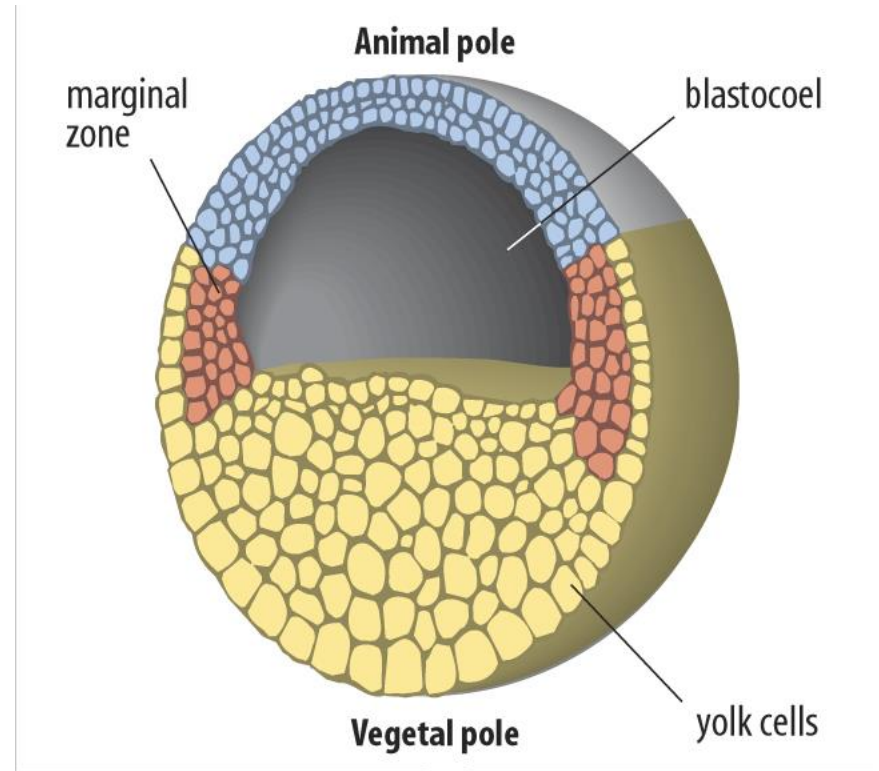
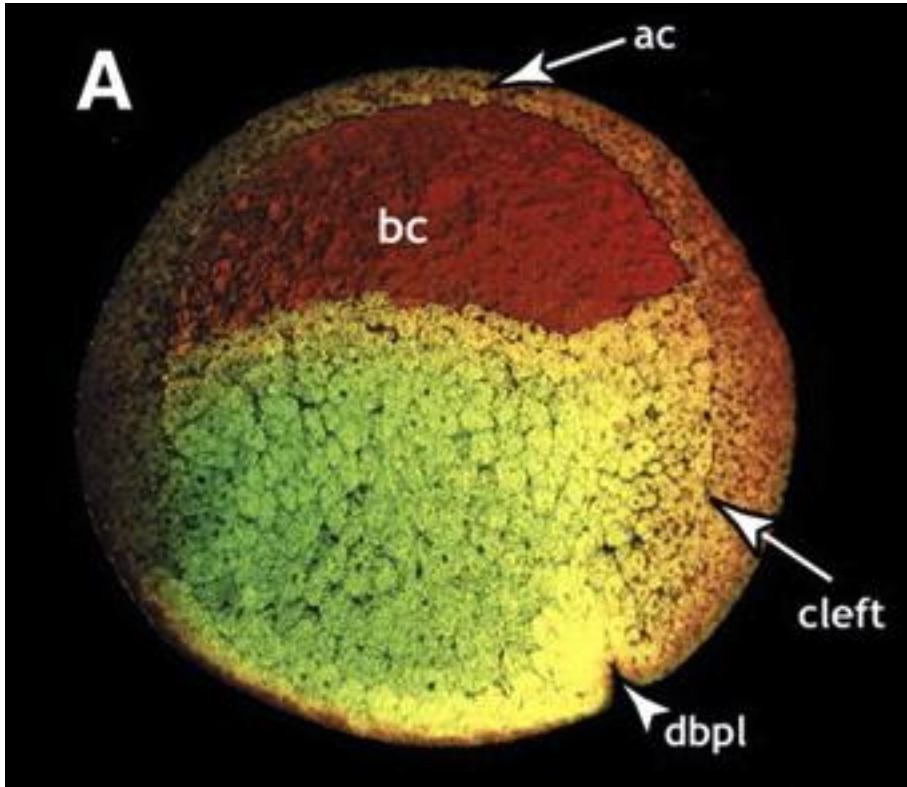
TRANSIZIONE DI MEDIOBLASTULA: Xenopus dopo la 12° divisione



MAPPA DEI TERRITORI PRESUNTIVI

Blastula pluristratificata:
nella zona equatoriale (*zona marginale*)
la mappa è diversa se la si osserva
dall'esterno o dall'interno

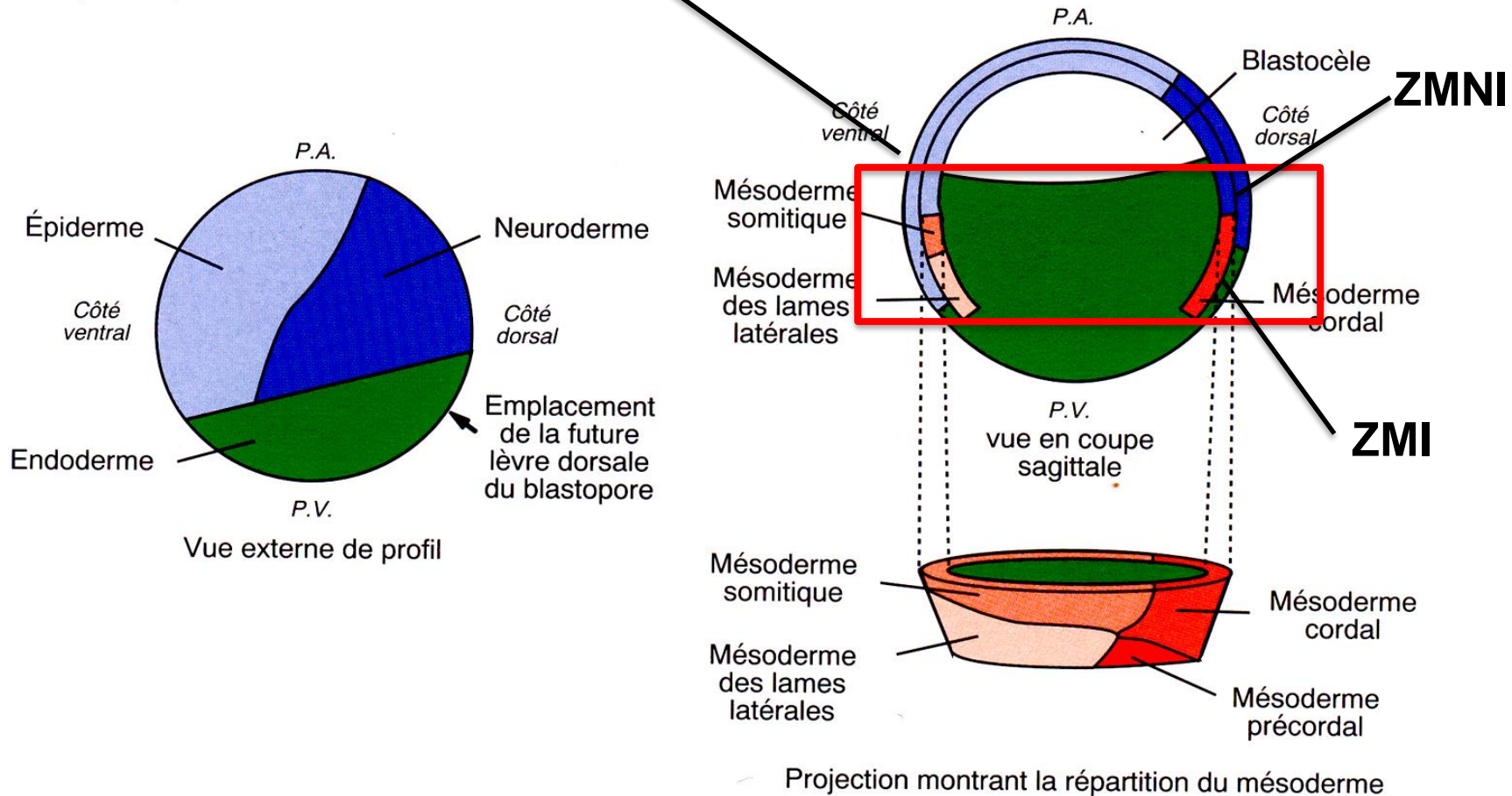
- Ectoderma
- Mesoderma
- Endoderma



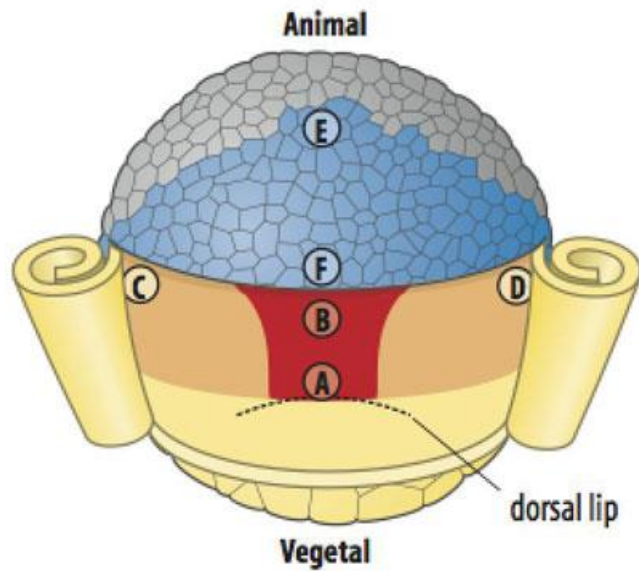
Mappa dei territori presuntivi negli *Anuri*

ZONA MARGINALE

a) Xénope

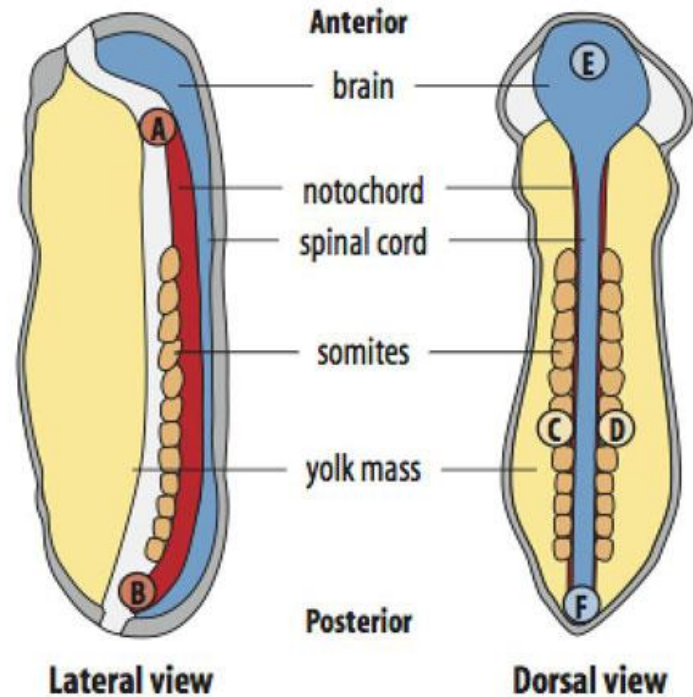


Fate map of late blastula of *Xenopus*

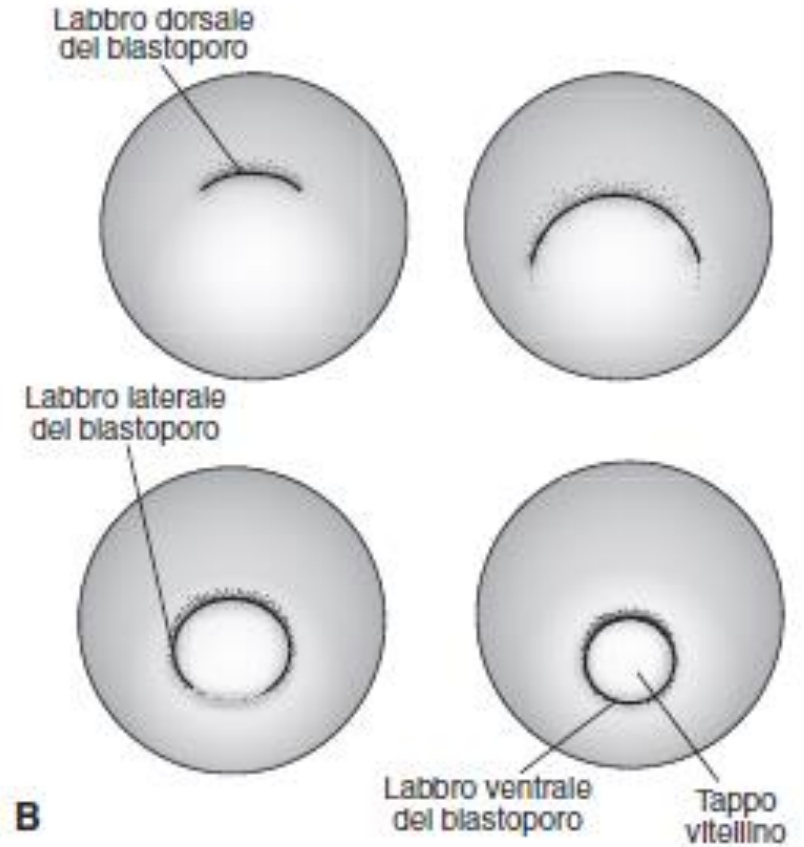


- neural ectoderm
- endoderm
- mesoderm
- mesoderm (notochord)

Sections of tailbud-stage *Xenopus*

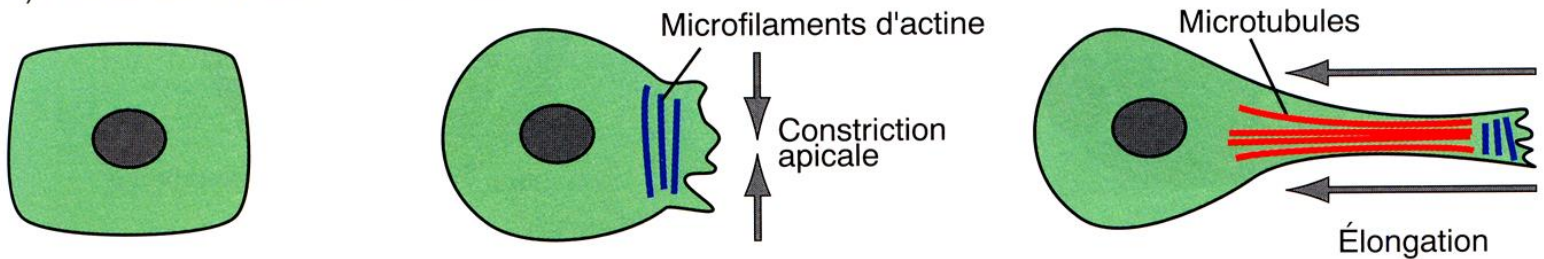


LA FORMAZIONE DEL BLASTOPORO PROCEDE IN DIREZIONE DORSO-VENTRALE ATTORNO AL TAPPO VITELLINO

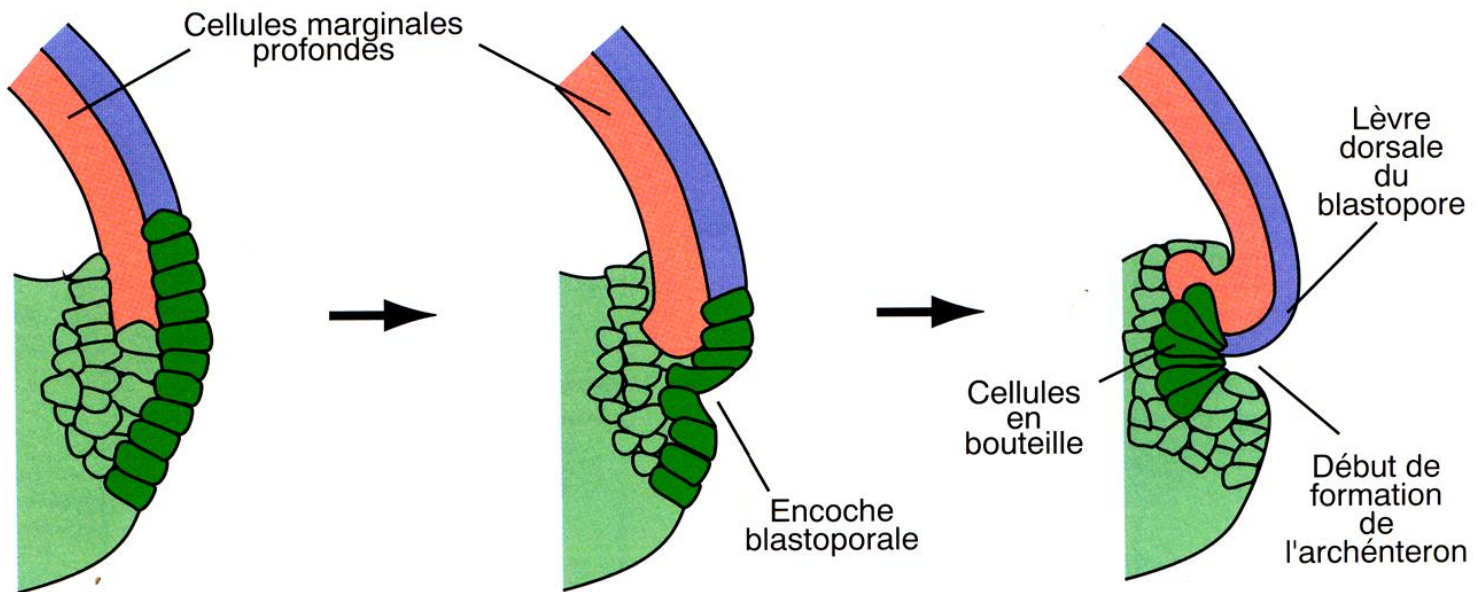


IL LABRO DEL BLASTOPORO SI ORIGINA CON LA FORMAZIONE DELLE CELLULE A FIASCO E L'INVAGINAZIONE DELLE CELLULE ENDODERMICHE SUPERFICIALI

b) Formation des cellules en bouteille



c) Schémas de la formation de l'archentéron



**LA GASTRULAZIONE
PROSEGUE MEDIANTE
MOVIMENTI DI INVOLUZIONE
DEL MESODERMA CHE
SCORRE AL DI SOTTO
DELL'ECTODERMA**

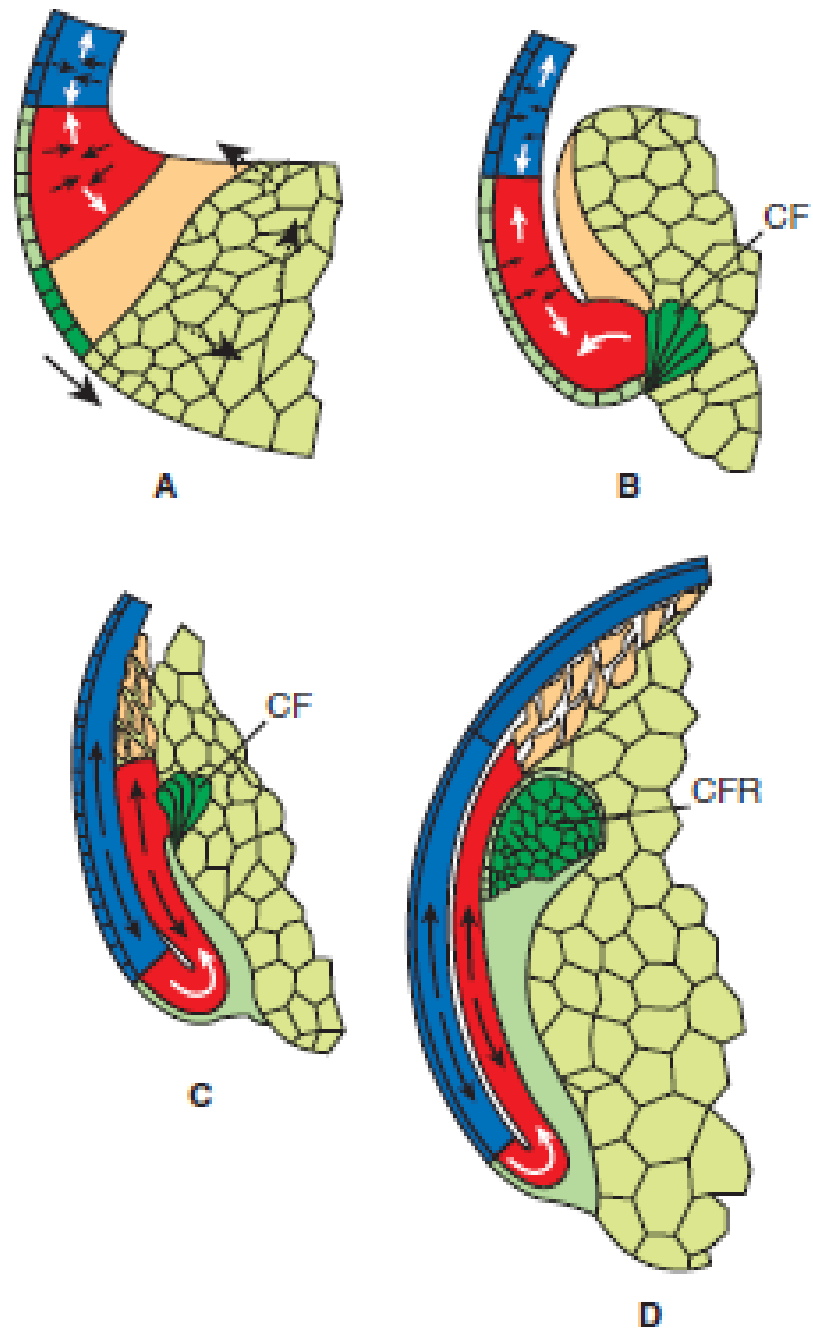
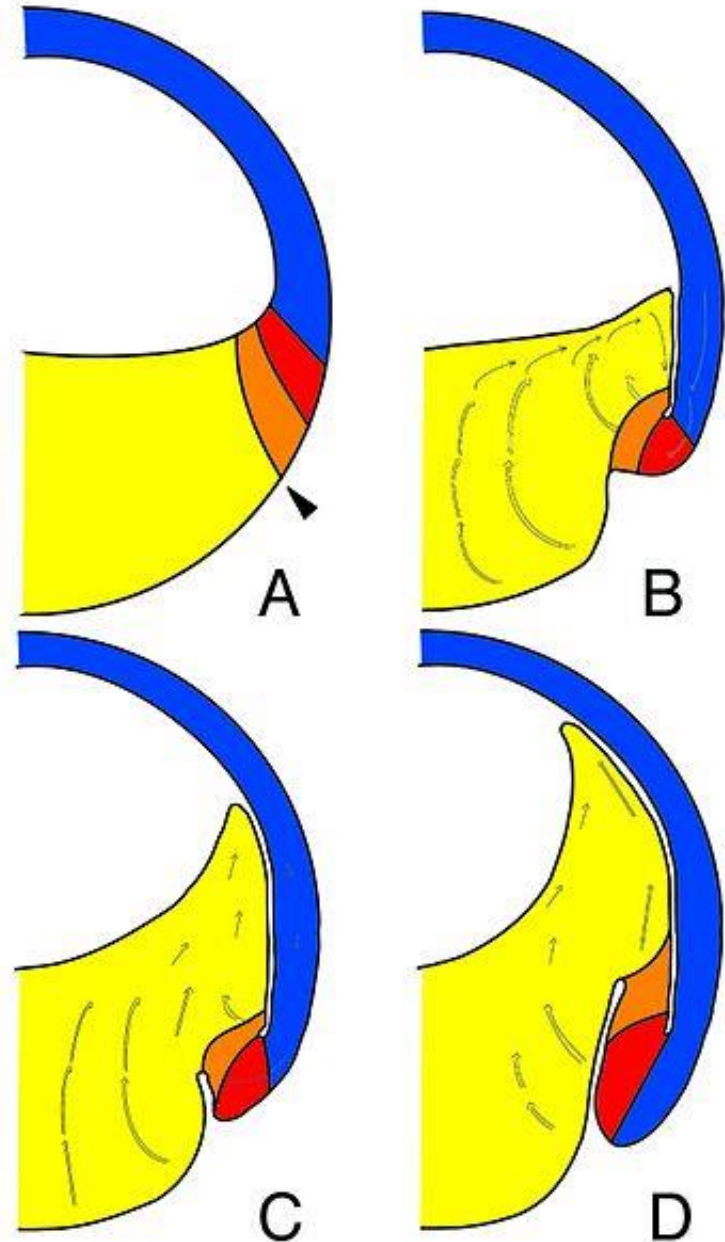
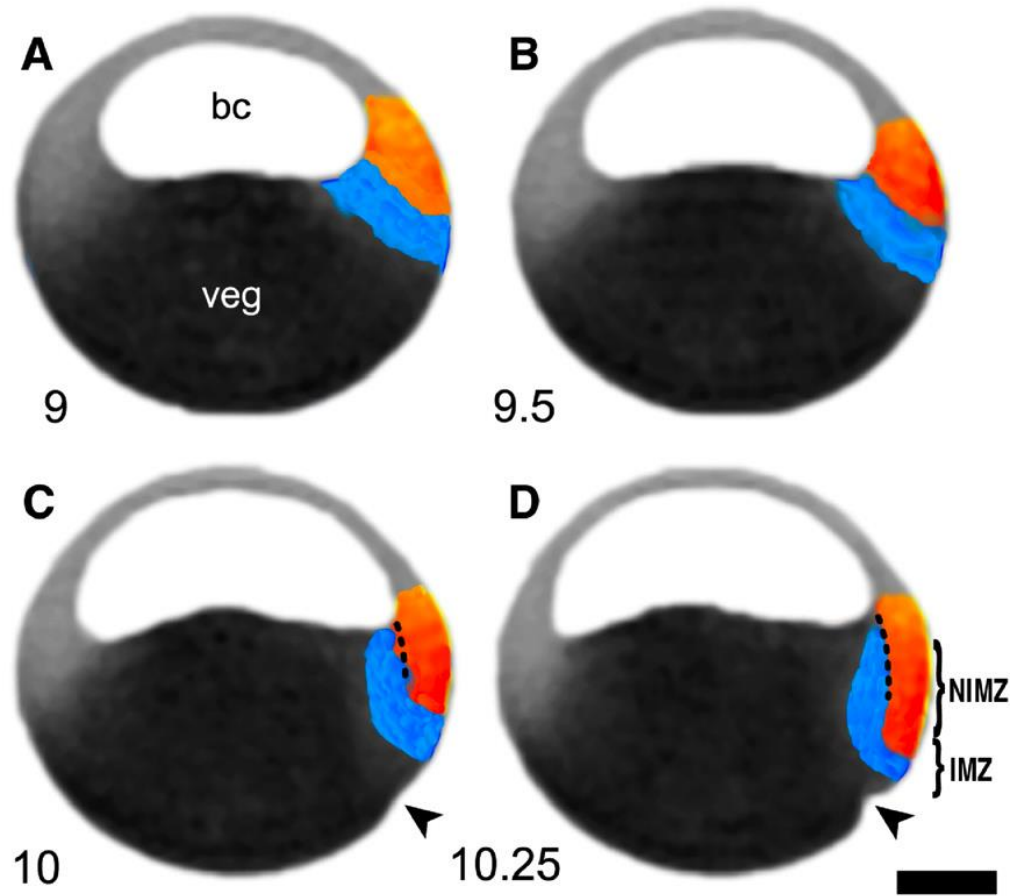
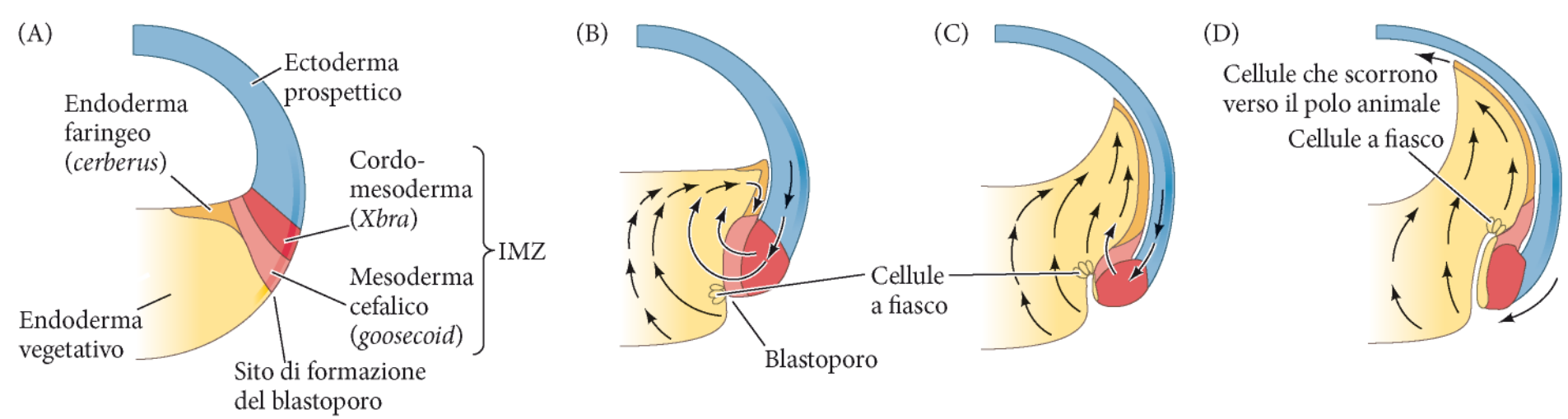


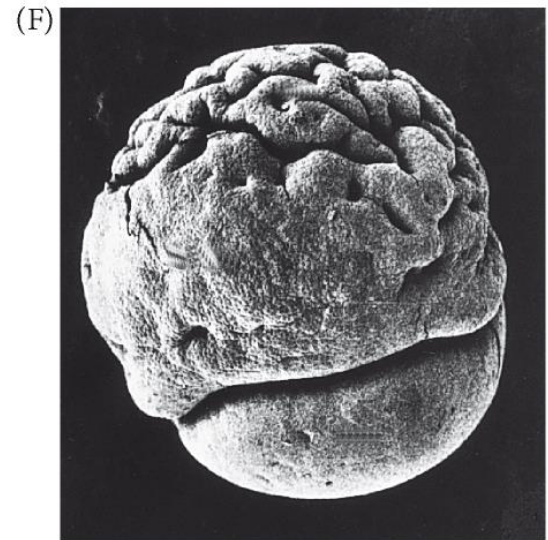
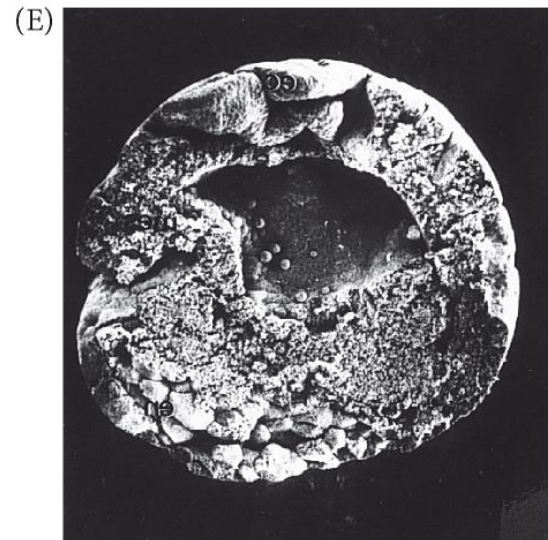
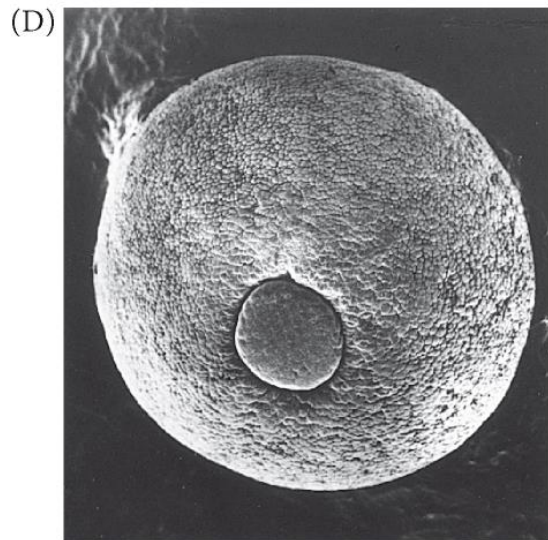
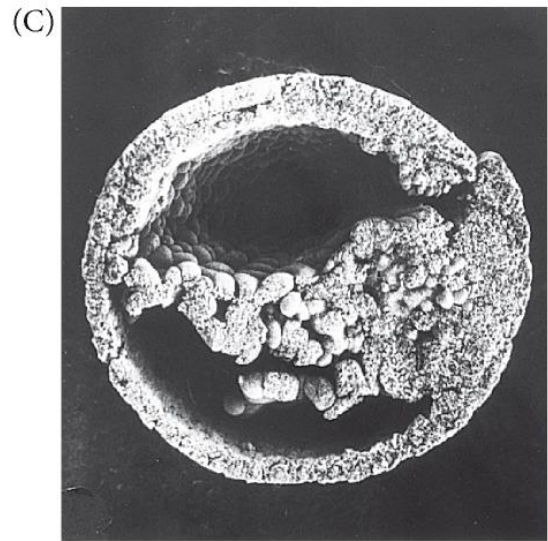
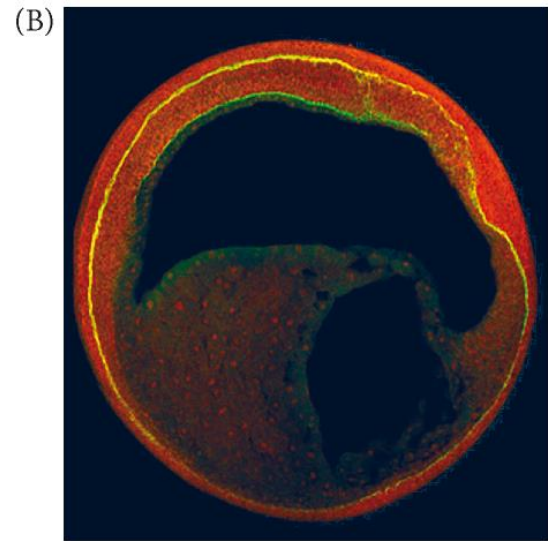
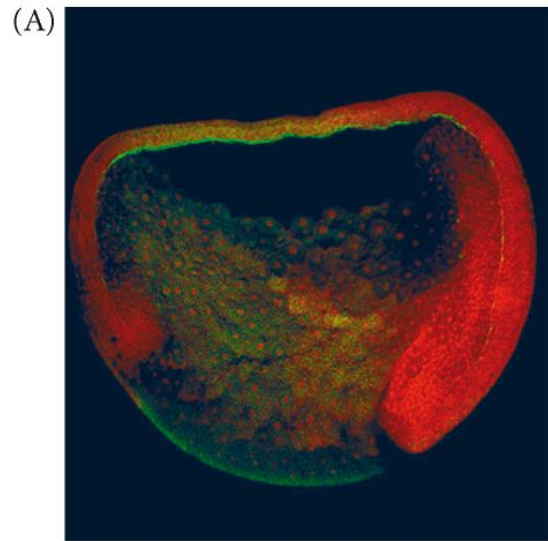
Figura 7

**L'INVOLUZIONE DEL MESODERMA
E' PROMOSSA DA MOVIMENTI DI
ROTAZIONE DELLA MASSA
VEGETATIVA PROFONDA ED
EPIBOLIA DELLA ZONA
MARGINALE SUPERFICIALE**

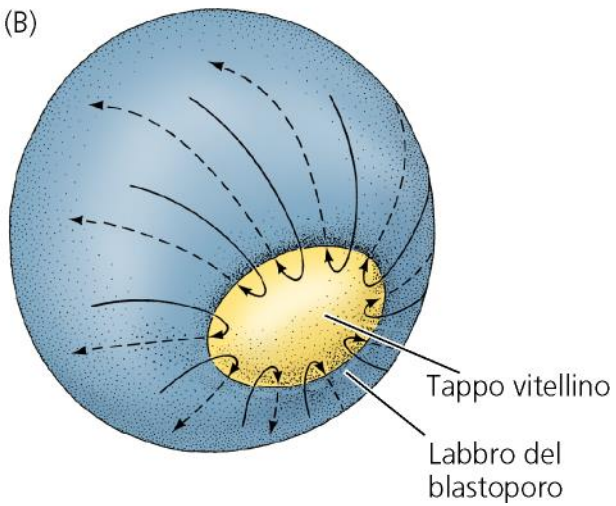
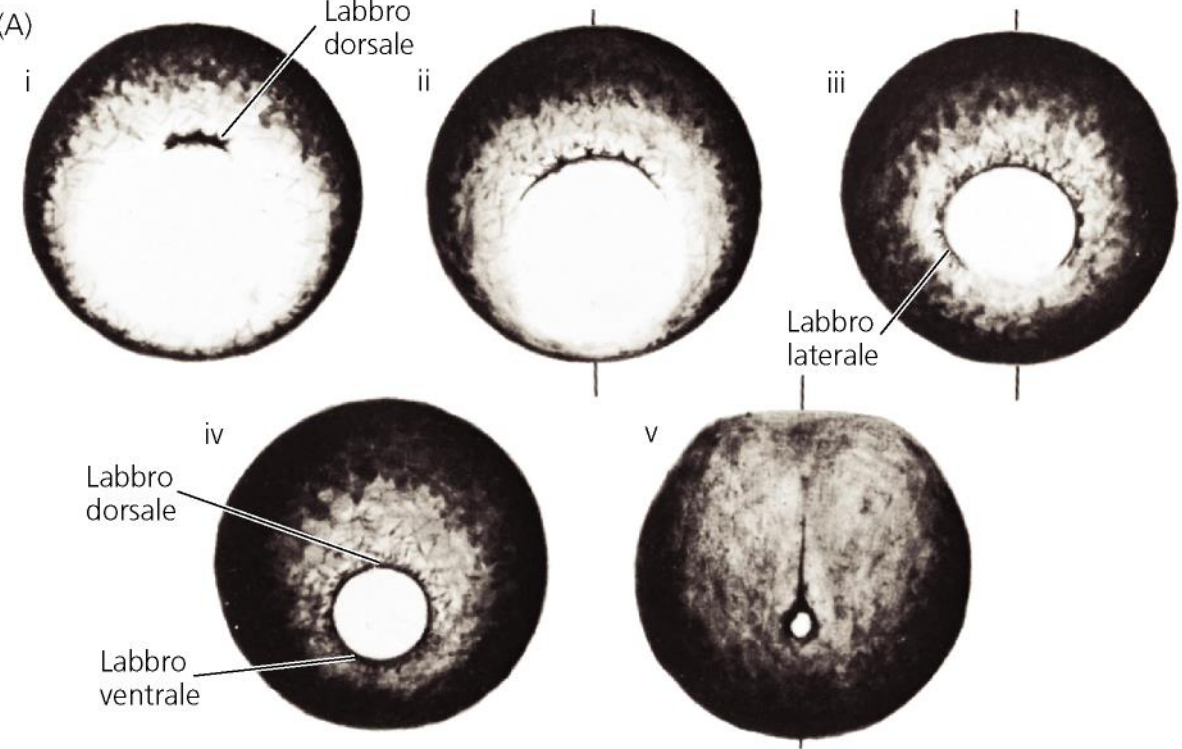


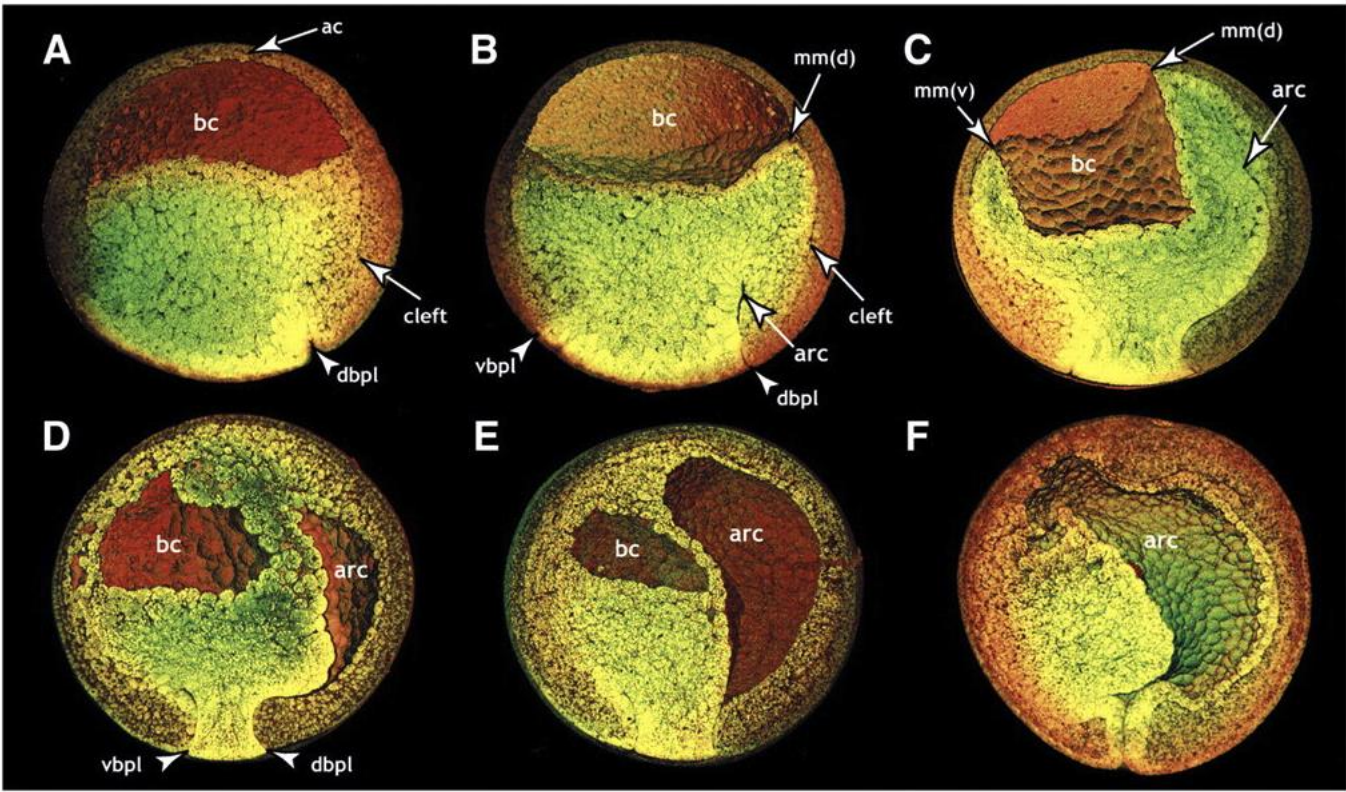
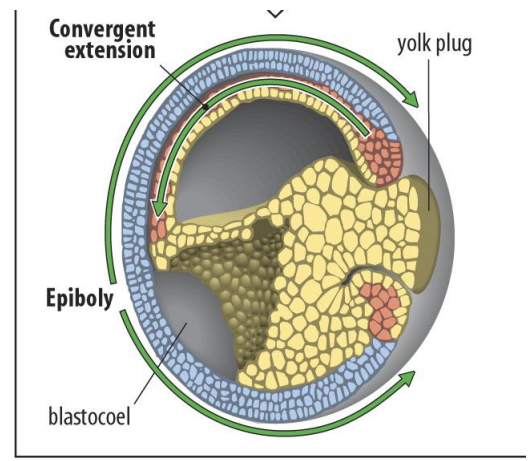
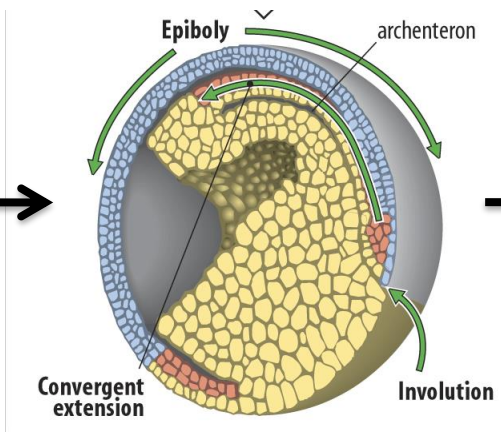
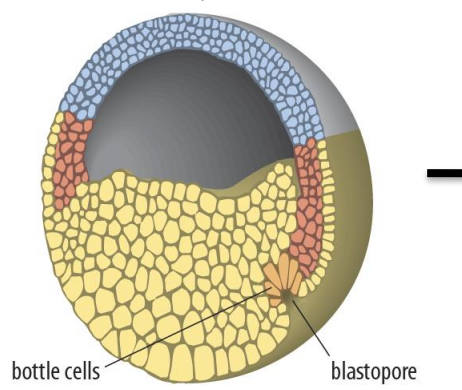
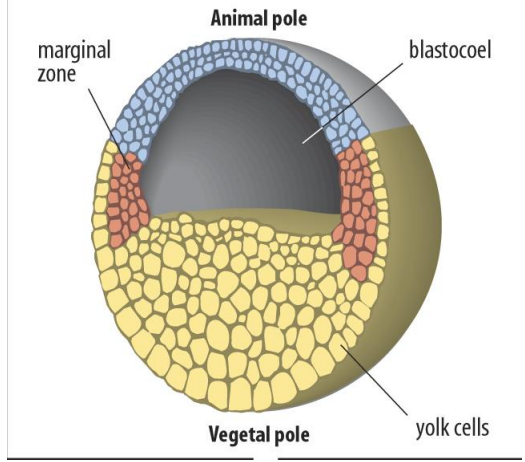


I MOVIMENTI DI INVOLUZIONE SONO MEDIATI DA INTERAZIONI DELLE CELLULE MESENDODERMICHE CON LA MATRICE EXTRA-CELLULARE PRODOTTA DALLE CELLULE DEL TETTO DEL BLASTOCELE

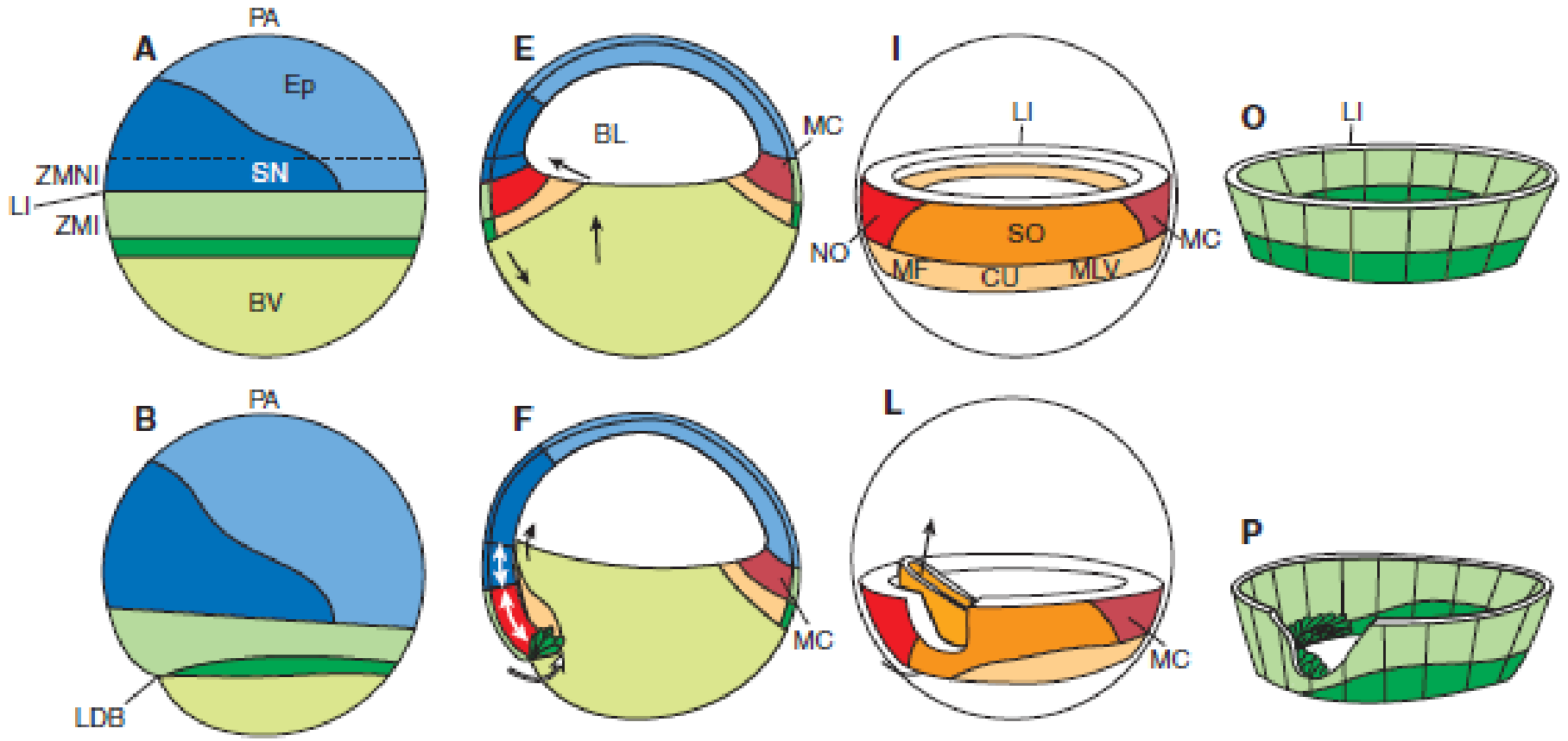


I MOVIMENTI DI GASTRULAZIONE SI ESTENDONO PROGRESSIVAMENTE IN DIREZIONE DORSO-VENTRALE

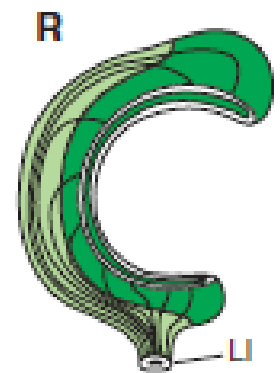
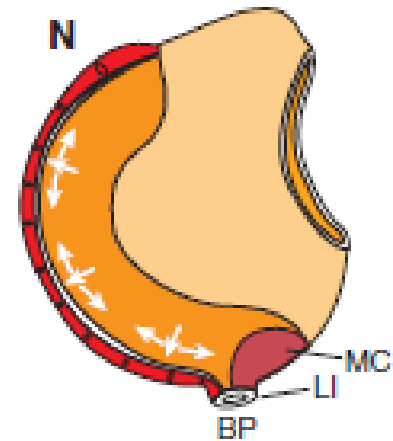
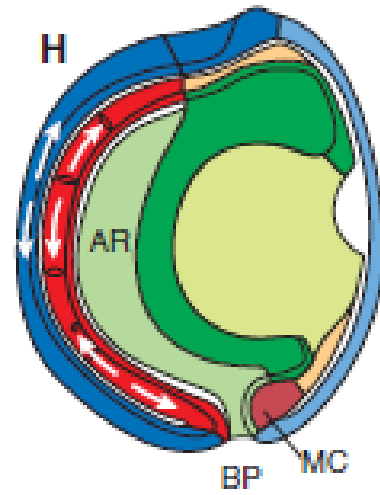
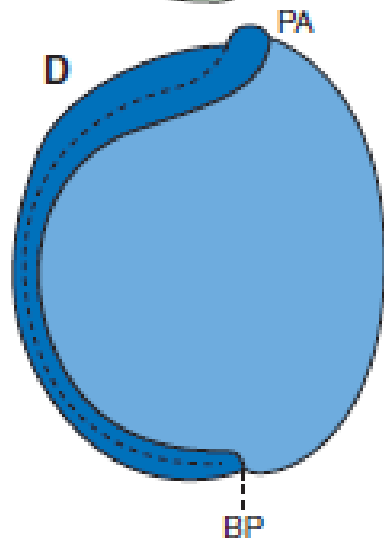
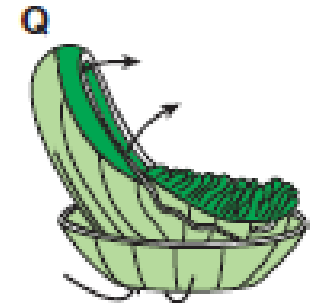
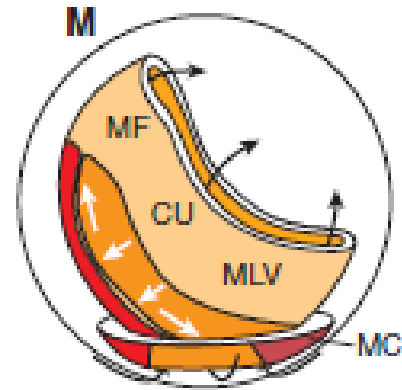
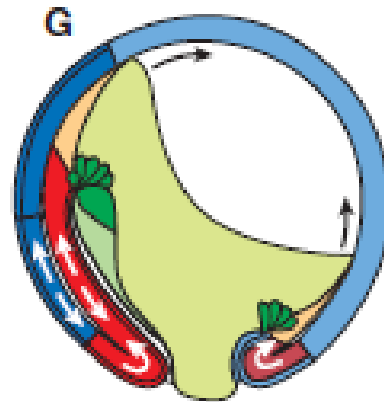
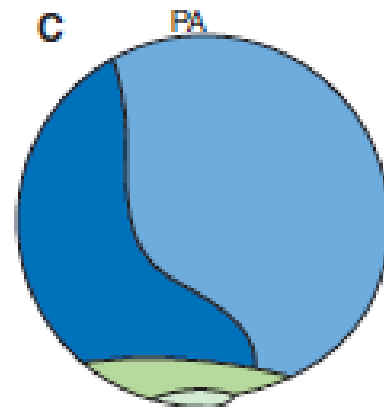




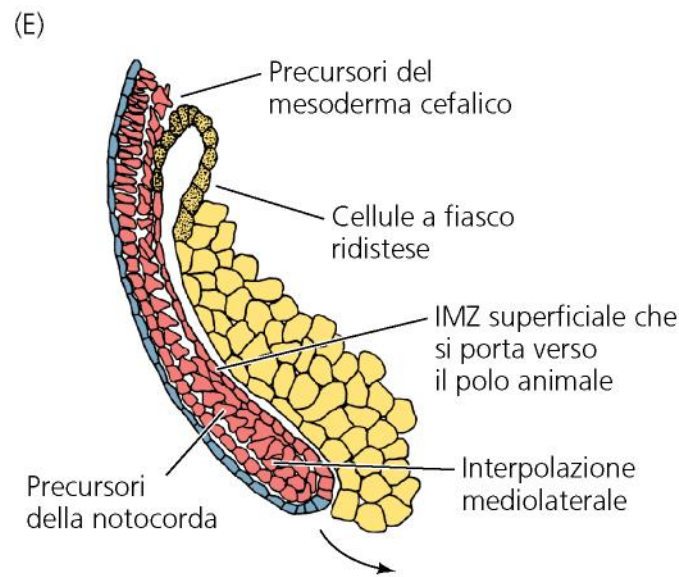
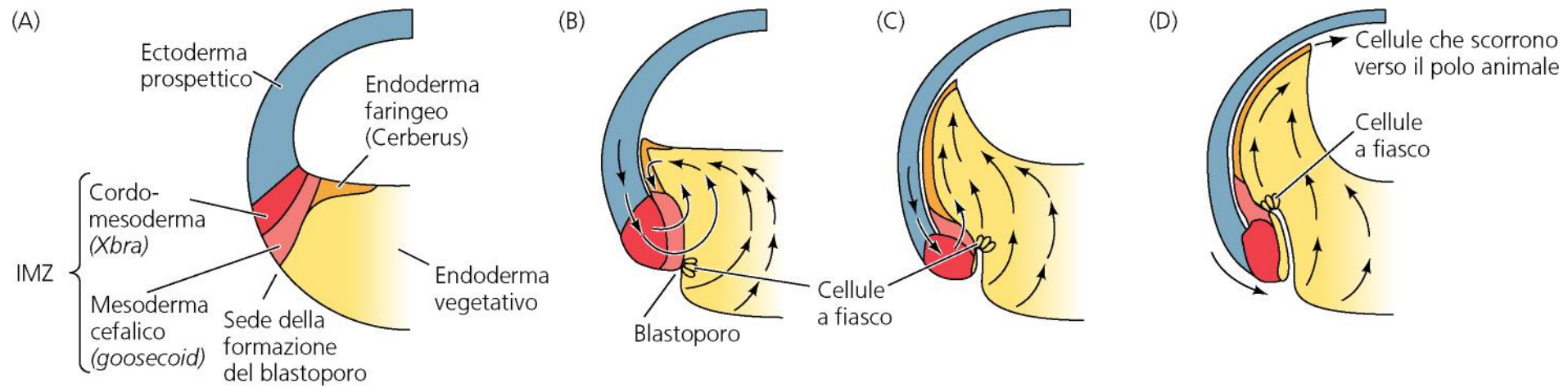
GASTRULA PRECOCE



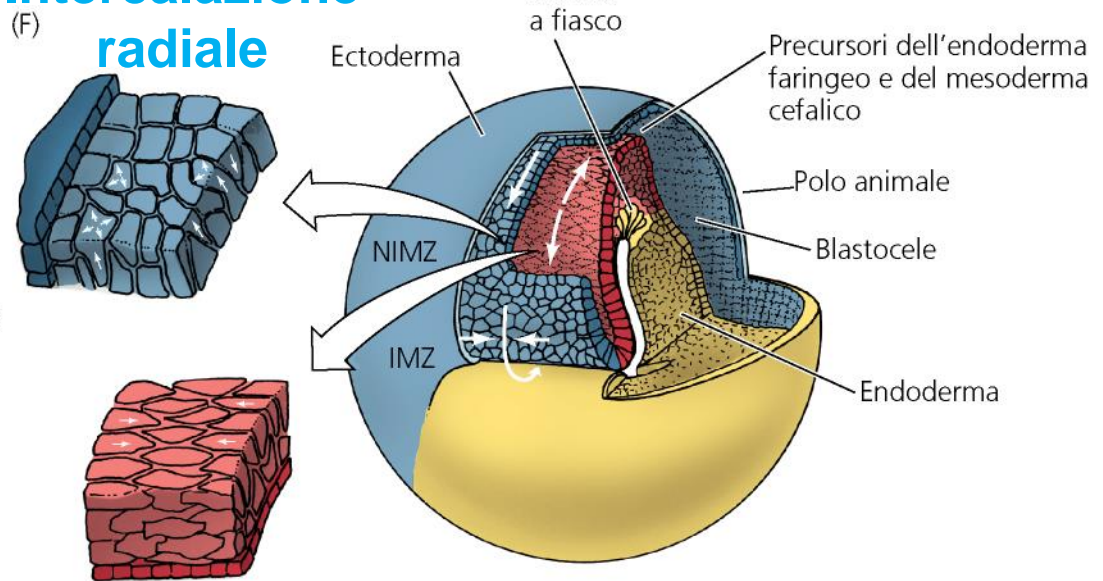
GASTRULA TARDIVA







Intercalazione radiale



Intercalazione medio-laterale

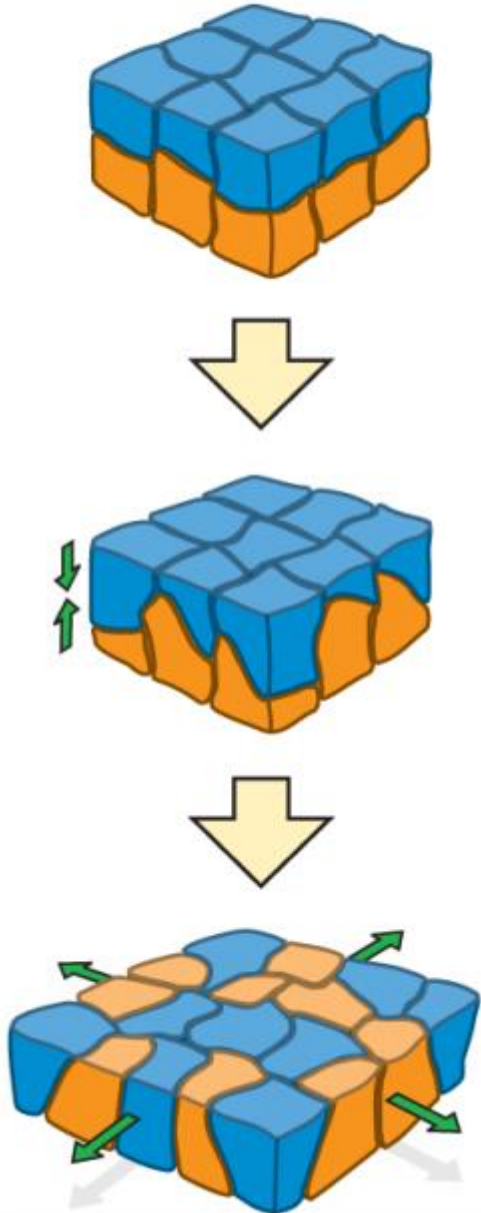
Invaginazione

Involuzione

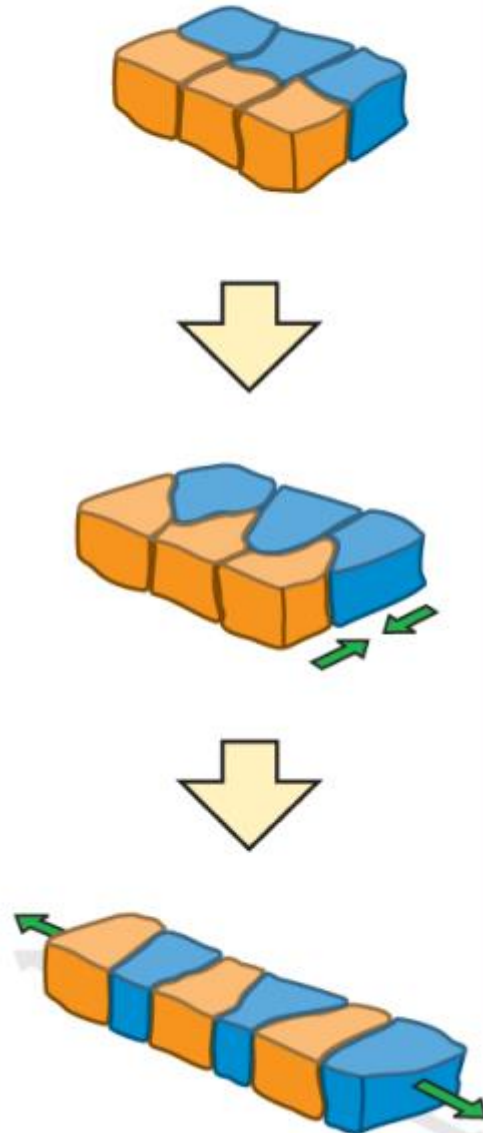
Epibolia

Epibolia
dell'ectoderma

**Radial
intercalation**

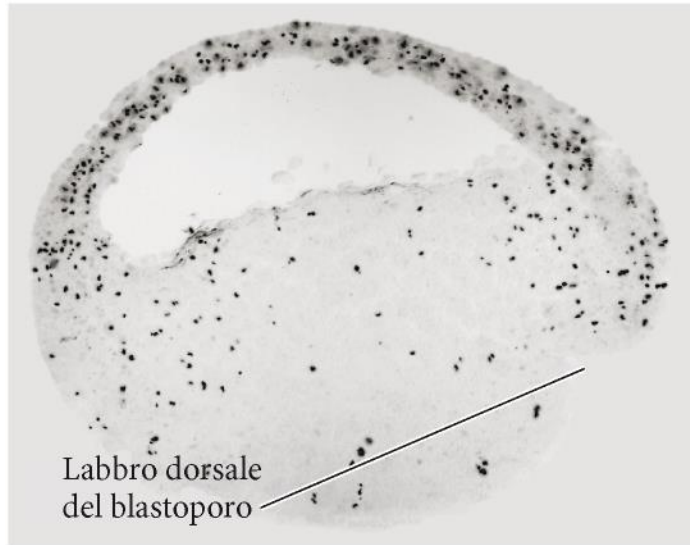


**Medio-lateral
intercalation**

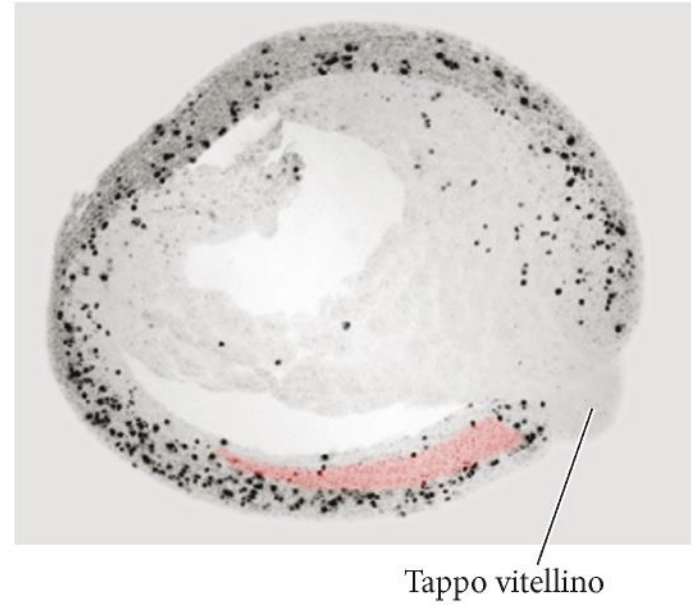


**Estensione
convergente**
della notocorda,
dell'archenteron
e del tubo
neurale

(A)



(B)



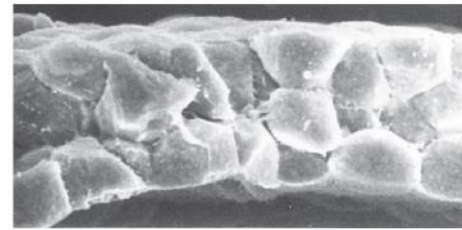
(C)



8



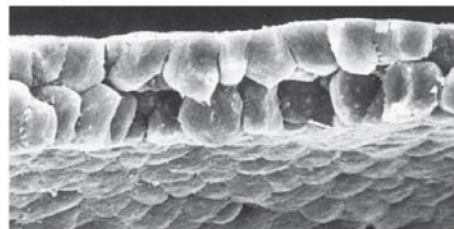
9



10

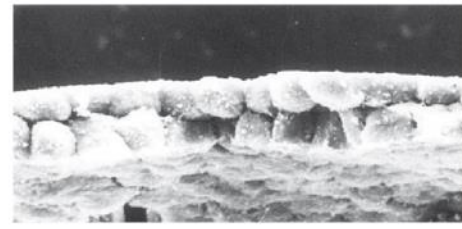
Stadio

10,5

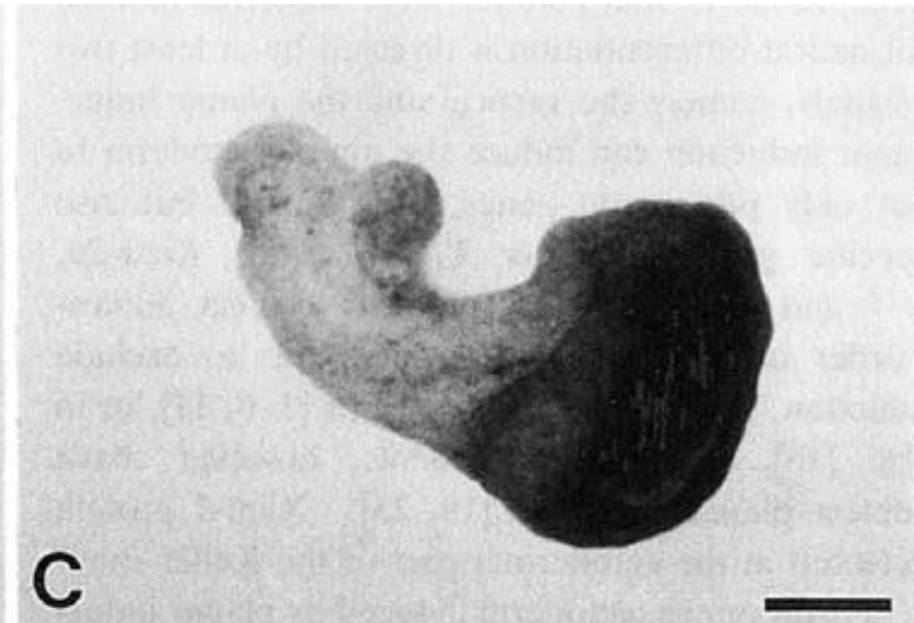
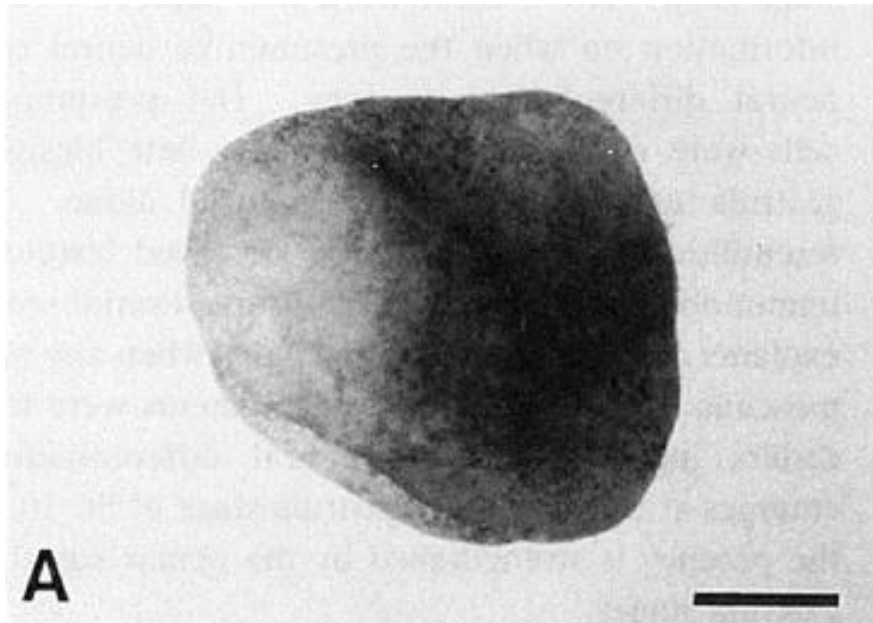
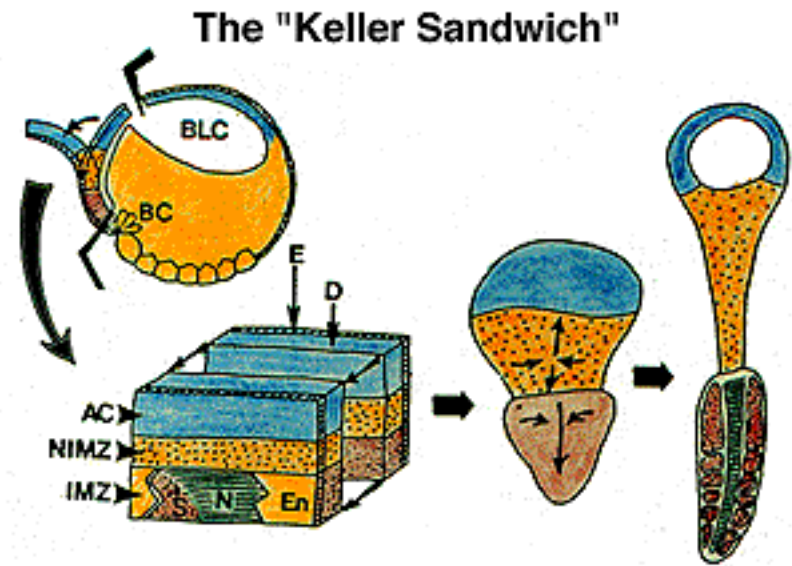
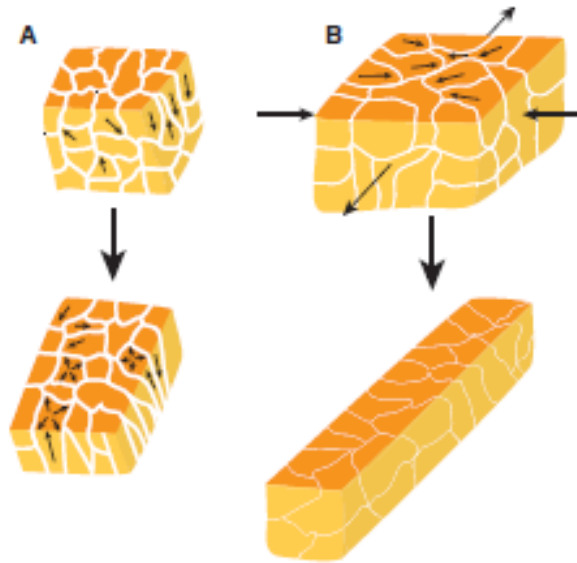


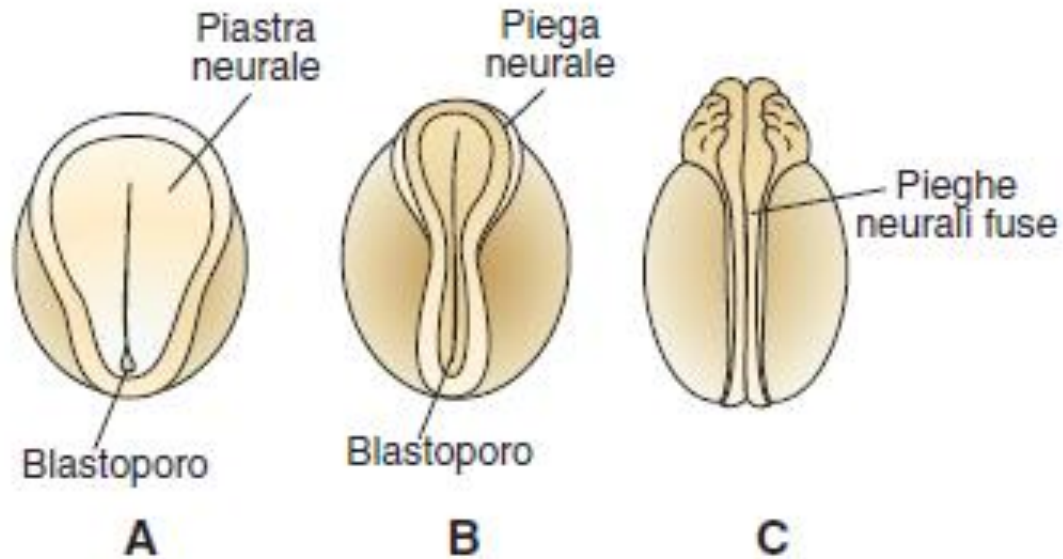
11

11,5

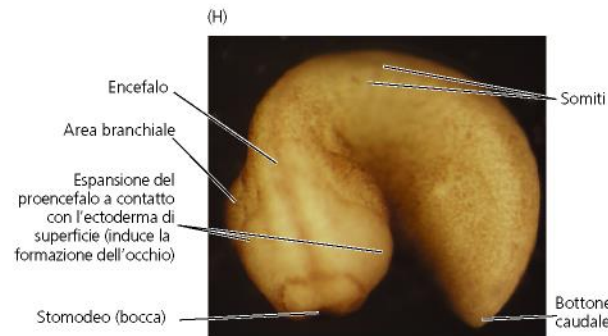
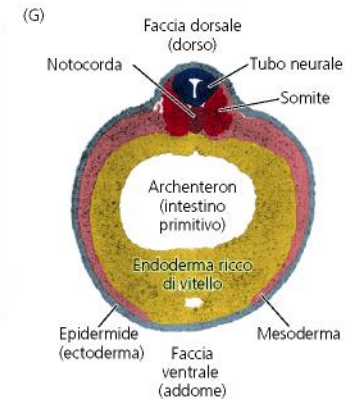
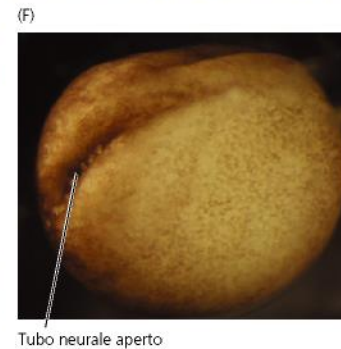
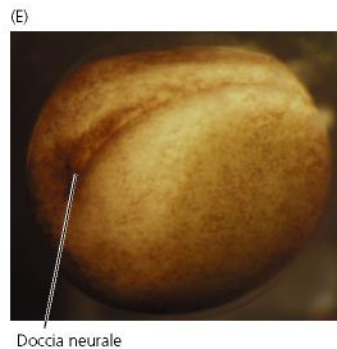


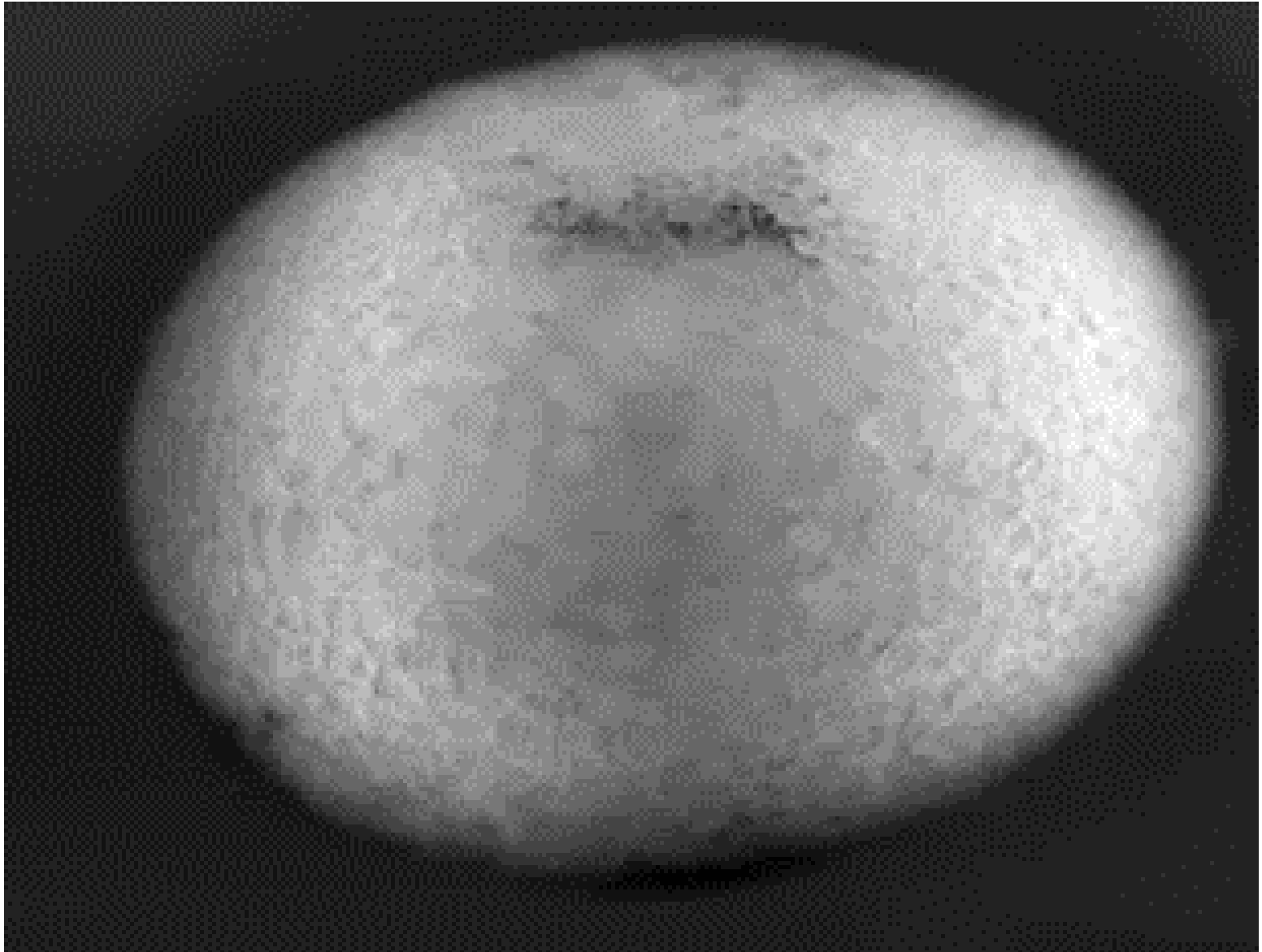
I MOVIMENTI DI ESTENSIONE CONVERGENTE GIOCANO UN RUOLO CHIAVE NELLA GASTRULAZIONE





I MOVIMENTI DI NEURULAZIONE CONDUCONO ALLA FORMAZIONE DEL TUBO NEURALE





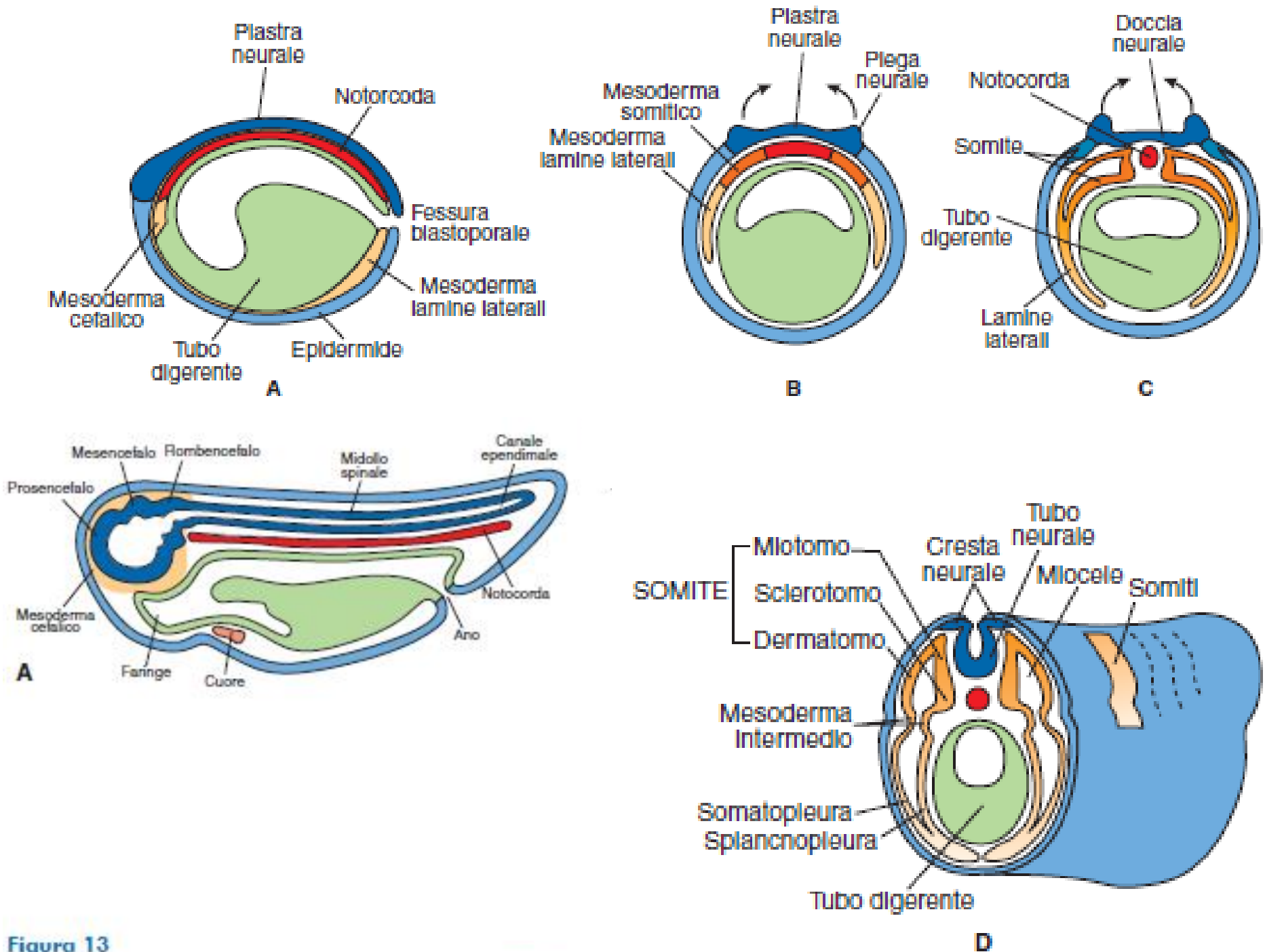
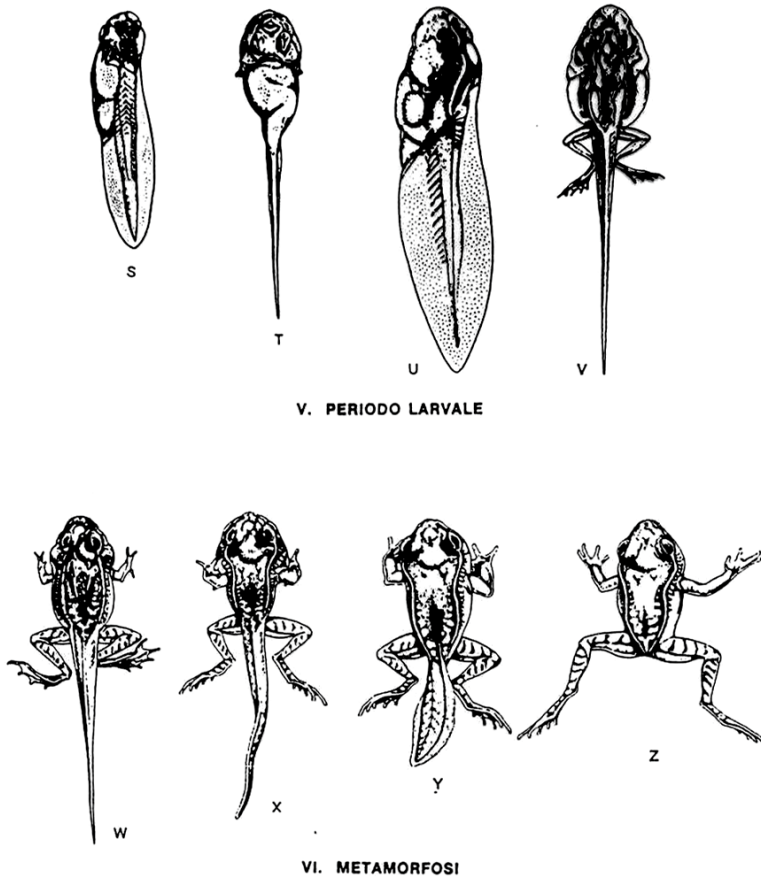


Figura 13

Metamorfosi

Pre-metamorfosi: accrescimento girino, Presenza di branchie, progressivo sviluppo arti posteriori.

Metamorfosi: arti anteriori, regressione pinna caudale e coda, modificazione tubo digerente, sviluppo polmoni.



Sviluppo della rana (continuazione). V - Periodo larvale. S, stadio a branchie esterne (visione laterale). T, formazione degli opercoli (visione ventrale). U, girino (visione laterale sinistra con lo spiracolo). V, girino (visione dorsale). VI - Metamorfosi. W, apparizione degli arti anteriori. X e Y, regressione della coda. Z, fine della metamorfosi

**Controllo ormonale:
ipofisi- ormone tireotropo
Tiroide- ormone tiroxina**