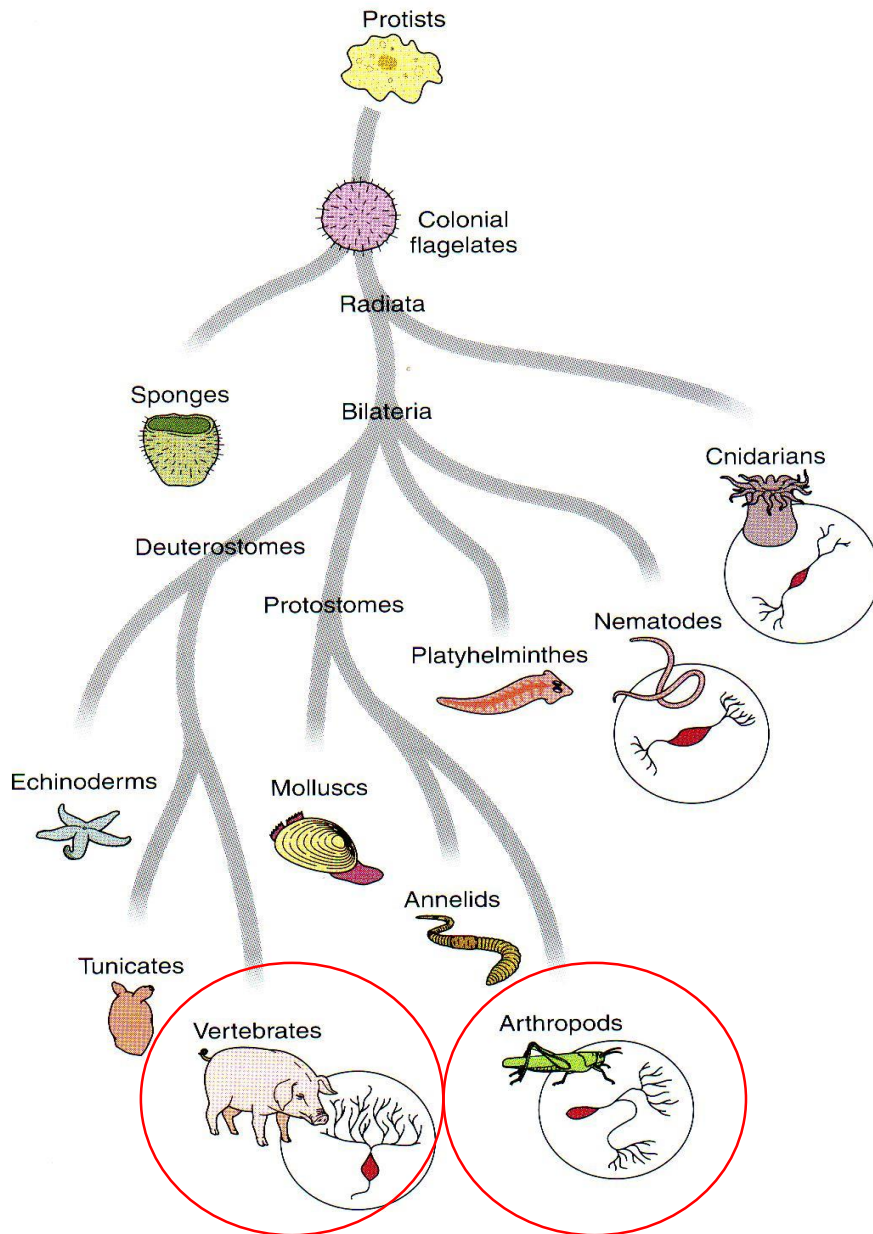


Specificazione del sistema nervoso nei Vertebrati



- Tutti gli organismi pluricellulari possiedono neuroni riconoscibili con lunghi processi e con attività elettrica simile

- Già dagli Cnidari è possibile trovare connessioni sinaptiche

- Molti dei segnali molecolari che contribuiscono alla fisiologia e allo sviluppo del sistema nervoso sono conservati durante l'evoluzione.

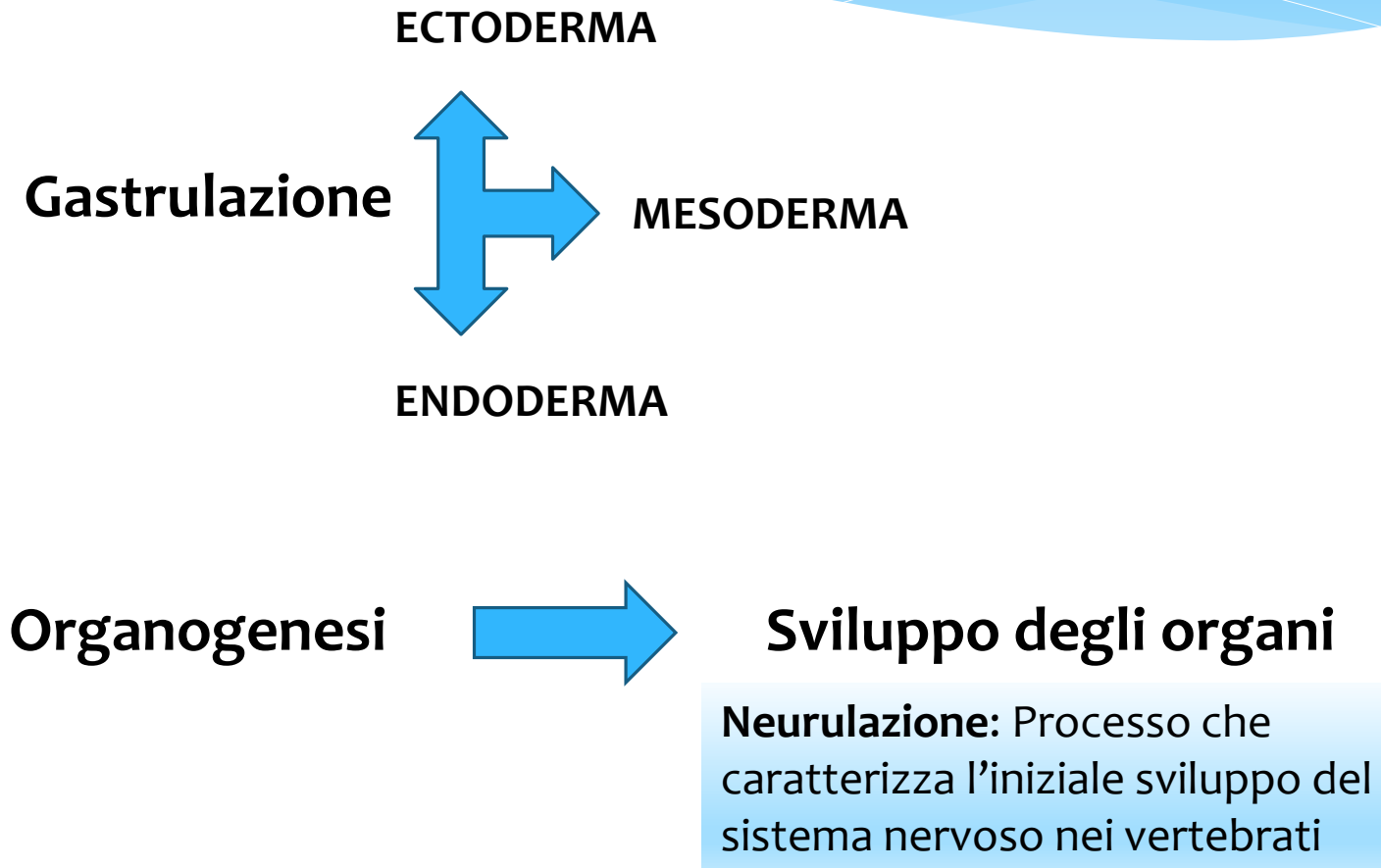
Qualche breve cenno di embriologia

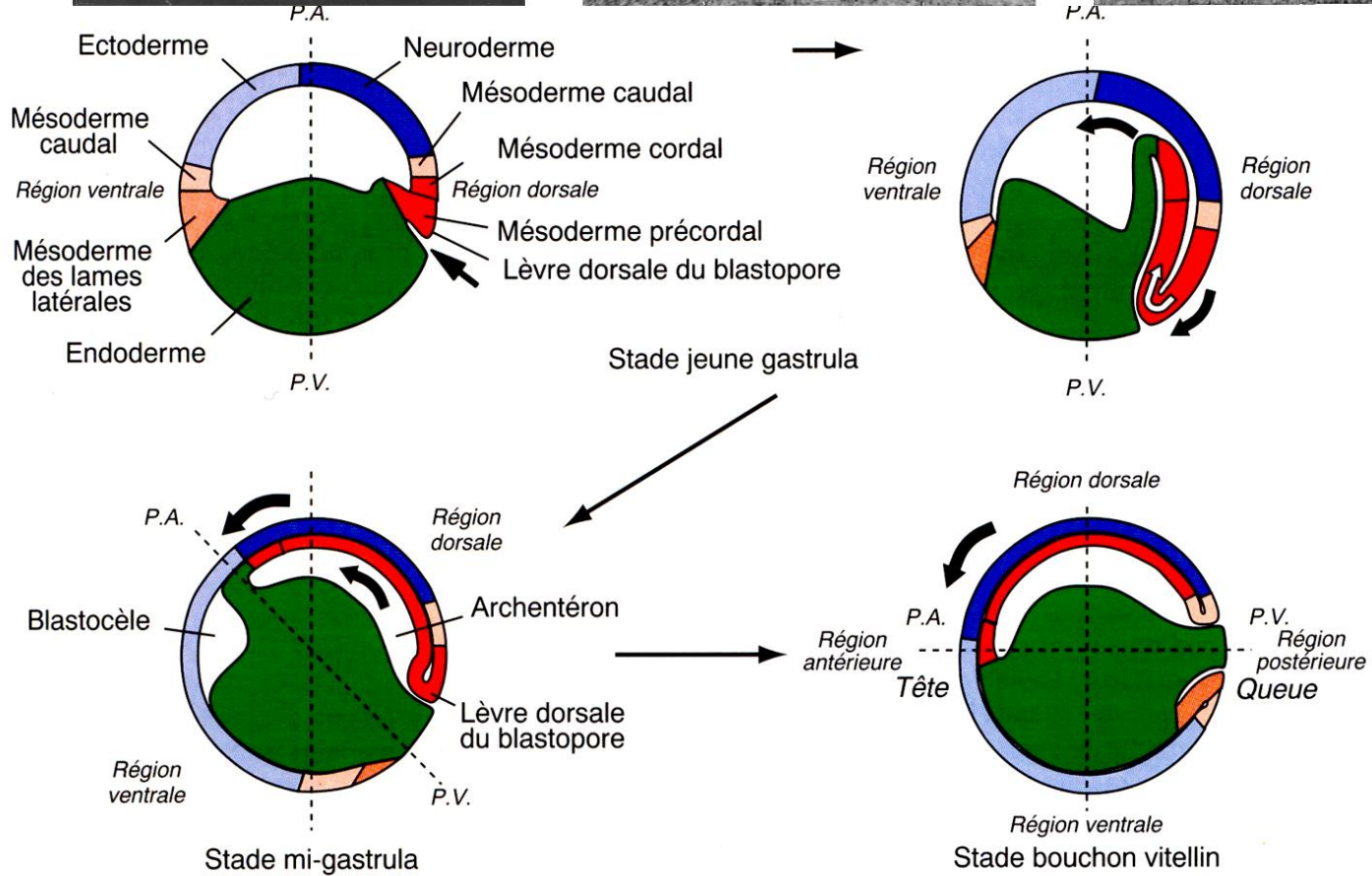
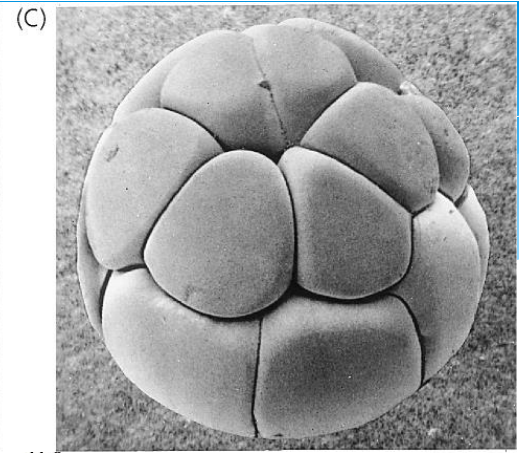
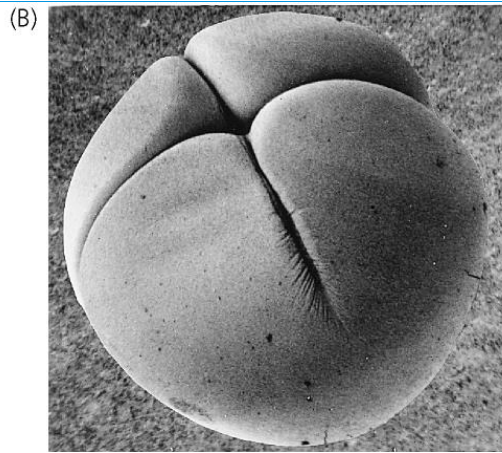
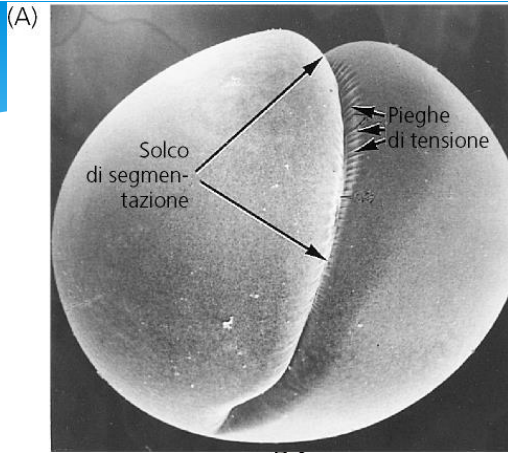
Embriologia dei Vertebrati

Tab. 1.2: *Principali fasi dell'embriogenesi*

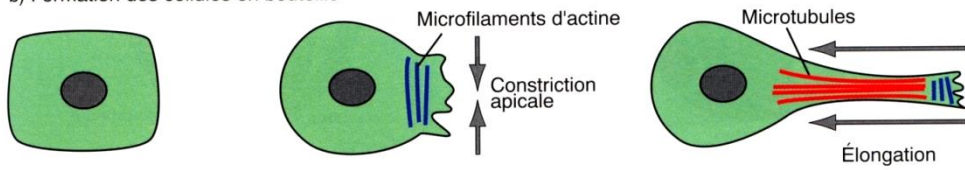


I Foglietti embrionali

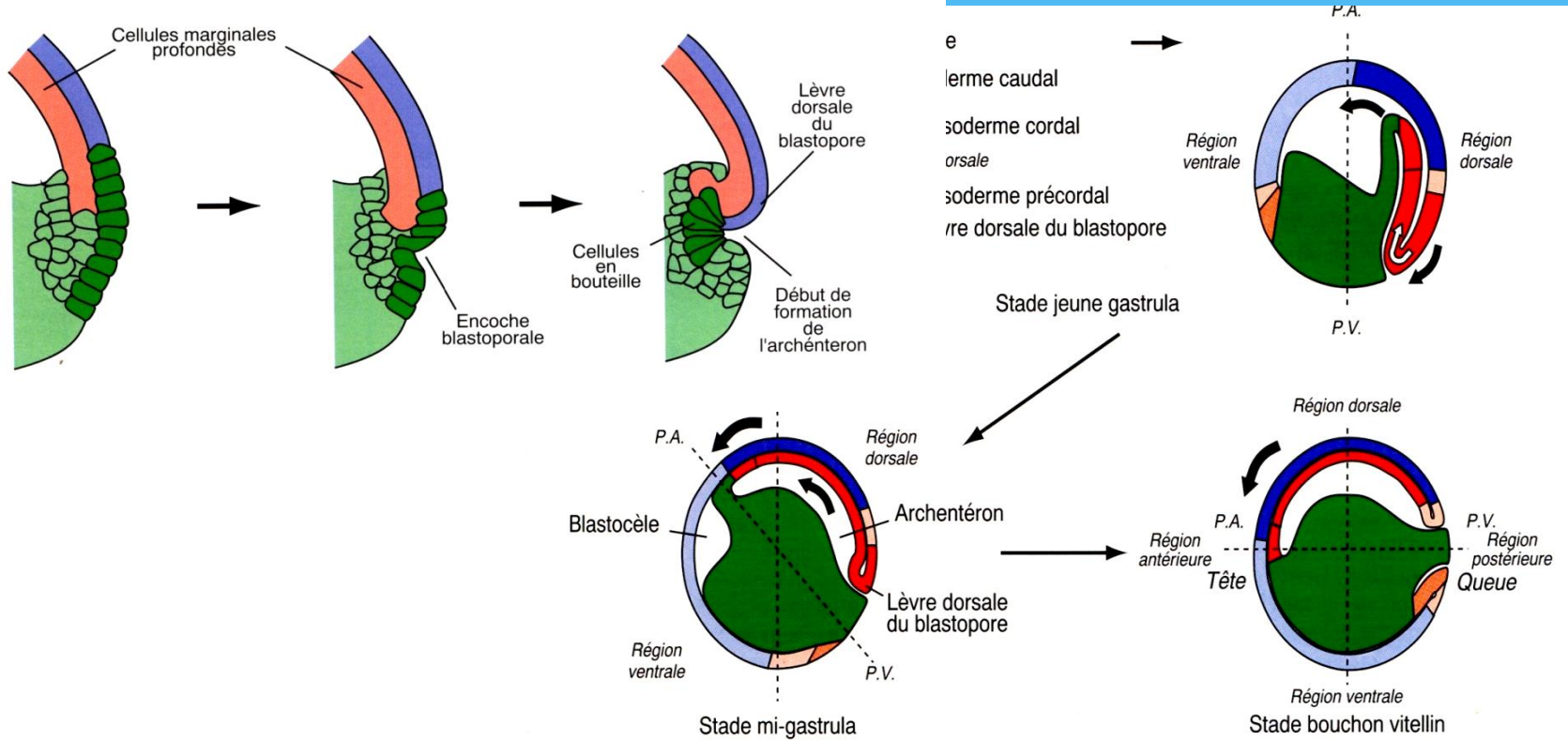


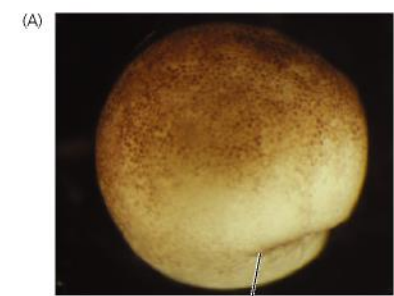


b) Formation des cellules en bouteille

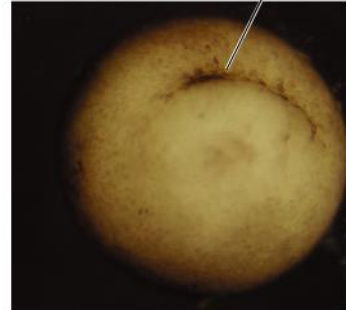


c) Schémas de la formation de l'archentéron





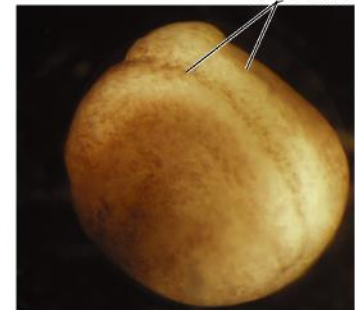
(B) Labbro dorsale del blastoporo



(C) Tappo vitellino Blastoporo



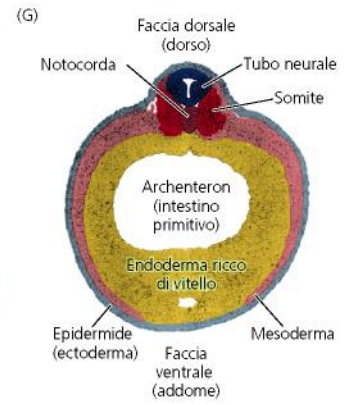
(D) Labbro dorsale del blastoporo Pieghe neurali



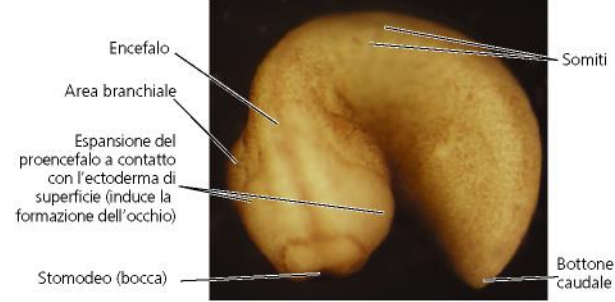
(E) Doccia neurale



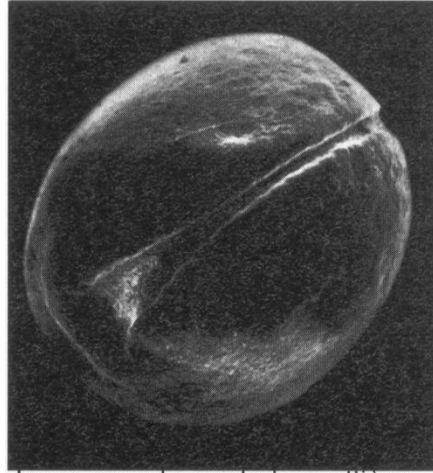
(F) Tubo neurale aperto



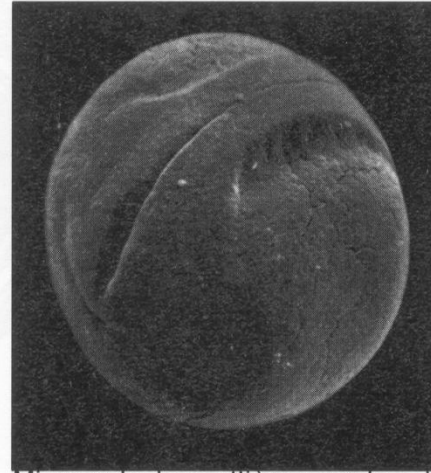
(H)



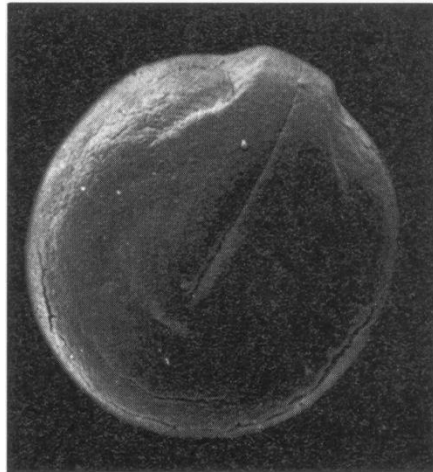
b) La neurulation, microphotographies d'embryons de xénope (les embryons sont dégangués et sans membrane de fécondation, x 50)



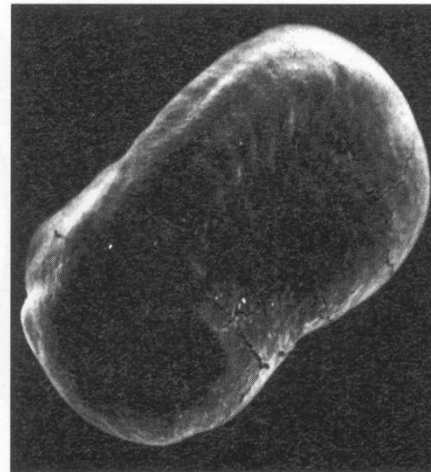
Jeune neurula au stade gouttière neurale



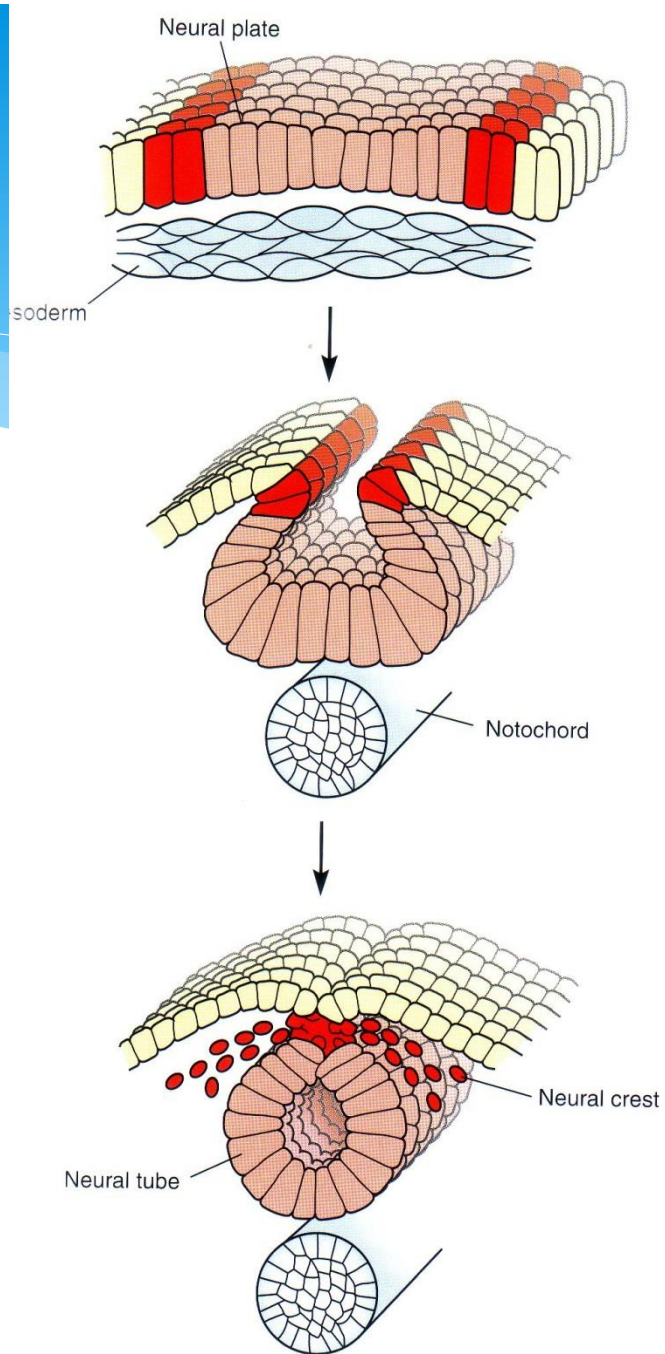
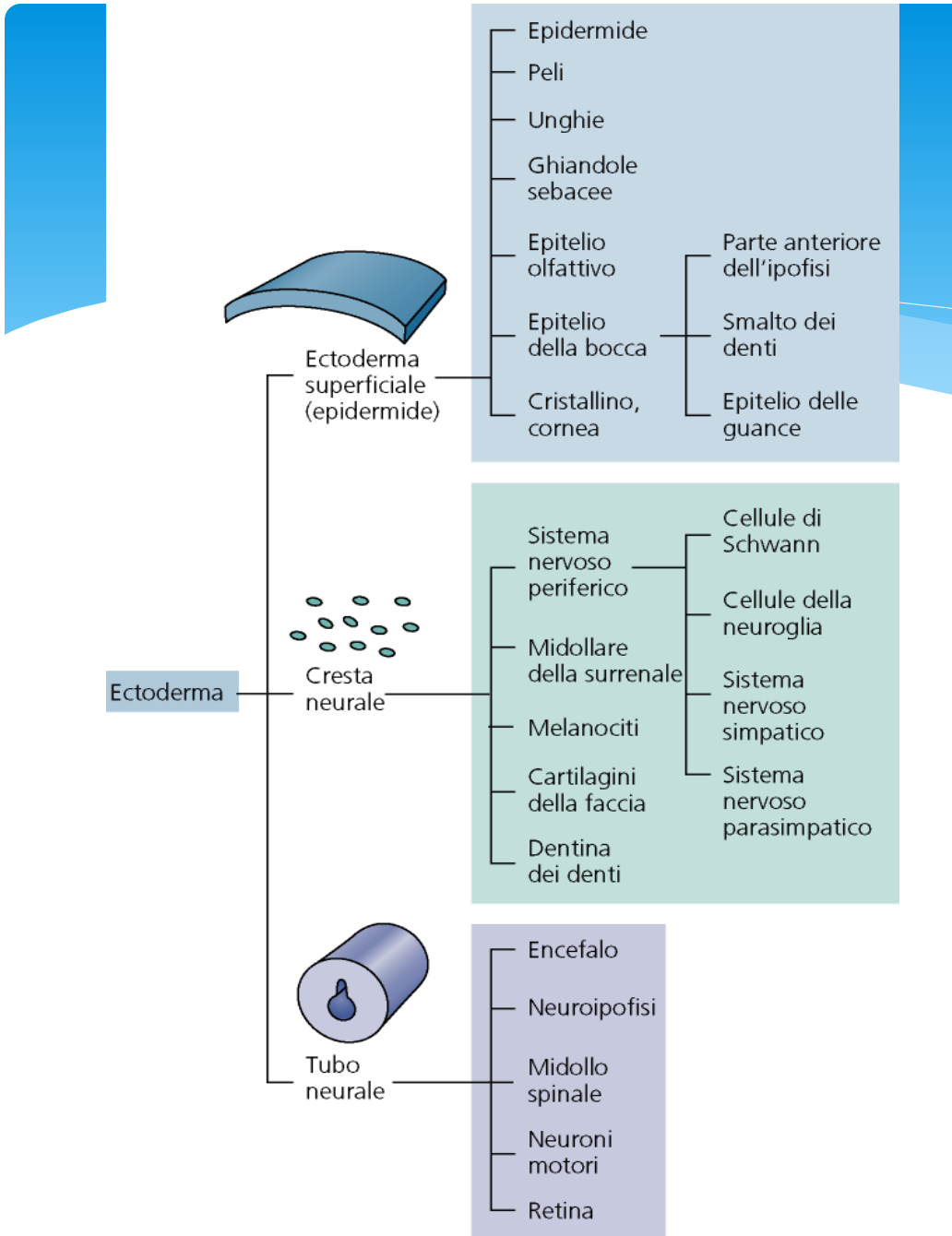
Mi-neurula, la gouttière neurale est fermée dans la région troncale



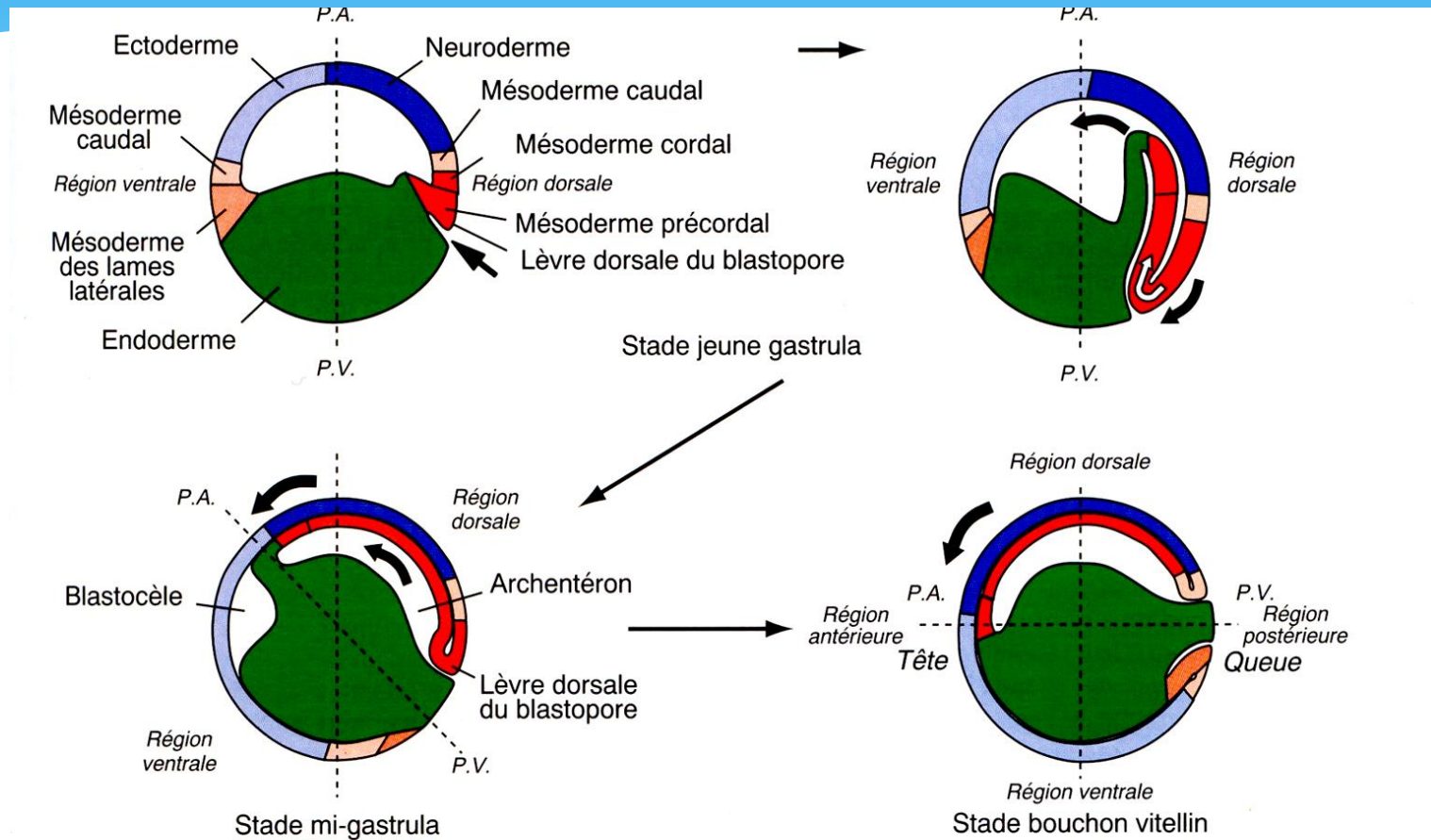
Neurula âgée



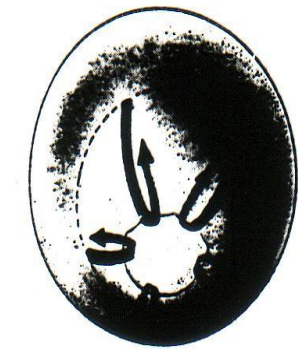
Jeune bourgeon caudal



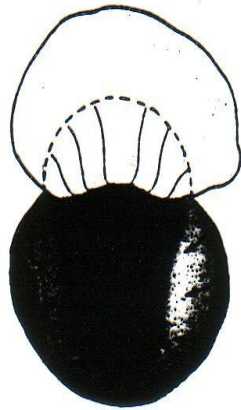
La mappa dei territori presuntivi ci indica il territorio presuntivo del sistema nervoso



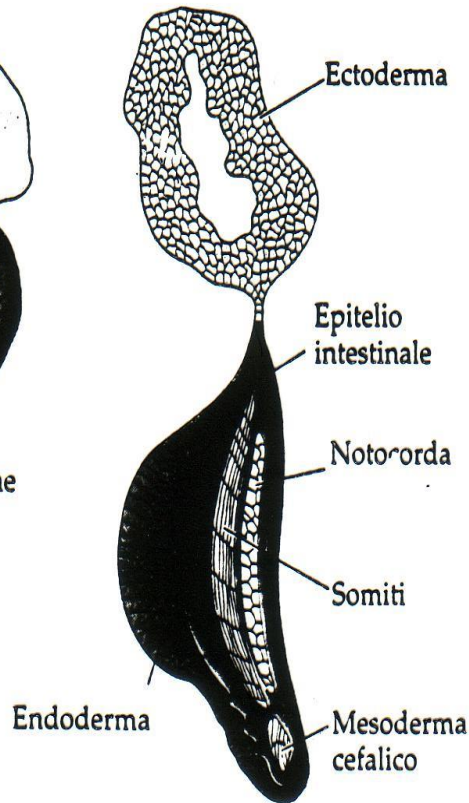
Esogastrule di Holtfreter



(A) Gastrulazione normale



(B) Esogastrulazione

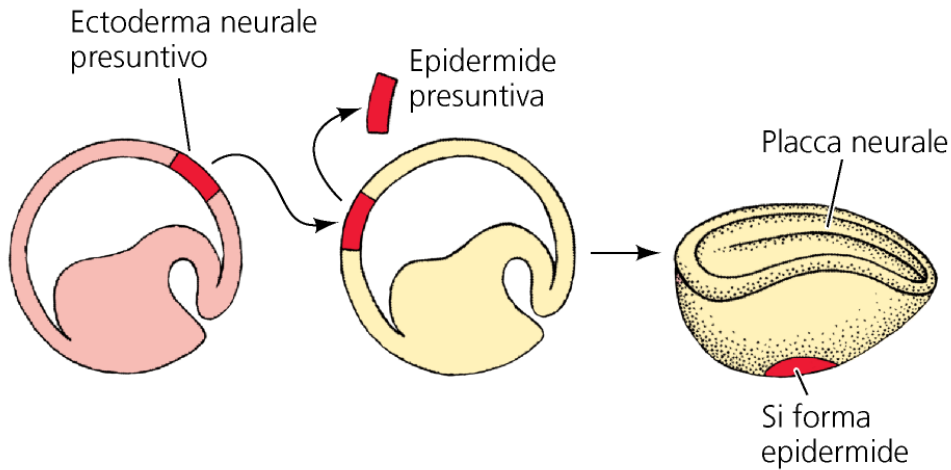


(C) Differenziazione in esogastrulazione

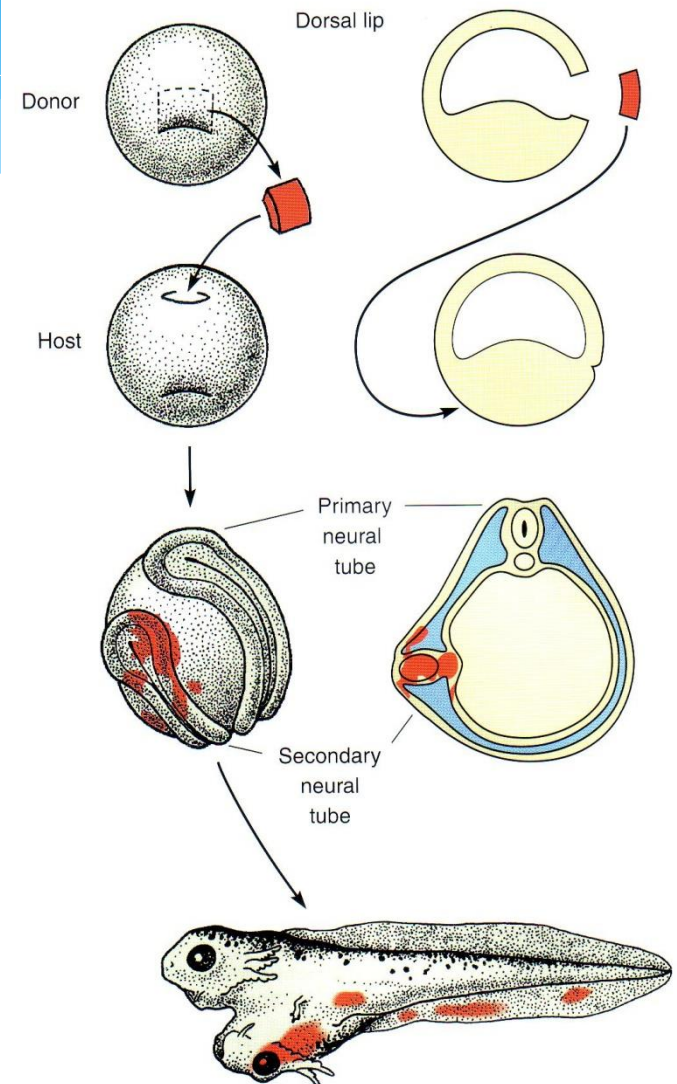
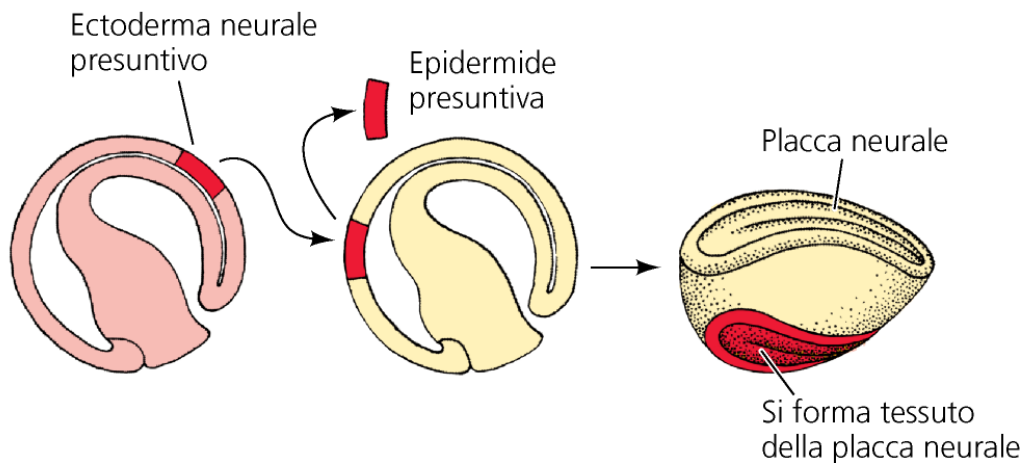
Figura 16.35
Esogastrulazione. (A) Nella gastrulazione normale, il mesoderma si involge sotto l'ectoderma. Tuttavia, quando l'embrione di anfibio viene posto in una soluzione salina ipertonica, il mesoderma subisce esogastrulazione (B), estroflettendosi all'esterno dell'ectoderma, anziché involgersi nell'embrione. (C) L'ectoderma in queste esogastrulazioni non forma tessuto neurale. (Da Holtfreter e Hamburger, 1955.)

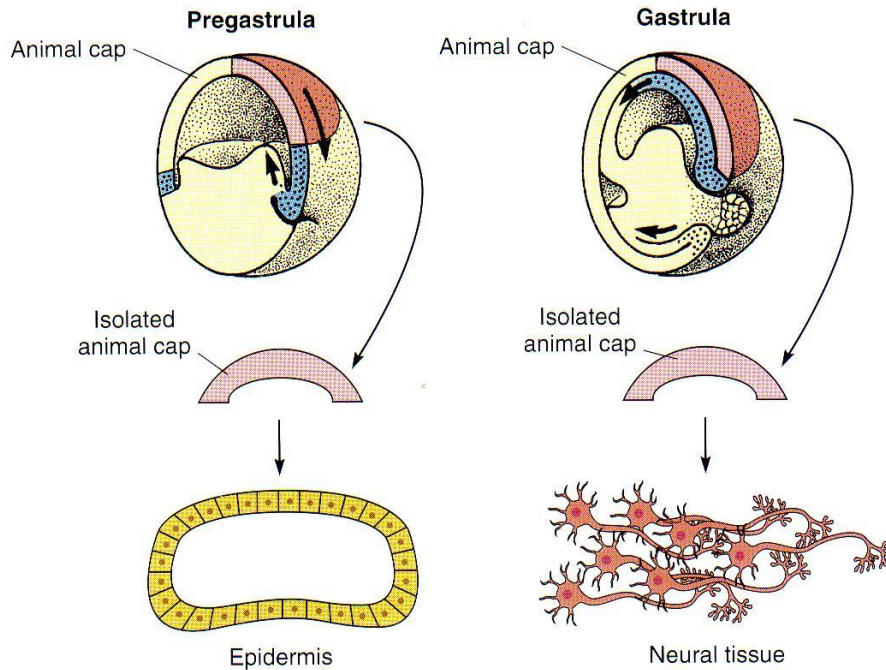
Quando viene specificato il neuroectoderma?

(A) TRAPIANTO IN GASTRULE INIZIALI



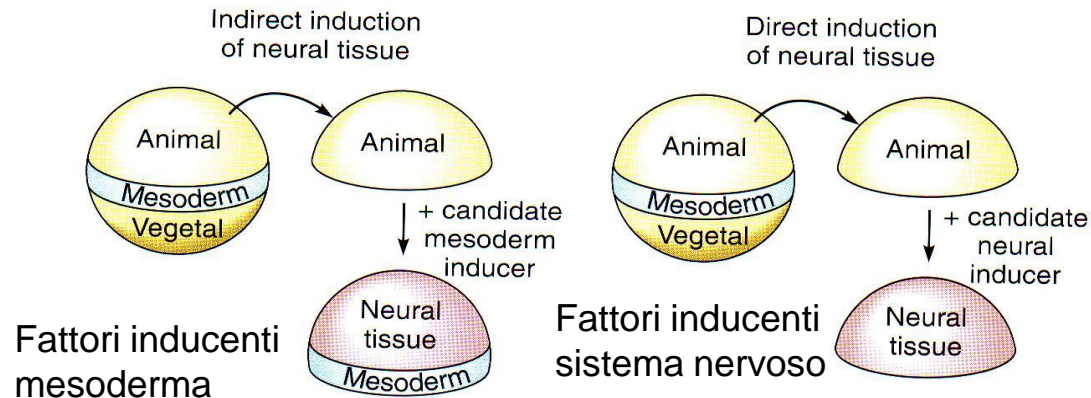
(B) TRAPIANTO IN GASTRULE AVANZATE



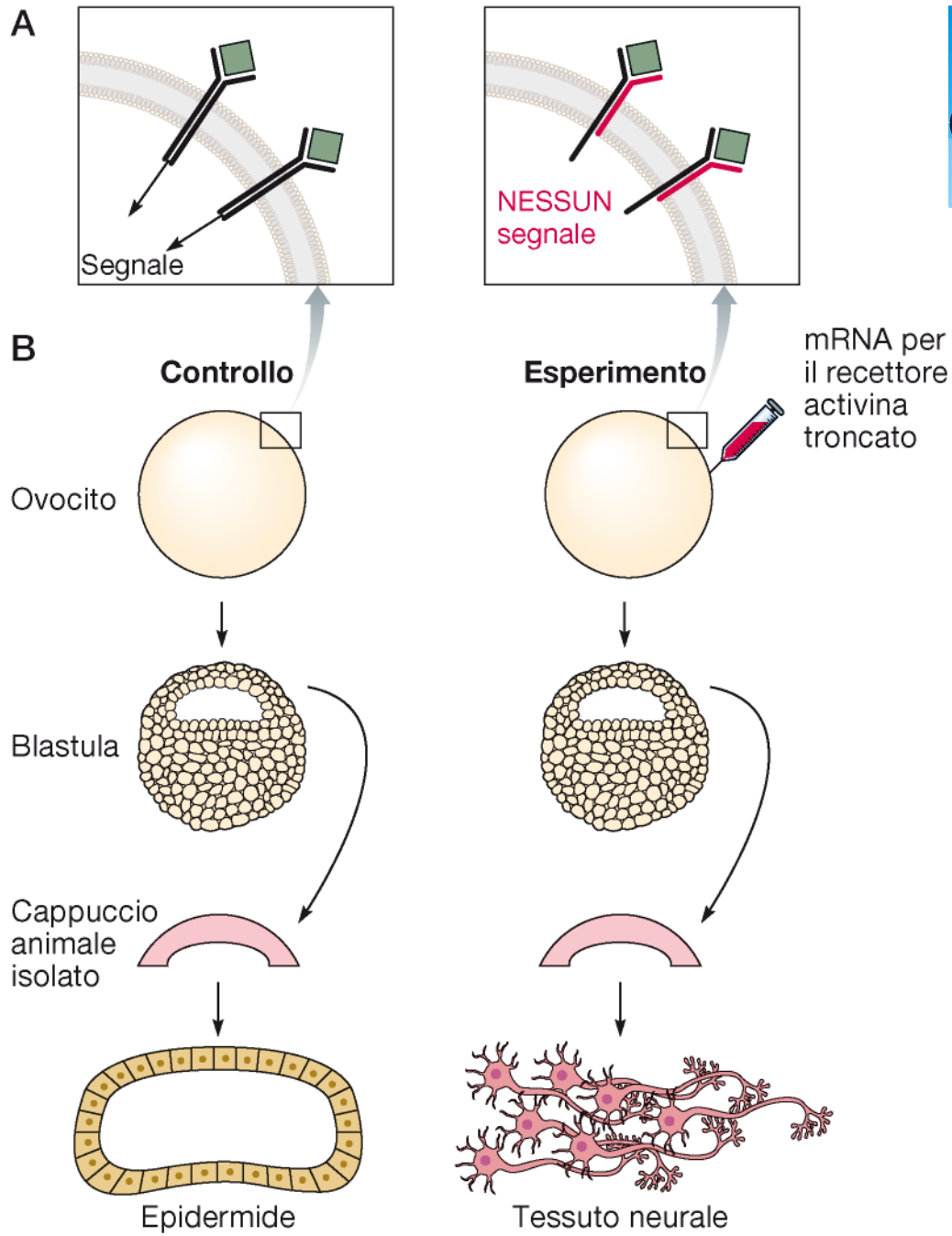


La specificazione del SN avviene durante la gastrulazione ???

Specificazione: iniziale acquisizione del destino maturativo. **Il processo è reversibile**



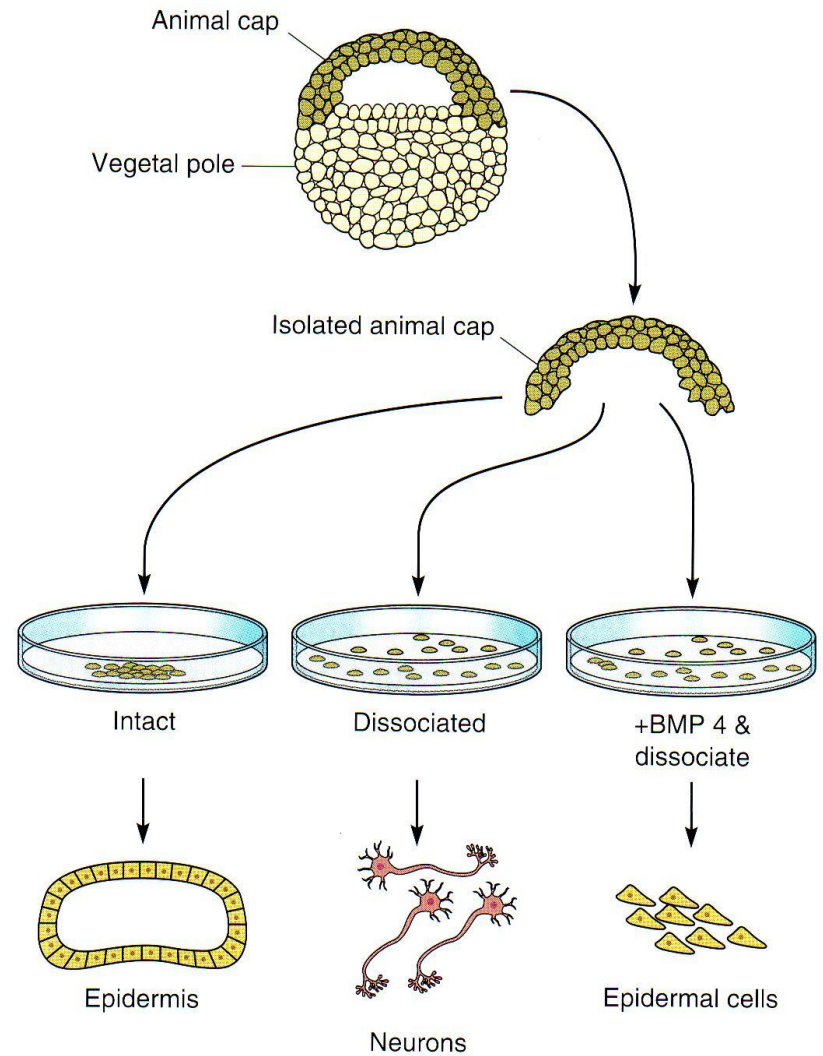
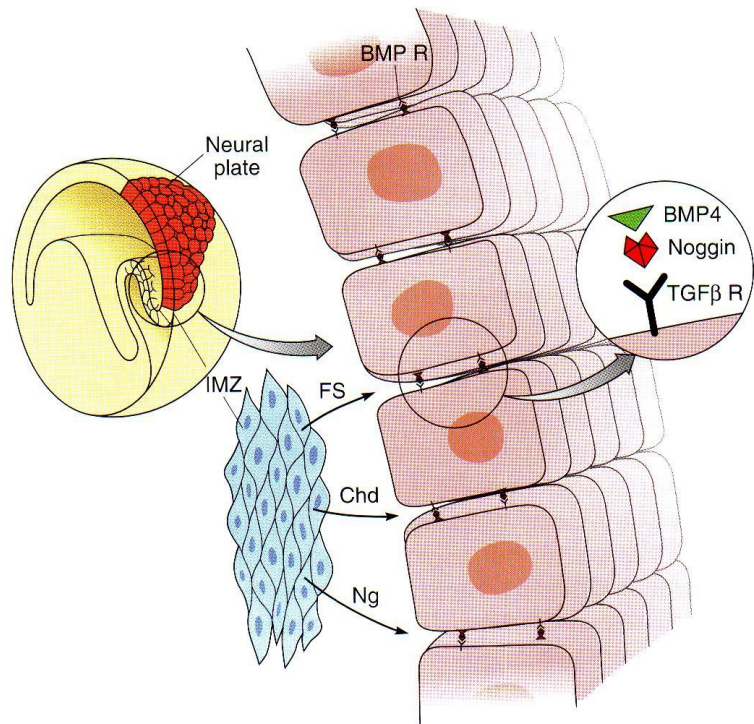
Determinazione del Neuroectoderma in Anfibi

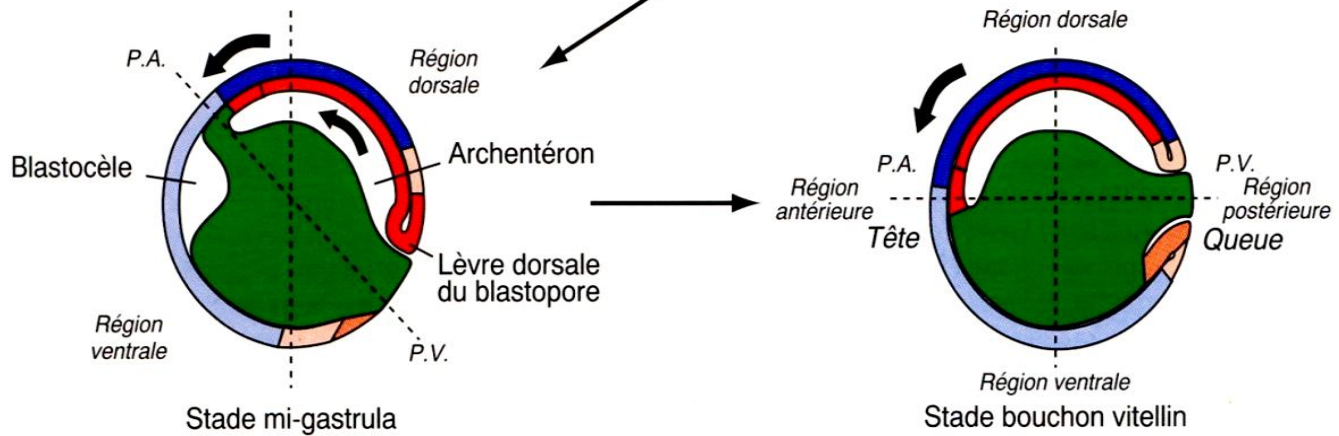
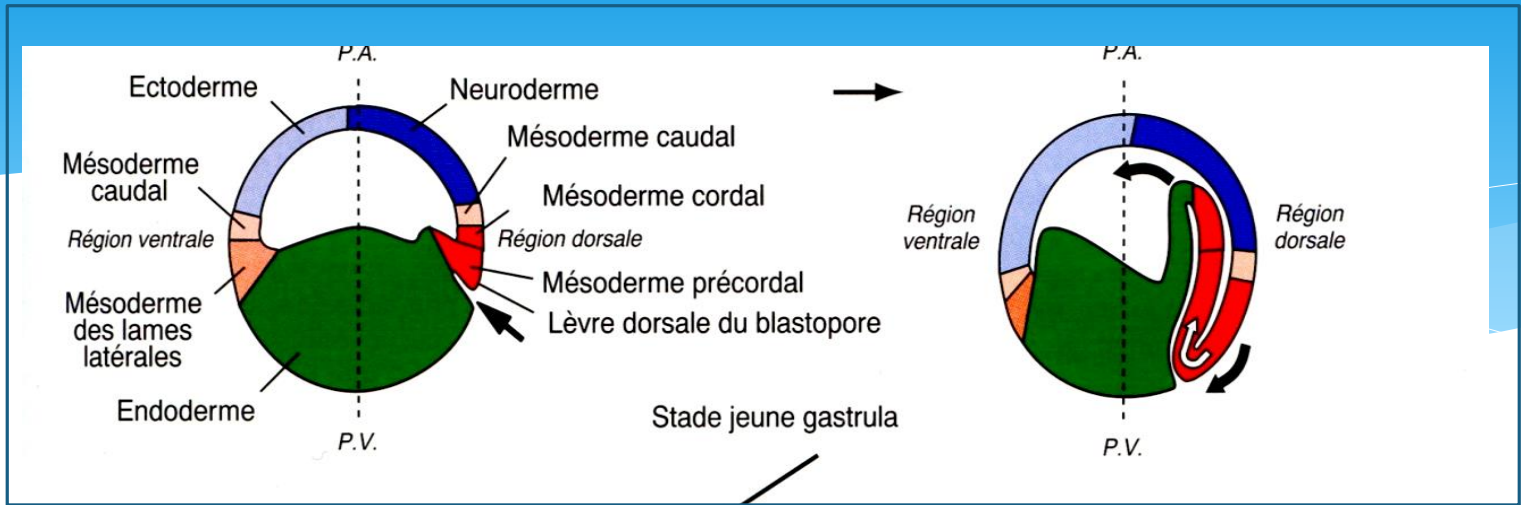


L'interferenza con la via di attivazione dell' attivina, non consente la formazione del mesoderma, ma permette la formazione del sistema nervoso.

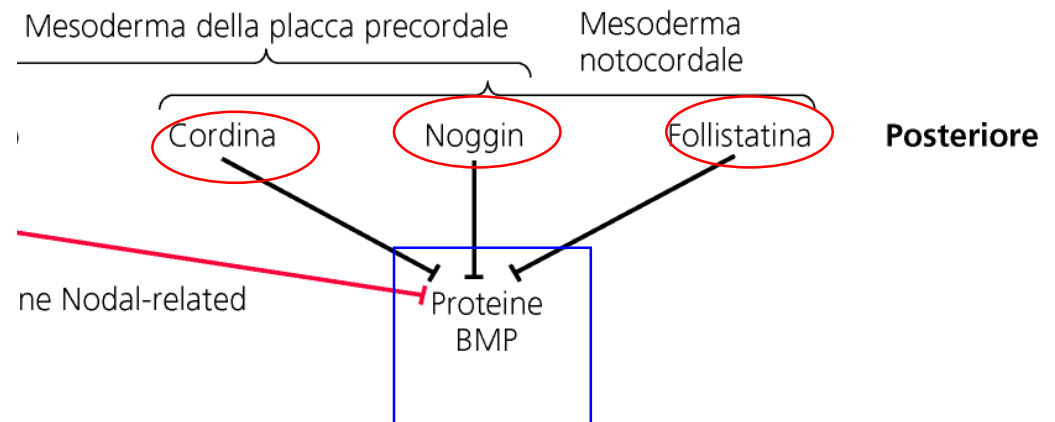
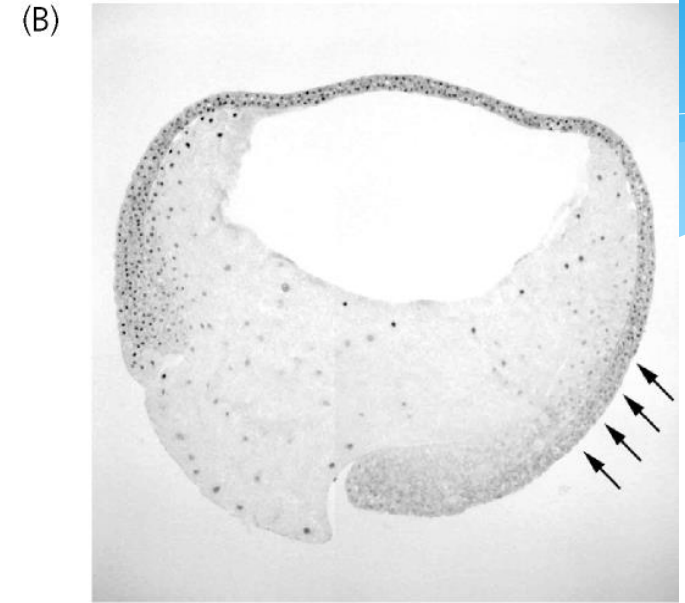
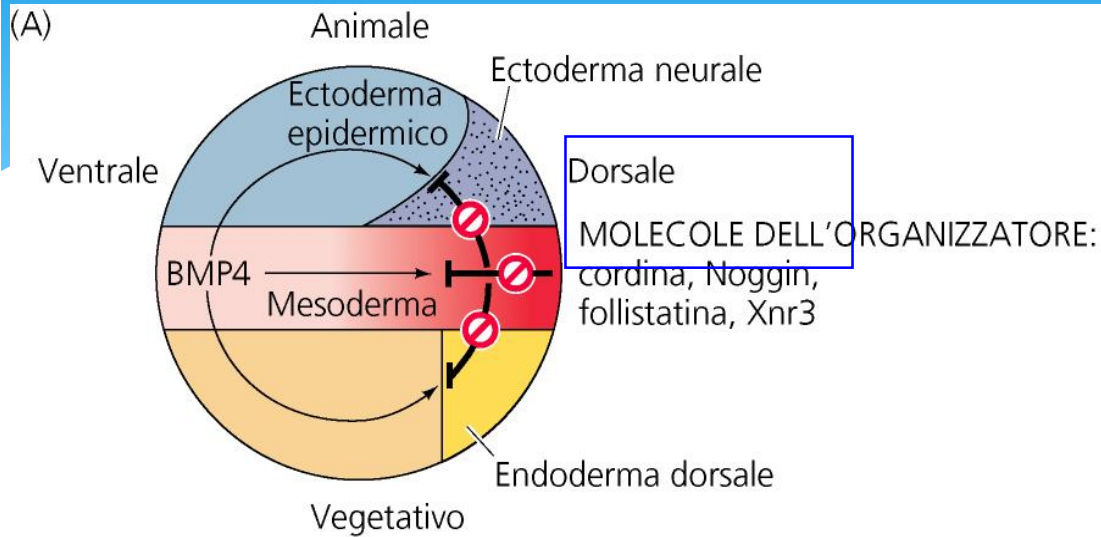
Fattori Tgf Beta hanno un effetto Inibitorio sulla formazione di SN

BMP 4 (TGF-beta factor) Bone Morphogenetic Protein



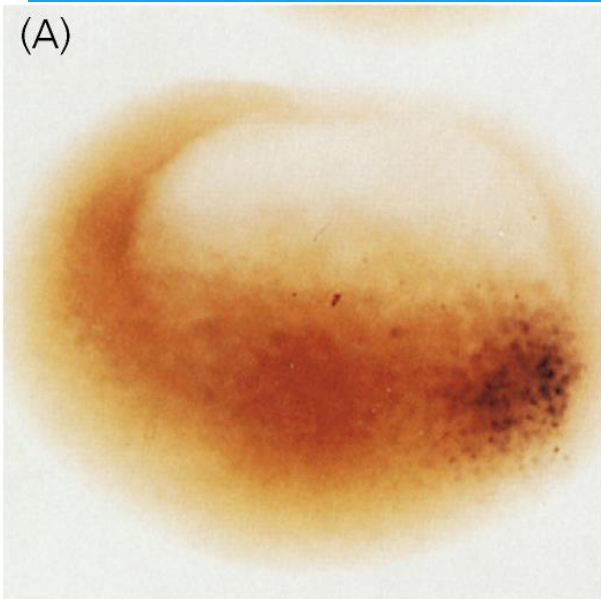


Gli inibitori della via BMP4

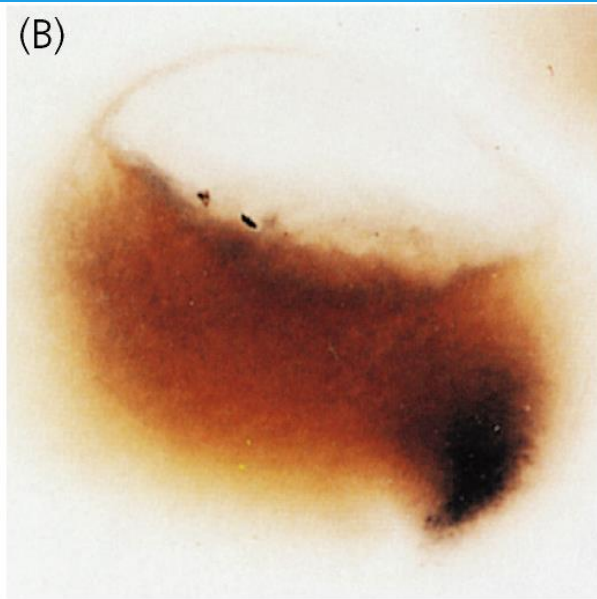


Espressione di Noggin e Cordina

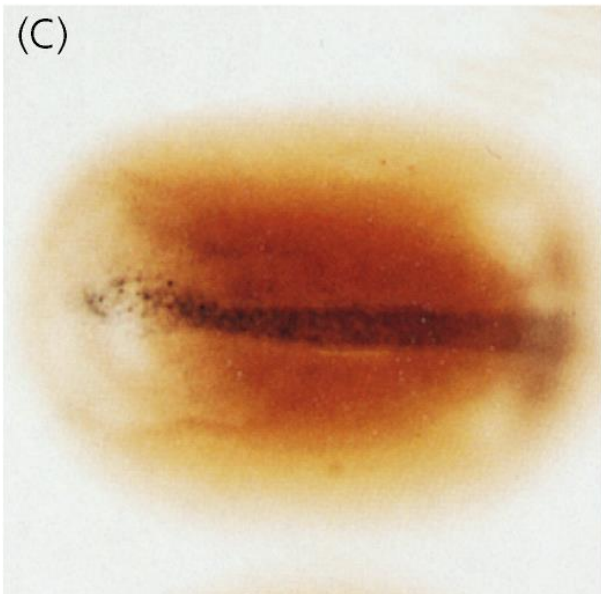
(A)



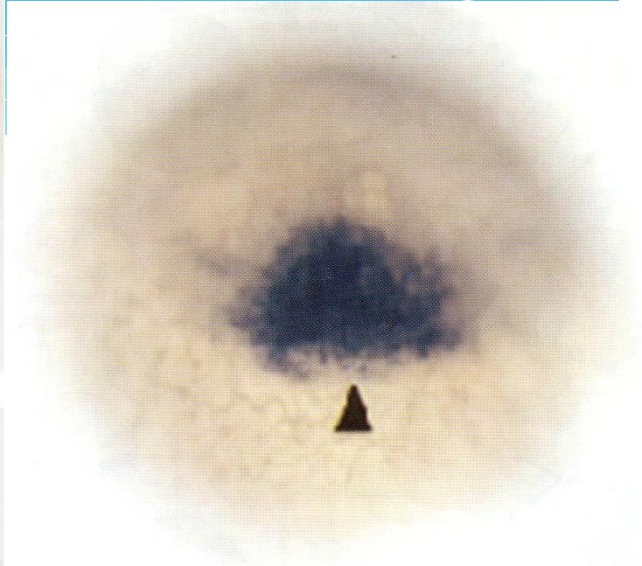
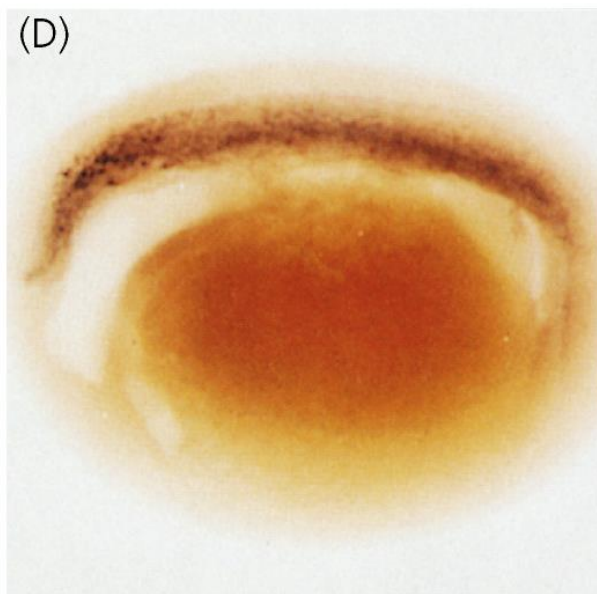
(B)



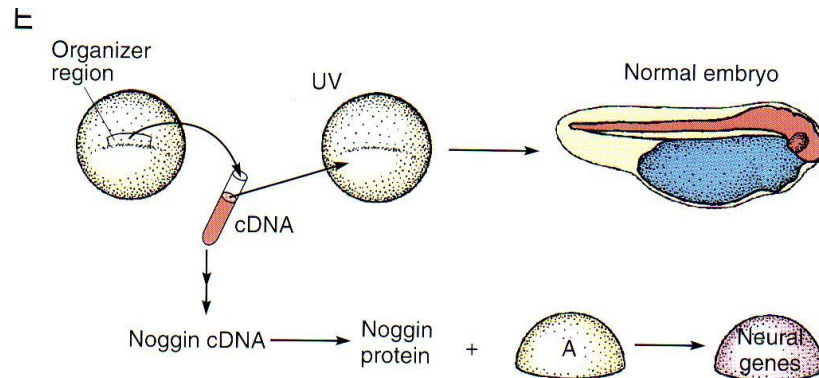
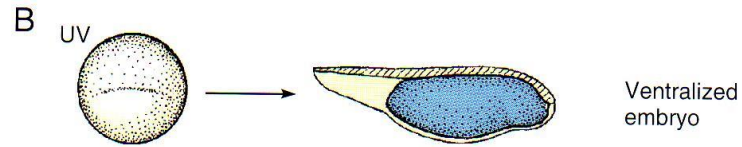
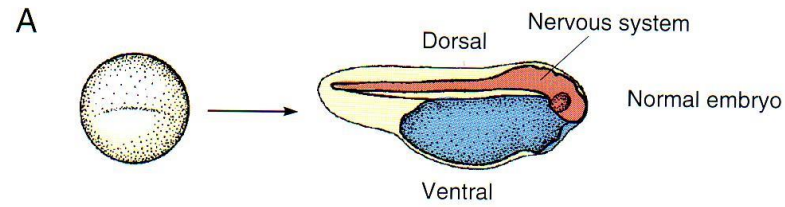
(C)



(D)



Noggin



WT

nog^{-/-}

nog/*chord*^{-/-}

A

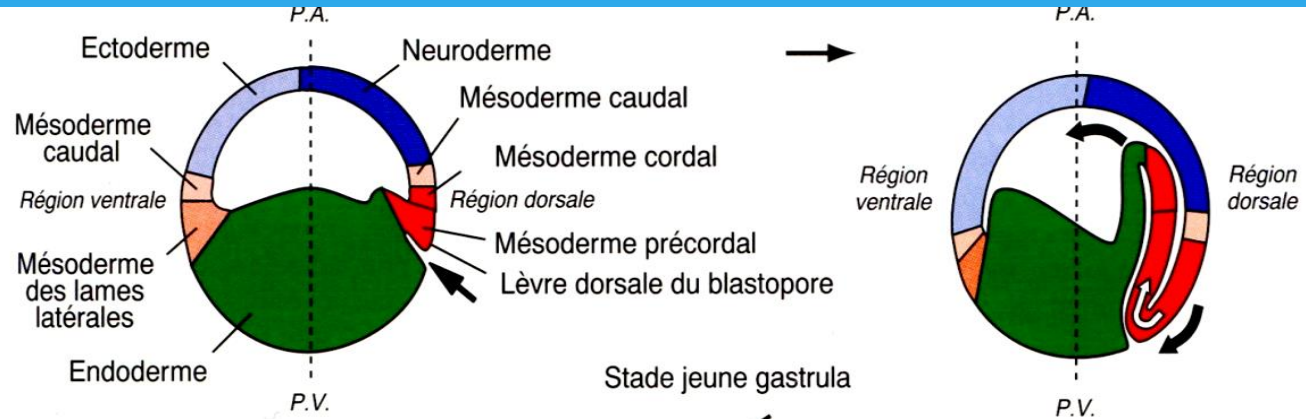


B

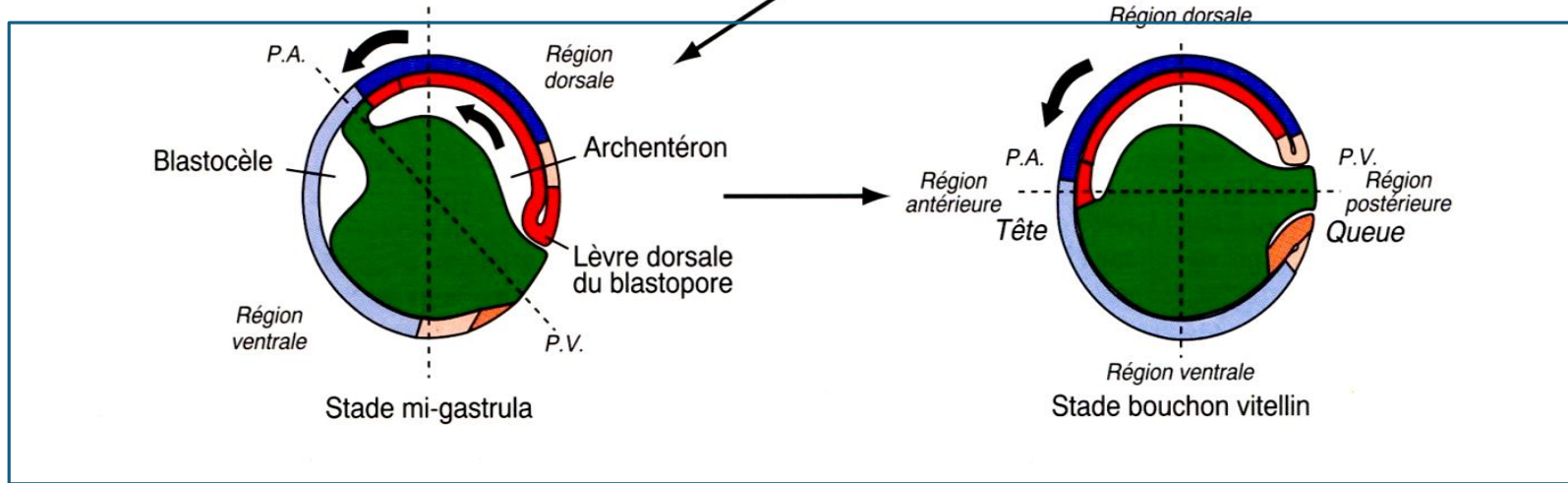


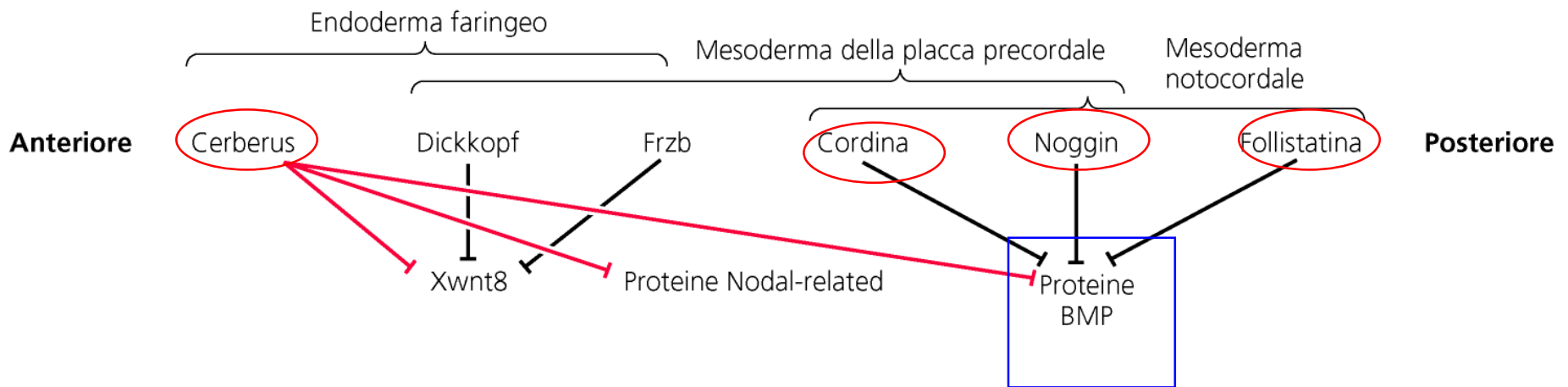
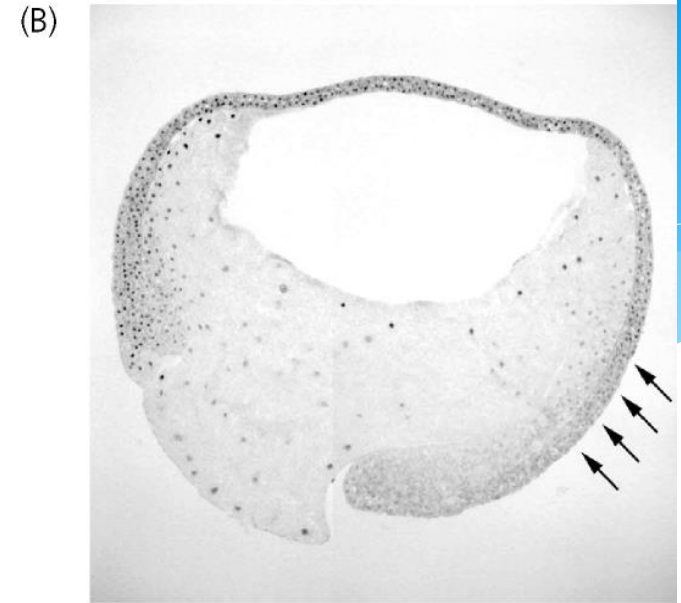
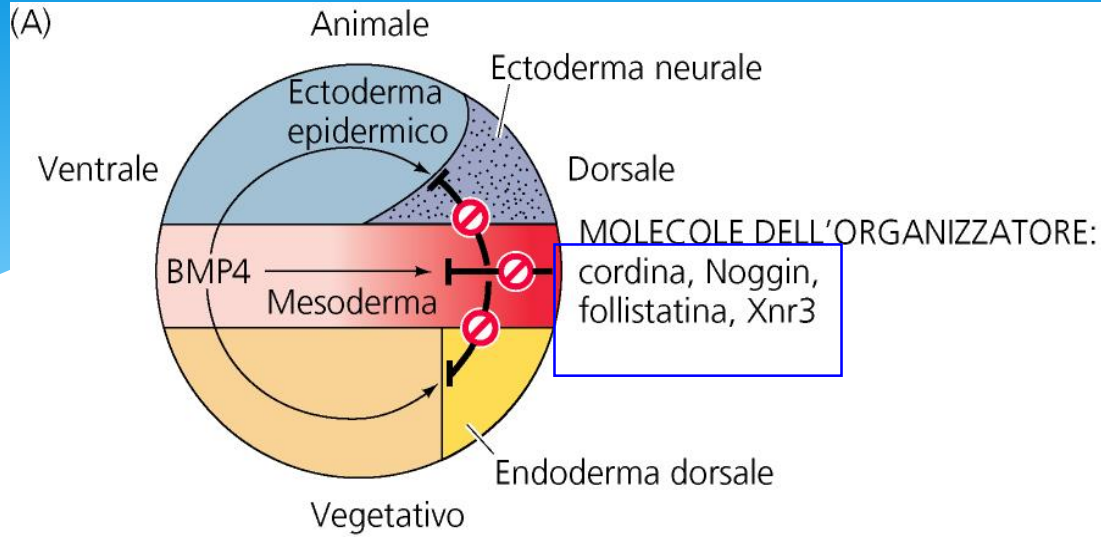
C



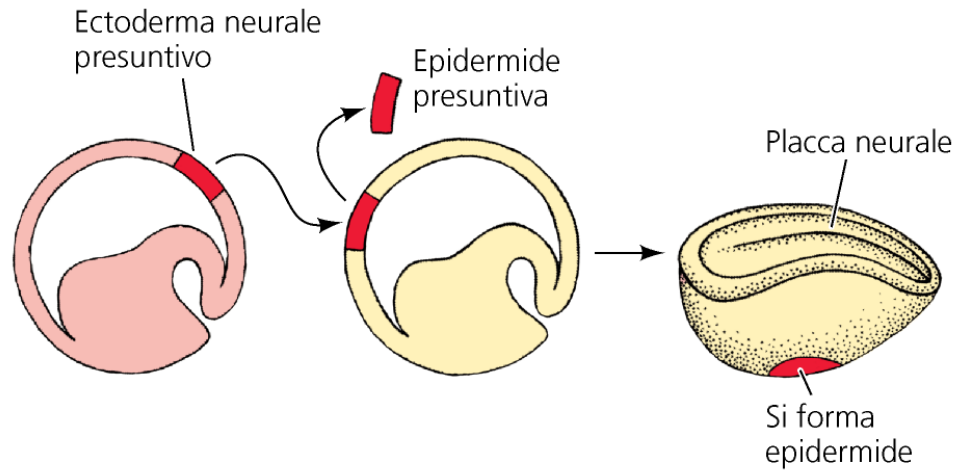


Stade jeune gastrula

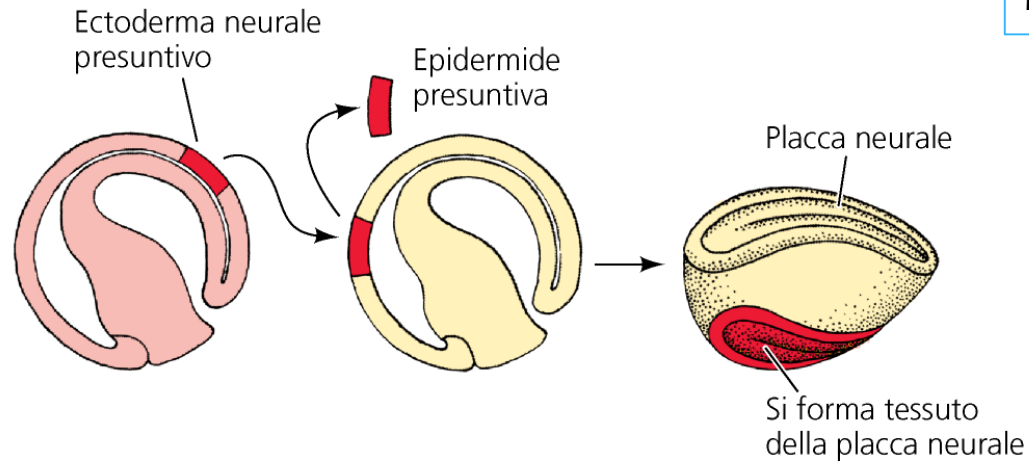




(A) TRAPIANTO IN GASTRULE INIZIALI

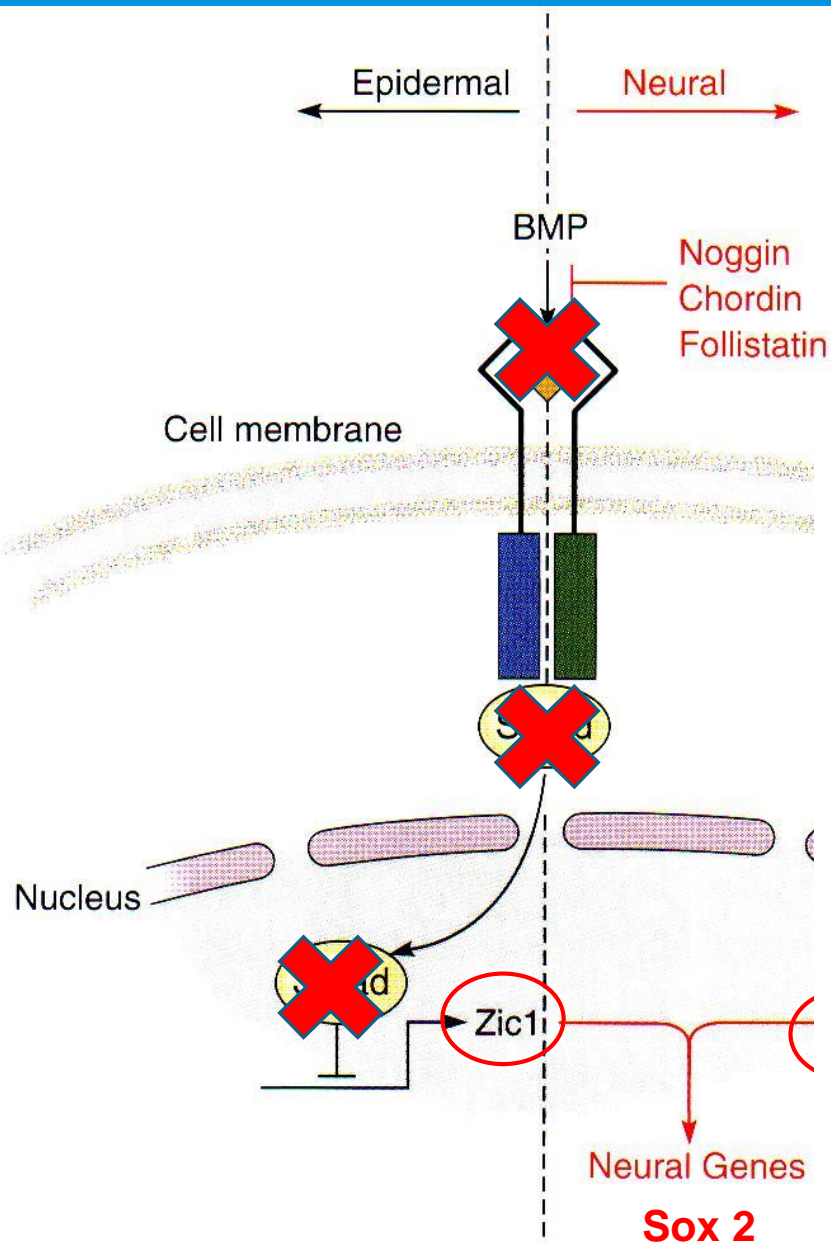


(B) TRAPIANTO IN GASTRULE AVANZATE

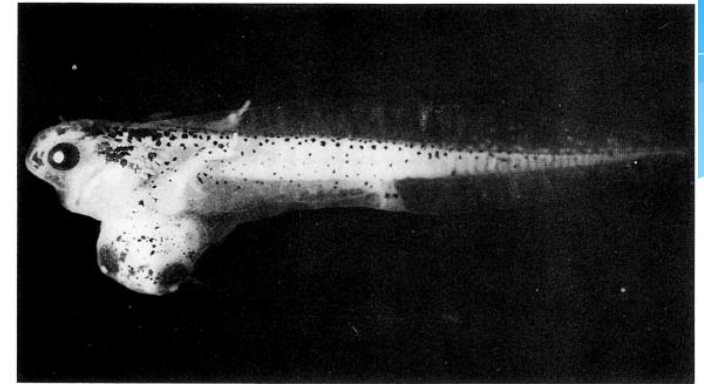
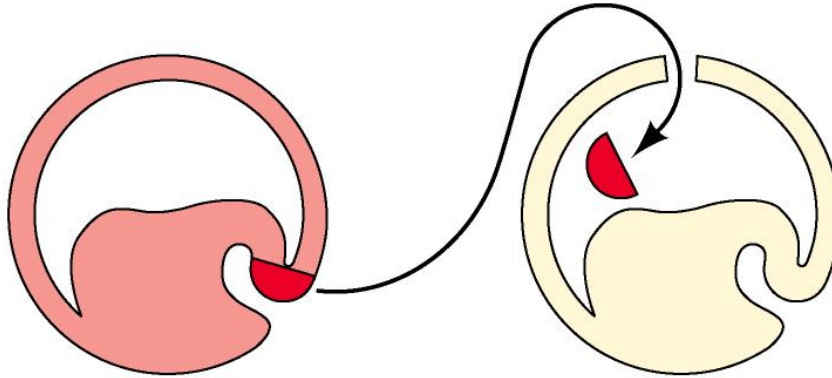


Specificazione: iniziale acquisizione del destino maturativo. **Il processo è reversibile**

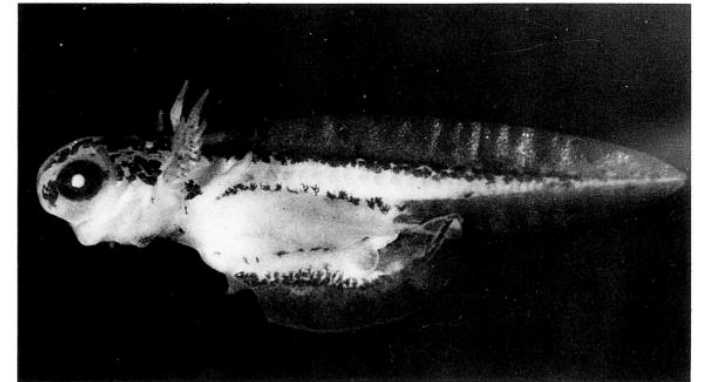
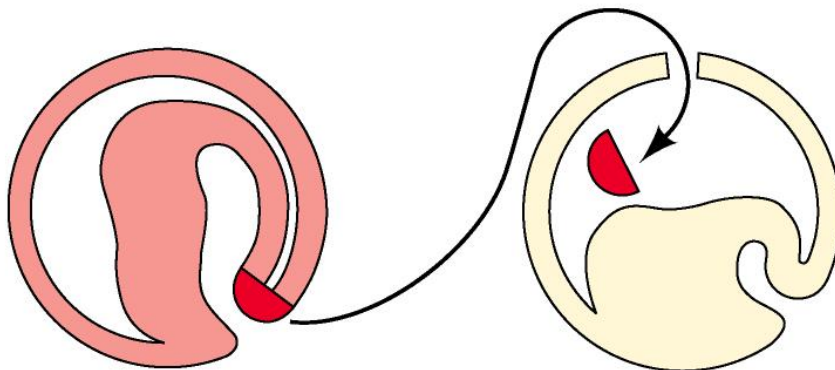
Determinazione: acquisizione del destino maturativo. **Il processo è irreversibile**



(A) Trapianto del labbro dorsale di gastrula in stadio iniziale



(B) Trapianto del labbro dorsale di gastrula in stadio avanzato



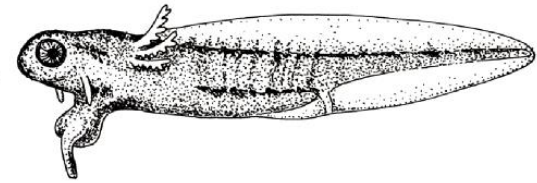
FGF posteriorizza il sistema nervoso

(A)

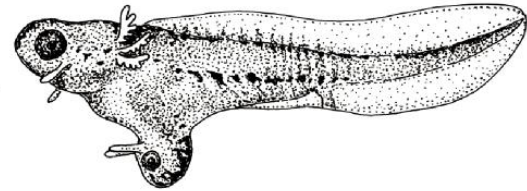
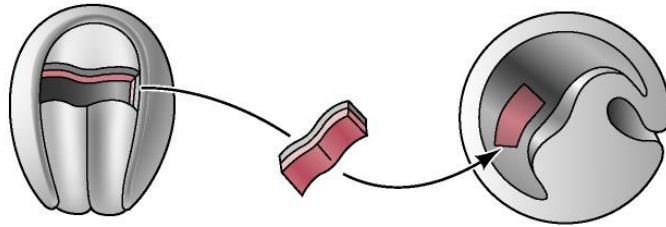


Parte del tetto
dell'archenteron trapiantata
in una gastrula iniziale

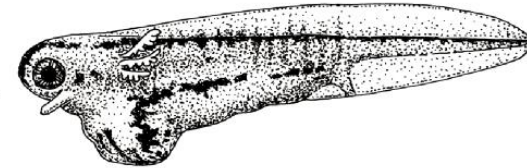
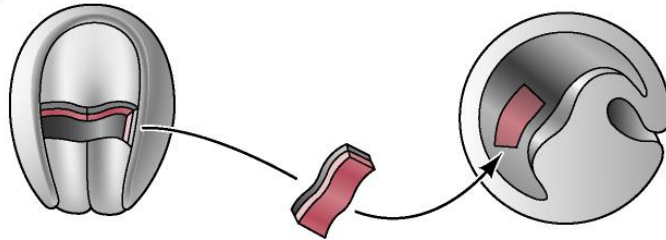
Animale
risultante



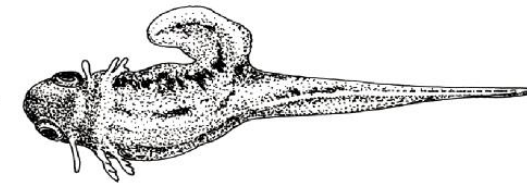
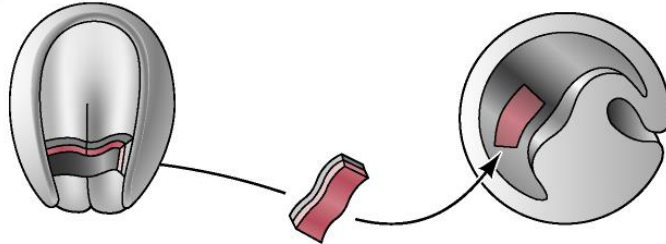
(B)

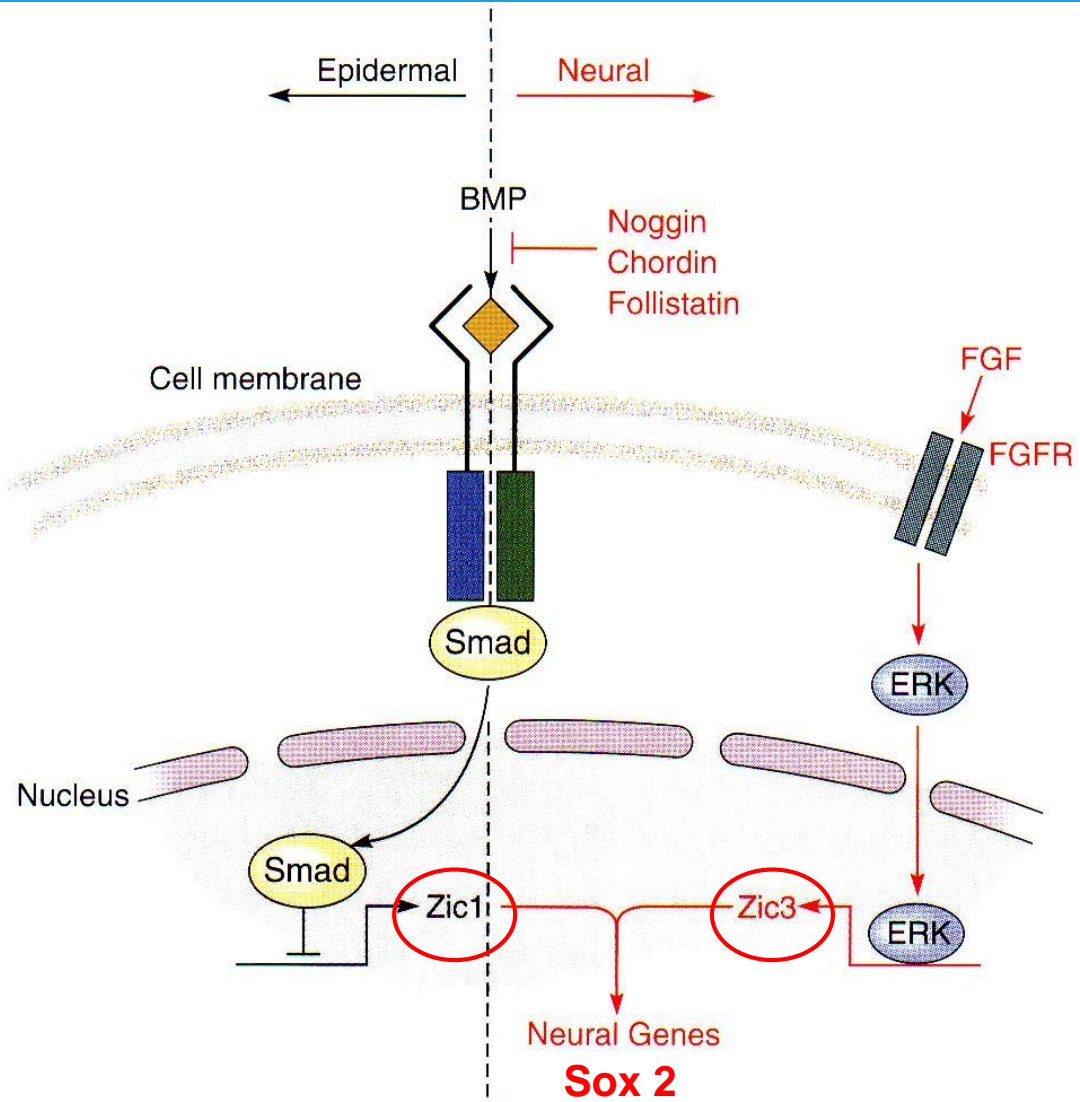


(C)



(D)





Sviluppo del Sistema Nervoso

- **Specificazione /Induzione**
- Proliferaazione
- Determinazione del fenotipo cellulare



Neuroni

Glia

- Migrazione
- Differenziamento

Neurone

Crescita assonale

Formazione sinapsi

