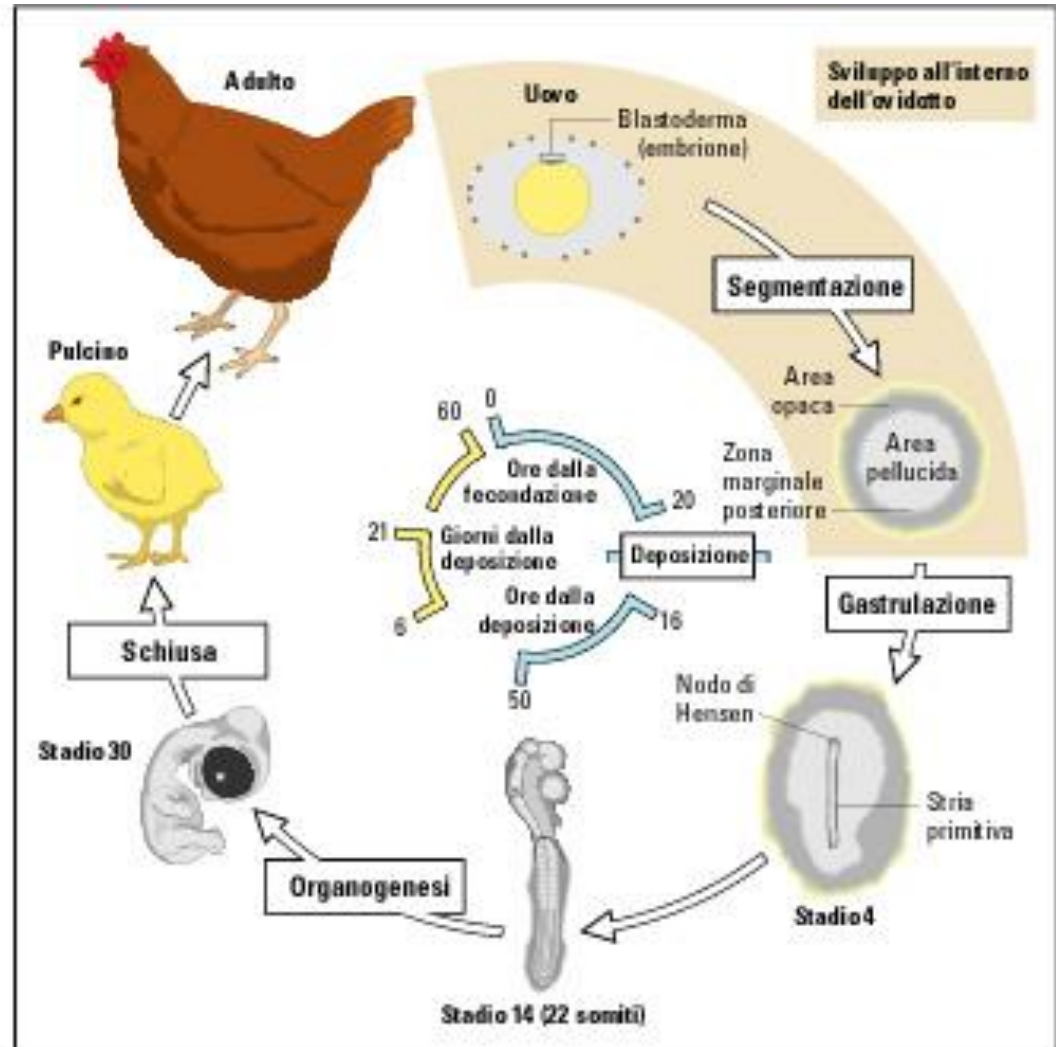
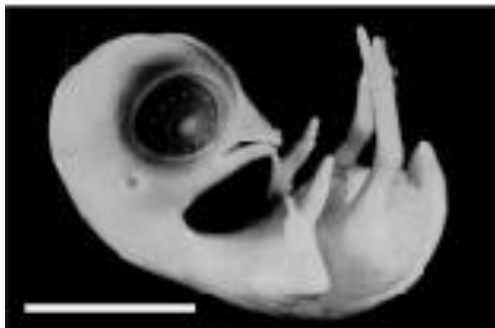


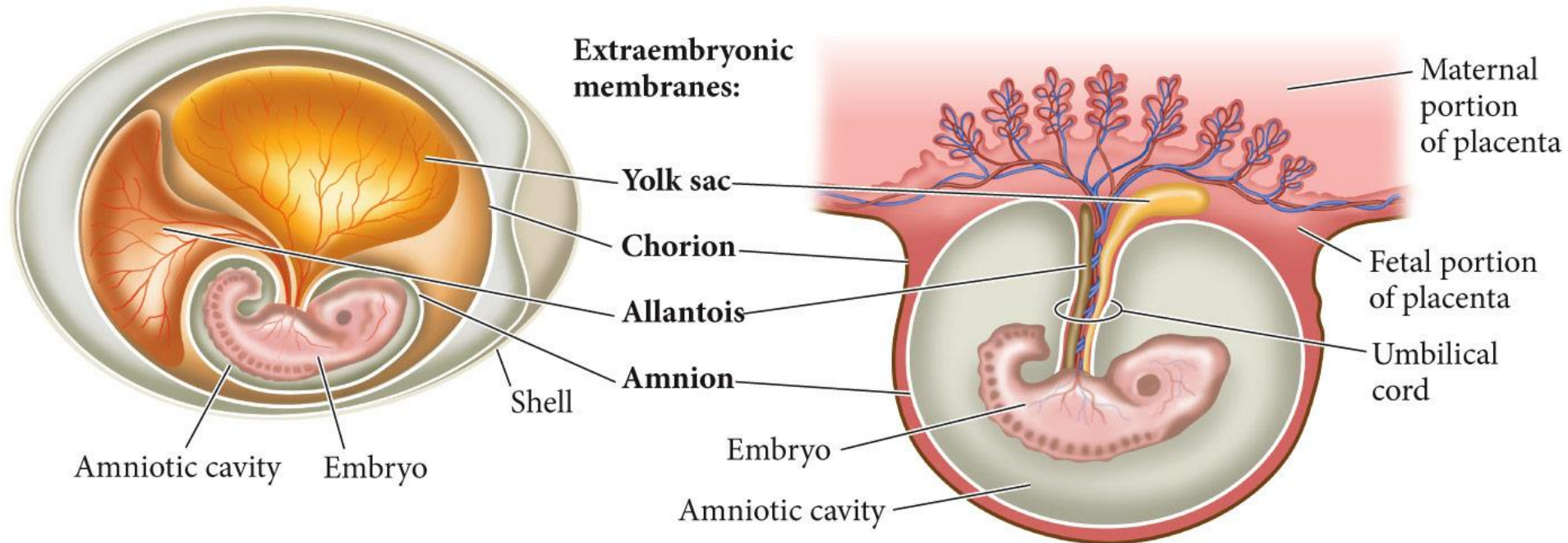
Sviluppo Uccelli



Sviluppo diretto

**AMNIOTI: formazione degli annessi embrionali necessari
allo sviluppo in ambiente terrestre
Presenza durante lo sviluppo di territori presuntivi extra-embryonali
destinati alla formazione degli annessi**

(B)

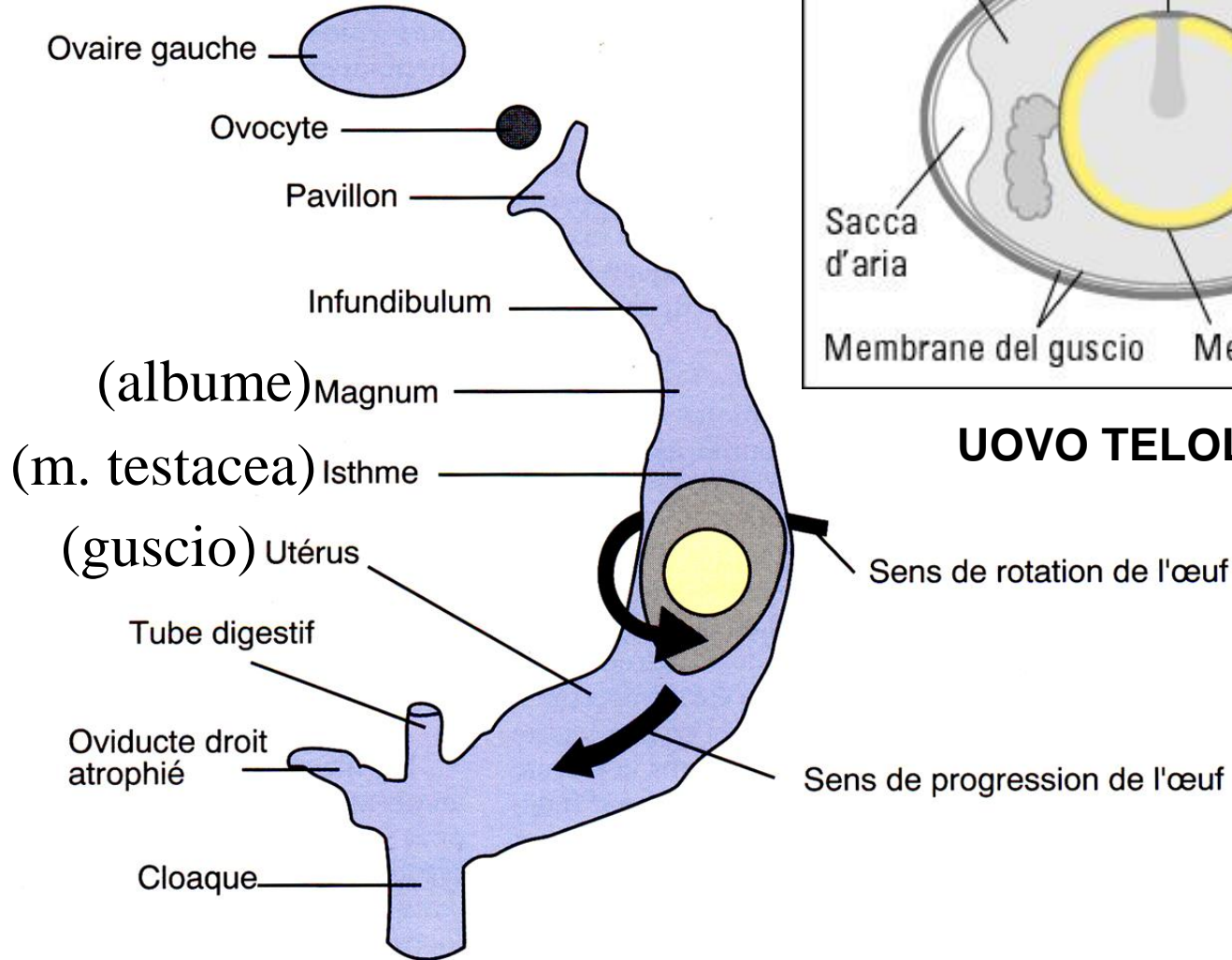


DEVELOPMENTAL BIOLOGY 11e, Figure 12.1 (Part 2)

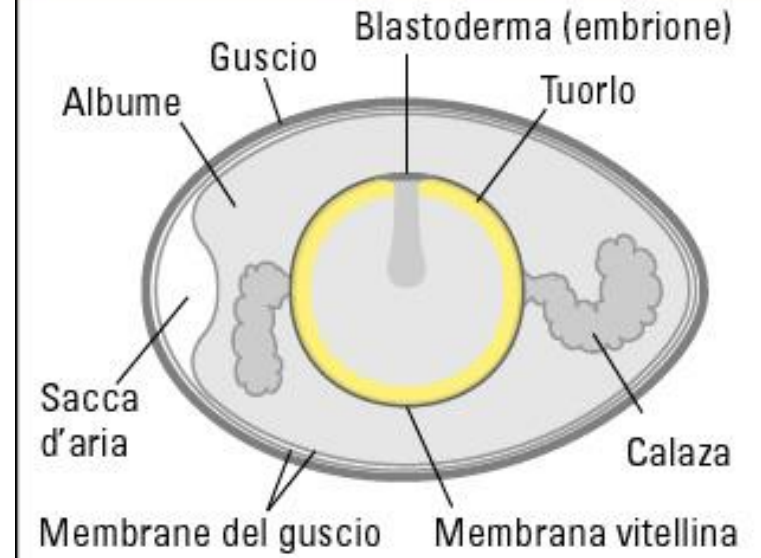
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FECONDAZIONE INTERNA (NELL'OVIDOTTO)

Transit dans le tractus génital maternel



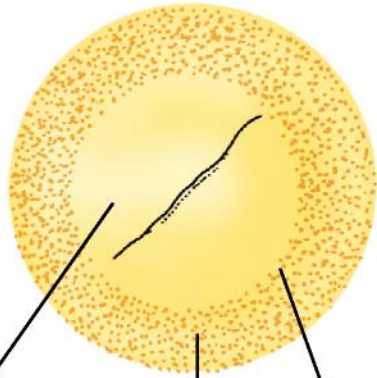
Struttura dell'uovo di pollo fecondato al momento della deposizione



UOVO TELELECITICO

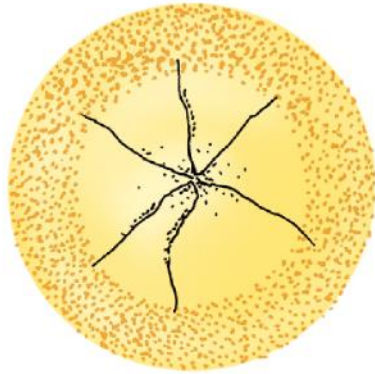
SEGMENTAZIONE MEROBLASTICA DISCOIDALE

(A)

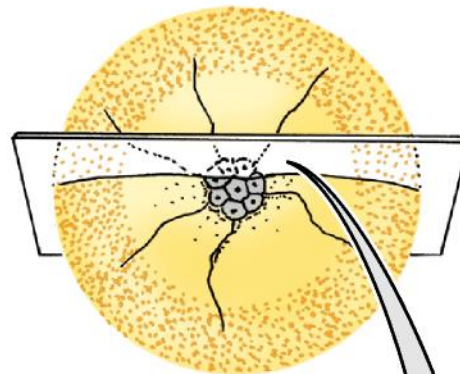


Area pellucida Area opaca Zona marginale

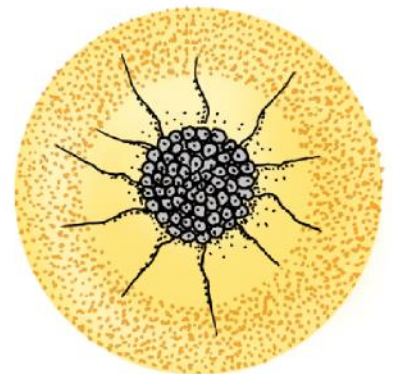
(B)



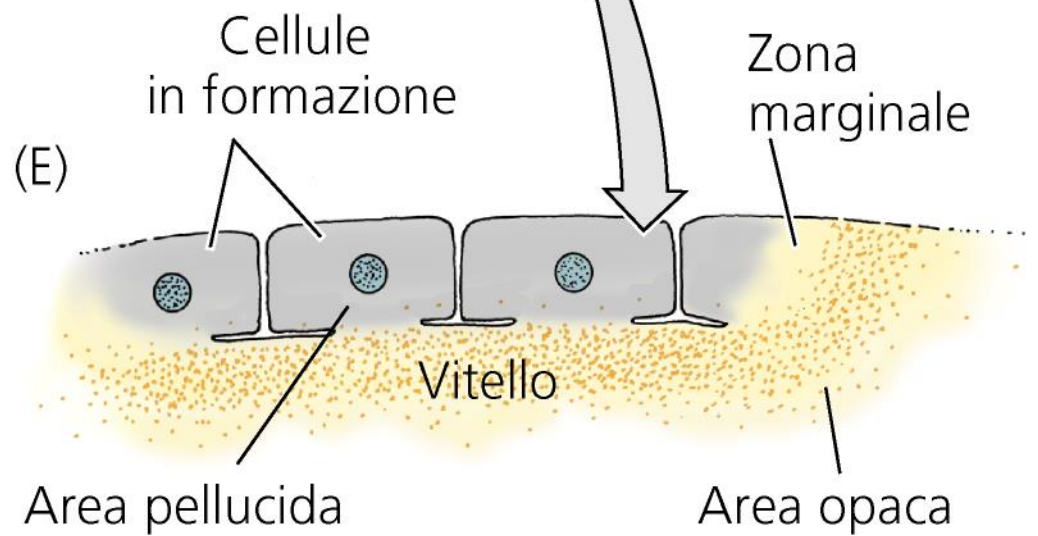
(C)



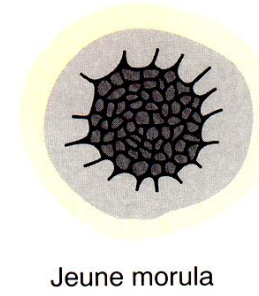
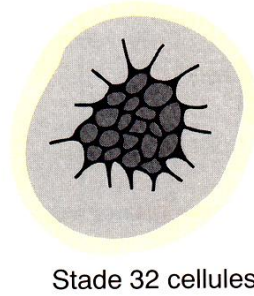
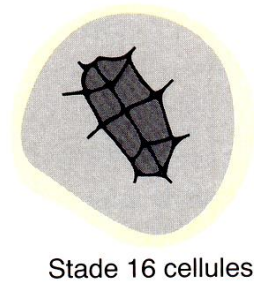
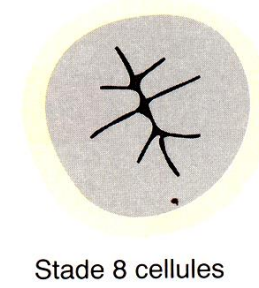
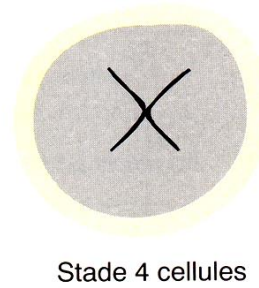
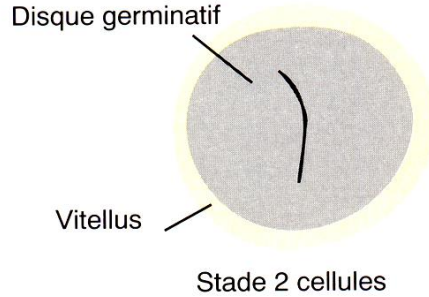
(D)



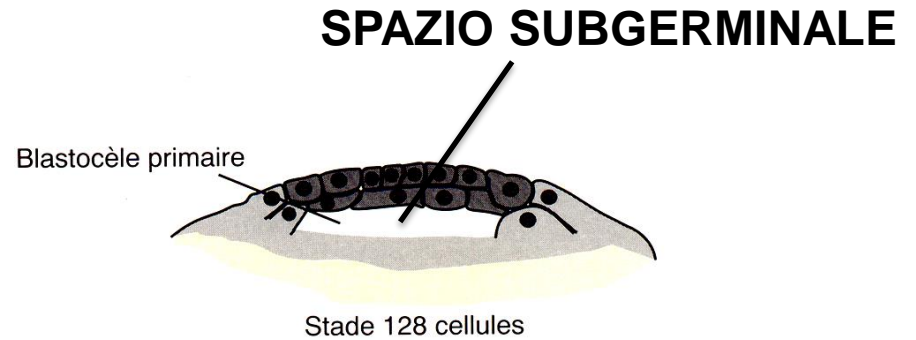
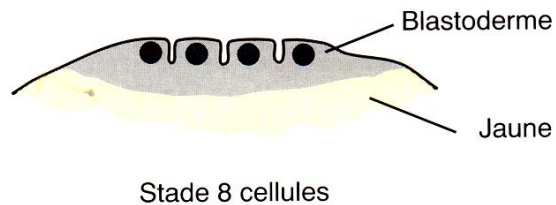
(E)



FORMAZIONE DEL BLASTODERMA E DELLO SPAZIO SUBGERMINALE



b) Observations en coupe du disque germinatif

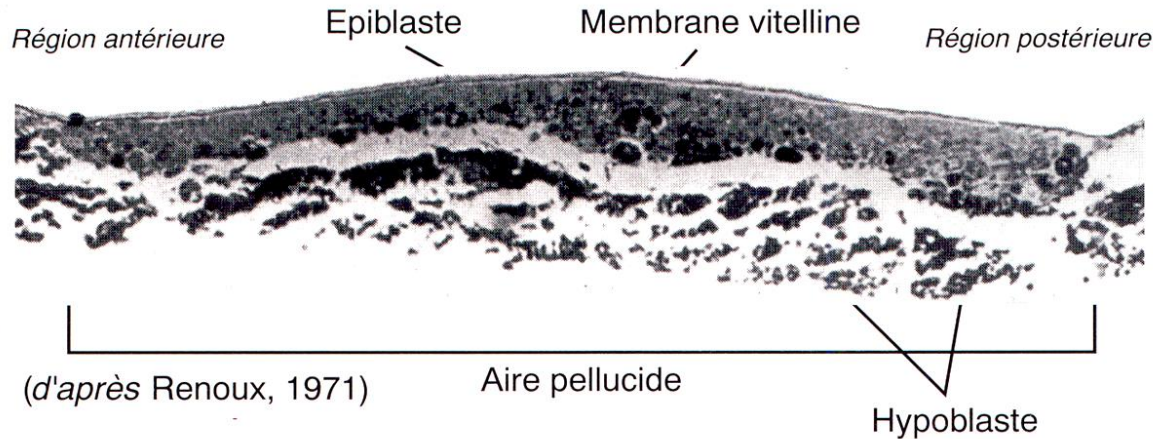
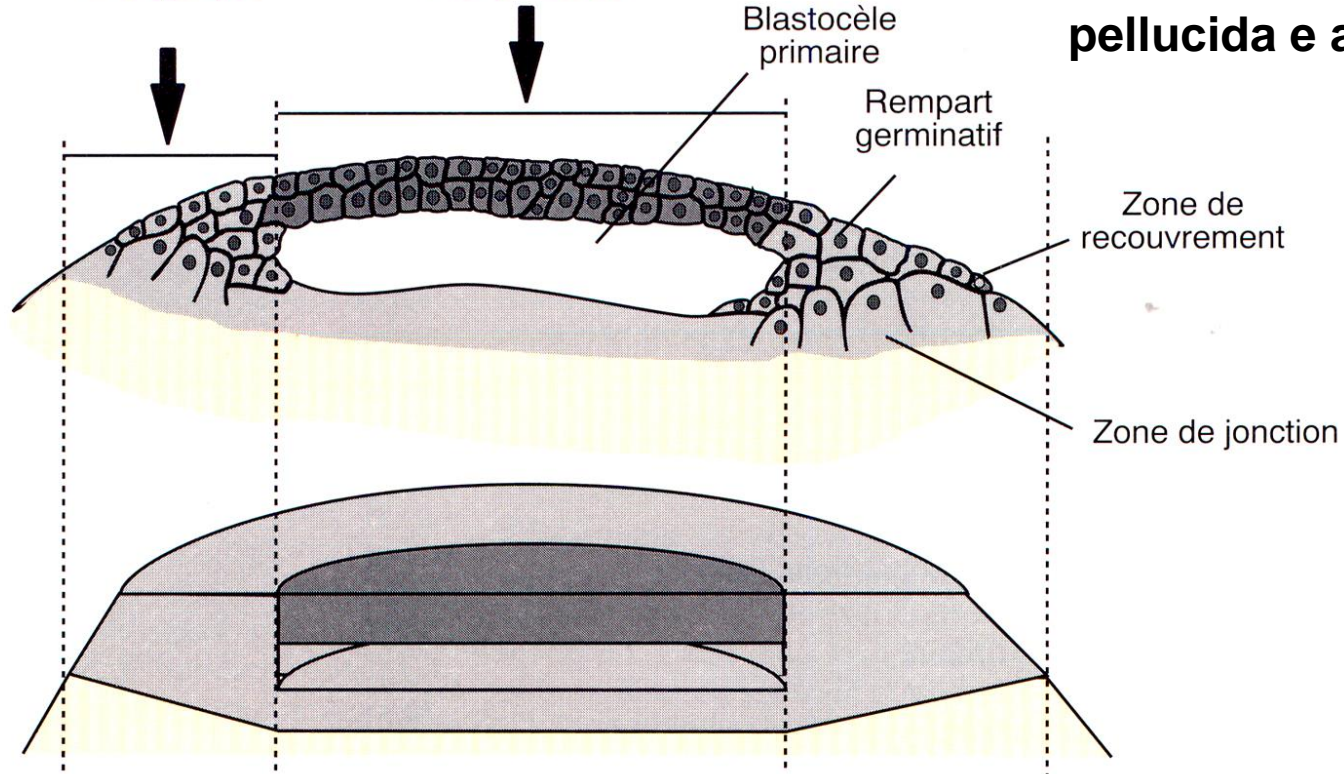


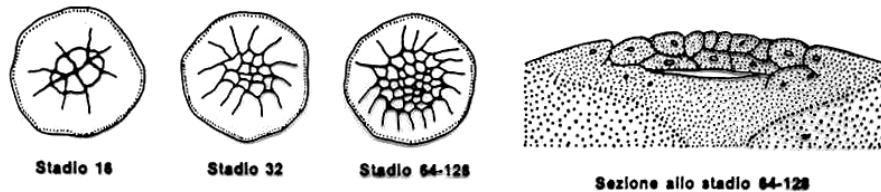
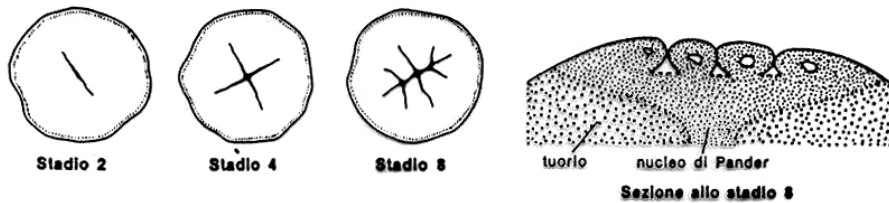
AREA OPACA AREA PELLUCIDA

Aire opaque

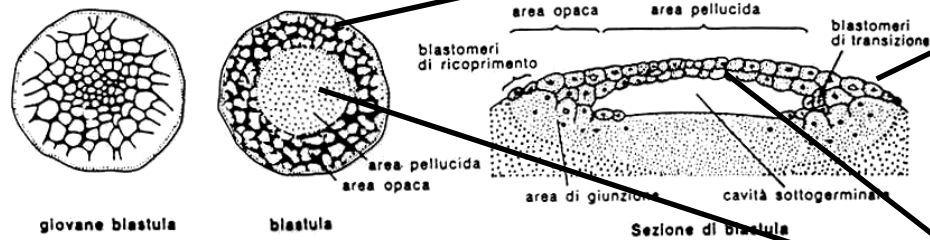
Aire pellucide

ZONA MARGINALE Zona di transizione fra area pellucida e area opaca

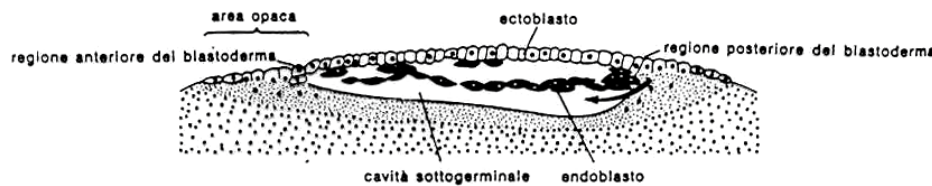




I. SEGMENTAZIONE



II. BLASTULA

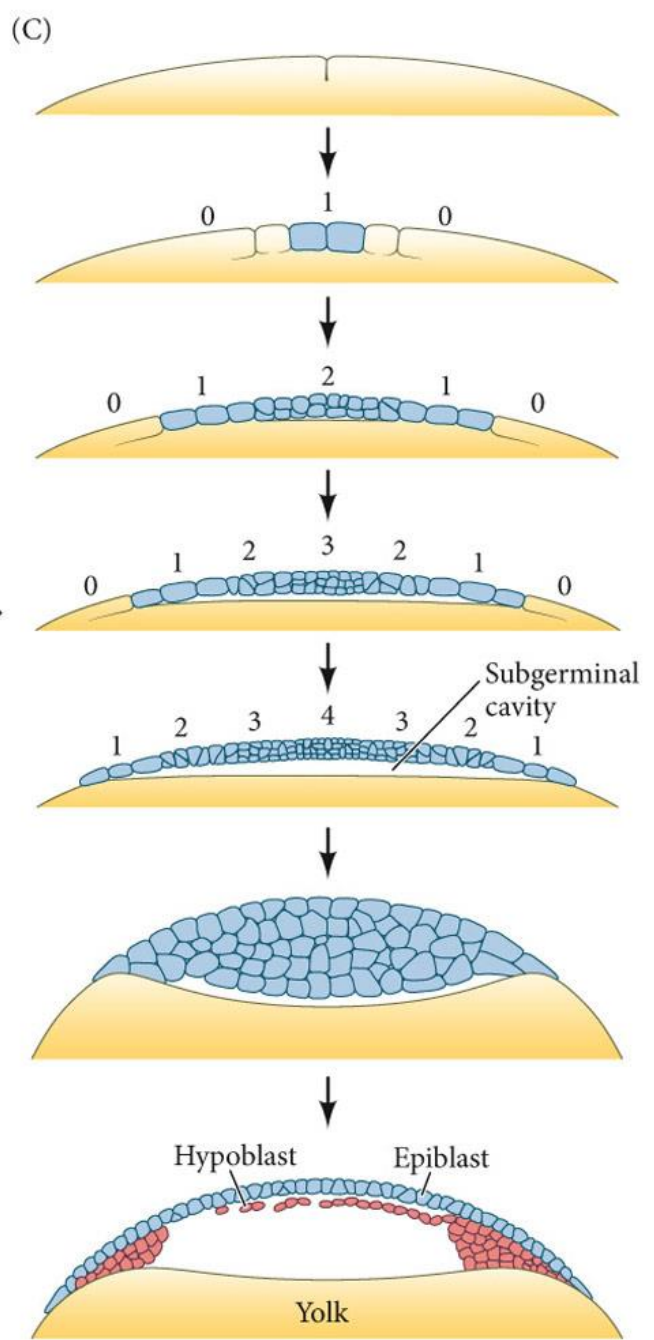
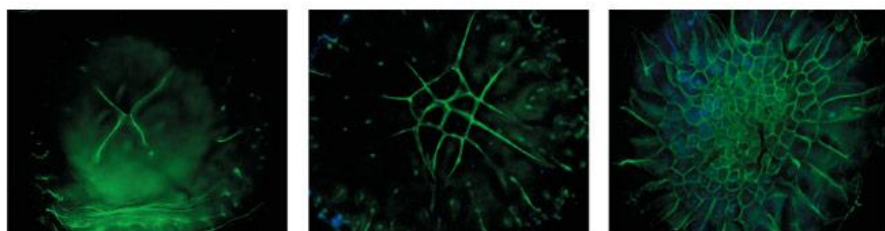
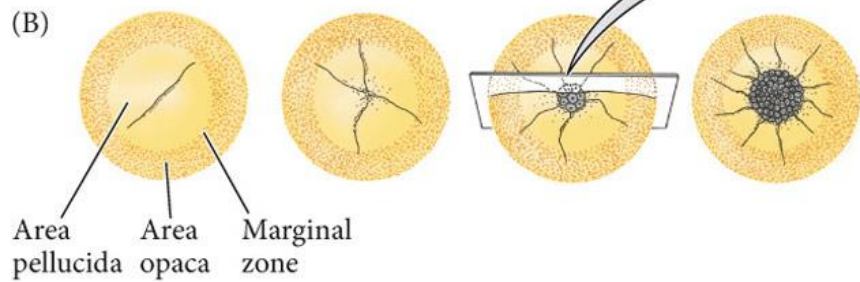
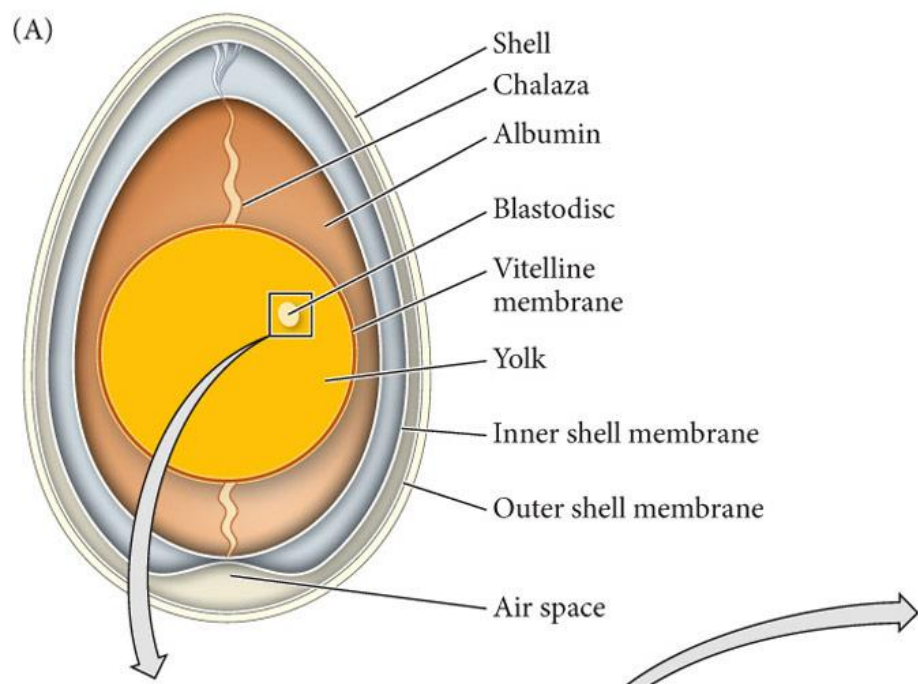


III. FORMAZIONE DELL'ENDOBlasto

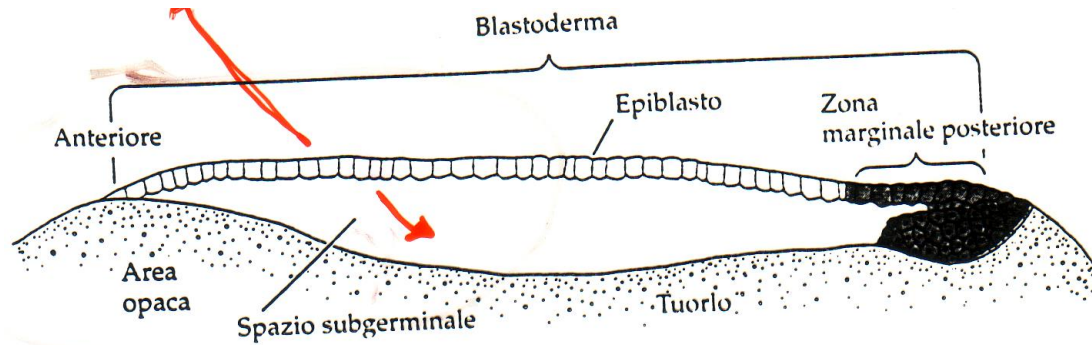
AREA OPACA

AREA PELLUCIDA
(Le cellule degli strati profondi dell'area pellucida muoiono dando origine a un foglietto monostratificato)

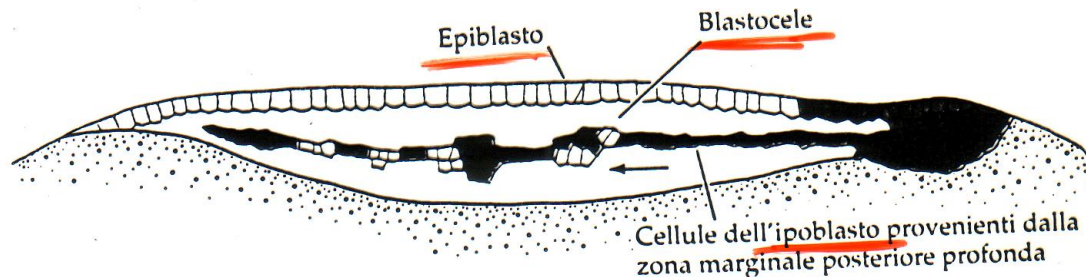
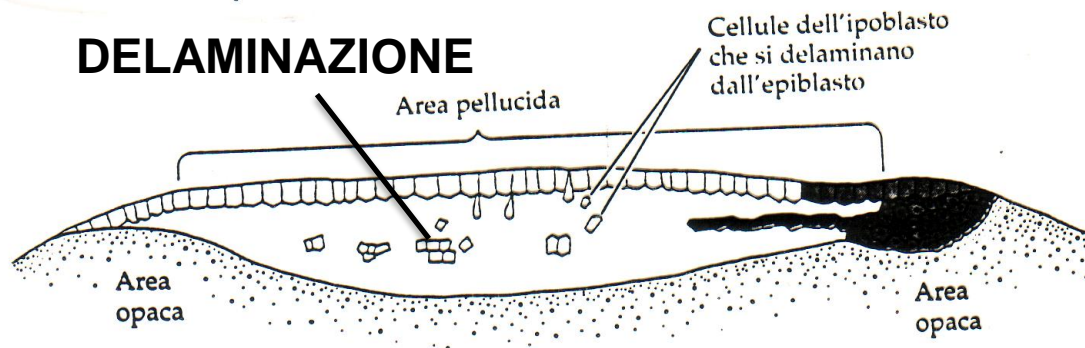
Sviluppo dell'uovo di pollo. I - Segmentazione; la regione della cicatrice è rappresentata in visione dall'alto e in sezione. II - Blastula; compare la differenza fra area opaca e area pellucida. III - Sezione al momento della ovideposizione; la freccia indica il movimento delle cellule che vanno a costituire lo strato endoblastico.



FORMAZIONE DELL'IPOBLASTO



DELAMINAZIONE



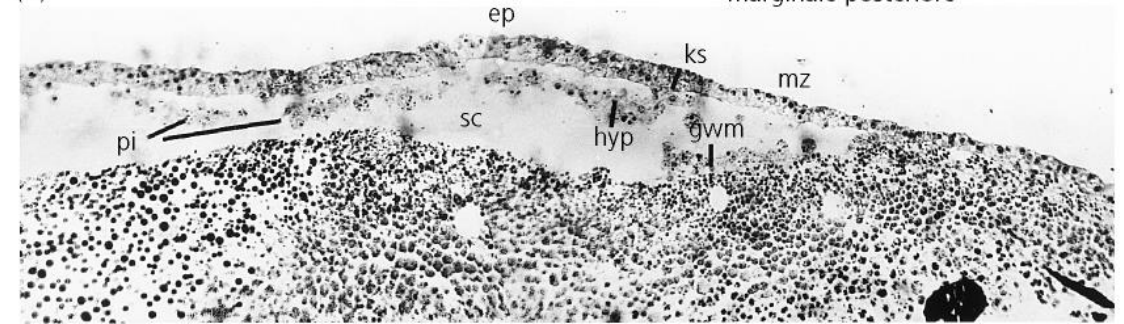
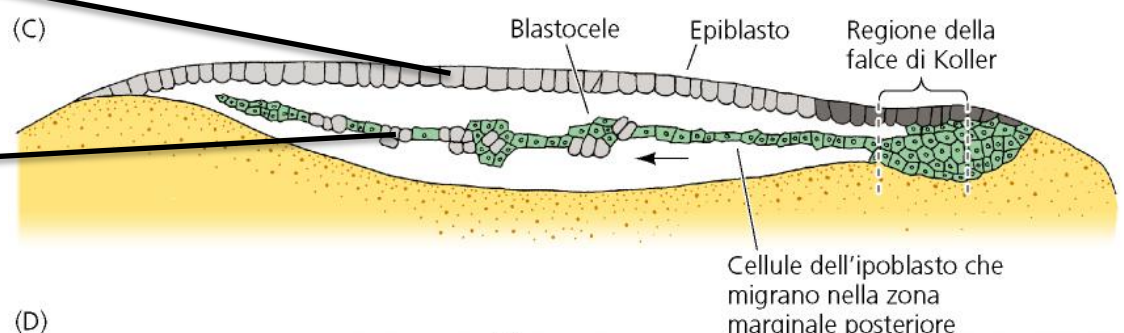
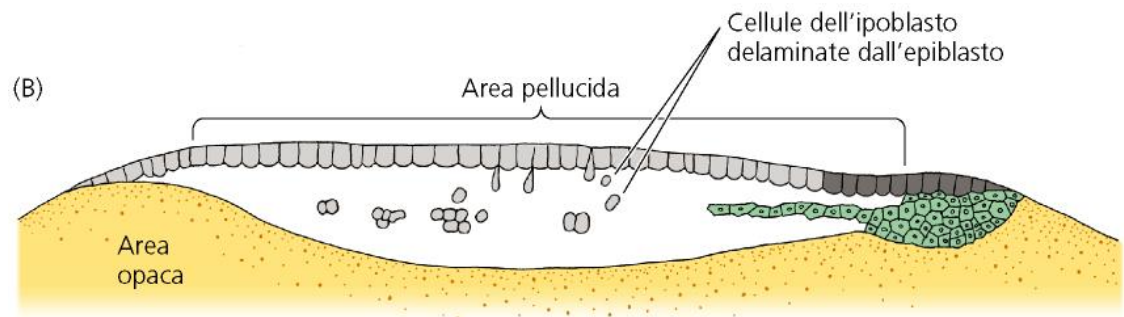
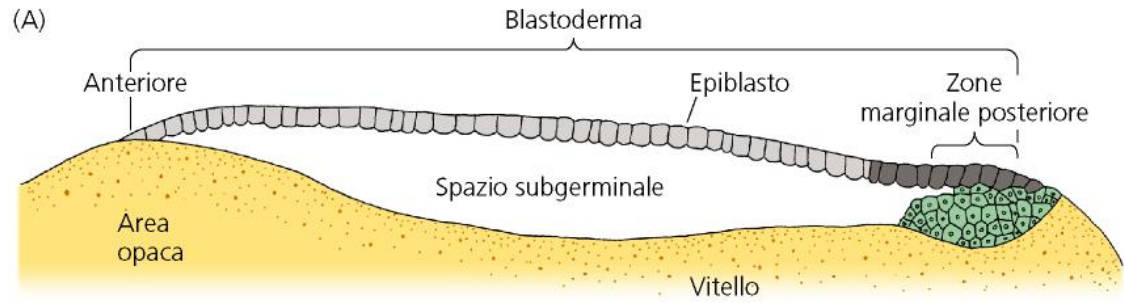
Ipoblasto 1°: delaminazione di cellule dell'epiblasto (isole di poli-invaginazione)

Ipoblasto 2°: migrazione di cellule della zona marginale posteriore (falce di Koller)

FORMAZIONE DEL BLASTODERMA A DUE STRATI (EPIBLASTO E IPOBLASTO)

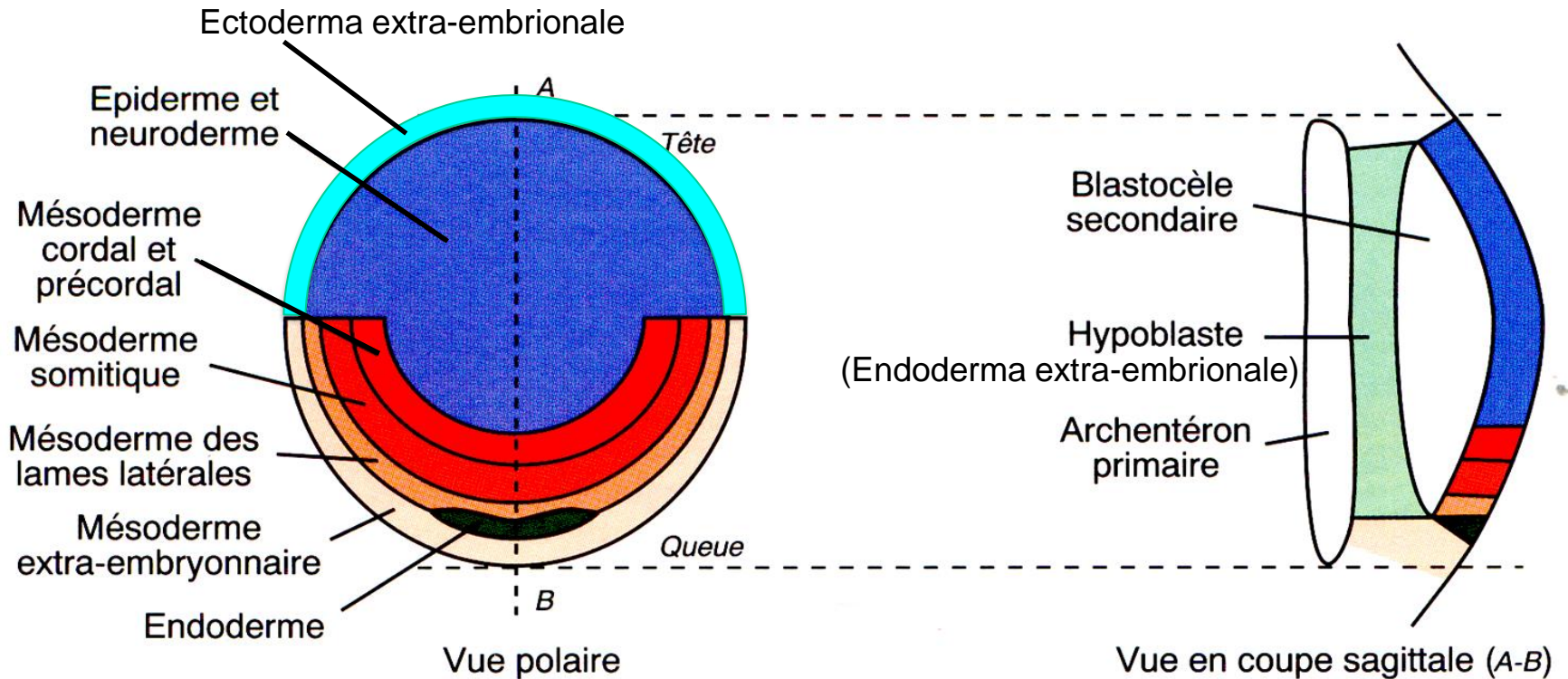
Epiblasto: forma l'embrione e parte degli annessi embionali

Ipoblasto: forma parte degli annessi (sacco vitellino e allantoide)



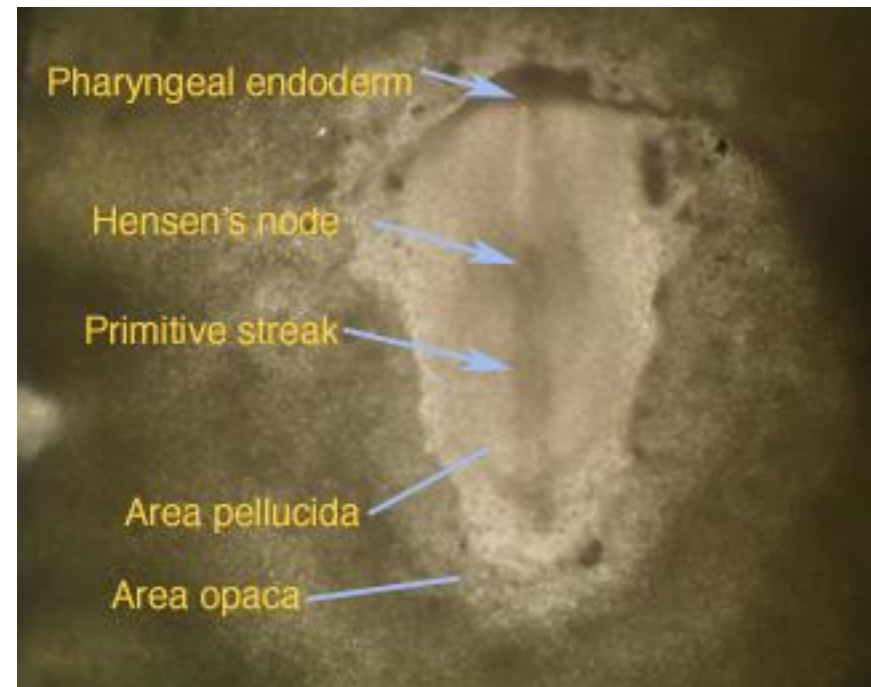
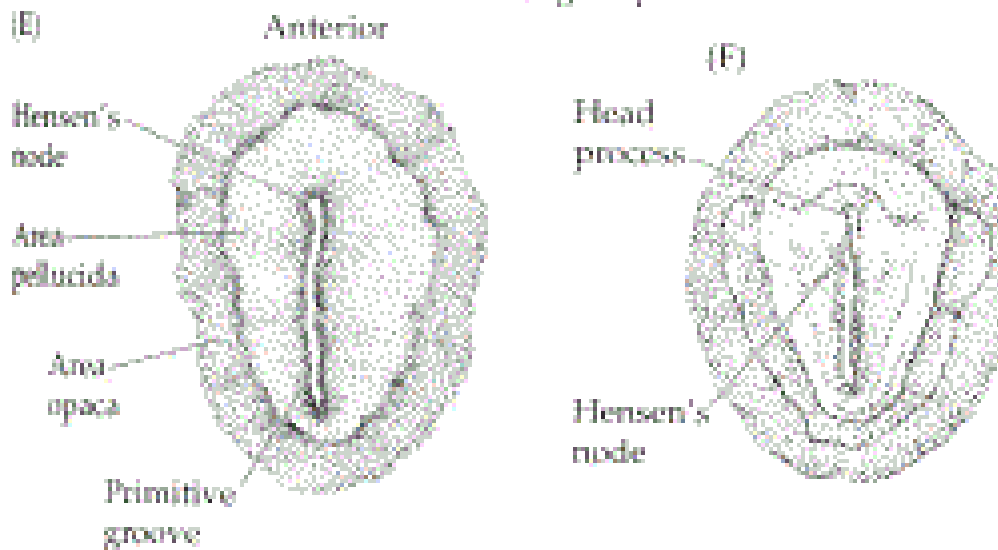
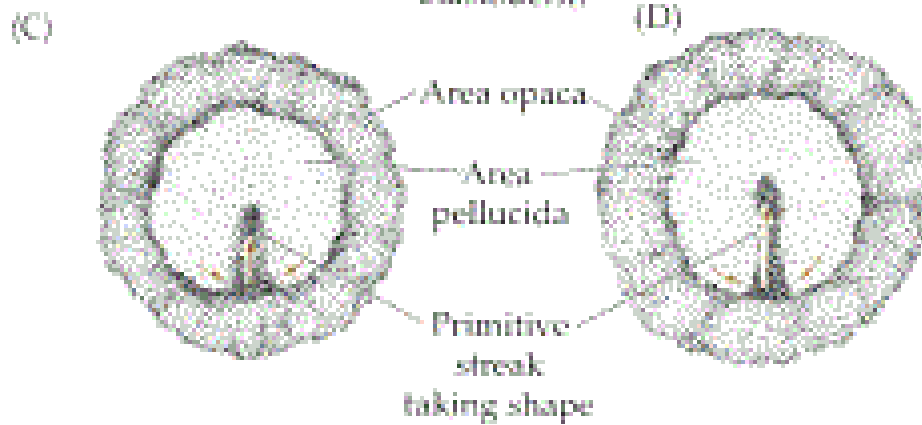
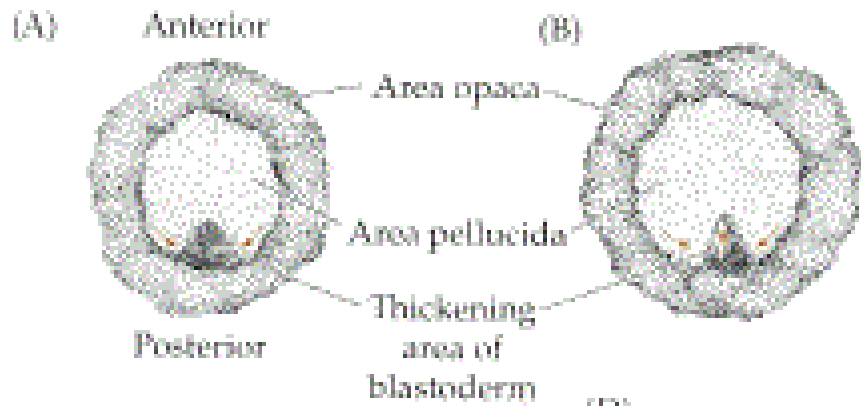
MAPPA DEI TERRITORI PRESUNTIVI NELL'EPIBLASTO DI POLLO

Carte des territoires présomptifs au niveau de l'épiblaste

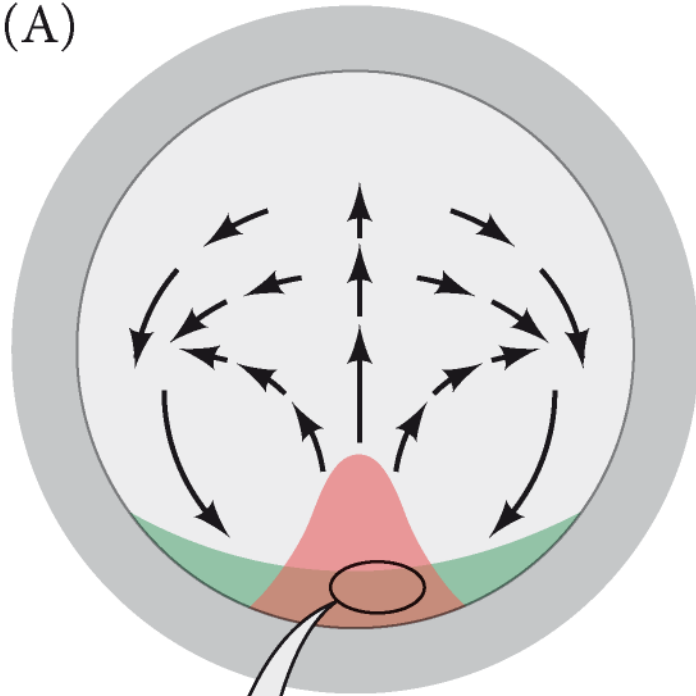


I tre foglietti embrionali (ectoderma, mesoderma ed endoderma) hanno una componente **embrionale** che dà origine ai tessuti dell'embrione ed una componente **extra-embryonale** che dà origine agli annessi

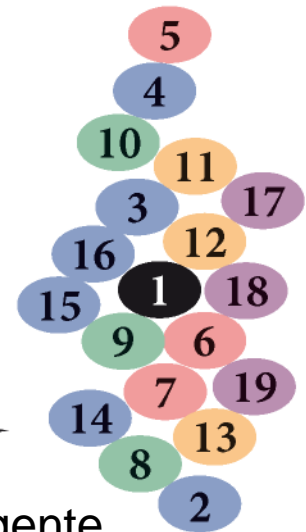
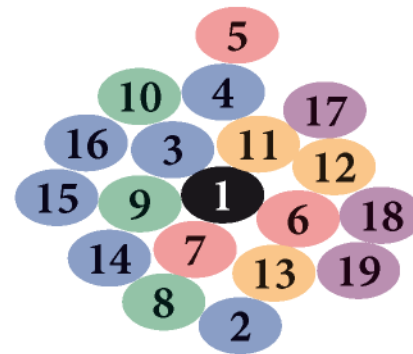
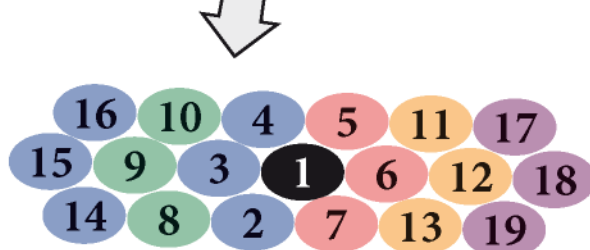
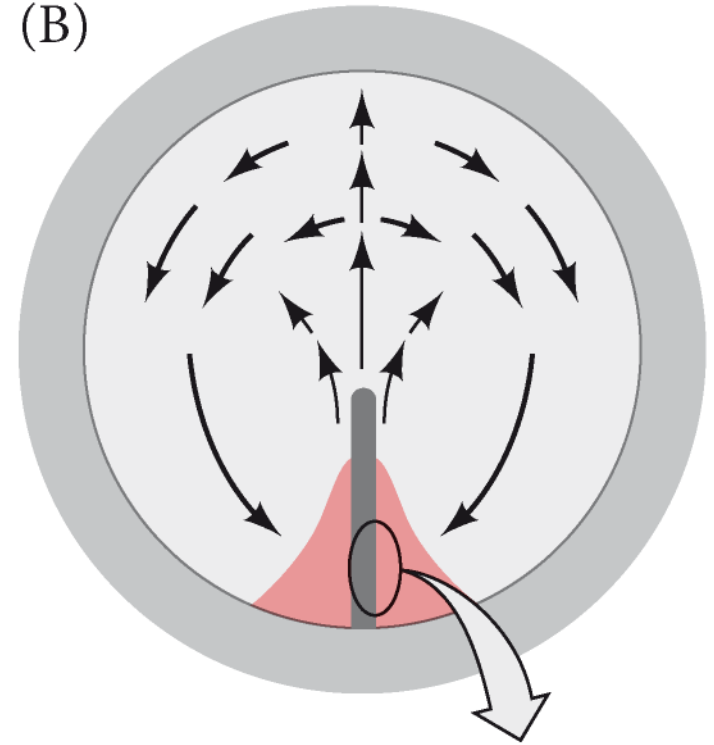
LA FORMAZIONE DELLA STRIA PRIMITIVA SEGNA L'INIZIO DELLA GASTRULAZIONE



(A)



(B)

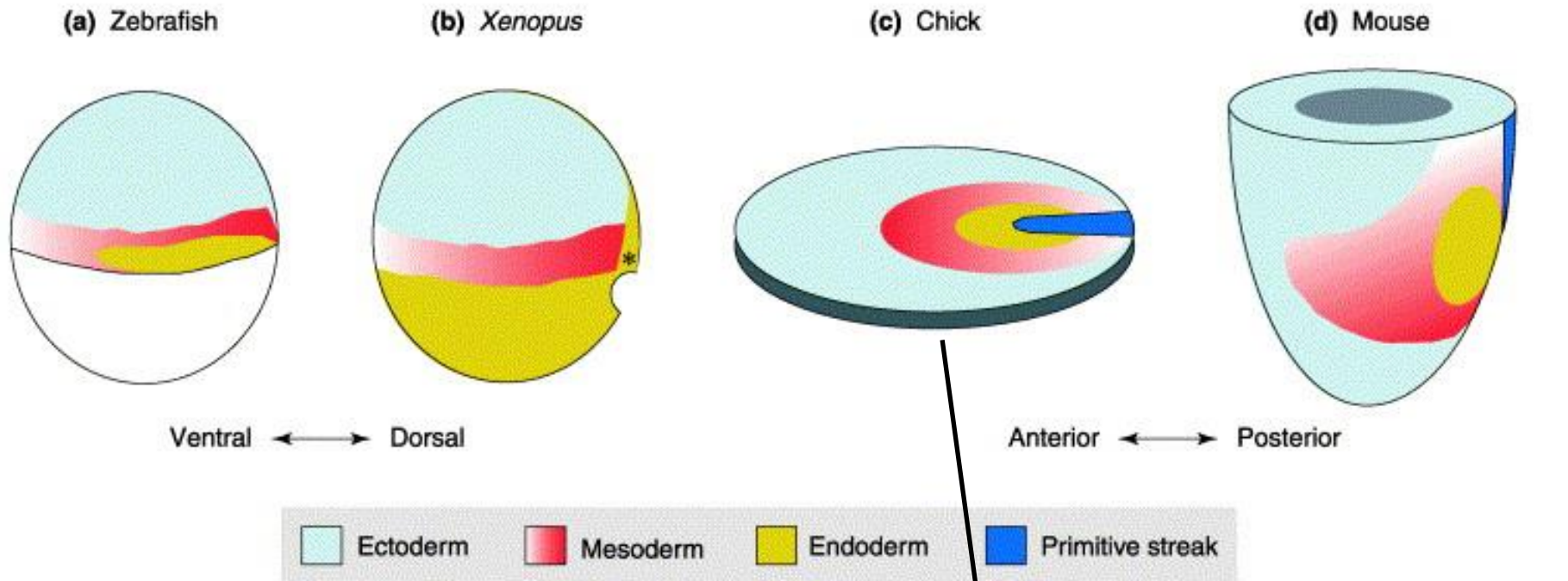


Tempo

L'allungamento della stria primitiva è un processo di estensione convergente promosso da movimenti di intercalazione medio-laterale

CONFRONTO FRA LE MAPPE PRESUNTIVE DI EMBRIONI DI VERTEBRATI ALLO STADIO DI GASTRULA PRECOCE

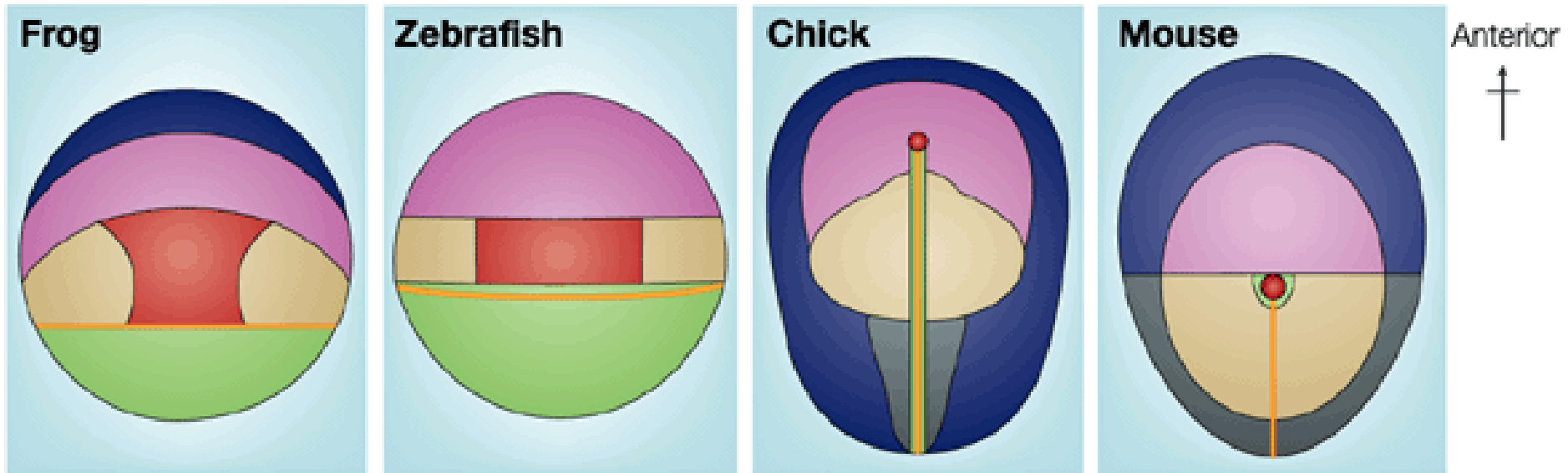
Anche nel pollo il territorio presuntivo del mesoderma embrionale è inizialmente racchiuso fra l'ectoderma e l'endoderma embrionali presuntivi



Current Opinion in Genetics & Development

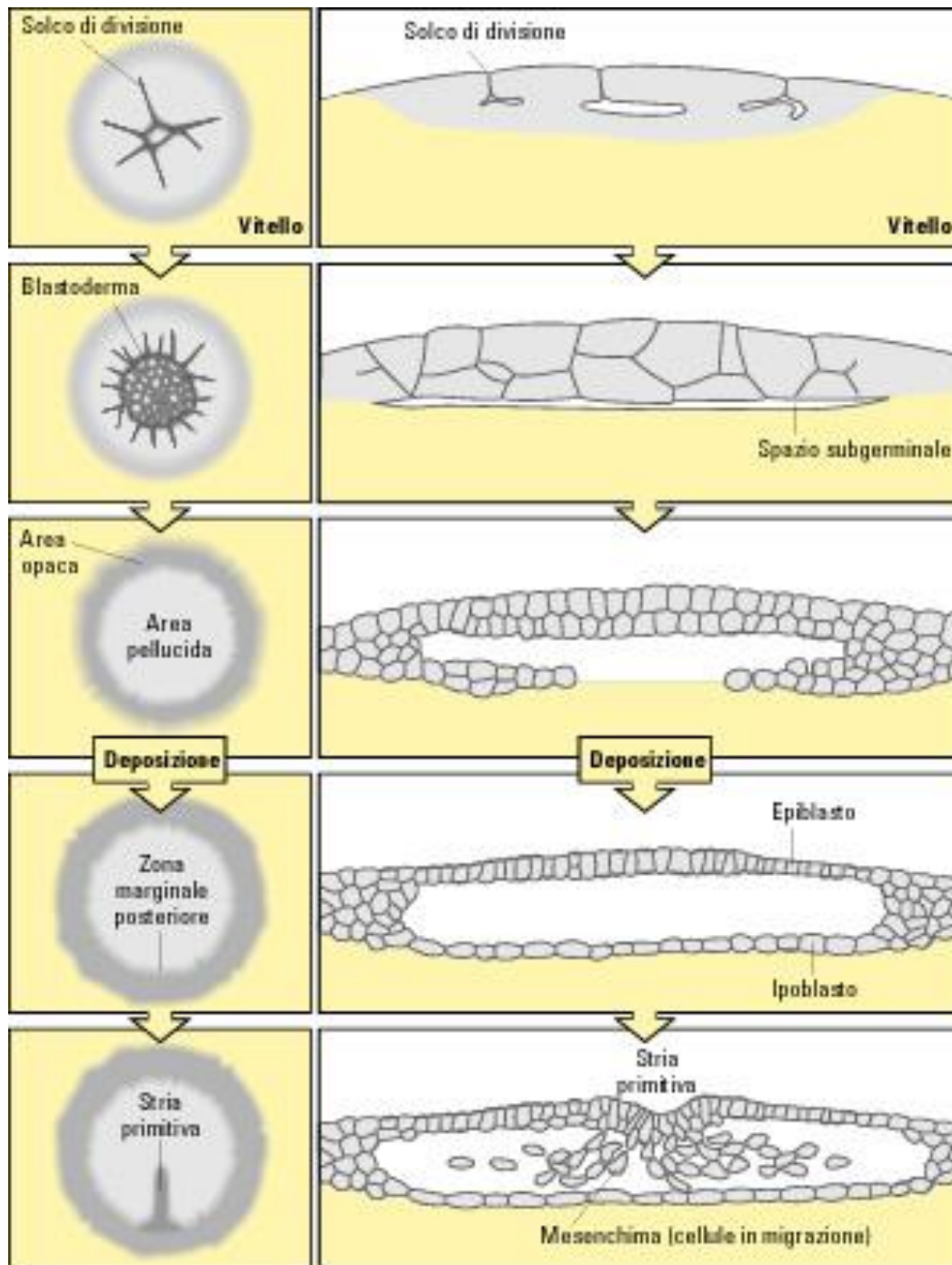
Mappa dei territori presuntivi embrionali all'inizio della formazione della stria primitiva

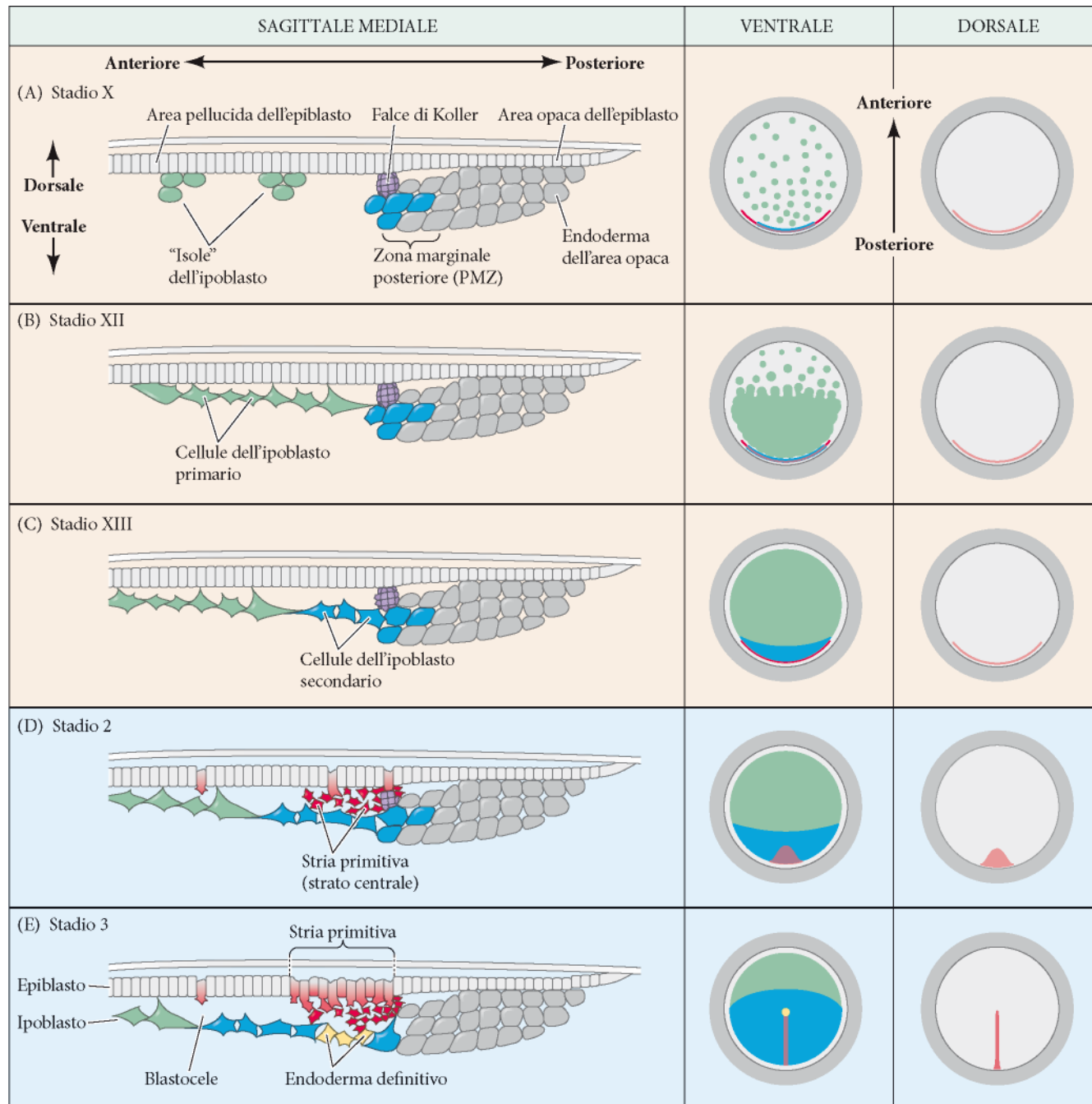
Mapa dei territori presuntivi nell'epiblasto alla fine dell'allungamento della stria primitiva



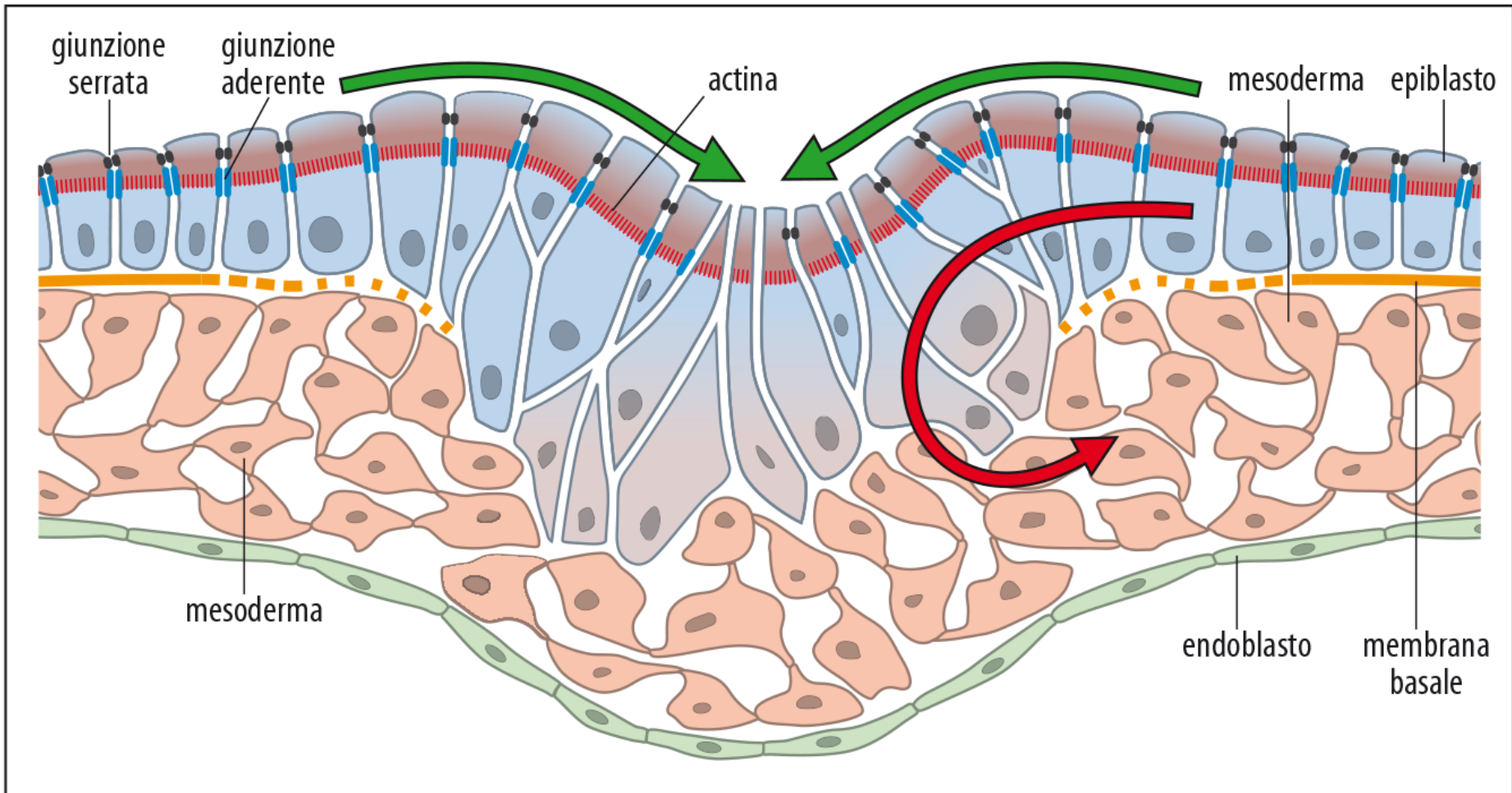
Endoderm	Ectoderm	Neural ectoderm	Notochord
Extra-embryonic mesoderm	Mesoderm	Site of ingression	

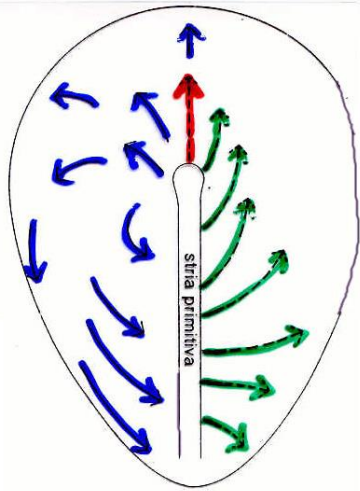
Anche nel pollo il territorio presuntivo del mesoderma cordale è contiguo a quello dell'ectoderma neurale





Il solco al centro della stria si forma per cambiamento di forma delle cellule (cellule a cuneo) dovuto a costrizione apicale. Successivamente le cellule del mesendoderma che si trovano nel solco si internalizzano tramite transizione epitelio-mesenchimatica e movimenti individuali di ingressione.





epiblasto

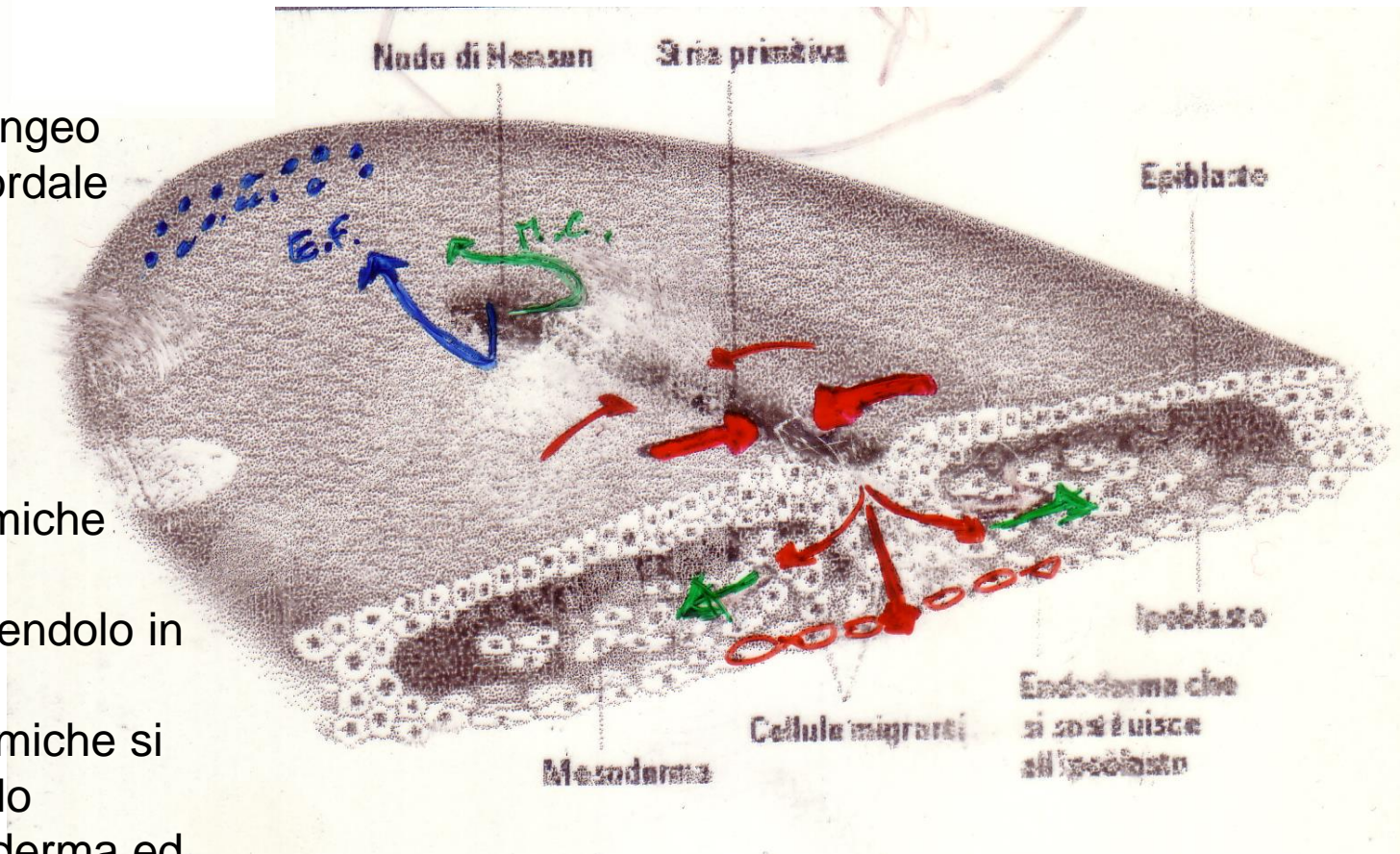
cellule migranti

Stria primitiva ↔ blastoporo

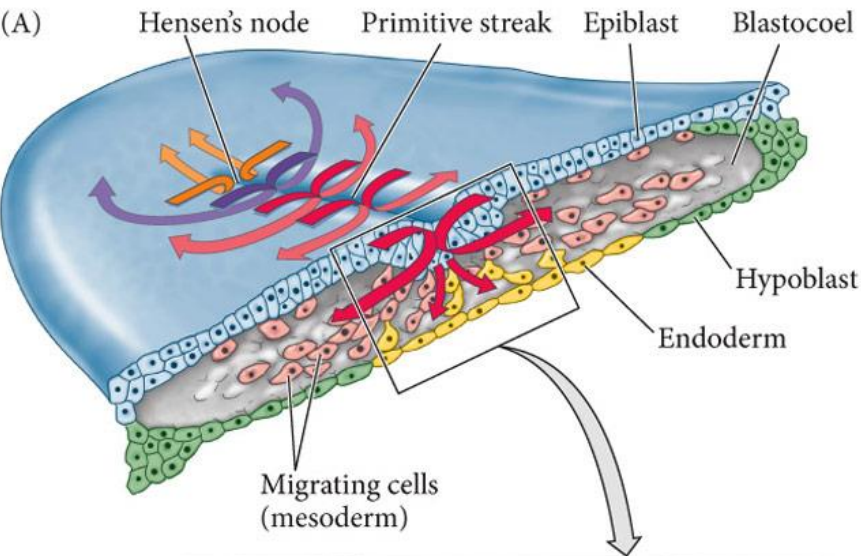
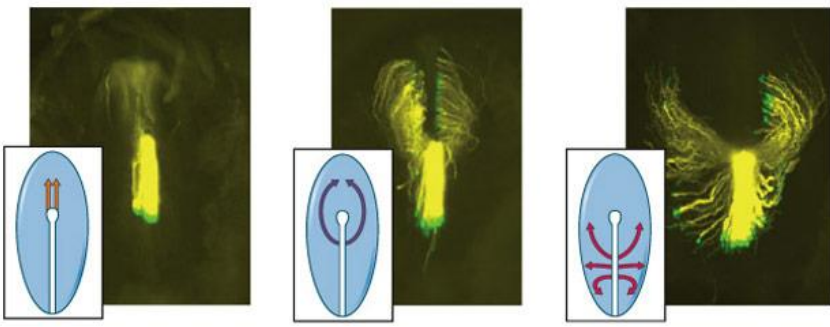
Nodo di Hensen ↔ labbro dorsale blastoporo

EF: endoderma faringeo
MC: mesoderma cordale

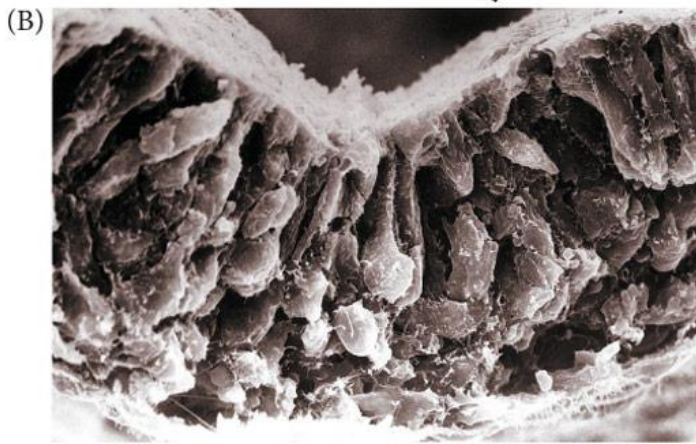
Le cellule endodermiche migrano al livello dell'ipoblasto spingendolo in periferia.
Le cellule mesodermiche si collocano a un livello intermedio fra ectoderma ed endoderma



Le cellule che migrano attraverso porzioni diverse della stria primitiva vanno incontro a destini diversi

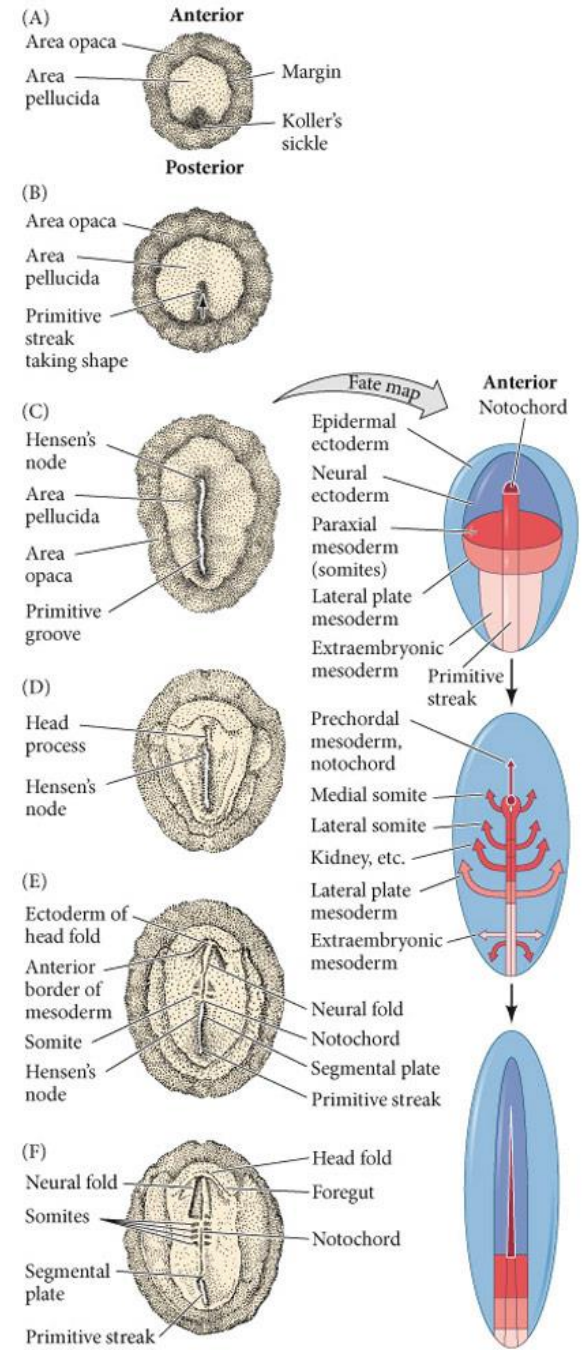
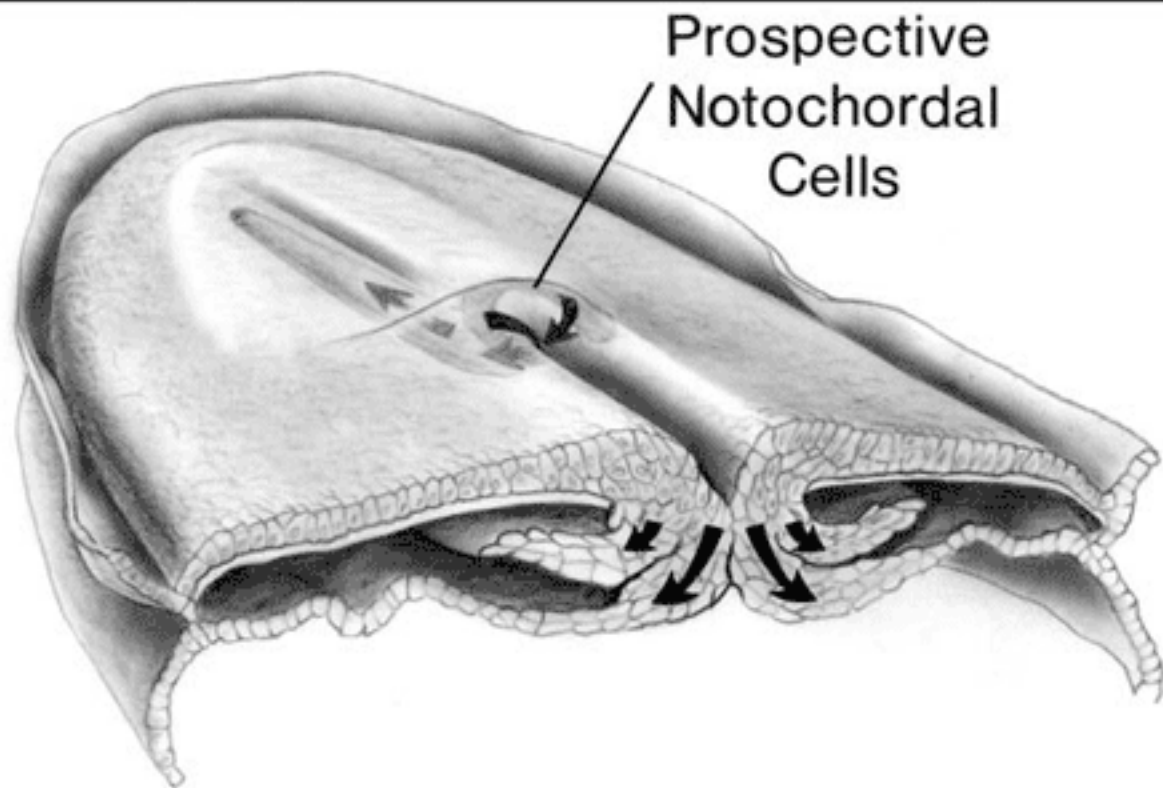
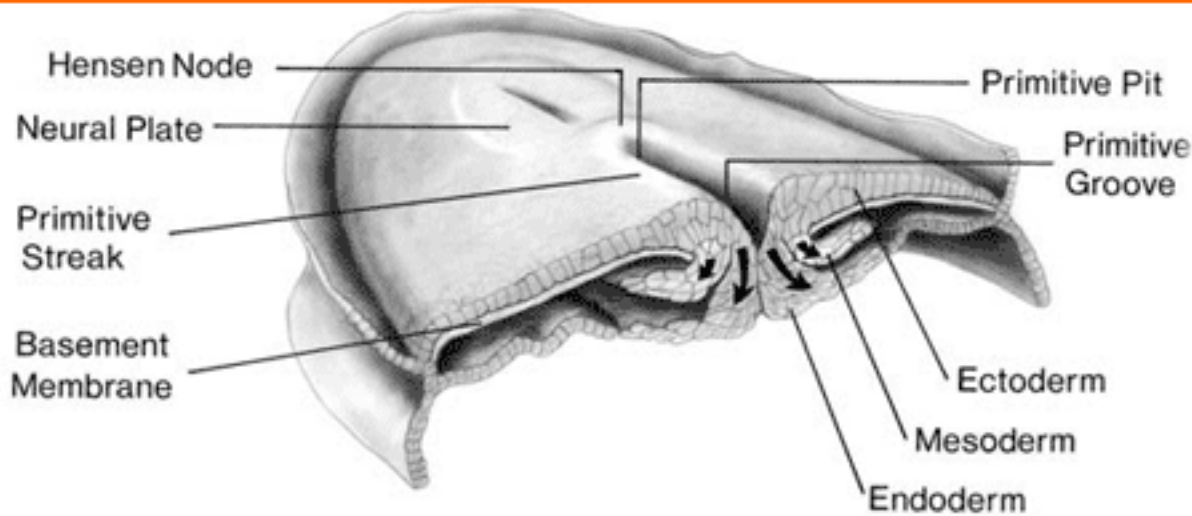


Cellule che migrano attraverso la stria formano: cellule mesodermiche (mesoderma latero ventrale, extraembrionale, quest'ultimo attraverso la regione posteriore della stria), endoderma embrionale (l'endoderma extraembrionale si forma dall'ipoblasto).

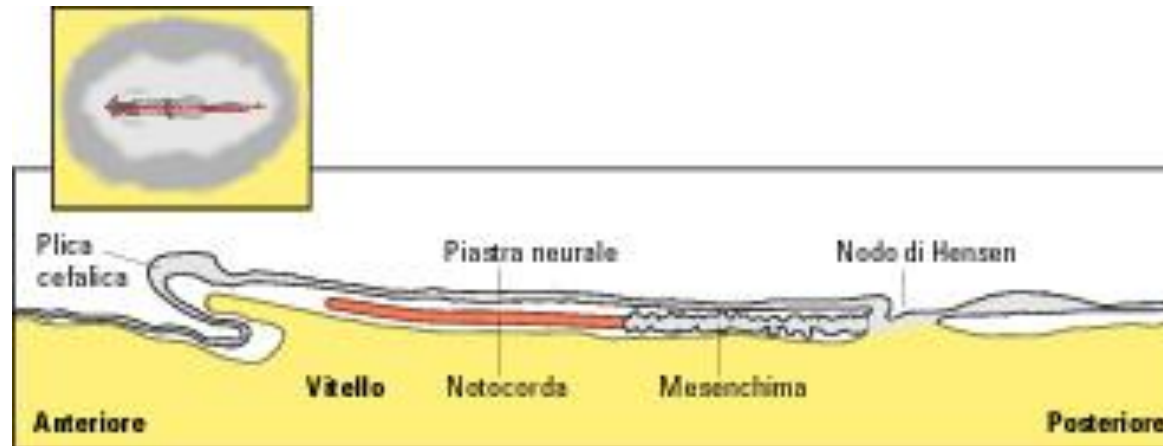
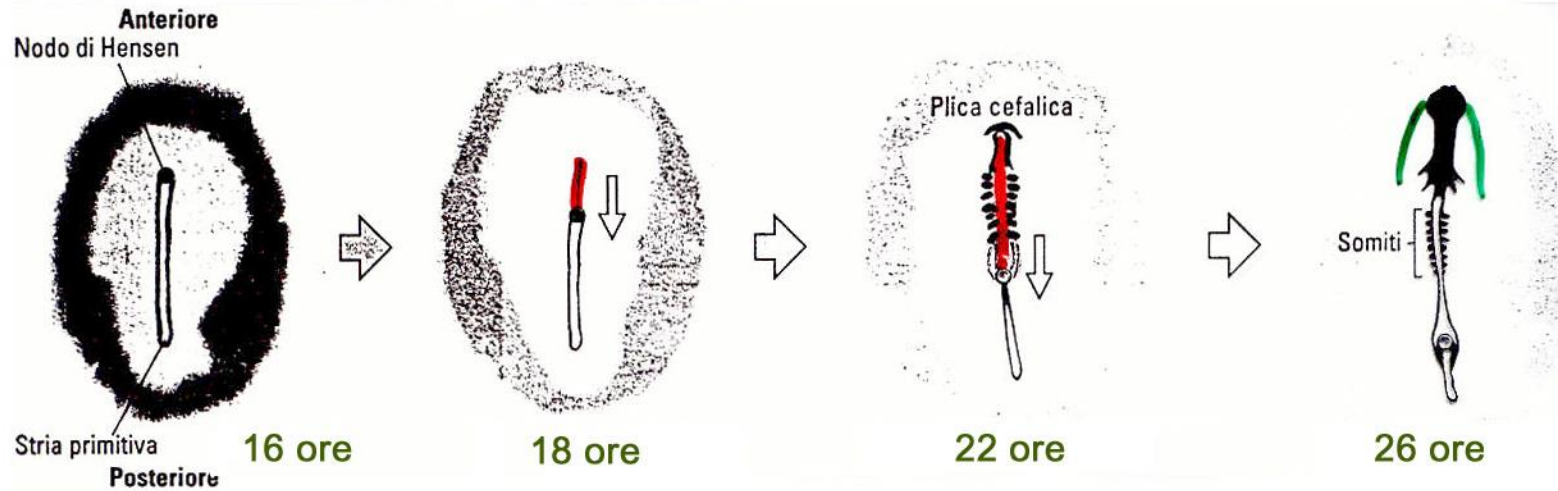


Cellule che entrano attraverso il nodo di Hensen formano: endoderma faringeo, mesoderma cefalico, mesoderma dorsale (notocorda, somiti).

La stria primitiva e' costituita da popolazioni cellulari in continuo cambiamento.

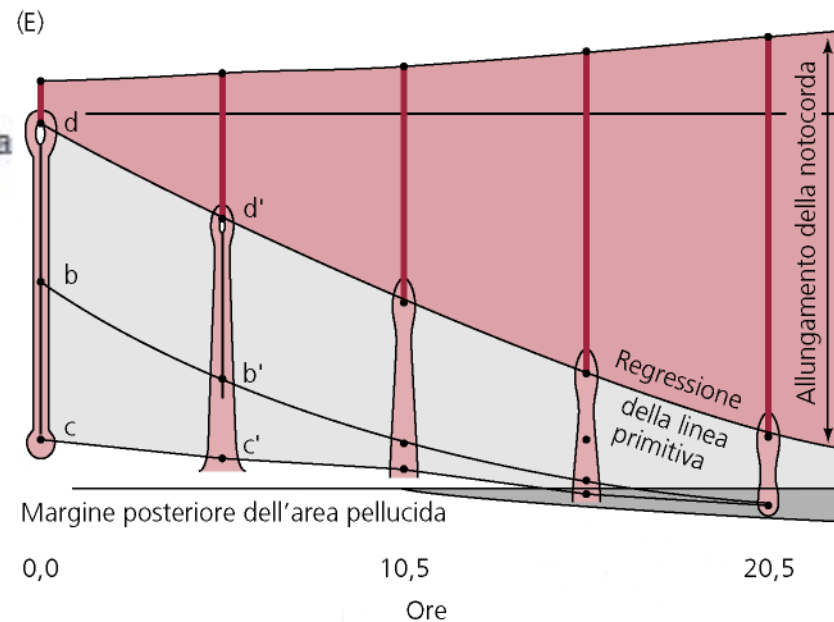
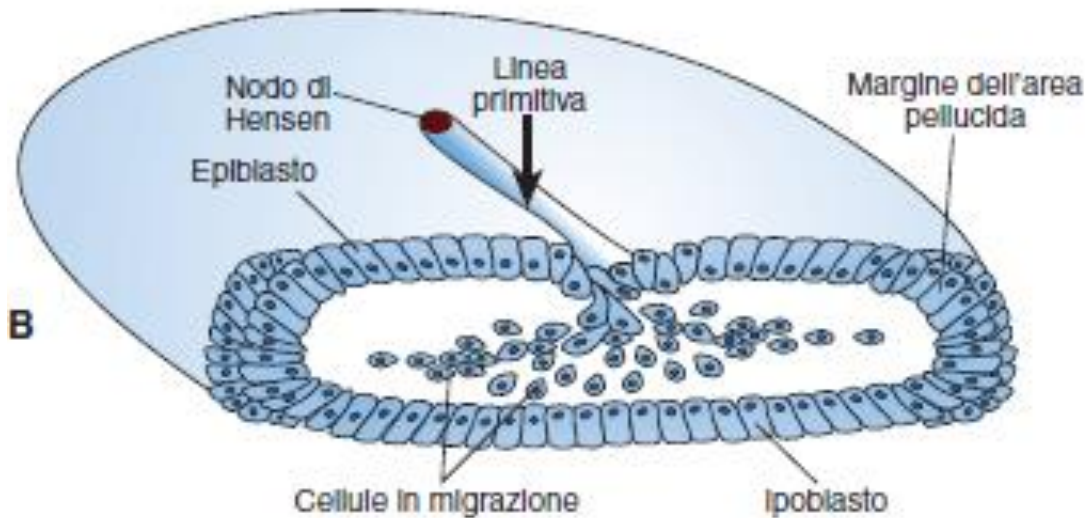
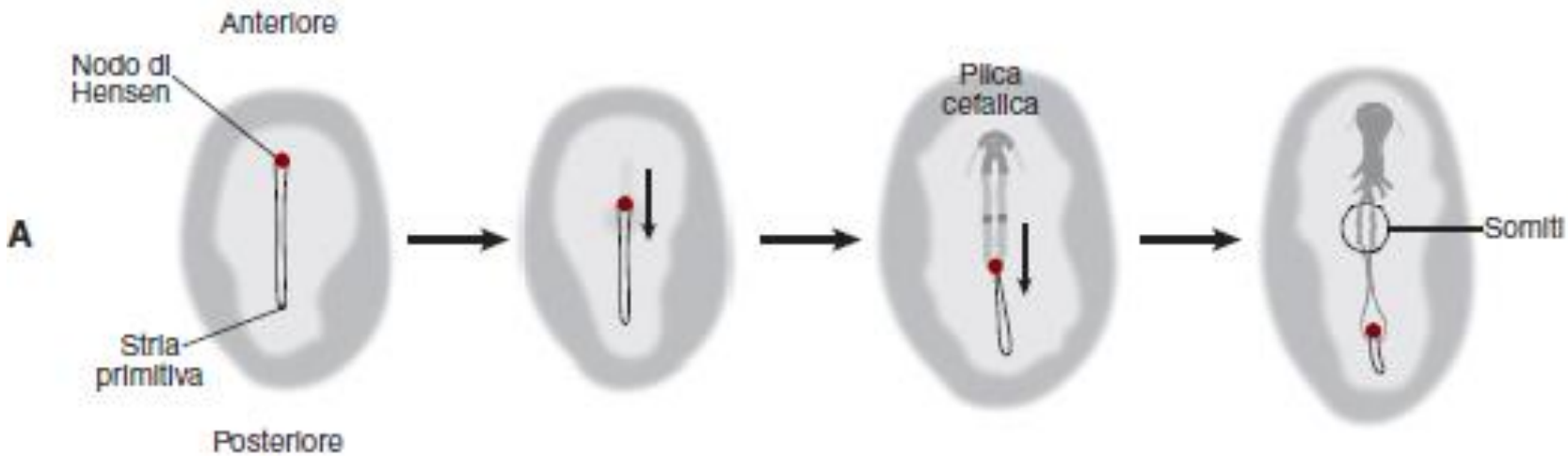


NELLE FASI TARDIVE DELLA GASTRULAZIONE SI VERIFICA LA REGRESSIONE DELLA STRIA PRIMITIVA

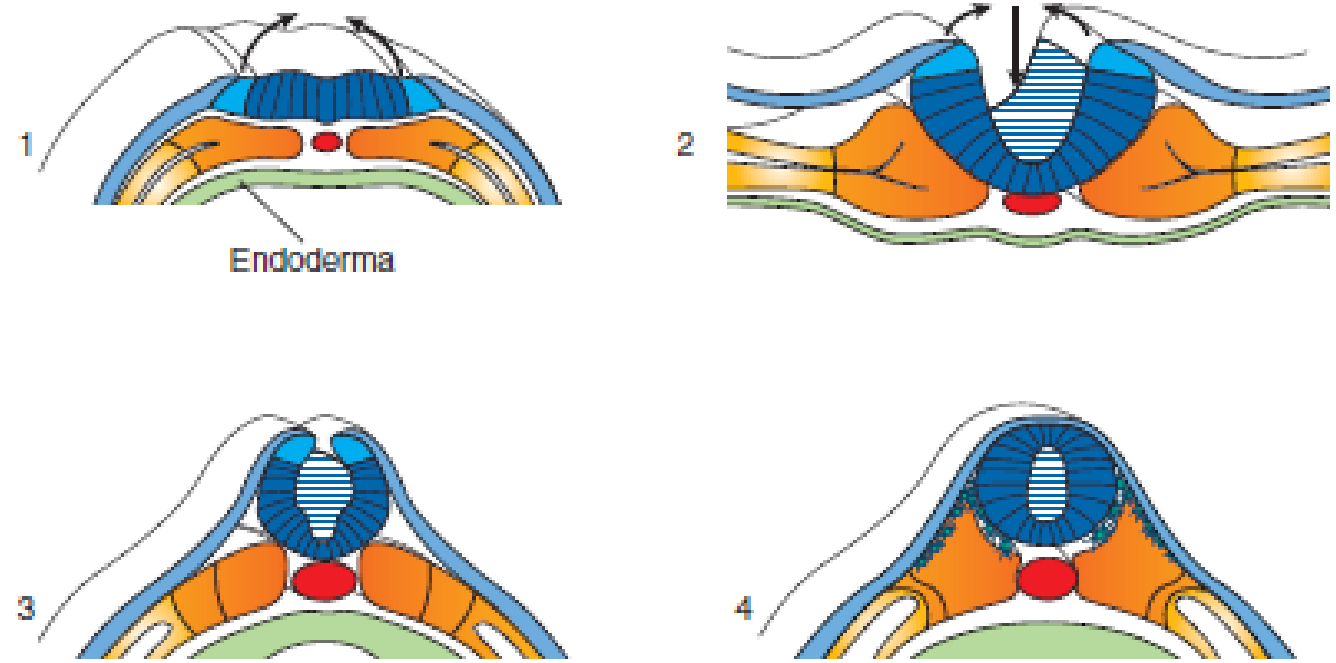
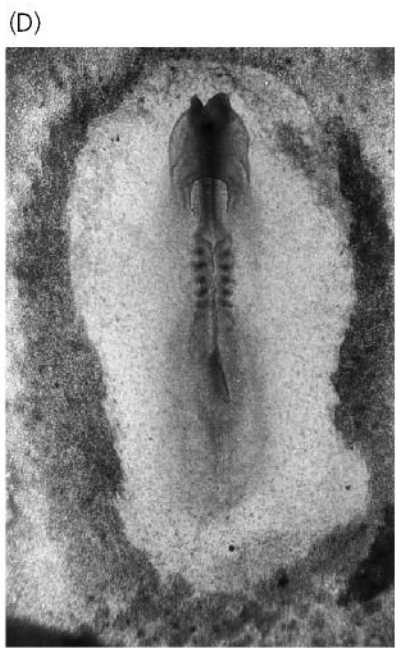
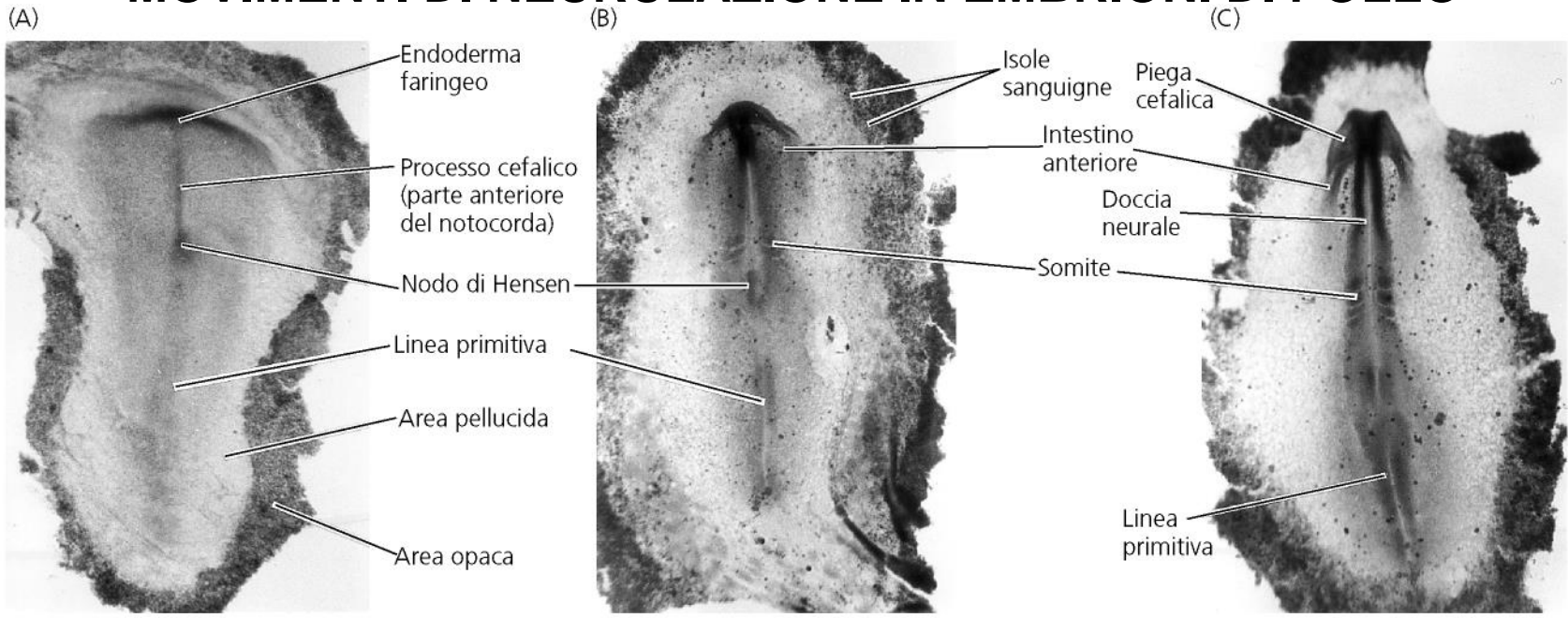


Dalla regressione del nodo di Hensen, si ha la deposizione del materiale del cordomesoderma

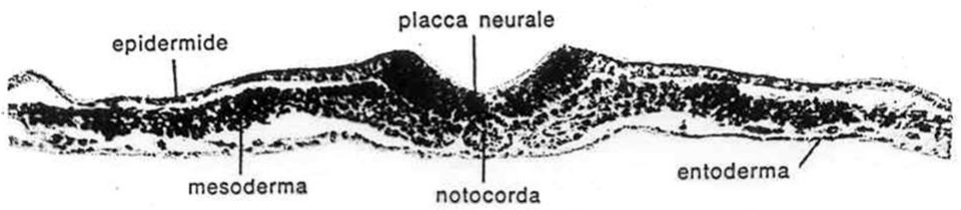
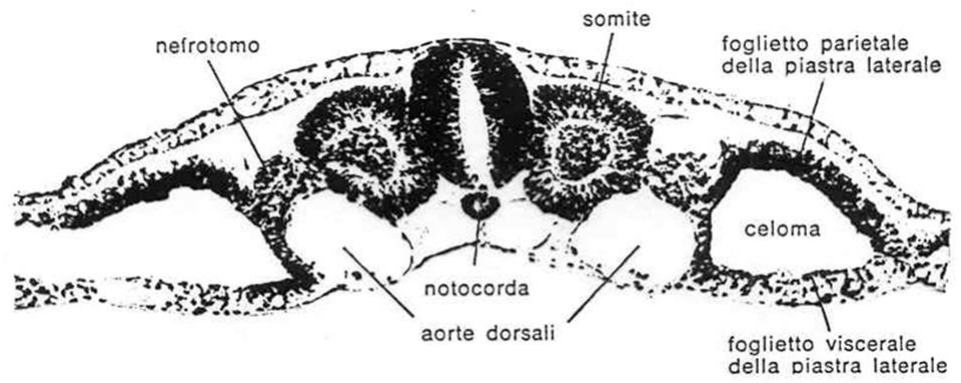
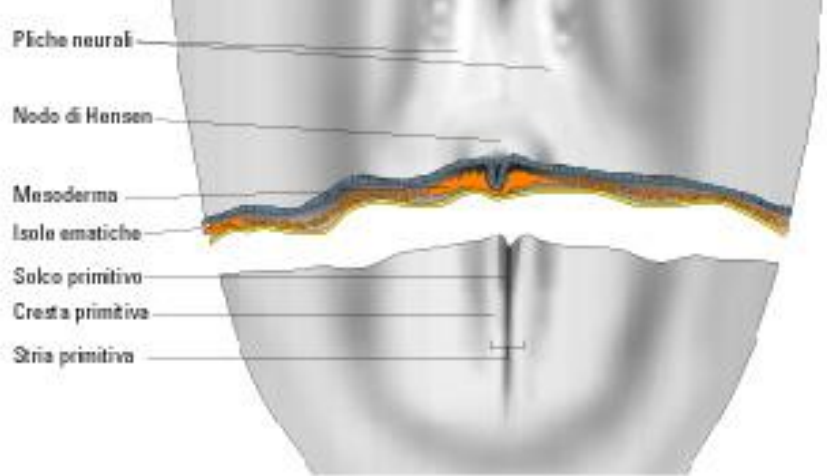
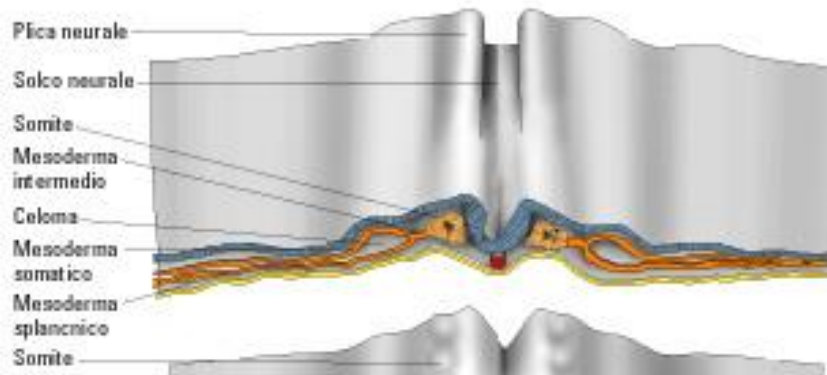
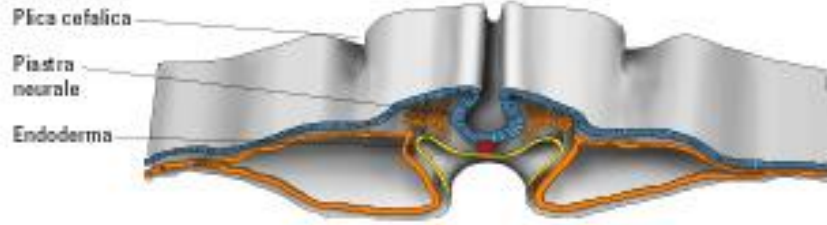
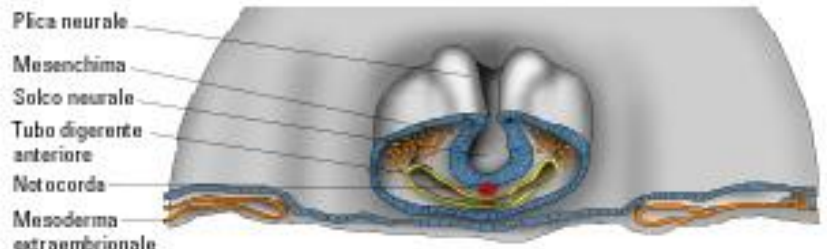
La regressione del nodo di Hensen nelle regioni caudali è accompagnata dall'inizio della neurulazione nelle regioni cefaliche



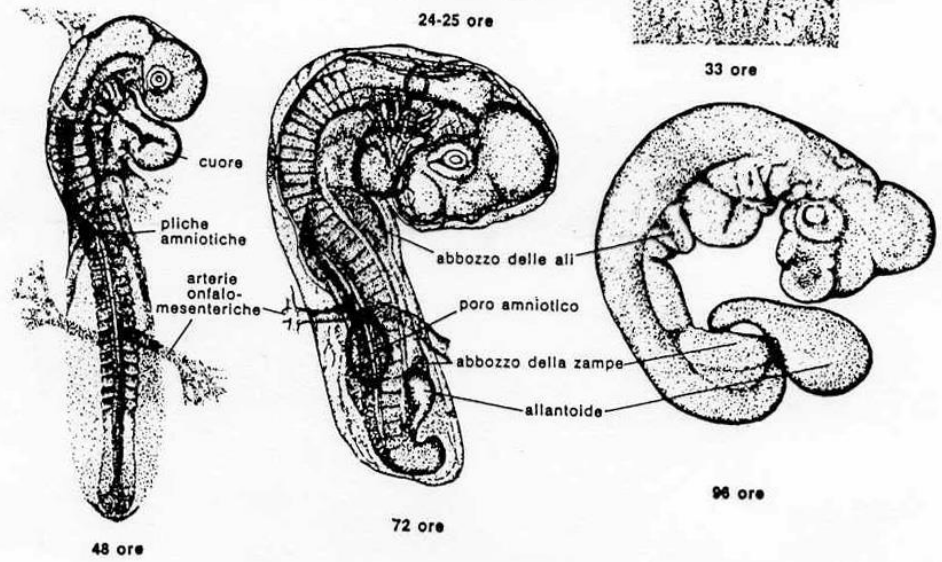
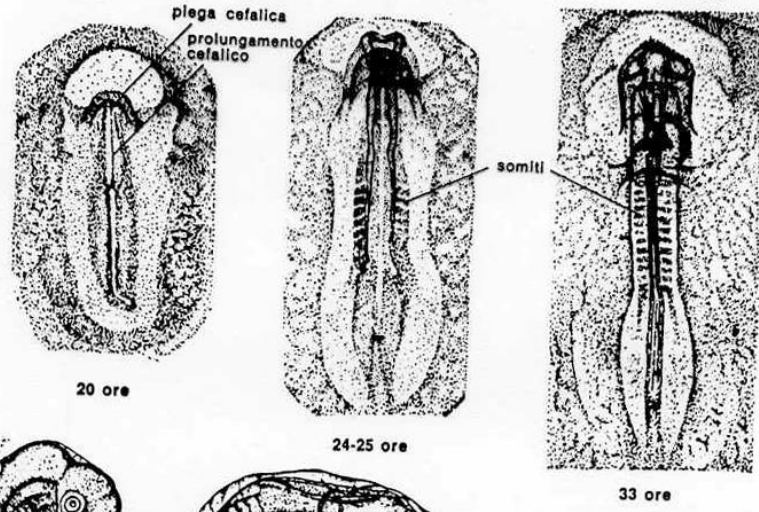
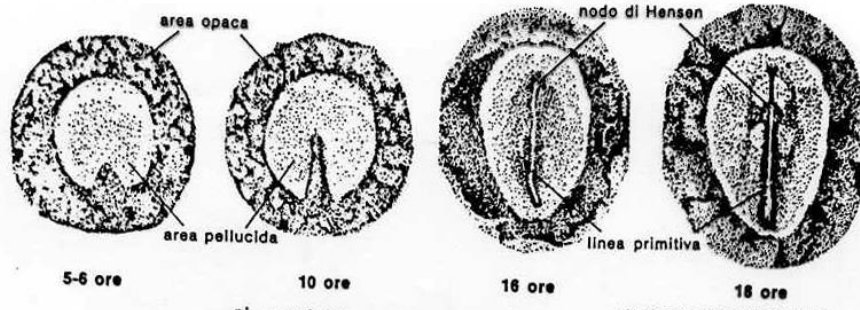
MOVIMENTI DI NEURULAZIONE IN EMBRIONI DI POLLO



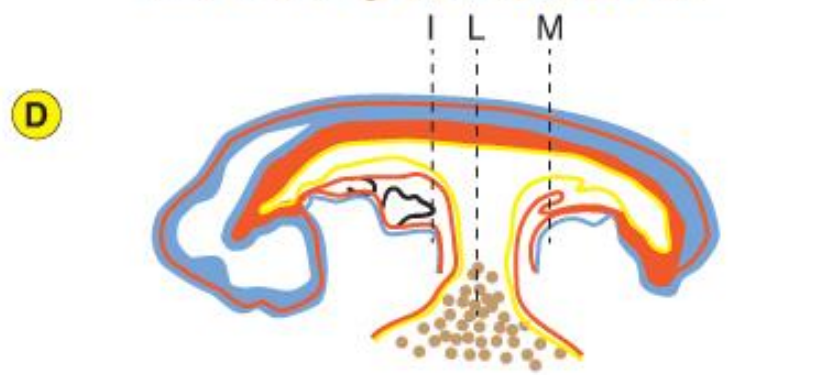
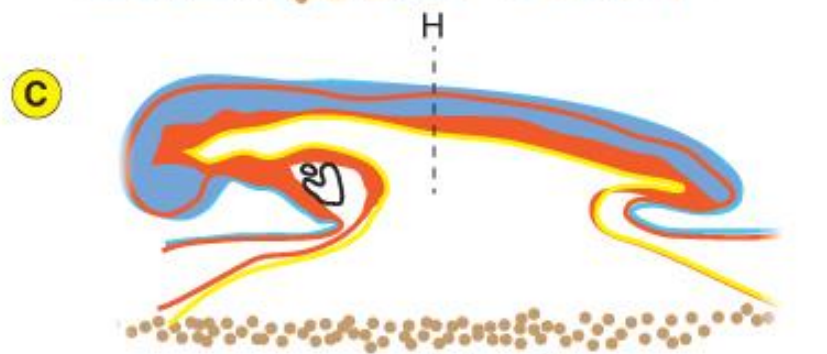
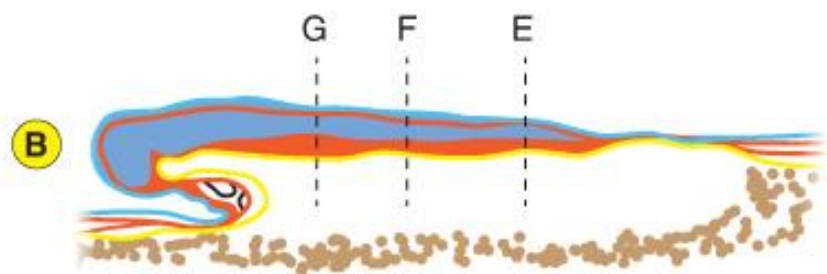
I MOVIMENTI DI GASTRULAZIONE E NEURULAZIONE AVVENGONO A TEMPI DIVERSI LUNGO L'ASSE ANTERO-POSTERIORE

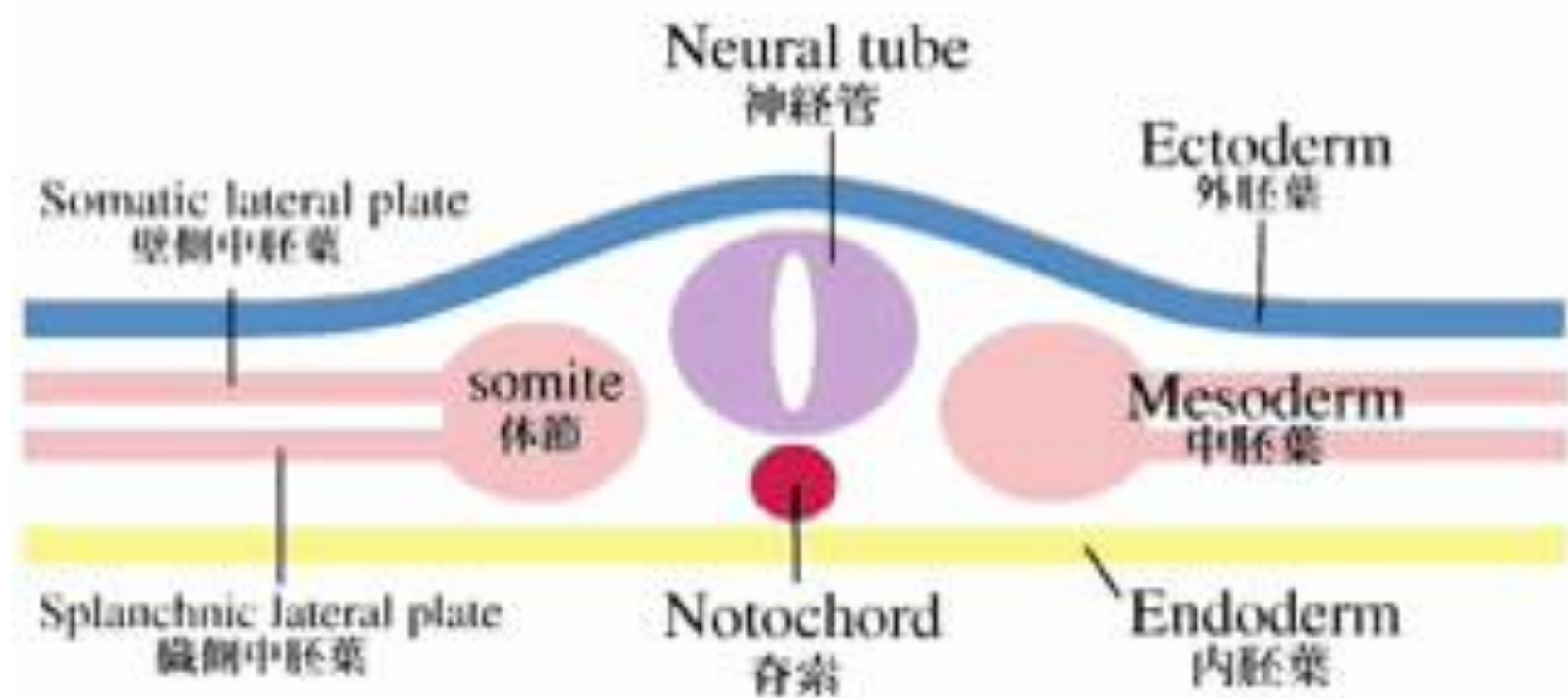






Principali stadi di sviluppo dell'uovo di pollo nei primi giorni di incubazione. Nello stadio a 96 ore l'embrione è stato liberato dall'amnios.





Annessi embrionali

- Lo sviluppo embrionale in ambiente terrestre ha determinato la comparsa di strutture che consentono di proteggere e nutrire l'embrione

FUNZIONI

Prevenire disidratazione: Amnios

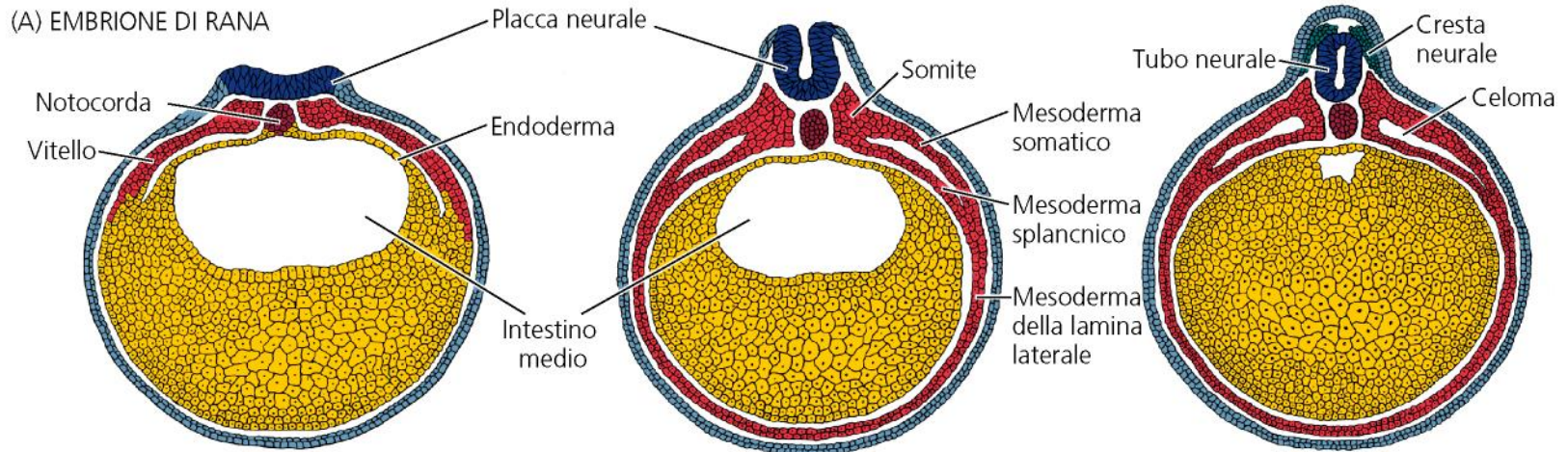
Permettere scambi gassosi: Corion e Allantoide

Eliminare scorie metaboliche: Allantoide

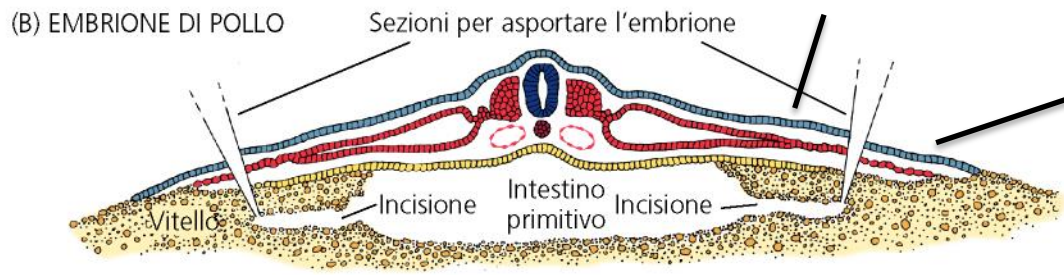
Assorbimento dei nutrienti del tuorlo: Sacco del tuorlo

Cellule dell'Amnios producono il liquido amniotico che fornisce un ambiente acquoso per lo sviluppo

Nutrienti del tuorlo sono digeriti da cellule endodermiche del sacco del tuorlo e trasportati tramite vascolatura del sacco del tuorlo

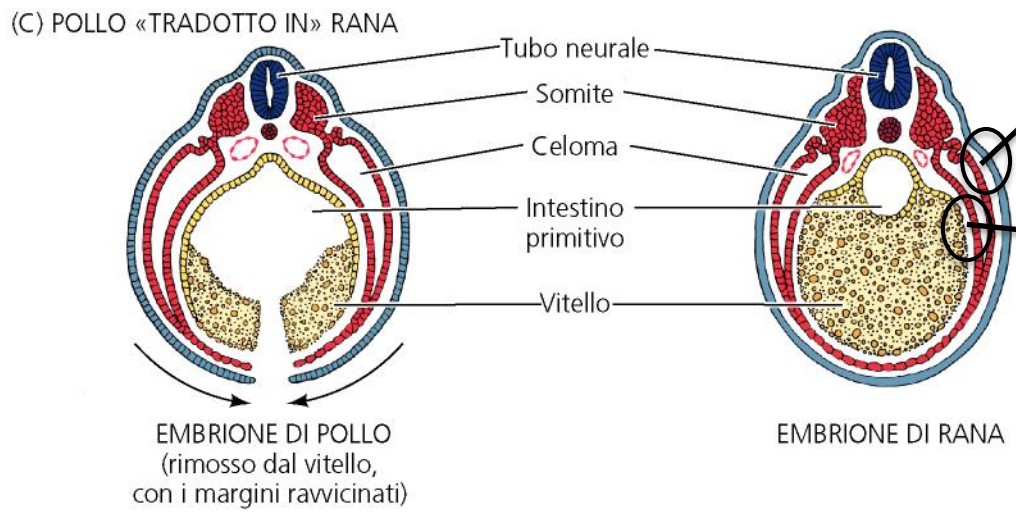


Territori embrionali



Territori extra-embryionali

- Somatopleura
- Ectoderma
- Mesoderma somatico



- Splancnopleura
- Endoderma
- Mesoderma splancnico

ANNESI EMBRIONALI

Componente ectodermica o endodermica fornisce tessuti epiteliali

Componente mesodermica fornisce la vascolatura

CORION → Funzione: scambi gassosi, protezione, riassorbimento del calcio
Membrane: Somatopleura extra-embrionale
(ectoderma extra-embr. + mesod. somatico extra-embr.)

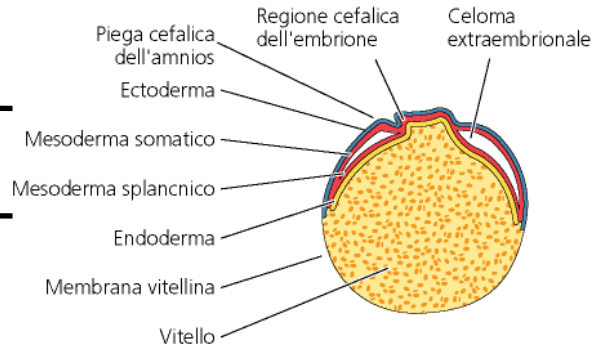
AMNIOS → Funzione: Impedire disidratazione e attutire gli urti
Membrane: Somatopleura extra-embrionale
(ectoderma extra-embr. + mesod. somatico extra-embr.)

ALLANTOIDE → Funzione: Assorbimento materiali di rifiuto
Membrane: Splancnopleura extra-embrionale
(ipoblasto + mesod. splancnico extra-embr.)

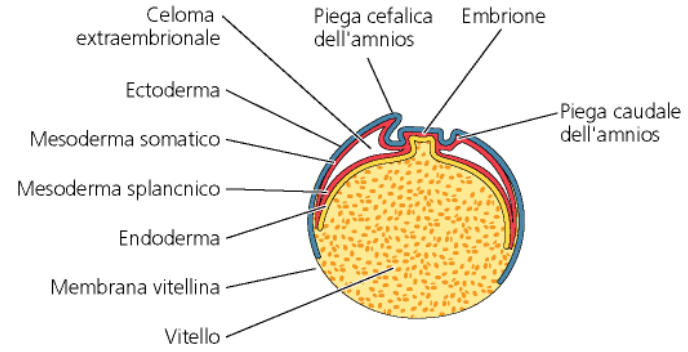
SACCO DEL TUORLO → Funzione: Avvolgimento e Assorbimento del tuorlo
Membrane: Splancnopleura extra-embrionale
(ipoblasto + mesod. splancnico extra-embr.)

Porzione
extra-emb.

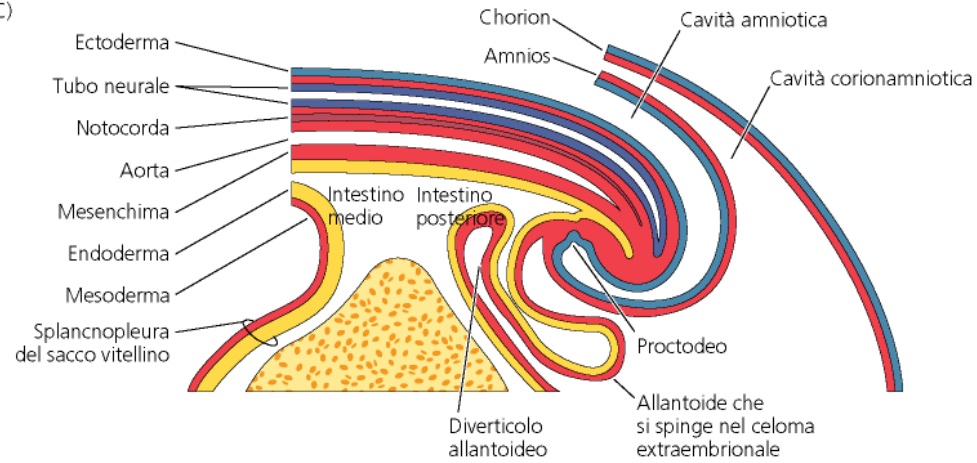
(A)



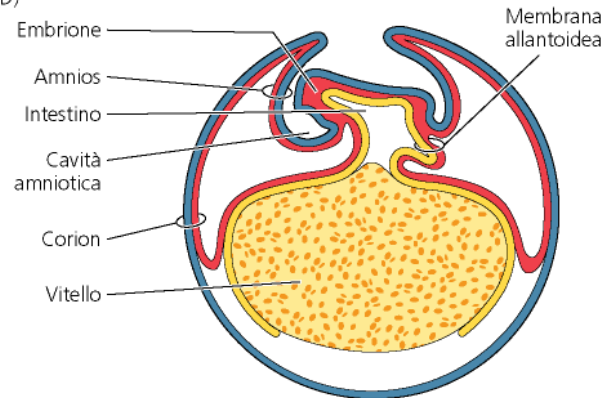
(B)



(C)



(D)



(E)

