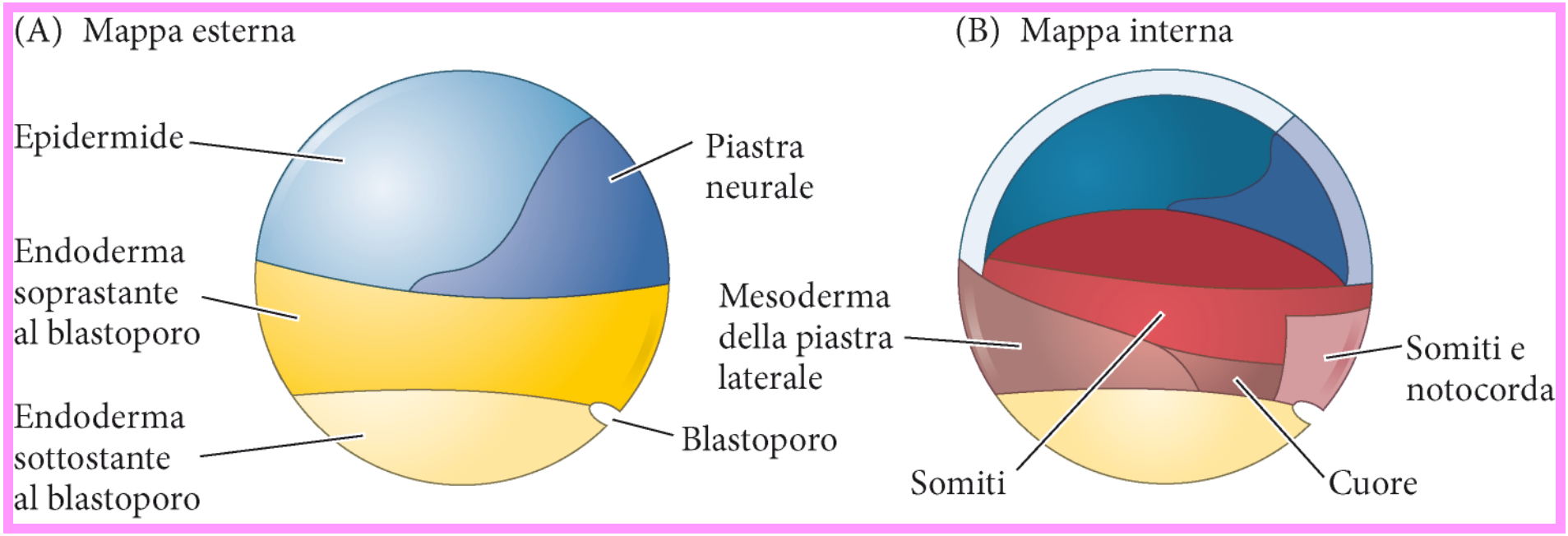
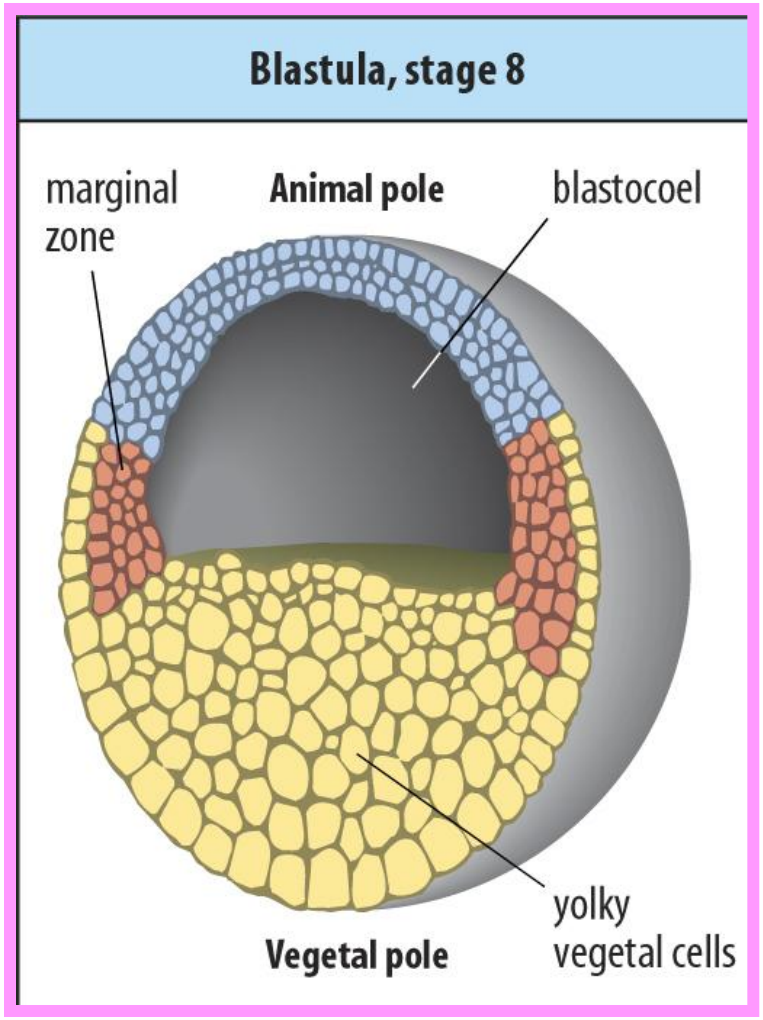
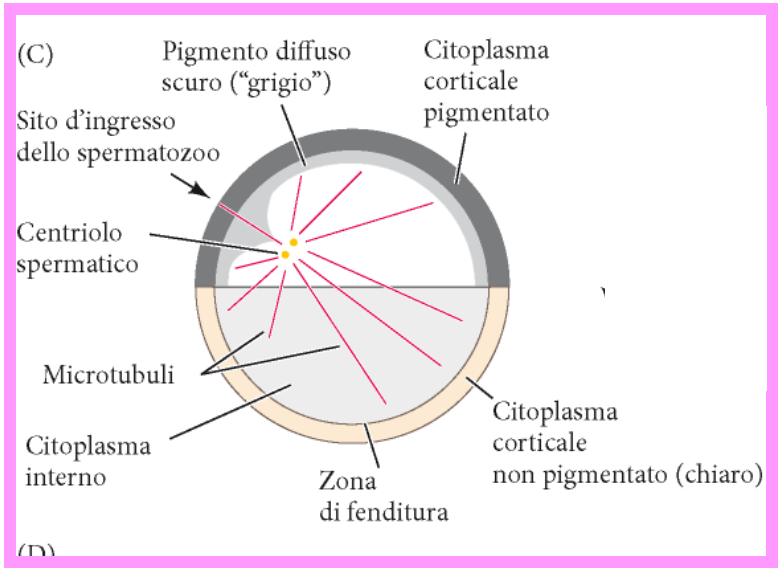
Mappa dei territori presuntivi: anfibi

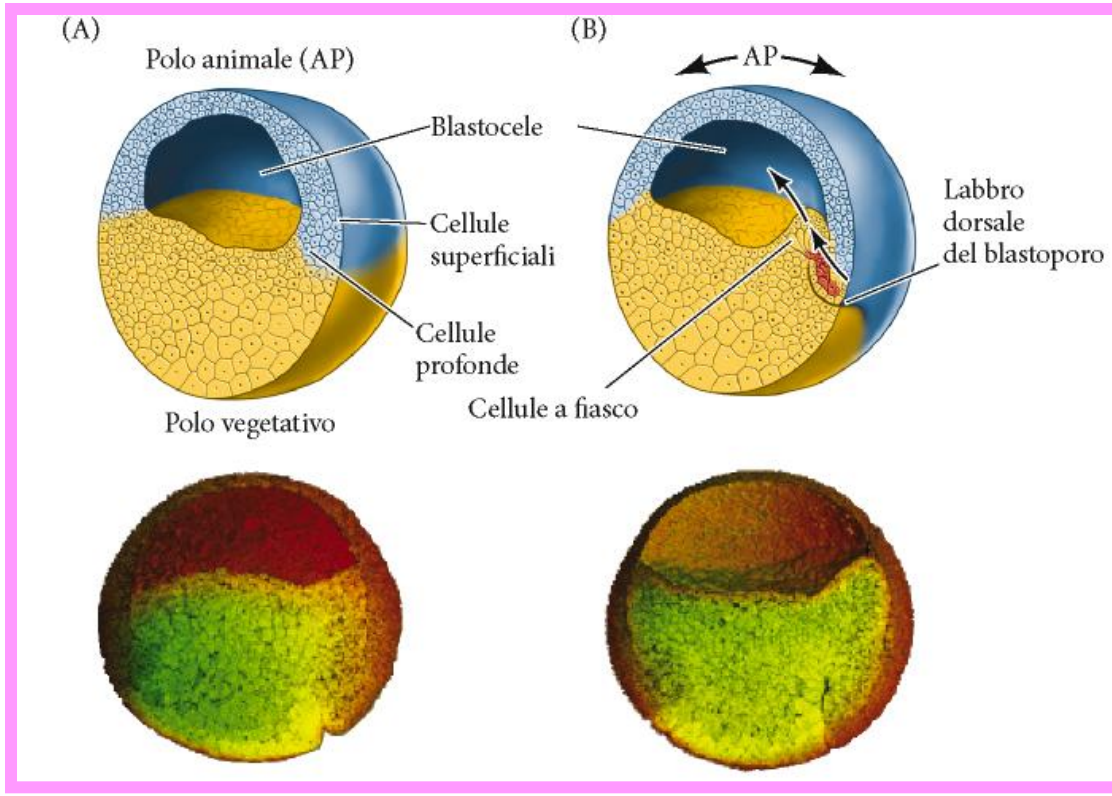


Gastrulazione anfibi

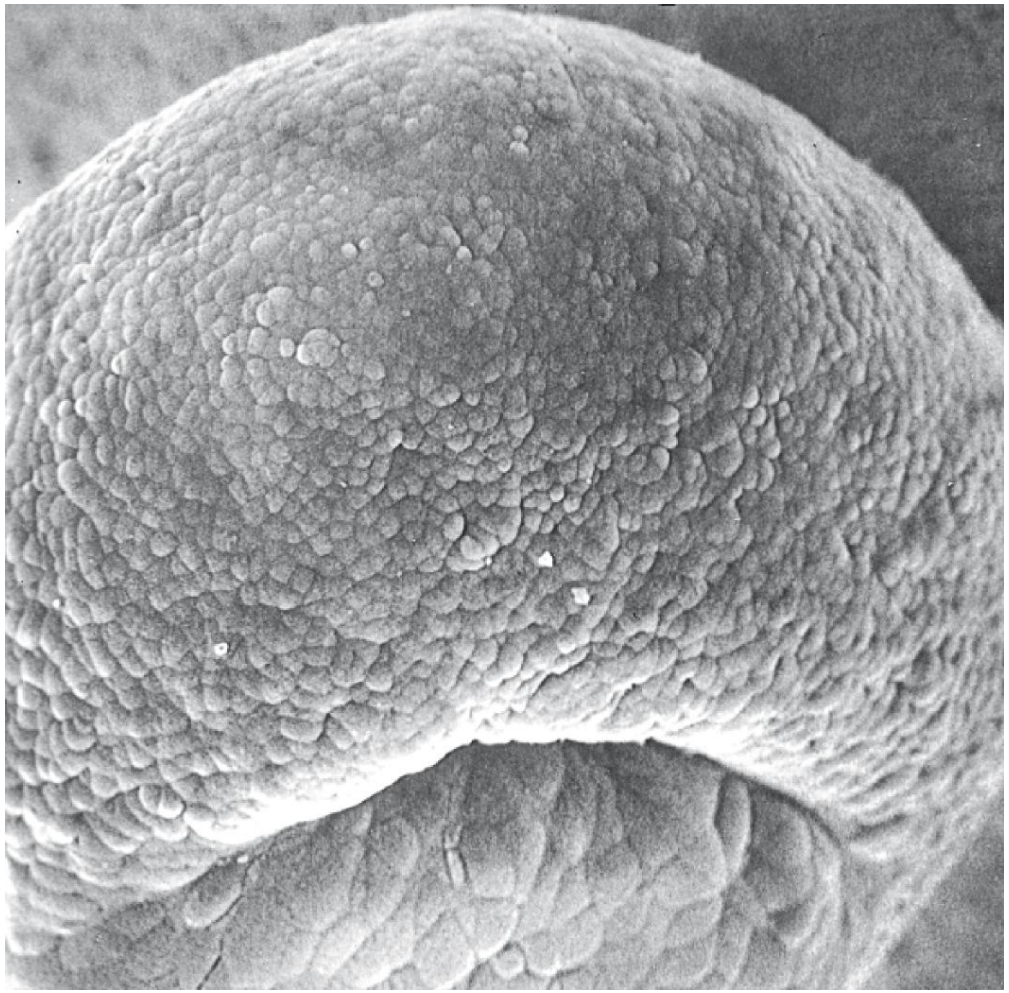


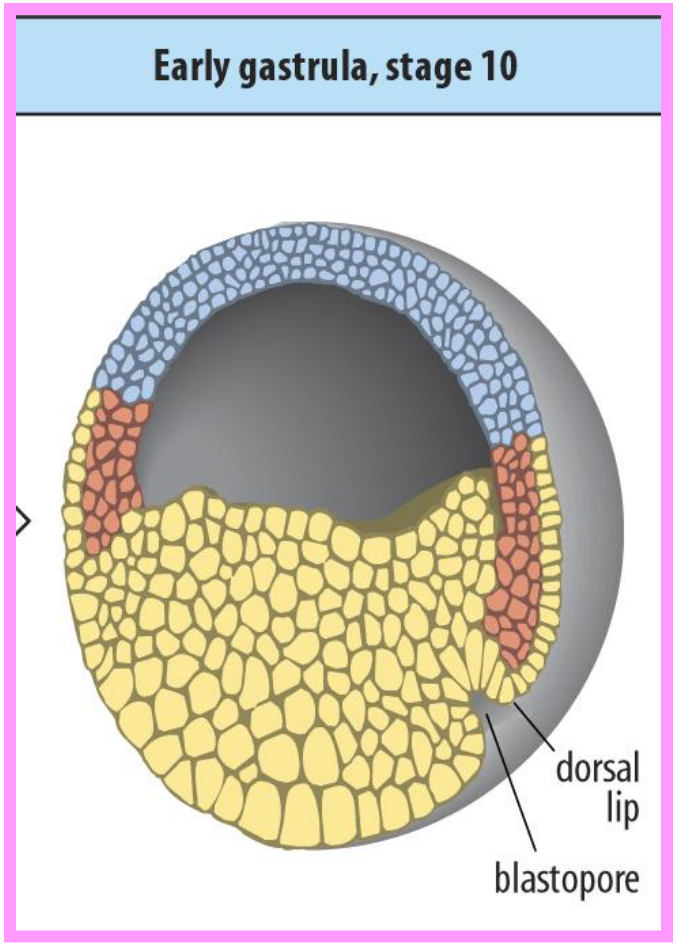
Gastrulazione anfibi

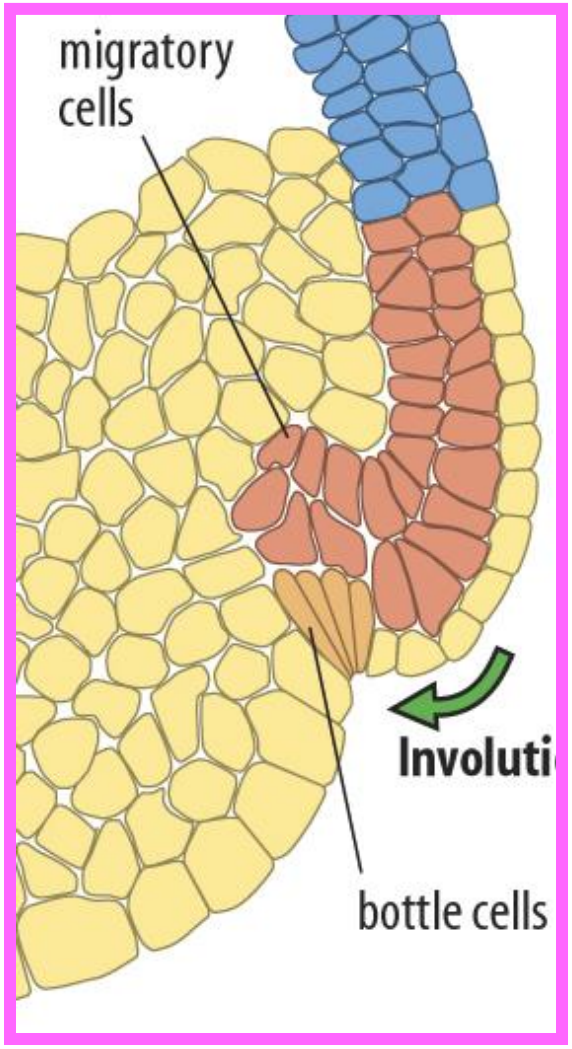




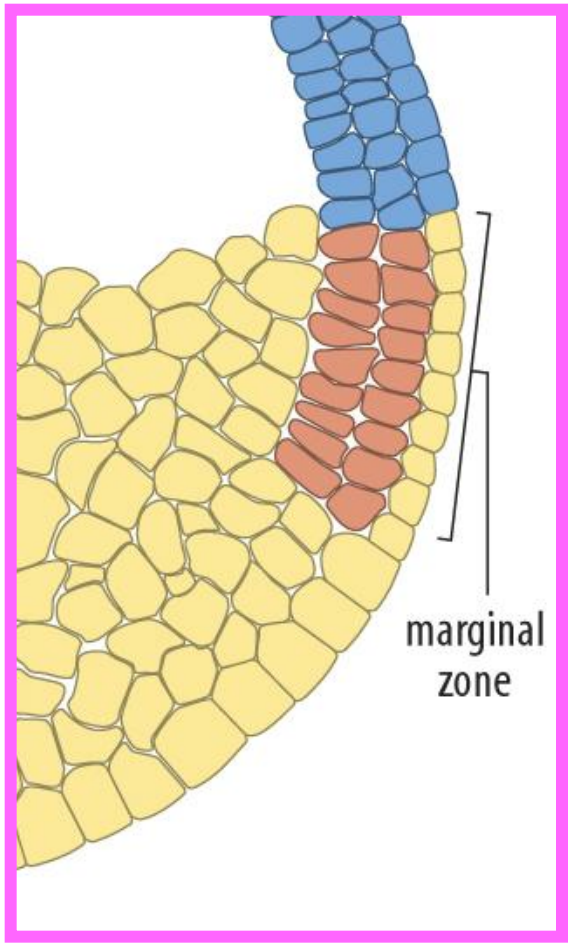
Le cellule si invaginano formando un blastoporo.

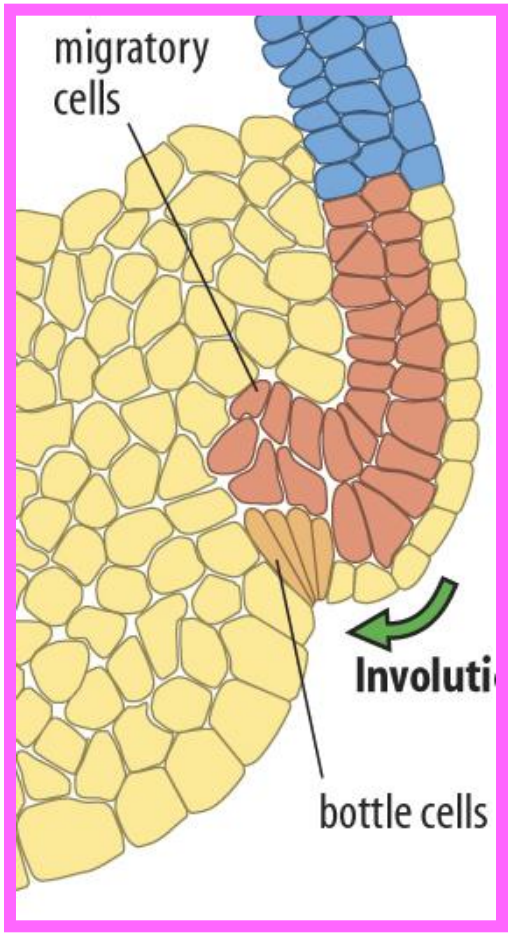



Early gastrula, stage 10
dorsal lip
blastopore

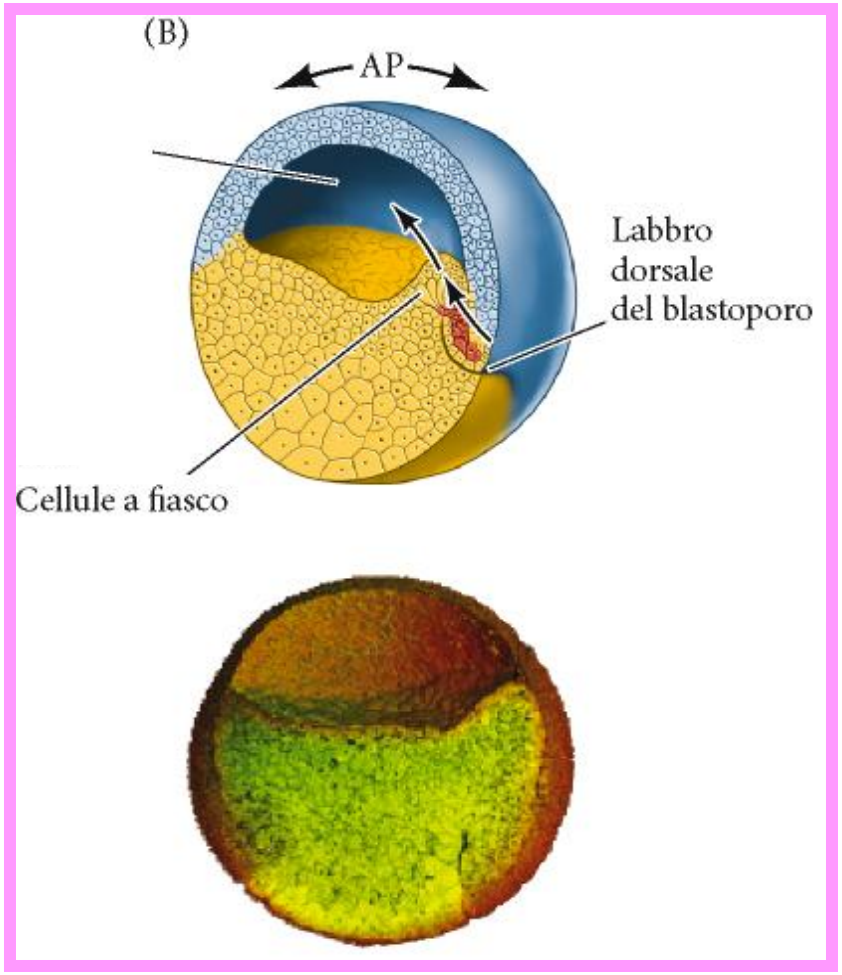

migratory cells
Involuti
bottle cells

La gastrulazione inizia nella zona marginale

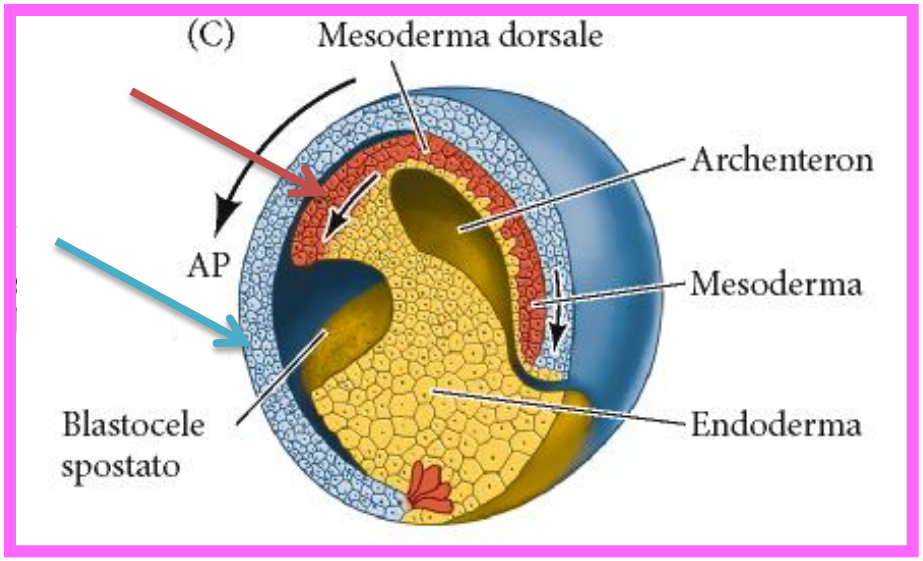


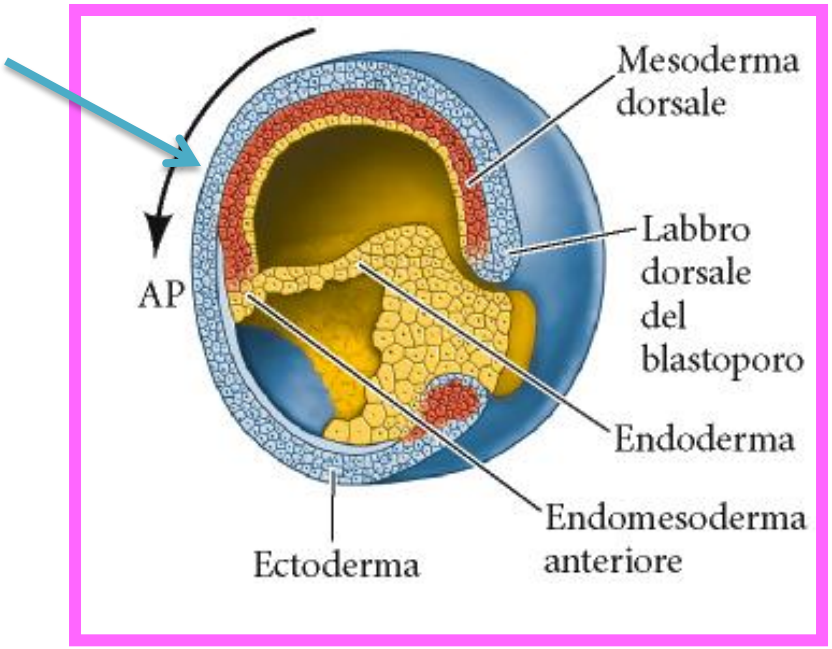


La gastrulazione inizia nella zona marginale

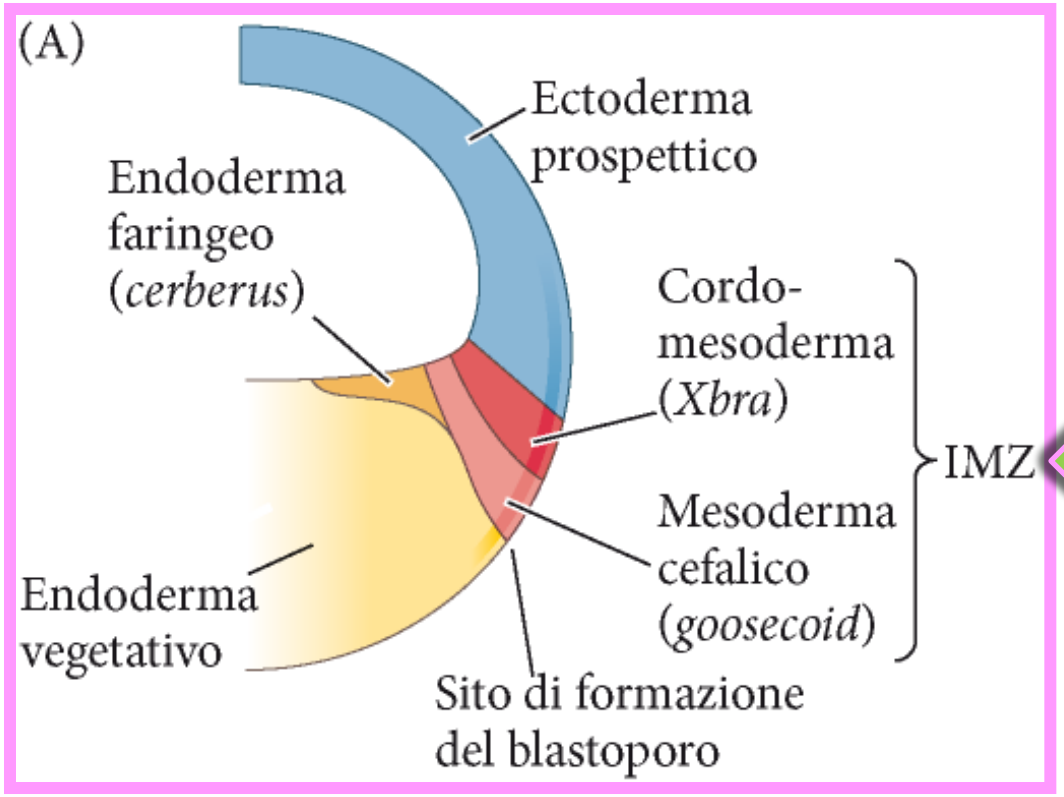


La gastrulazione inizia nella zona marginale

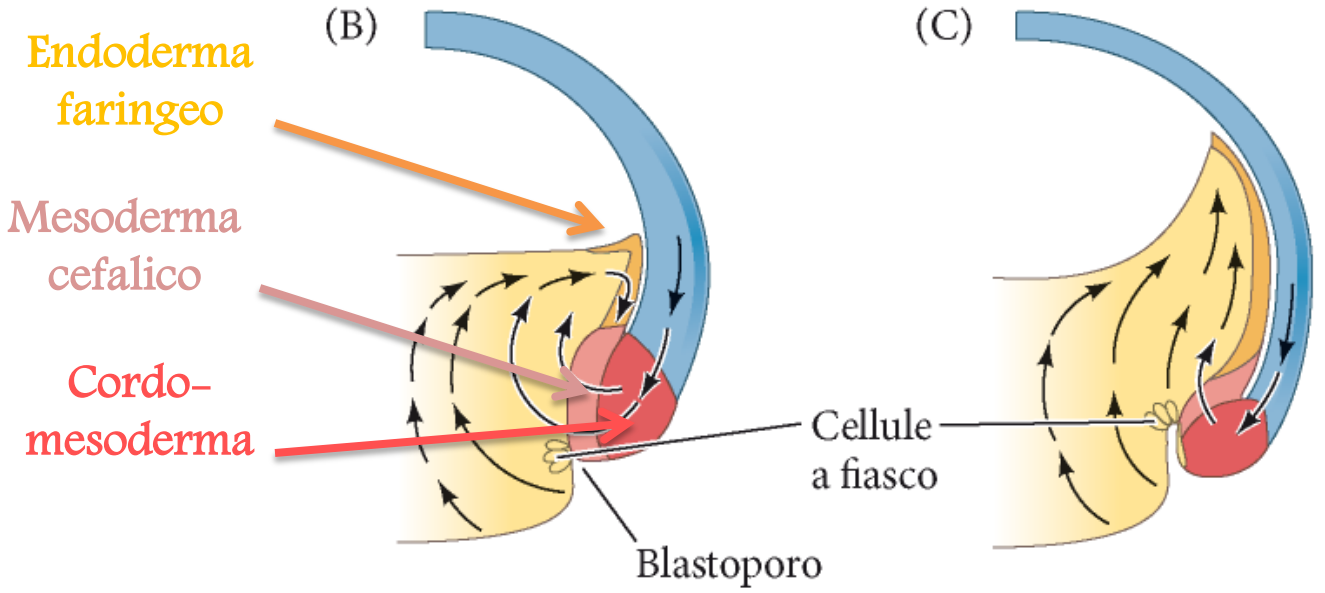




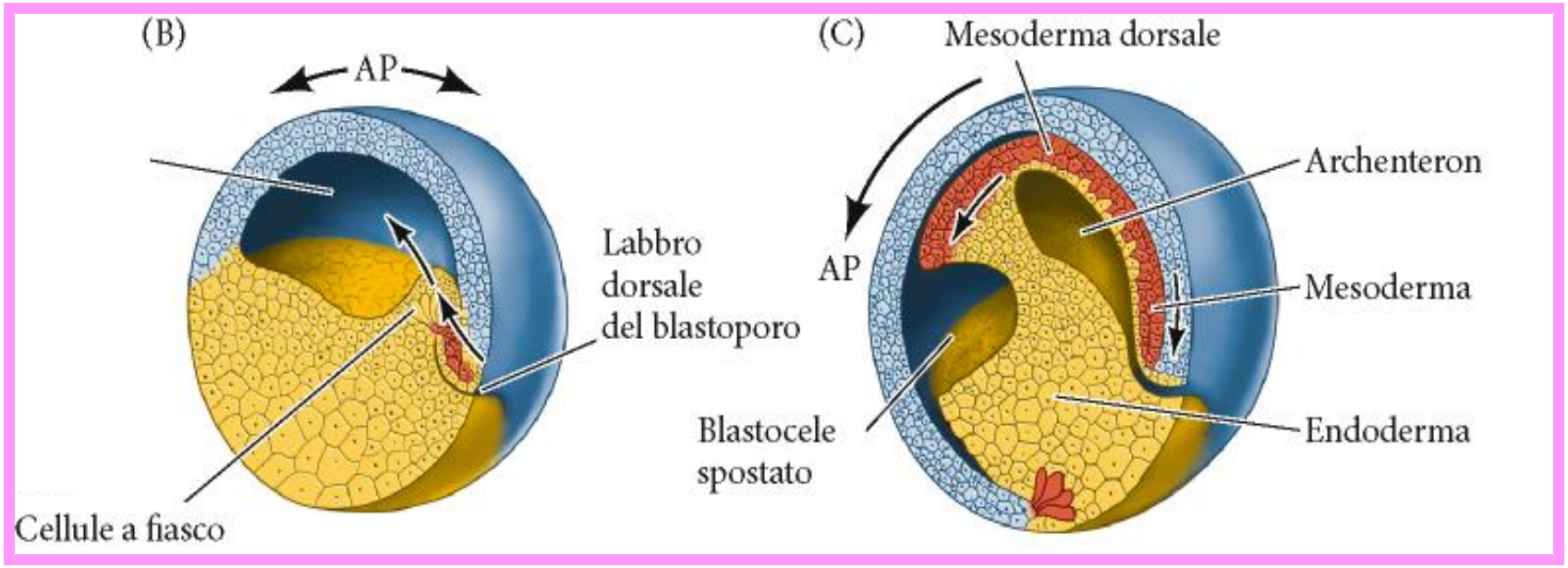
Embolia attraverso il labbro dorsale



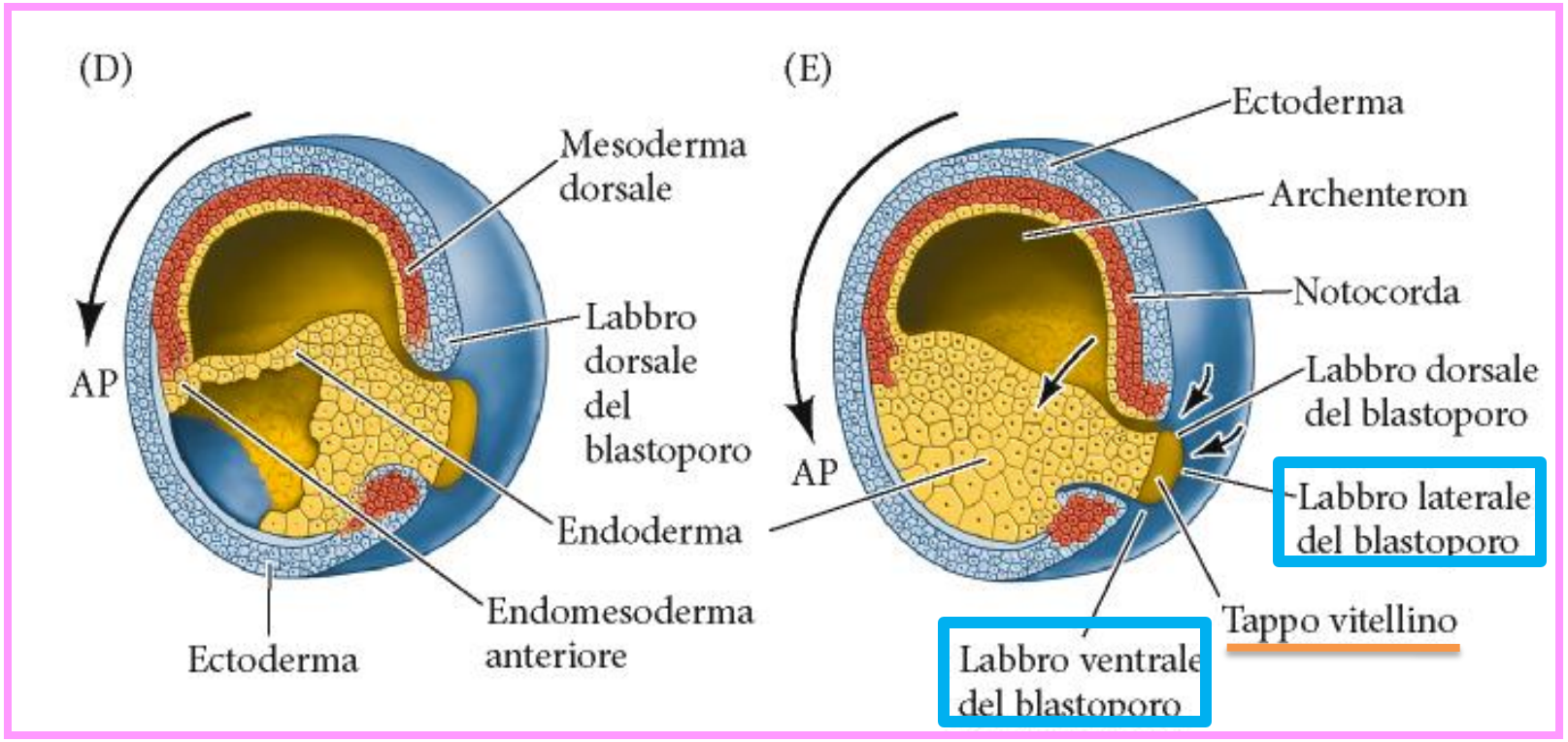
Embolia attraverso il labbro dorsale



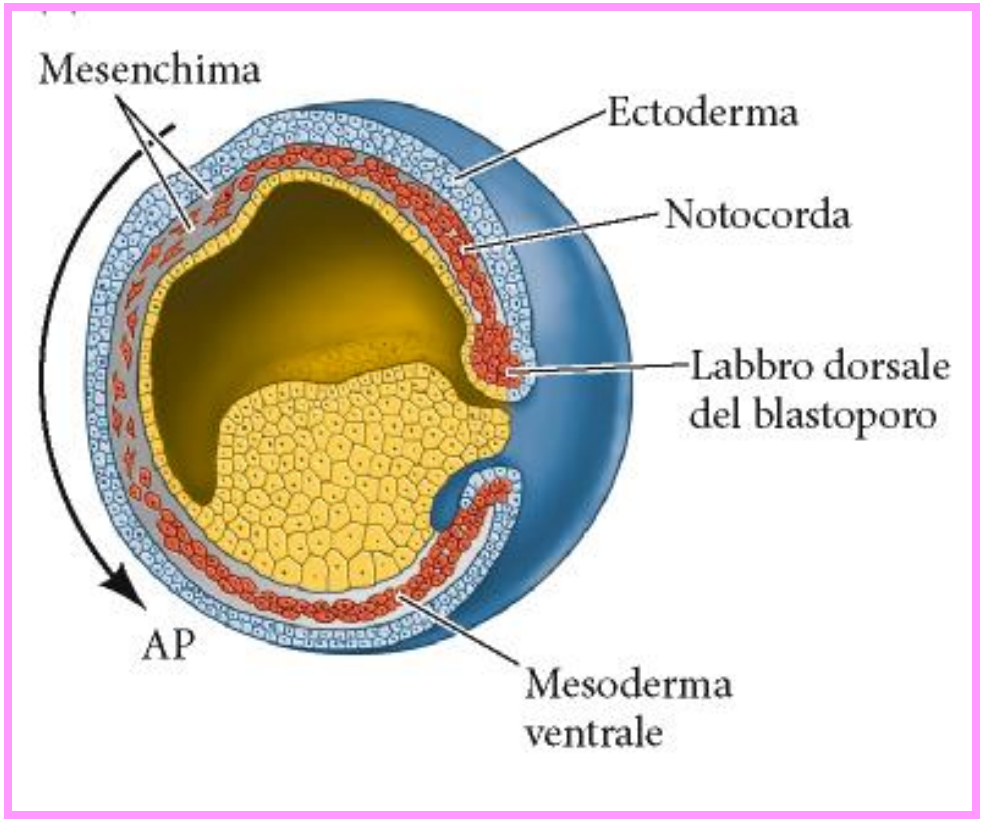
Embolia attraverso il labbro dorsale



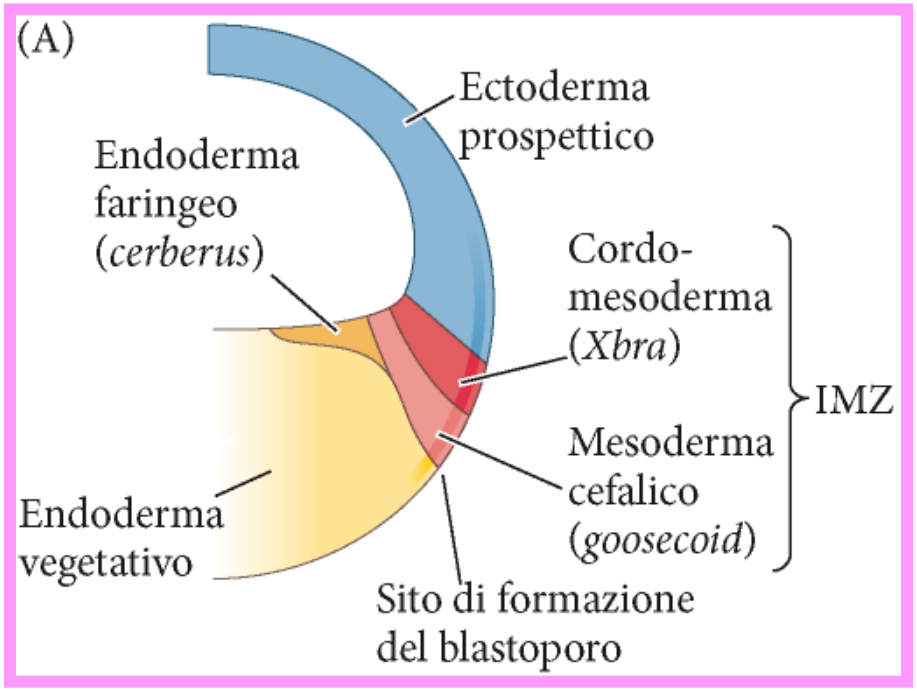
Embolia attraverso il labbro dorsale

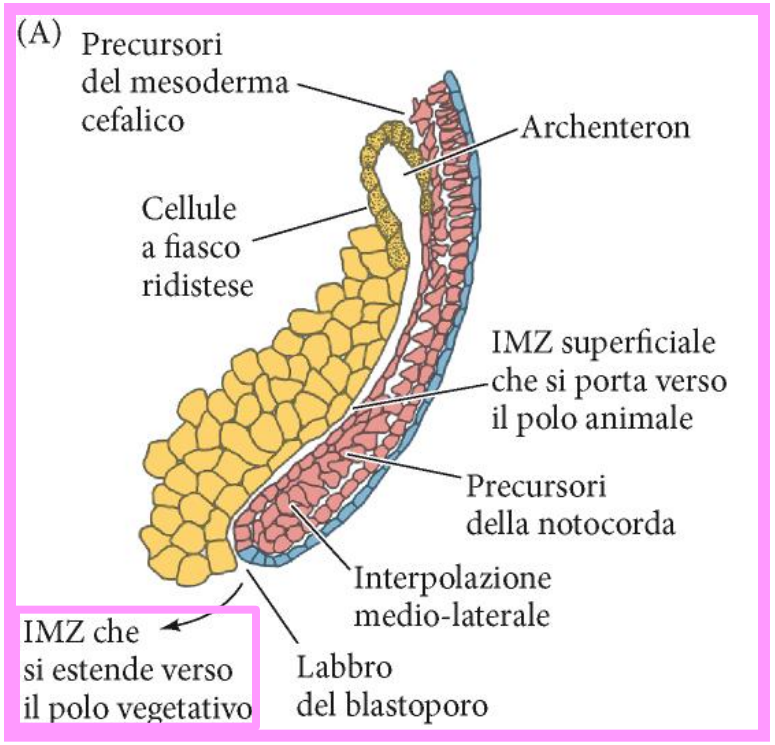


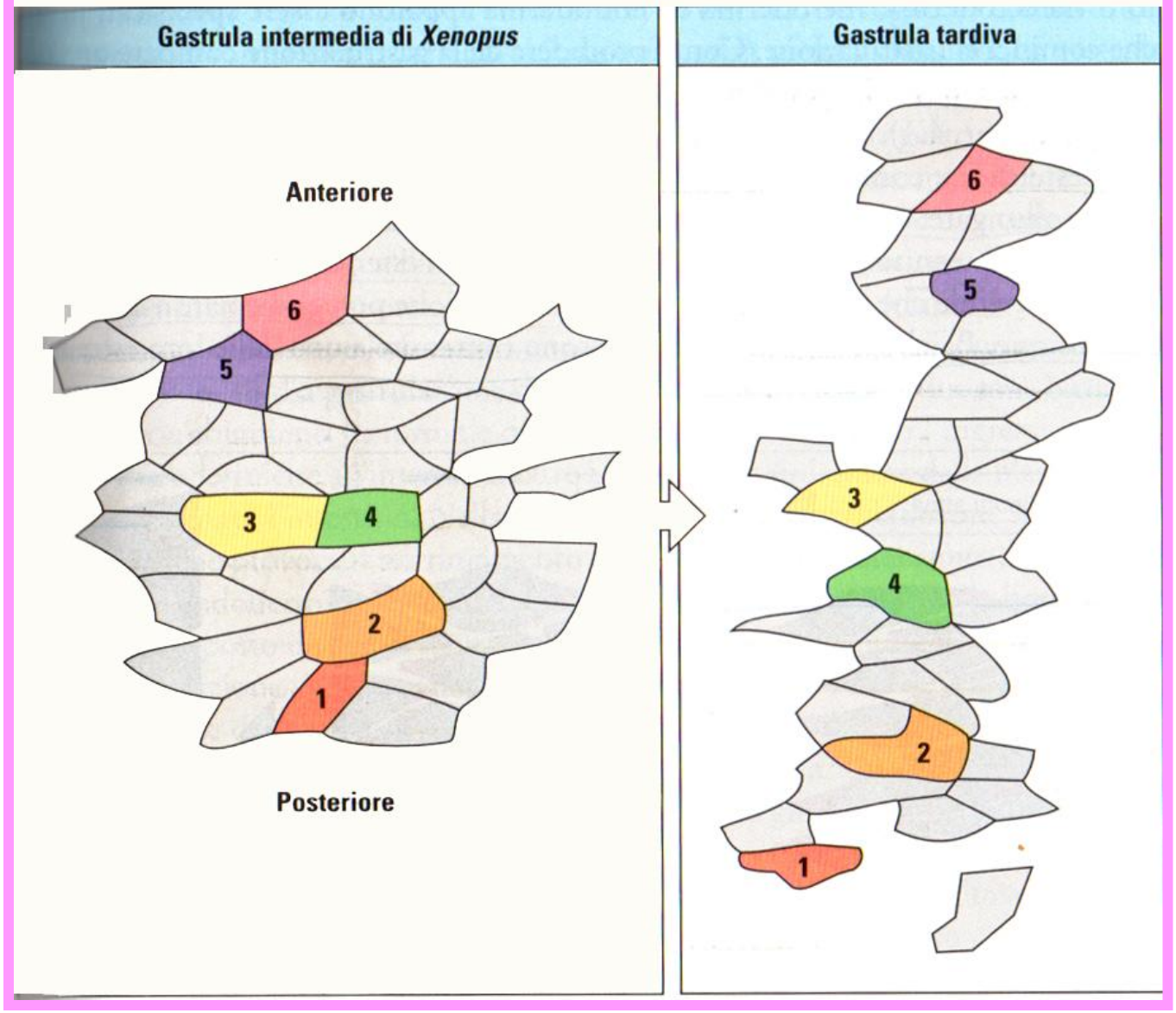
Embolia attraverso il labbro dorsale



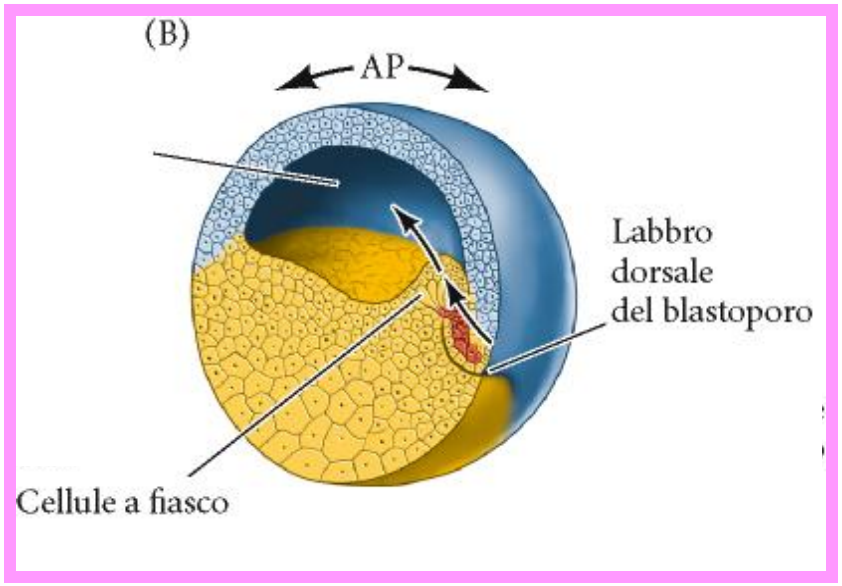
Estensione convergente del mesoderma

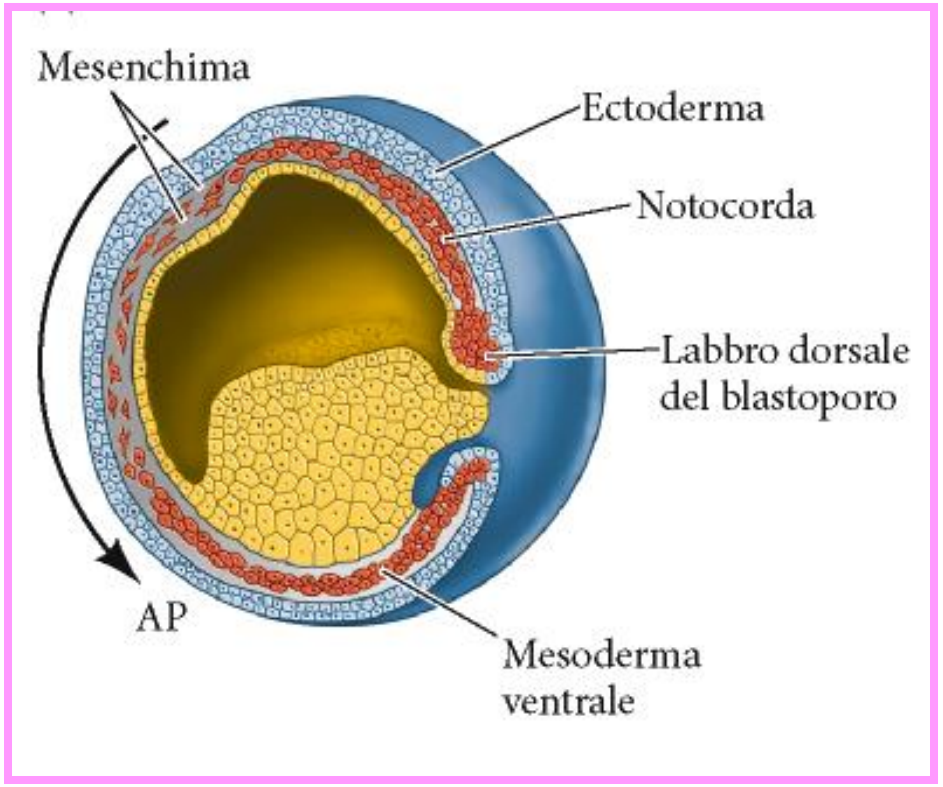




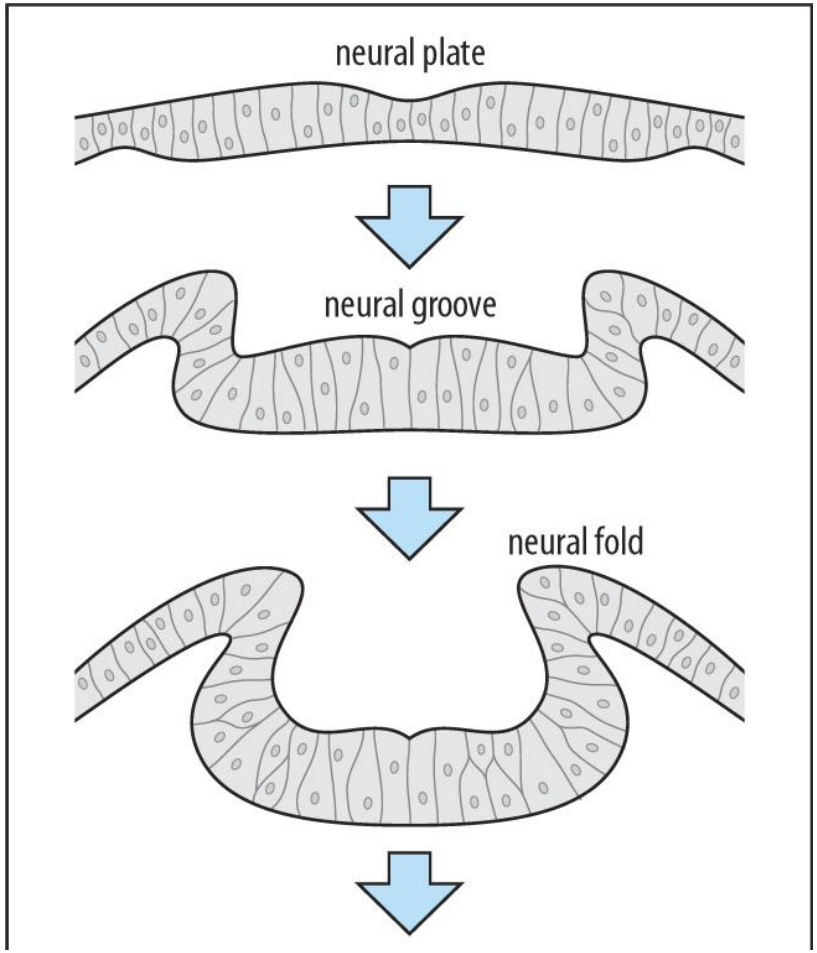

Gastrula intermedia di *Xenopus*
Gastrula tardiva
Anteriore
6
5
3
4
2
1
Posteriore
6
5
3
4
2
1

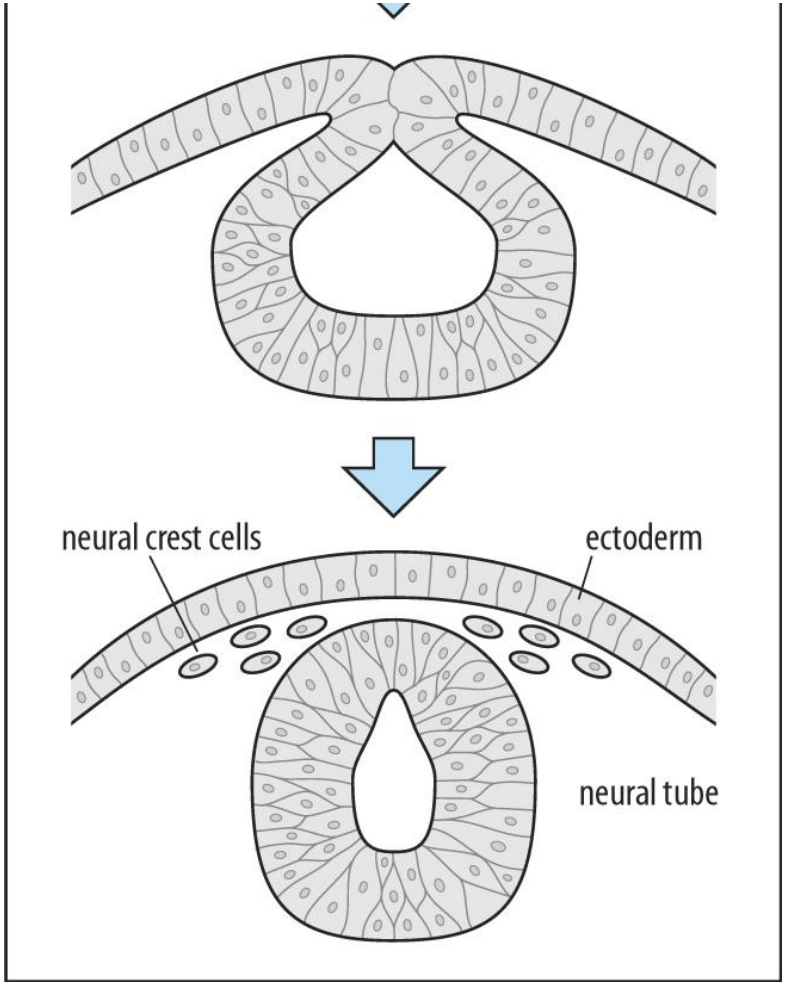
Epibolia dell'ectoderma

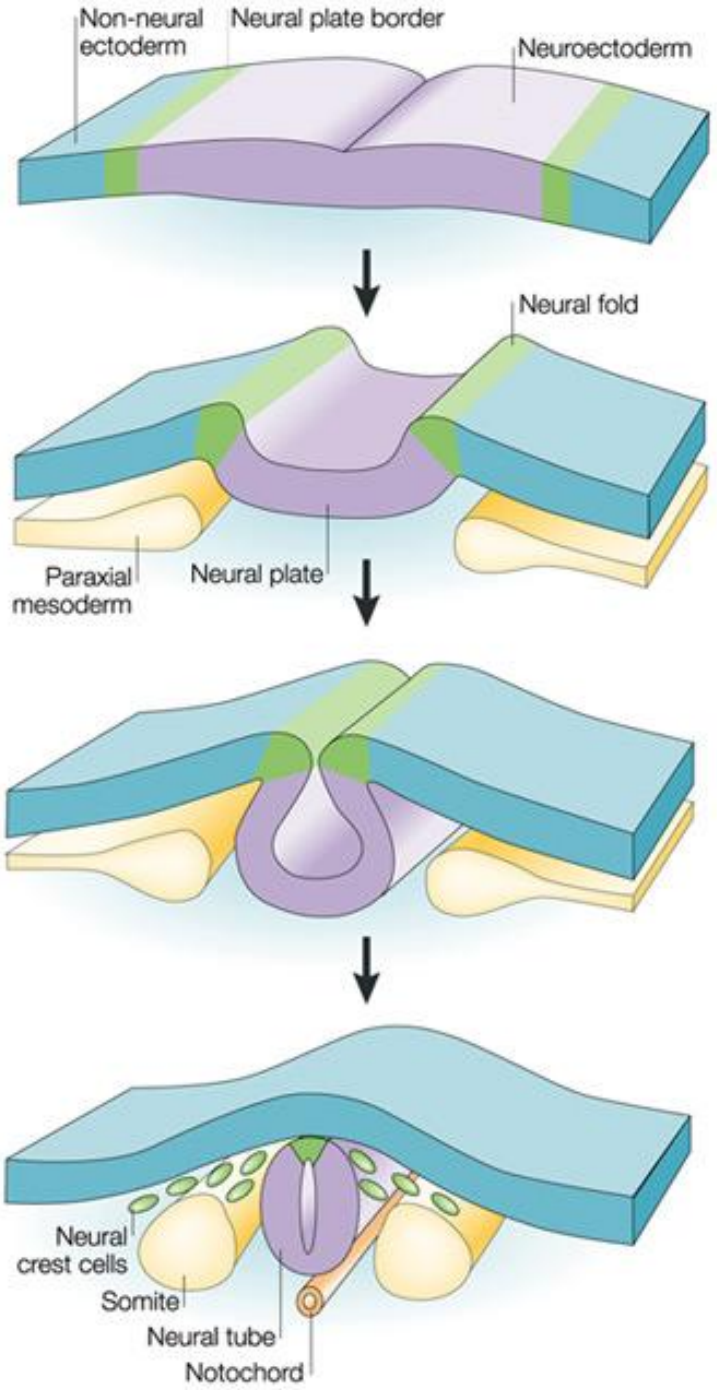


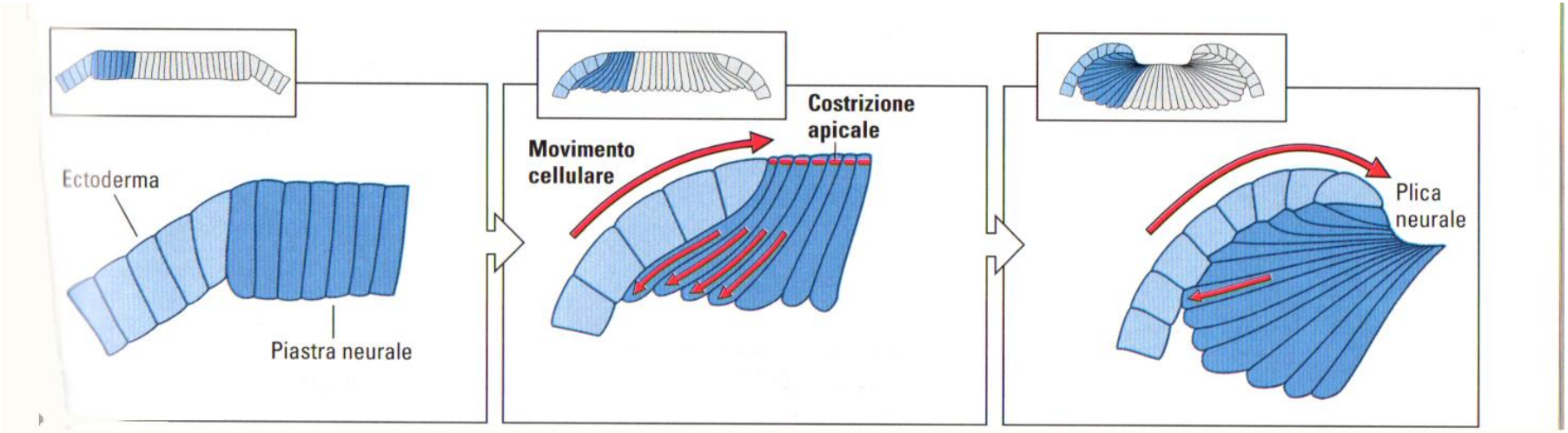


Neurulazione in Xenopus

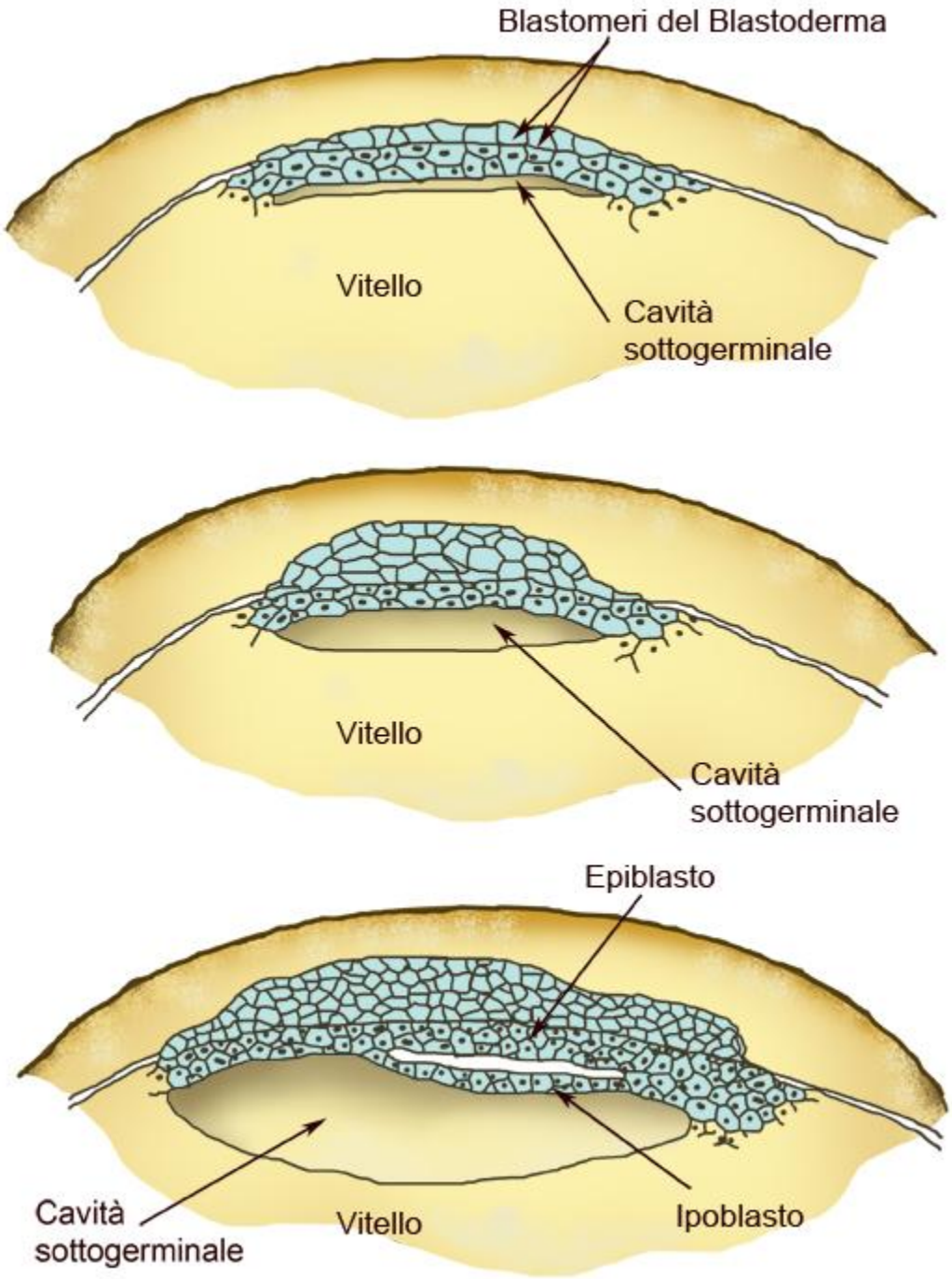




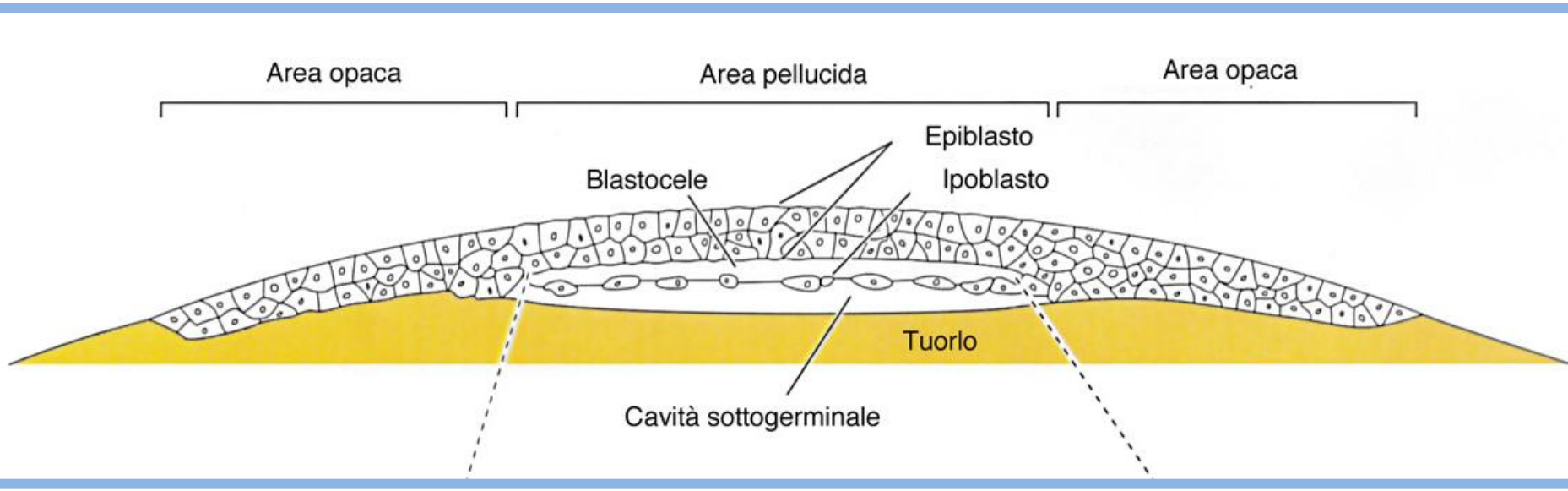

Non-neural ectoderm
Neural plate border
Neuroectoderm
Neural fold
Paraxial mesoderm
Neural plate
Neural crest cells
Somite
Neural tube
Notochord

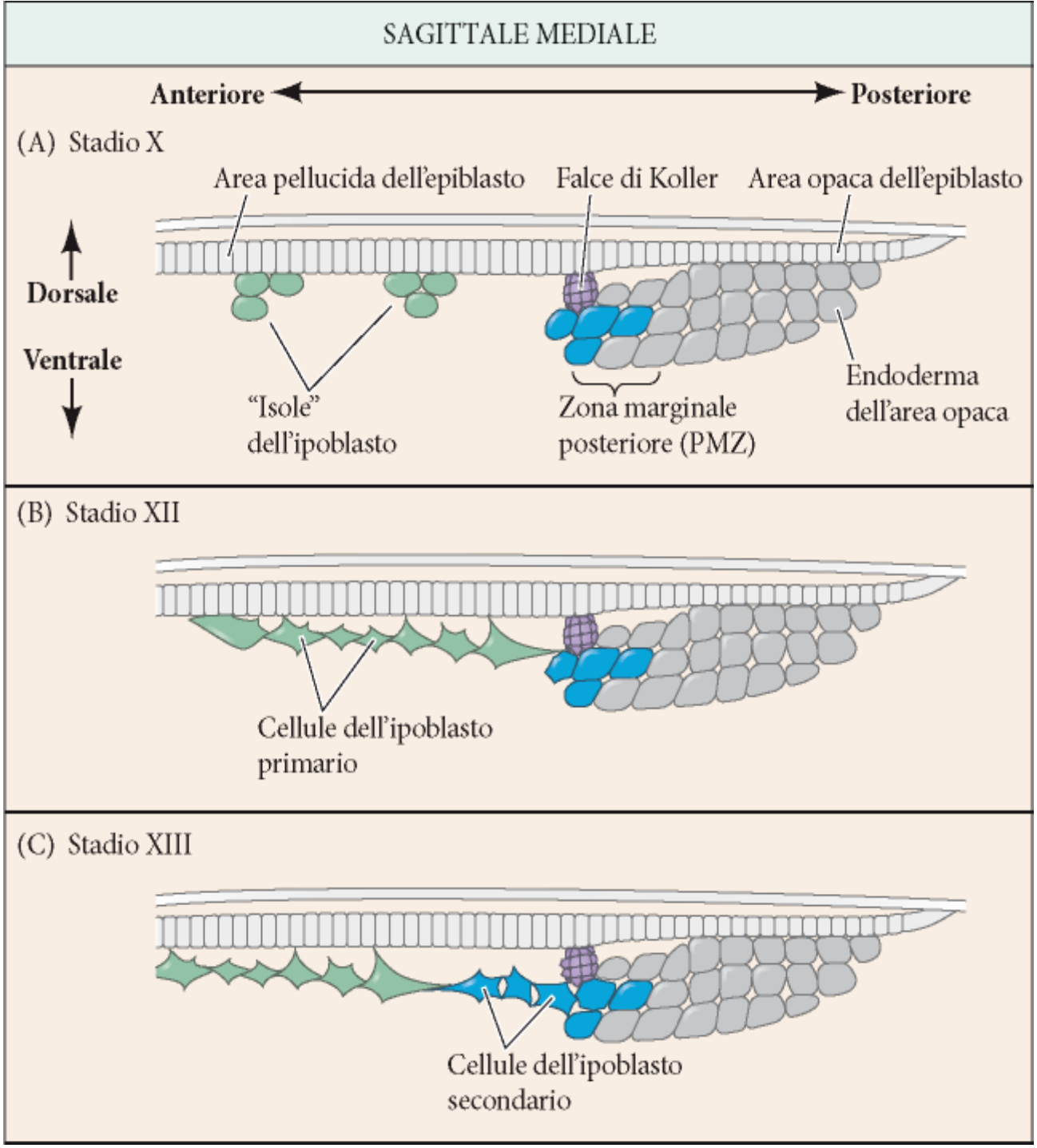

Ectoderma
Piastra neurale
Movimento cellulare
Costrizione apicale
Plica neurale

Uccelli

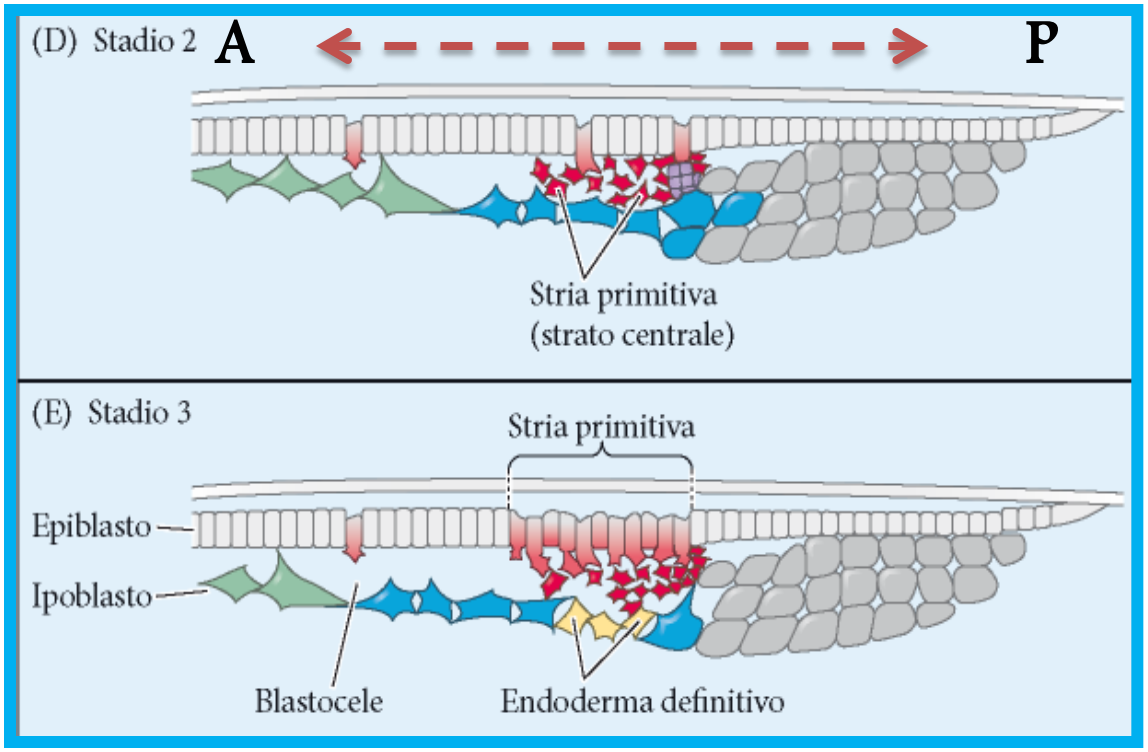

Blastomeri del Blastoderma
Vitello
Cavità sottogerminale
Vitello
Cavità sottogerminale
Epiblasto
Cavità sottogerminale
Vitello
Ipoblasto

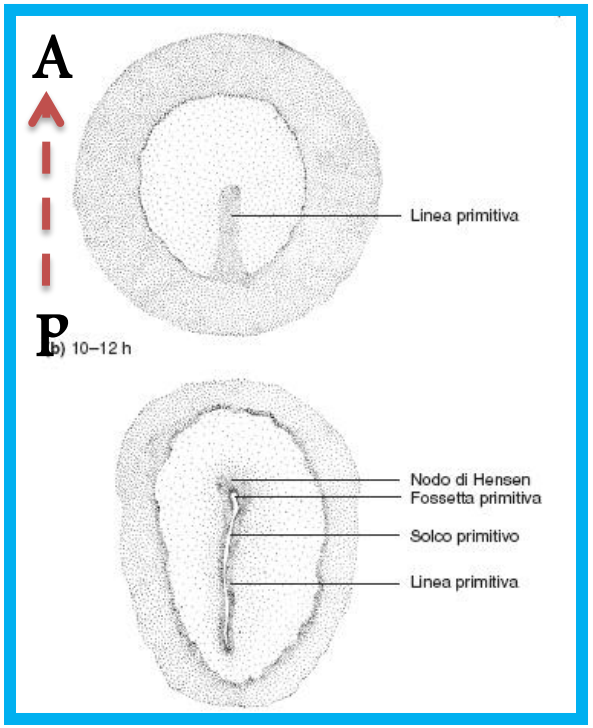
Gastrulazione uccelli



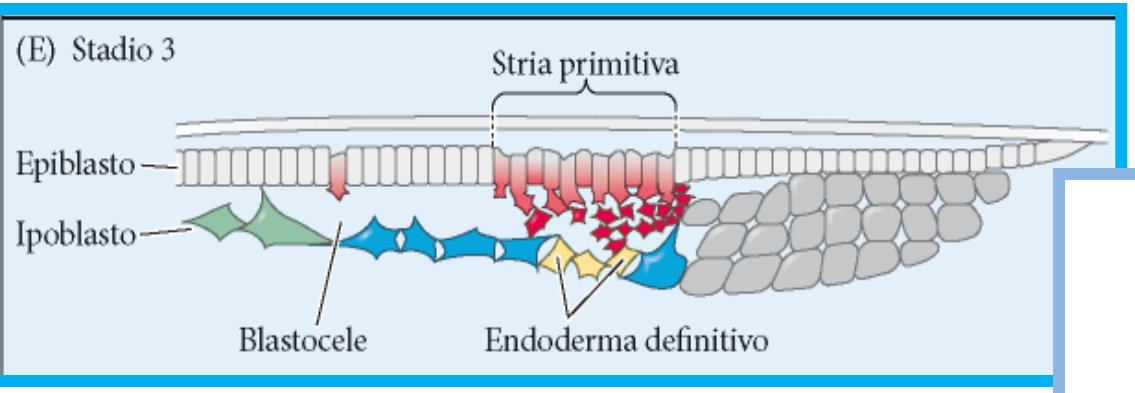

SAGITTALE MEDIALE
Anteriore
Posteriore
(A) Stadio X
Area pellucida dell'epiblasto
Falce di Koller
Area opaca dell'epiblasto
Dorsale
Ventrale
"Isole" dell'ipoblasto
Zona marginale posteriore (PMZ)
Endoderma dell'area opaca
(B) Stadio XII
Cellule dell'ipoblasto primario
(C) Stadio XIII
Cellule dell'ipoblasto secondario

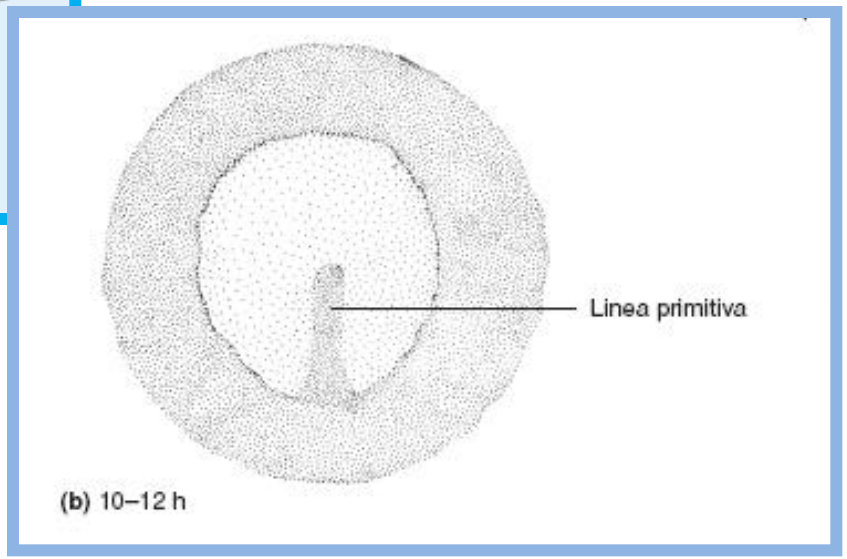
Gastrulazione uccelli: la stria primitiva



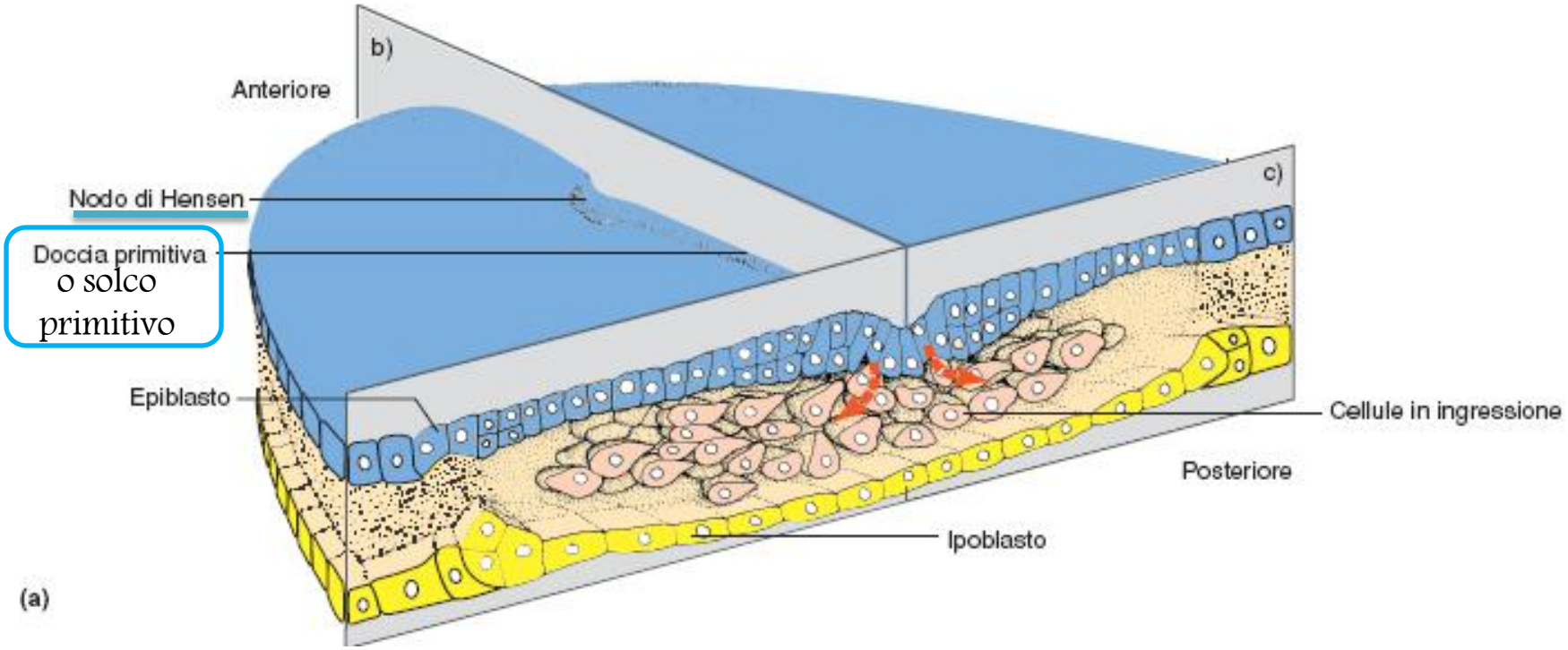


Gastrulazione uccelli: la stria primitiva

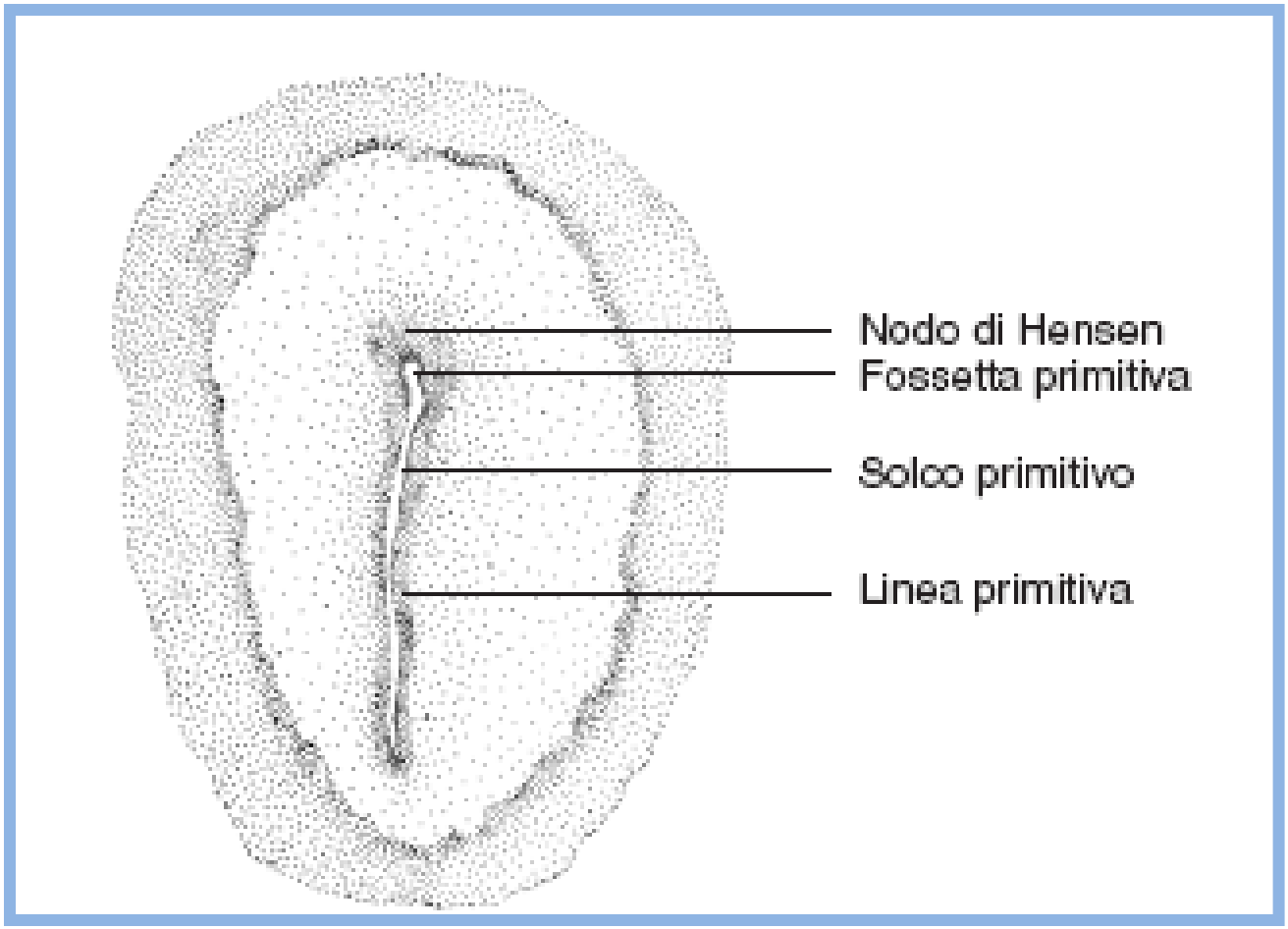




Gastrulazione uccelli: la stria primitiva



Gastrulazione uccelli: la stria primitiva



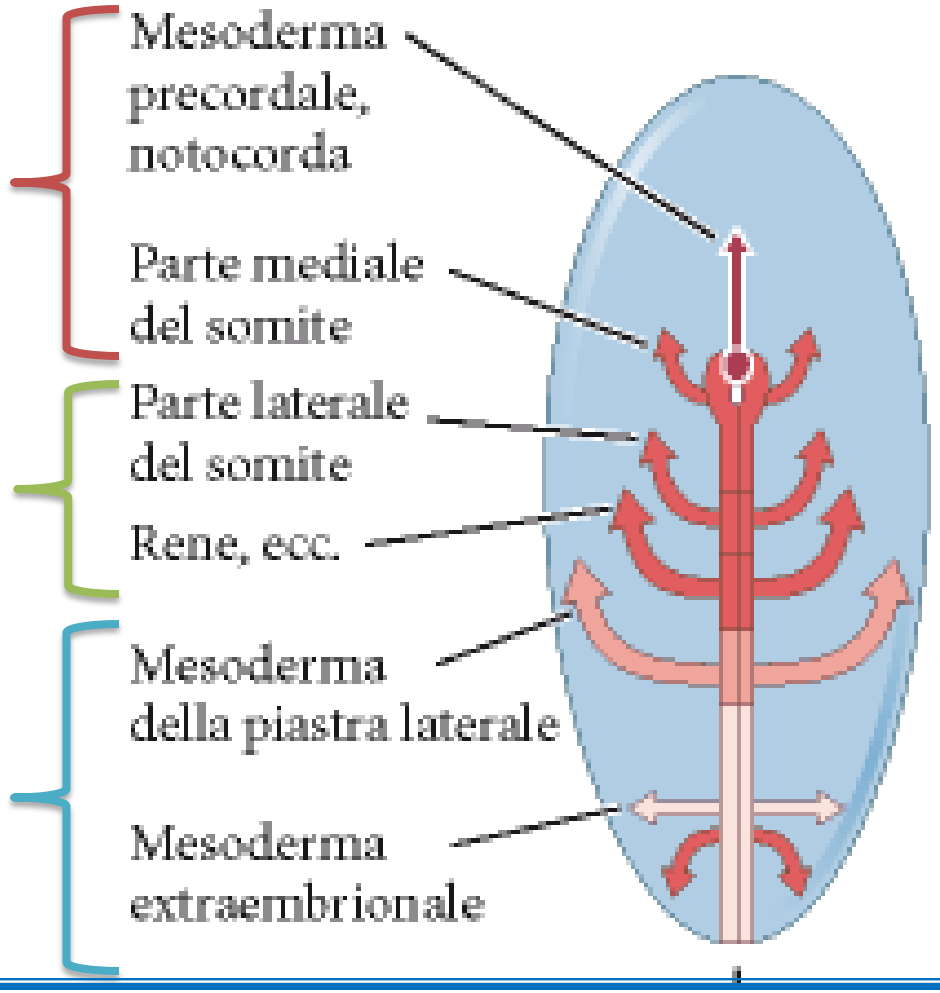
Gastrulazione uccelli: il nodo di Hensen

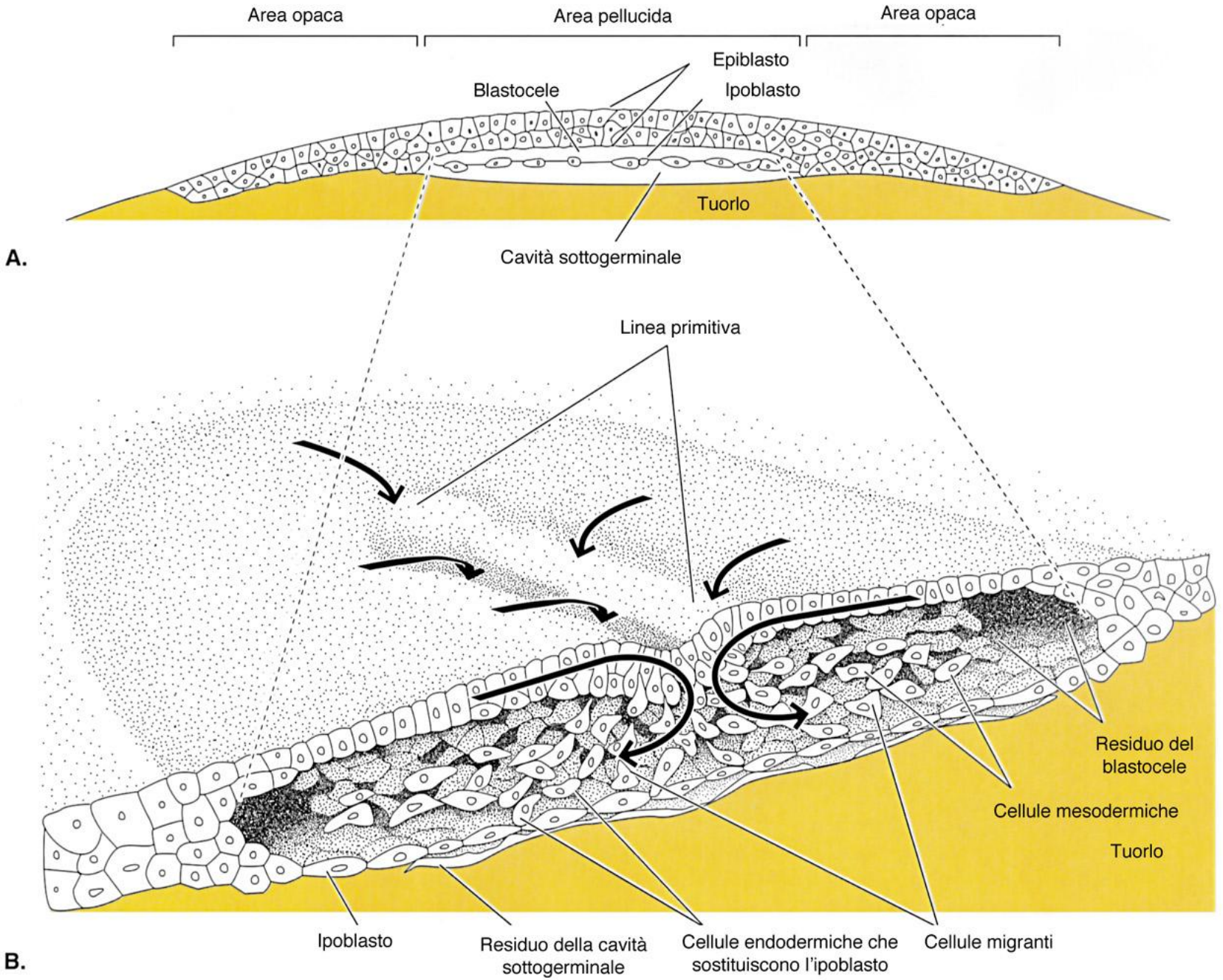
Mappa presuntiva

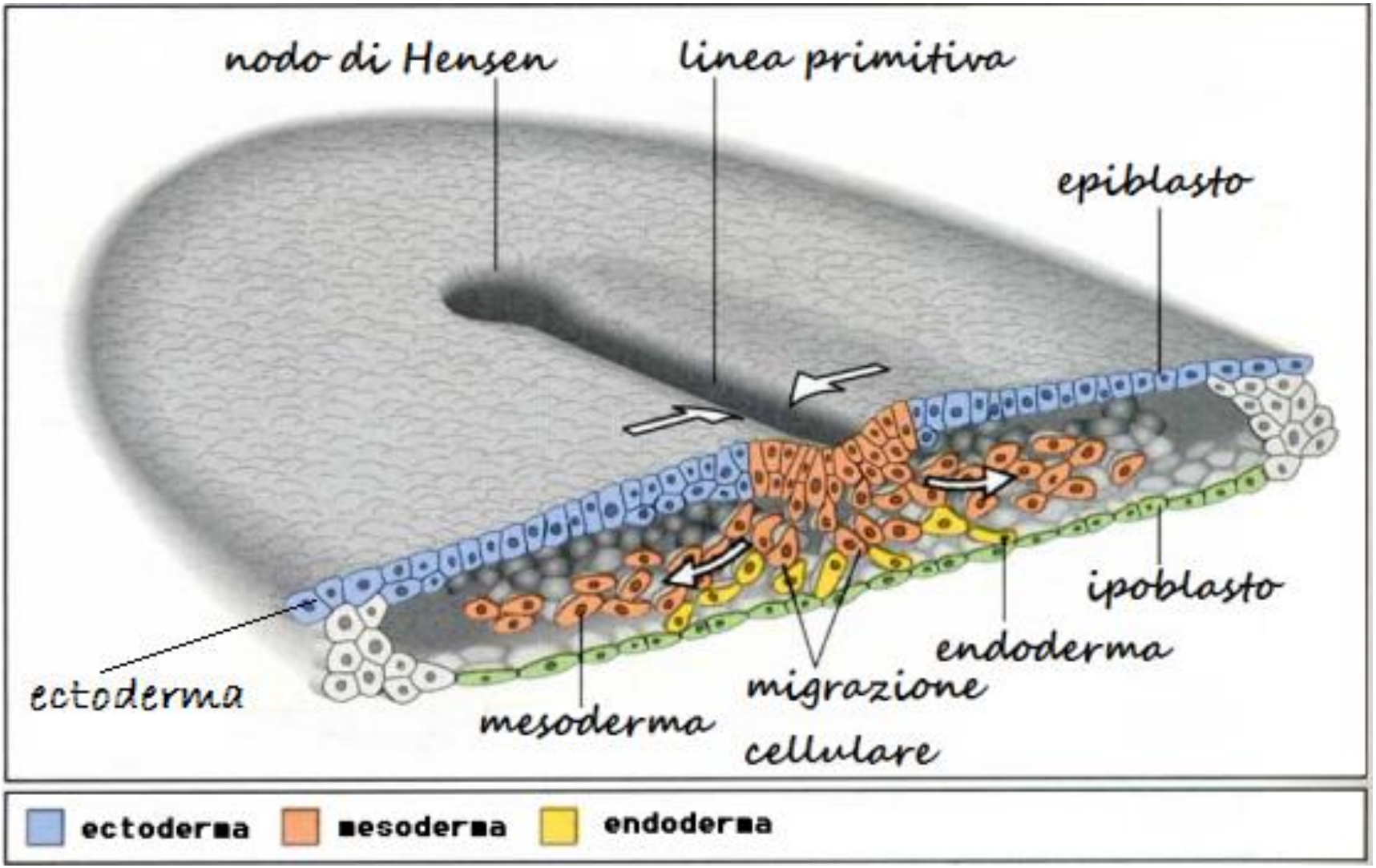
Estremità anteriore della stria

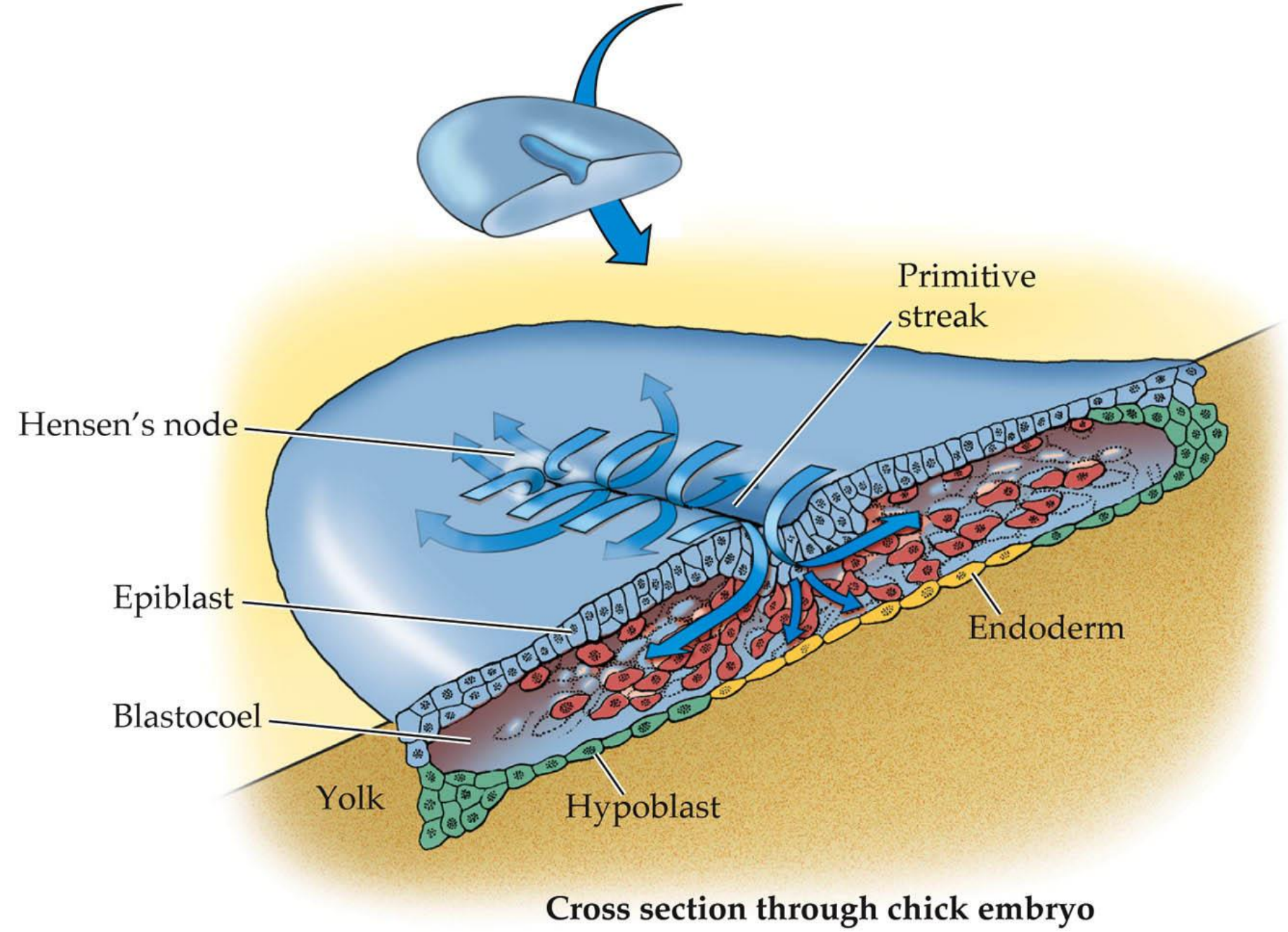
Cellule che entrano attraverso il centro stria

Cellule che entrano attraverso la porzione posteriore




Area opaca
Area pellucida
Area opaca
Epiblasto
Blastocele
Ipoblasto
Tuorlo
A.
Cavità sottogerminale
Linea primitiva
Residuo del blastocele
Cellule mesodermiche
Tuorlo
B.
Ipoblasto
Residuo della cavità sottogerminale
Cellule endodermiche che sostituiscono l'ipoblasto
Cellule migranti


nodo di Hensen
linea primitiva
epiblasto
ipoblasto
endoderma
migrazione cellulare
mesoderma
ectoderma
ectoderma
mesoderma
endoderma



Cross section through chick embryo

LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, **Figure 20.13 Gastrulation in Birds (Part 2)**

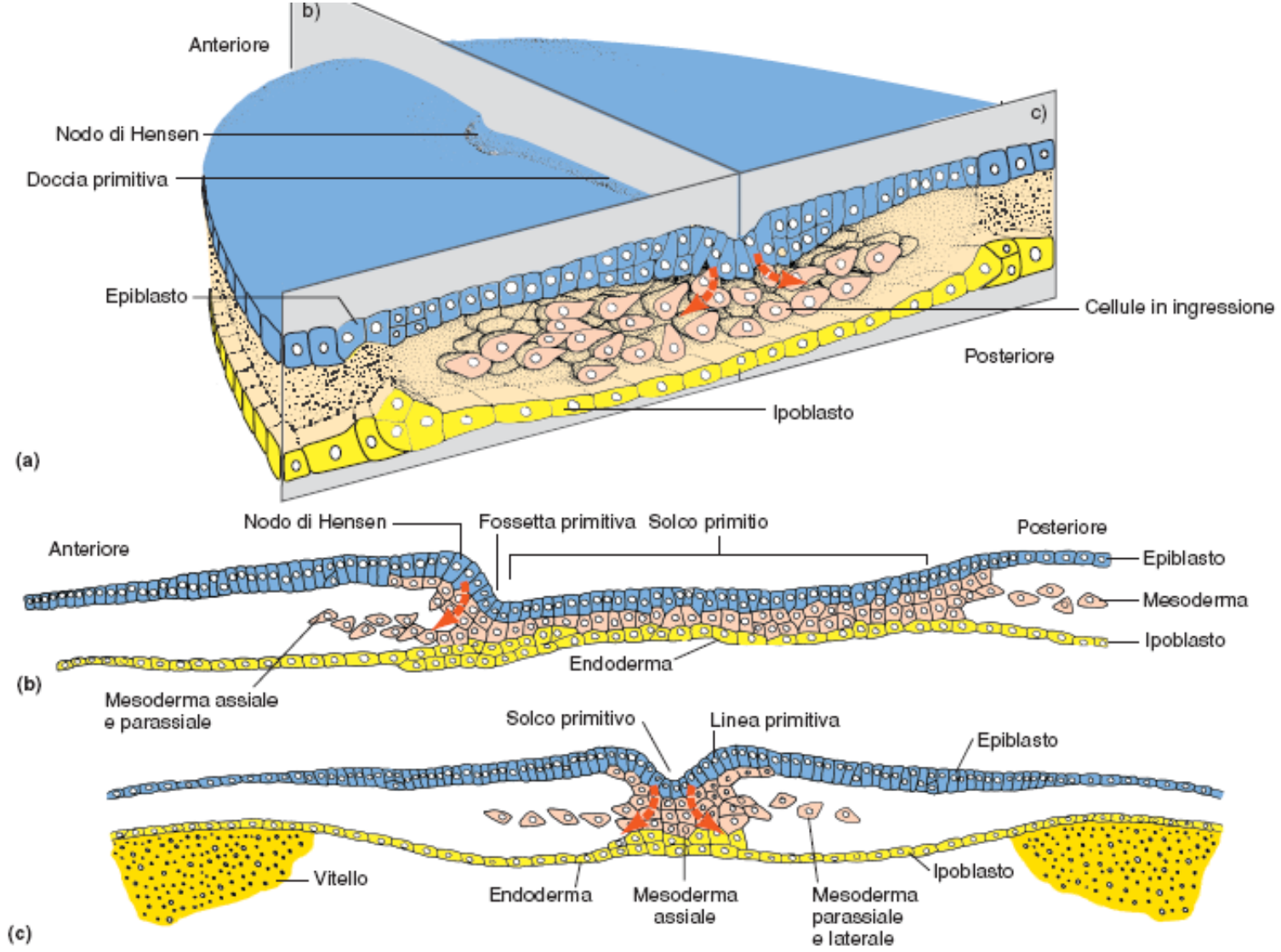


Figura 10.27 **Movimento di ingressione delle cellule dell'endoderma e del mesoderma attraverso la fossetta primitiva e il solco primitivo in un embrione di uccello.** **(a)** Visione tridimensionale. Le prime cellule dell'endoderma che entrano sostituiscono le cellule dell'ipoblasto. **(b)** Sezione sagittale. Le cellule che entrano attraverso la fossetta primitiva formano il mesoderma assiale (notocorda) e il mesoderma parassiale (somiti). **(c)** Sezione trasversale. Le cellule che entrano attraverso la doccia primitiva formano il mesoderma assiale, parassiale, intermedio e laterale.

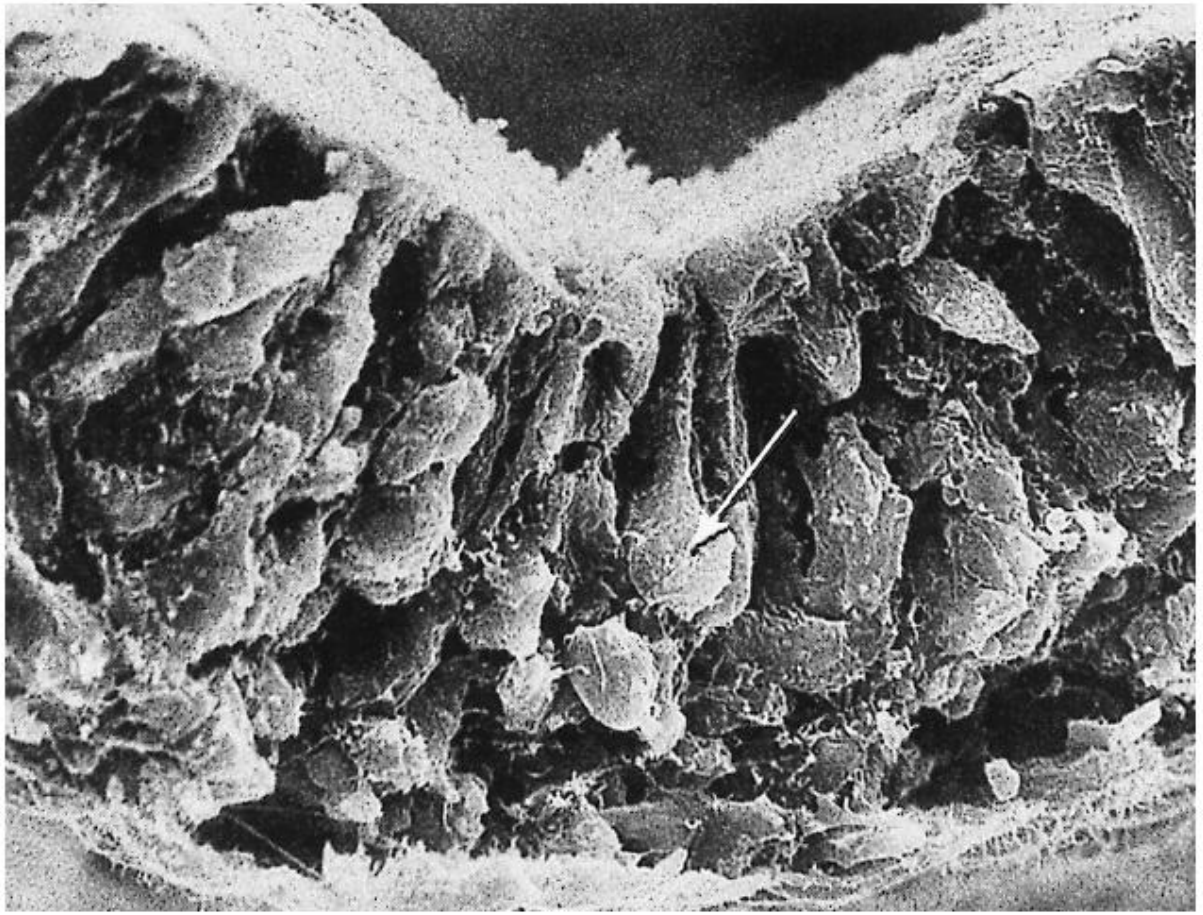
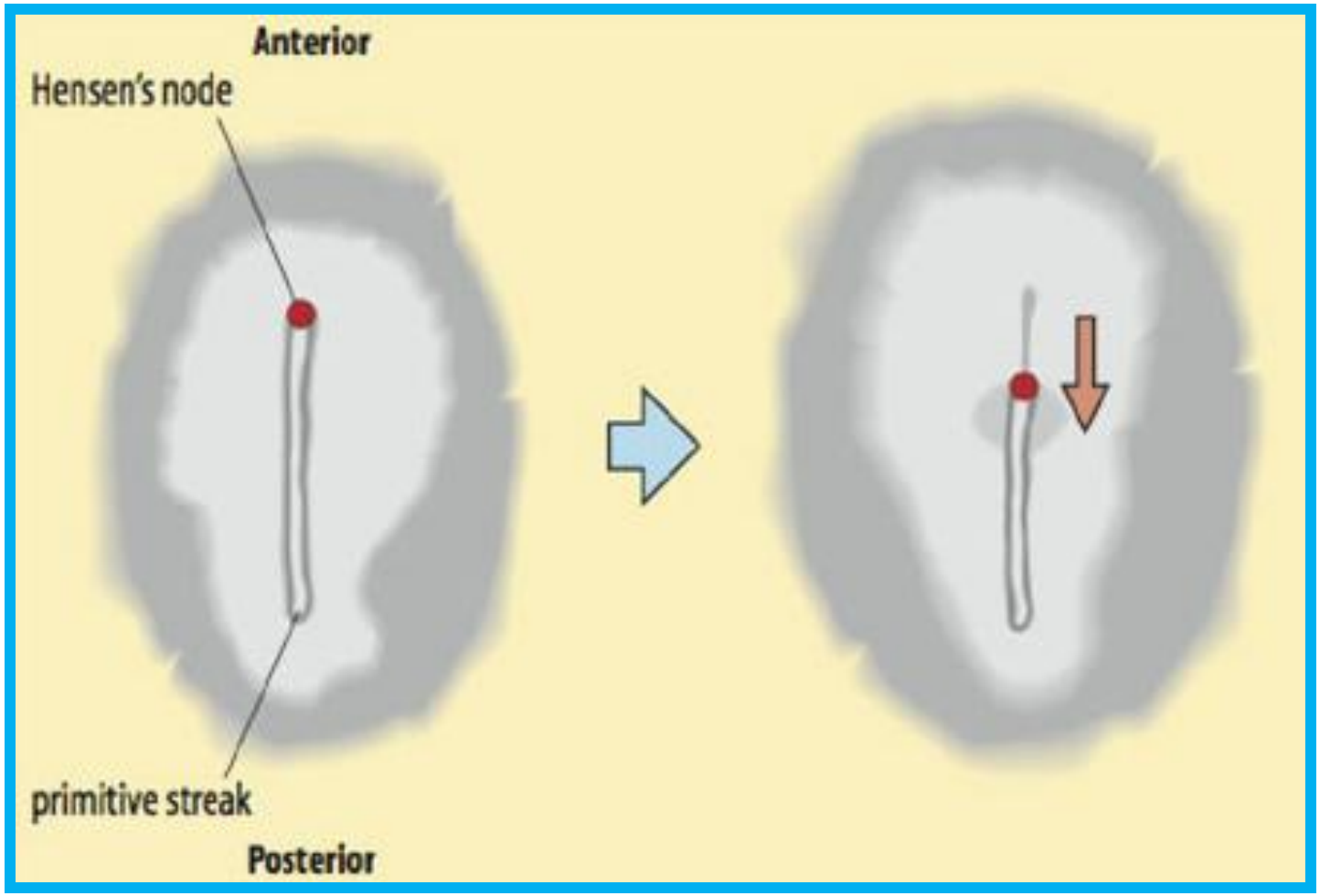
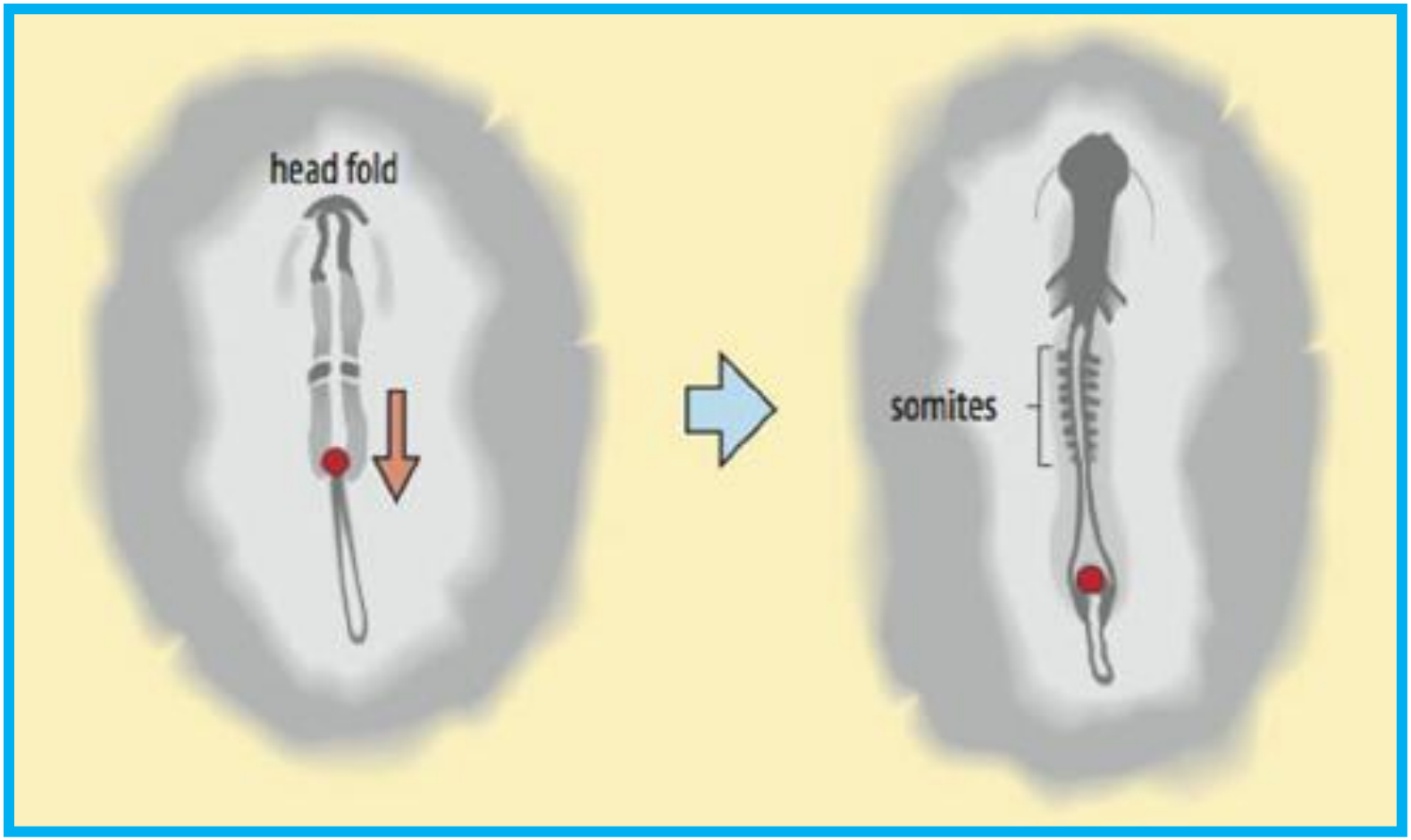
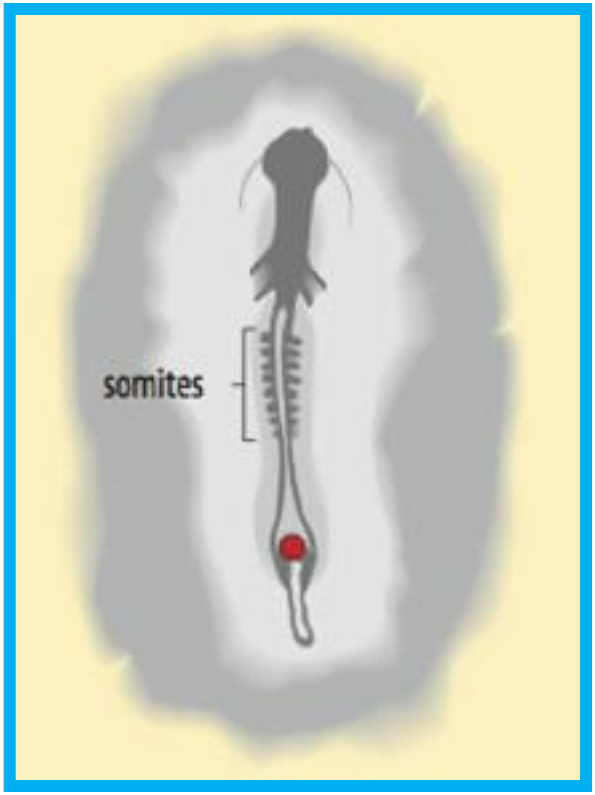


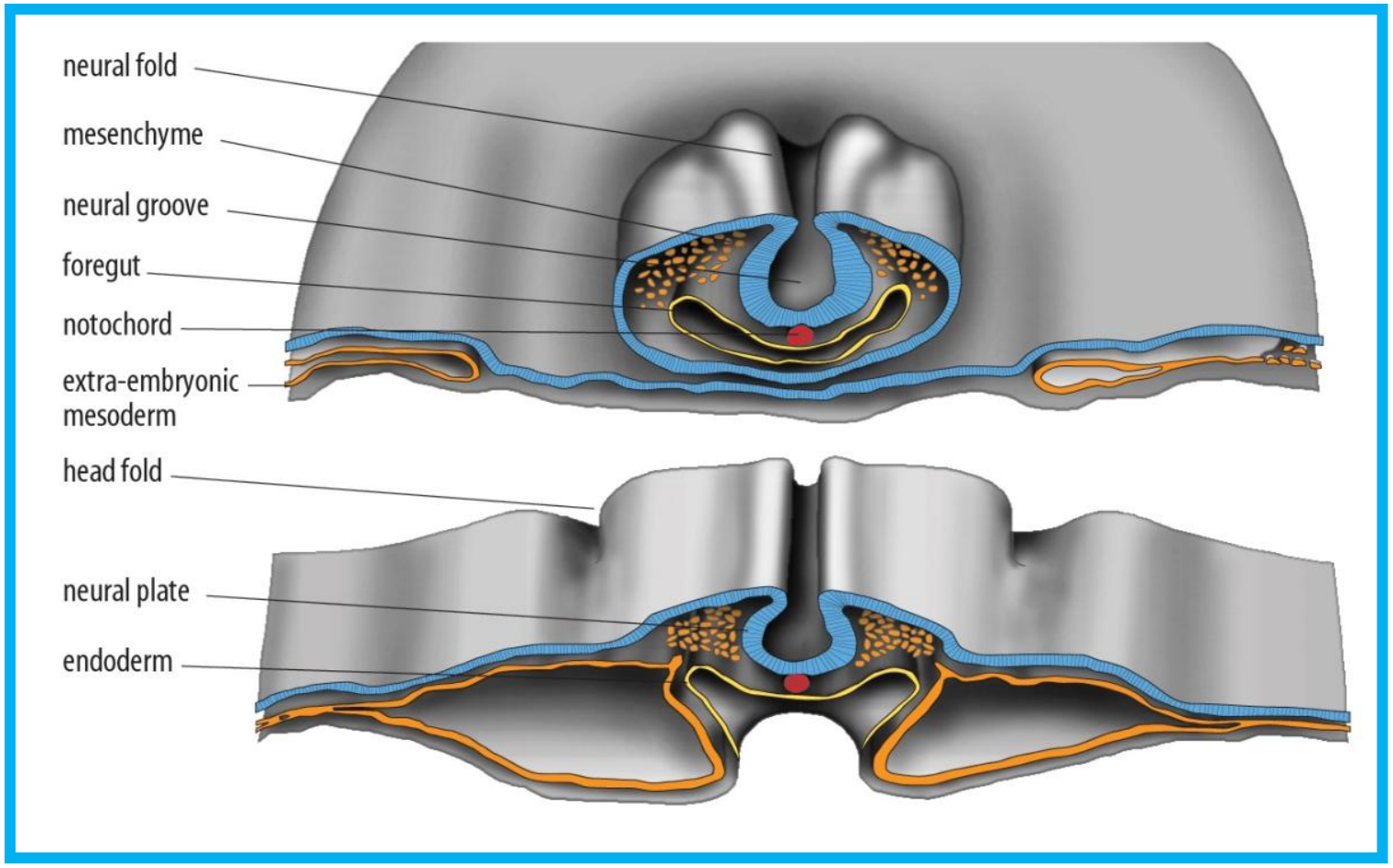
Figura 10.28 Immagine al microscopio elettronico a scansione della linea primitiva di un embrione di uccello in sezione trasversale. Le cellule che entrano nel blastocele attraverso il solco primitivo assumono una forma a bottiglia (freccia).

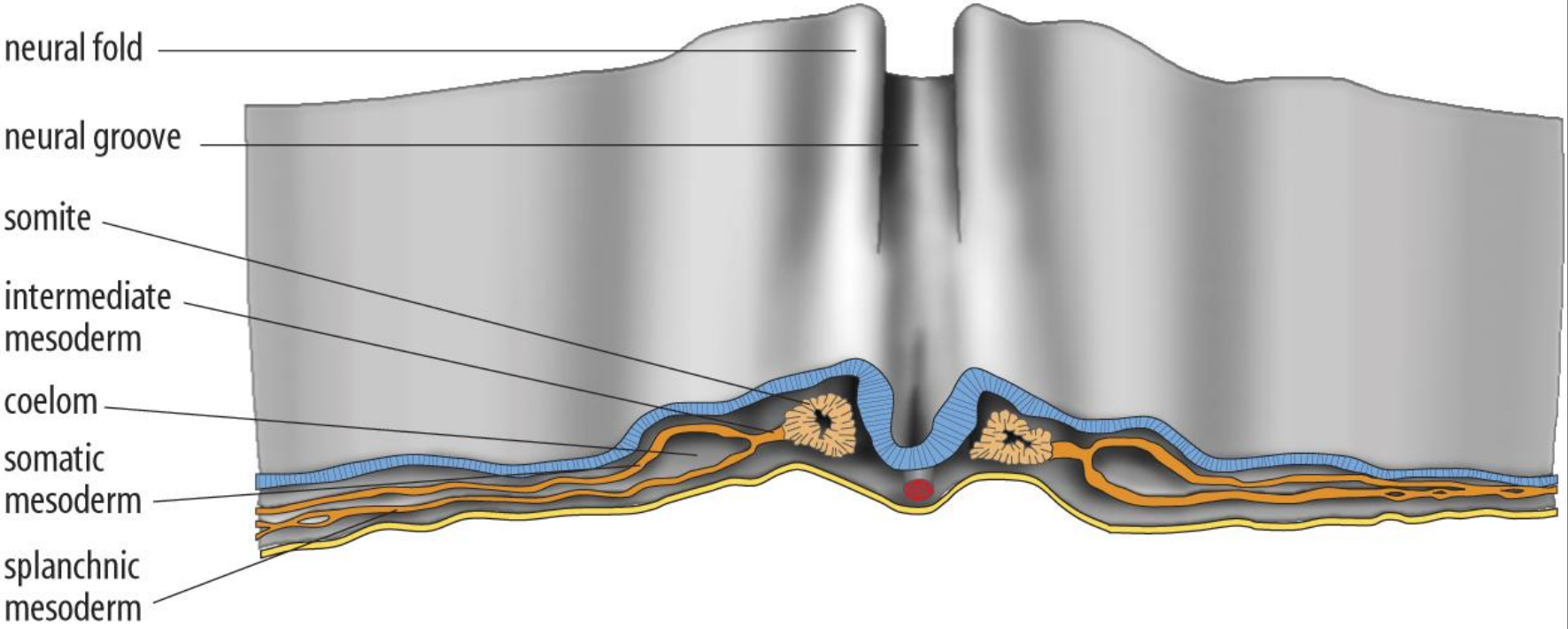

Anterior
Hensen's node
primitive streak
Posterior


head fold
somites

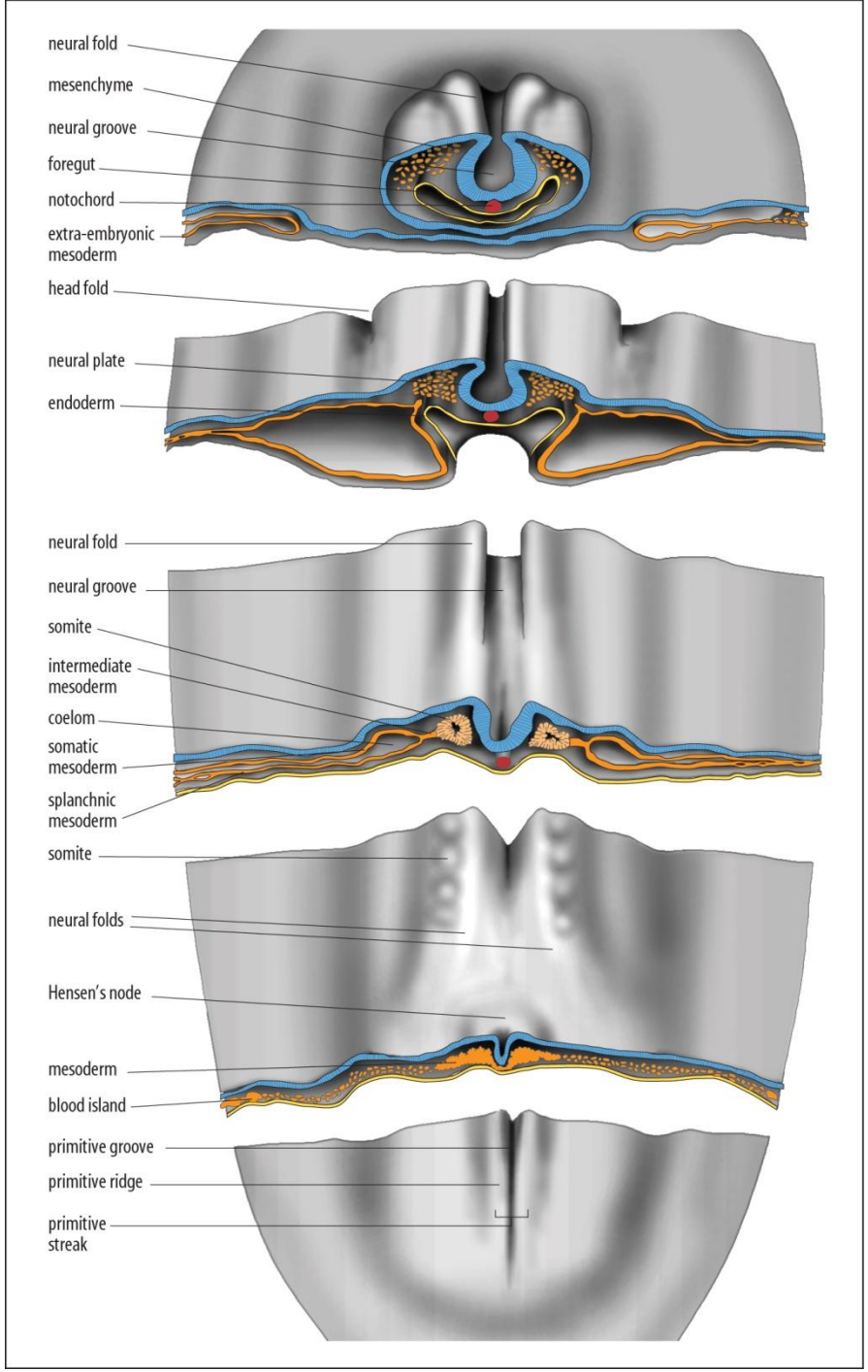

somites

Neurulazione uccelli

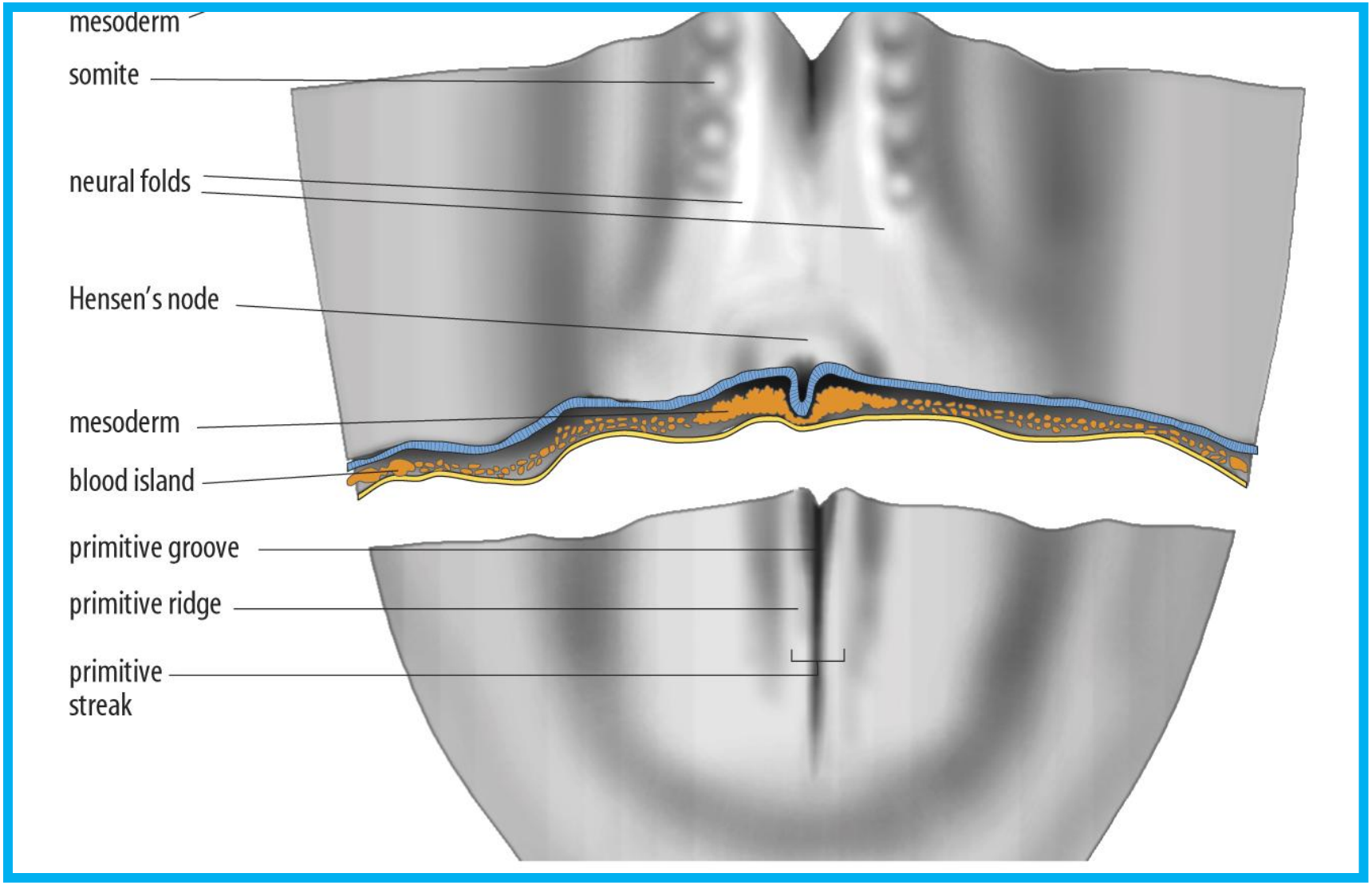



neural fold
neural groove
somite
intermediate mesoderm
coelom
somatic mesoderm
splanchnic mesoderm

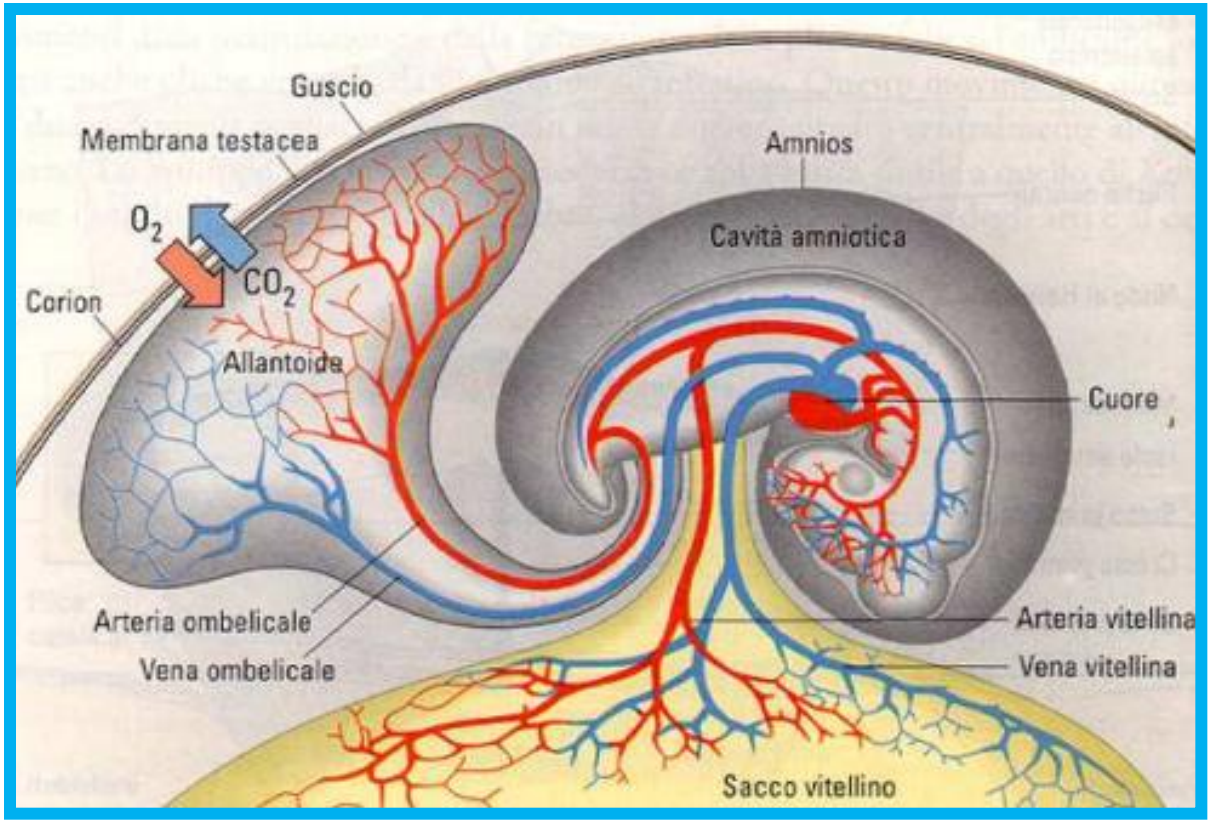
A


neural fold
mesenchyme
neural groove
foregut
notochord
extra-embryonic mesoderm
head fold
neural plate
endoderm
neural fold
neural groove
somite
intermediate mesoderm
coelom
somatic mesoderm
splanchnic mesoderm
somite
neural folds
Hensen's node
mesoderm
blood island
primitive groove
primitive ridge
primitive streak

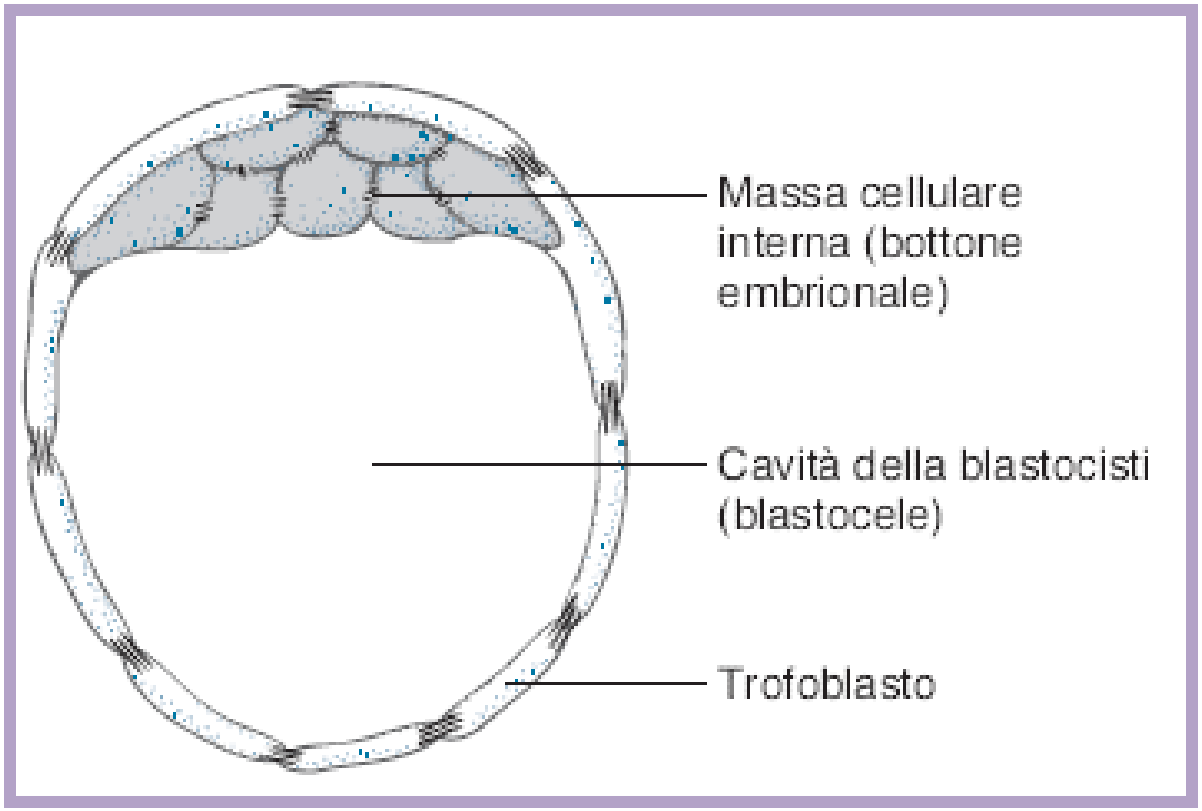
P

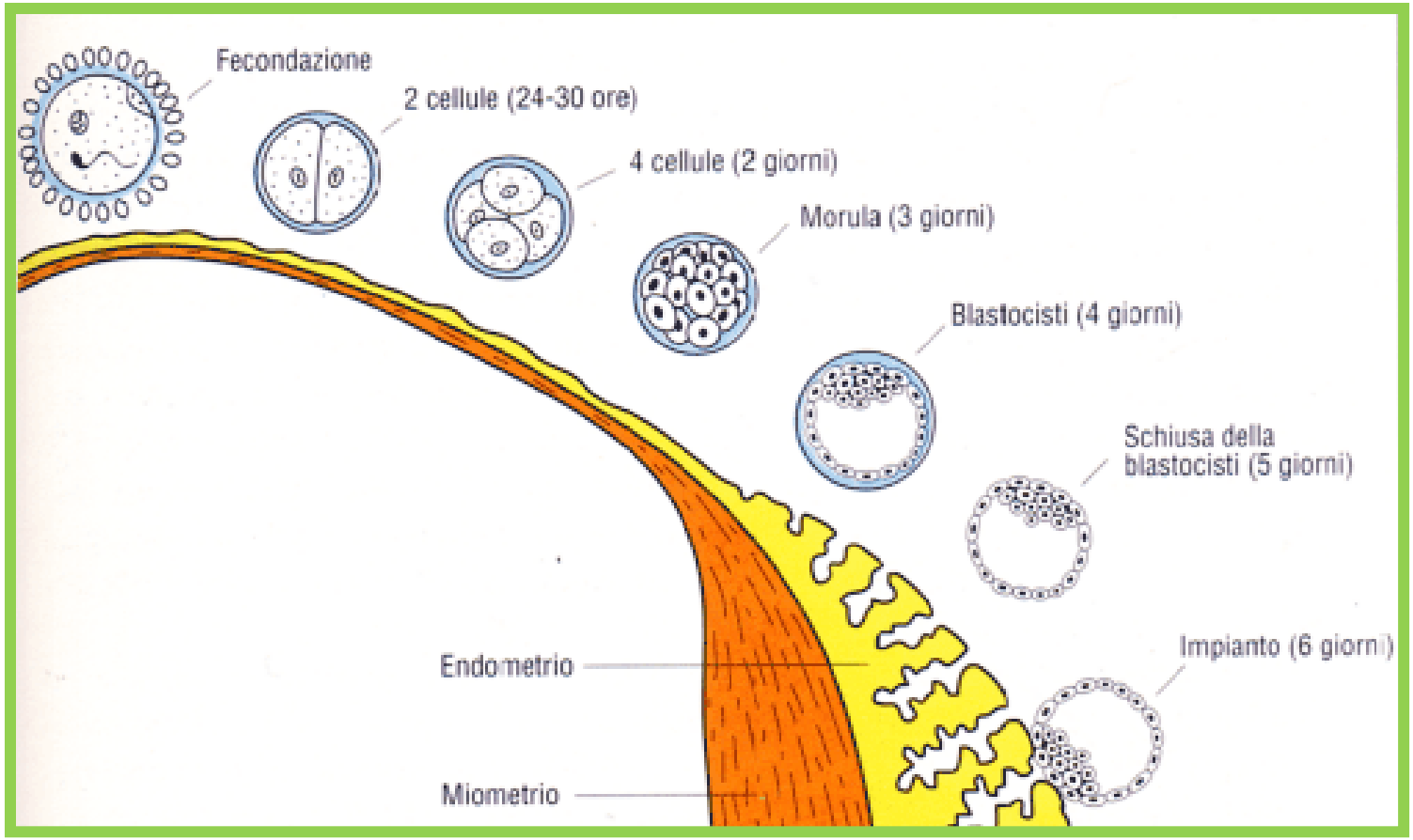

mesoderm
somite
neural folds
Hensen's node
mesoderm
blood island
primitive groove
primitive ridge
primitive streak

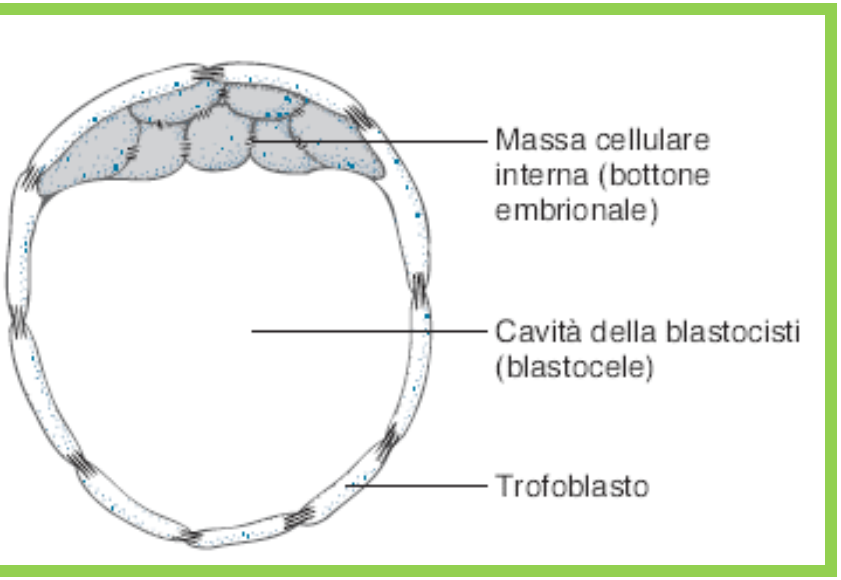

Zipper
Ear
Branchial Arches
Brain
Eye
Heart
Wing Bud
Somite
Leg Bud
Tail Bud
13- somite Stage
20 Somite Stage
40 Somite Stage


Guscio
Membrana testacea
Amnios
O_2
Cavità amniotica
CO_2
Corion
Allantoide
Cuore
Arteria ombelicale
Arteria vitellina
Vena ombelicale
Vena vitellina
Sacco vitellino

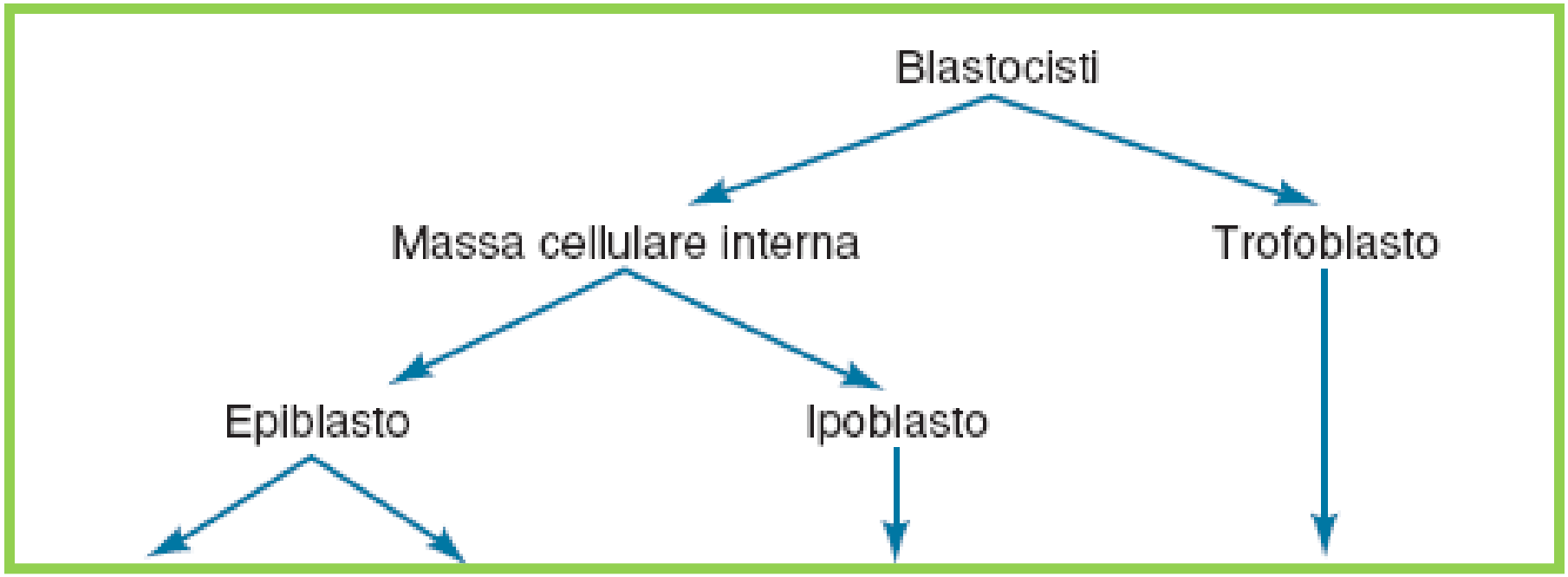
Gastrulazione mammiferi



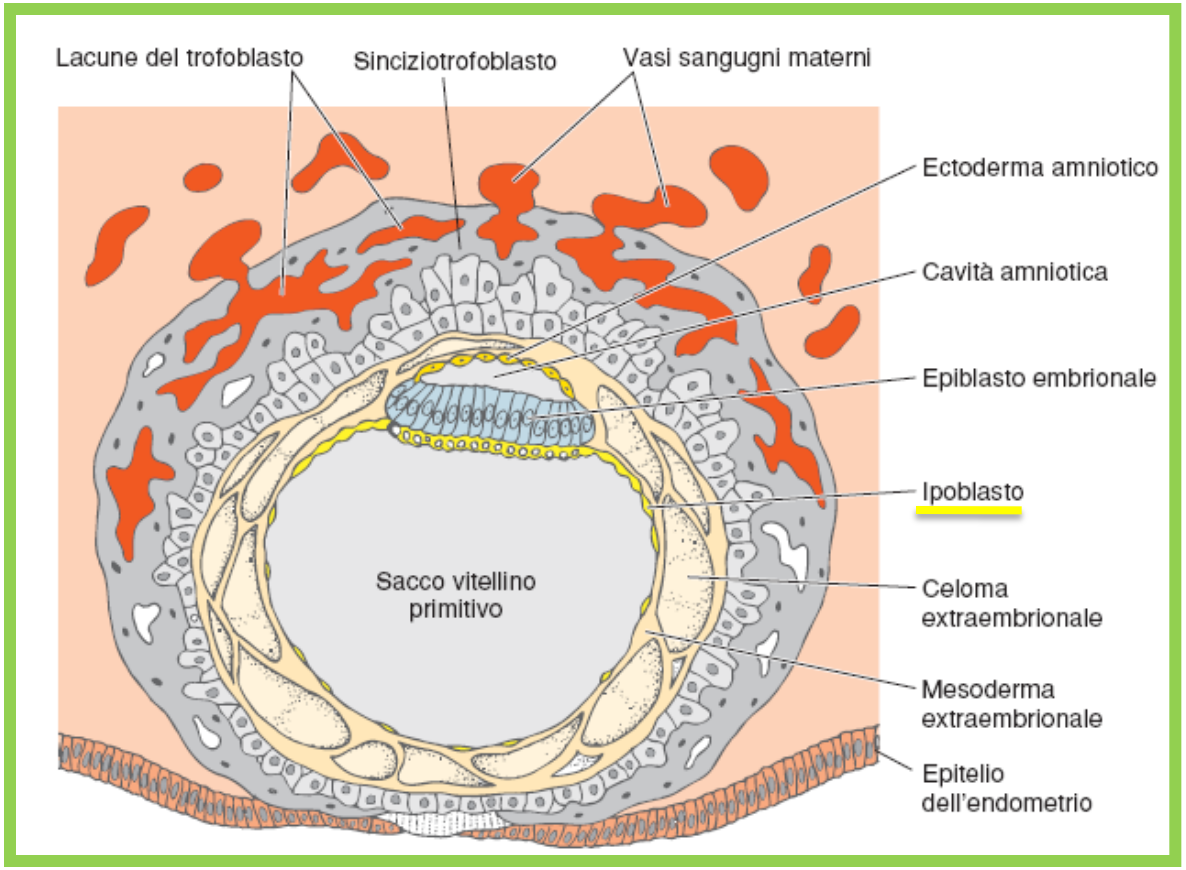

Fecondazione
2 cellule (24-30 ore)
4 cellule (2 giorni)
Morula (3 giorni)
Blastocisti (4 giorni)
Schiusa della blastocisti (5 giorni)
Impianto (6 giorni)
Endometrio
Miometrio


Massa cellulare interna (bottone embrionale)
Cavità della blastocisti (blastocele)
Trofoblasto

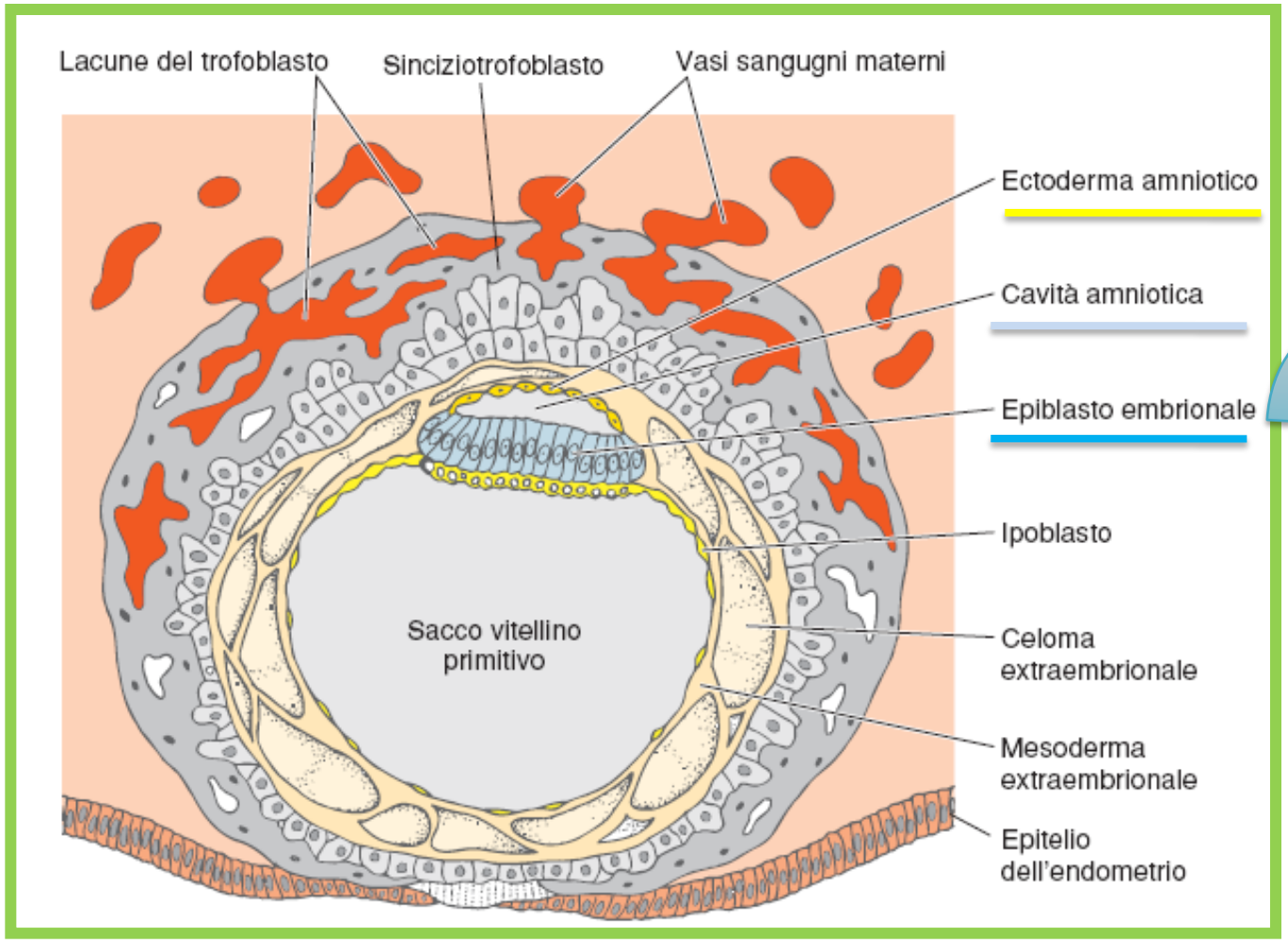

Epitelio uterino (endometrio)
Capillare materno
Disco germinativo bilaminare
Epiblasto
Ipoblasto
Blastocele
Trofoblasto


Blastocisti
Massa cellulare interna
Trofoblasto
Epiblasto
Ipoblasto

L'ipoblasto

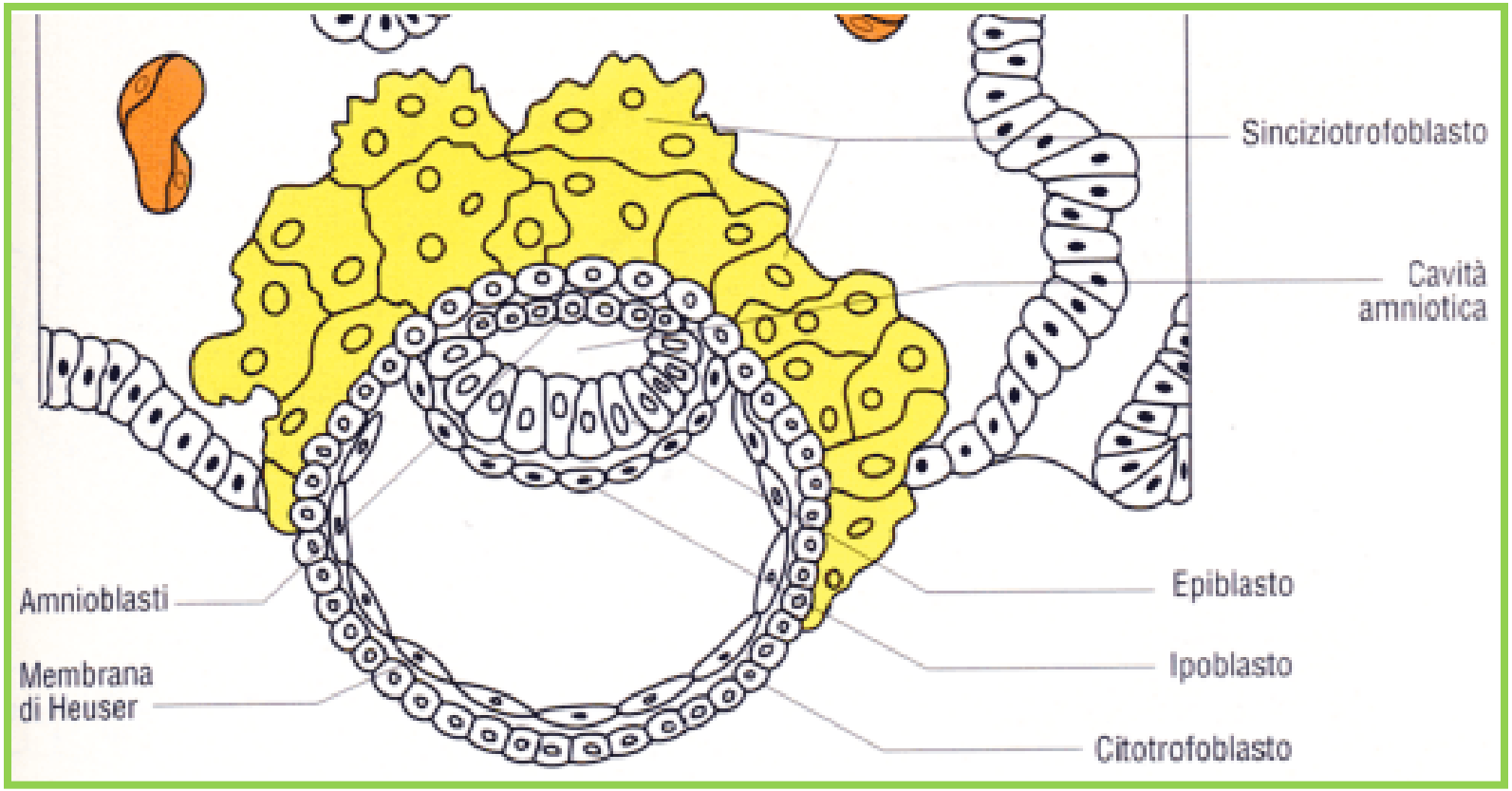

Lacune del trofoblasto
Sinciziotrofoblasto
Vasi sangugni materni
Ectoderma amniotico
Cavità amniotica
Epiblasto embrionale
Ipoblasto
Sacco vitellino primitivo
Celoma extraembrionale
Mesoderma extraembrionale
Epitelio dell'endometrio

Gastrulazione mammiferi: l'epiblasto



Embrione vero e proprio

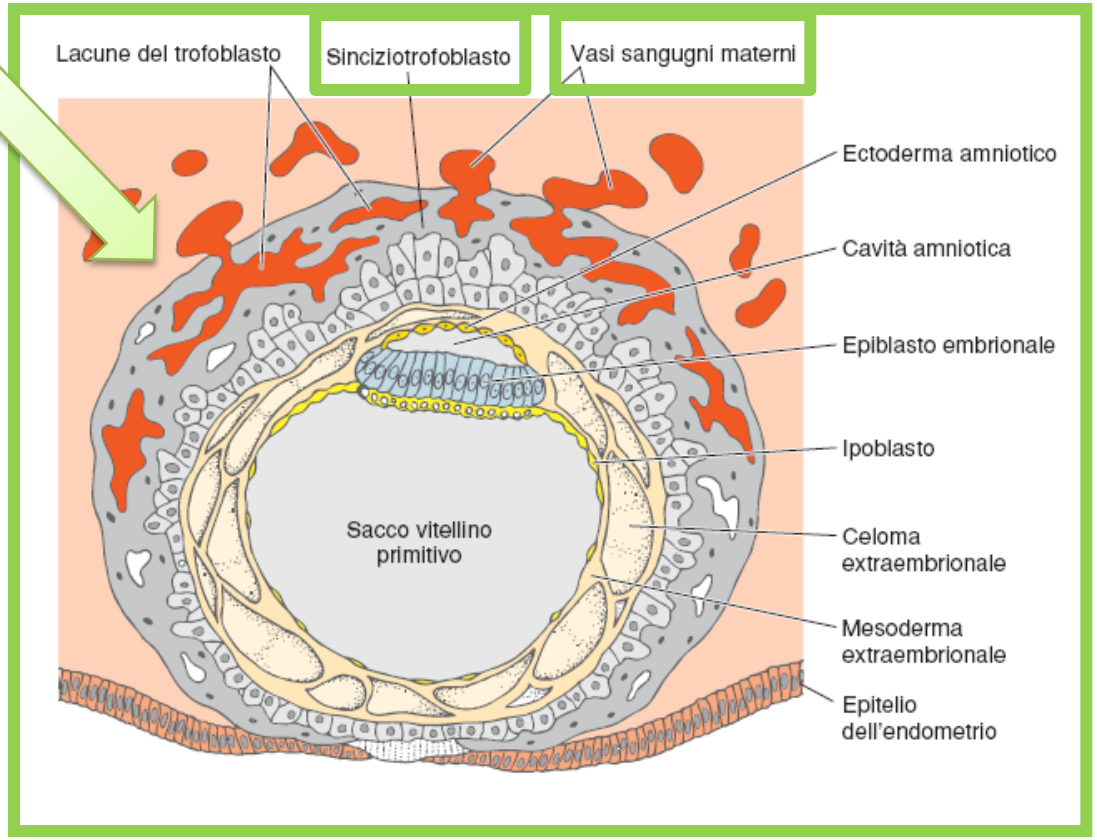
...e il trofoblasto????



...e il torfoblasto????

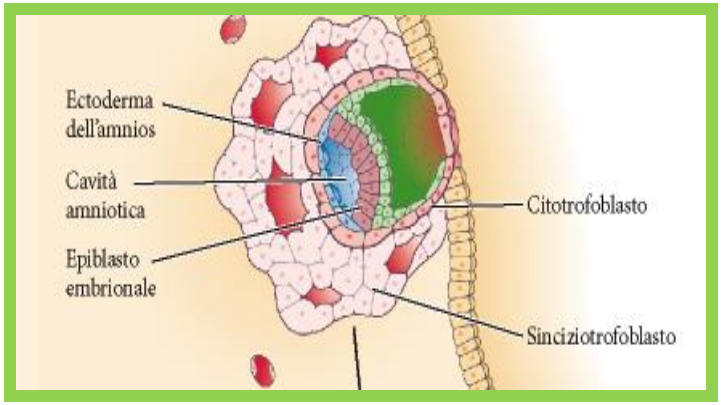
Polo embrionale

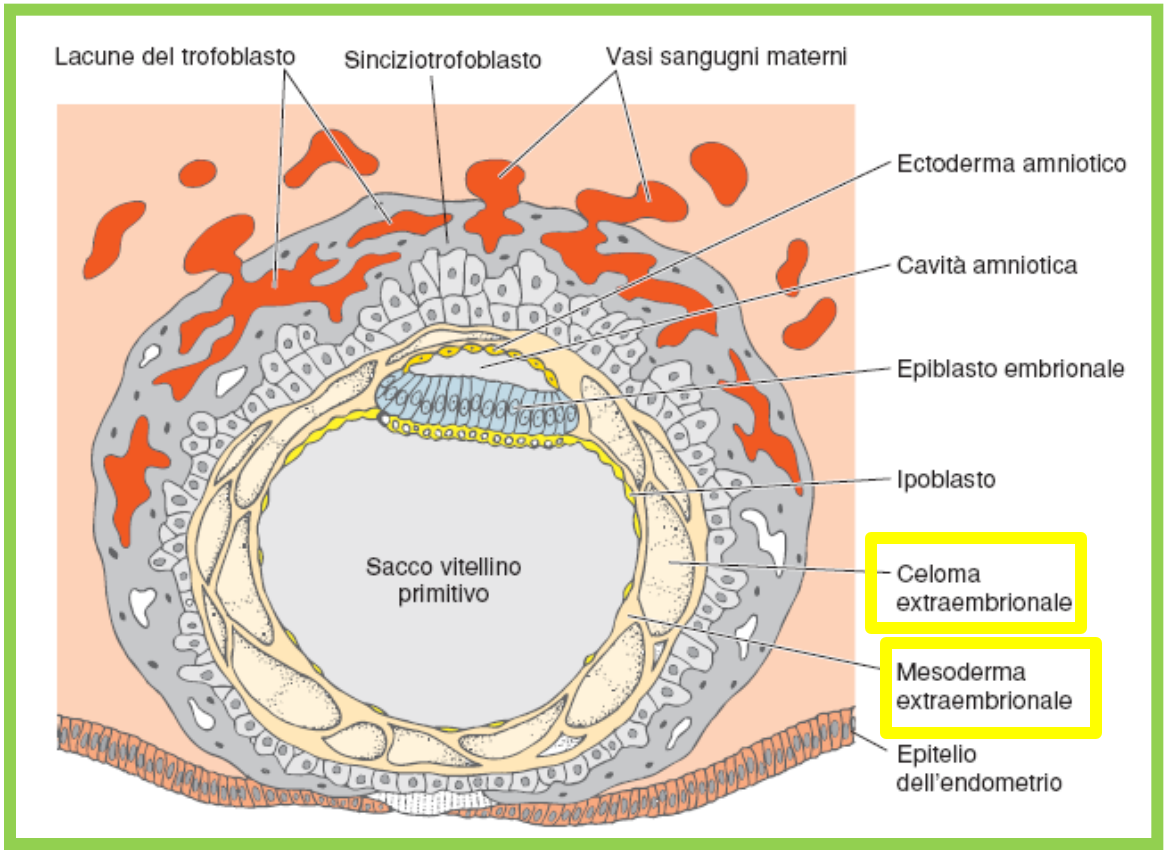
Il sinciziotrofoblasto



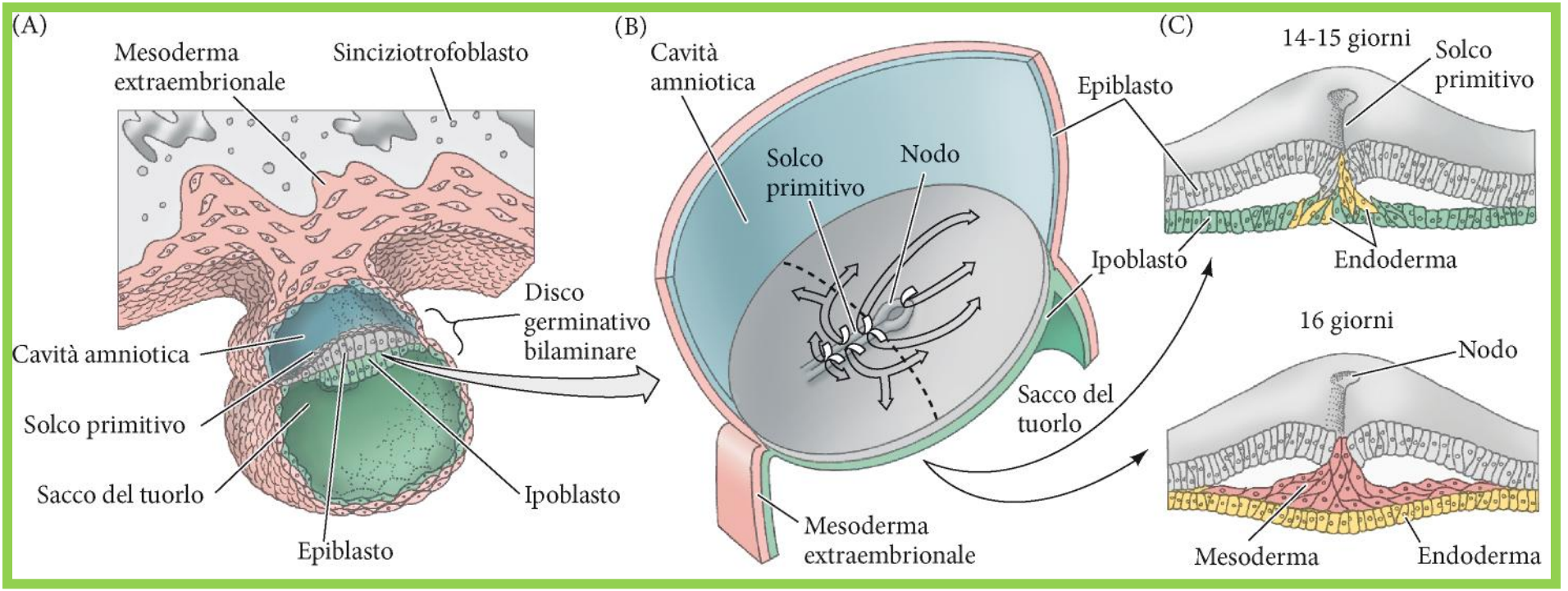
...e il torfoblasto????

Il citotrofoblasto

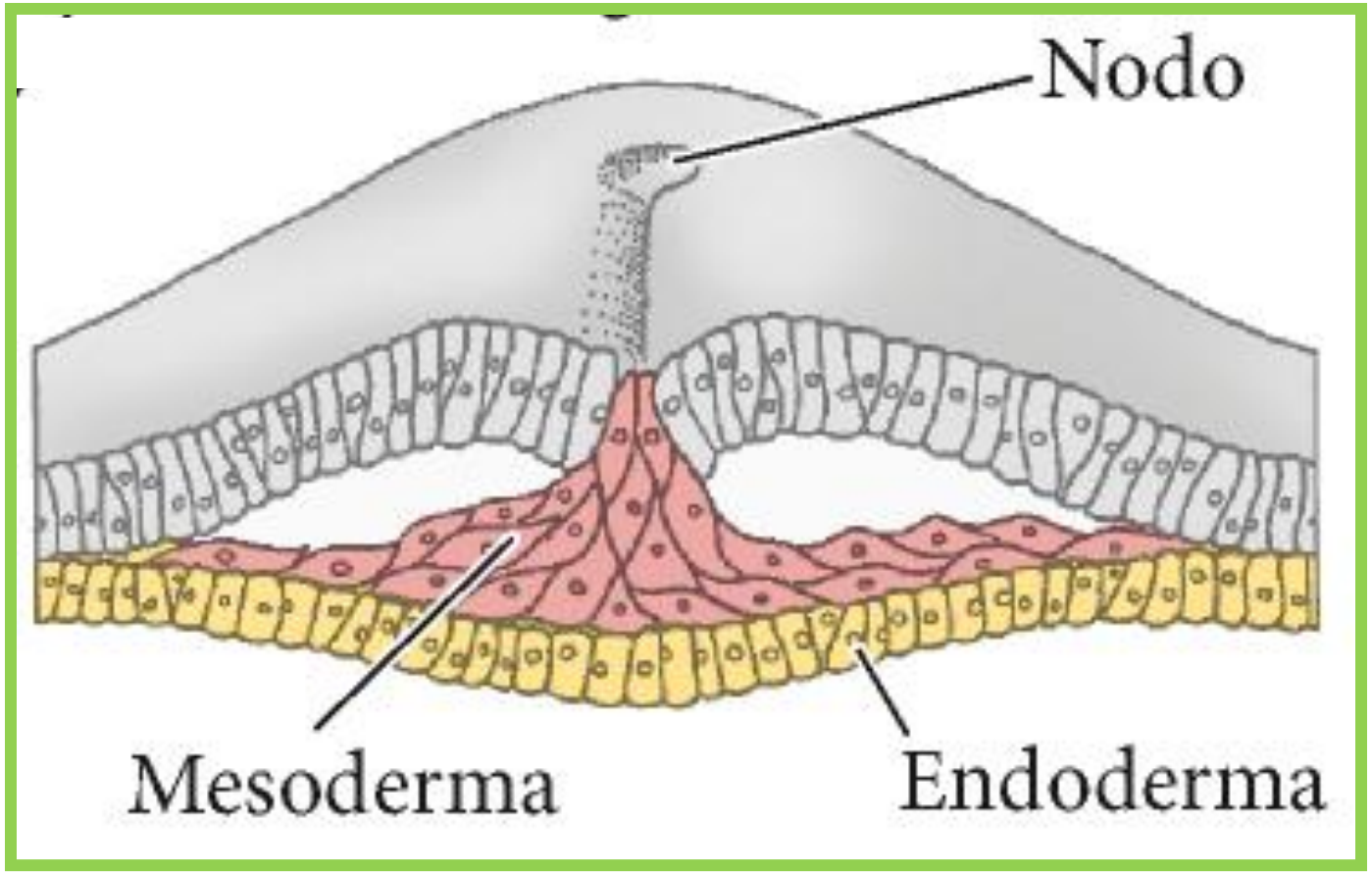




Gastrulazione mammiferi



Gastrulazione mammiferi



La migrazione e la specificazione delle cellule sono determinati da fattori di crescita dei fibroblasti (FGF).

Stria primitiva

Sintetizza e risponde

FGF

Omozigosi per delezione *fgf8*

X

NO migrazione cellulare attraverso la stria

NO mesoderma

NO endoderma

L'FGF regola probabilmente il movimento delle cellule nella stria primitiva **reprimendo** la produzione di E-caderina che tiene unite le cellule dell'epiblasto.