

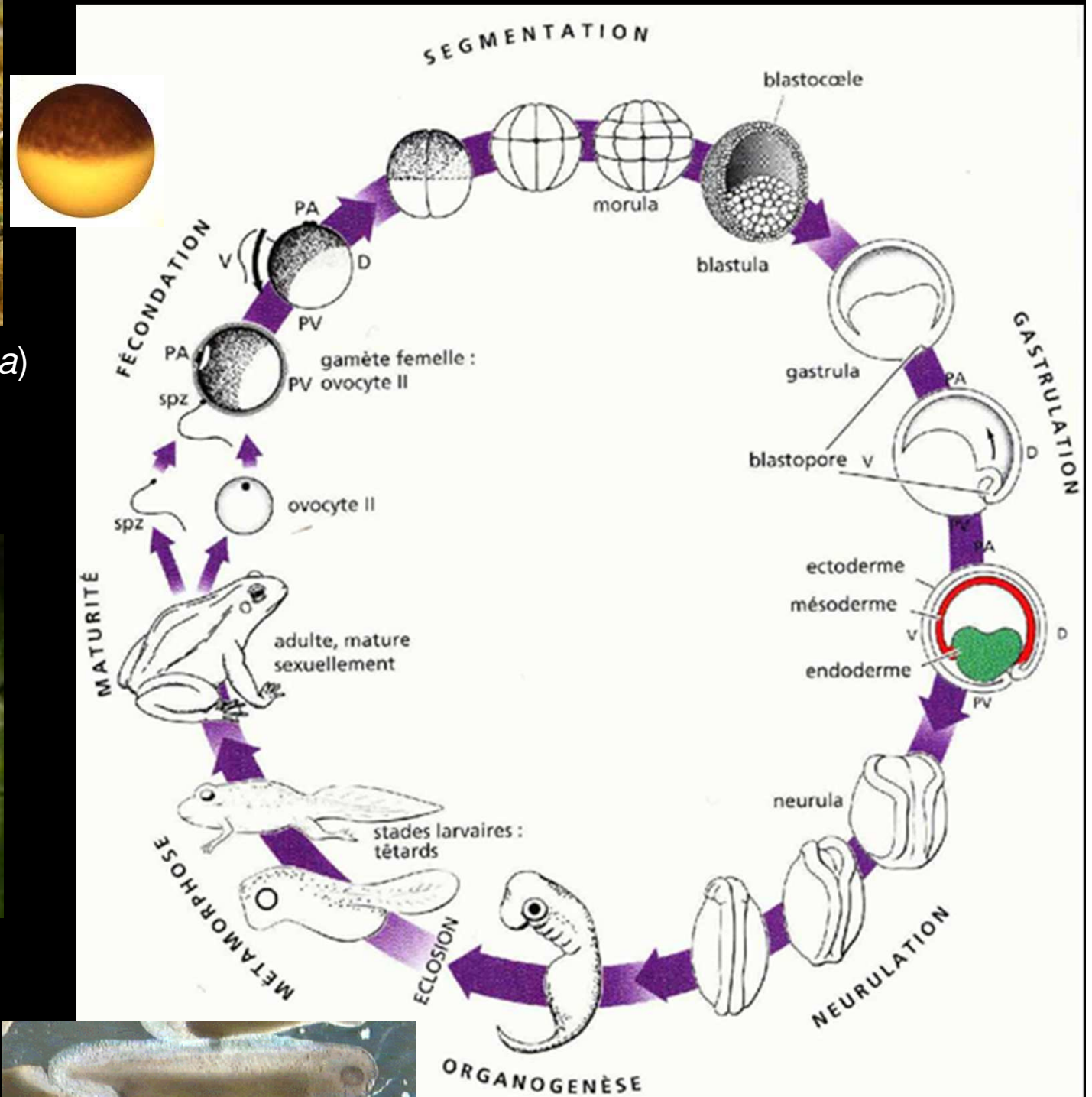
IID-TP : développement embryonnaire des Amphibiens



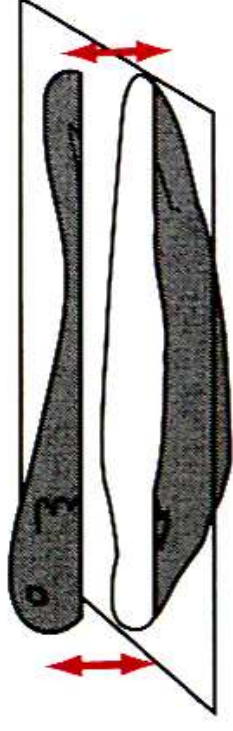


Grenouille verte (*Rana esculenta*)

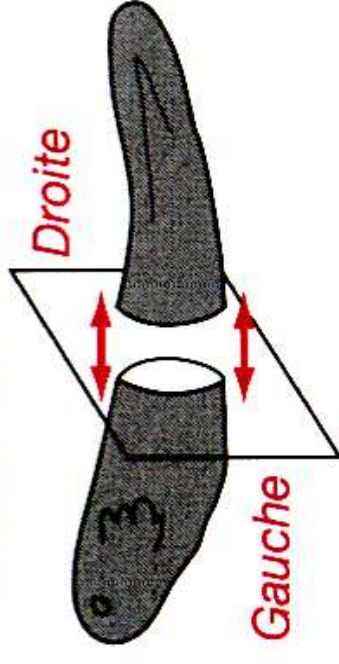
Xénope (*Xenopus laevis*)



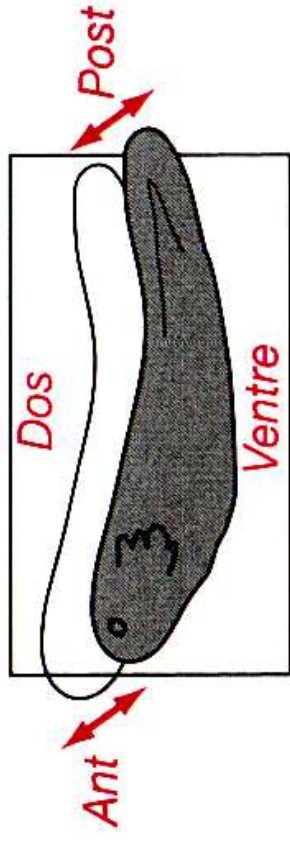
Coupe frontale



Coupe transversale

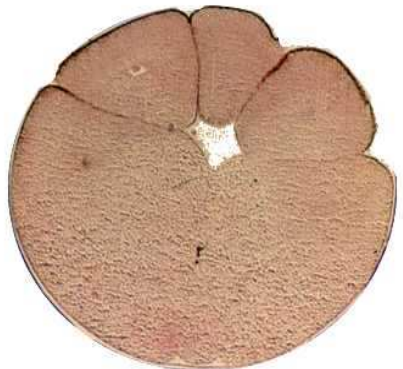
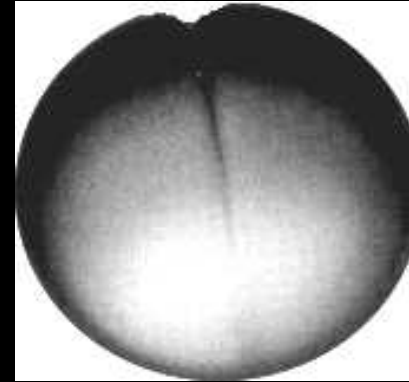
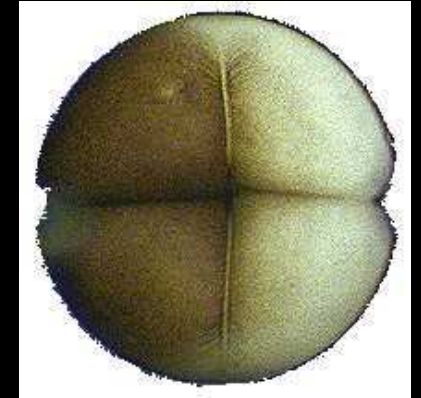
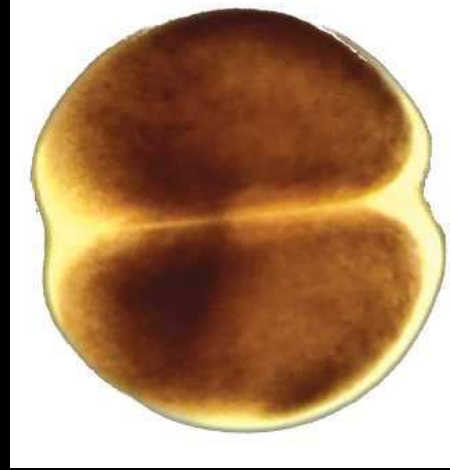


Coupe sagittale



I. La segmentation

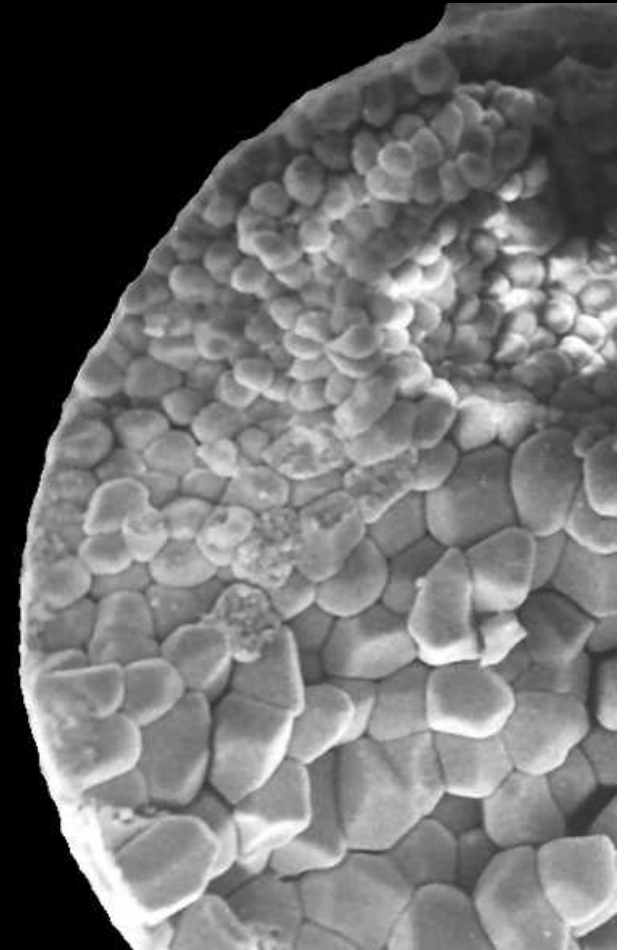
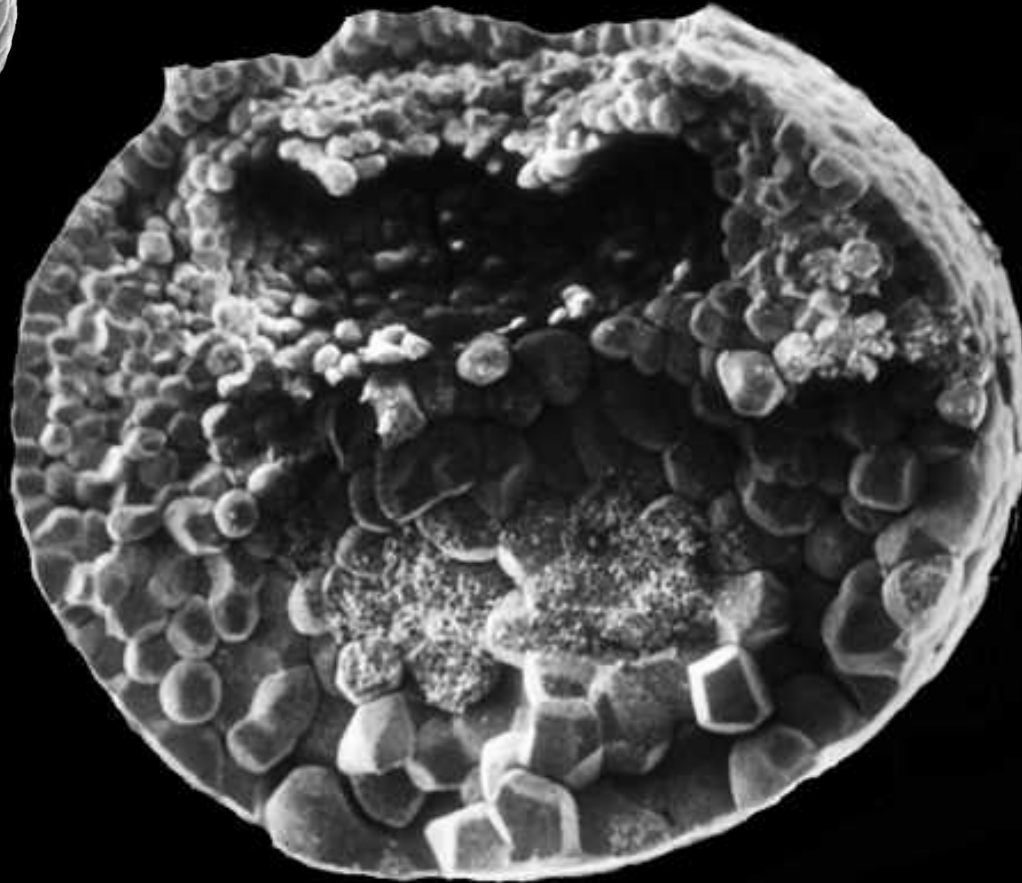
La segmentation



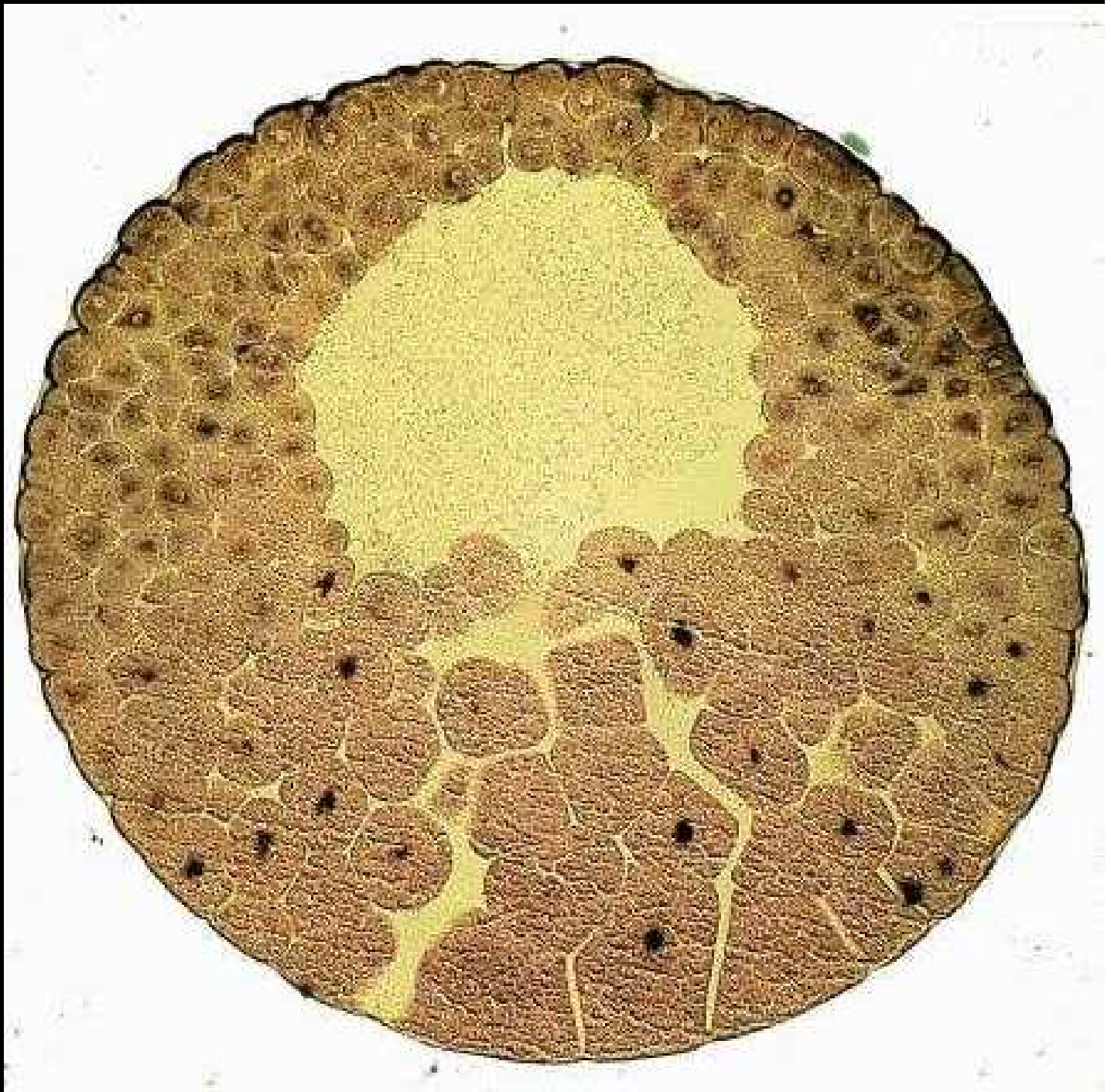
Morula

Blastula

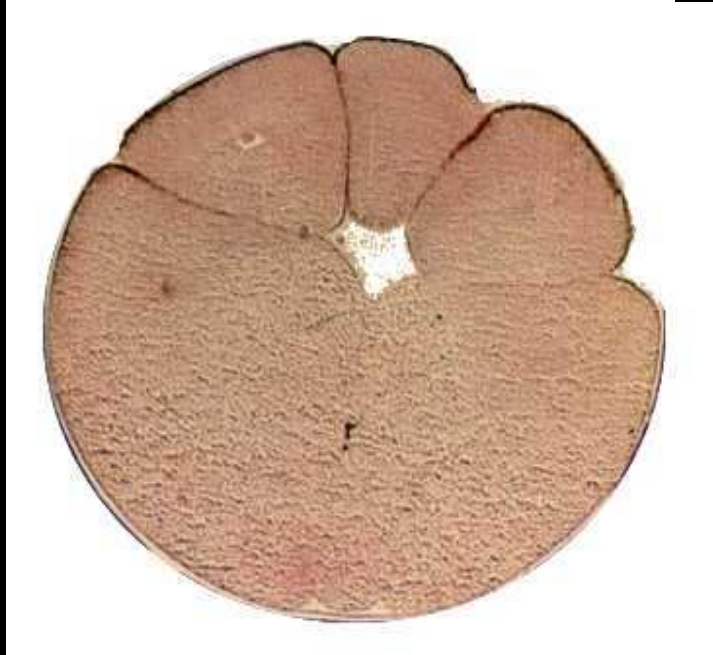
Le stade Blastula



Le stade Blastula



Une segmentation totale, et inégale

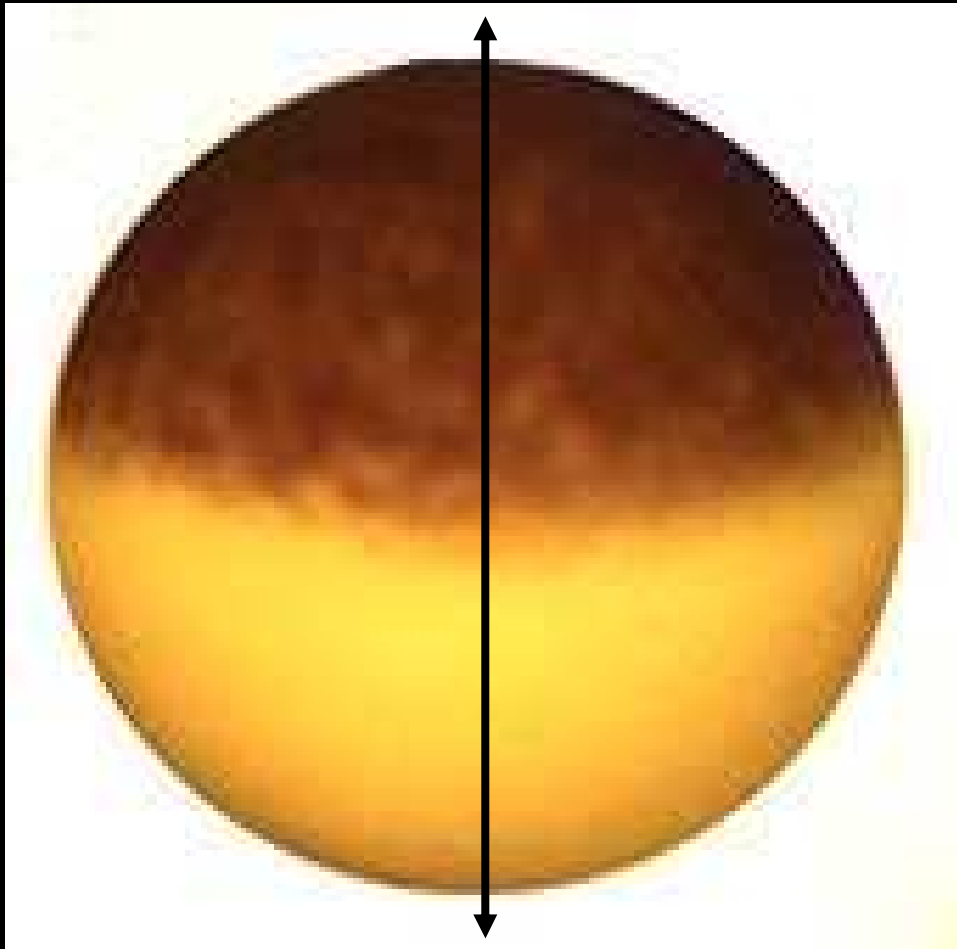


Axes de polarité



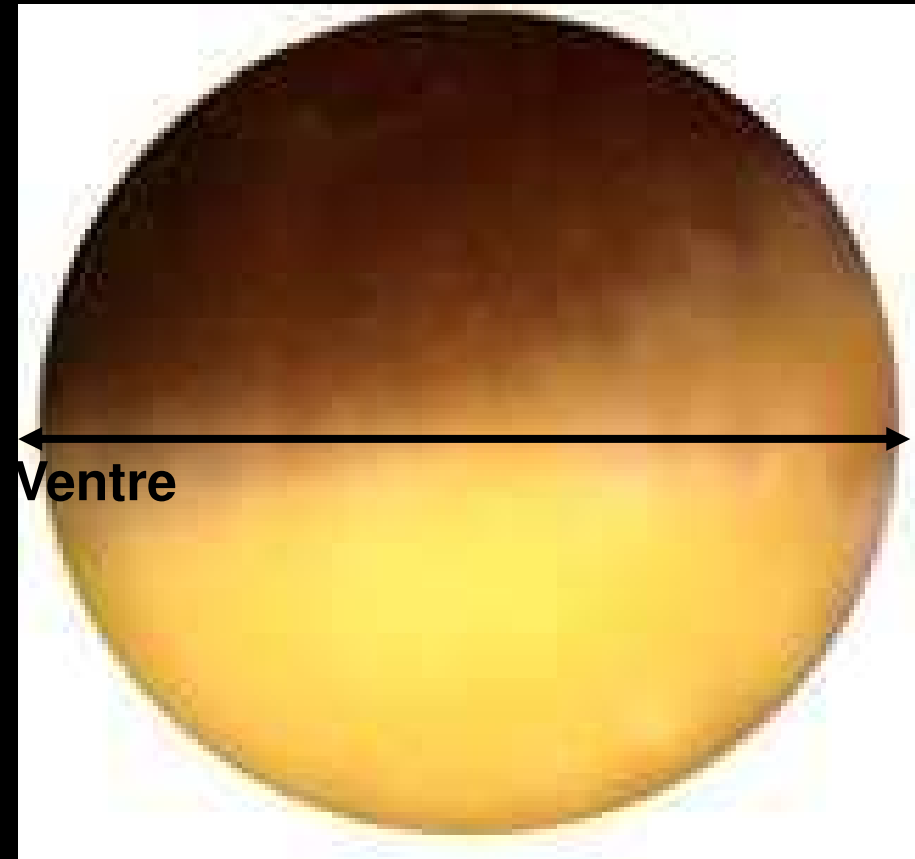
Axes de polarité

Pôle animal = PA



Pôle végétatif = PV

Axe PA-PV hérité de l'ovocyte



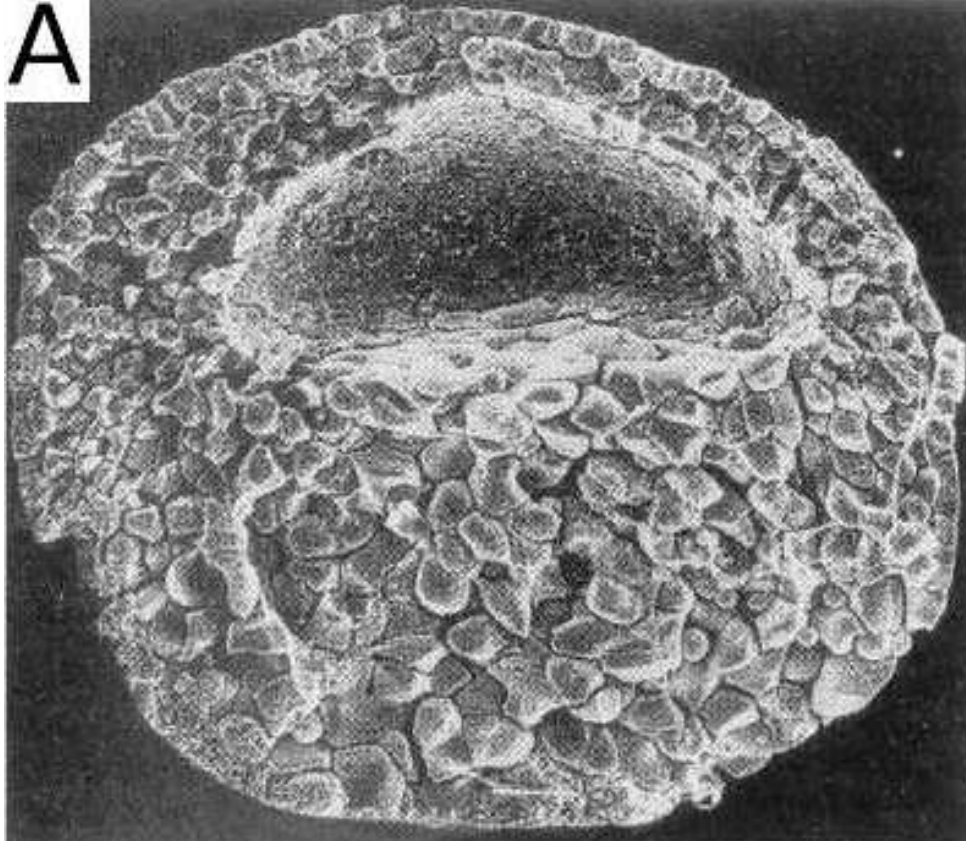
Ventre

Dos

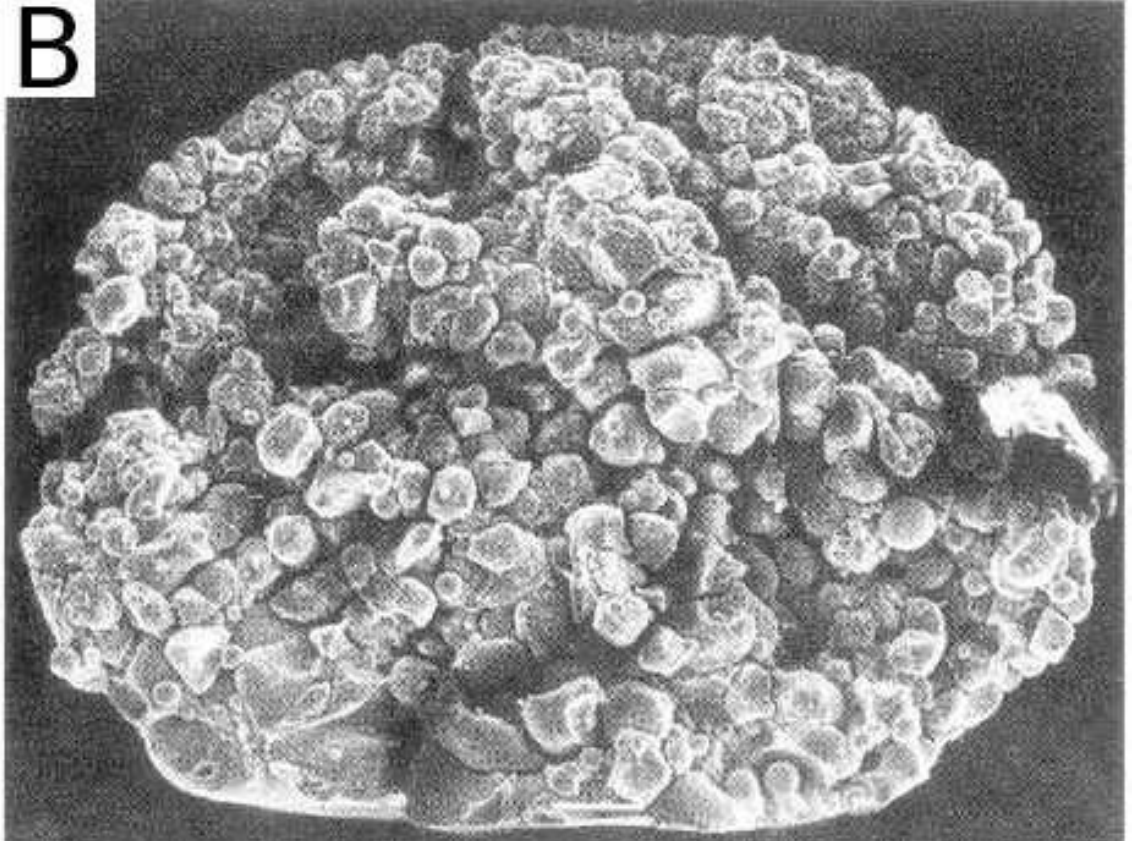
Axe D-V formé lors de la fécondation

Expérience d'injection d'ARNm antisens de cadhérine

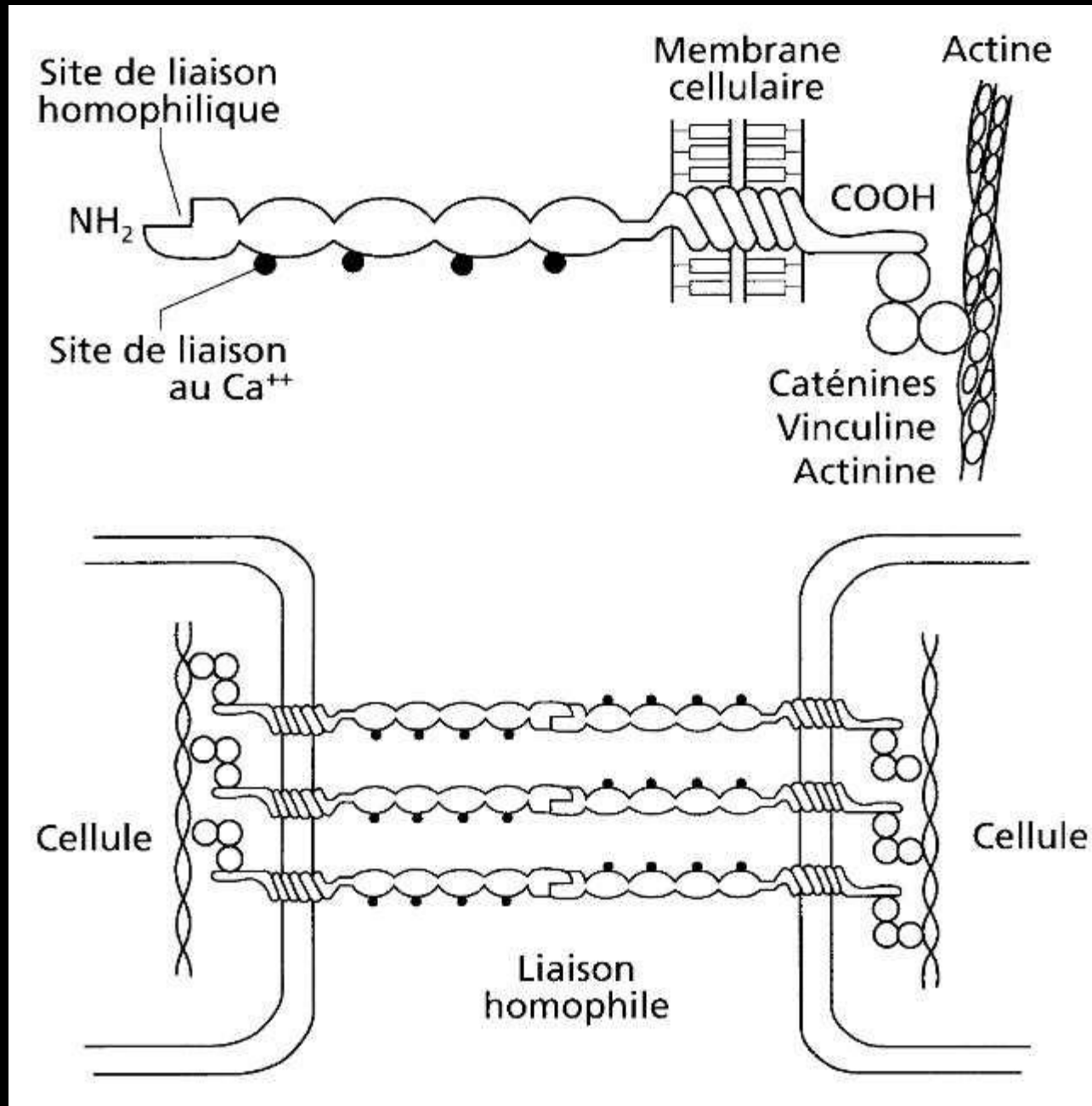
A



B

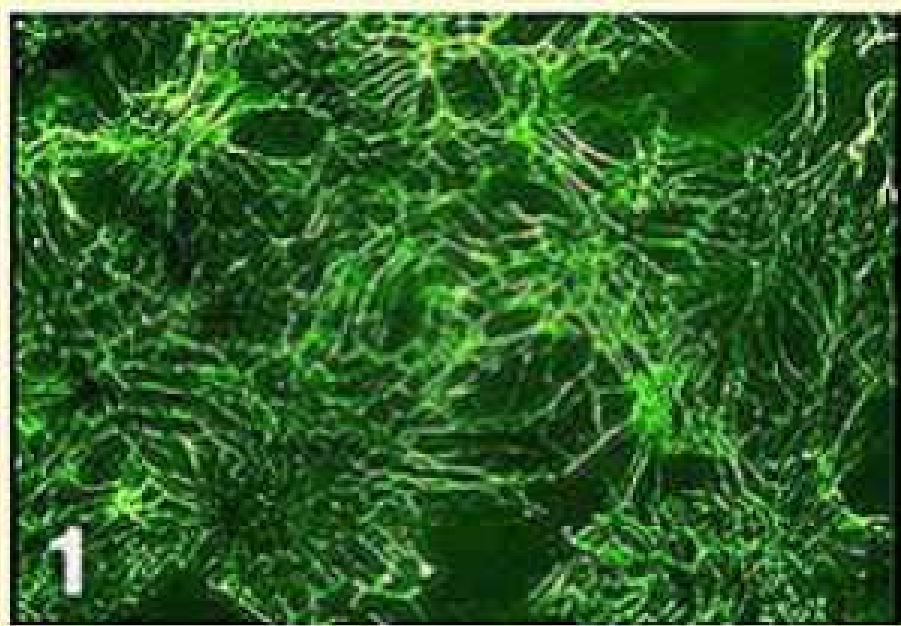


Les cadhérines, des protéines d'adhérence intercellulaire spécifique

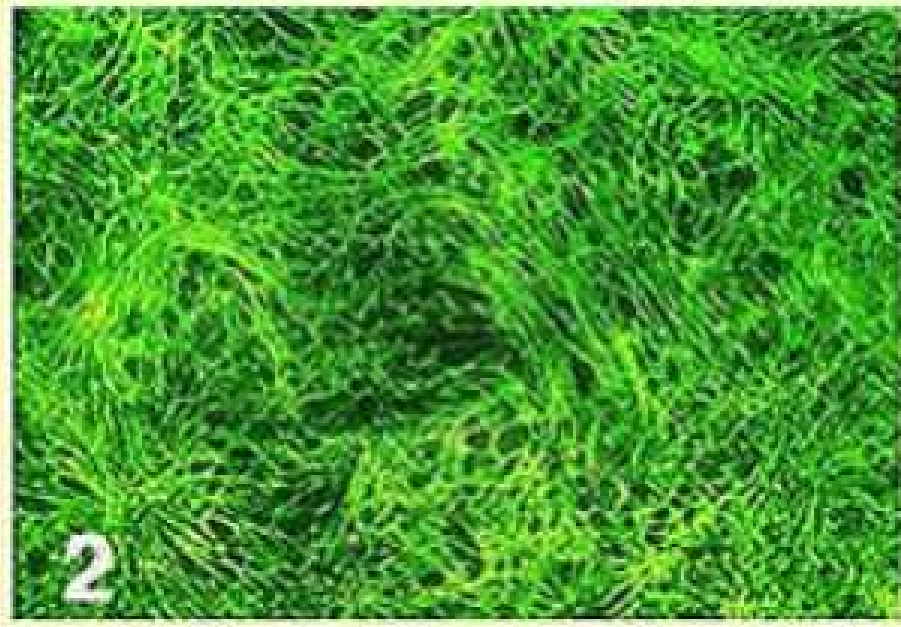


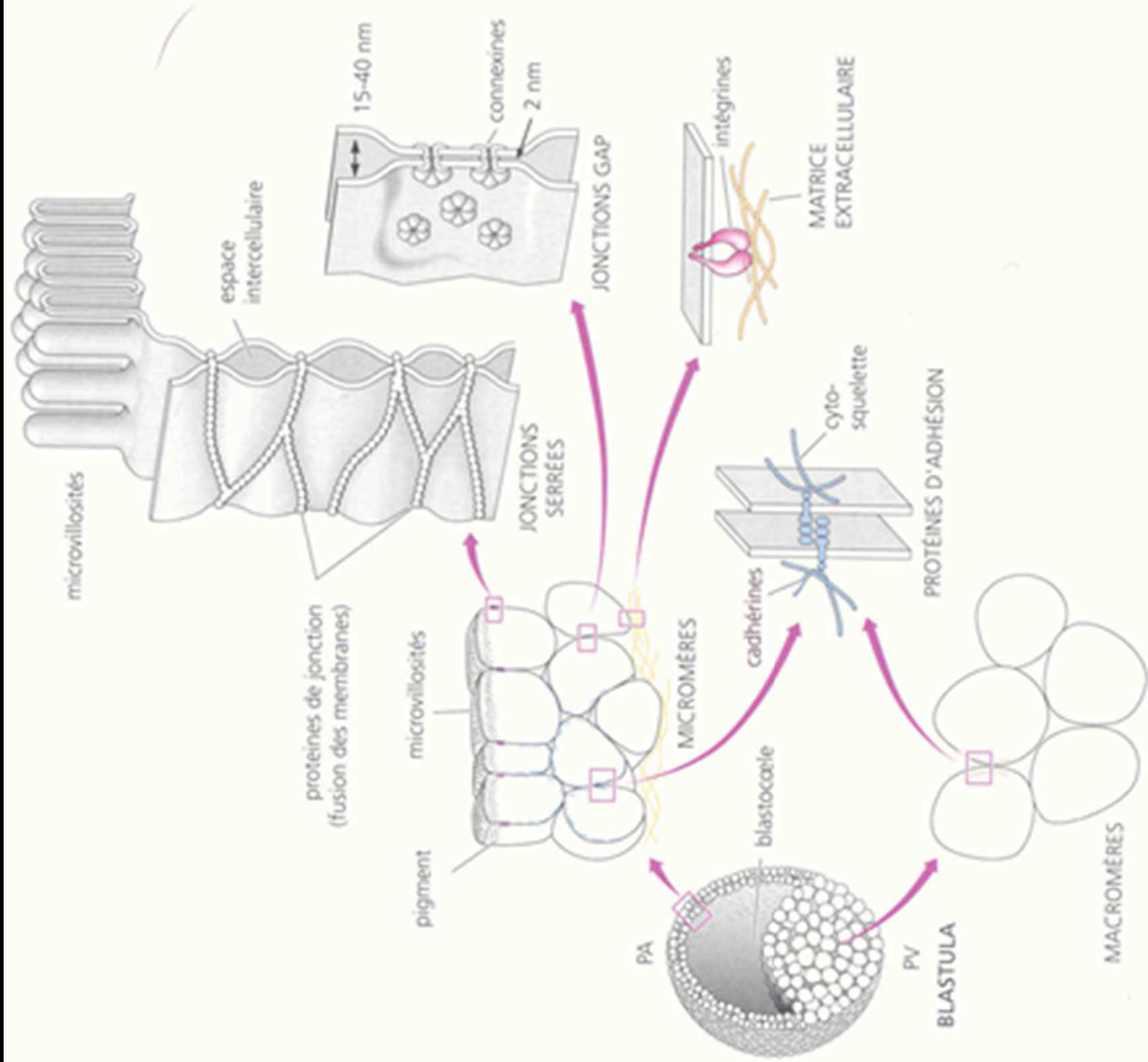
Marquage de la fibronectine sur le toit du blastocoele

Stade blastula



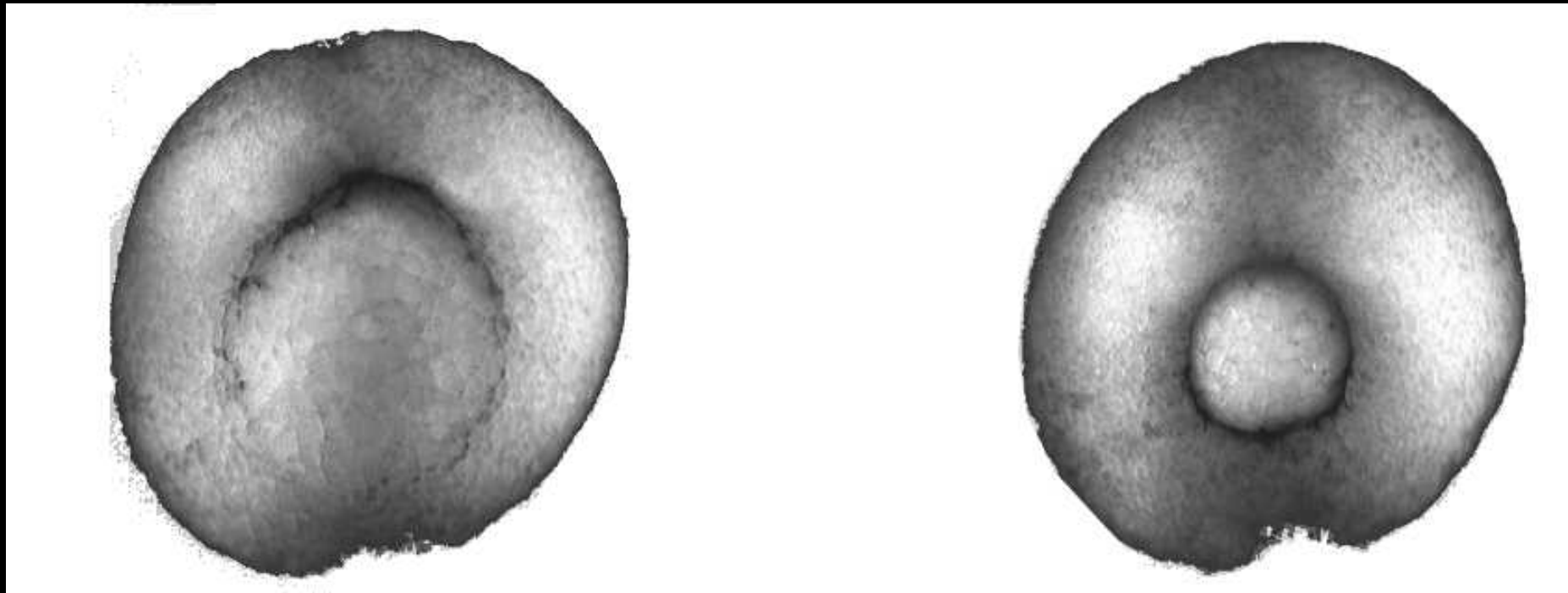
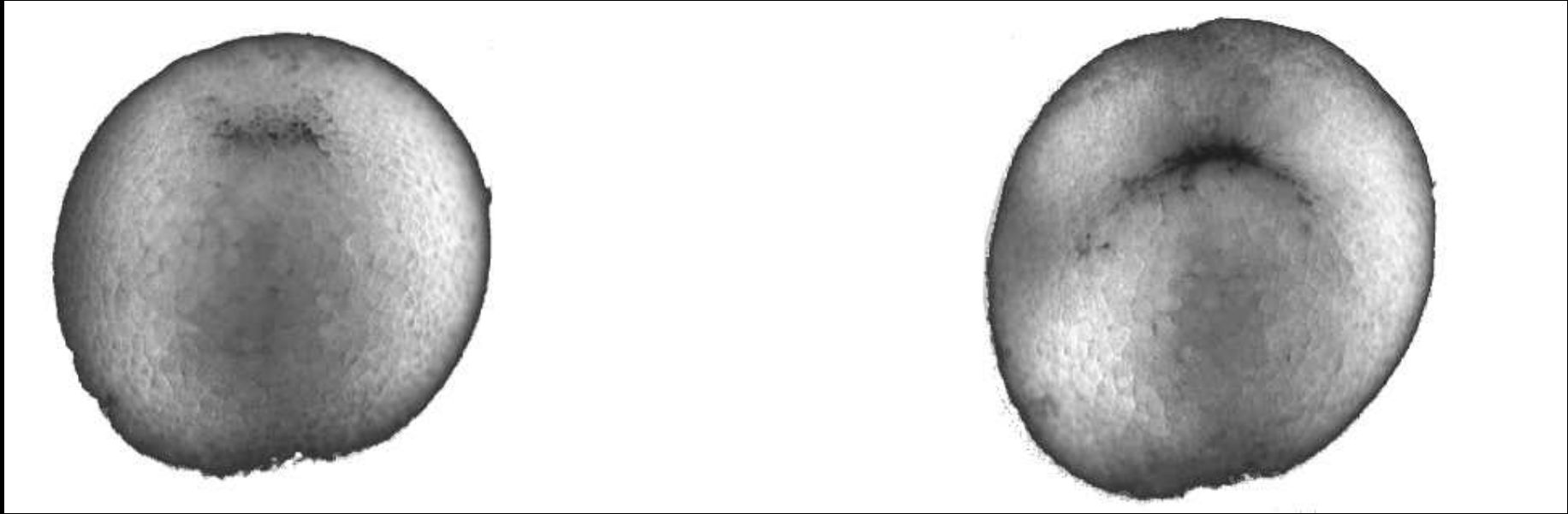
Stade gastrula





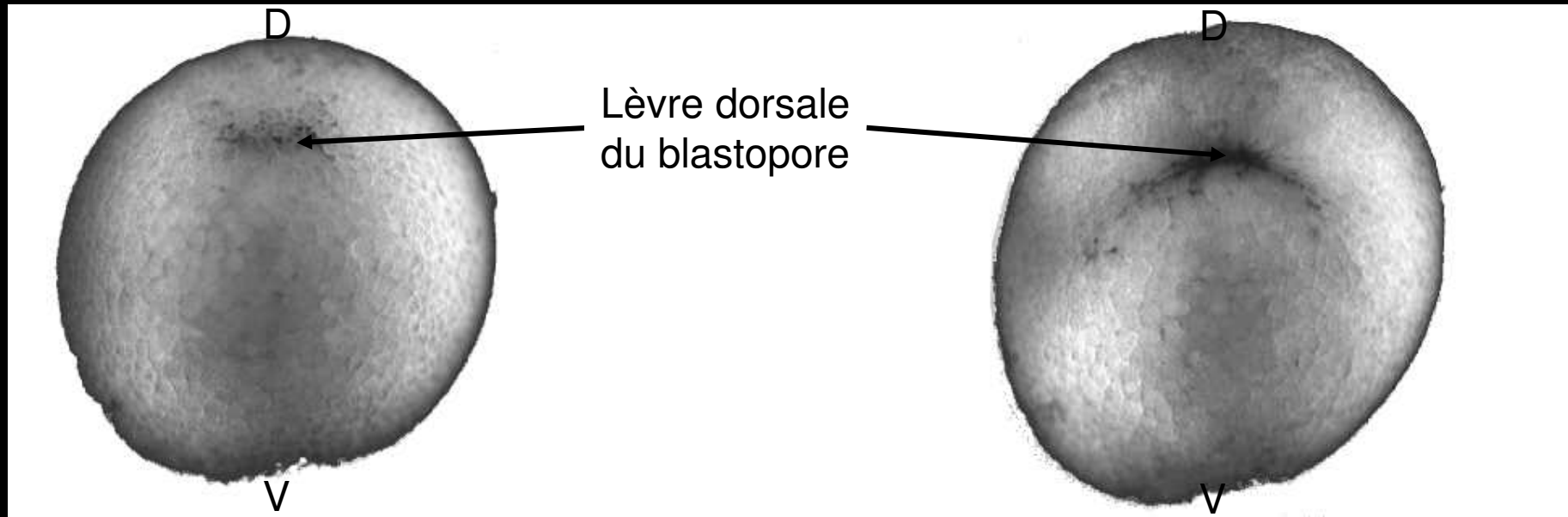
II. La gastrulation

Jeune Gastrula



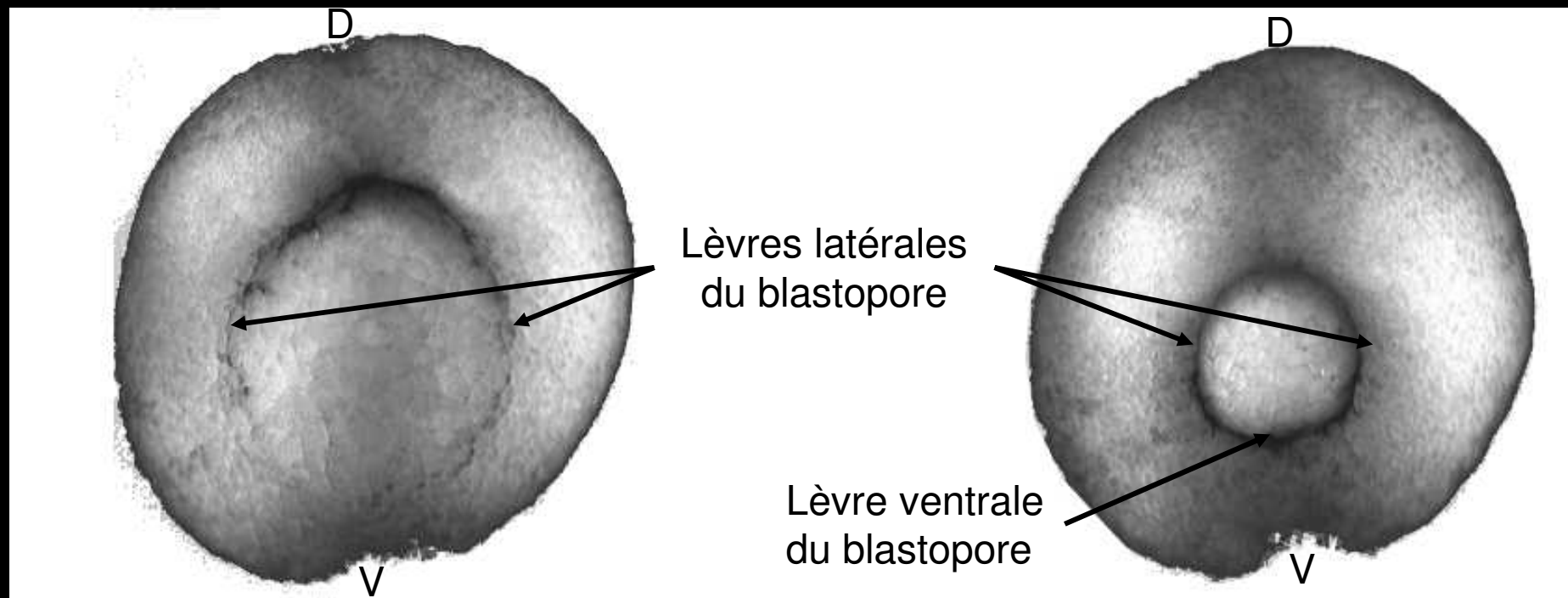
Gastrula âgée

Jeune Gastrula



Stade encoche blastoporale

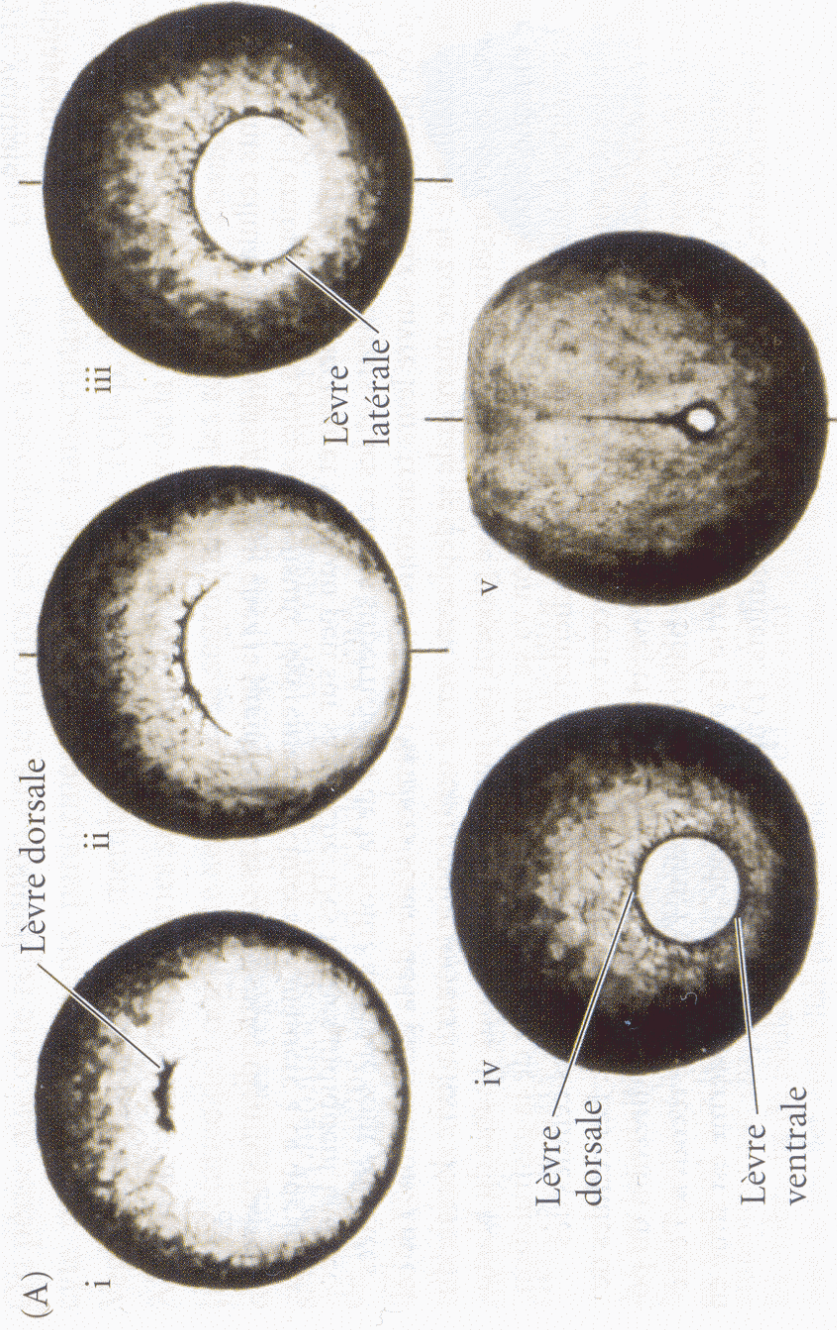
Stade anse de panier



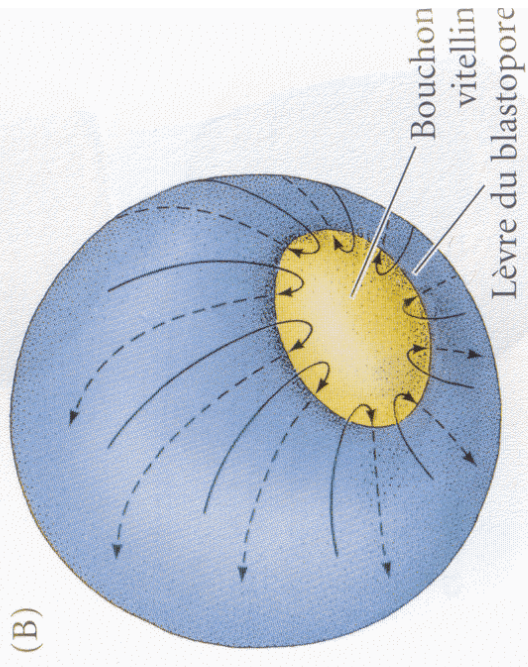
Stade fer à cheval

Stade bouchon vitellin

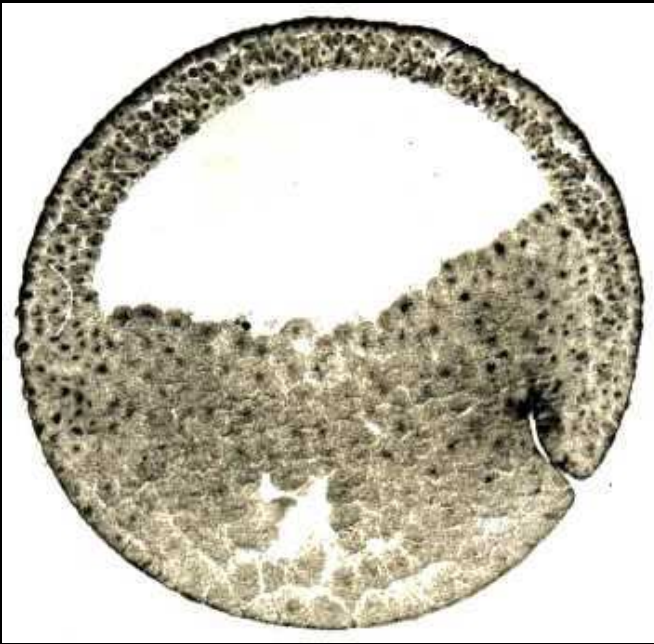
d'épibolie de l'ectoderme, et d'involution du
 mésoderme, qui contourne le rebord du blastopore
 et vient se placer juste au-dessous de la surface qu'
 vient de quitter. L'endoderme, situé sous le
 blastopore, est immobile et enveloppé par ces
 déplacements cellulaires. (A d'après Balinsky 1975
 photographies avec l'autorisation de B. I. Balinsky



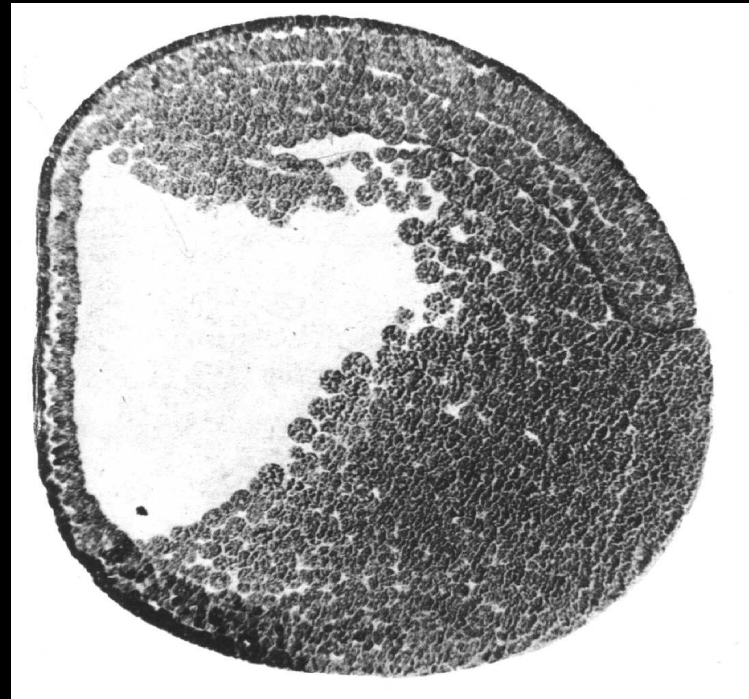
(B)



1



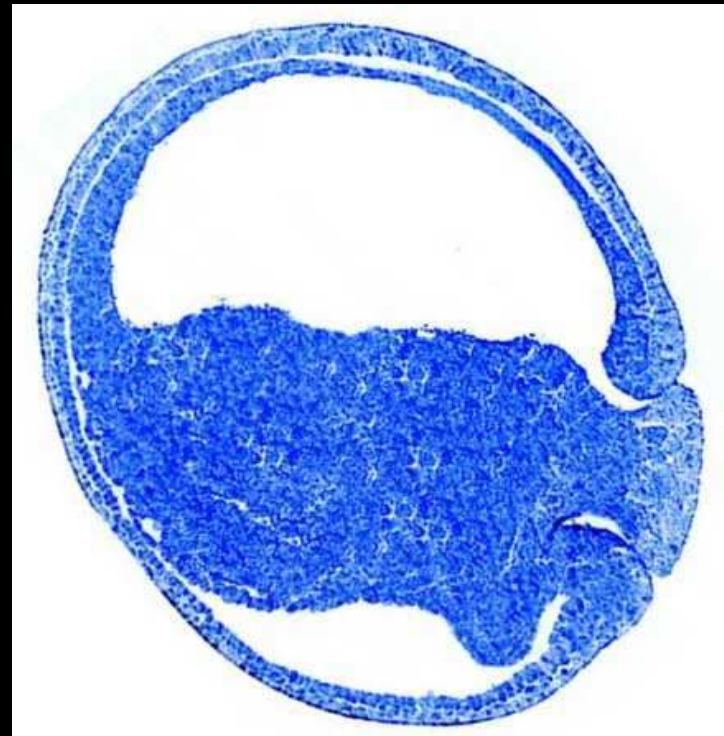
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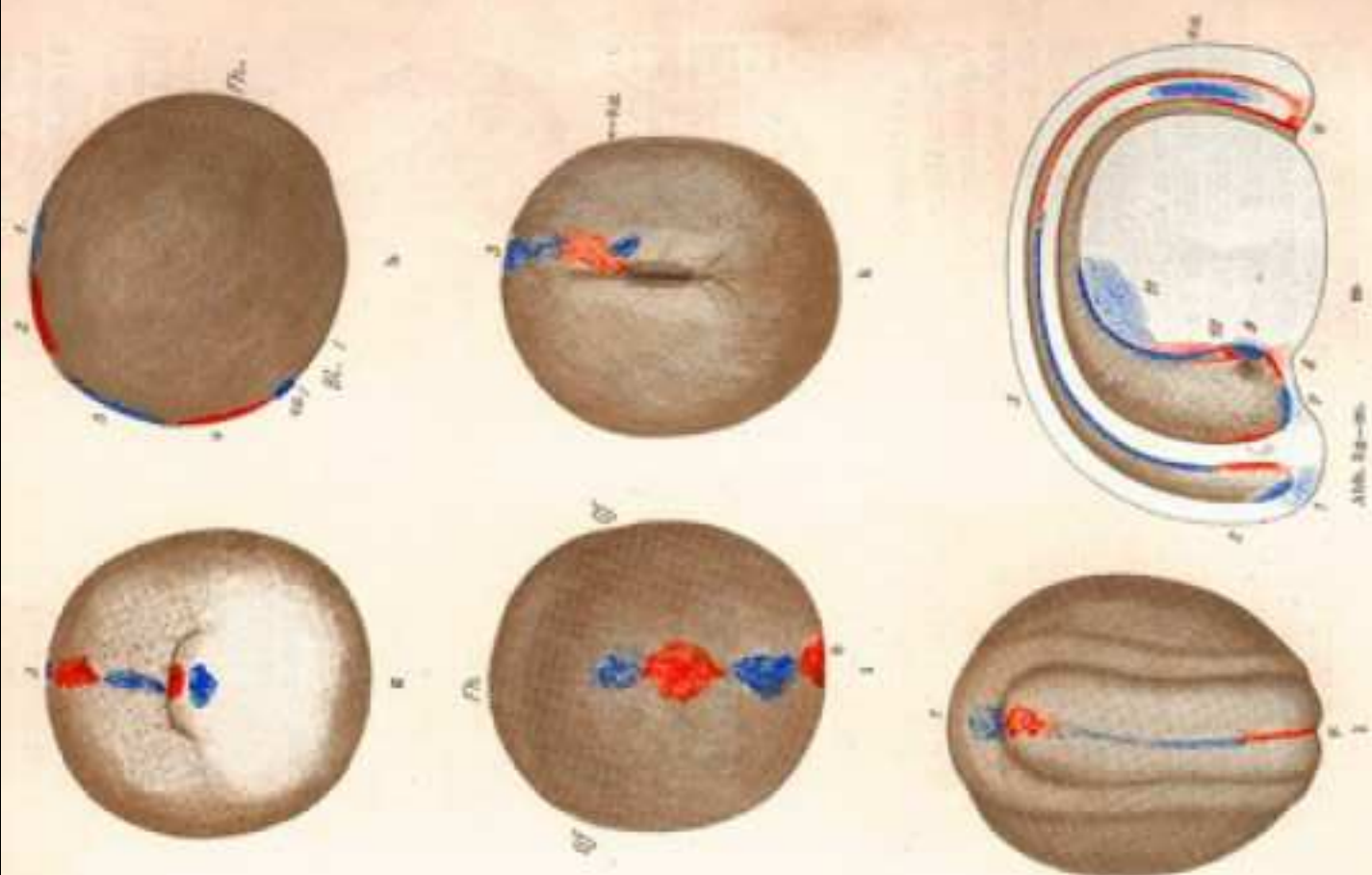


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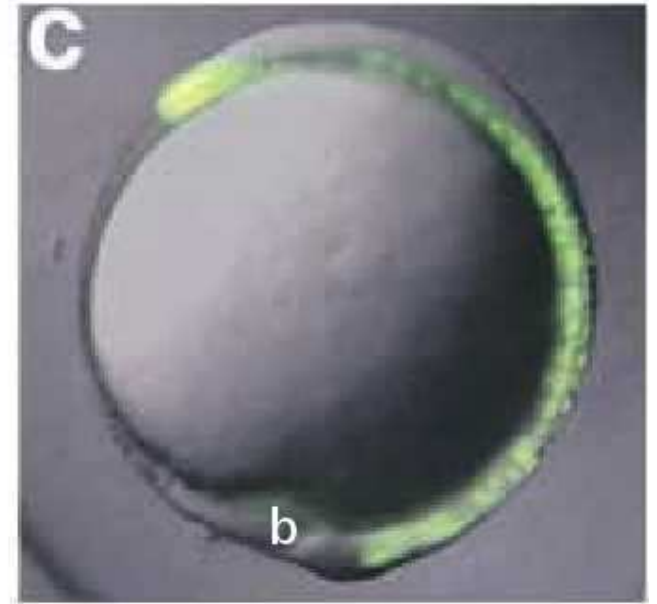
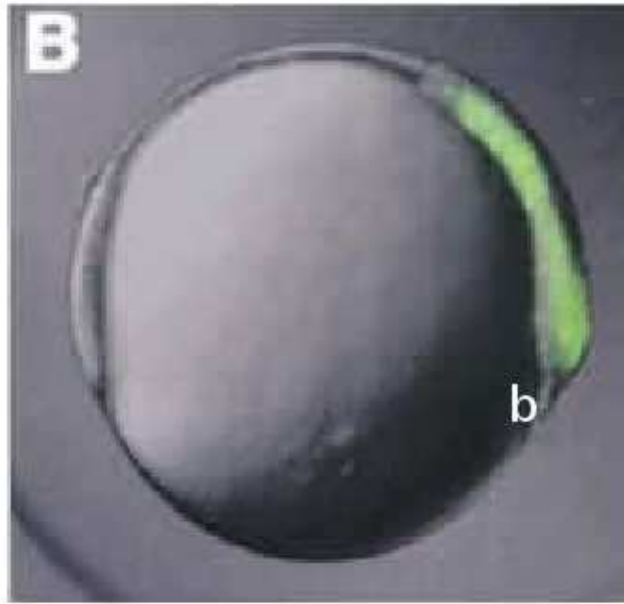
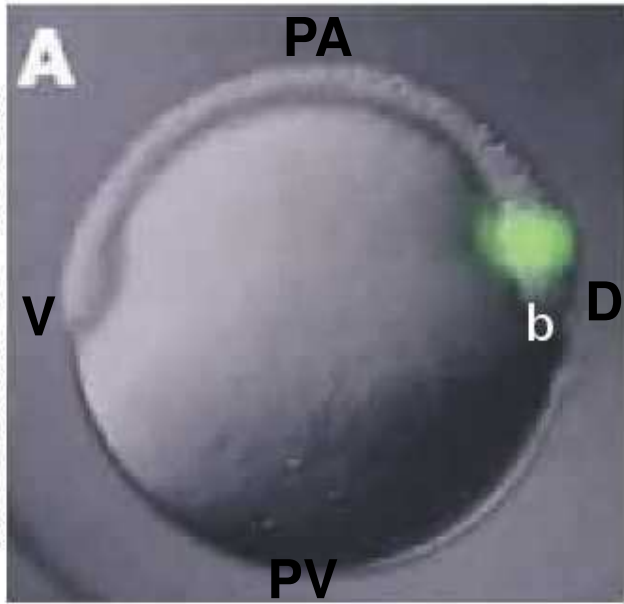


4

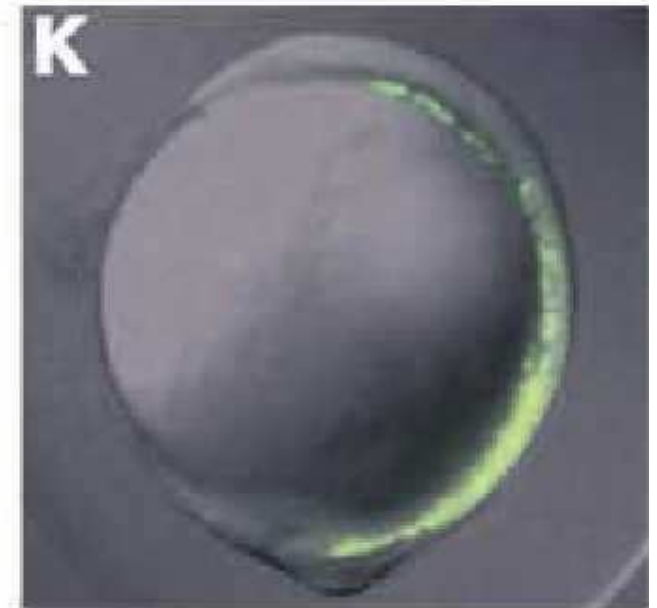
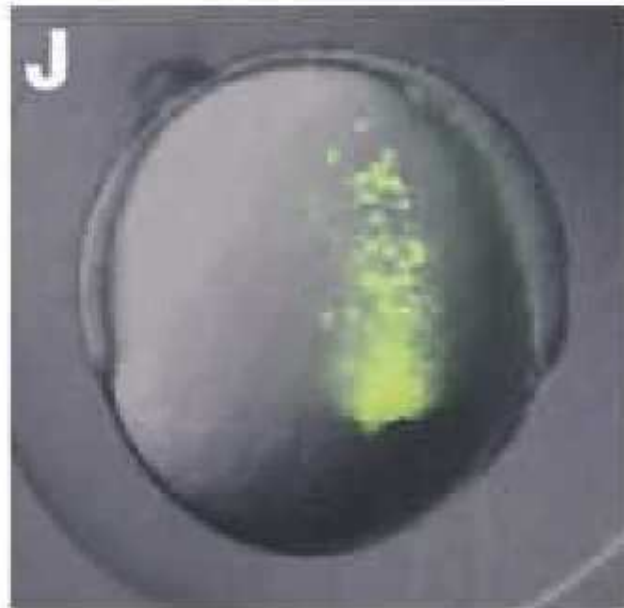


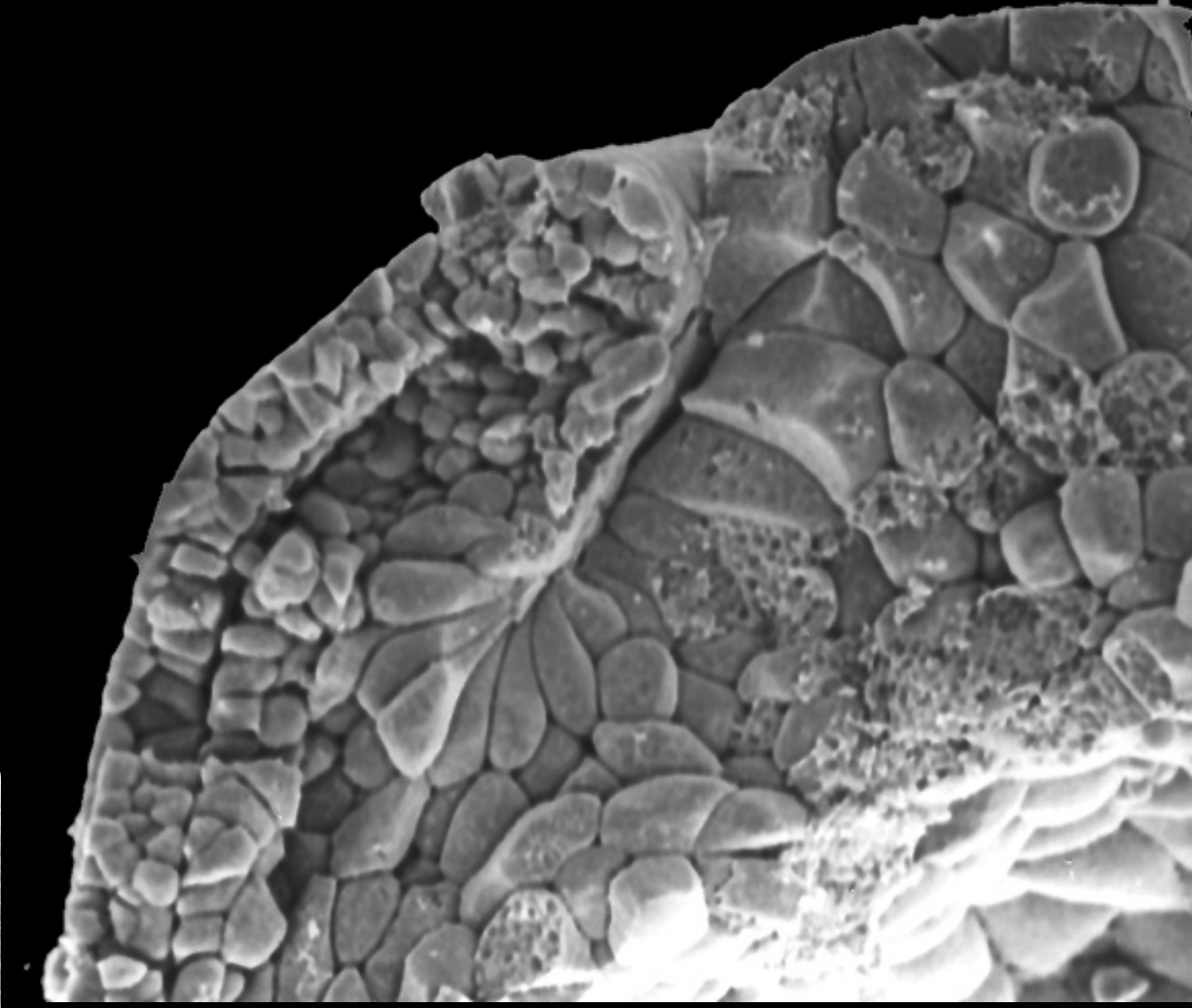
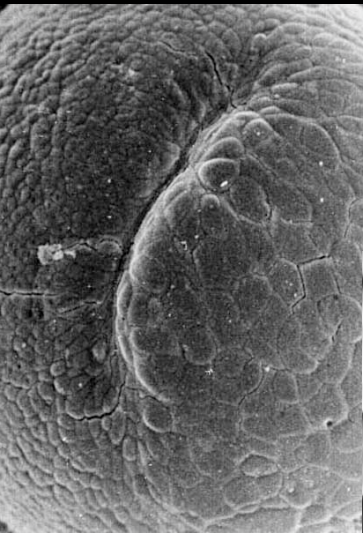


injection dans le
mésoblaste dorsal

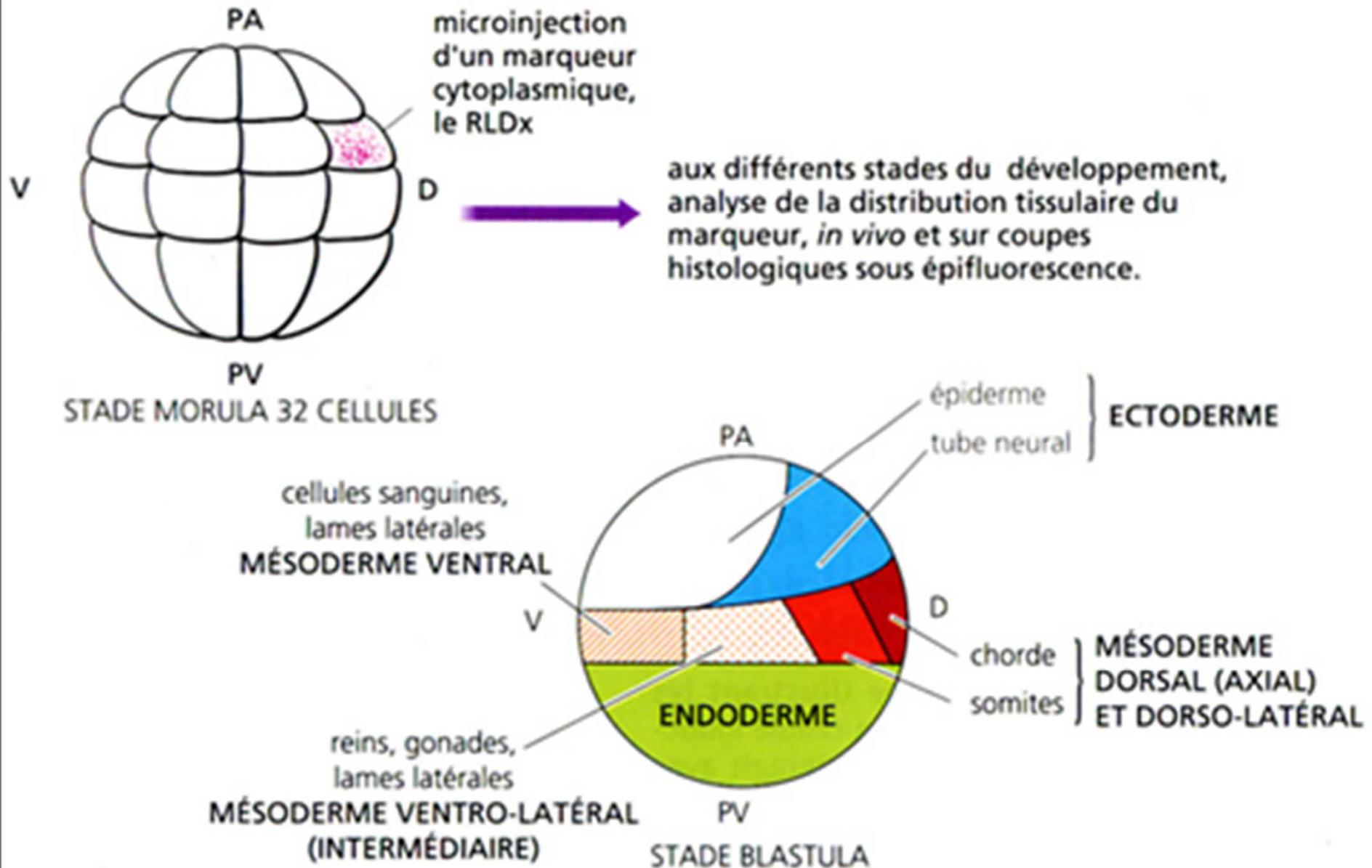


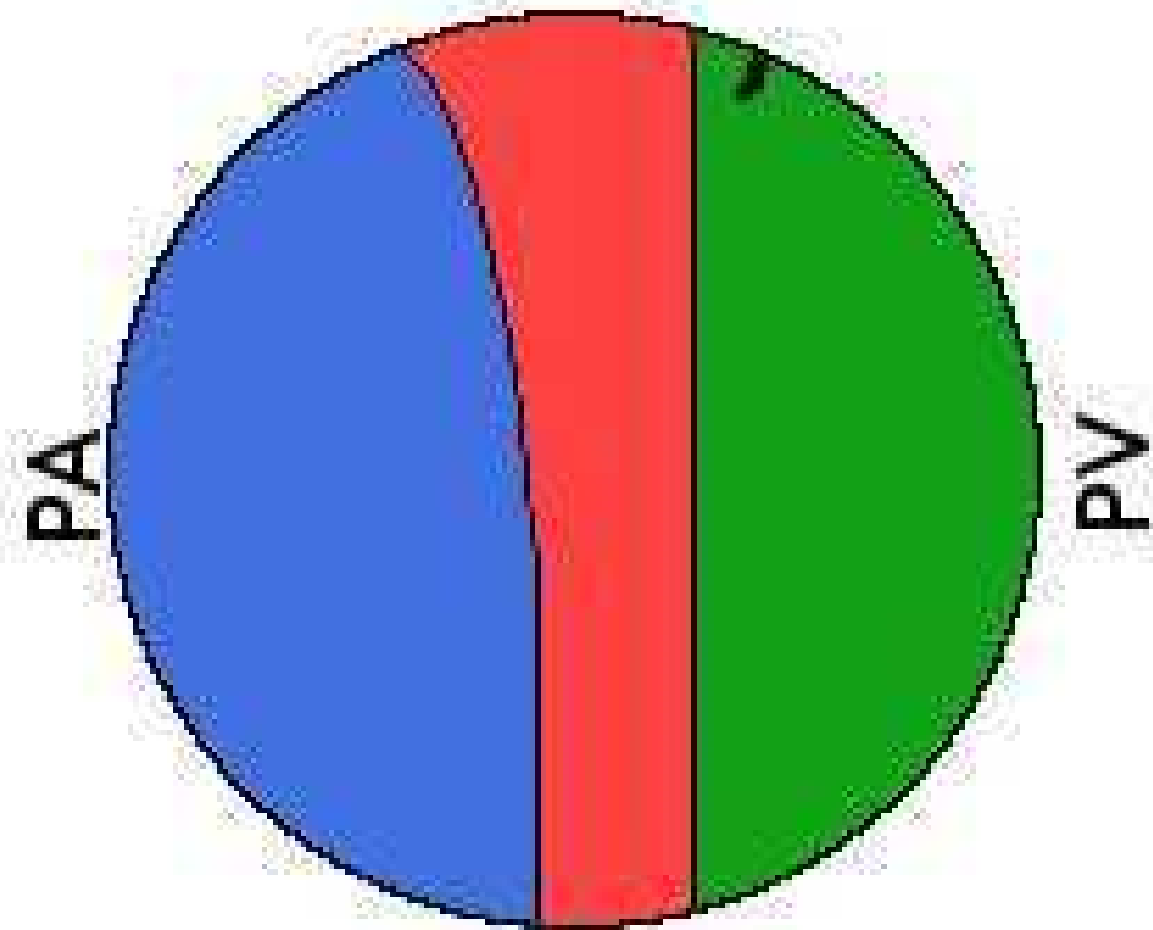
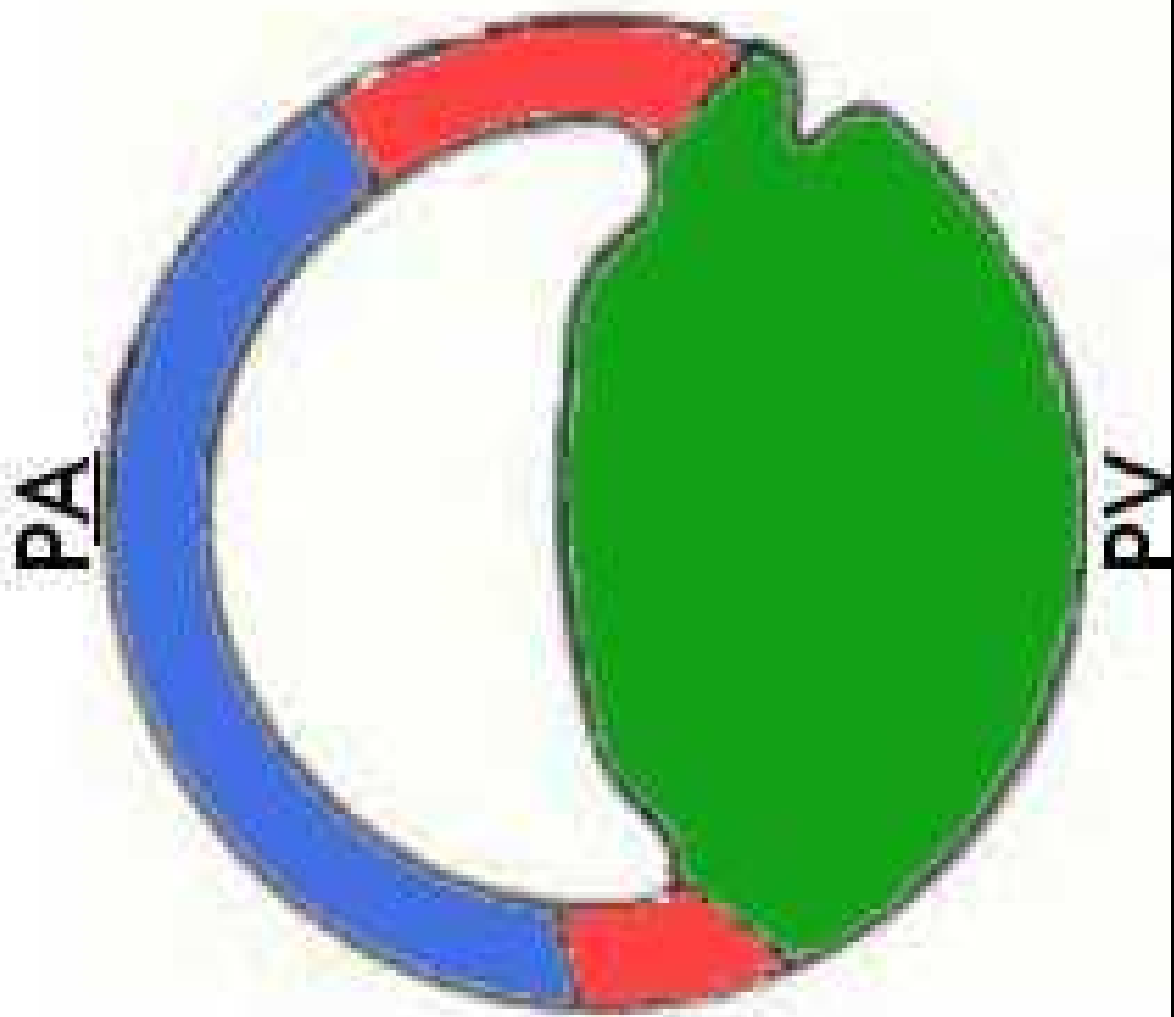
injection dans le
mésoblaste latéral



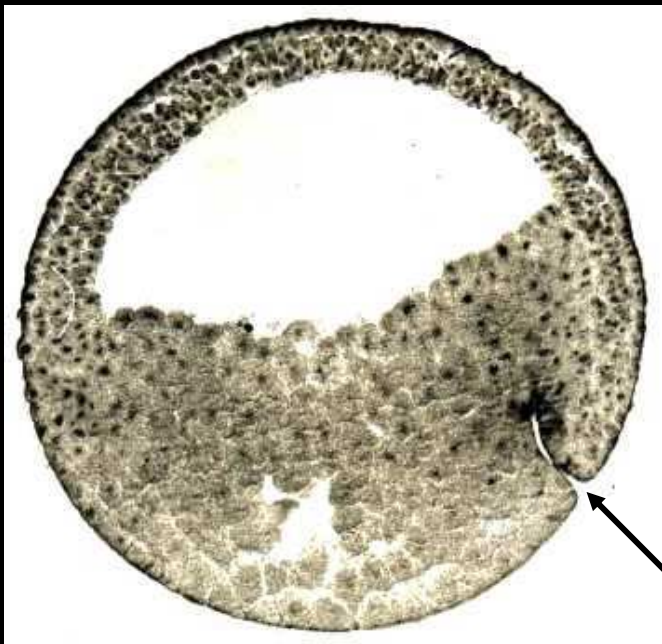


Principe de construction d'une carte des territoires présomptifs



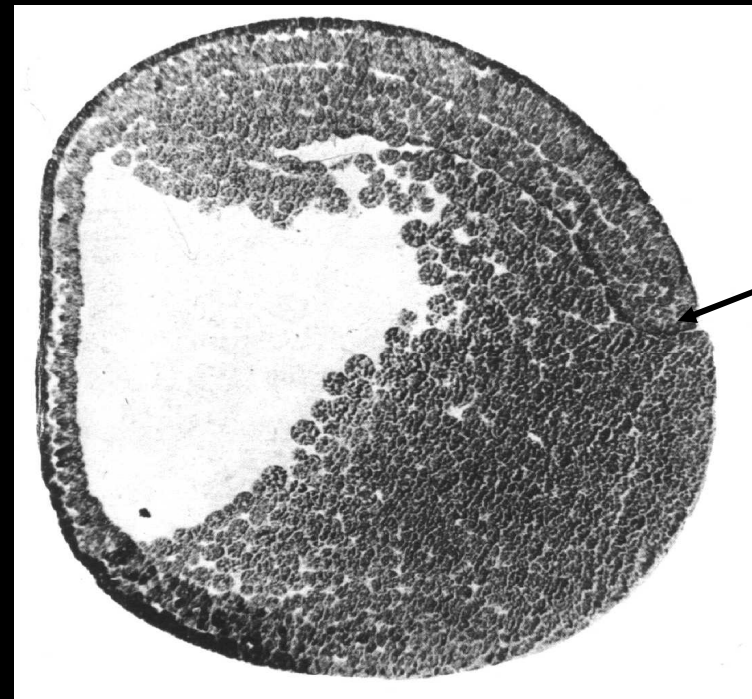


1



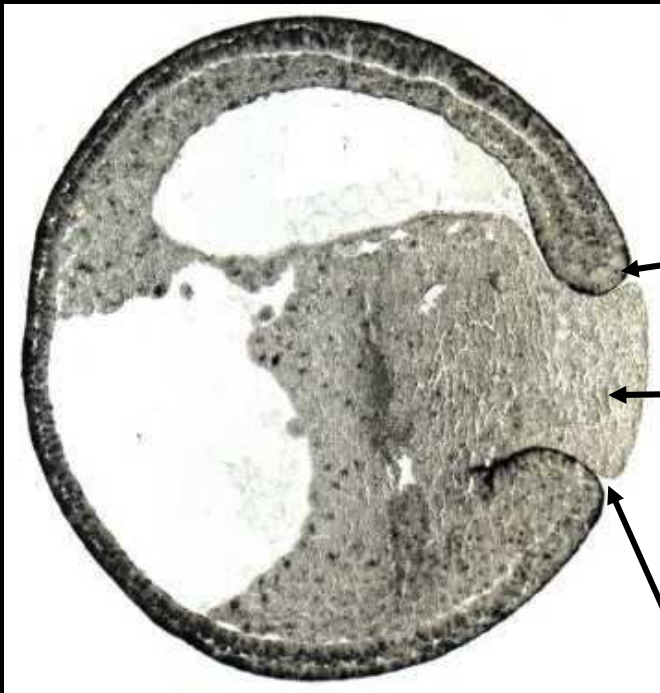
Lèvre
dorsale du
blastopore

2



Lèvre
dorsale

3

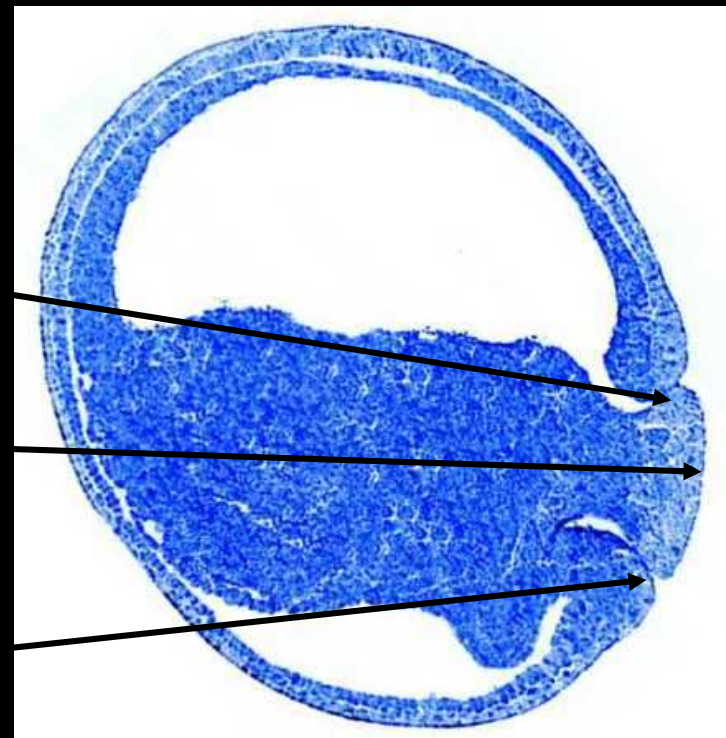


Lèvre
dorsale

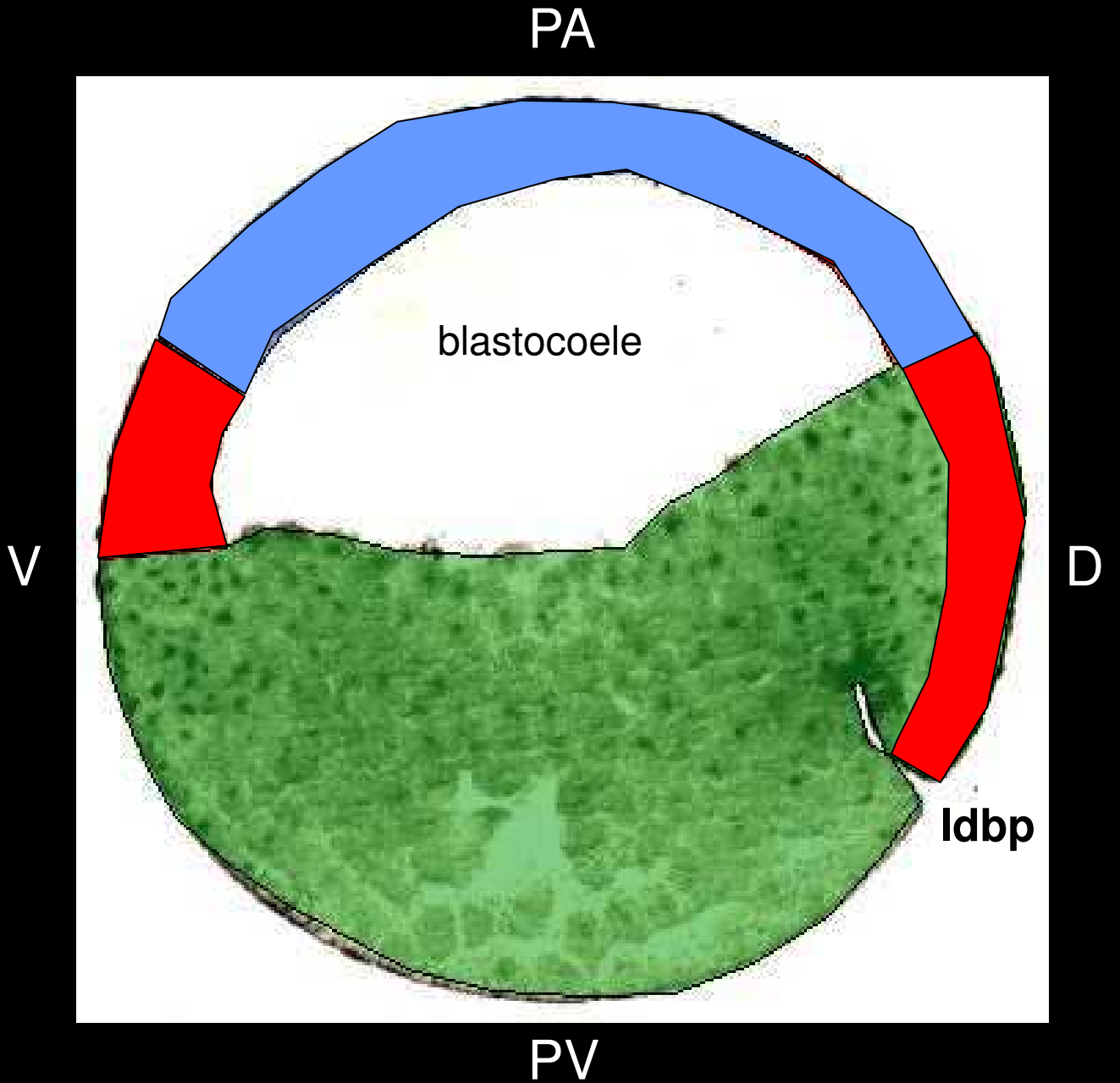
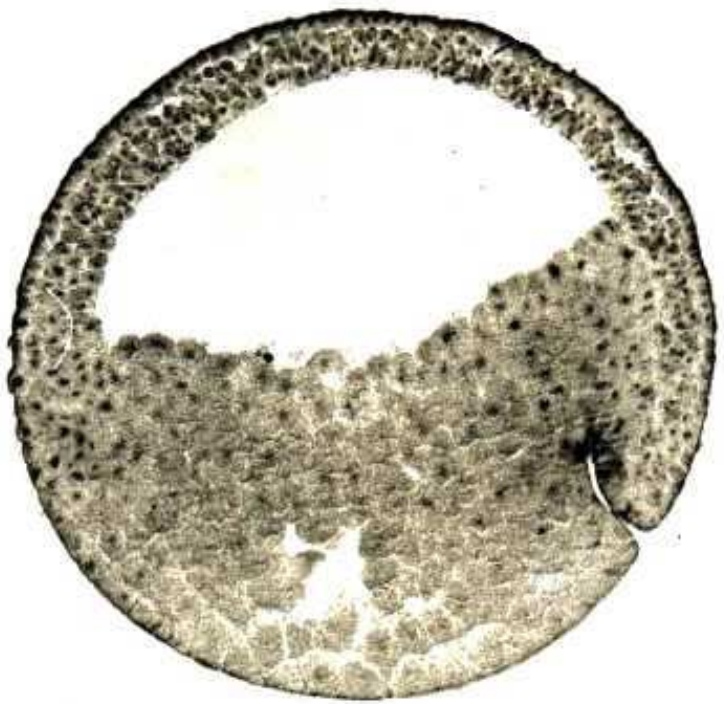
Bouchon
vitellin

Lèvre
ventrale

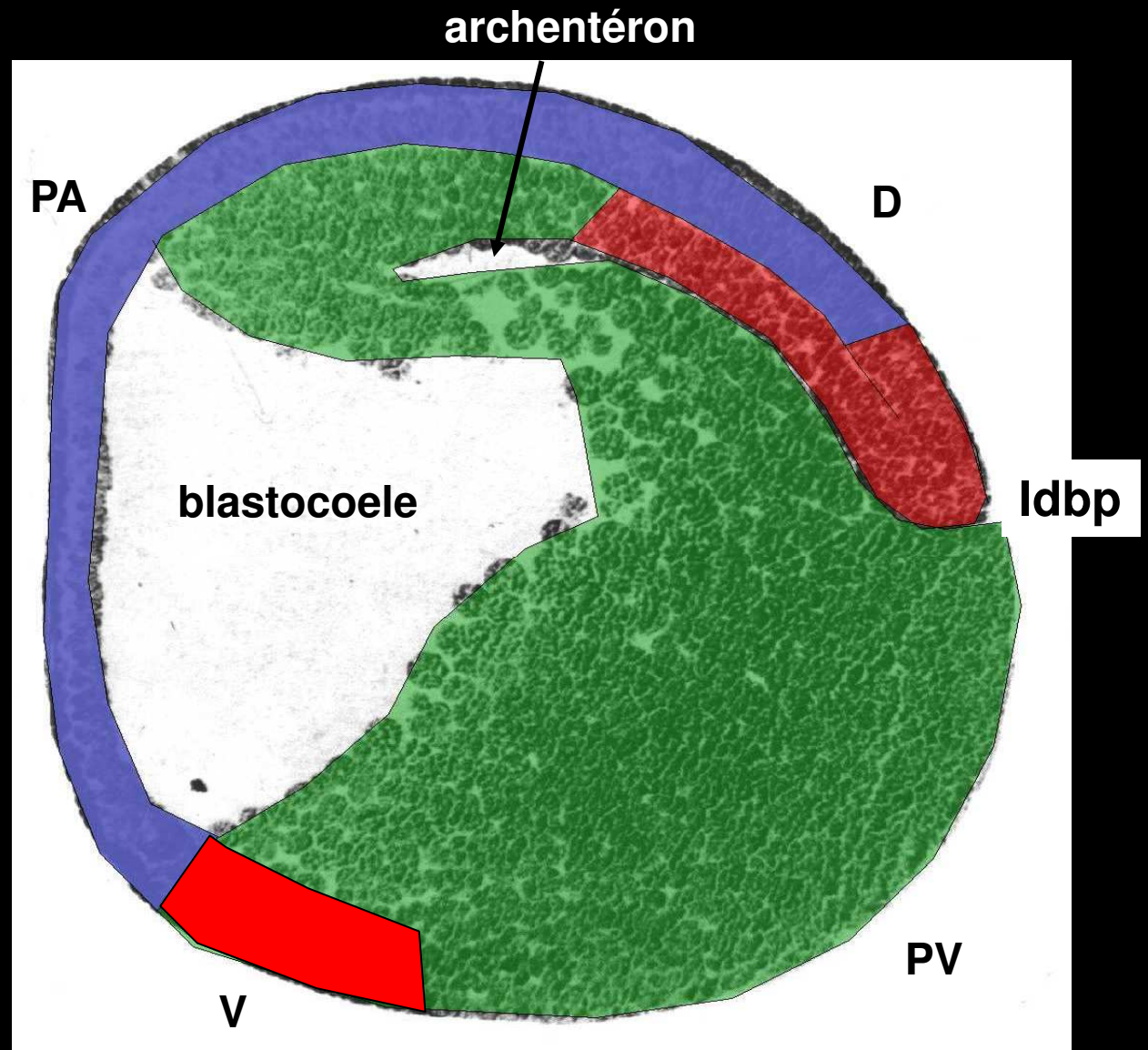
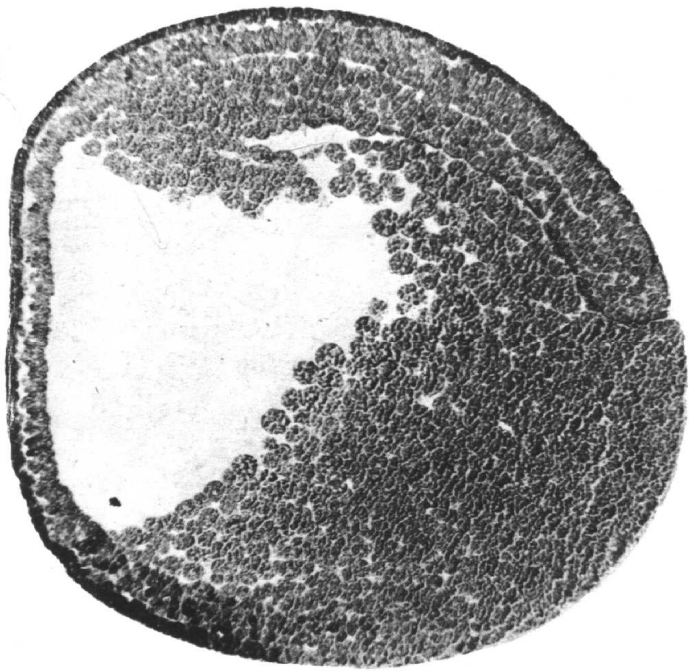
4



Stade encoche blastoporale



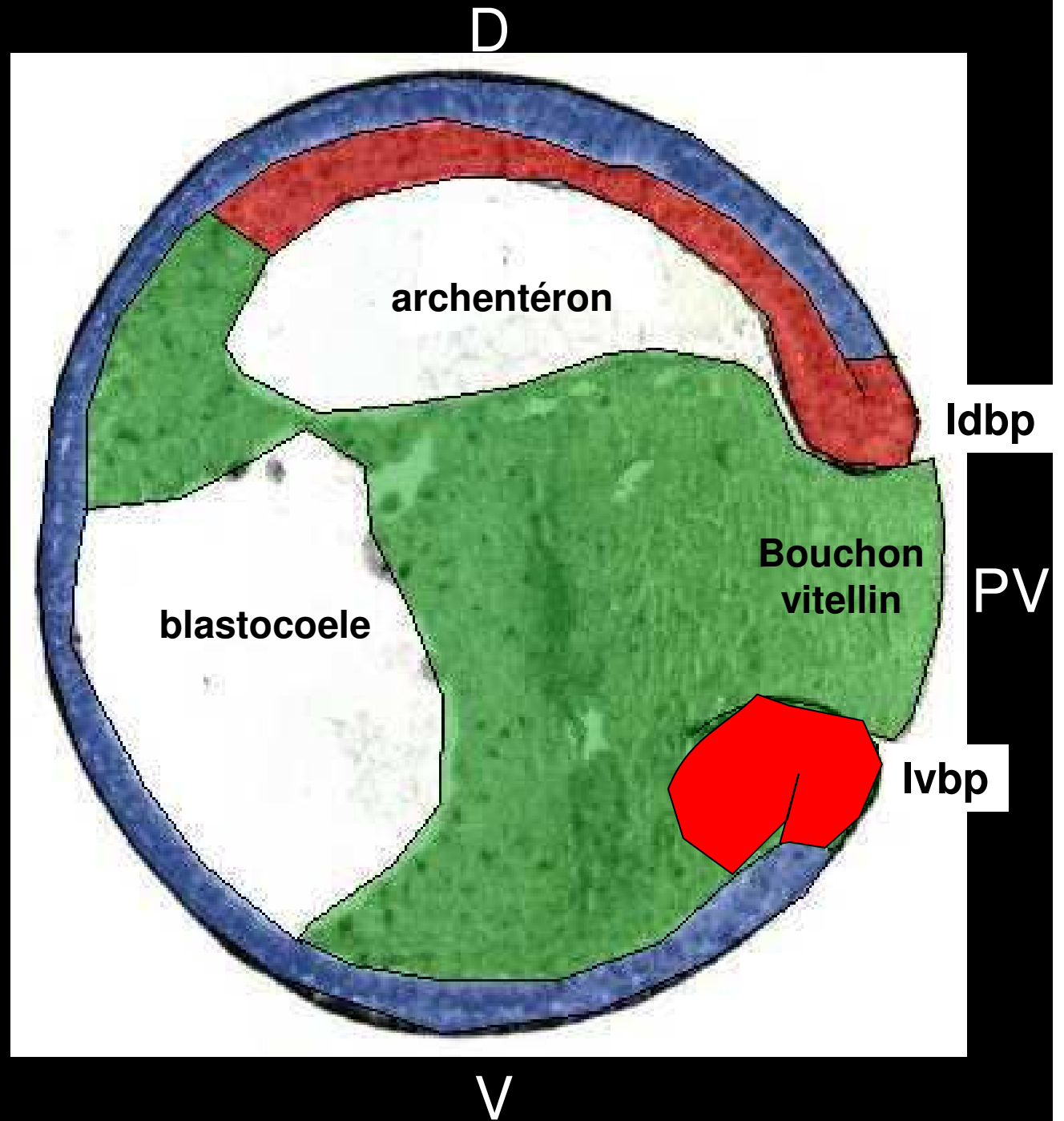
Stade anse de panier



Stade fer à cheval



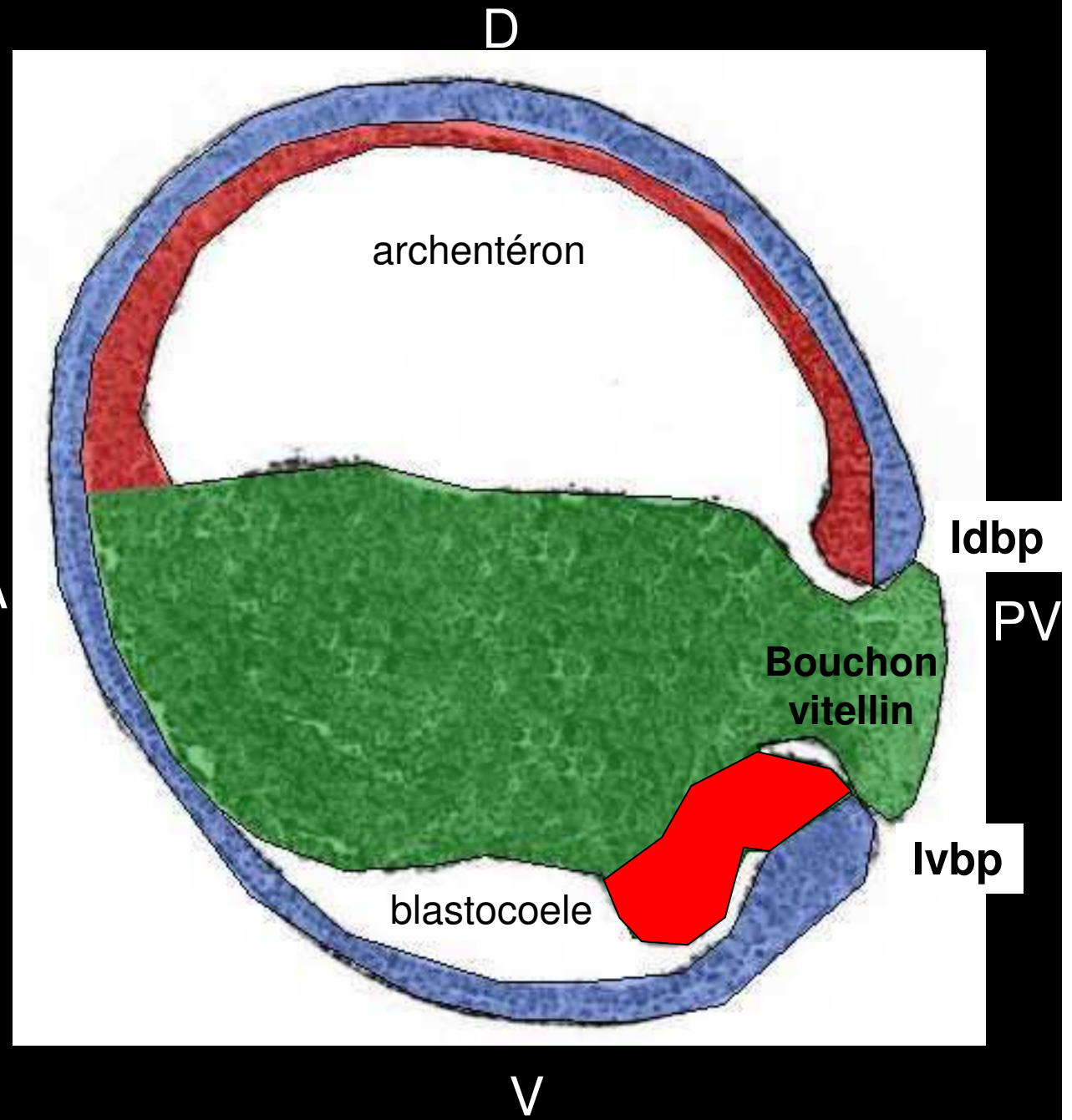
PA

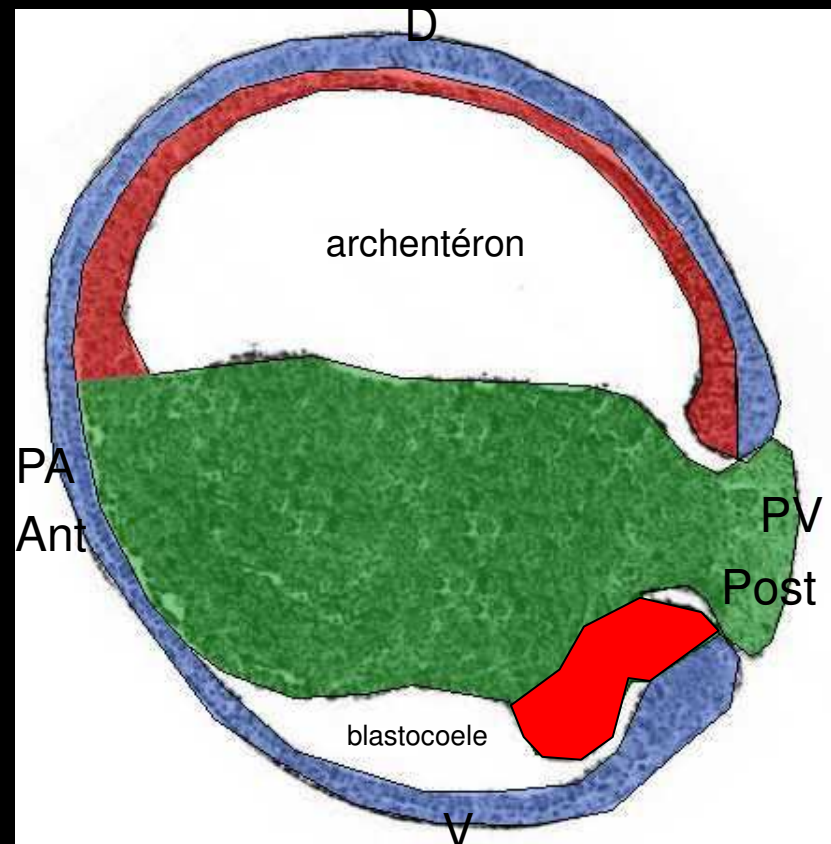
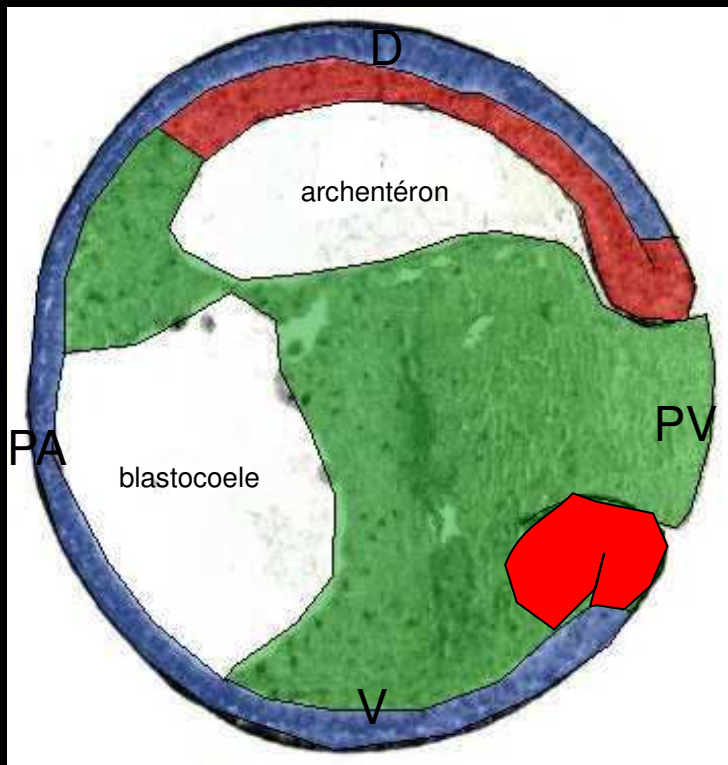
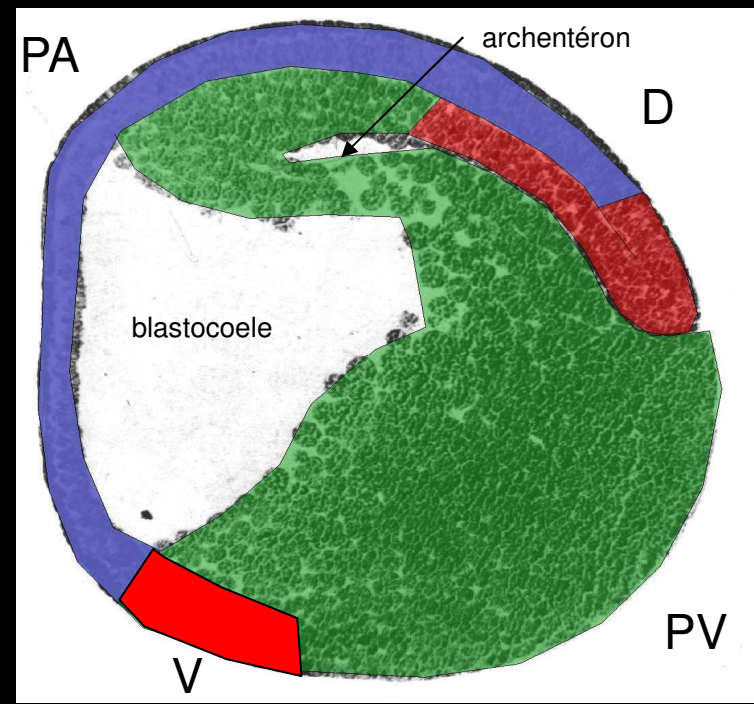
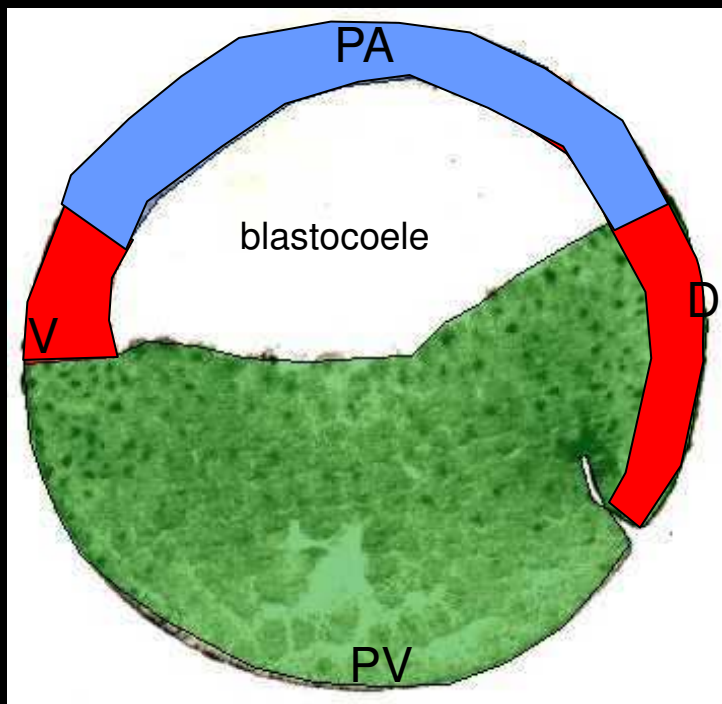


Stade bouchon vitellin

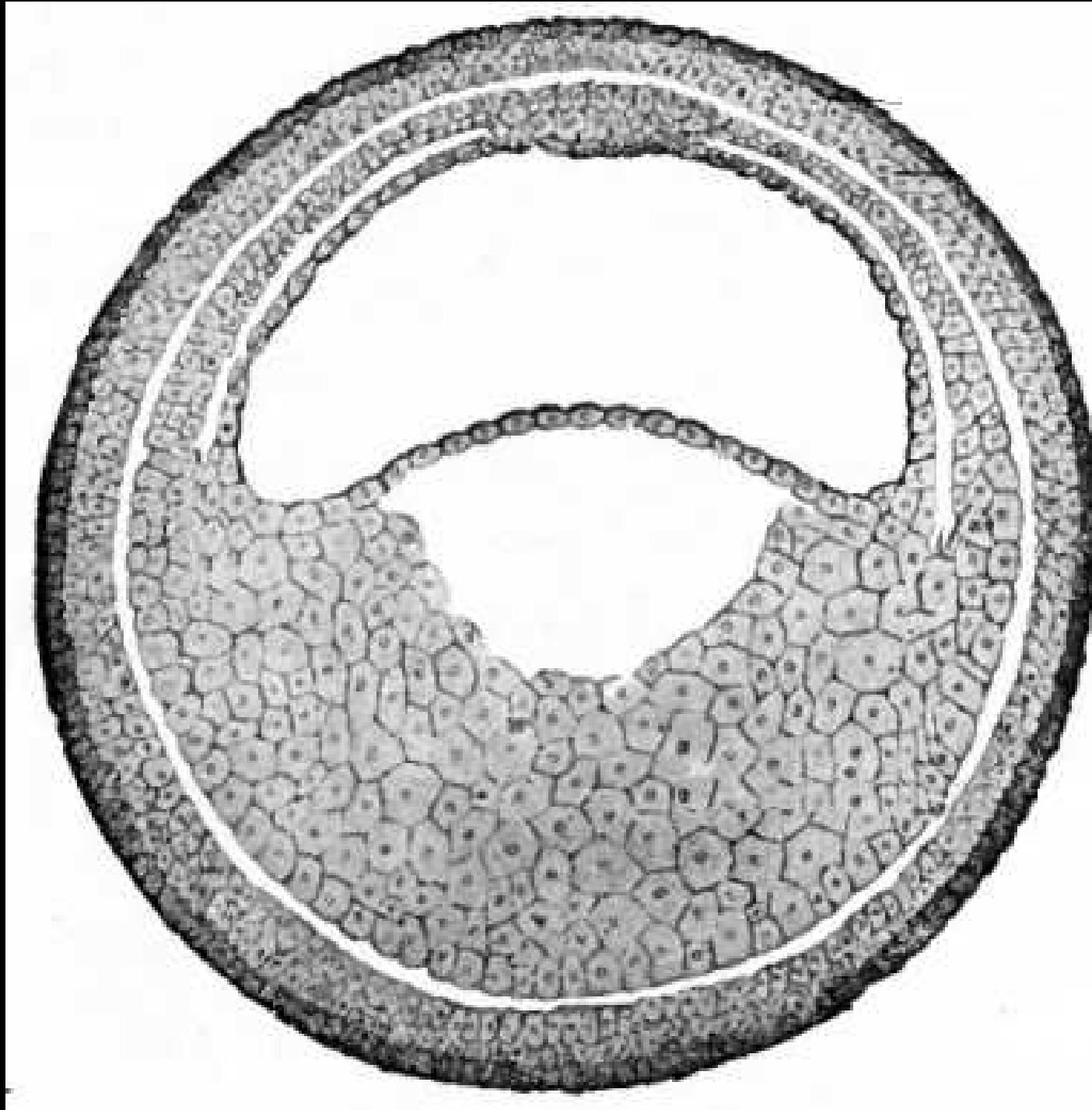


PA



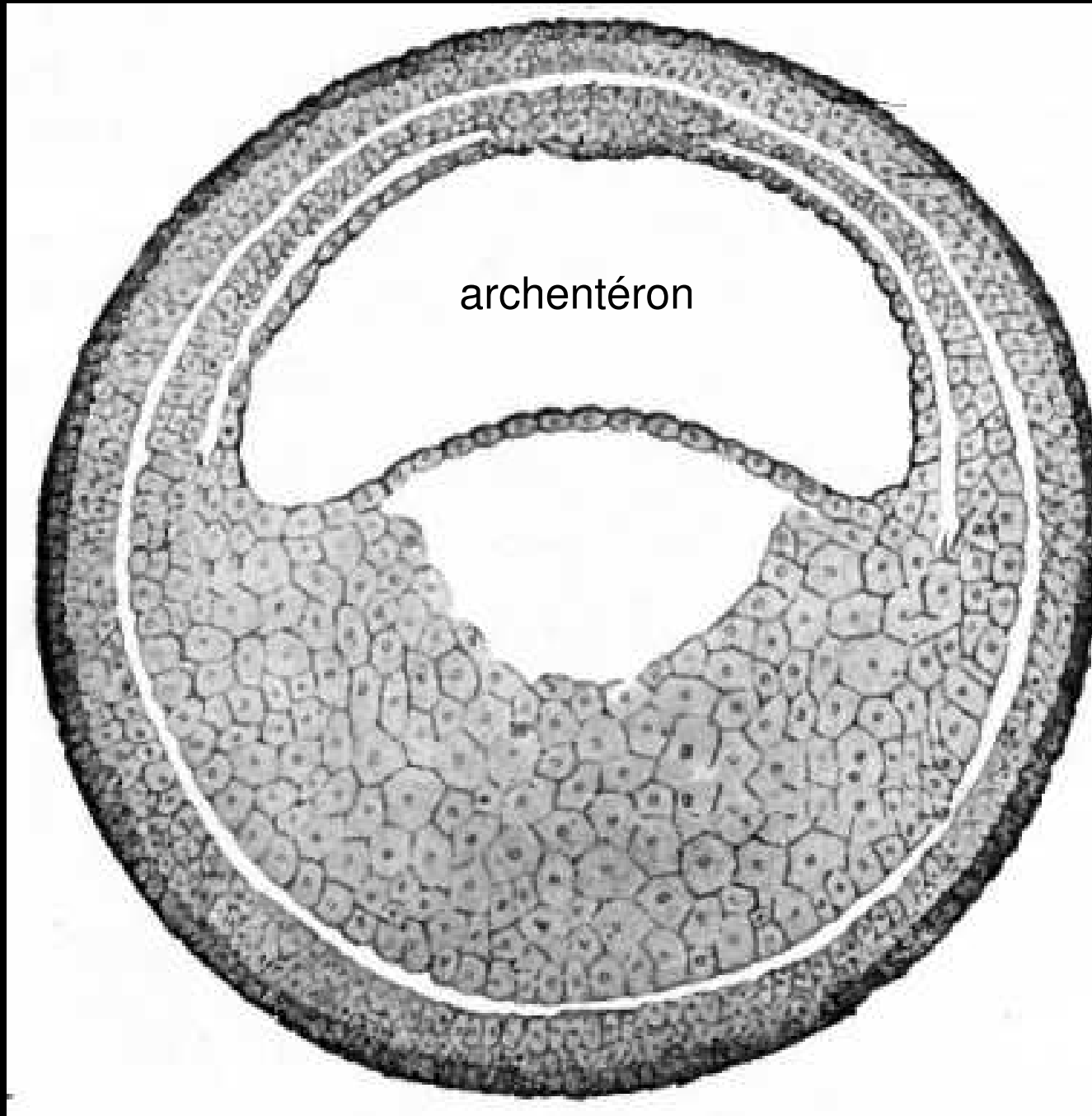


Coupe transversale d'une gastrula âgée

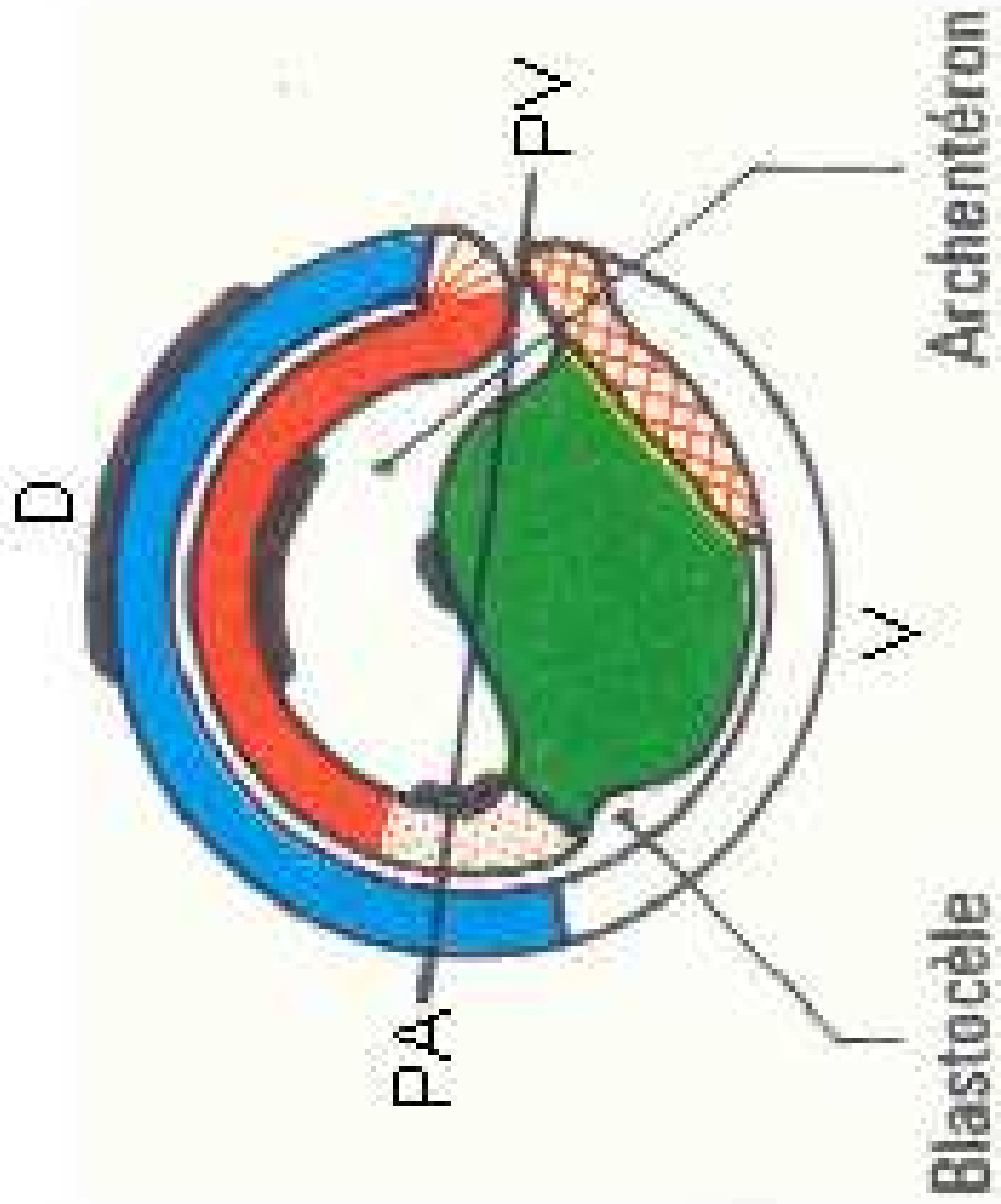


Coupe transversale d'une gastrula âgée

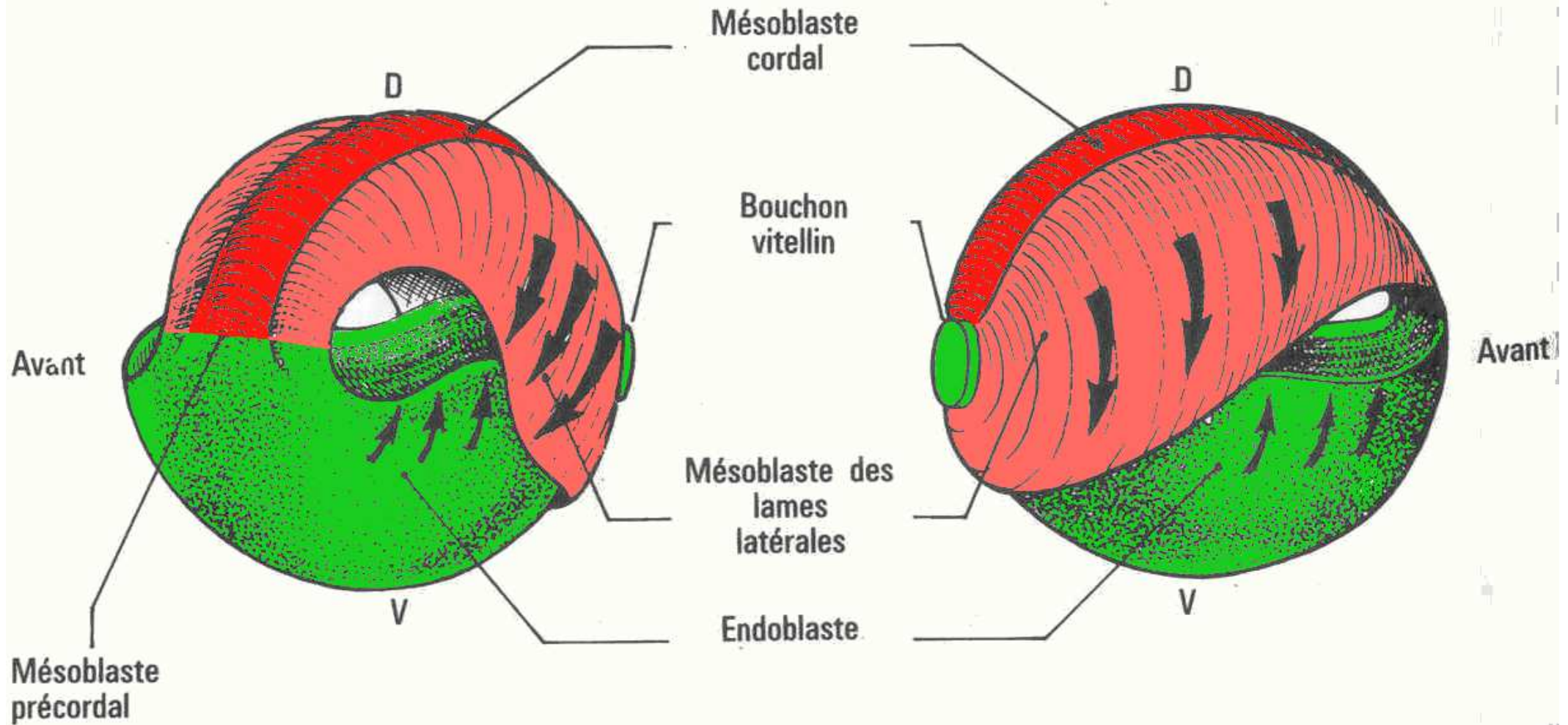
Dos



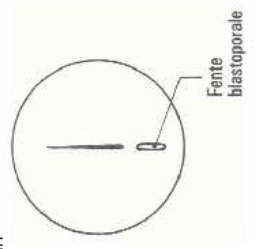
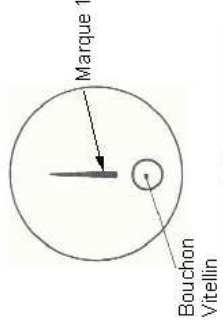
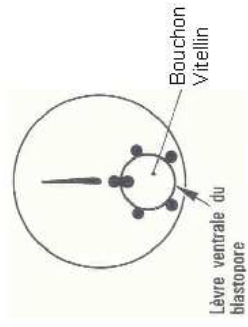
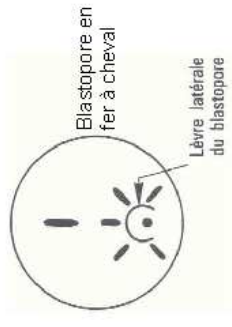
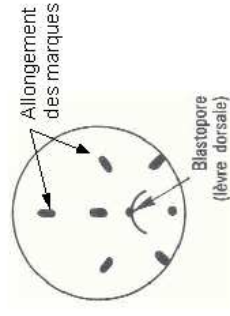
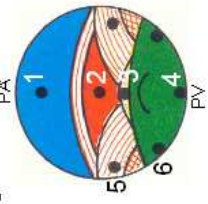
Ventre



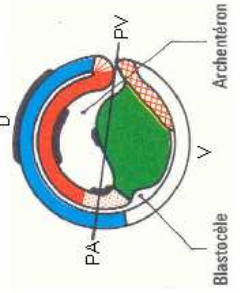
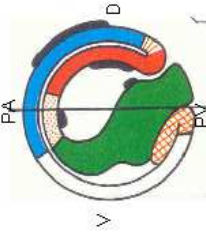
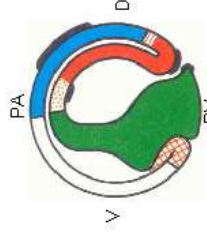
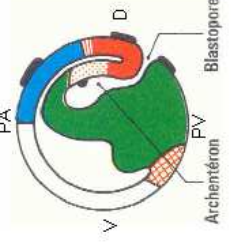
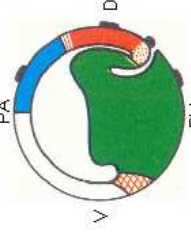
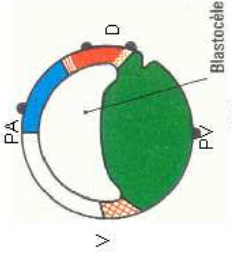
Divergence des lames latérales



Observations externes de la gastrulation (vue dorsale)



Observations de la gastrulation en coupe sagittale

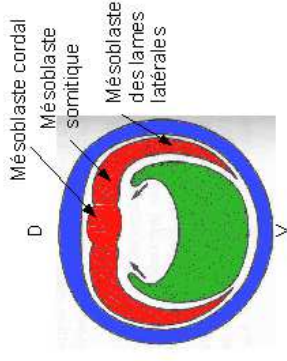


Début de gastrulation :
Formation de l'encoche blastoporale au niveau du croissant gris, sous la zone marginale

- Mésoblaste Cordal
- Mésoblaste Précordal
- Mésoblaste Somitique
- Mésoblaste Caudal
- Mésoblaste des lames latérales
- Epiblaste
- Neuroblaste
- Endoblaste

Mi-Gastrula
L'invagination des territoires mésodermiques et endodermiques délimite une cavité : l'archentéron

Fin de gastrulation
Le blastocèle est réduit. Le mésoderme est plaqué sous l'ectoderme. L'endoderme bouche le blastopore (bouchon vitellin)



Gastrula âgée en coupe transversale

III. L'organogenèse

La neurulation



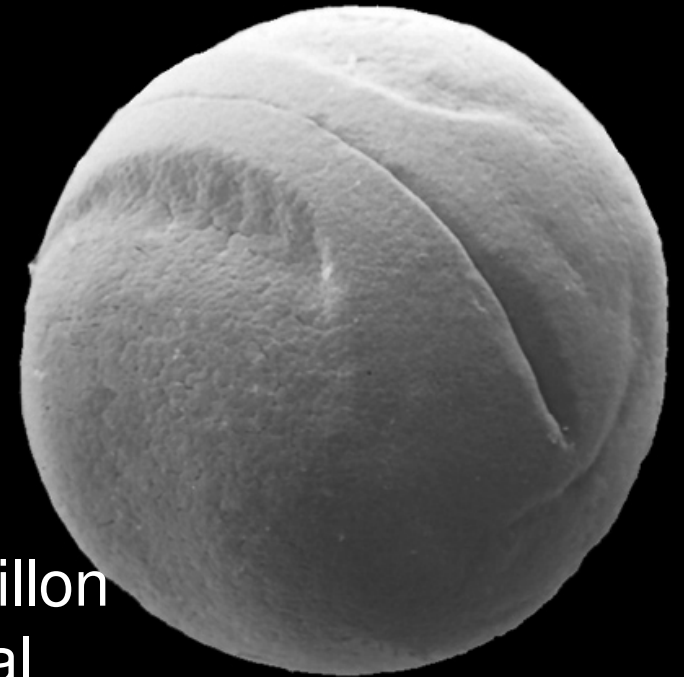
La neurulation



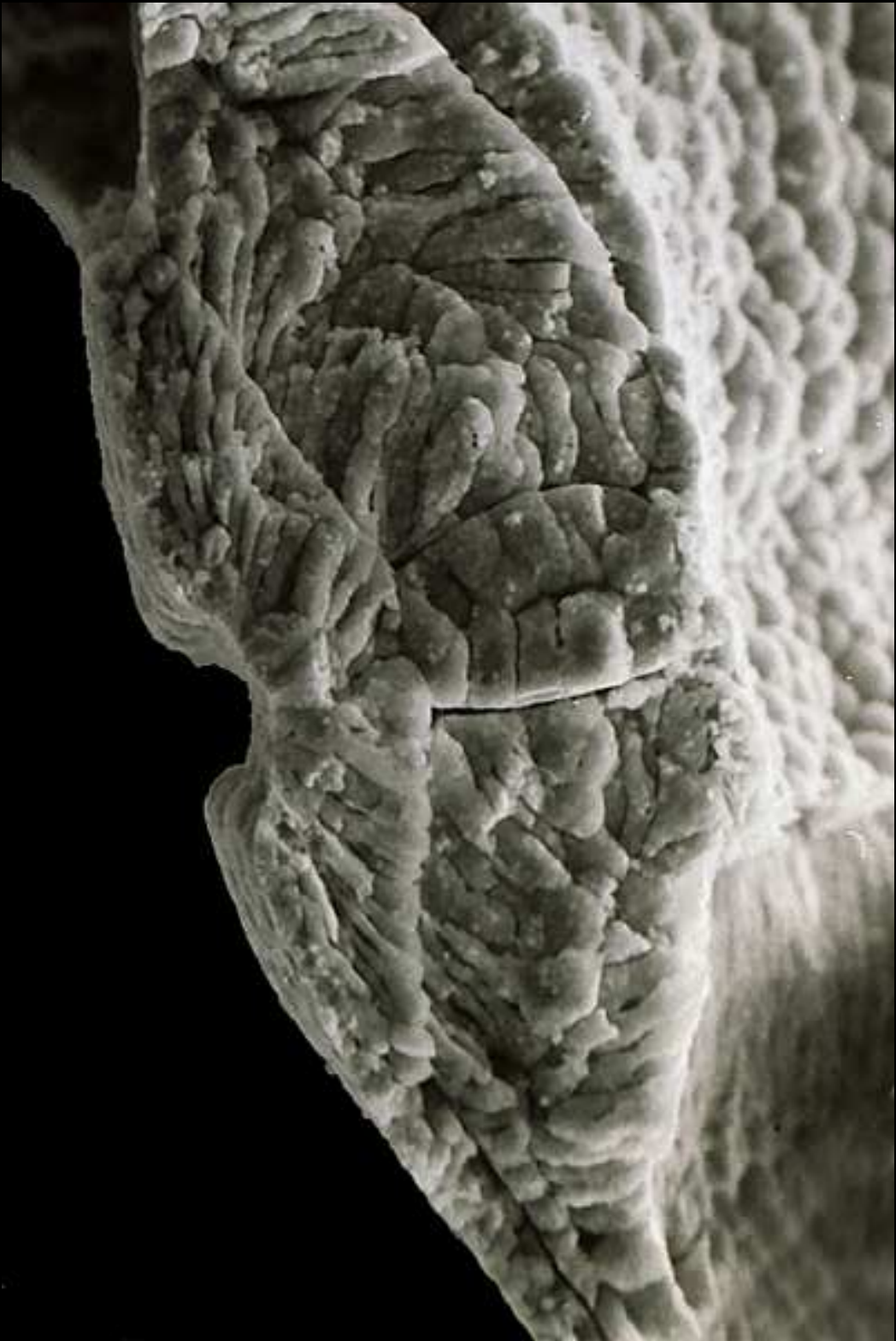
Stade plaque
neurale



Stade gouttière
neurale



Stade sillon
neural





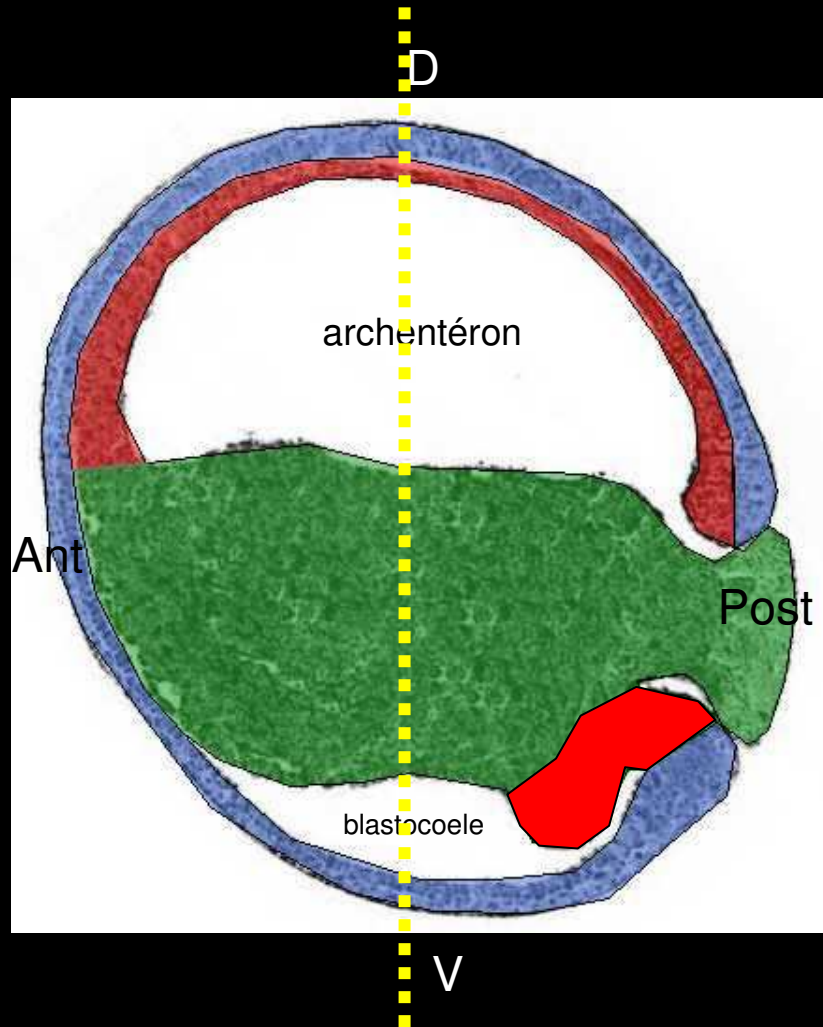
Stade plaque
neurale

Stade gouttière
neurale



Stade sillon
neural /
tube neural

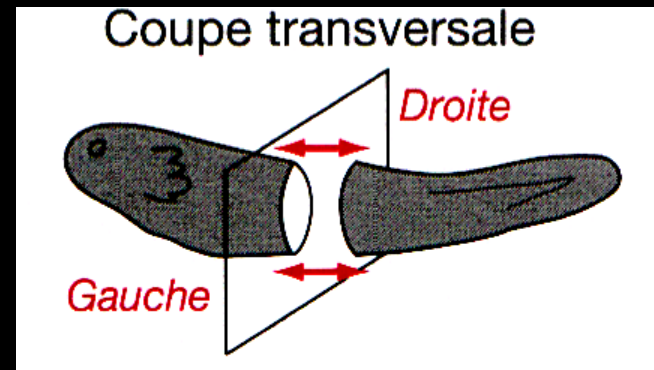
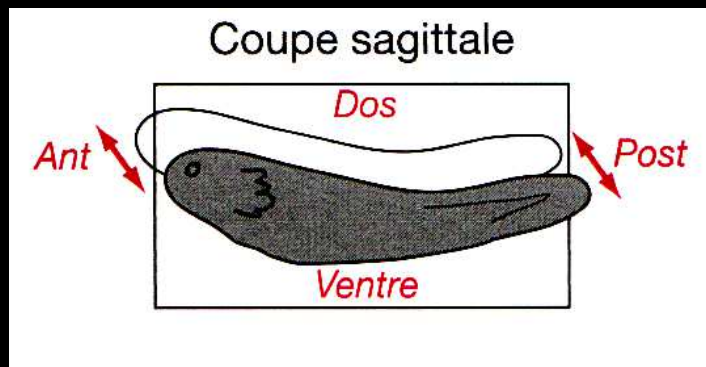




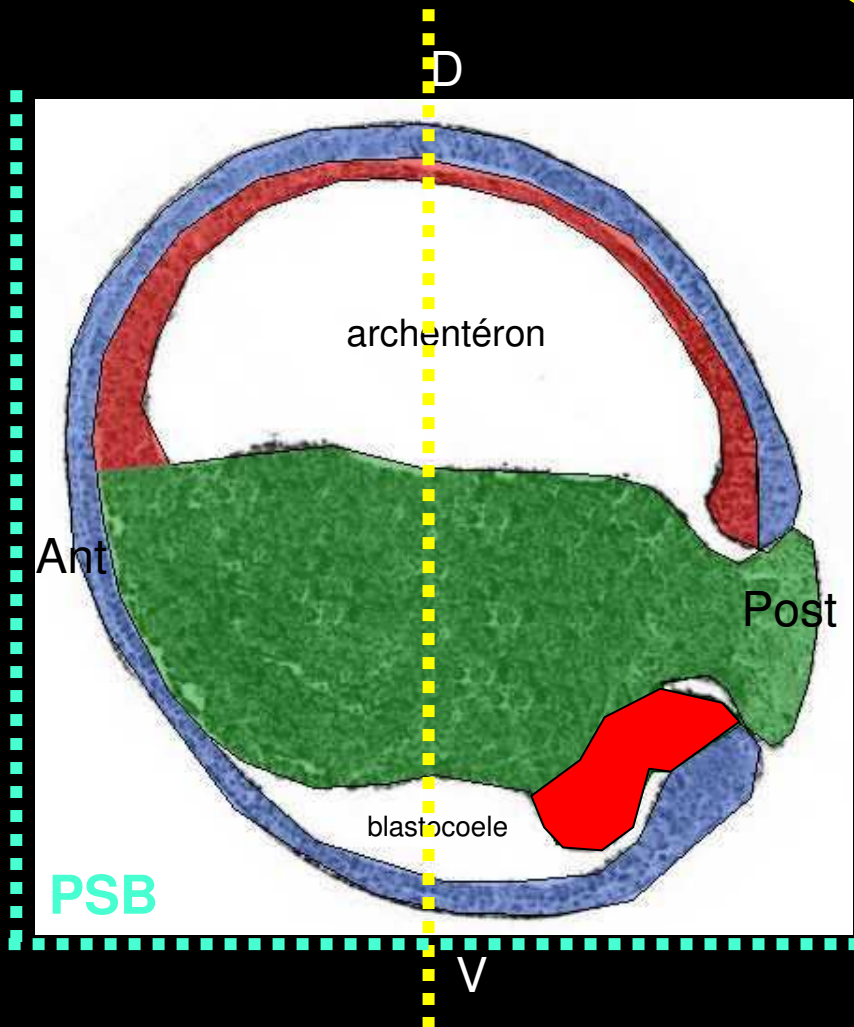
Coupe sagittale



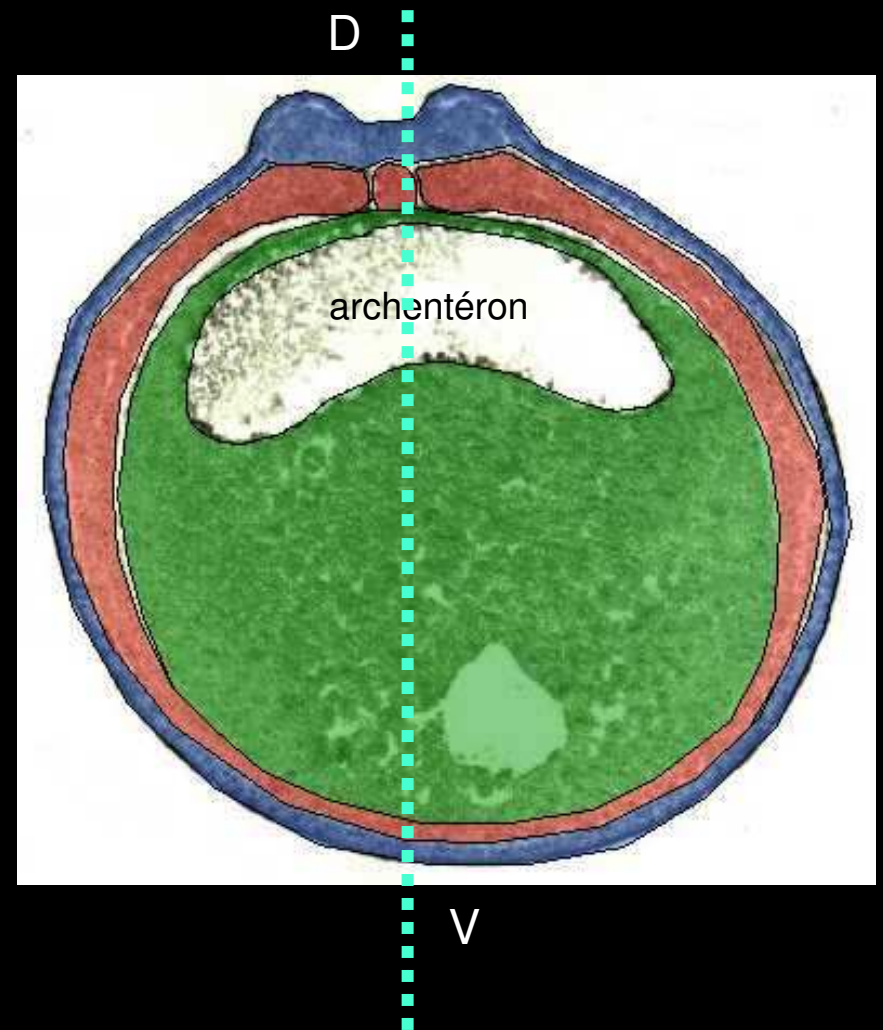
Coupe transversale



Plan de coupe transversale



Plan de symétrie bilatérale = PSB



Stade plaque
neurale

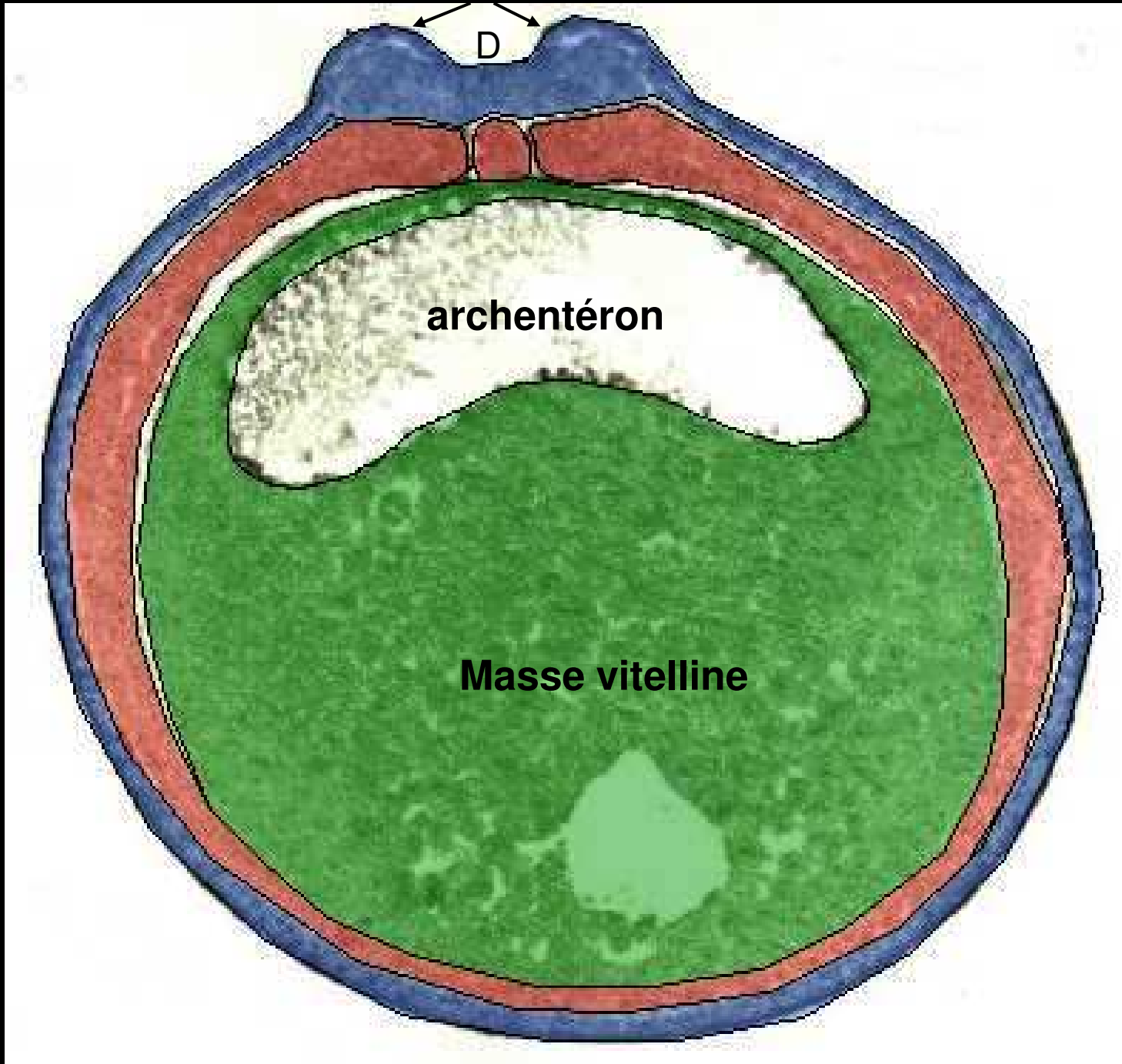
Bourrelets neuraux

D

archentéron

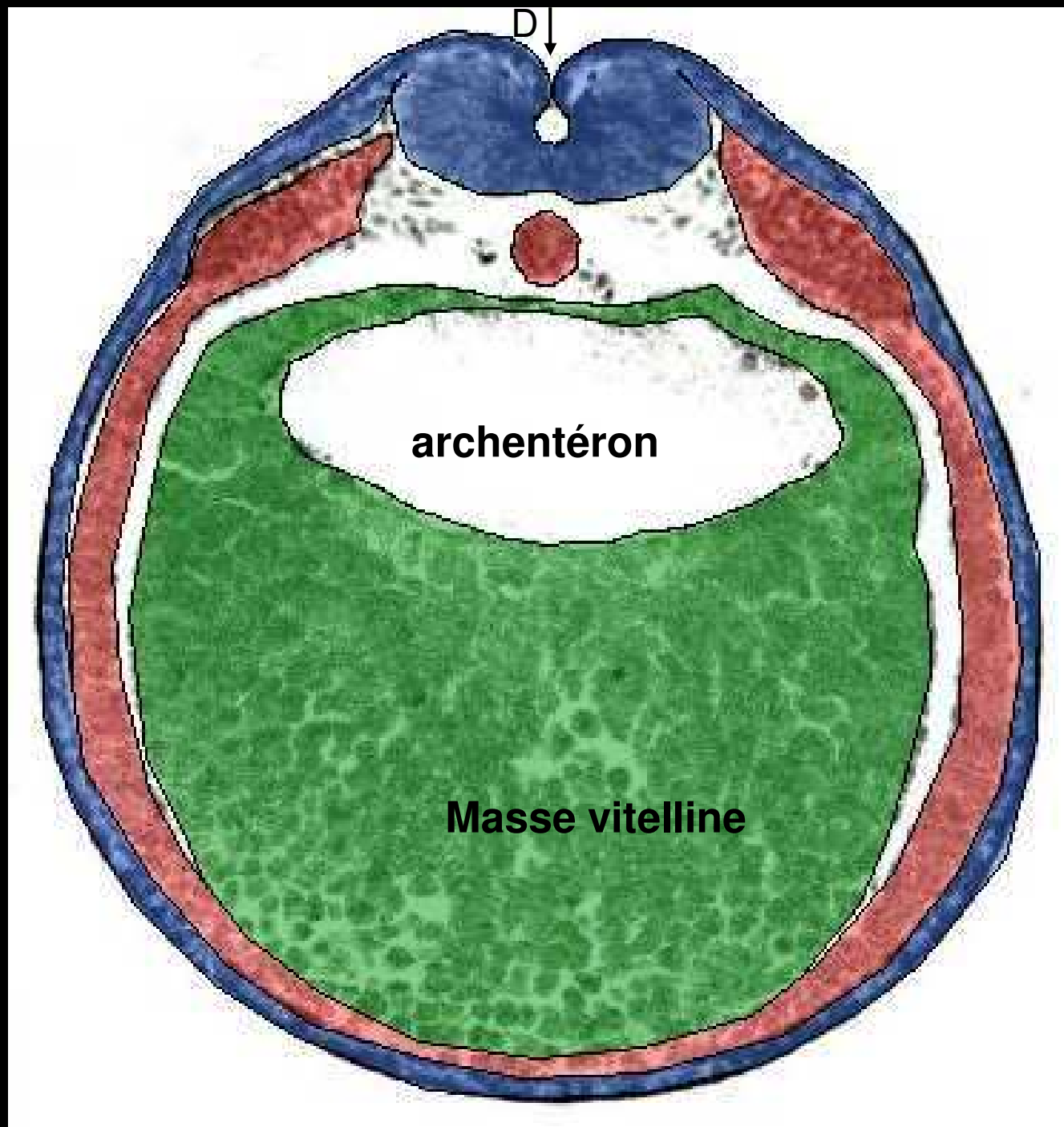
Masse vitelline

V



Stade gouttière neurale

Gouttière neurale

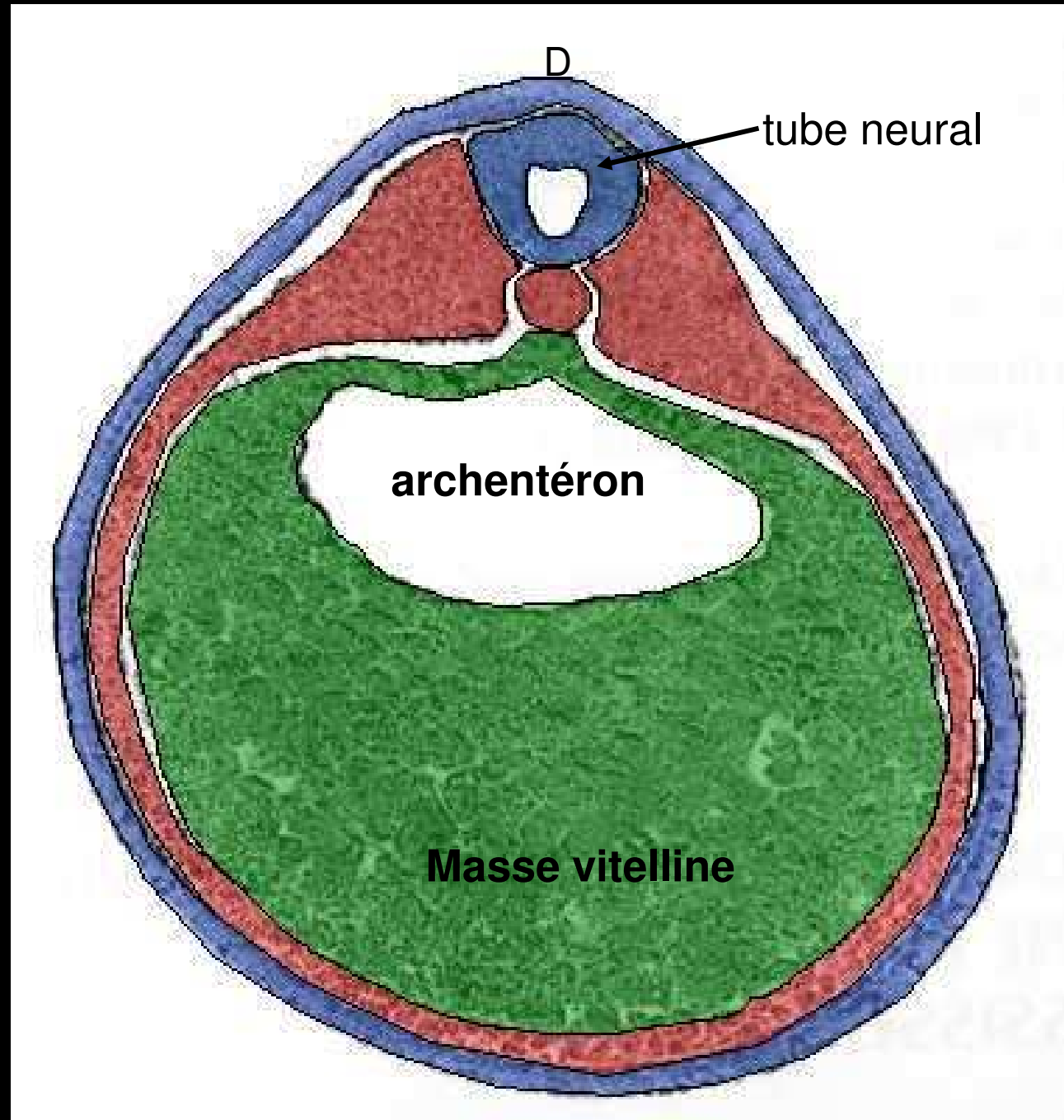


archentéron

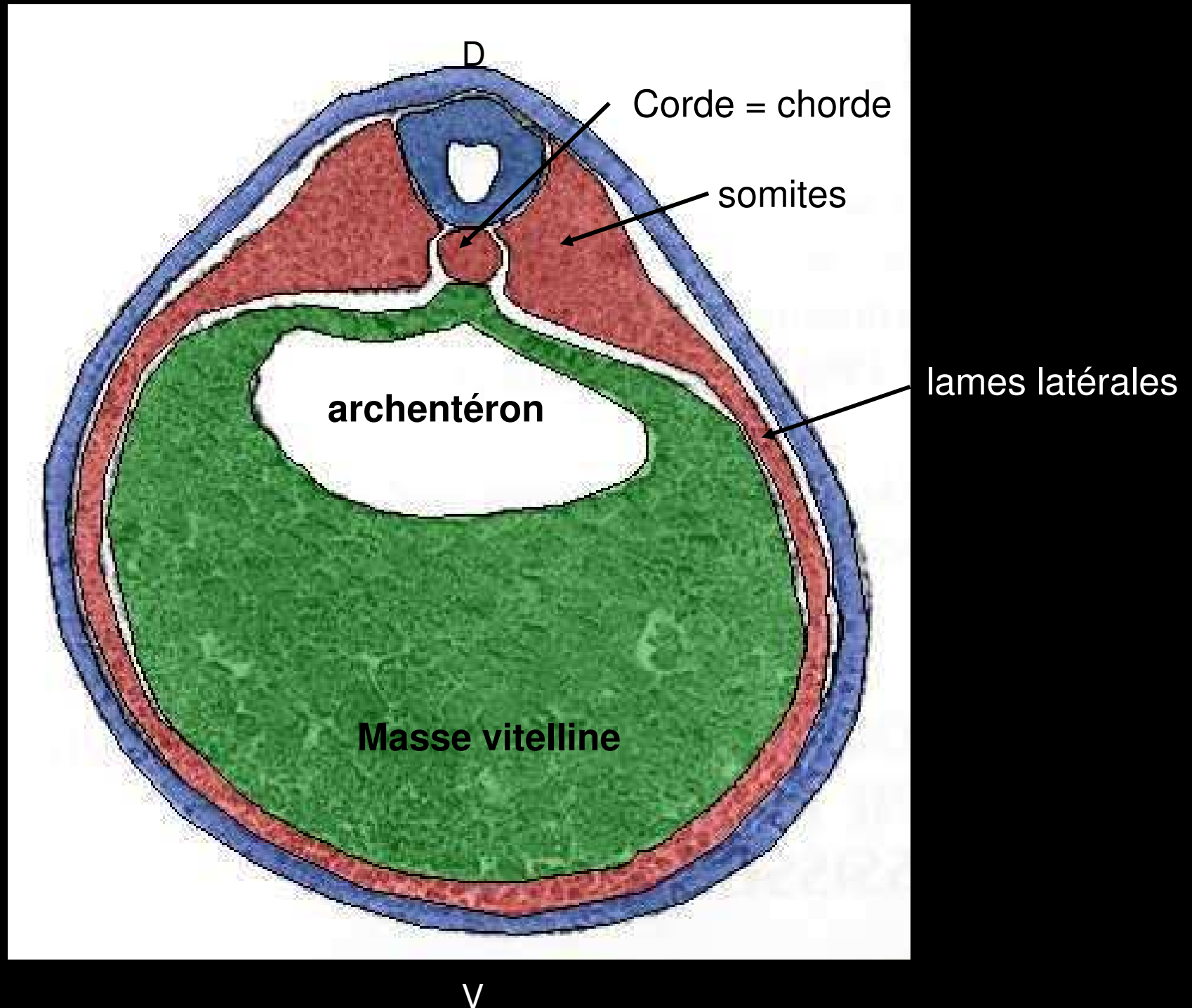
Masse vitelline

V

Stade sillon neural / tube neural



Evolution du mésoderme



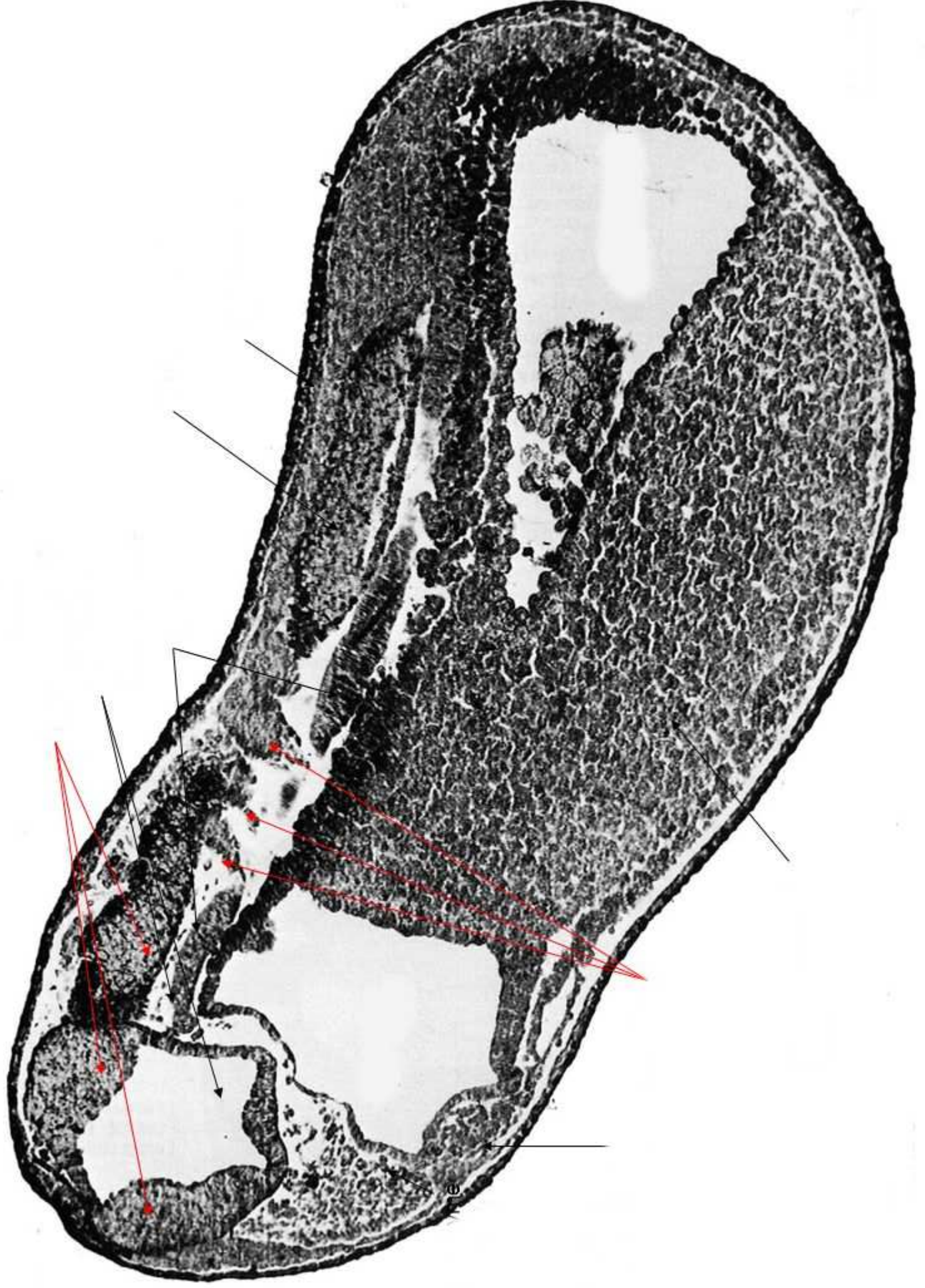
Le bourgeon caudal

tête

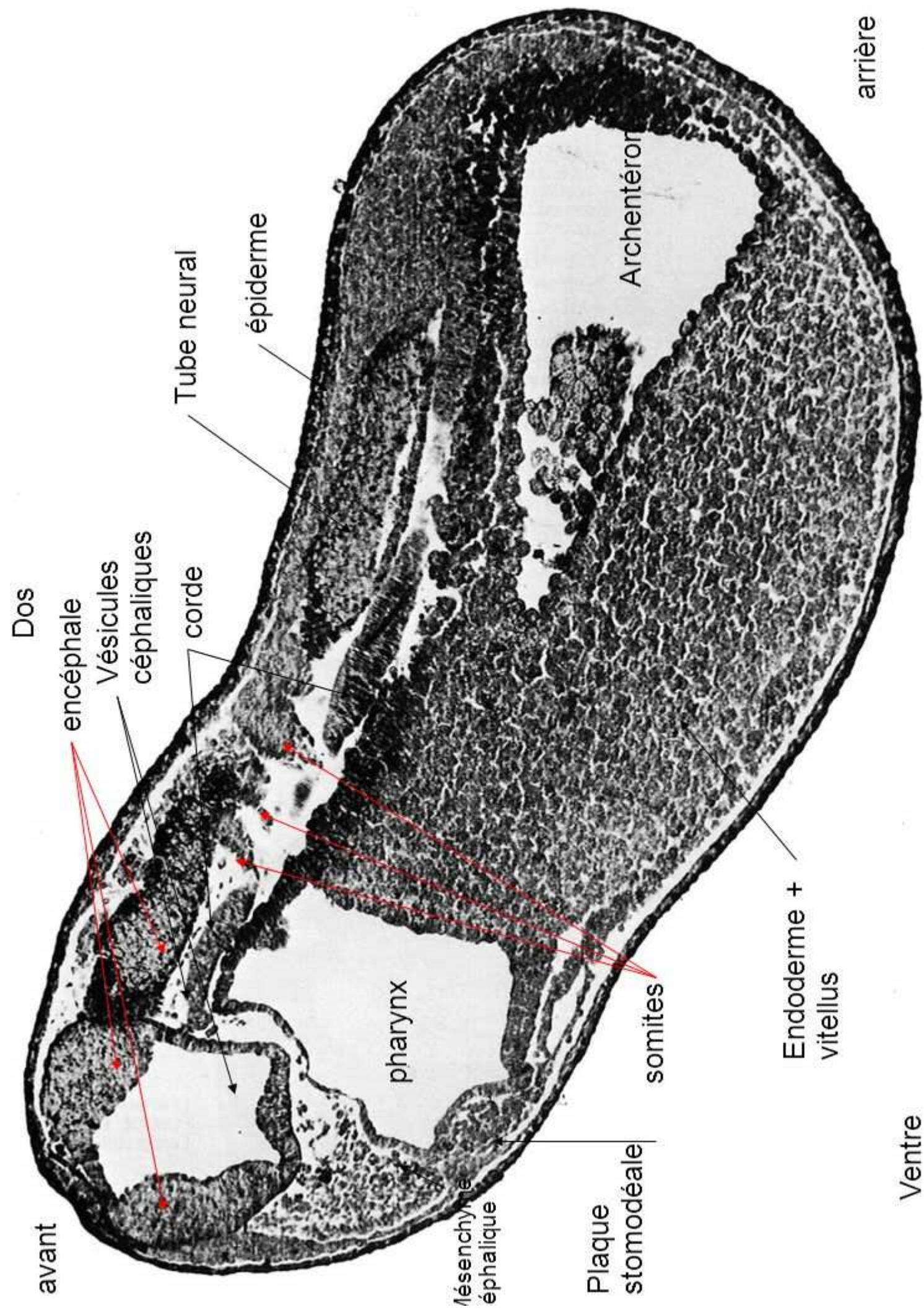
tronc

queue

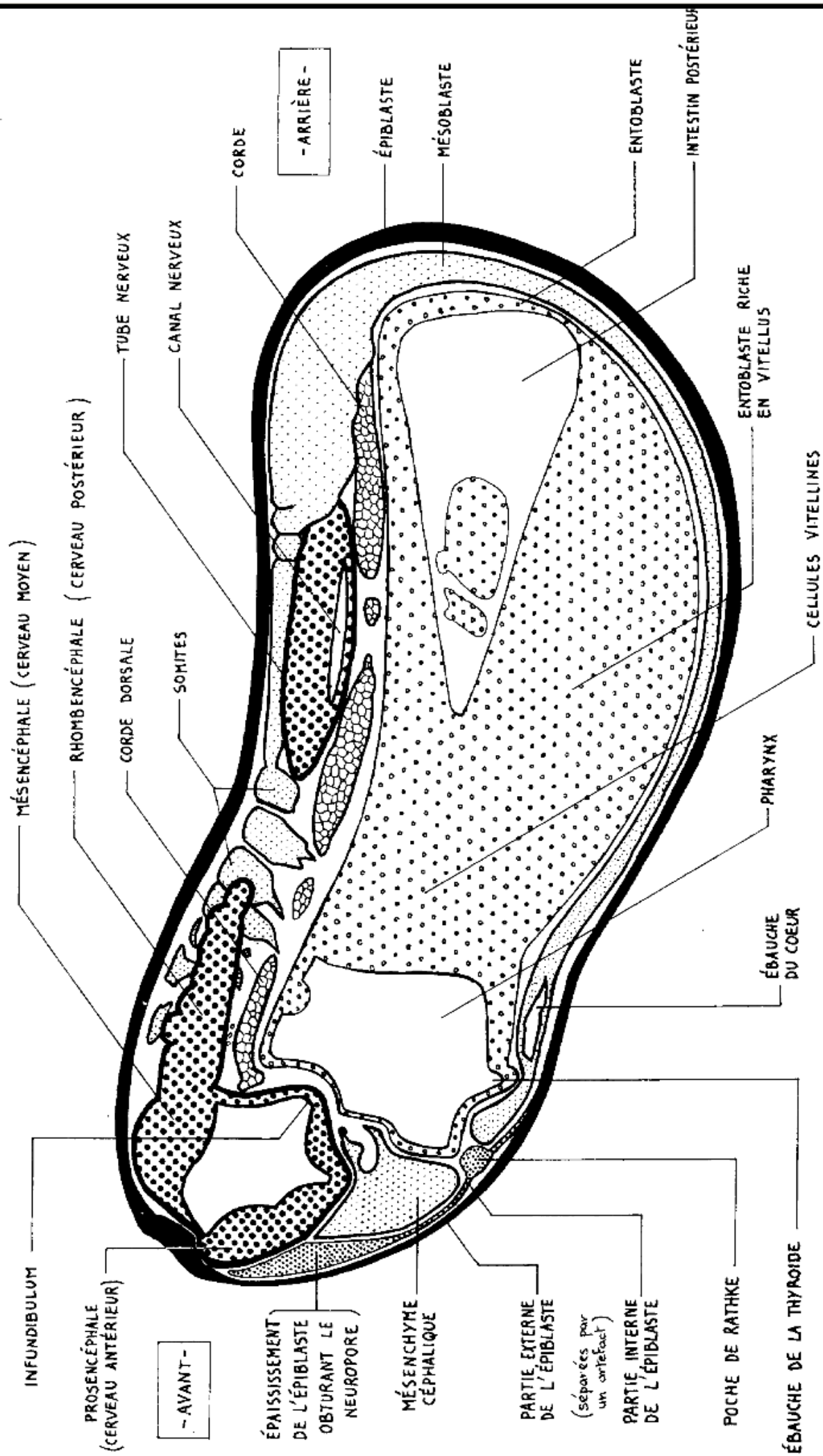




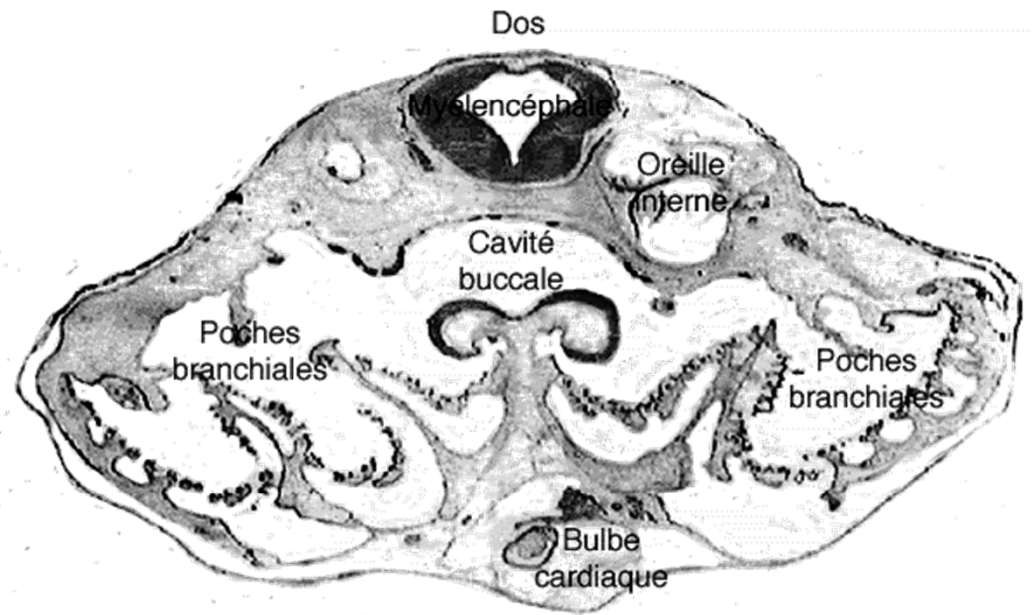
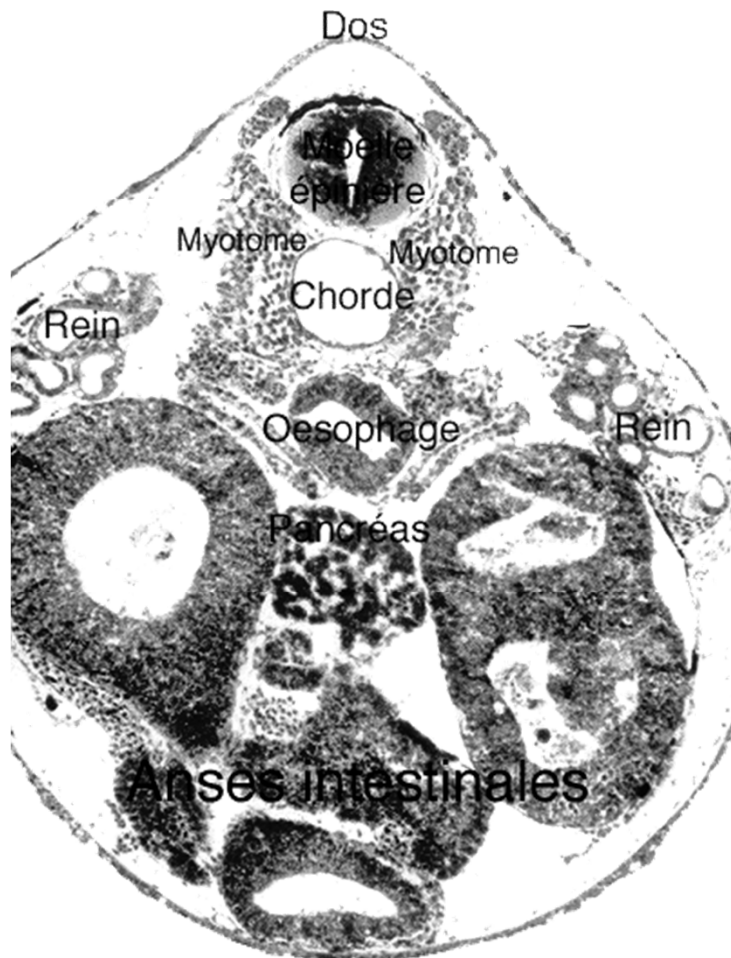
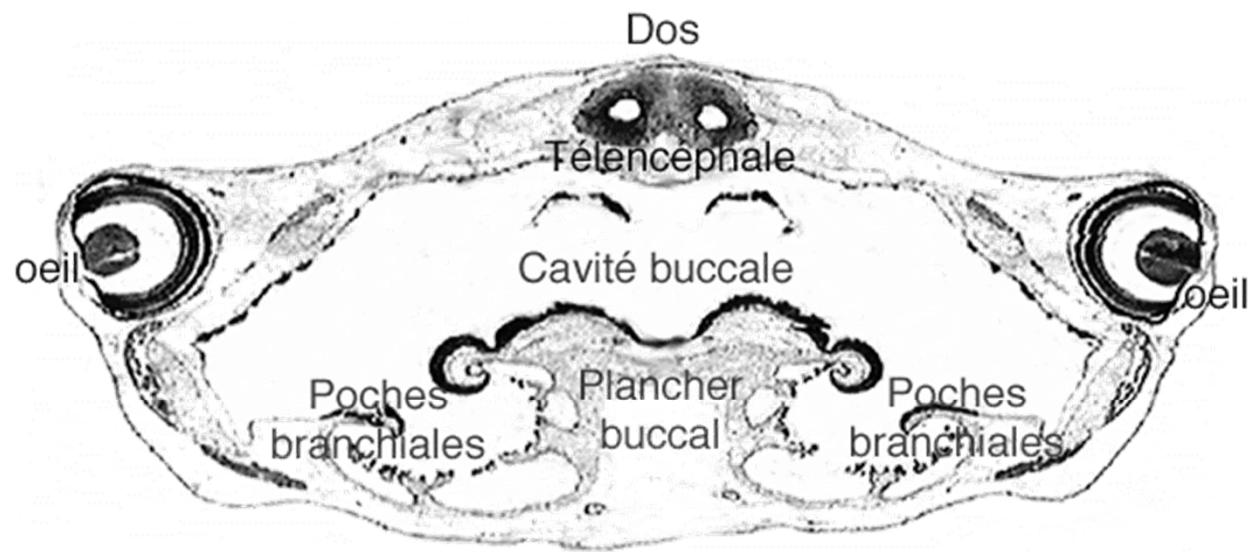
Coupe sagittale de jeune bourgeon caudal



Coupe sagittale de jeune bourgeon caudal







Coupes transversales têtard

Anoures : Grenouilles, Crapaud, Xénope



Crapaud commun (*Bufo bufo*)



Xénope (*Xenopus laevis*)



Grenouille verte (*Rana esculenta*)

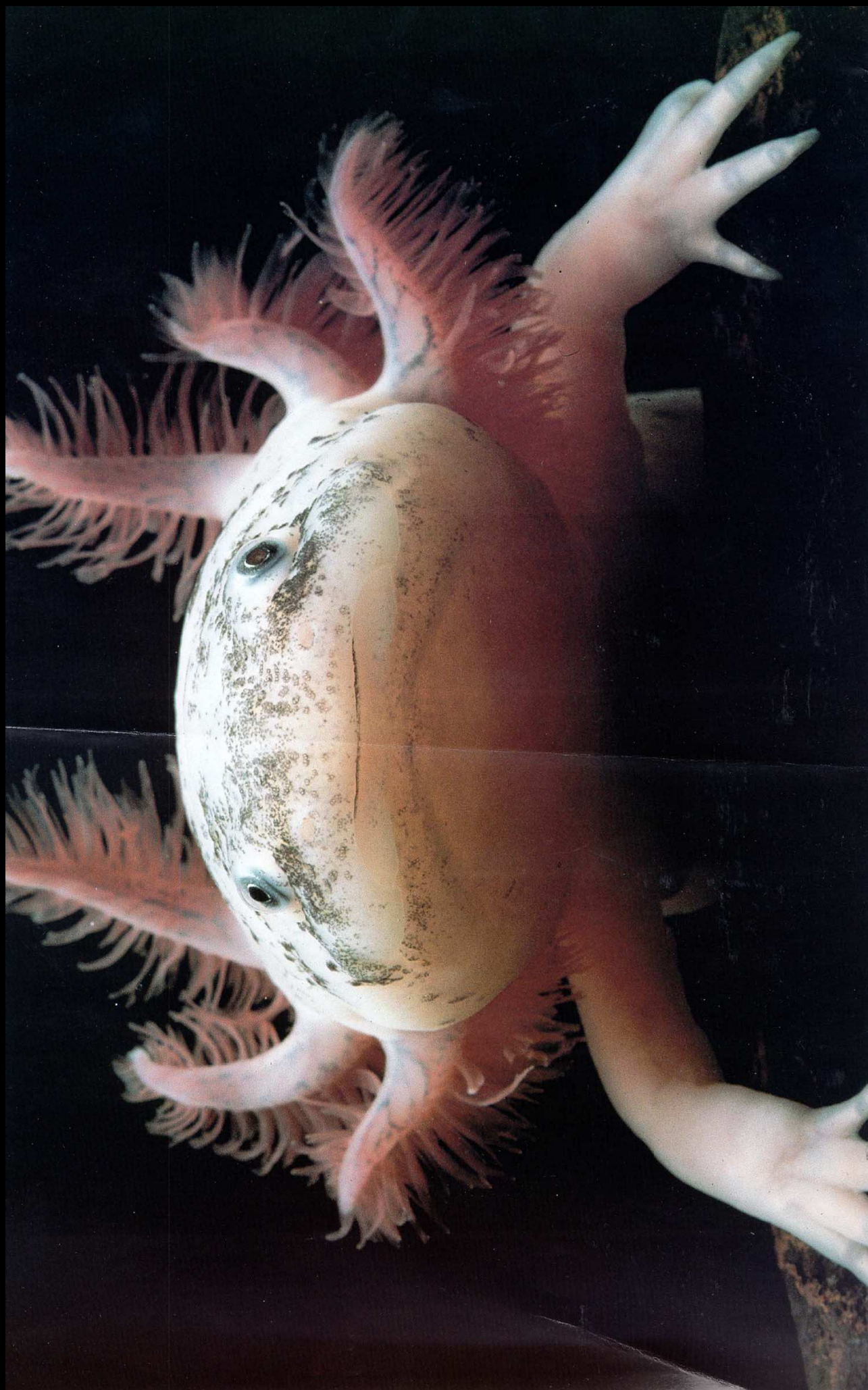
Urodèles : Salamandres et Tritons



Triton palmé (*Triturus helveticus*)



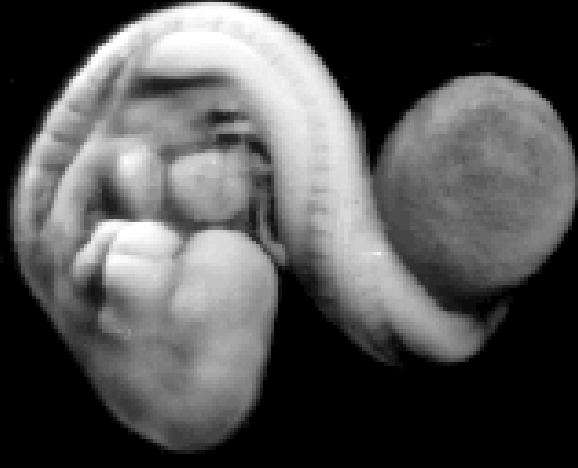
Salamandre terrestre (*Salamandra atra*)



Bird



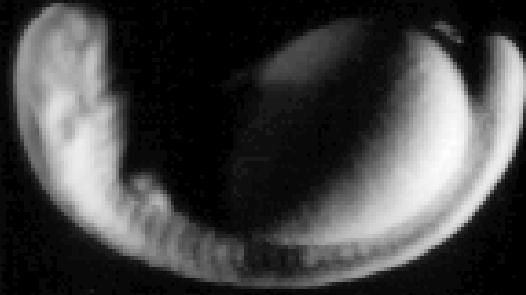
Mammal



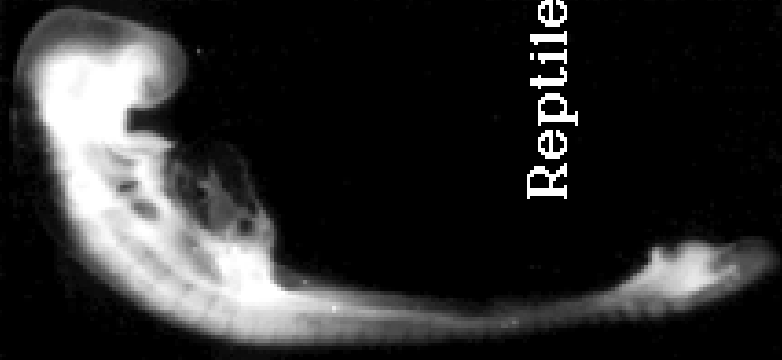
Amphibian



Fish

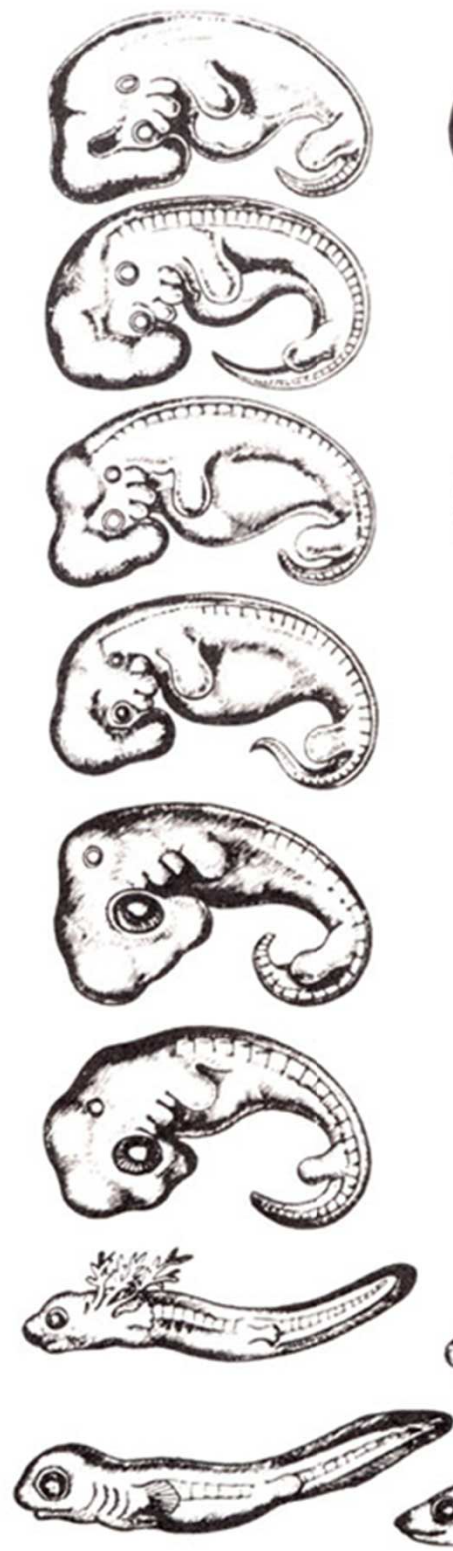


Reptile

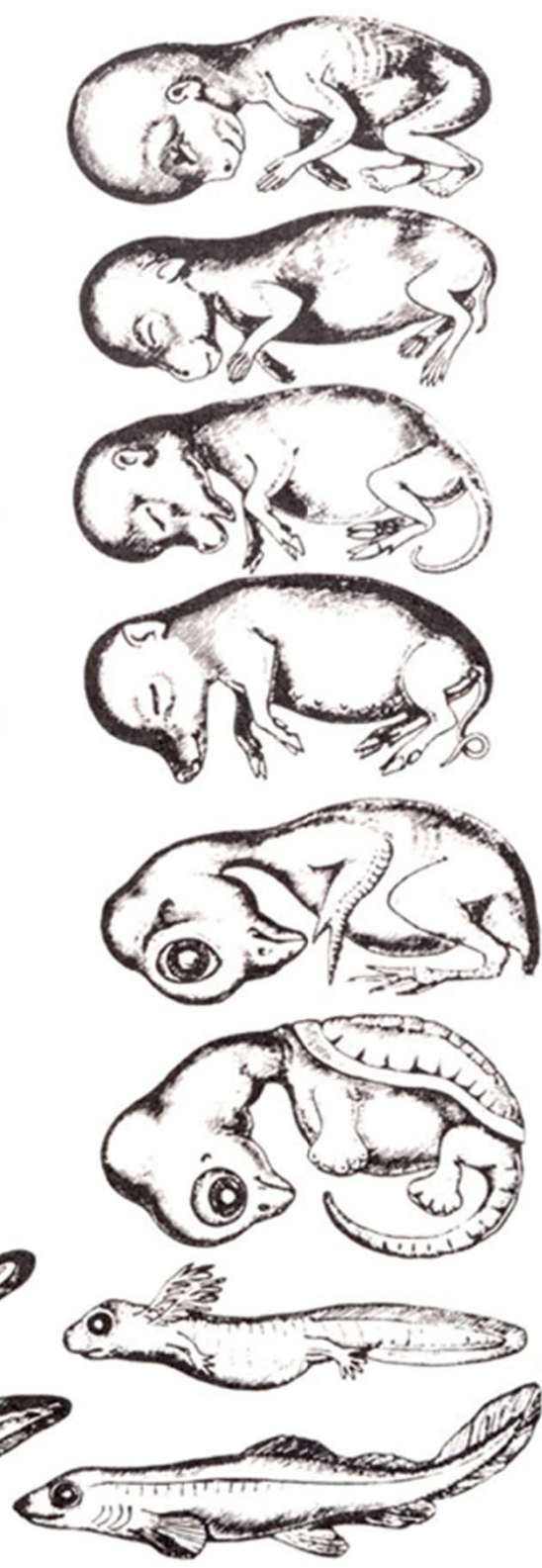




I



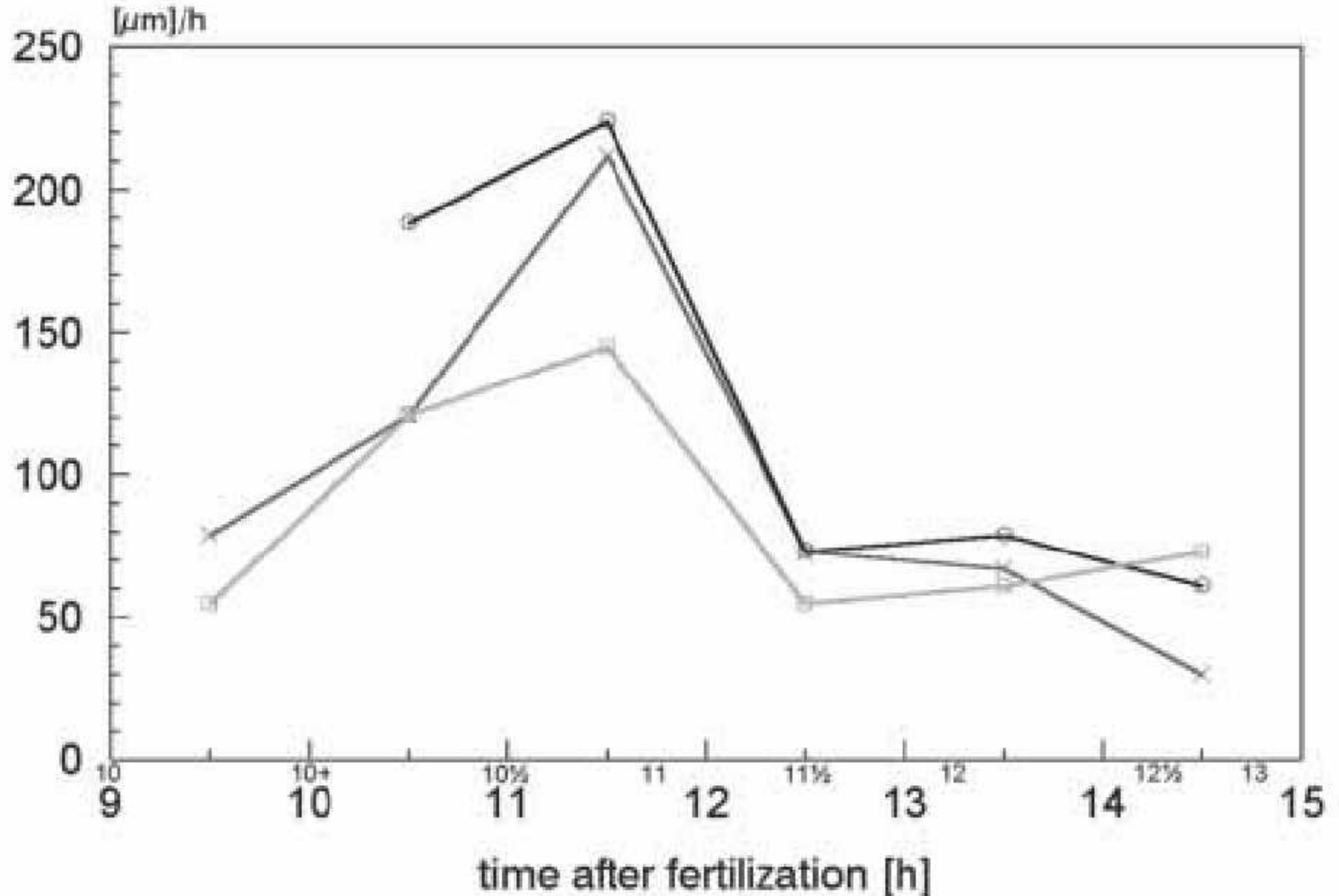
II



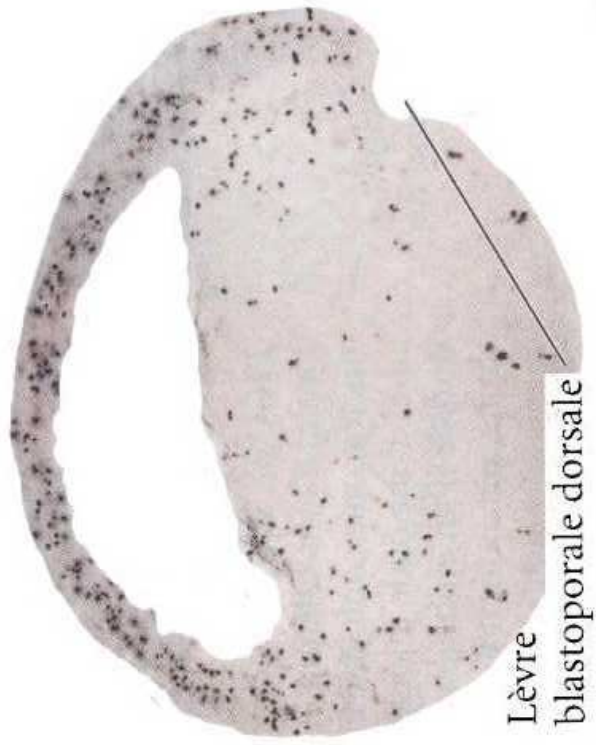
III

Fish Salamander Tortoise Chick Hog Calf Rabbit Human

Mesure de la vitesse des cellules mésoblastiques impliquées au cours du temps
(mesures réalisées à partir des distances entre la cellule considérée et le blastopore).



A



B



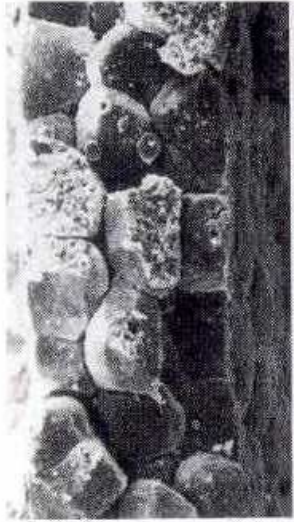
C



8

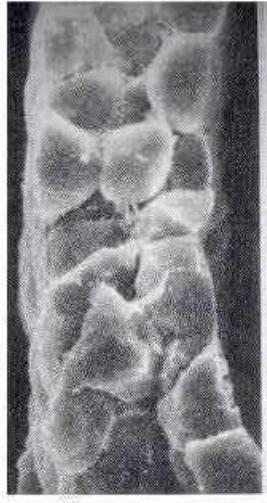
Stade

10.5



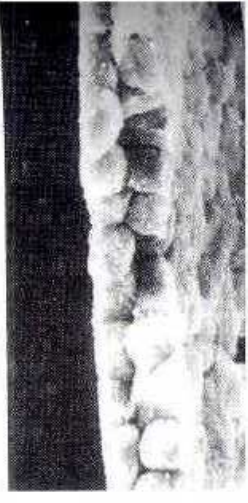
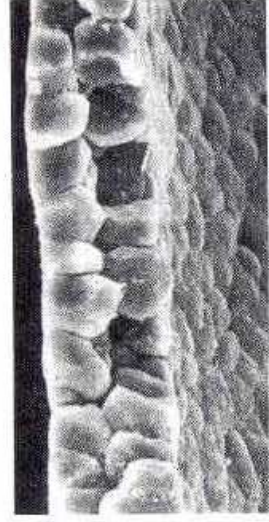
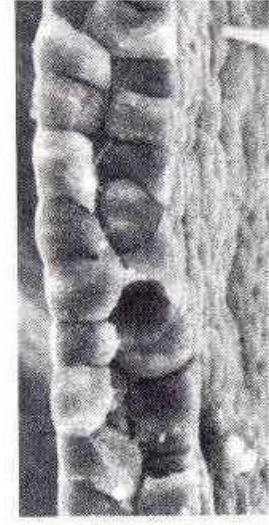
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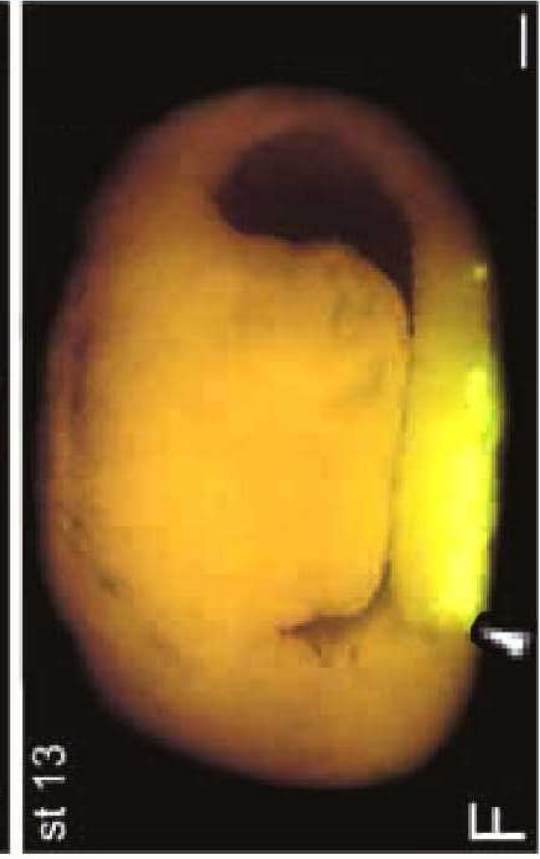
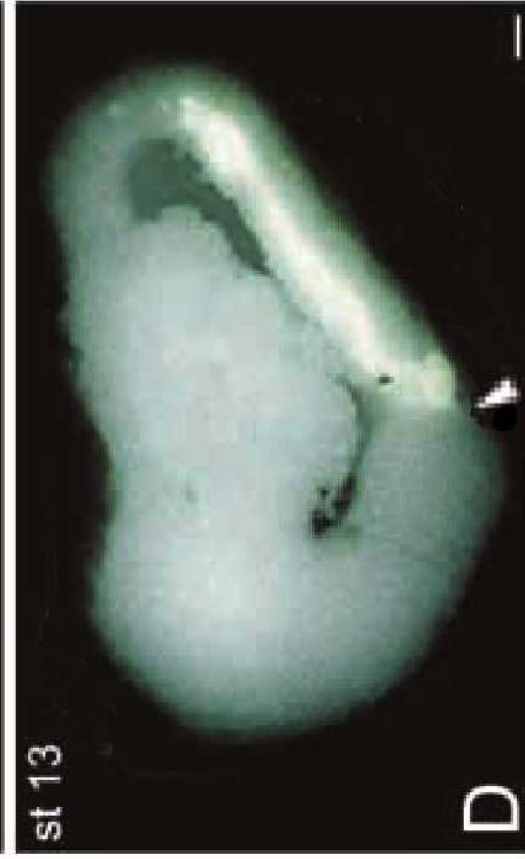
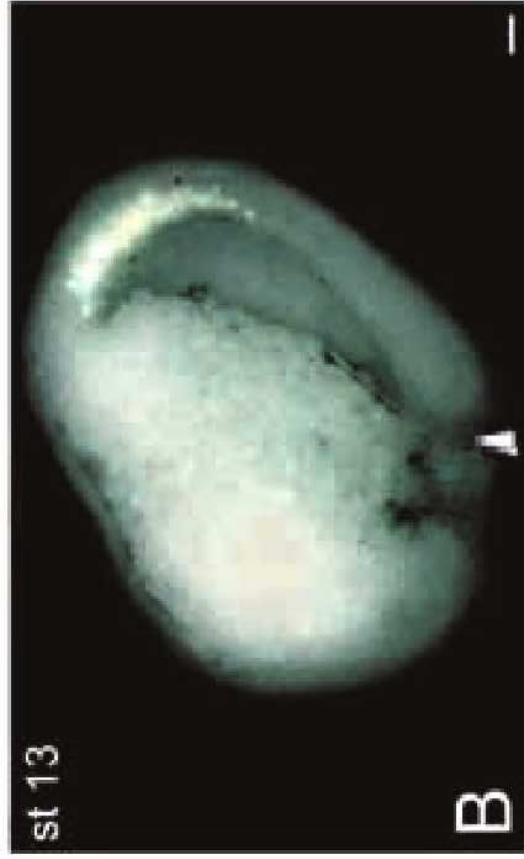
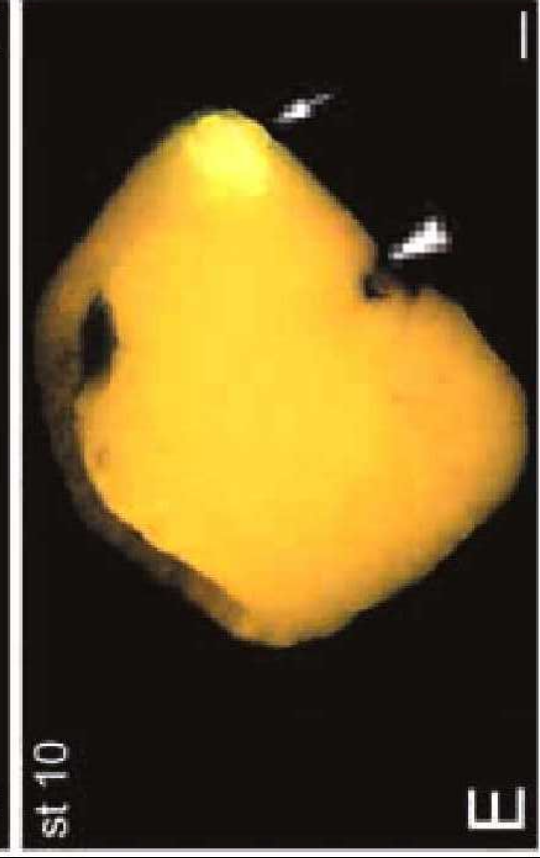
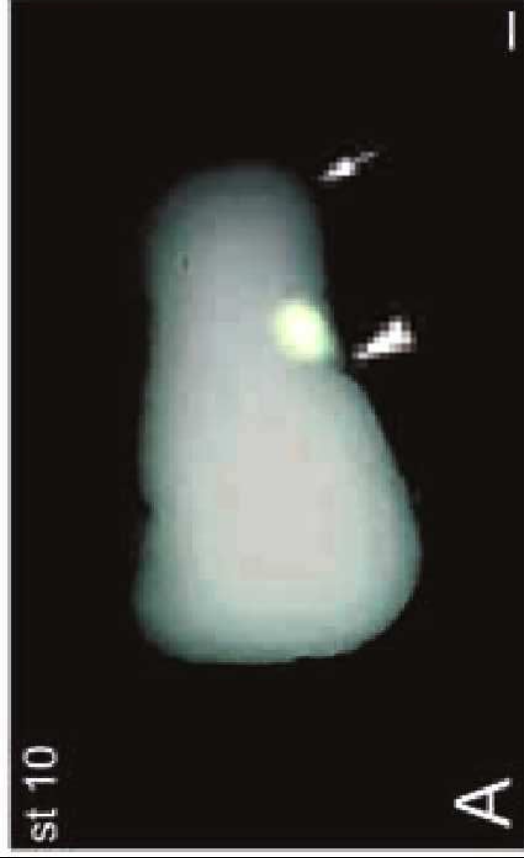
11



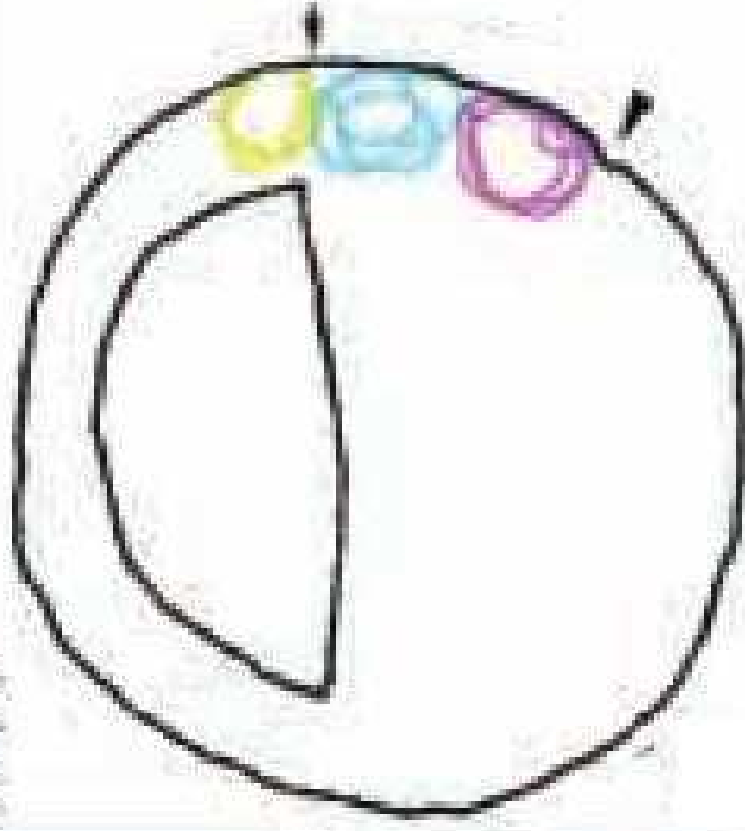
10

11.5

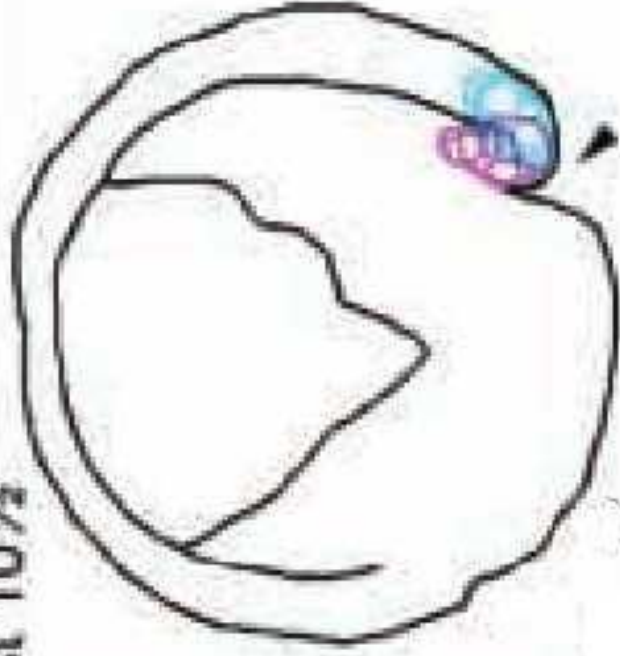




st 10



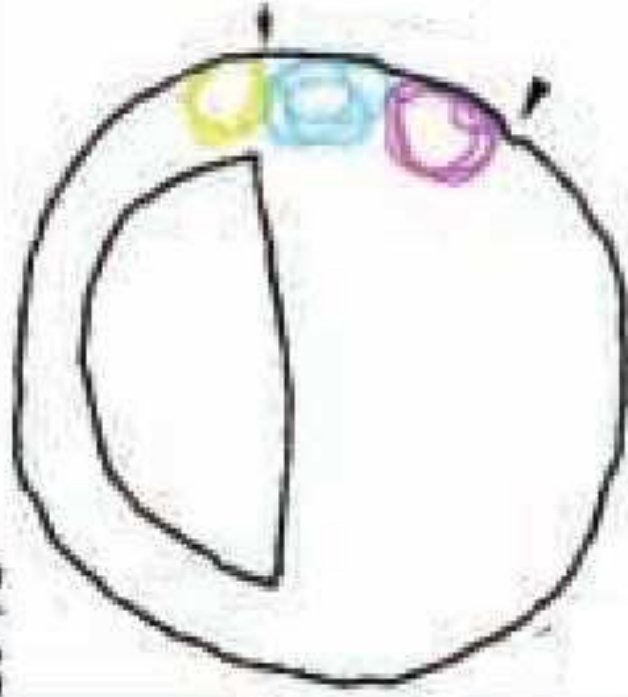
st 10½



st 13



st 10



st 11

