

**FACULTE DE MEDECINE TOULOUSE - PURPAN**

**LABORATOIRE D'ANATOMIE**

**ANATOMIE DU SYSTEME  
NERVEUX CENTRAL**

**Tome I**

**Pr. Jacques MOSCOVICI**

**DFGSM 3**

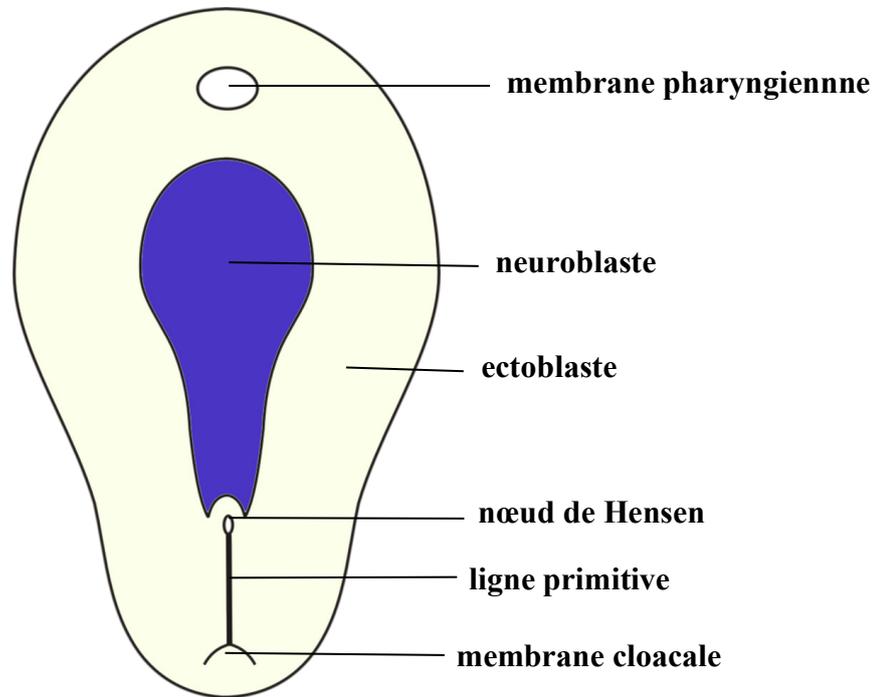
**Année 2014-2015**

**Ce recueil de schémas d'anatomie du système nerveux central n'est pas un simple support du cours. Il contient des éléments complémentaires, donnés à titre indicatif, destinés à favoriser la compréhension et pouvant servir pour d'autres enseignements.**

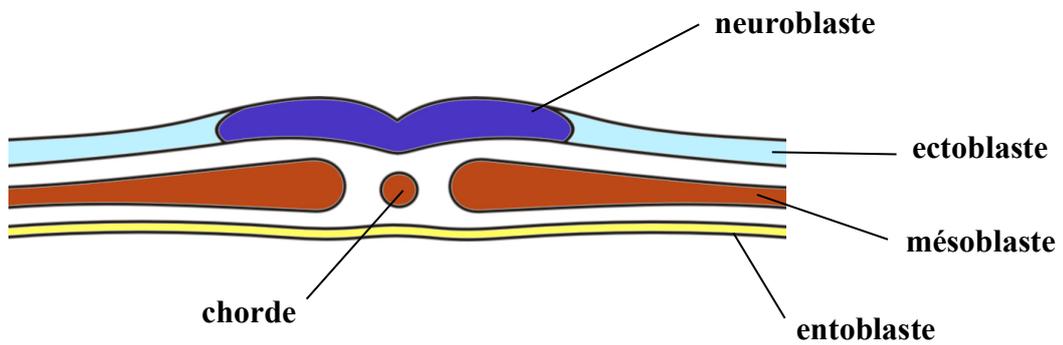
*Une version en couleur de ce polycopié est disponible sur le site des Facultés de Médecine de Toulouse ([www.medecine.ups-tlse.fr](http://www.medecine.ups-tlse.fr)), rubrique « Ressources pédagogiques ».*

# **ORGANOGENESE**

## ORIGINE DU SYSTEME NERVEUX



Face dorsale de l'embryon au 17<sup>ème</sup> jour



Coupe transversale de l'embryon au 17<sup>ème</sup> jour

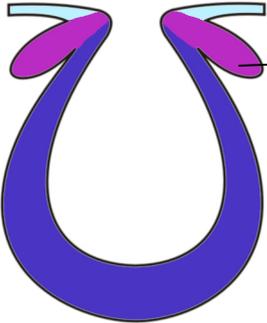
# LA NEURULATION

17<sup>ème</sup> jour



plaque neurale

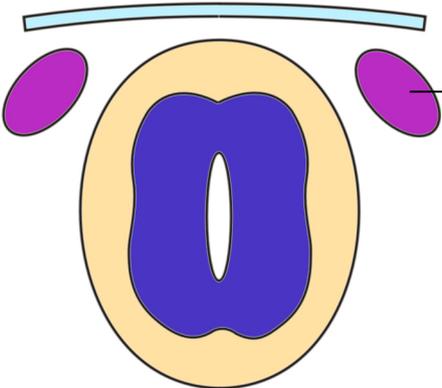
18<sup>ème</sup> jour



crête neurale

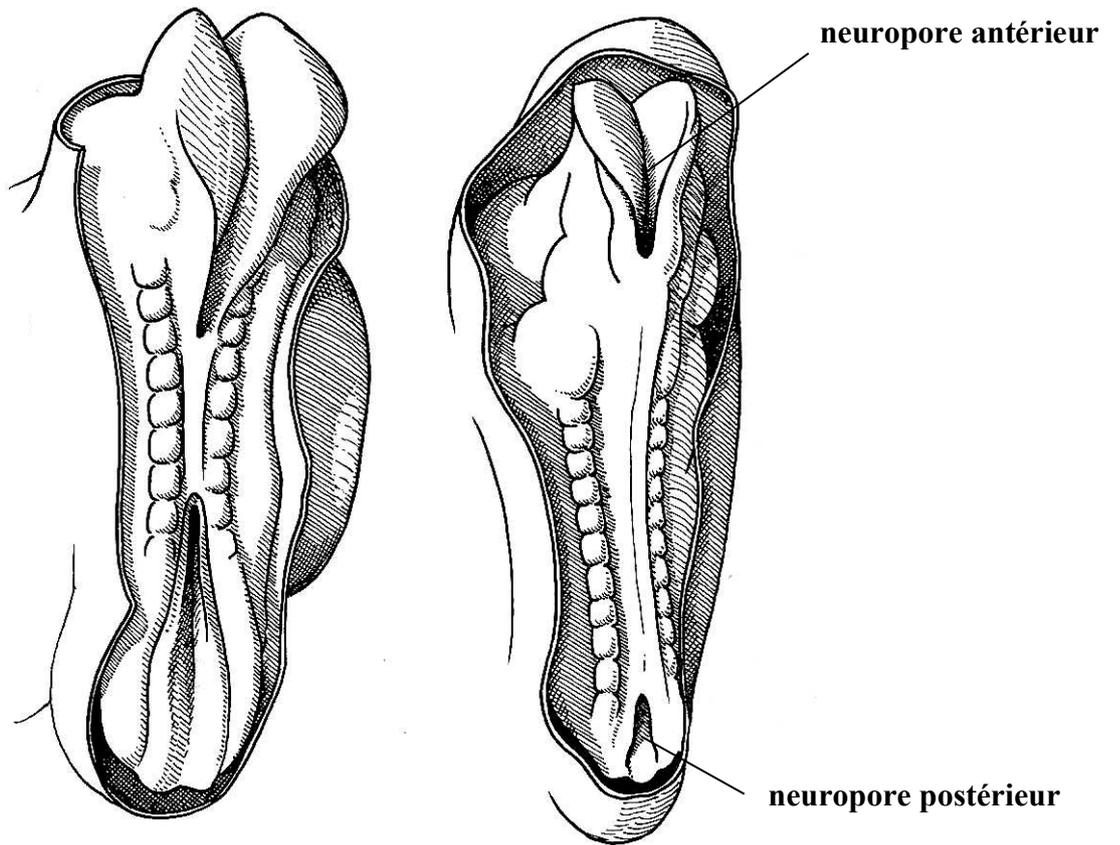
gouttière neurale

21<sup>ème</sup> jour



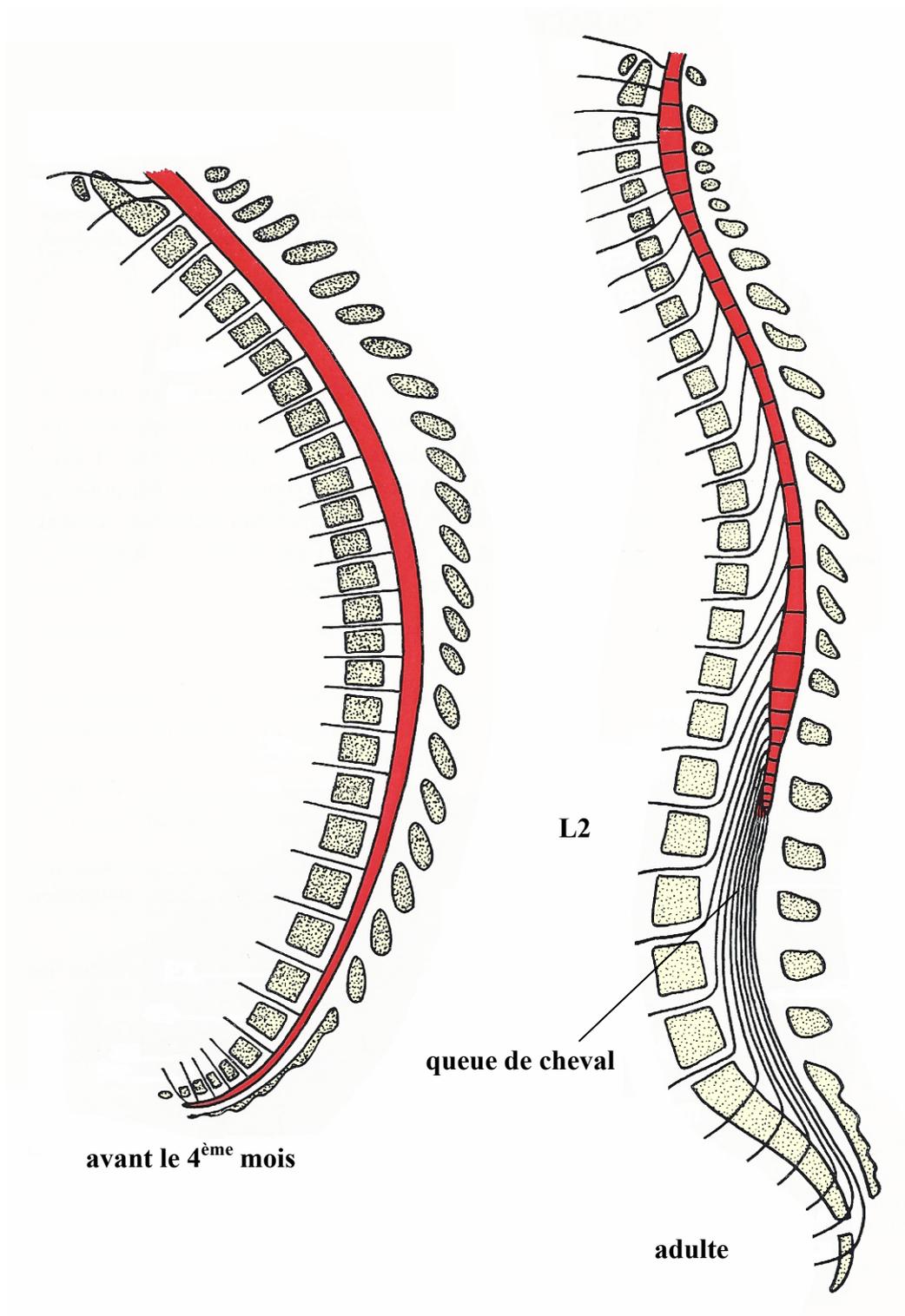
ganglion spinal

tube neural

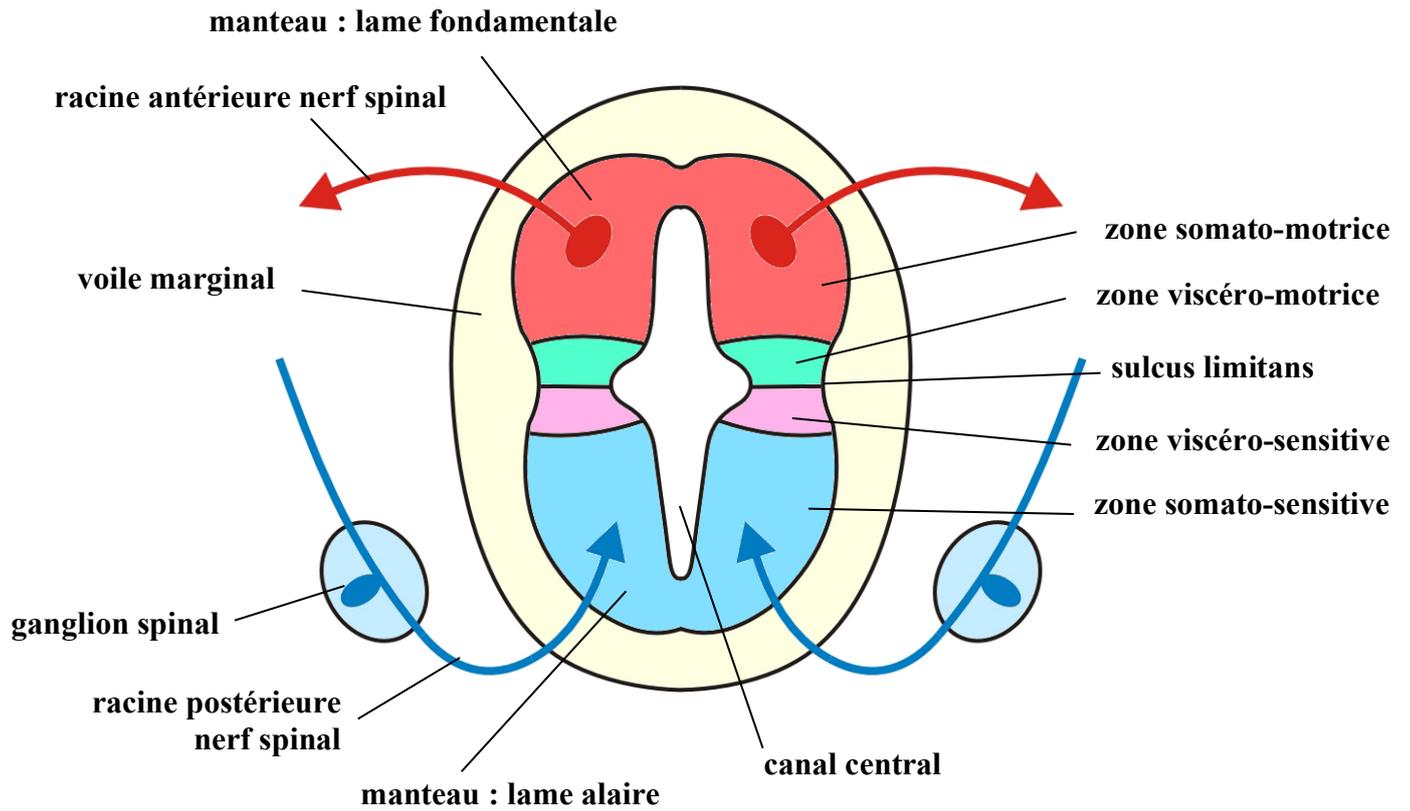


**Fermeture du tube neural**

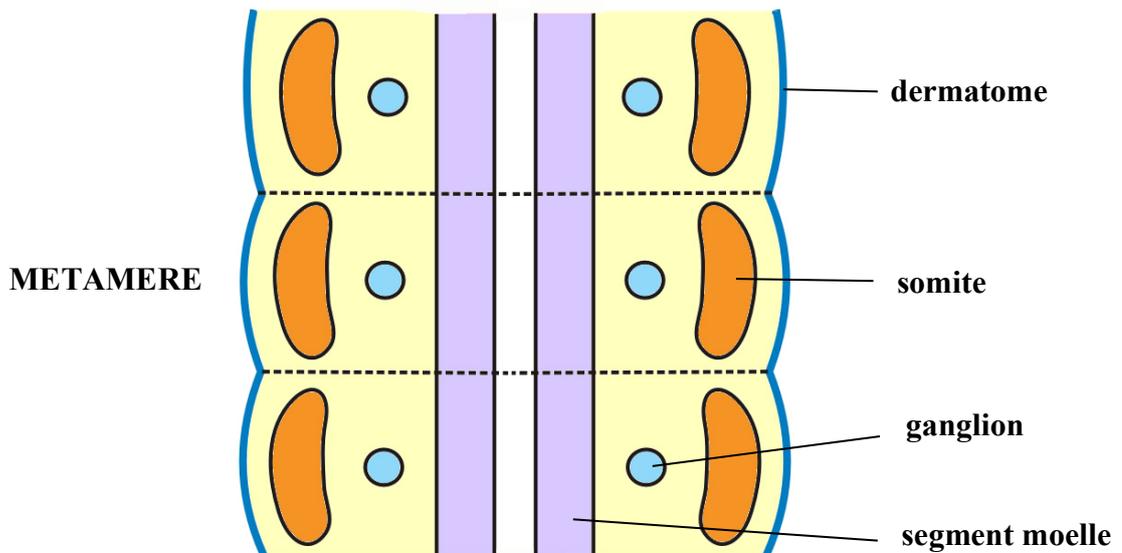
## DEVELOPPEMENT DE LA MOELLE EPINIERE



Rapports de la moelle et du canal vertébral

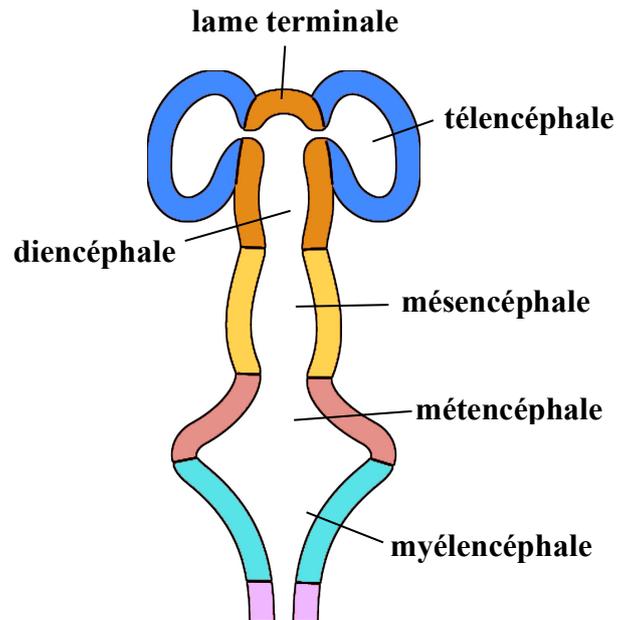
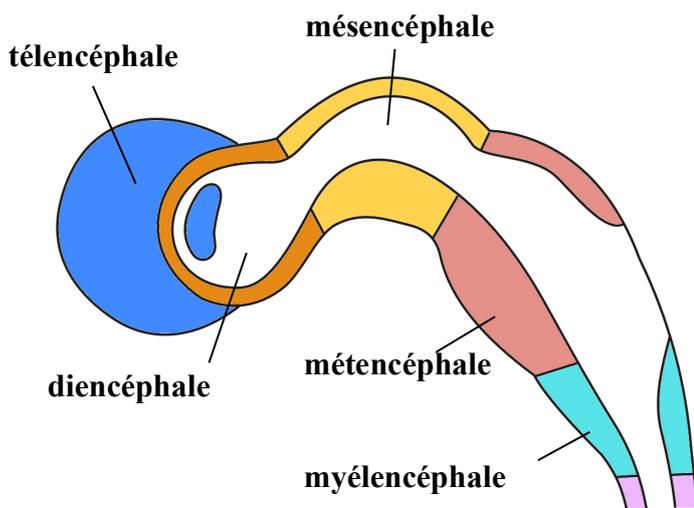
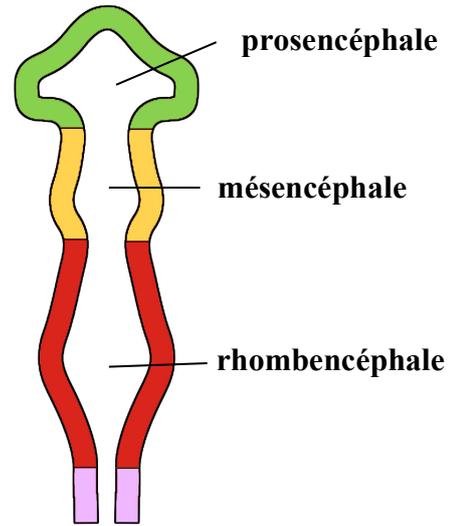
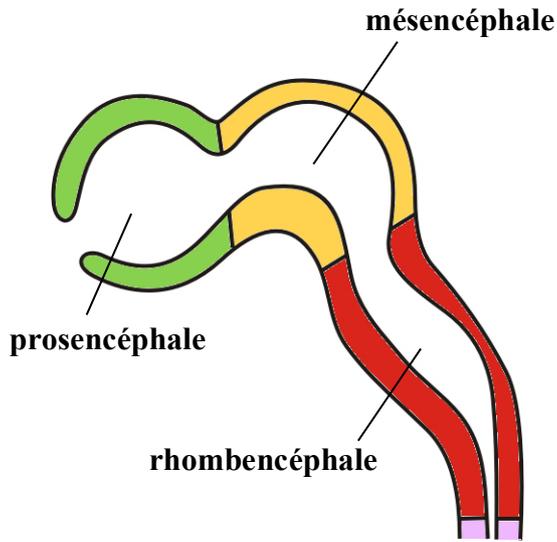


### Organogenèse de la moelle



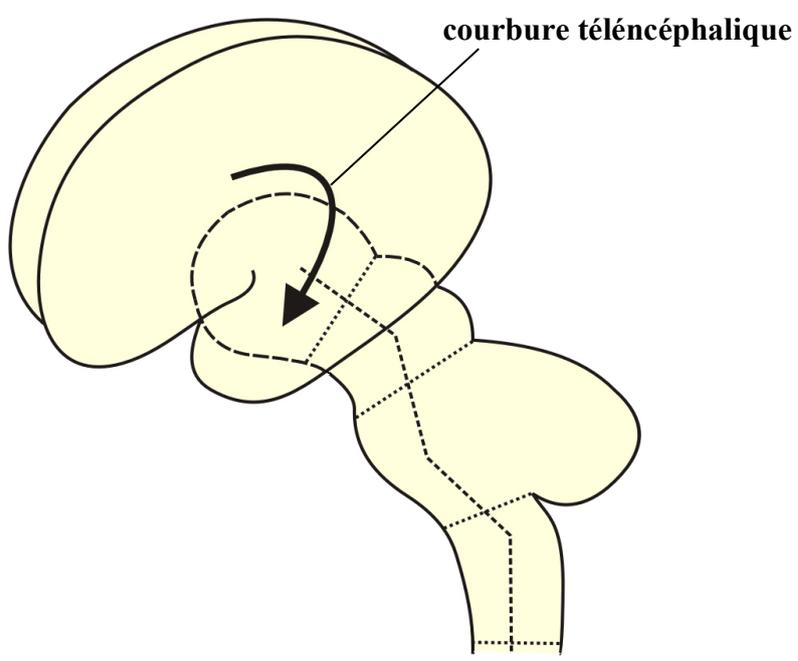
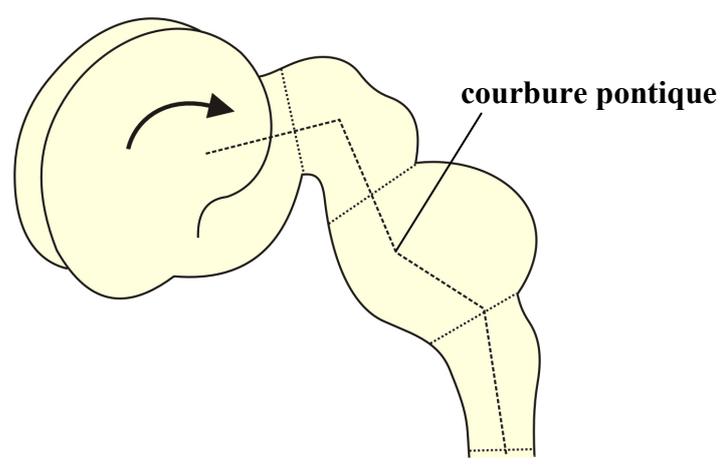
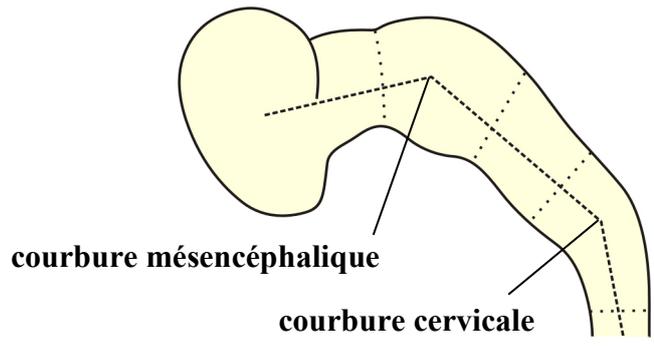
### Organisation métamérique

# DEVELOPPEMENT DE L'ENCEPHALE



Prosencéphale	Télencéphale	Cerveau
	Diencéphale	
Méencéphale	Méencéphale	Tronc cérébral et cervelet
Rhombencéphale	Métencéphale	
	Myéencéphale	

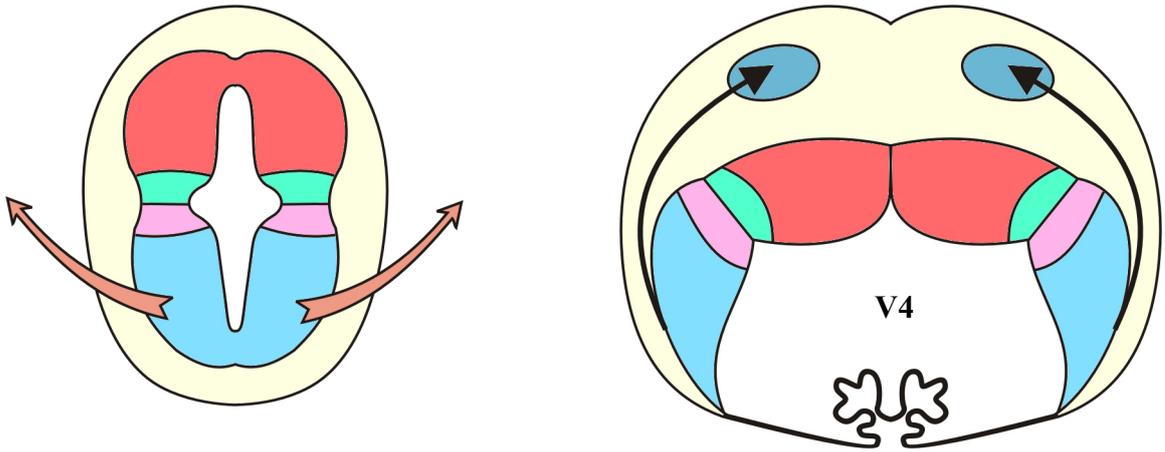
## Evolution des différentes vésicules



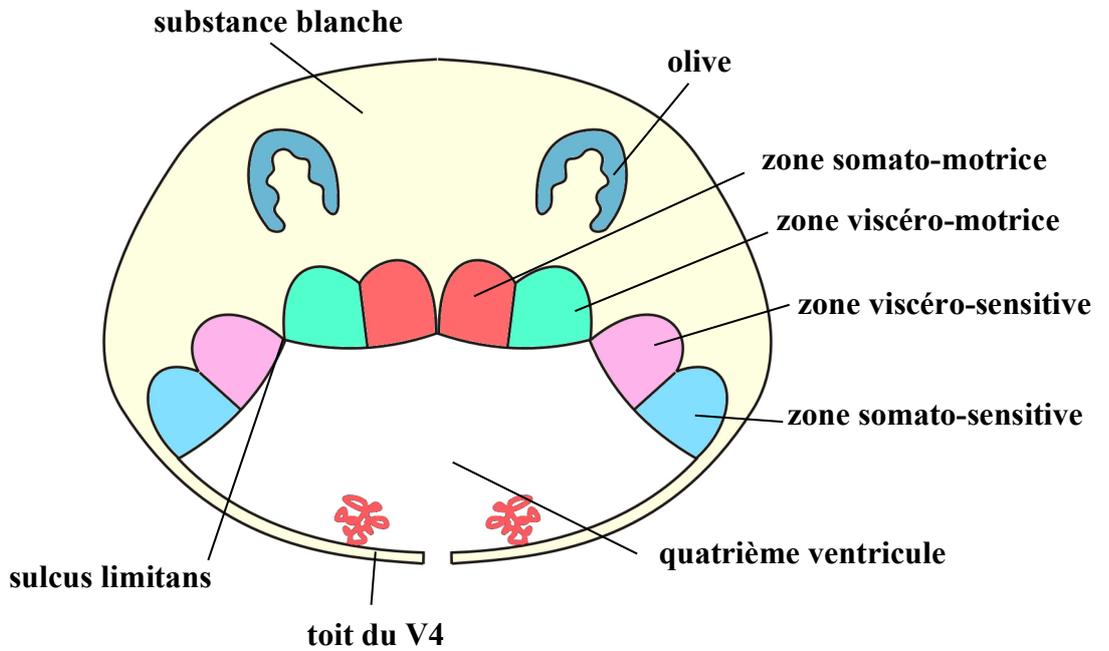
**Les courbures**

# TRONC CEREBRAL

## MYELENCEPHALE - MOELLE ALLONGEE OU BULBE

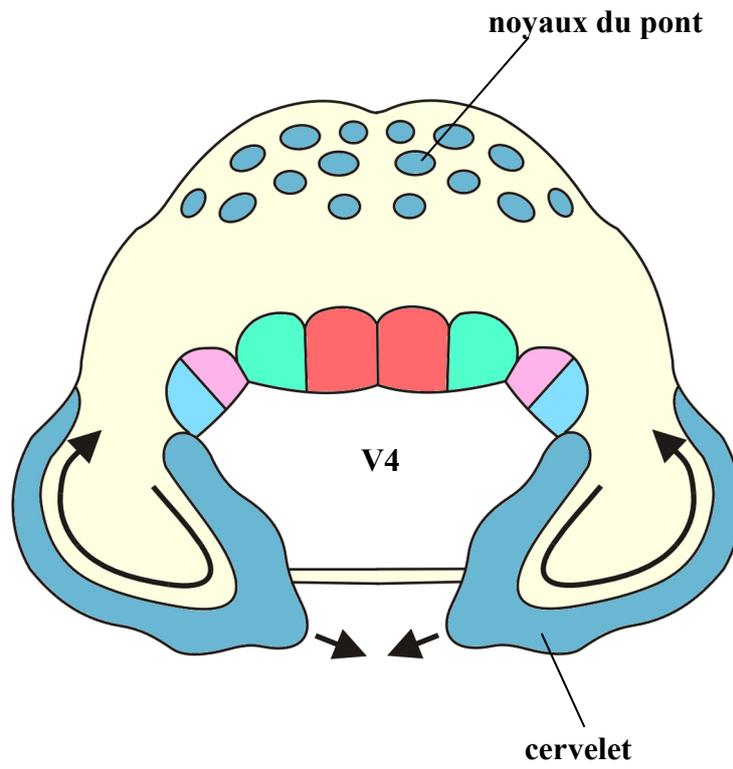


### Evolution des structures entre moelle et myélocéphale

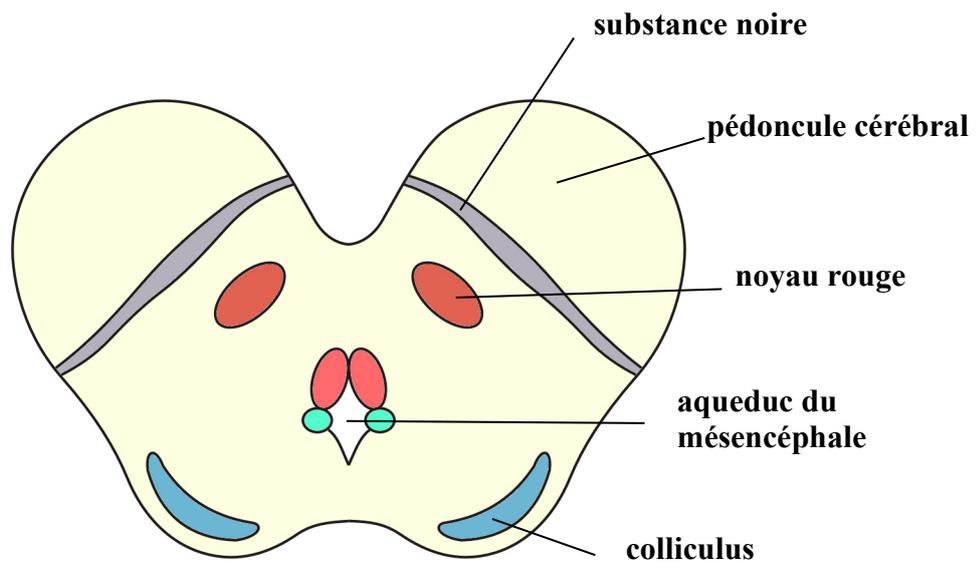


### Structure du myélocéphale

## METENCEPHALE - PONT

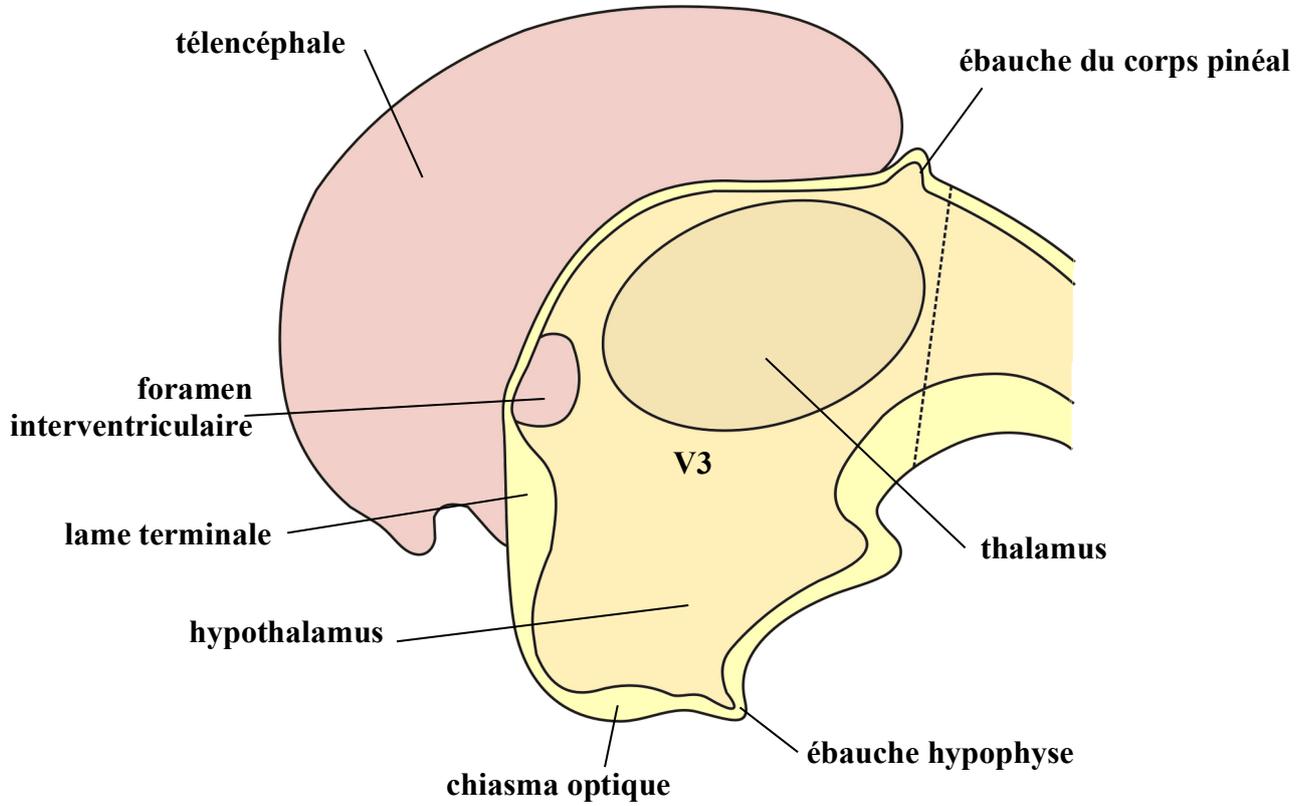


## MESENCEPHALE

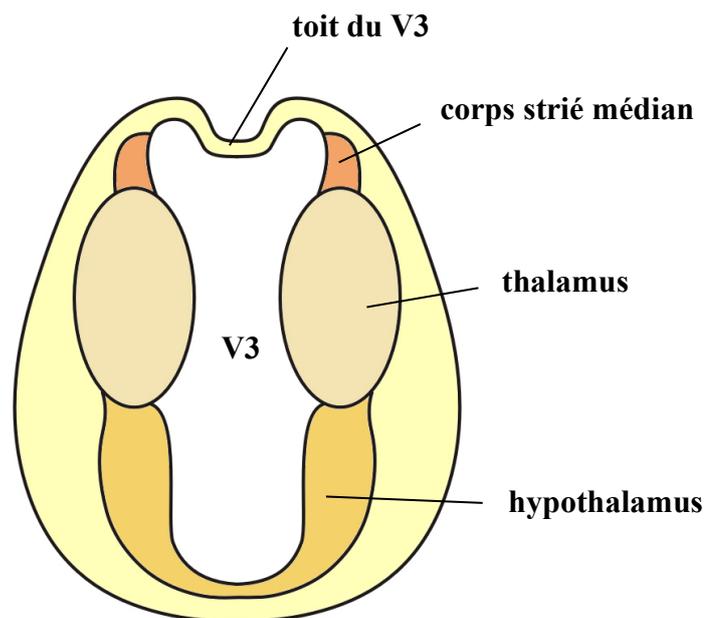


# CERVEAU

## DIENCEPHALE

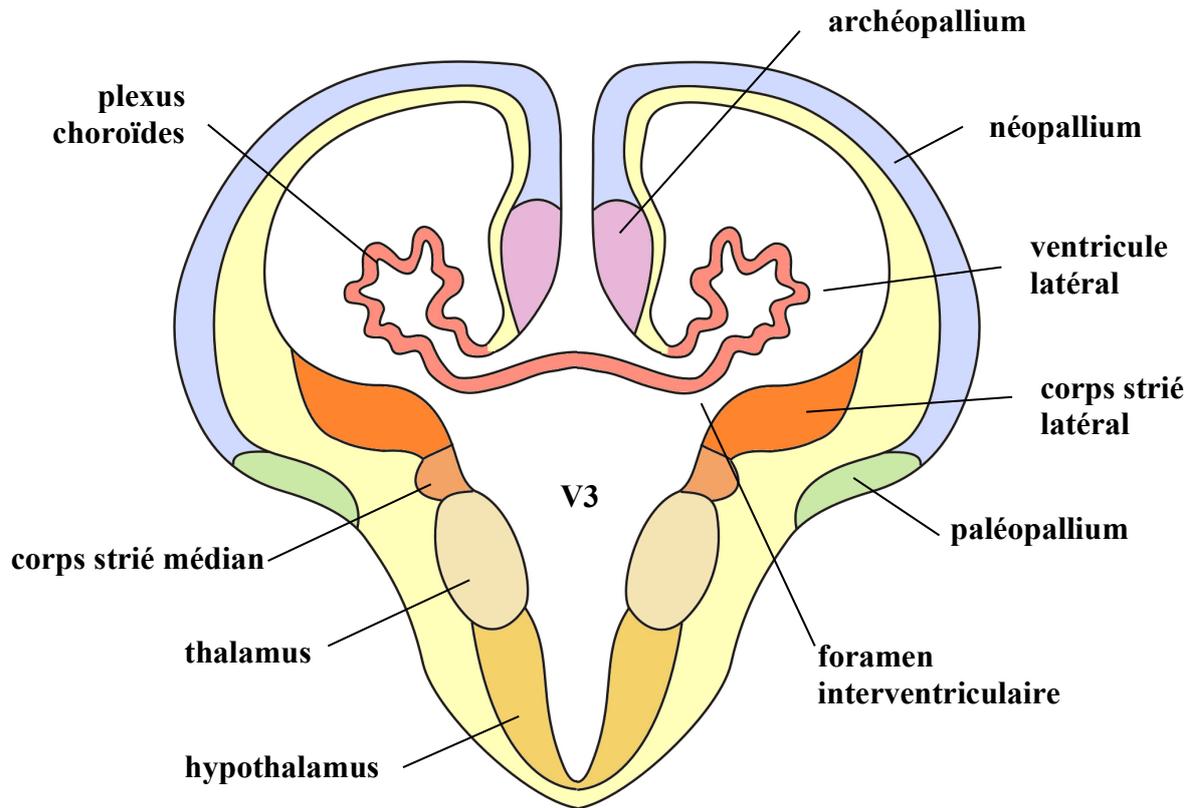


### Coupe sagittale médiane

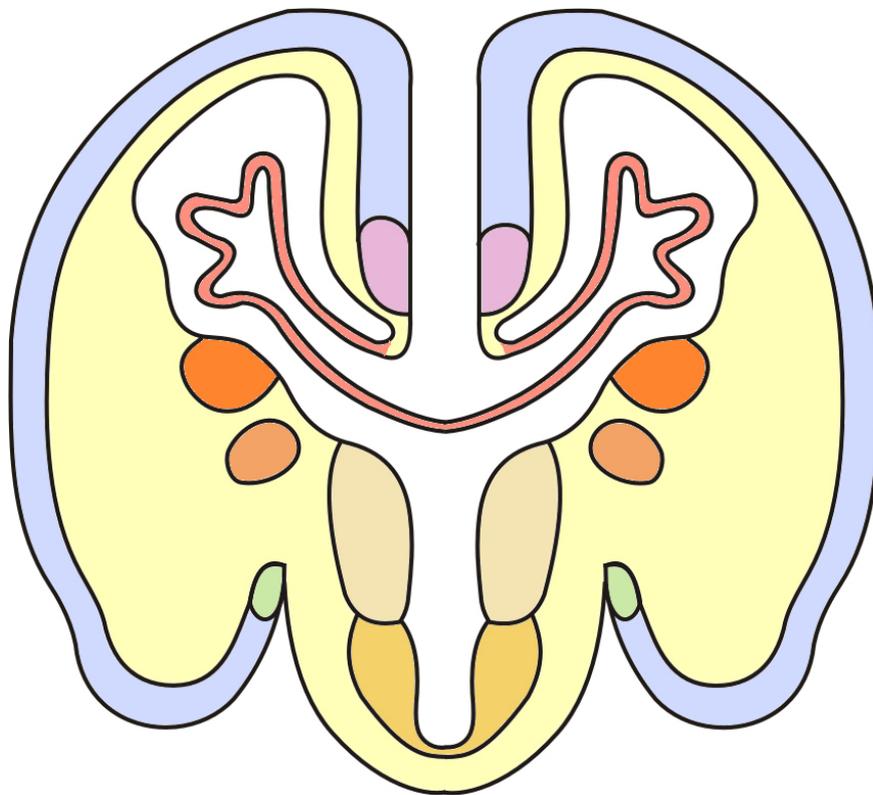


### Coupe frontale

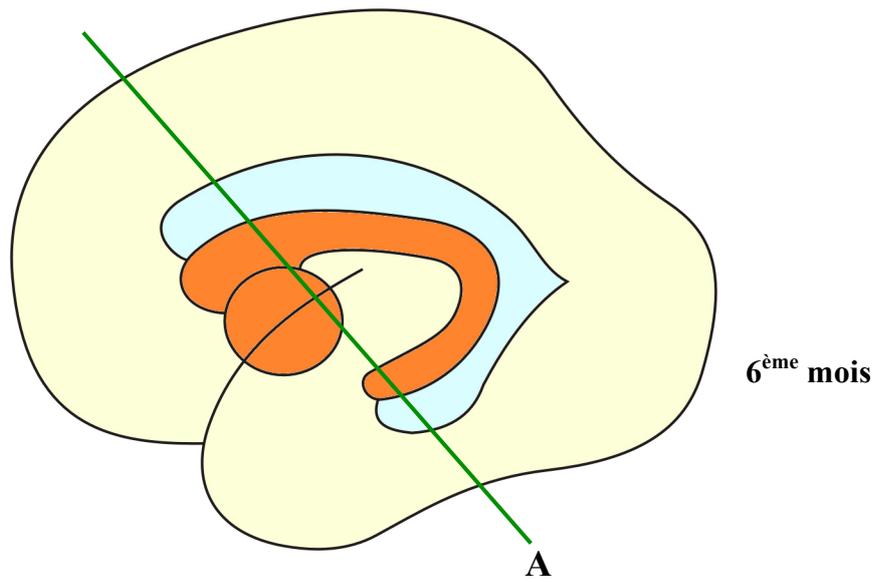
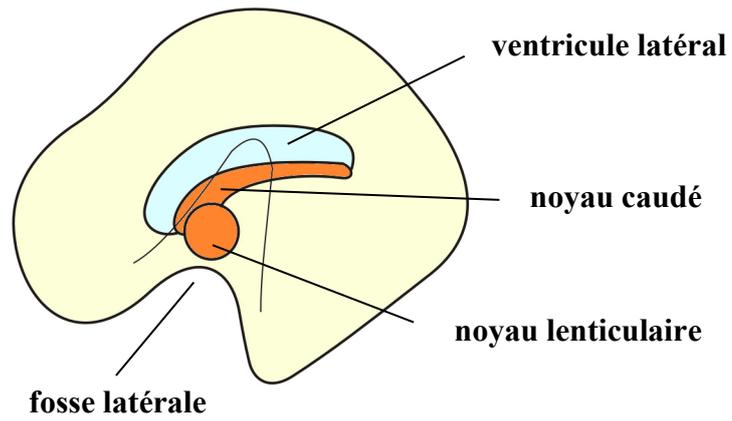
## TELENCEPHALE



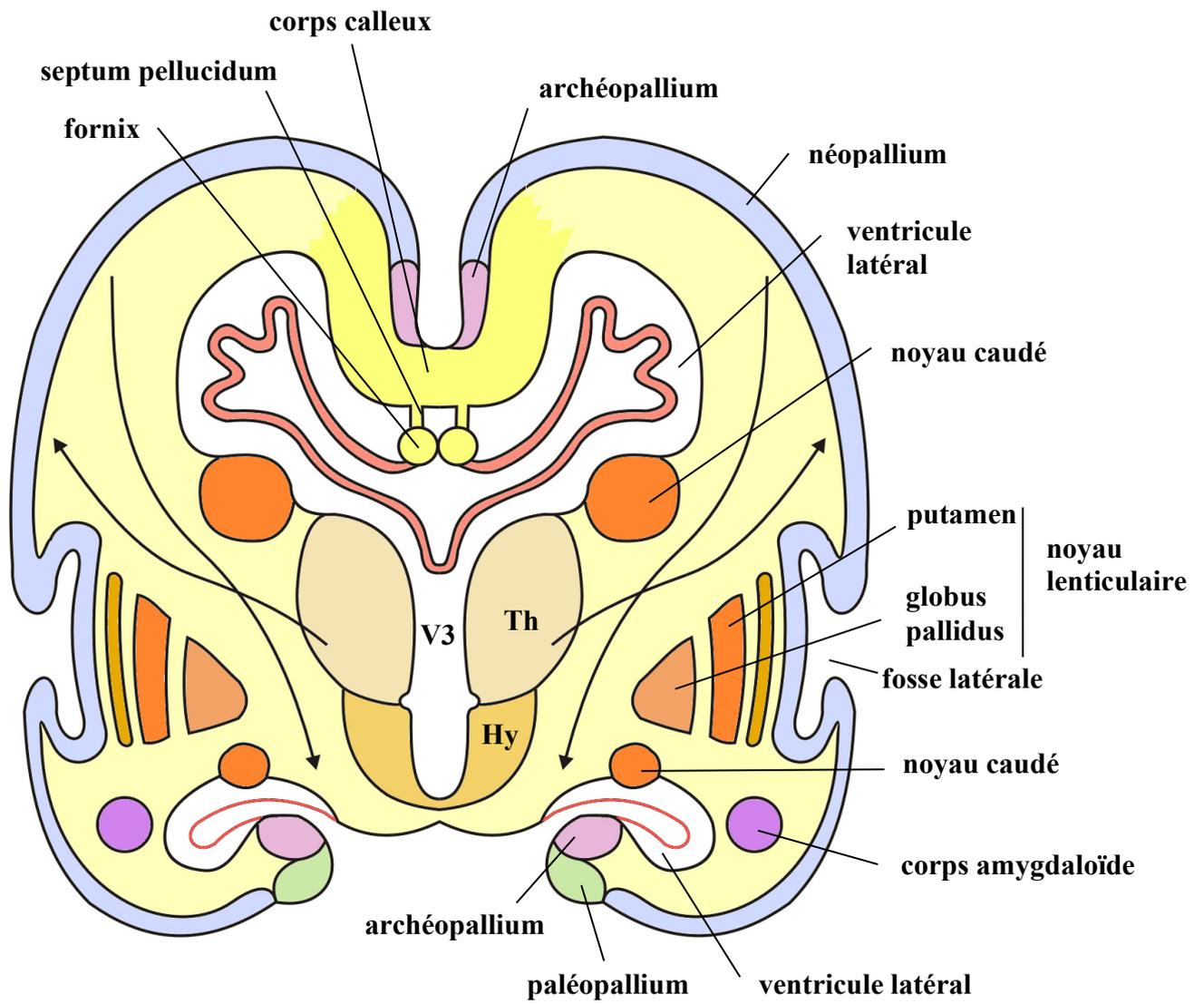
Coupe frontale avant le 2<sup>ème</sup> mois



Incorporation du diencephale dans le télencéphale

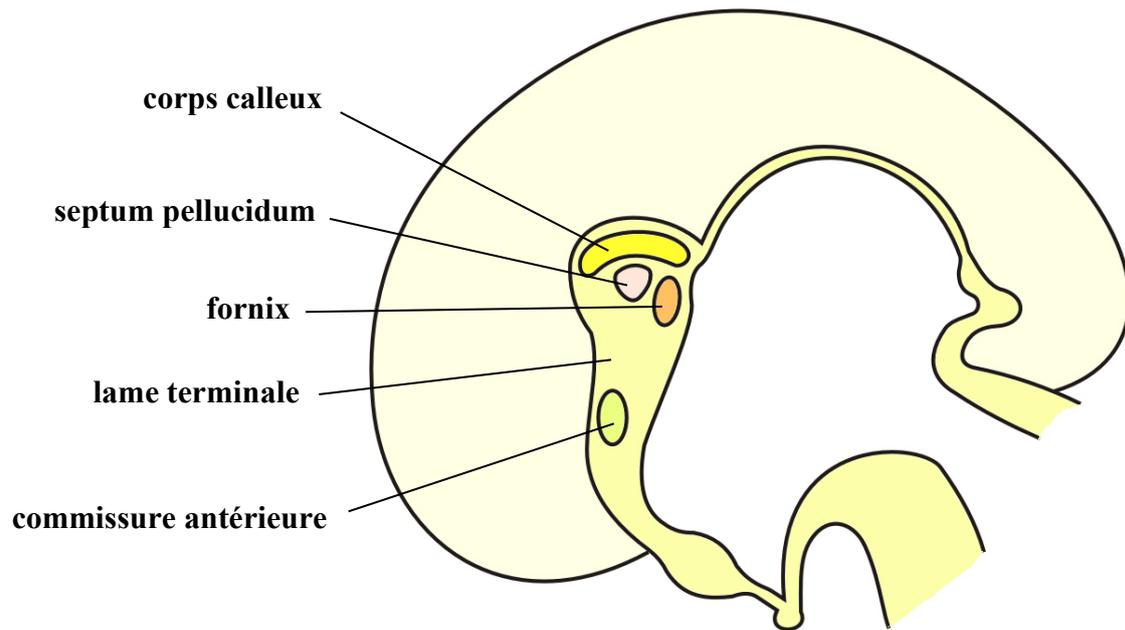


### La rotation télencéphalique



**Coupe frontale selon A**

## LES COMMISSURES

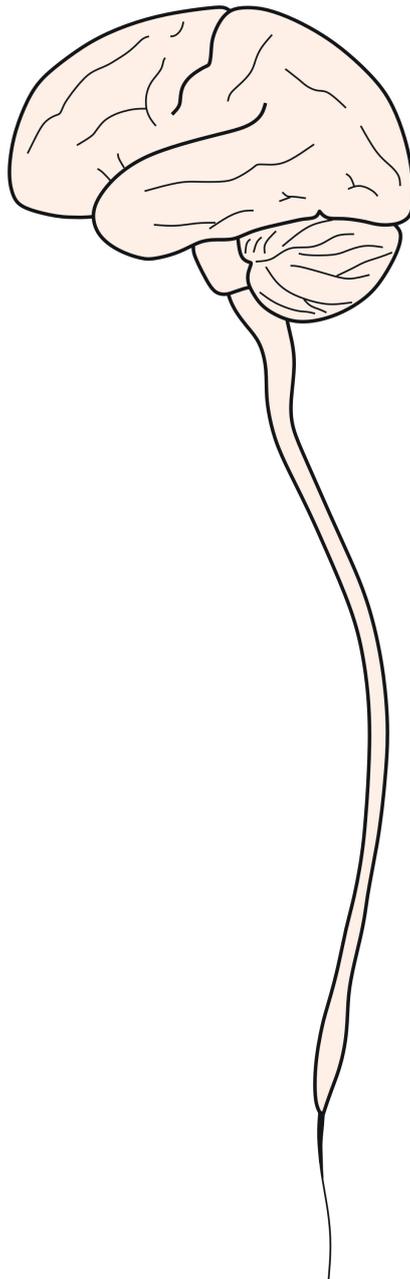


# ANATOMIE MORPHOLOGIQUE

**ENCÉPHALE :**

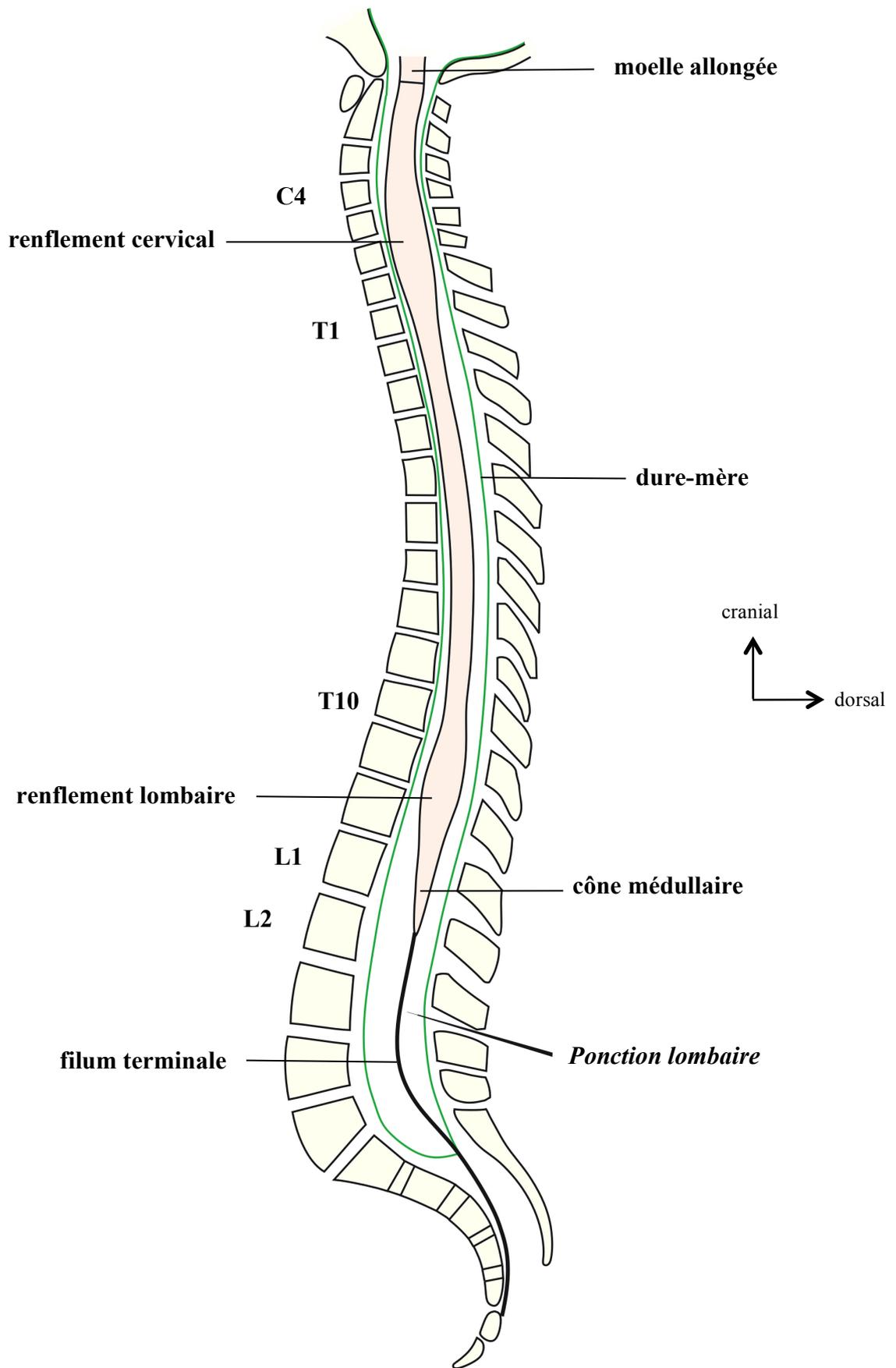
**cerveau**

**tronc cérébral - cervelet**

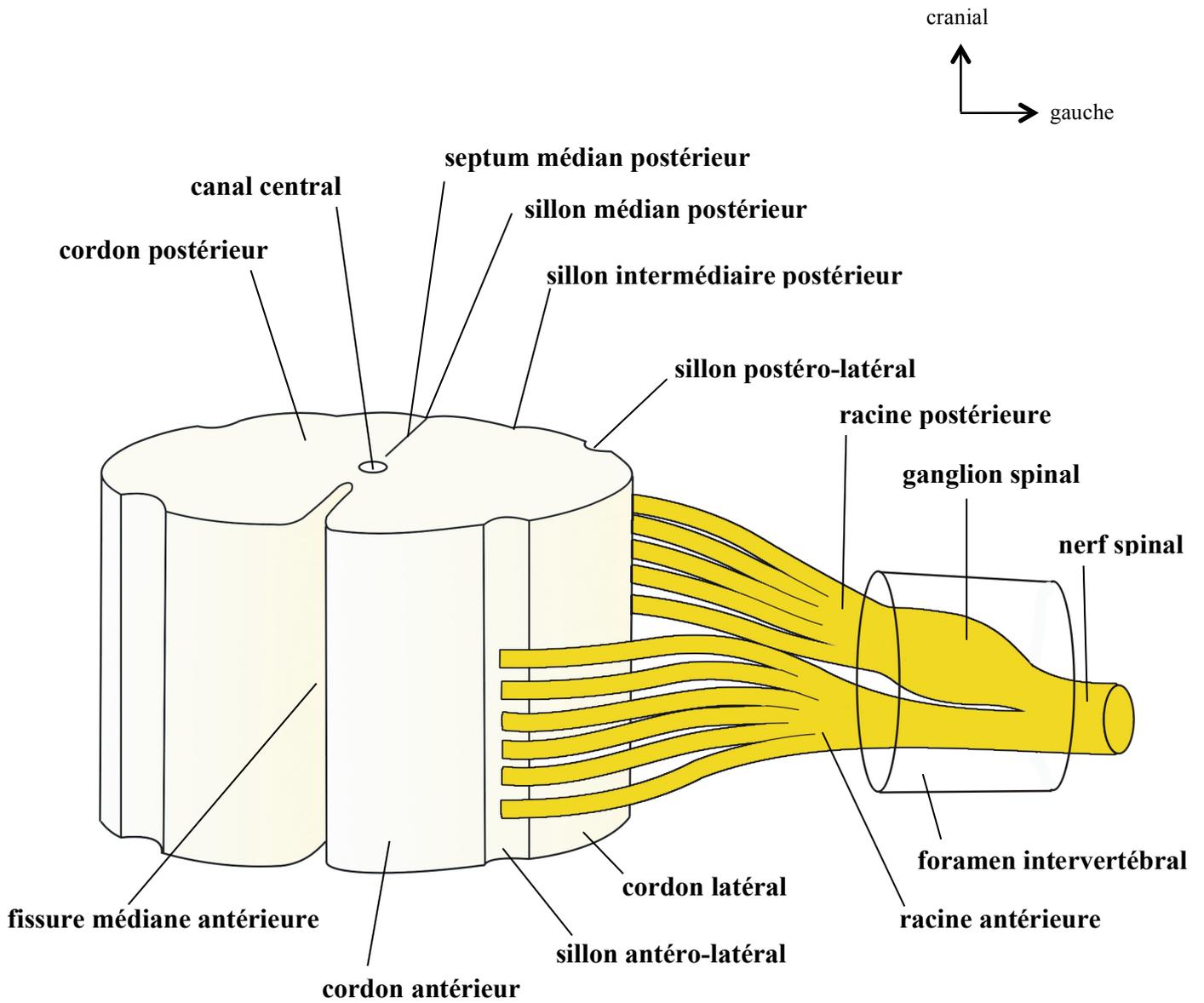


**MOELLE SPINALE**

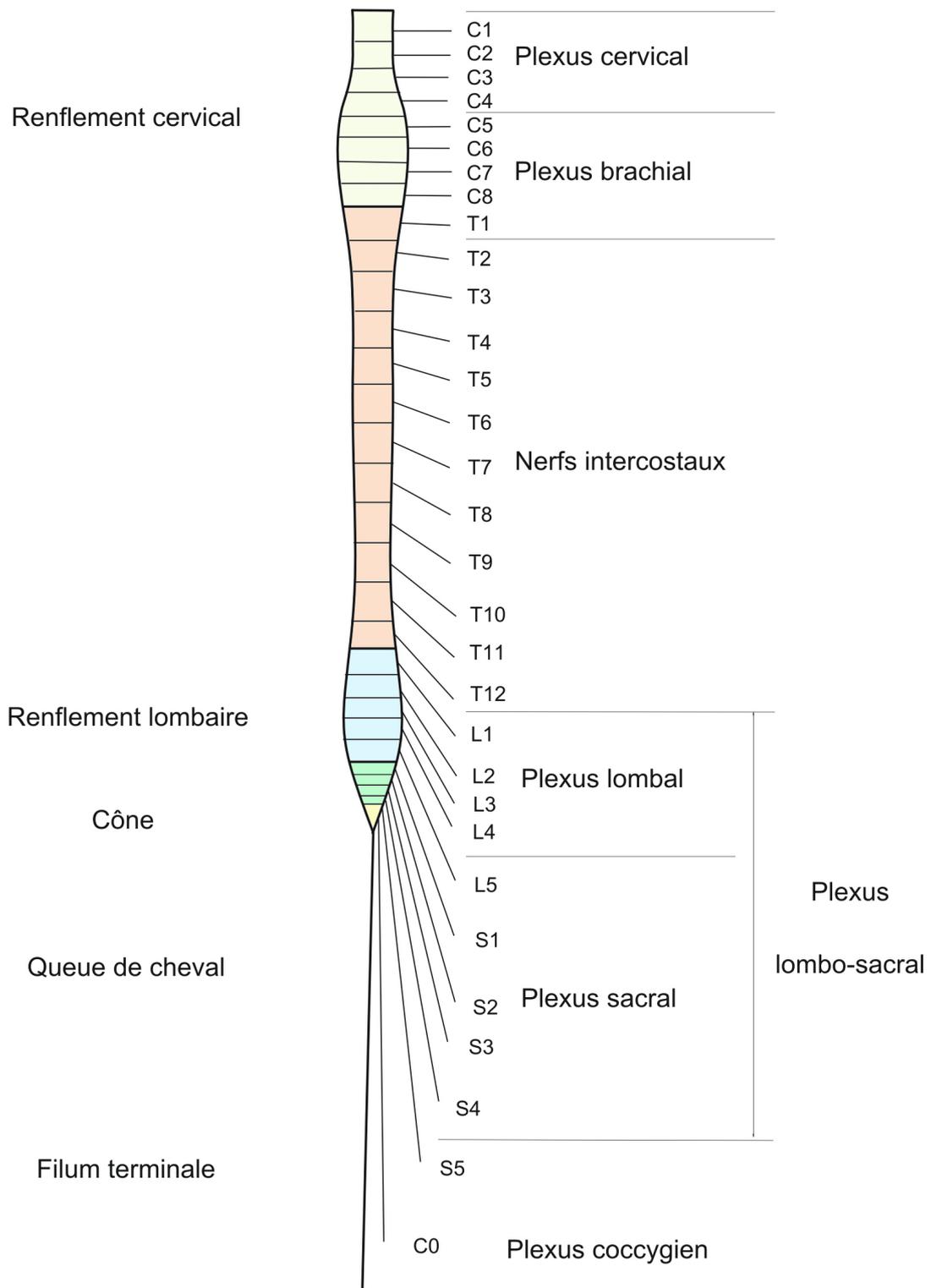
# **LA MOELLE SPINALE**



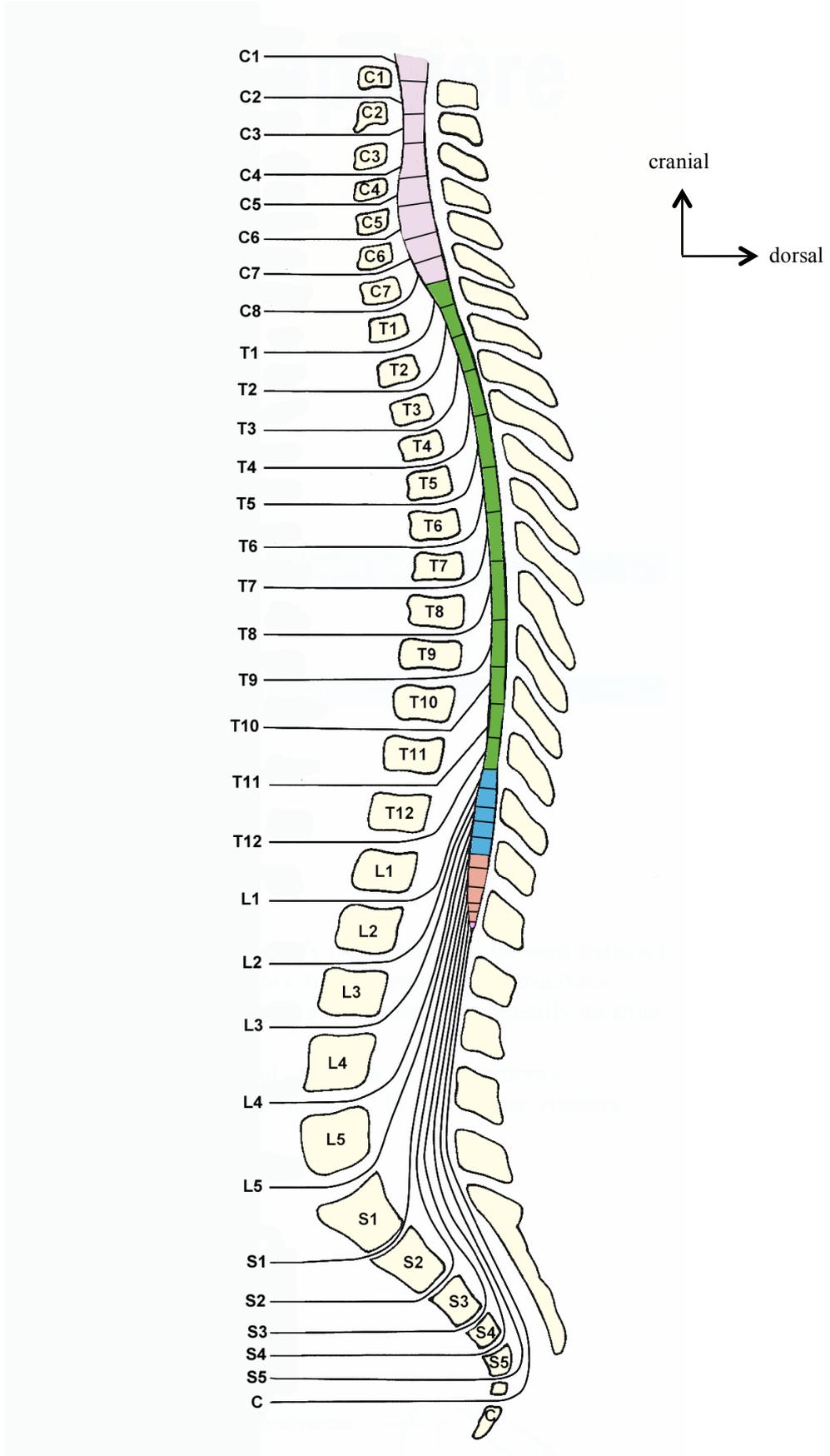
**Vue latérale de la moelle**



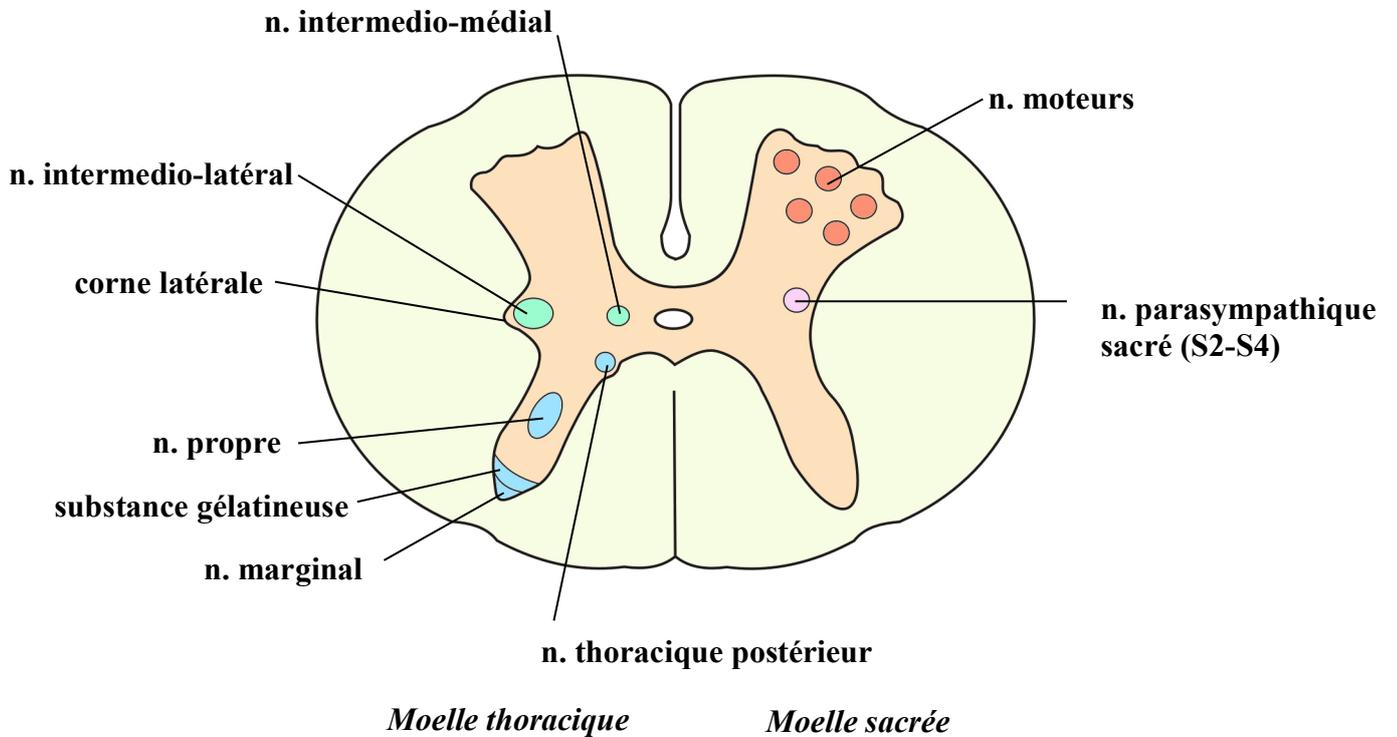
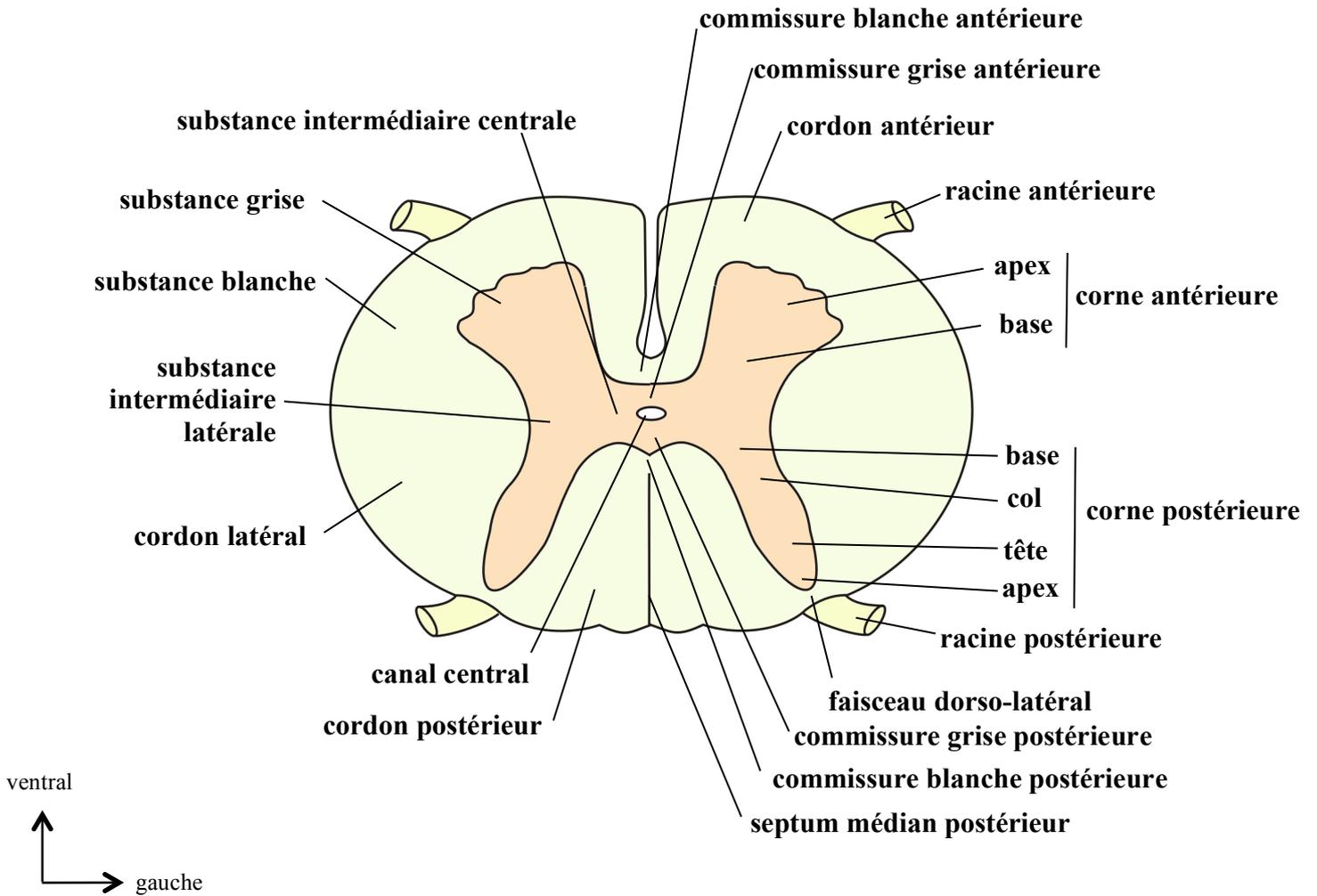
**Vue antéro-latérale d'un segment de moelle**



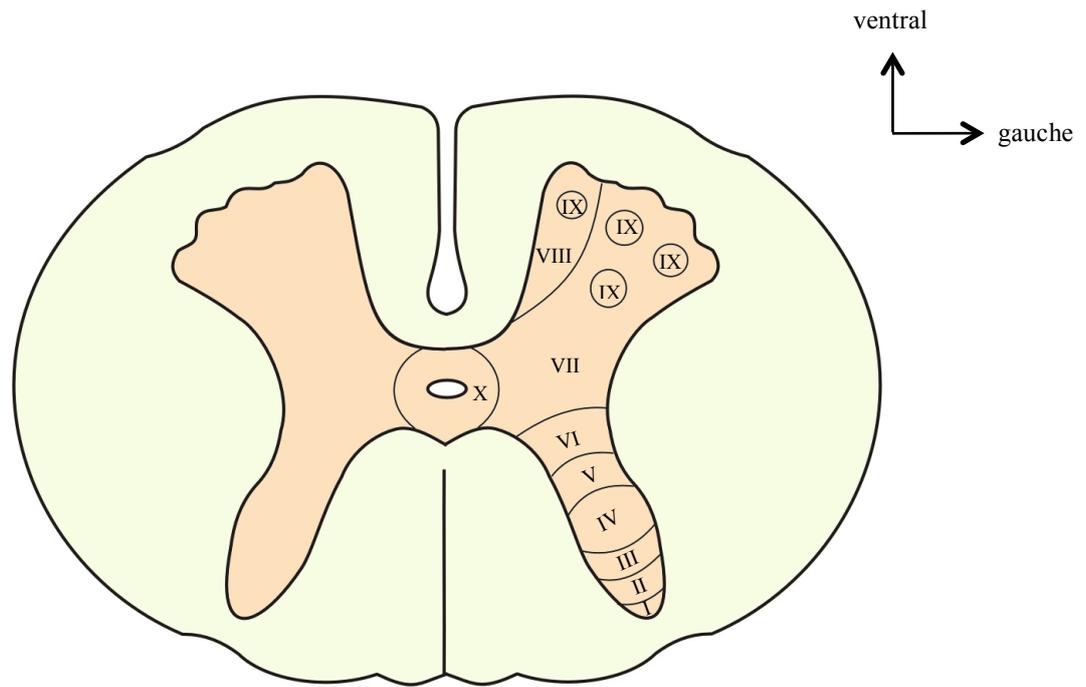
**Les segments médullaires et les nerfs spinaux  
(vue ventrale)**



**Les segments médullaires, les nerfs spinaux et les rapports vertébraux**

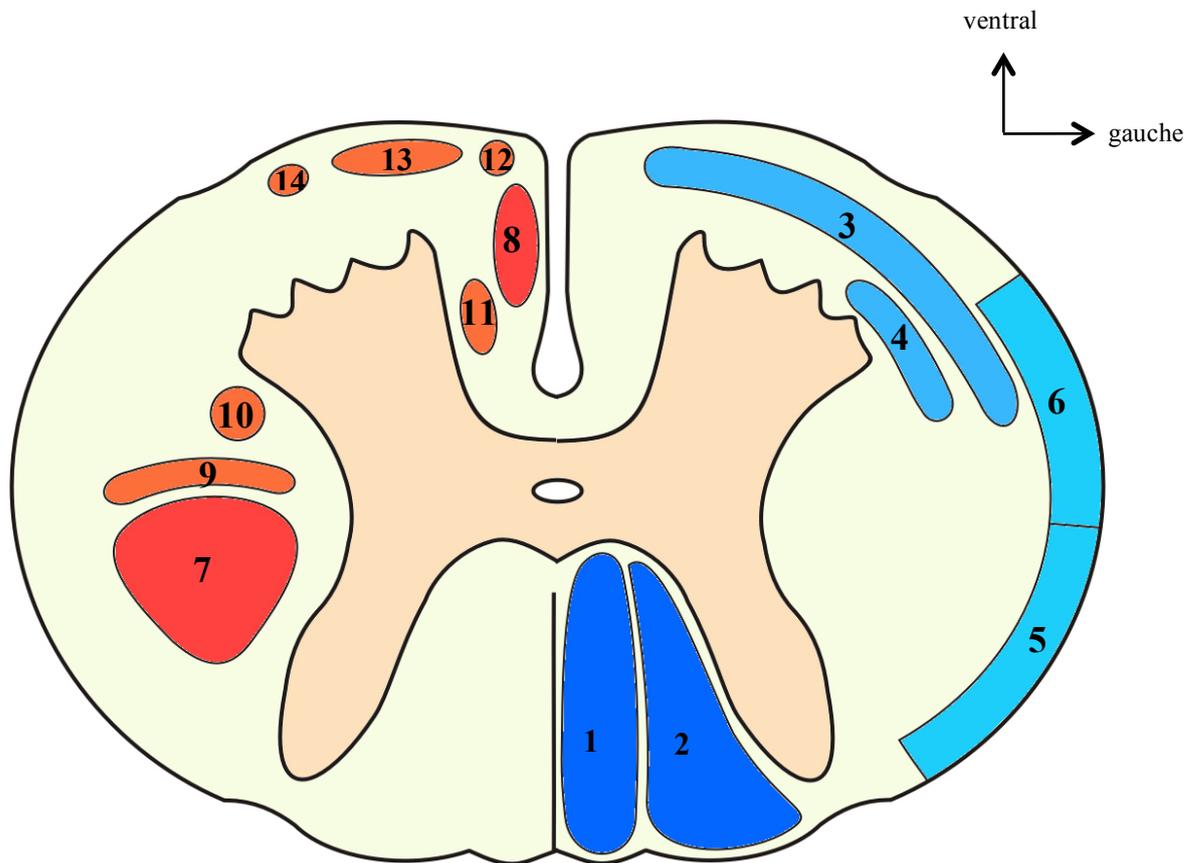


**Structure de la moelle (coupe horizontale)**



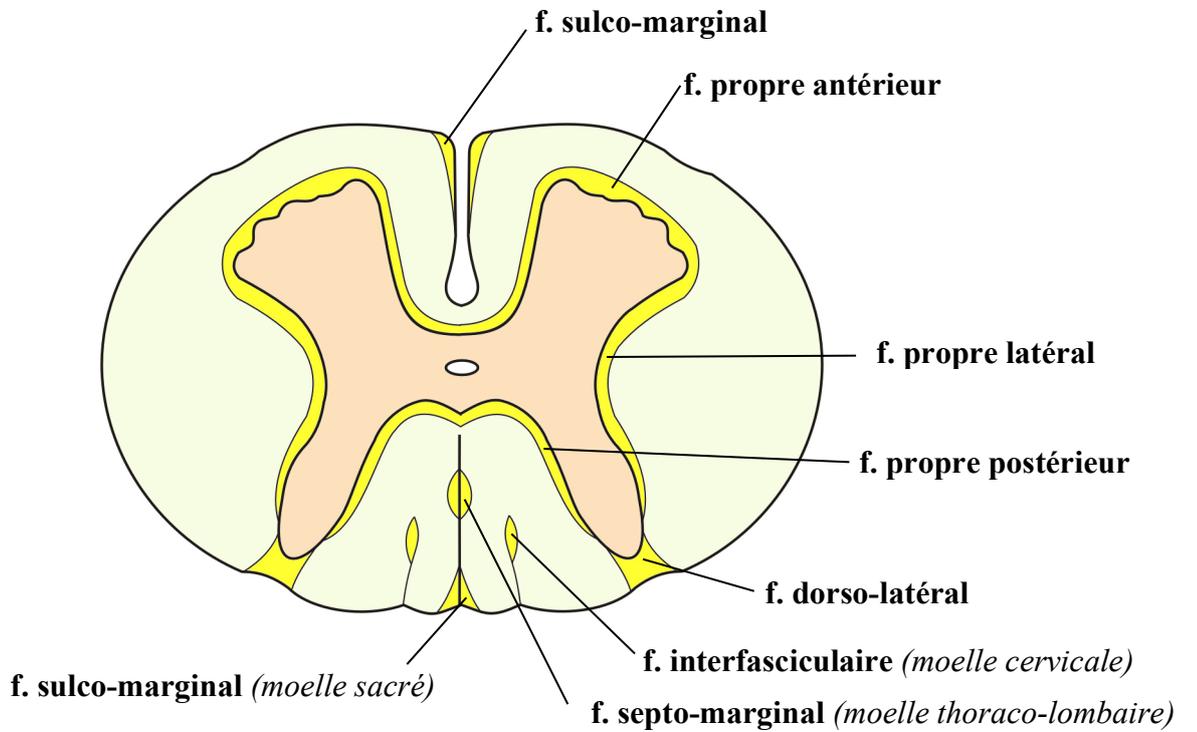
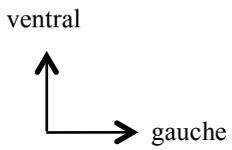
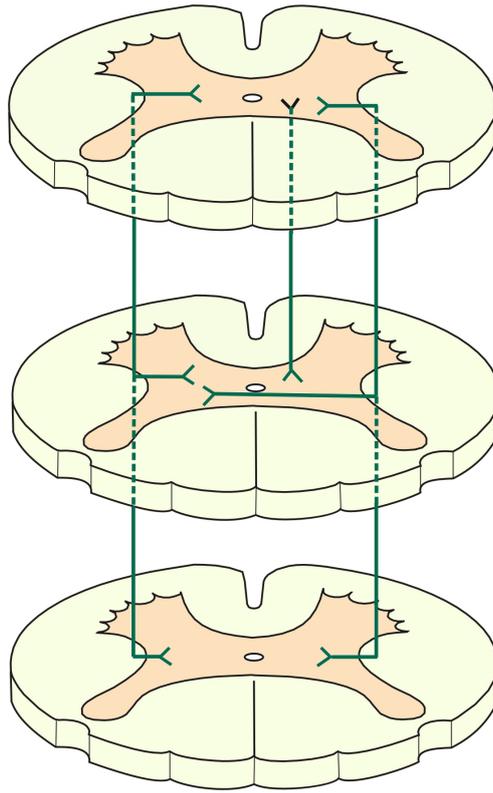
<b>Corne postérieure</b>	<b>Apex</b>	<b>Noyau marginal</b>	<b>Lame I</b>
	<b>Tête</b>	<b>Substance gélatineuse</b>	<b>Lame II</b>
	<b>Col</b>	<b>Noyau propre</b>	<b>Lame III</b>
			<b>Lame IV</b>
<b>Base</b>		<b>Lame V</b>	
<b>Substance intermédiaire latérale</b>			<b>Lame VII</b>
<b>Substance intermédiaire centrale</b>			<b>Lame X</b>
<b>Corne antérieure</b>			<b>Lame VIII</b>
			<b>Lame IX</b>

### Les lames de Rexed



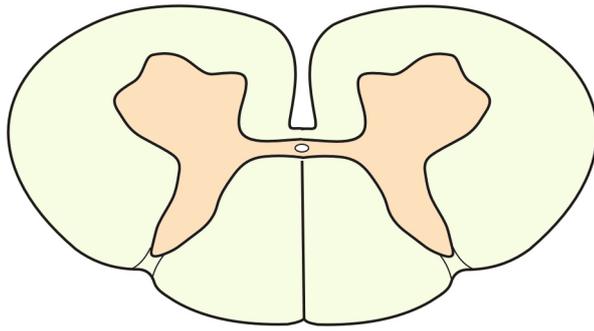
1	Faisceau gracile
2	Faisceau cunéiforme
3	Tractus néo-spino-thalamique
4	Tractus paléo-spino-réticulo-thalamique
5	Tractus spino-cérébelleux postérieur
6	Tractus spino-cérébelleux antérieur
7	Tractus cortico-spinal latéral
8	Tractus cortico-spinal antérieur
9	Tractus rubro-spinal
10	Tractus réticulo-spinal latéral
11	Tractus réticulo-spinal antérieur (médial)
12	Tractus tecto-spinal
13	Tractus vestibulo-spinal
14	Tractus olivo-spinal et spino-olivaire

**La substance blanche de la moelle - Principaux faisceaux  
(coupe horizontale schématique)**

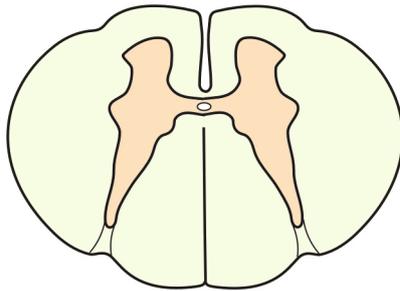


**Les faisceaux d'association**

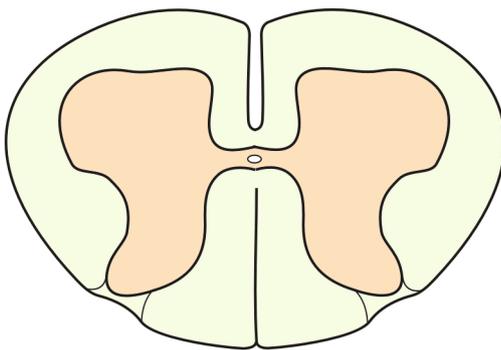
ventral  
↑  
gauche →



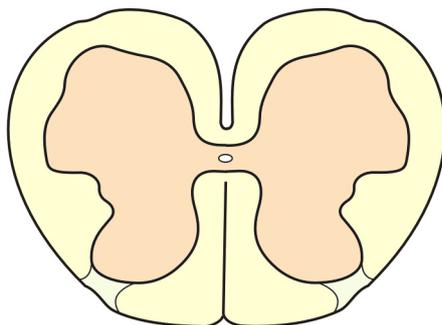
**Moelle cervicale**



**Moelle thoracique**

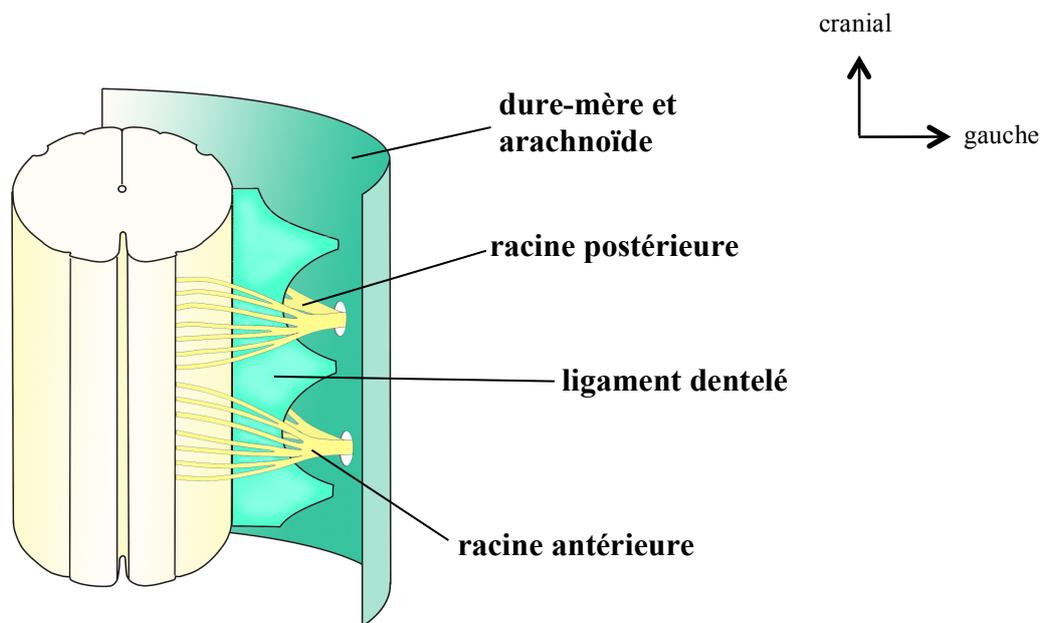
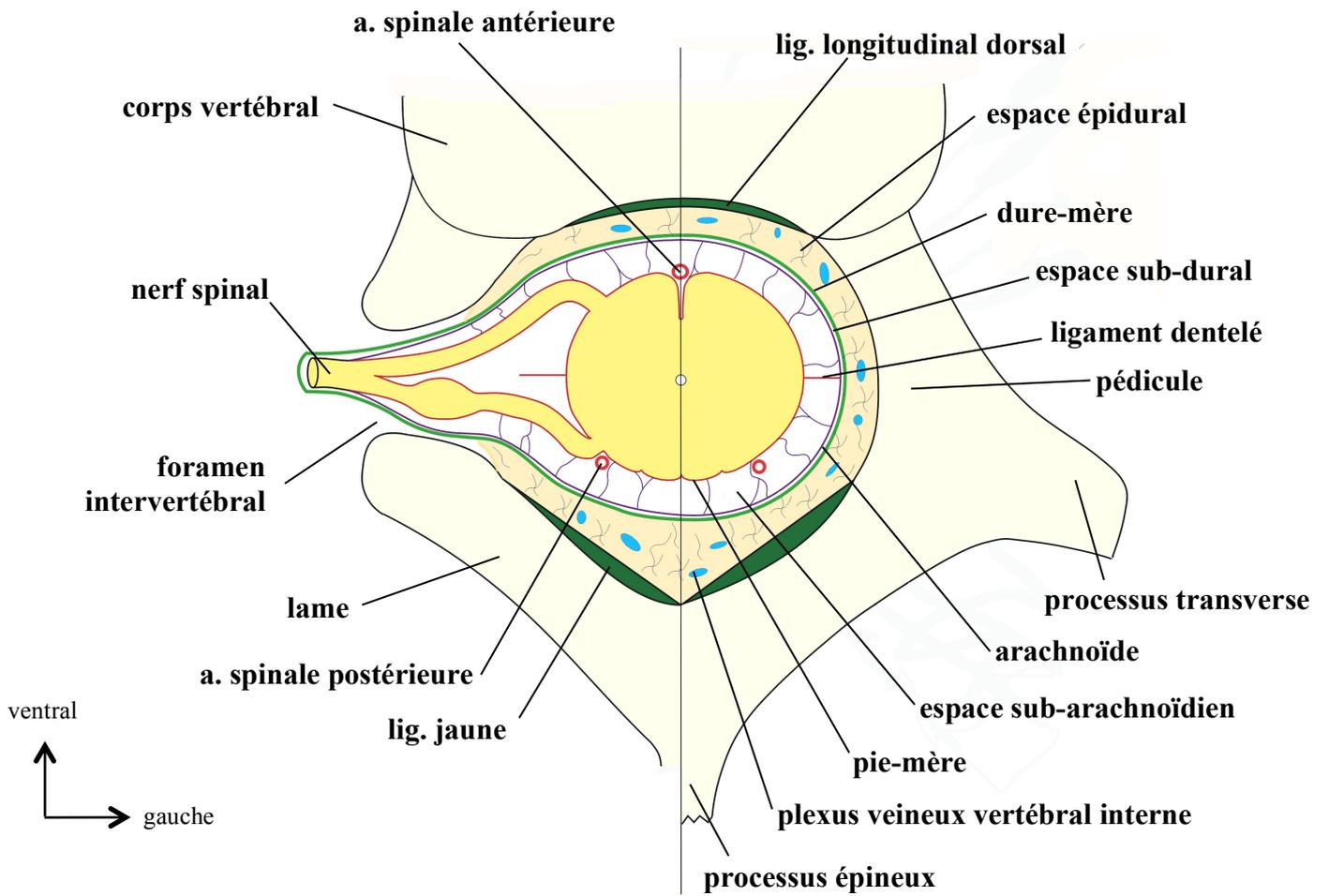


**Moelle lombaire**



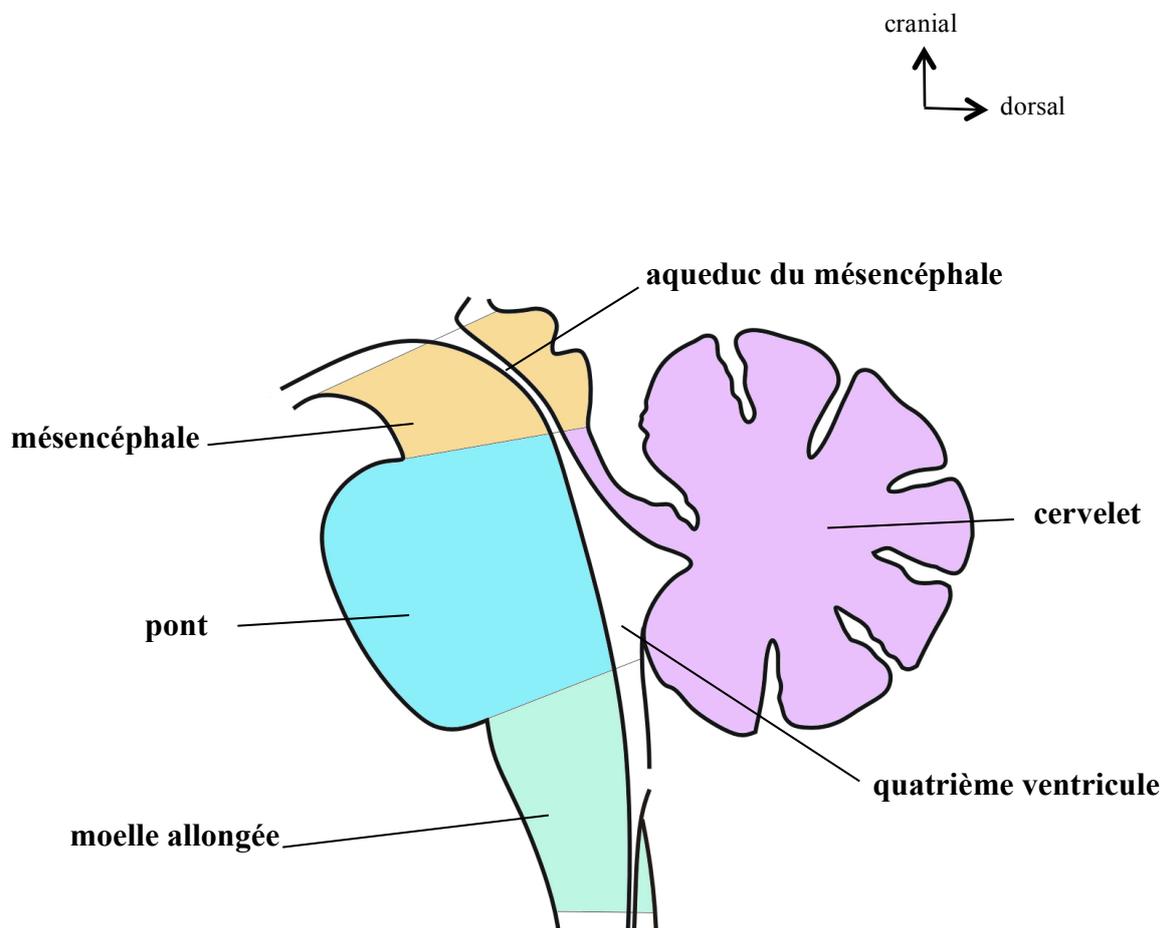
**Moelle sacrée**

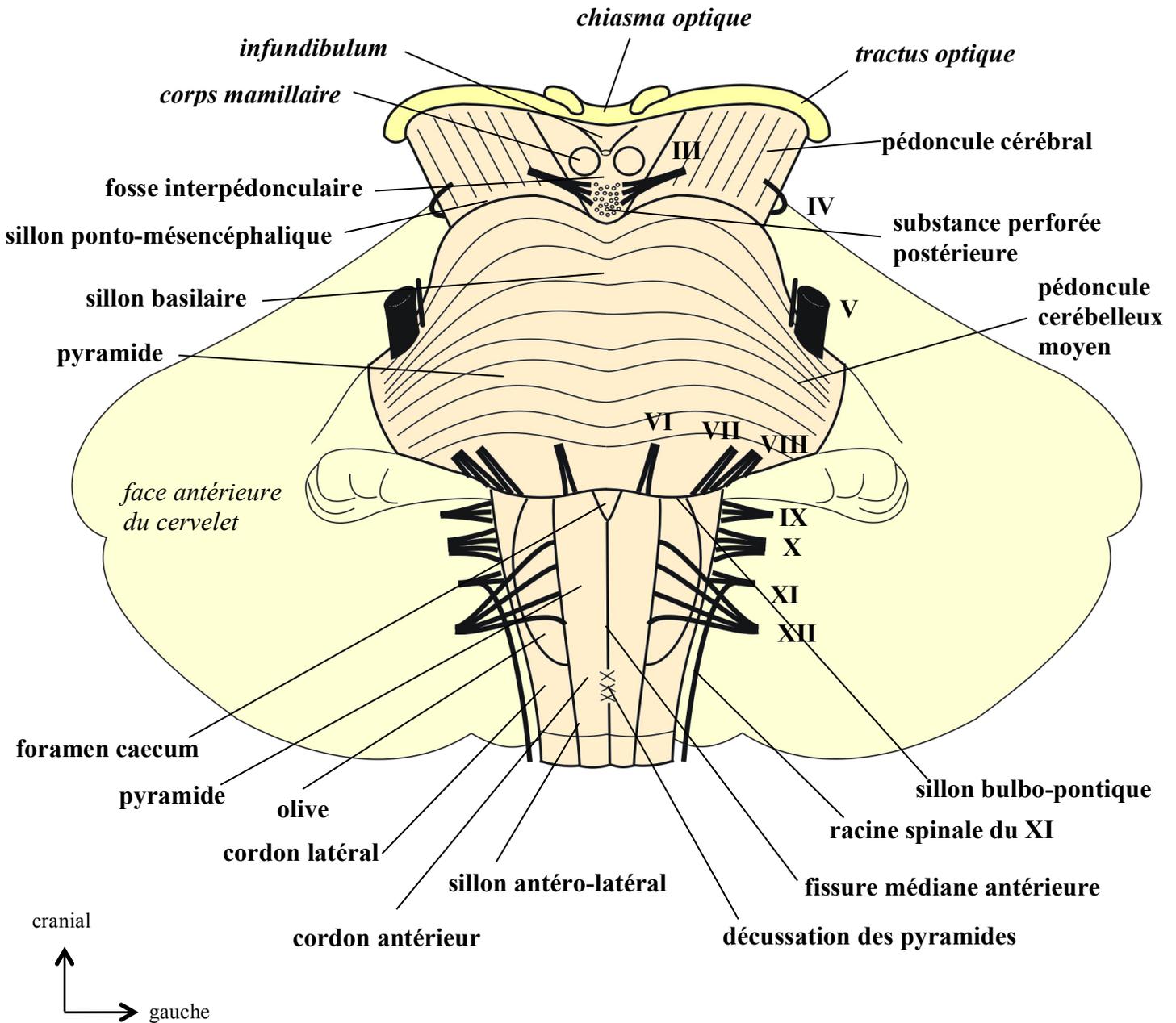
**Variation de structure de la moelle en fonction des niveaux**



### Rapports de la moelle

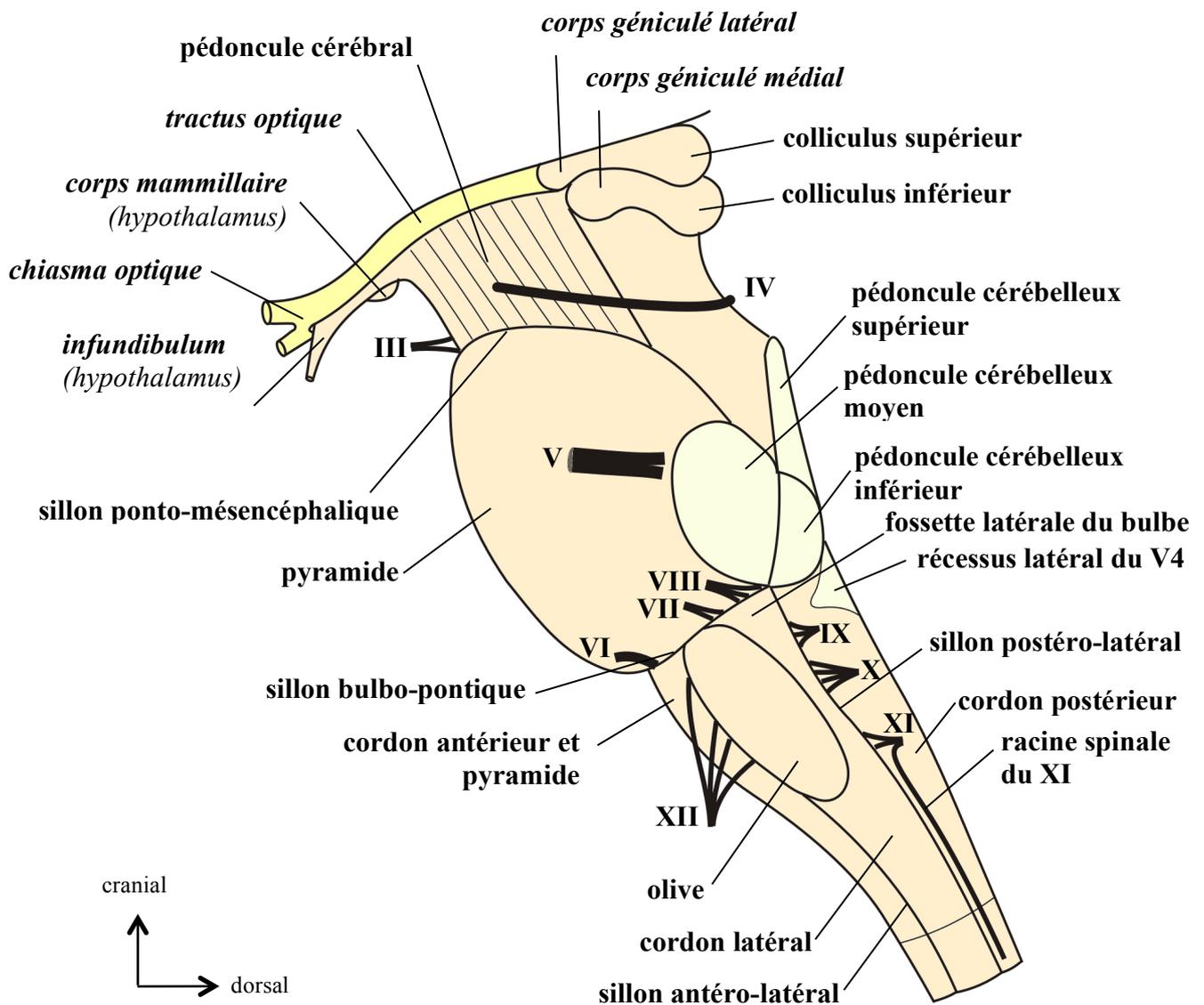
# LE TRONC CEREBRAL ET LE CERVELET



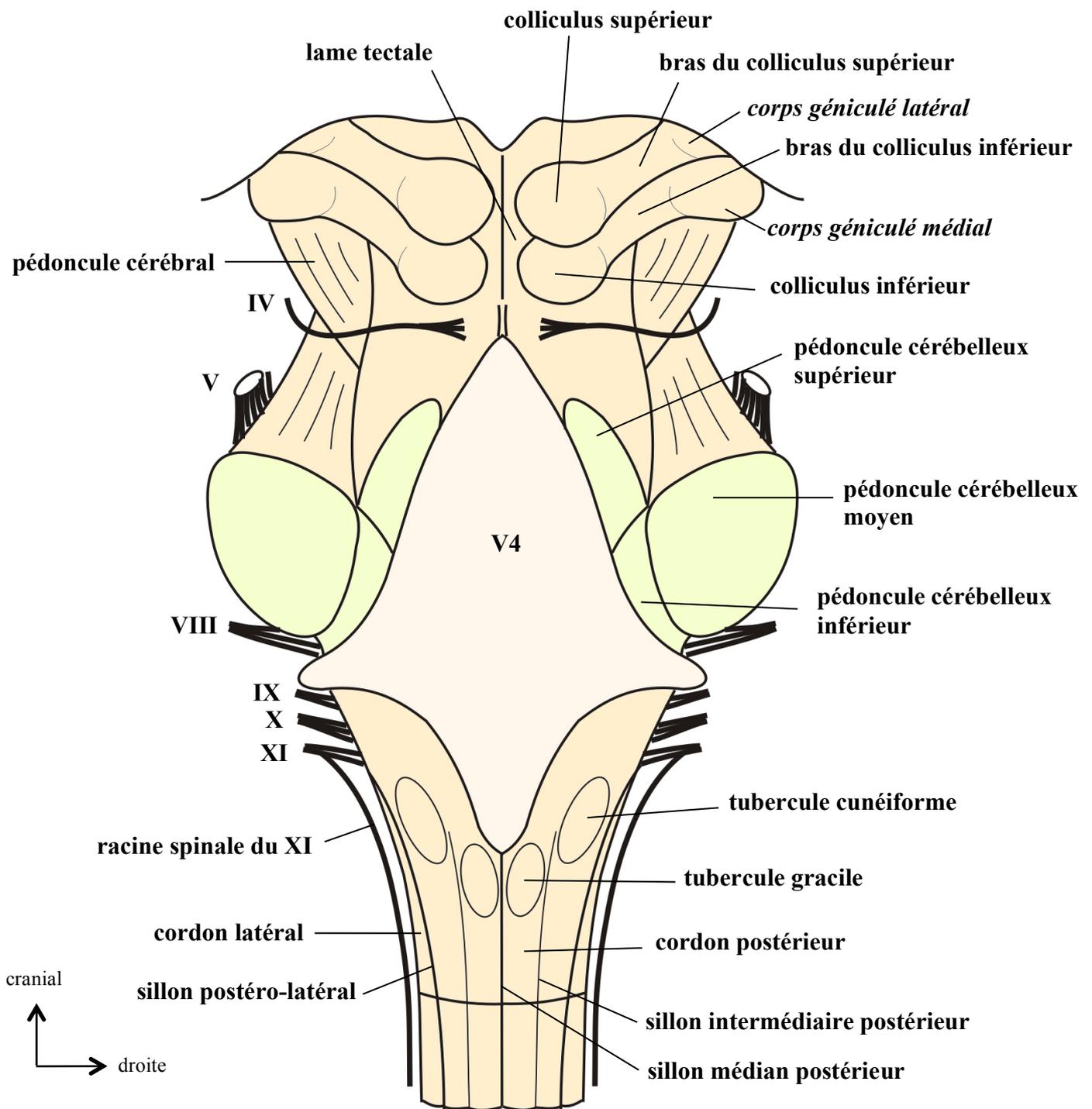


Nerfs crâniens	
III	nerf oculo-moteur
IV	nerf trochléaire
V	nerf trijumeau
VI	nerf abducens
VII	nerf facial
VIII	nerf vestibulo-cochléaire
IX	nerf glosso-pharyngien
X	nerf vague
XI	nerf accessoire
XII	nerf hypoglosse

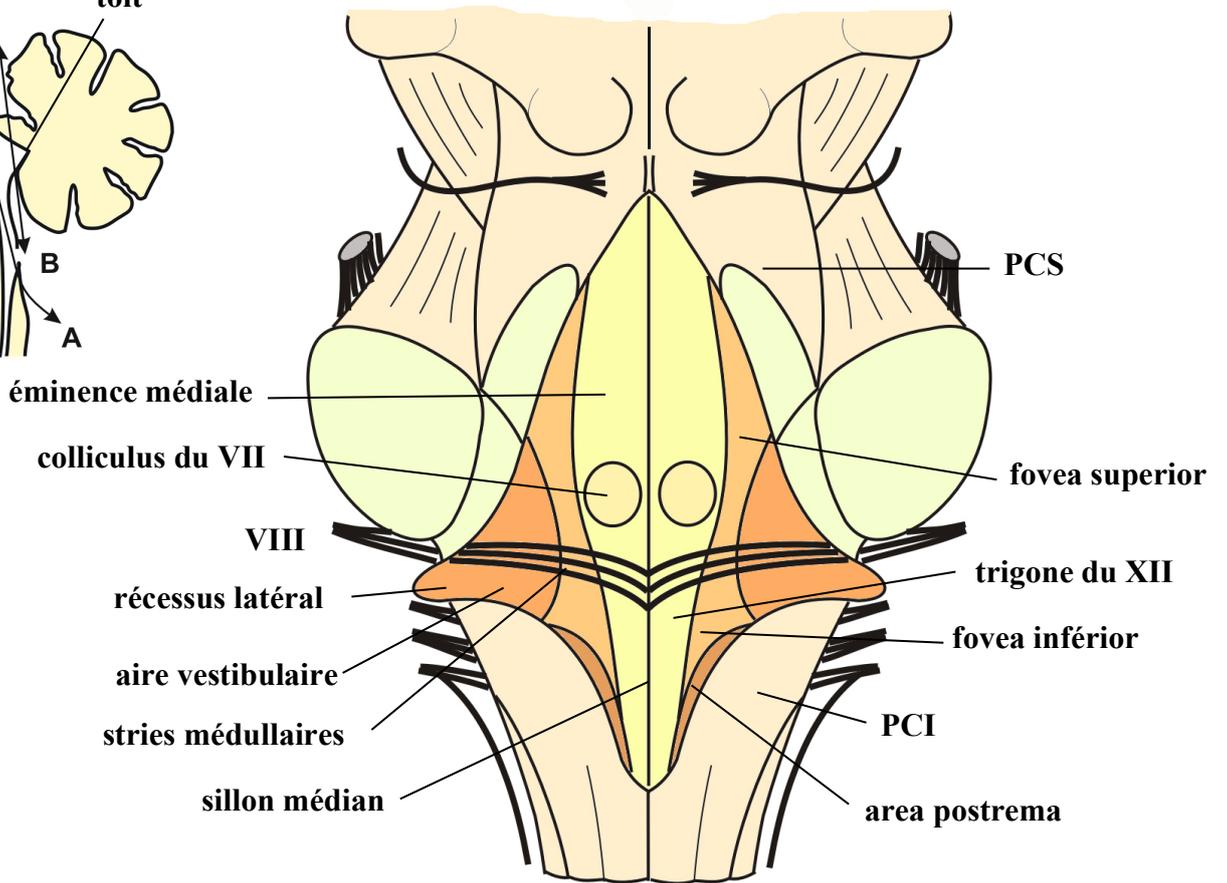
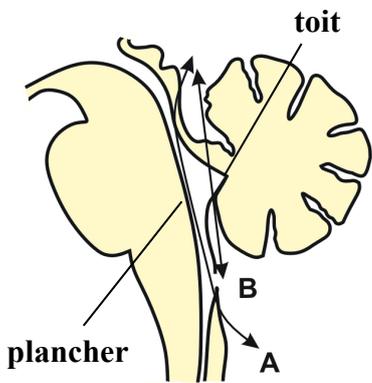
Vue antérieure du tronc cérébral



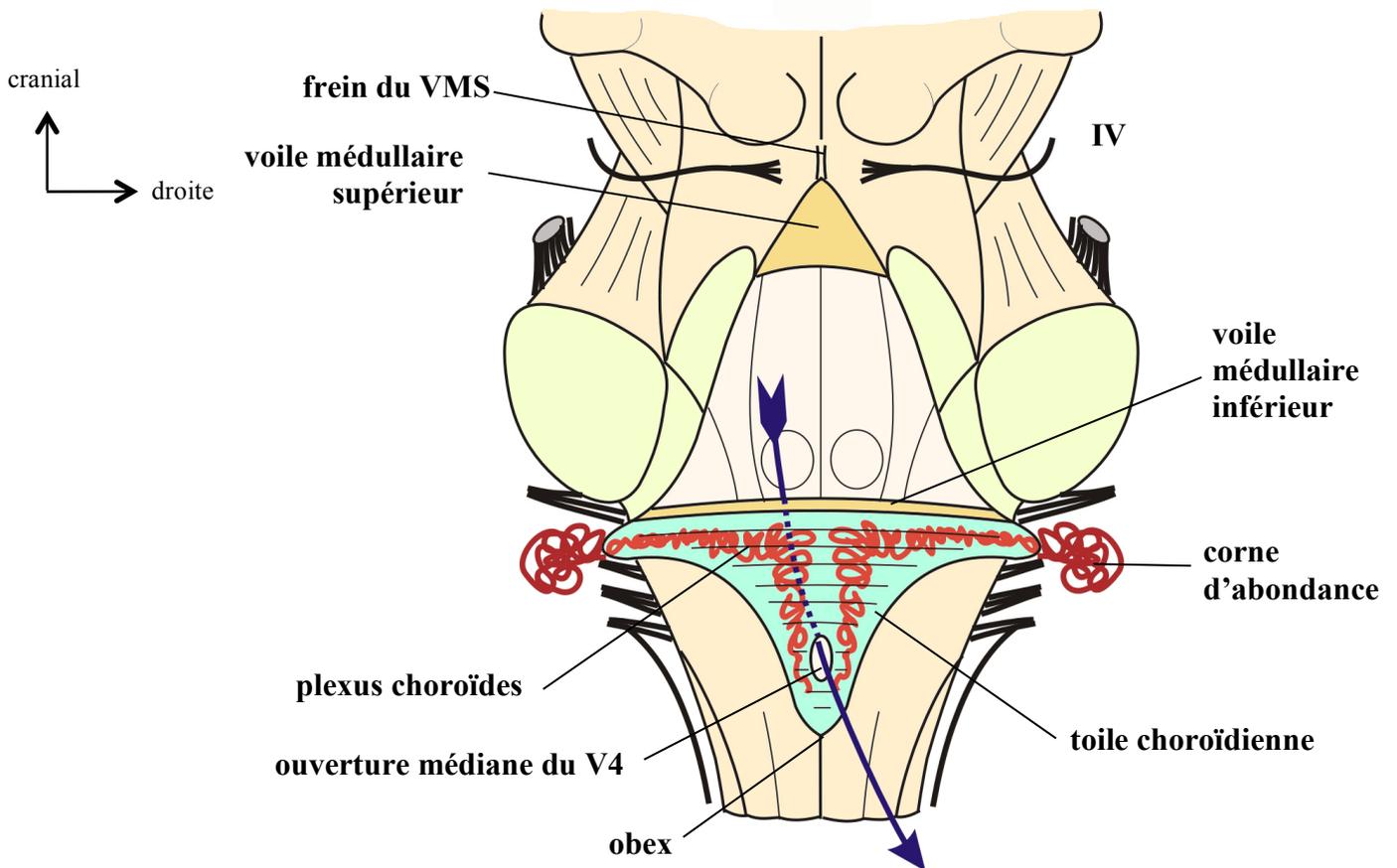
**Vue latérale gauche du tronc cérébral, après section des pédoncules cérébelleux et ablation du cervelet**



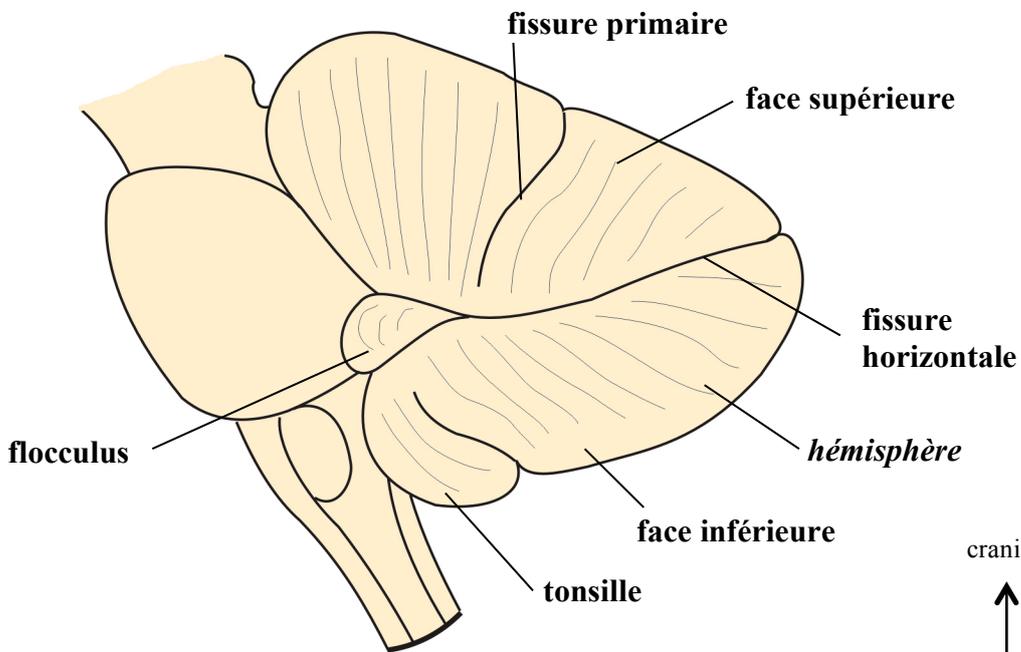
**Vue postérieure du tronc cérébral après section des pédoncules cérébelleux et ablation du cervelet**



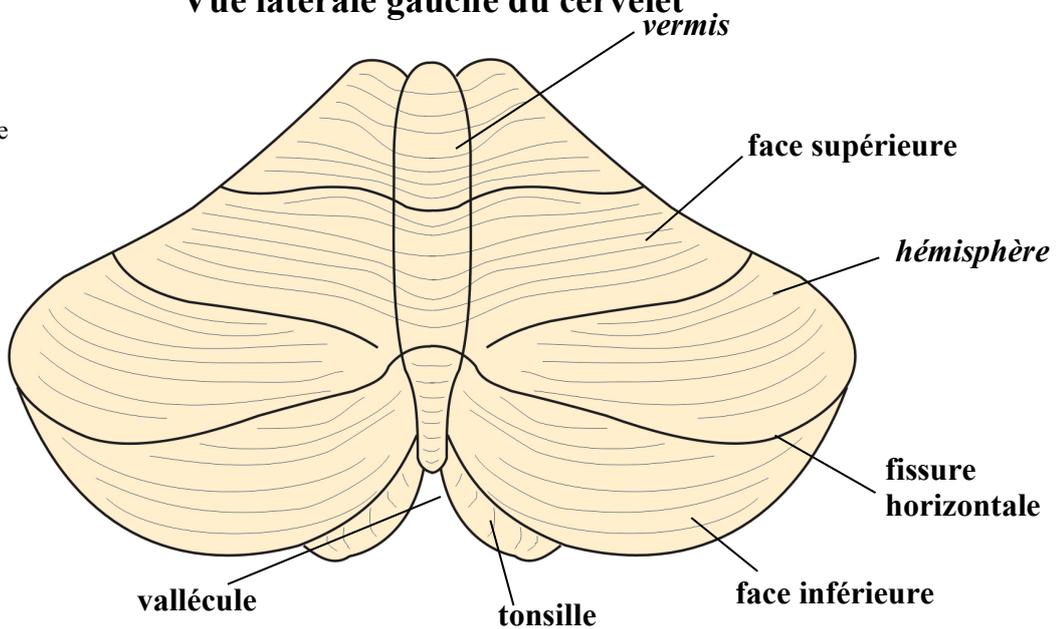
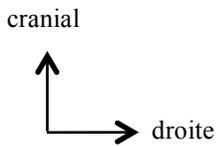
**Plancher du quatrième ventricule (fosse rhomboïde) après ablation du cervelet et du toit (A)**



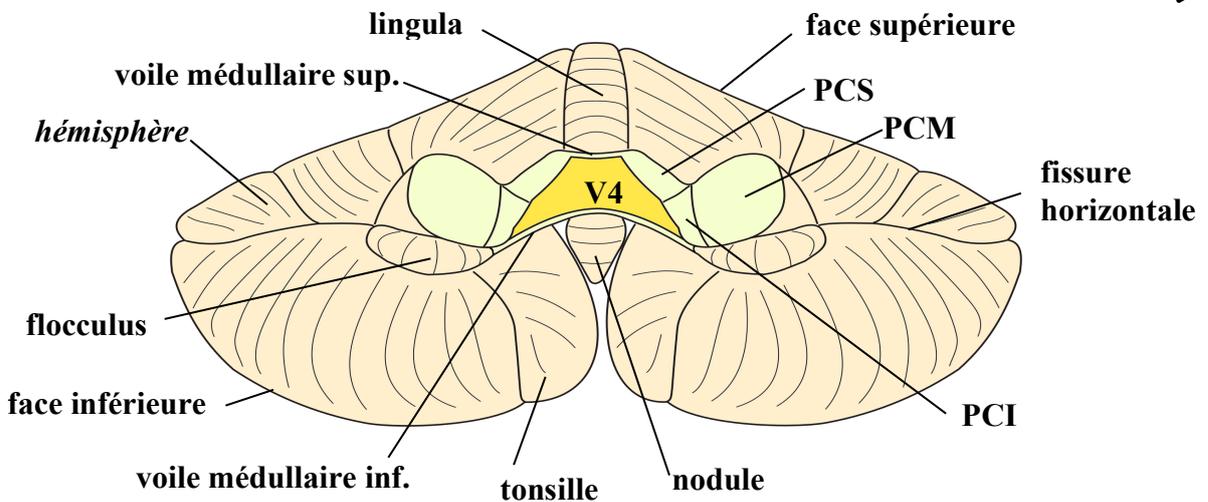
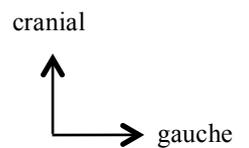
**Toit du quatrième ventricule après ablation du cervelet (B)**



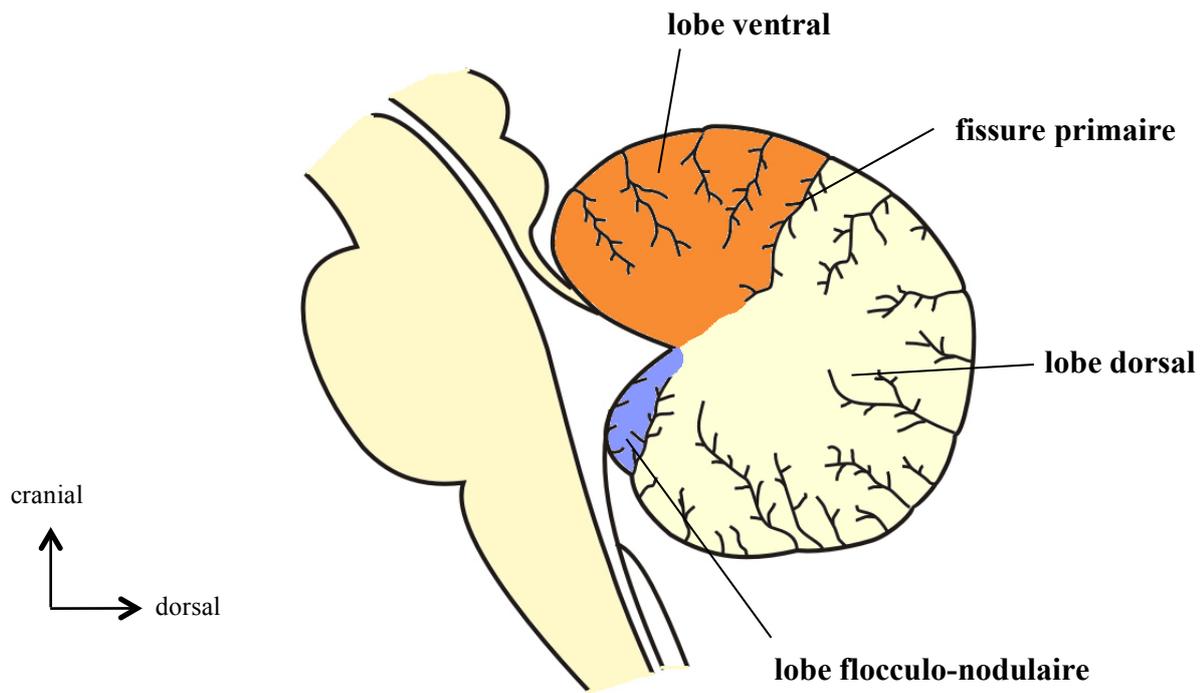
**Vue latérale gauche du cervelet**



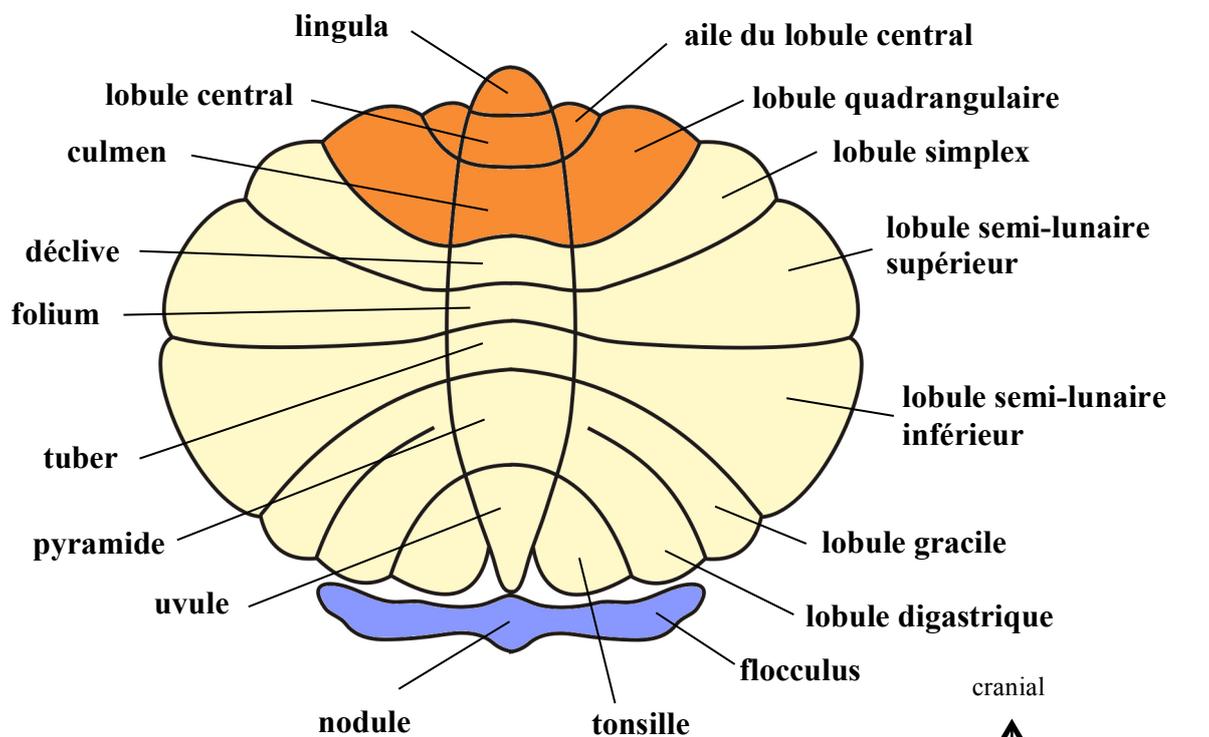
**vue postérieure du cervelet**



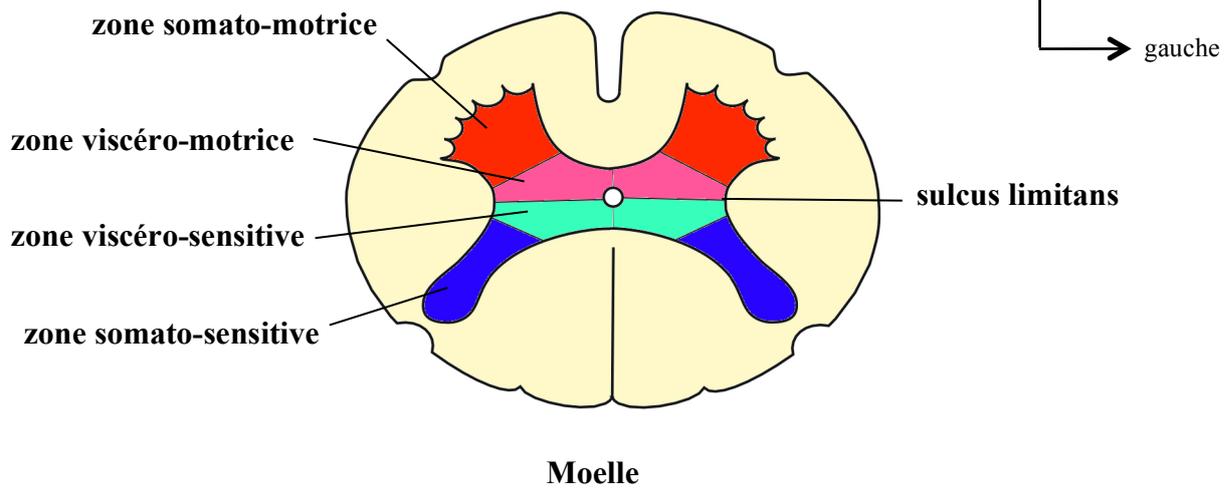
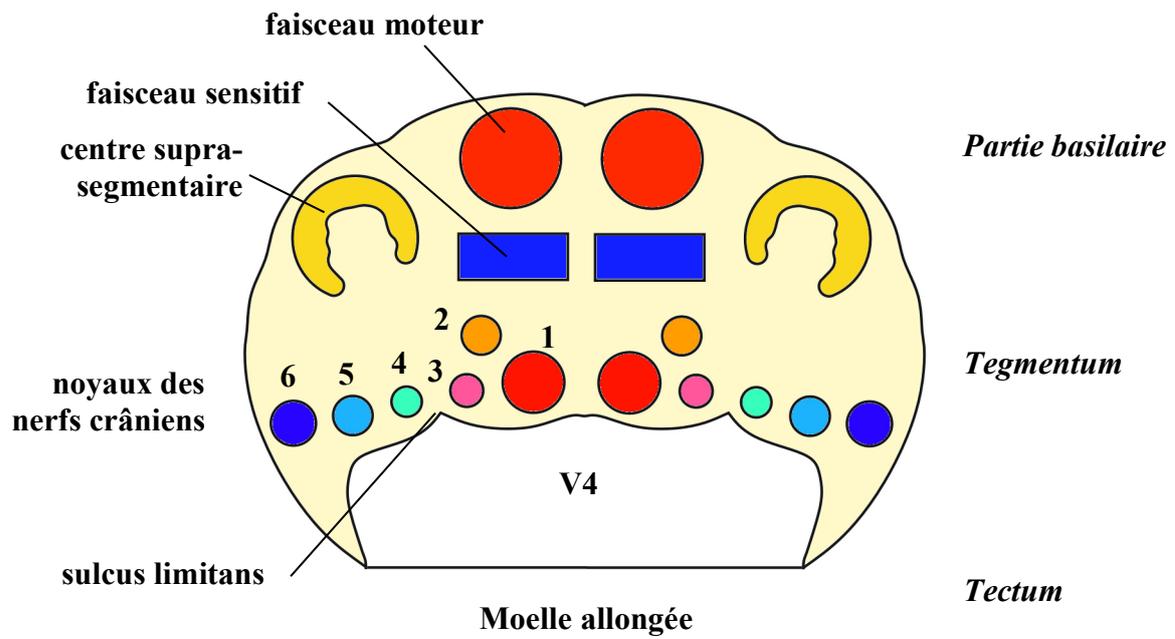
**Vue antérieure du cervelet après ablation du tronc cérébral**



**Les lobes du cervelet (coupe sagittale médiane)**

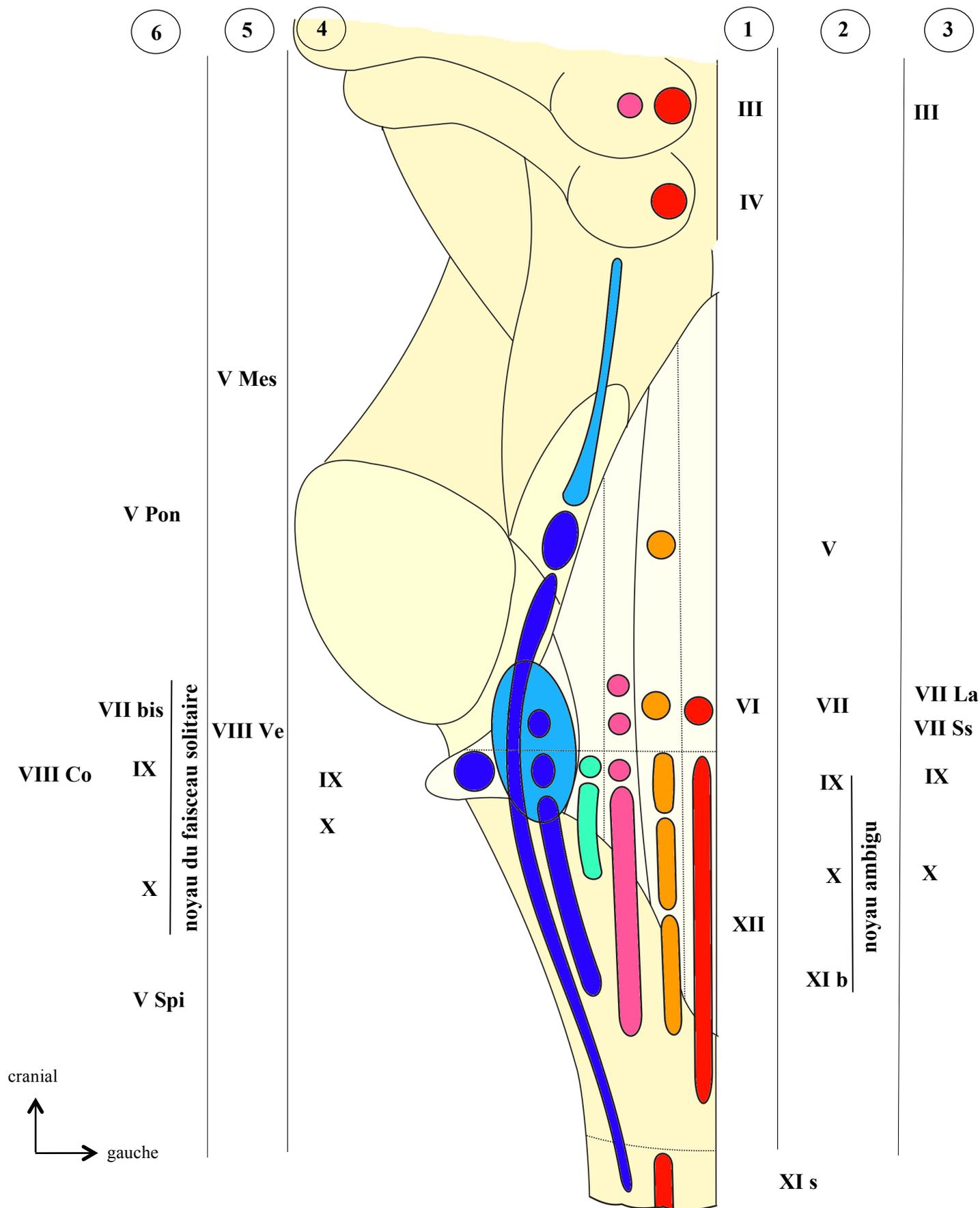


**Les lobules du cervelet (cervelet étalé)**

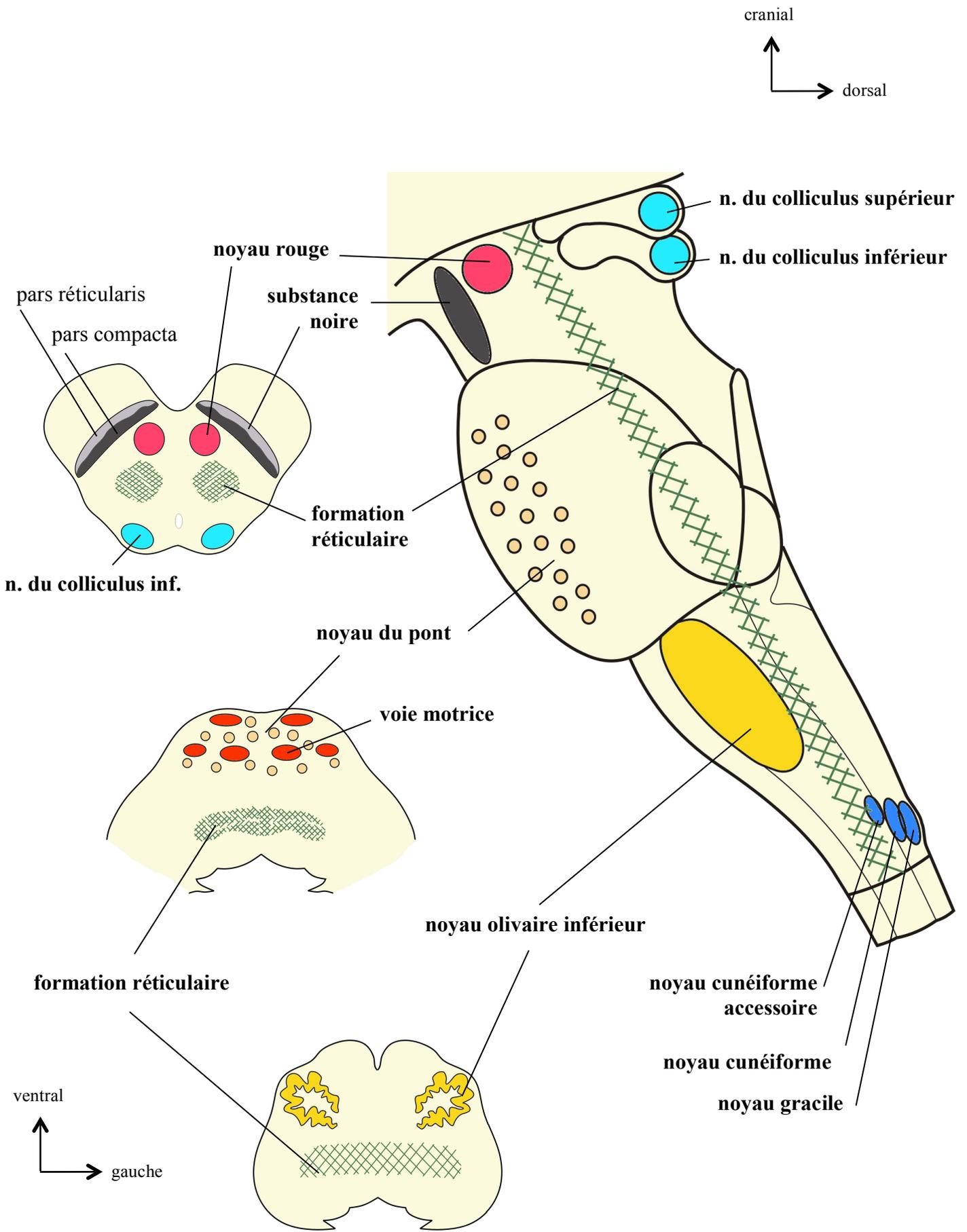


- 1 : colonne somato-motrice somitique*
- 2 : colonne somato-motrice branchiale*
- 3 : colonne viscéro-motrice*
- 4 : colonne viscéro-sensitive*
- 5 : colonne de la sensibilité proprioceptive*
- 6 : colonne de la sensibilité extéroceptive*

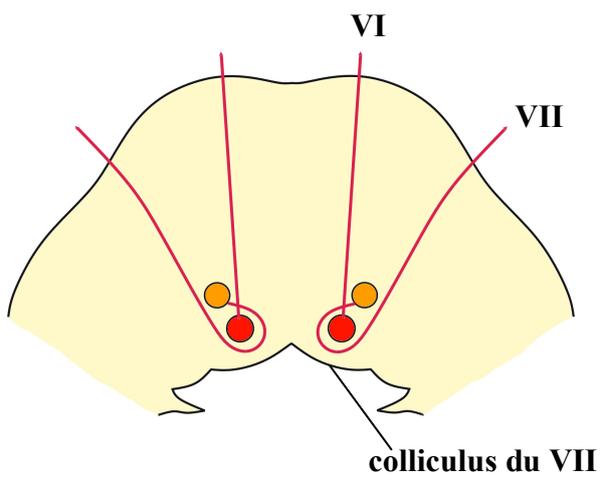
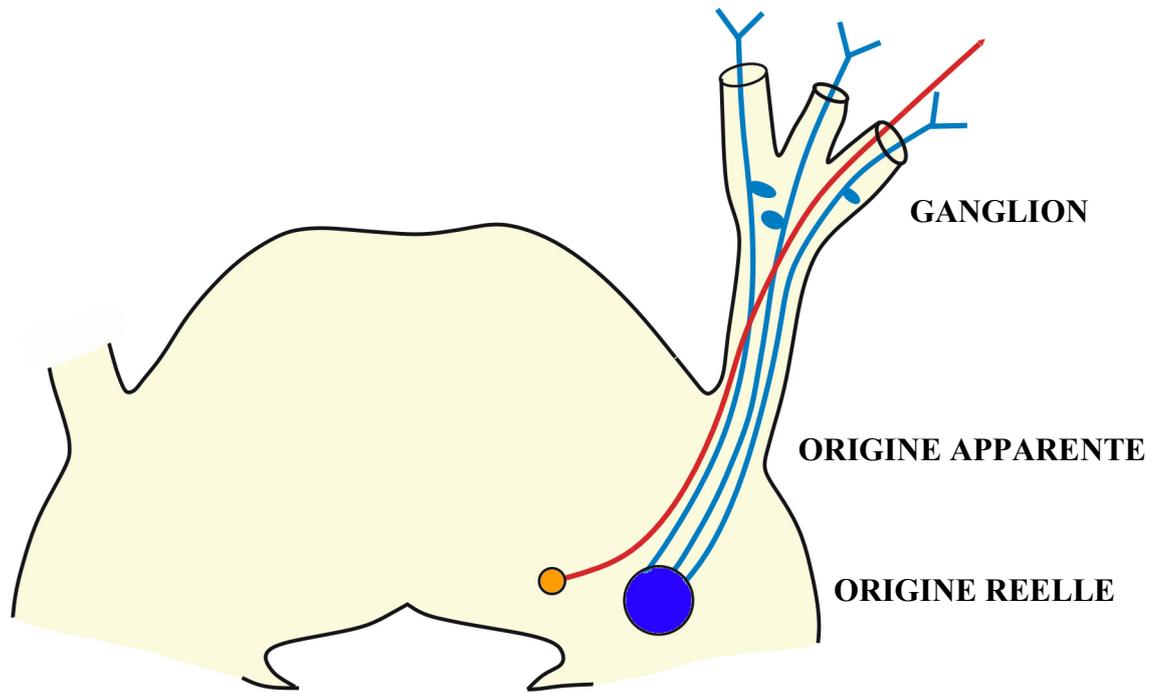
**Représentation schématique des modifications de structure entre la moelle et le tronc cérébral**



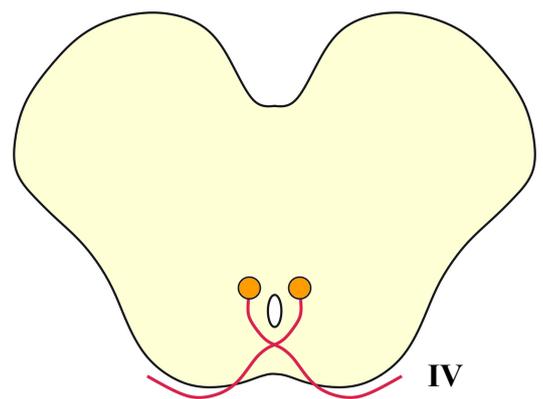
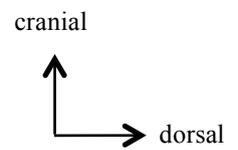
Noyaux des nerfs crâniens



**Les formations grises propres au tronc cérébral**



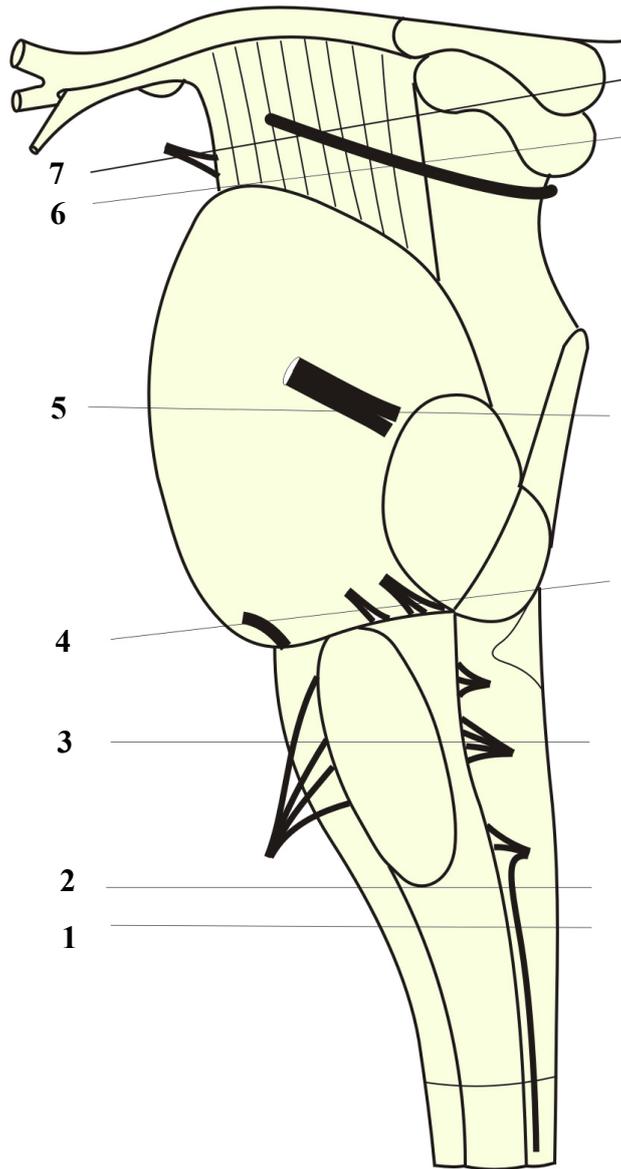
**Les neurones du VII contournent le noyau du VI**

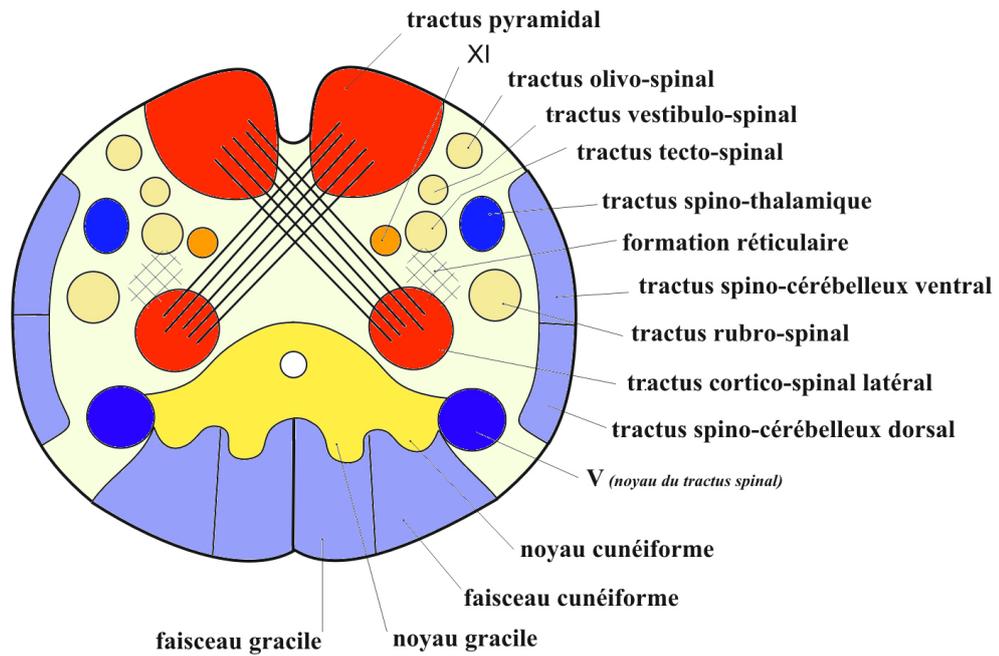


**Les neurones du IV croisent la ligne médiane**

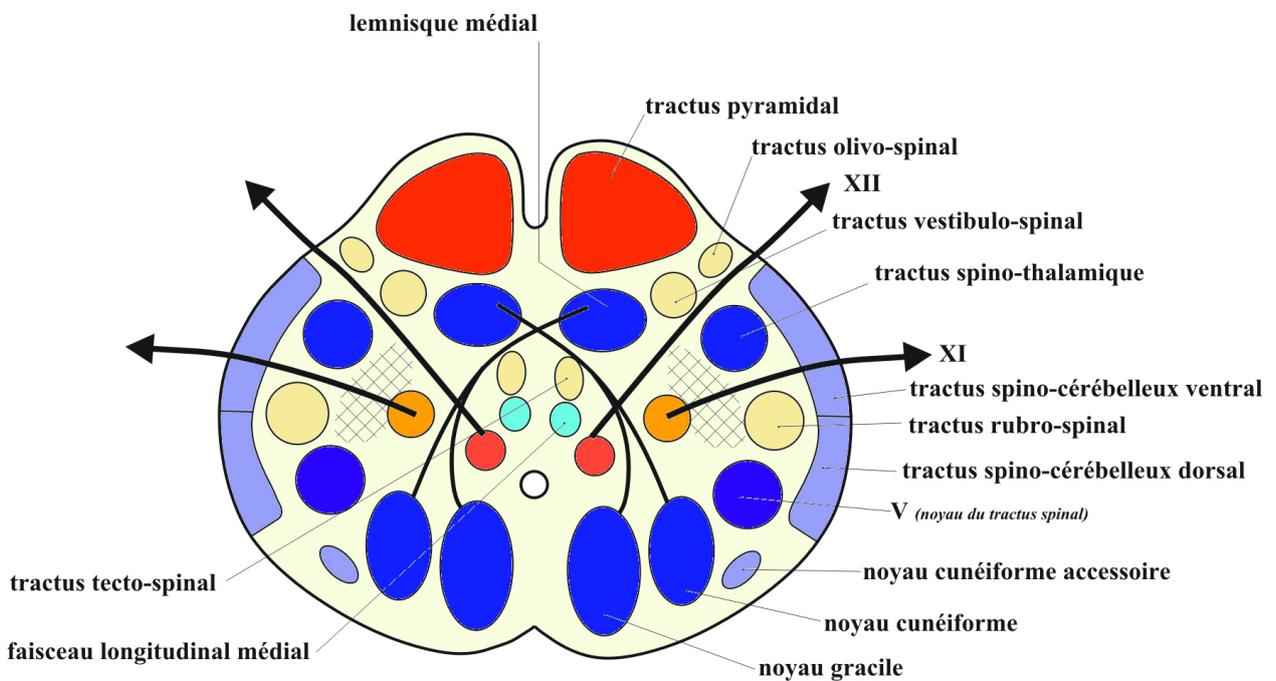
**Les neurones radiculaires des nerfs crâniens**

## Coupes schématiques du tronc cérébral

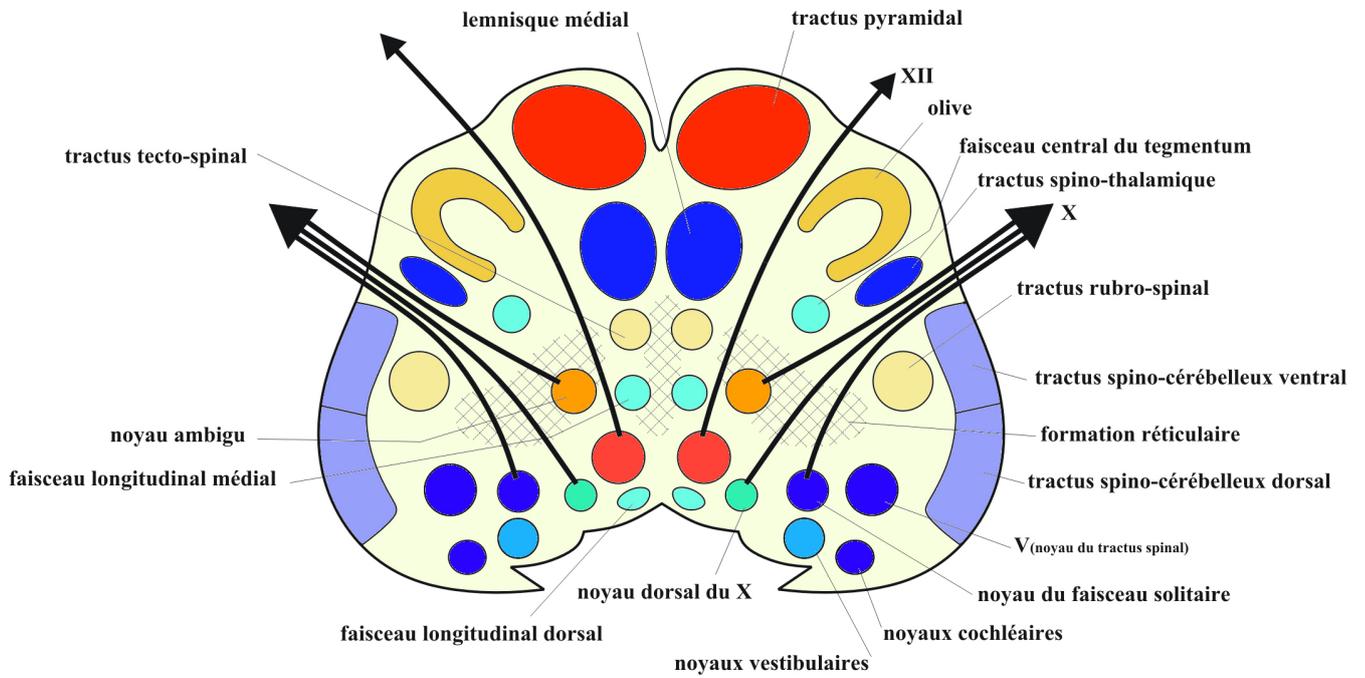




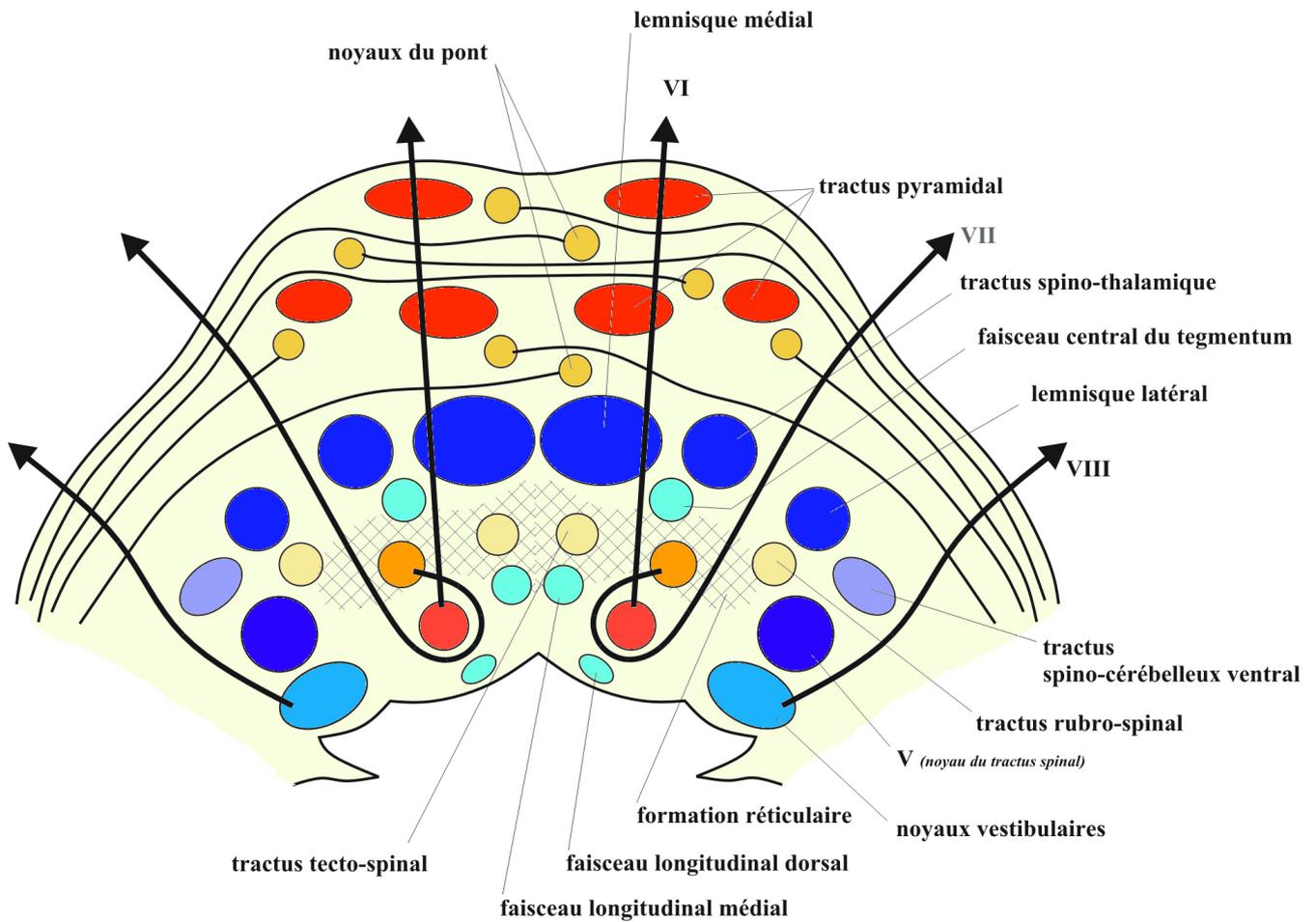
**Coupe 1 passant par la décussation motrice**



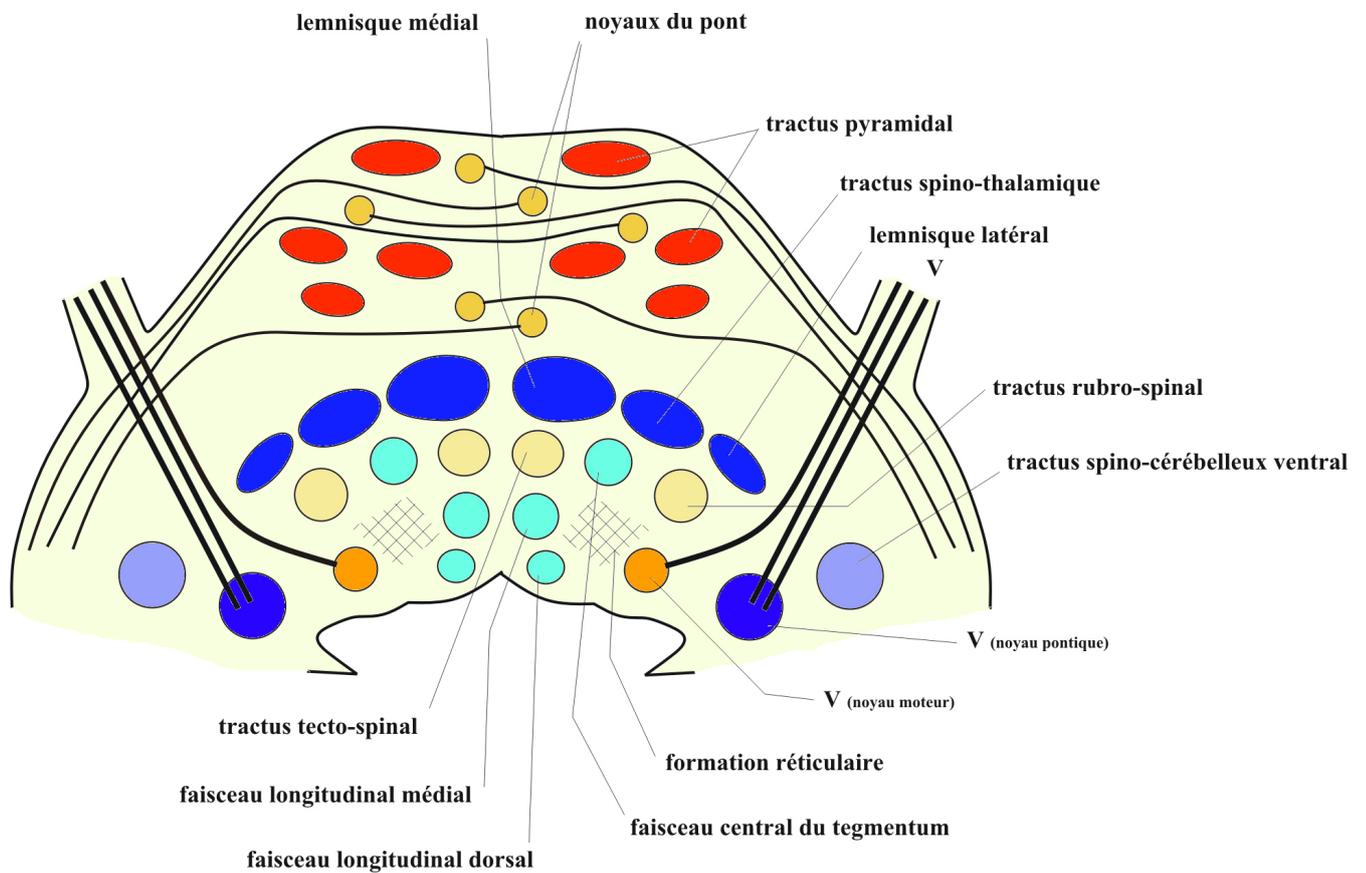
**Coupe 2 passant par la décussation sensitive**



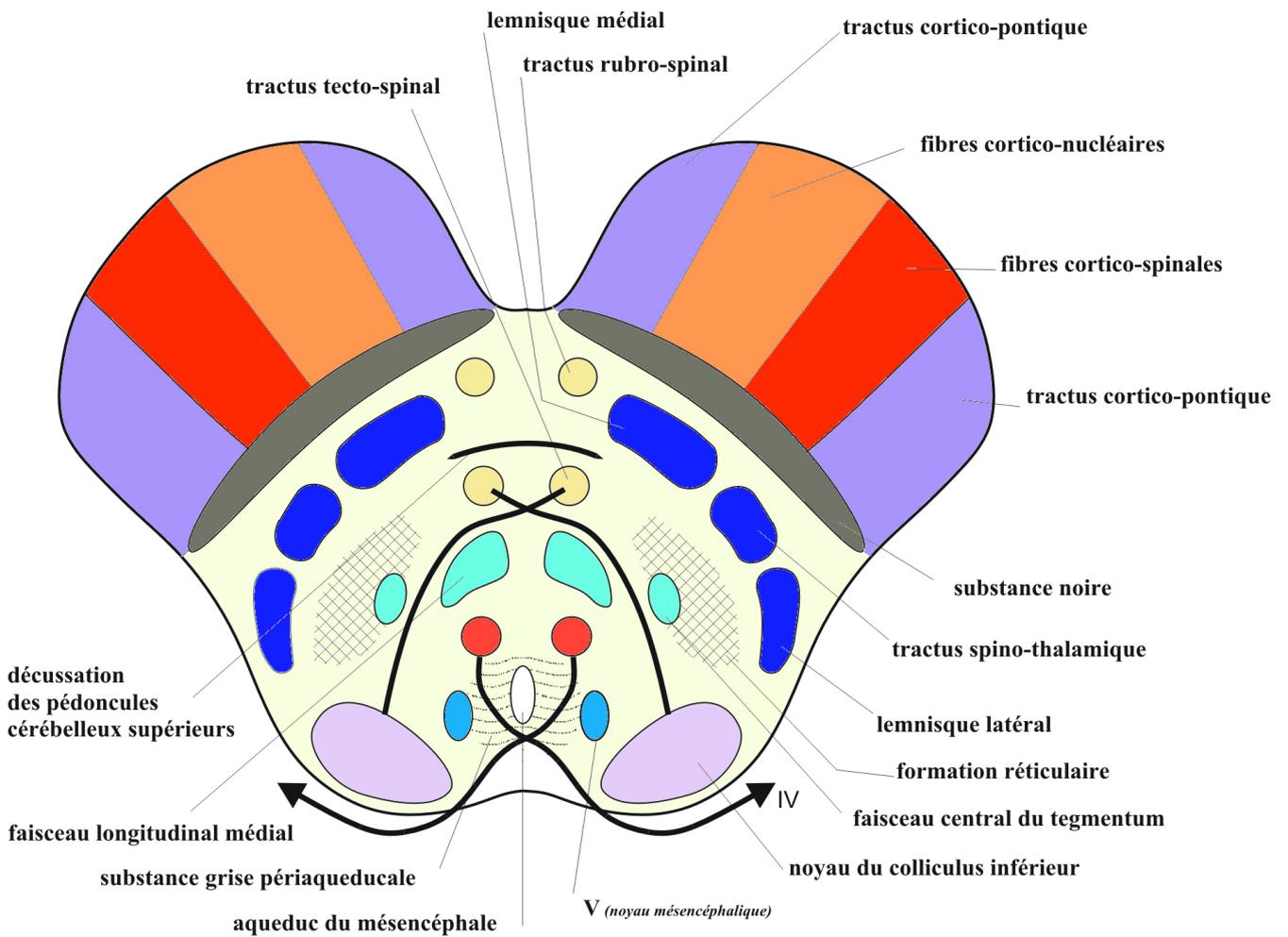
**Coupe 3 passant par l'olive**



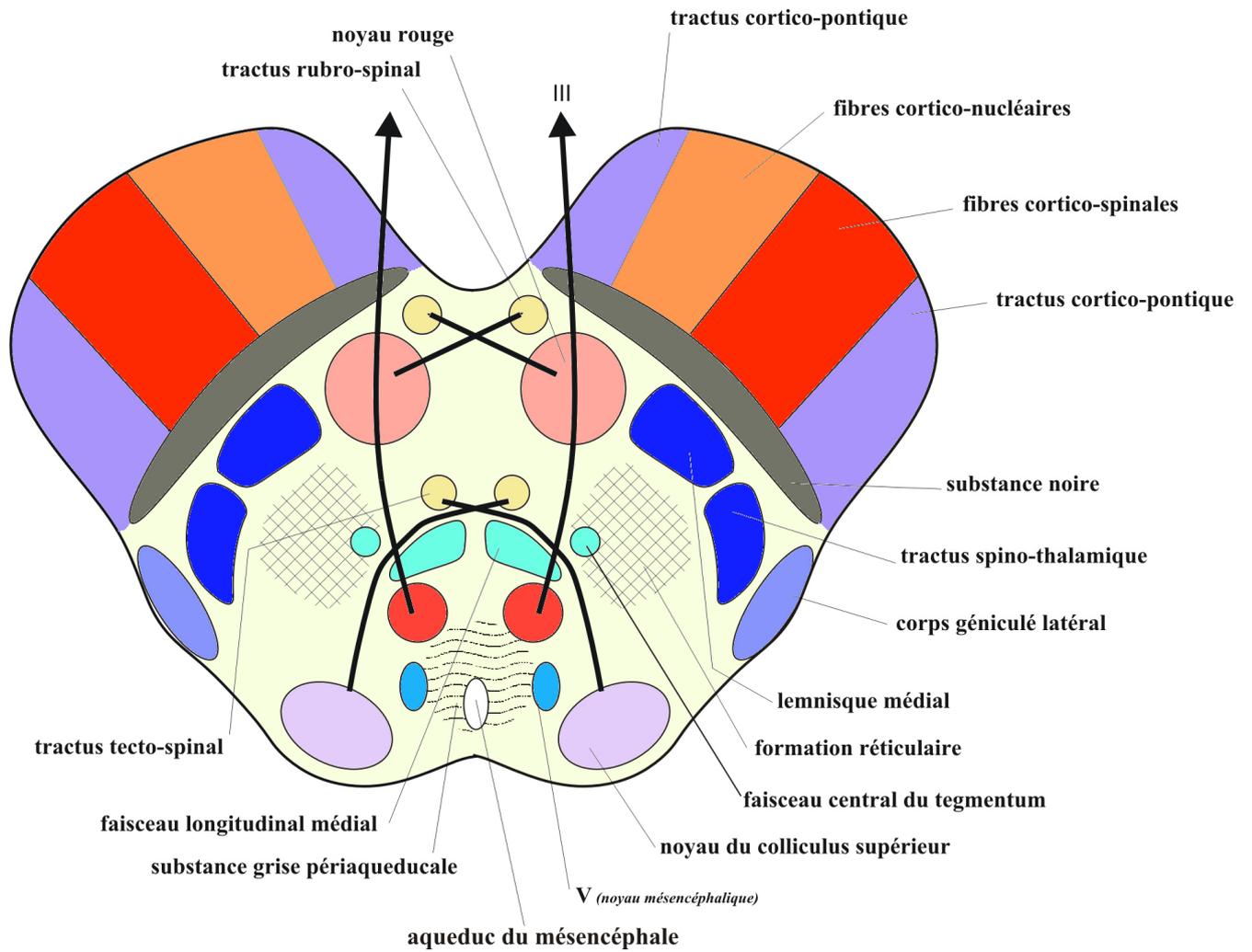
**Coupe 4 passant au-dessus du sillon bulbo-pontique**



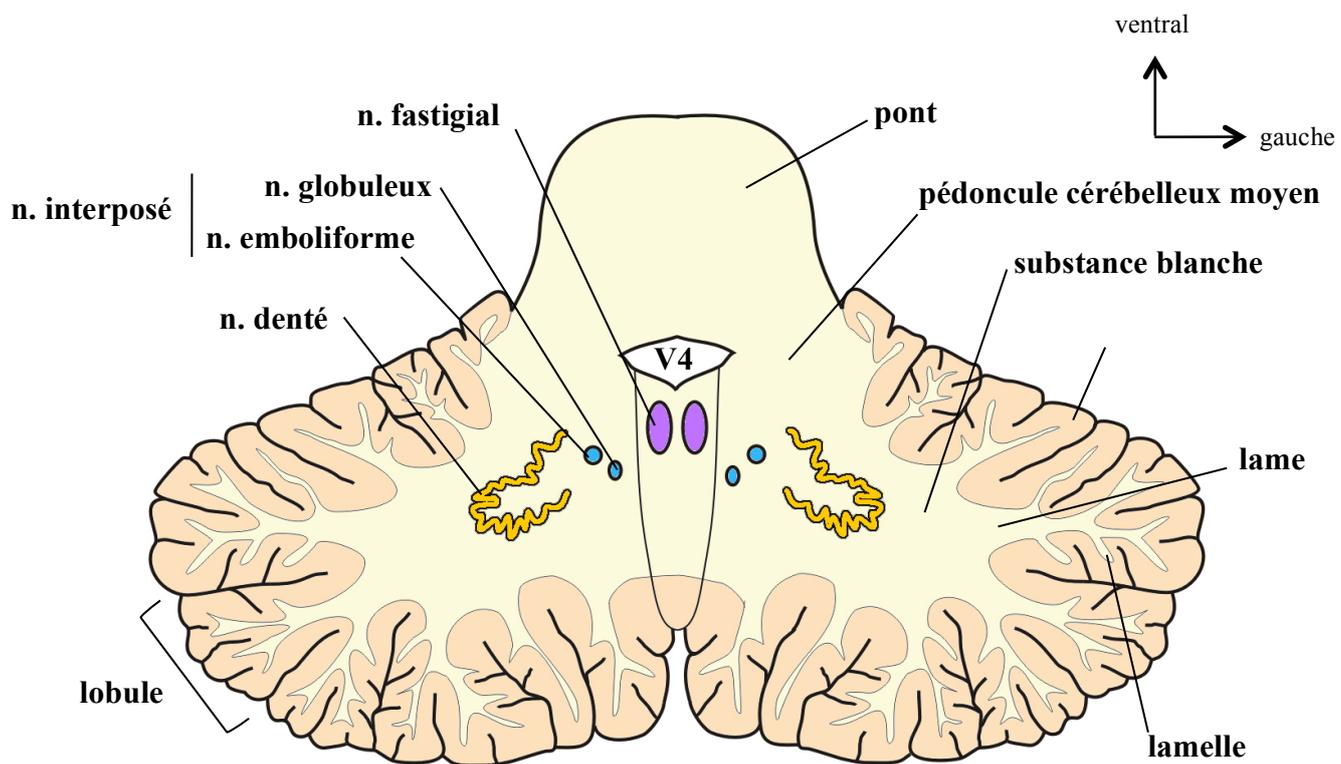
**Coupe 5 passant par la partie moyenne du pont**



**Coupe 6 passant par le colliculus inférieur**



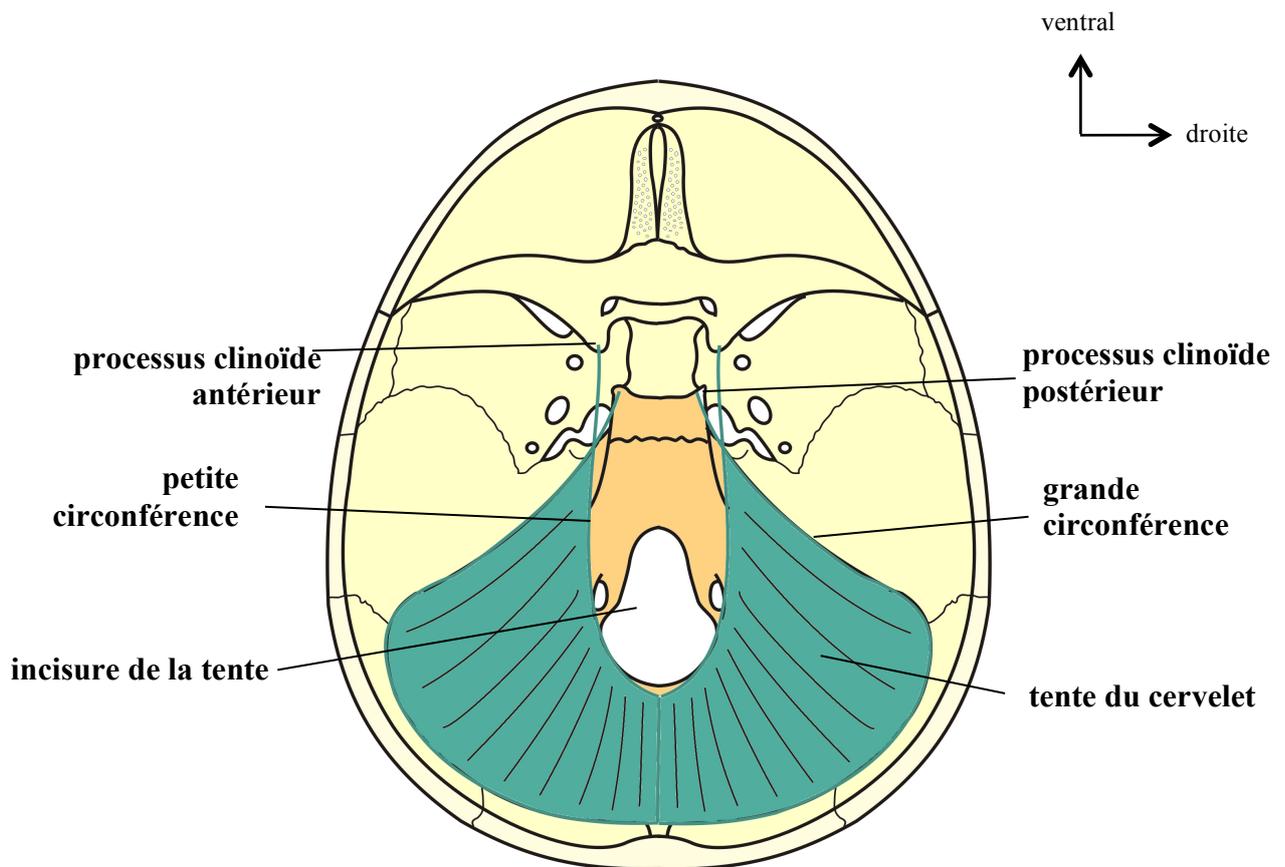
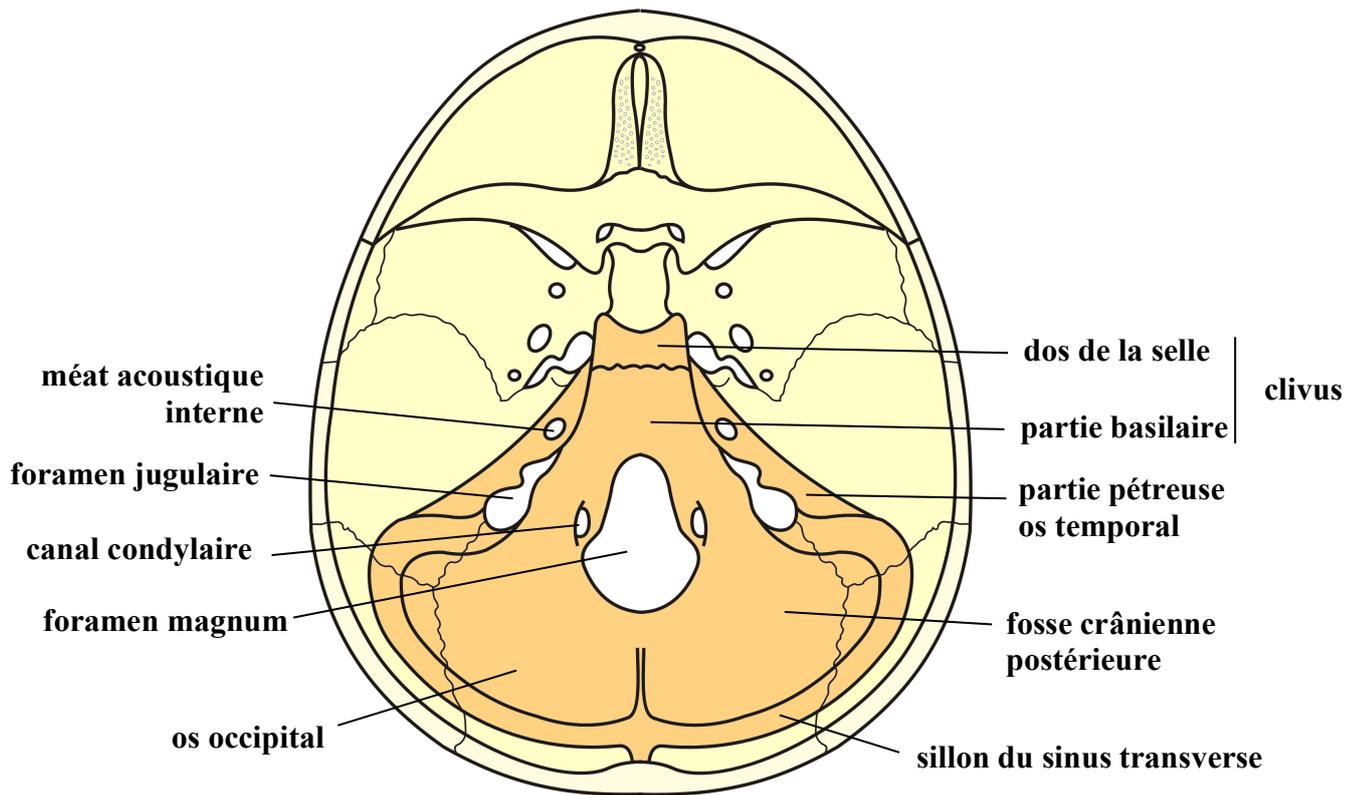
**Coupe 7 passant par le colliculus supérieur**



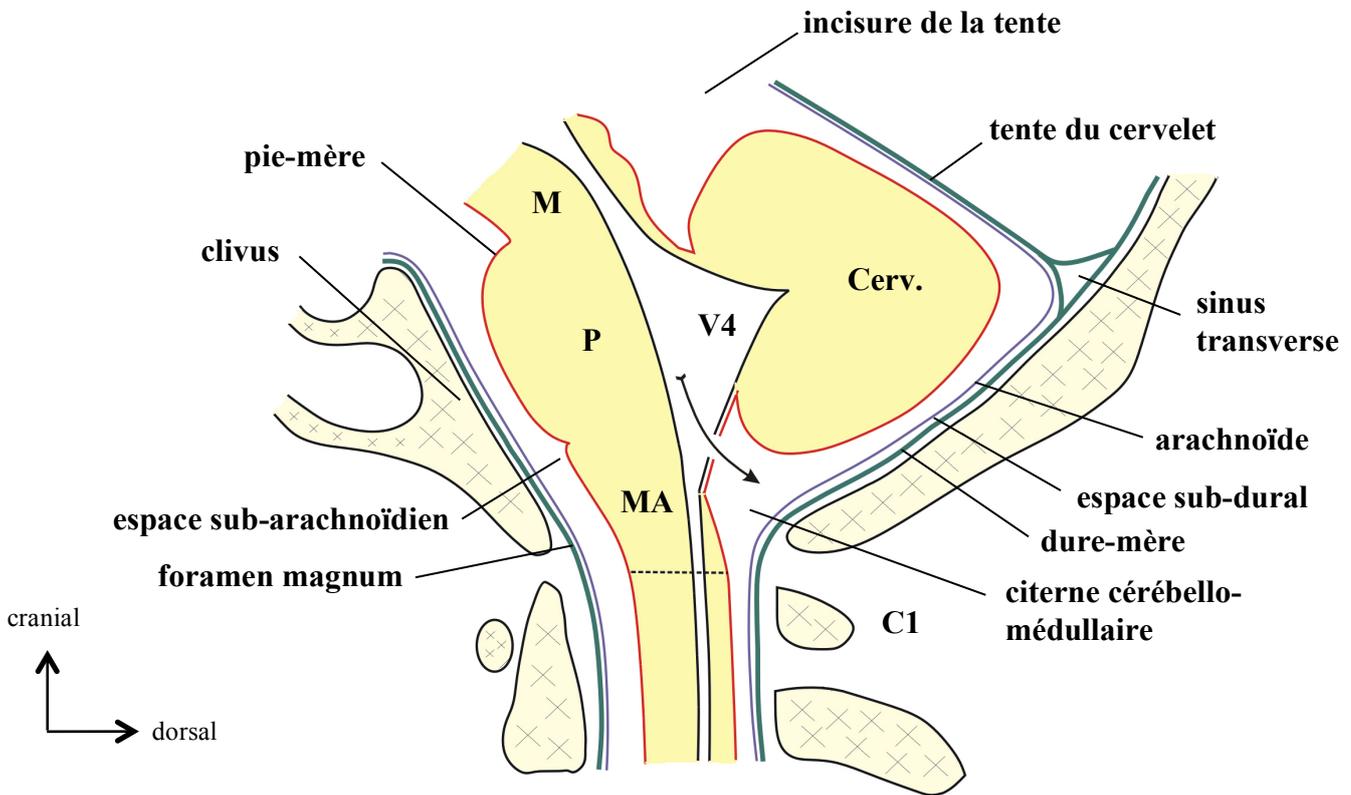
**Structure du cervelet (coupe horizontale)**



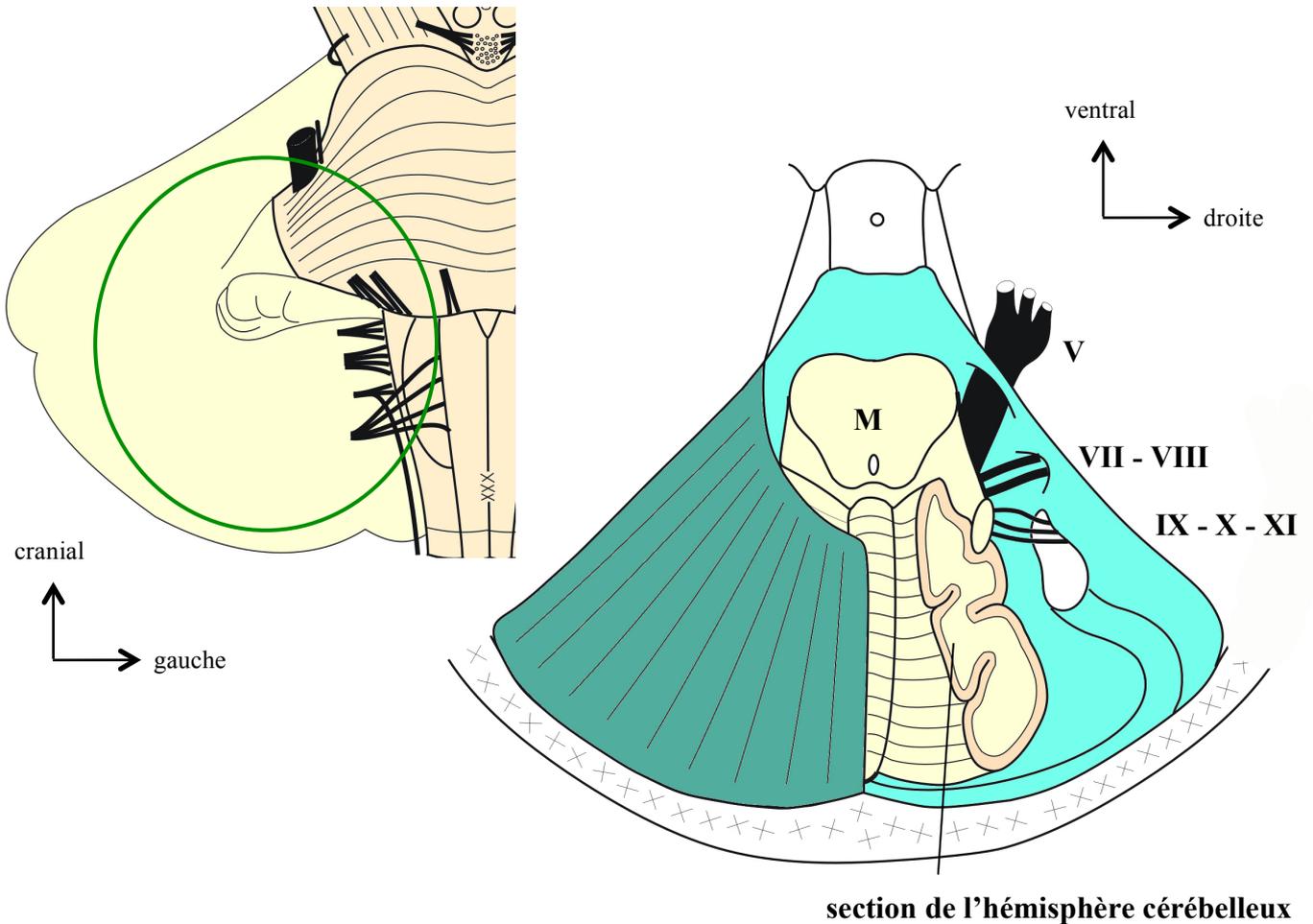
**Coupe sagittale médiane du cervelet montrant l'arbre de vie au niveau du vermis**



**Loge cérébrale postérieure**

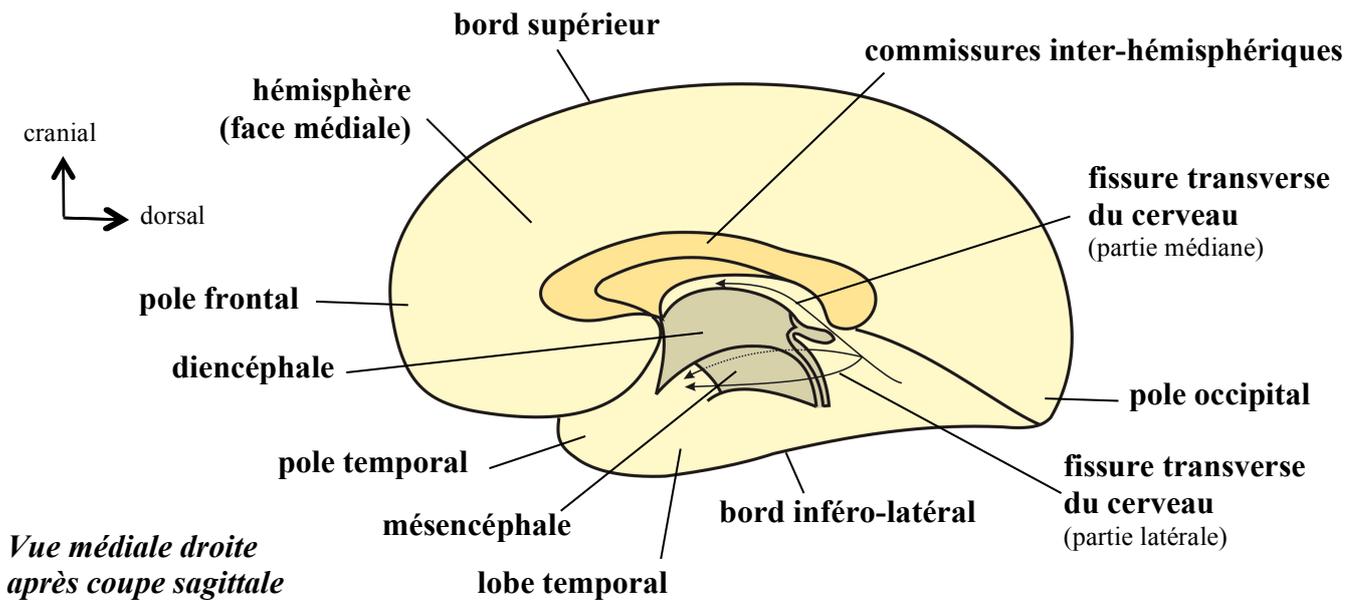
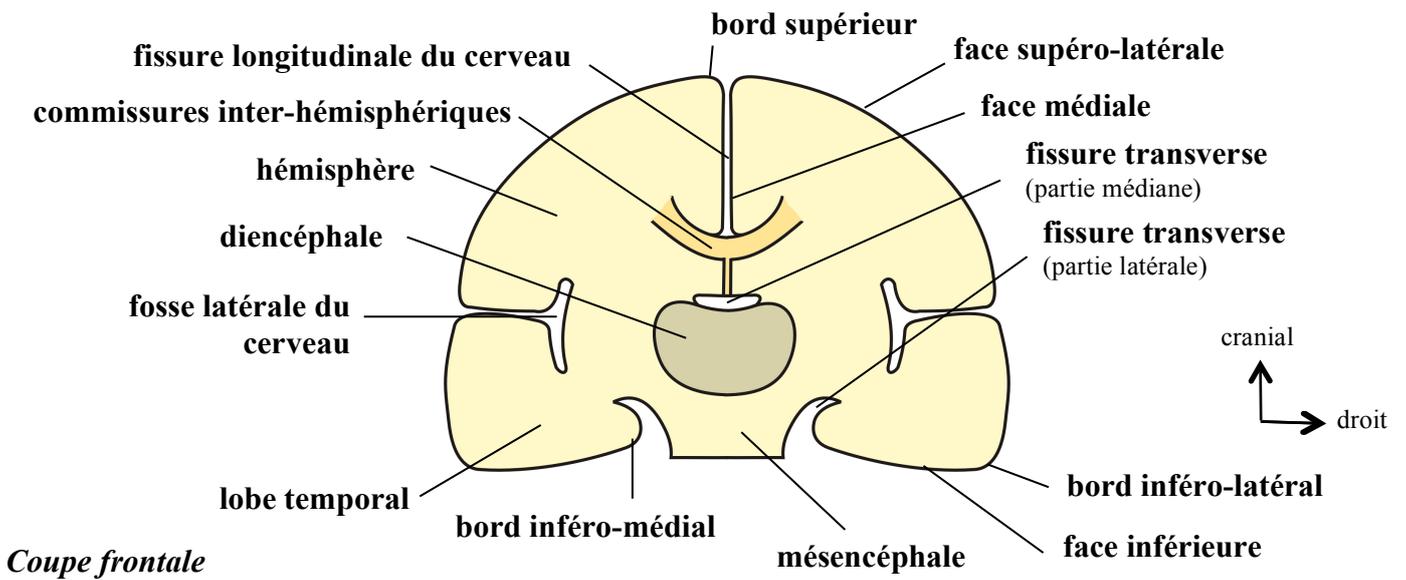
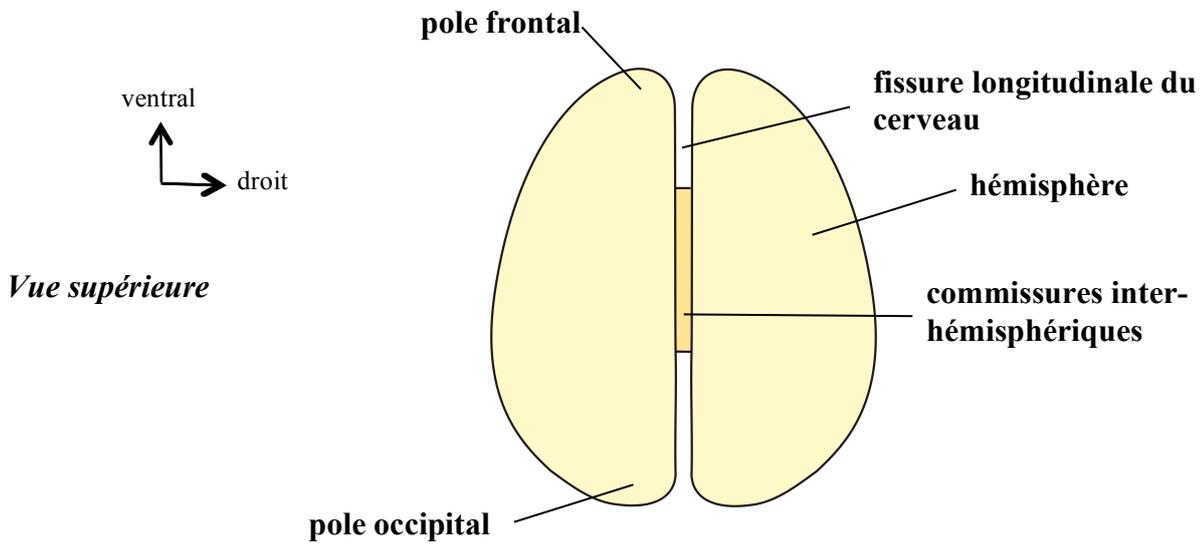


**Loge cérébrale postérieure - coupe sagittale médiane**

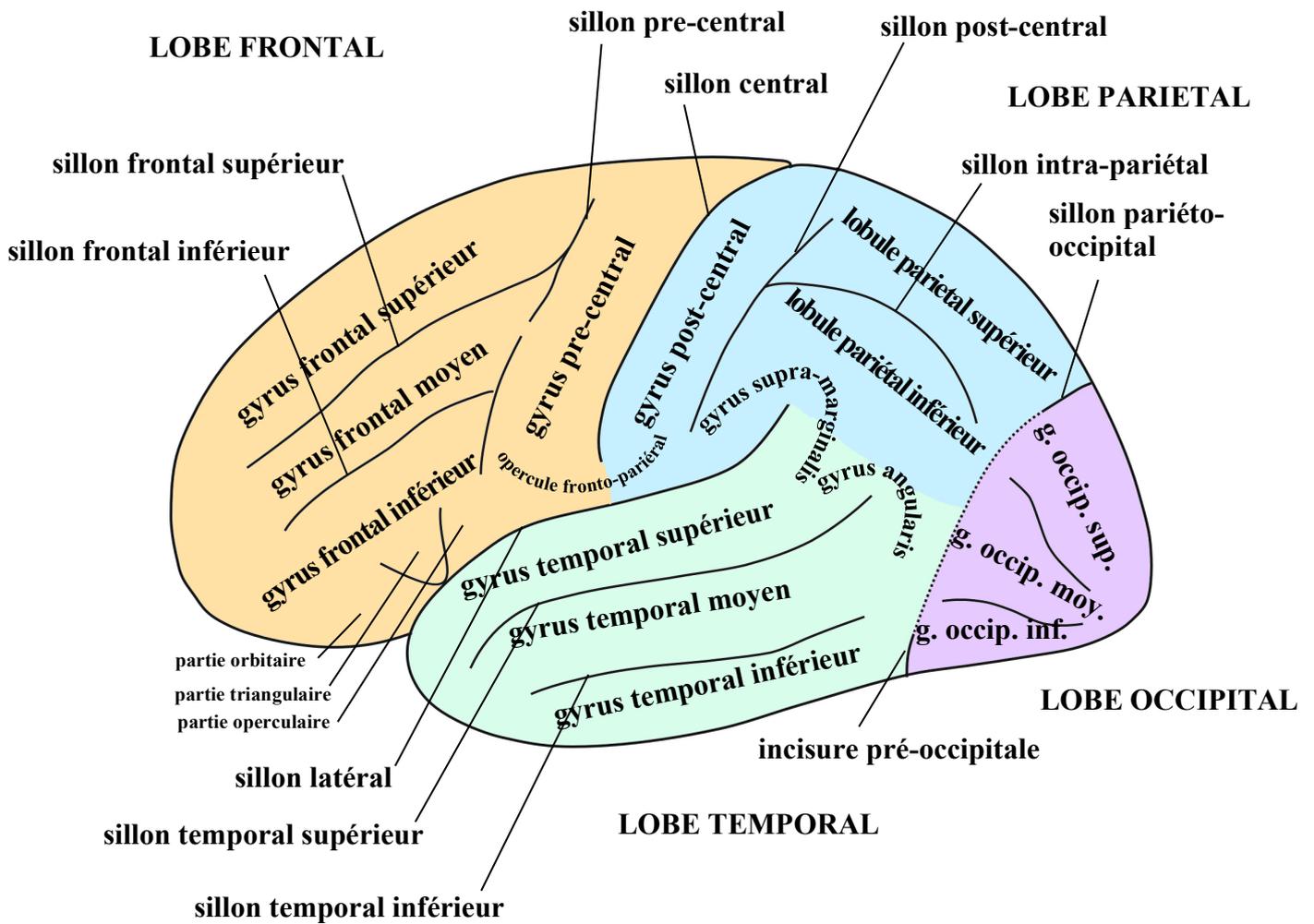


**L'angle ponto-cérébelleux**

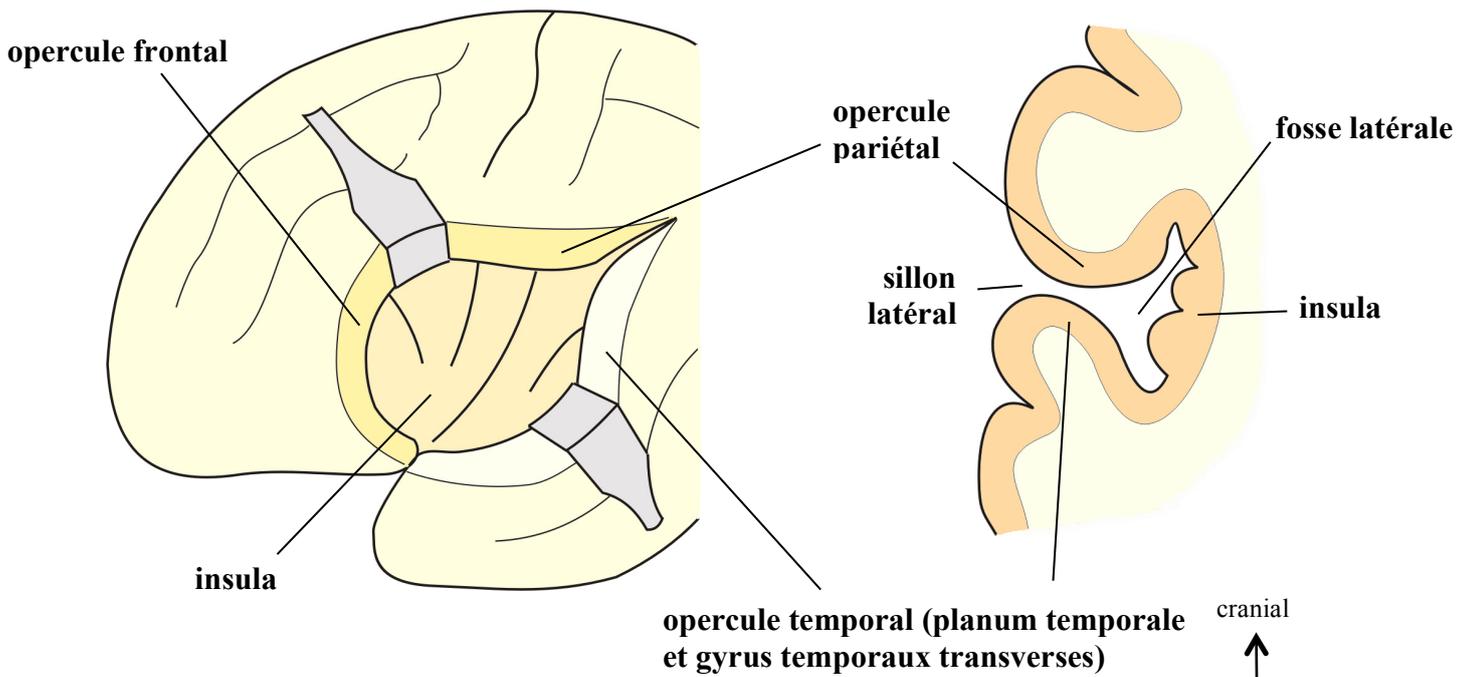
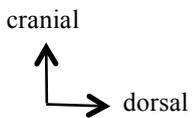
# **LE CERVEAU**



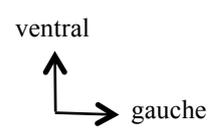
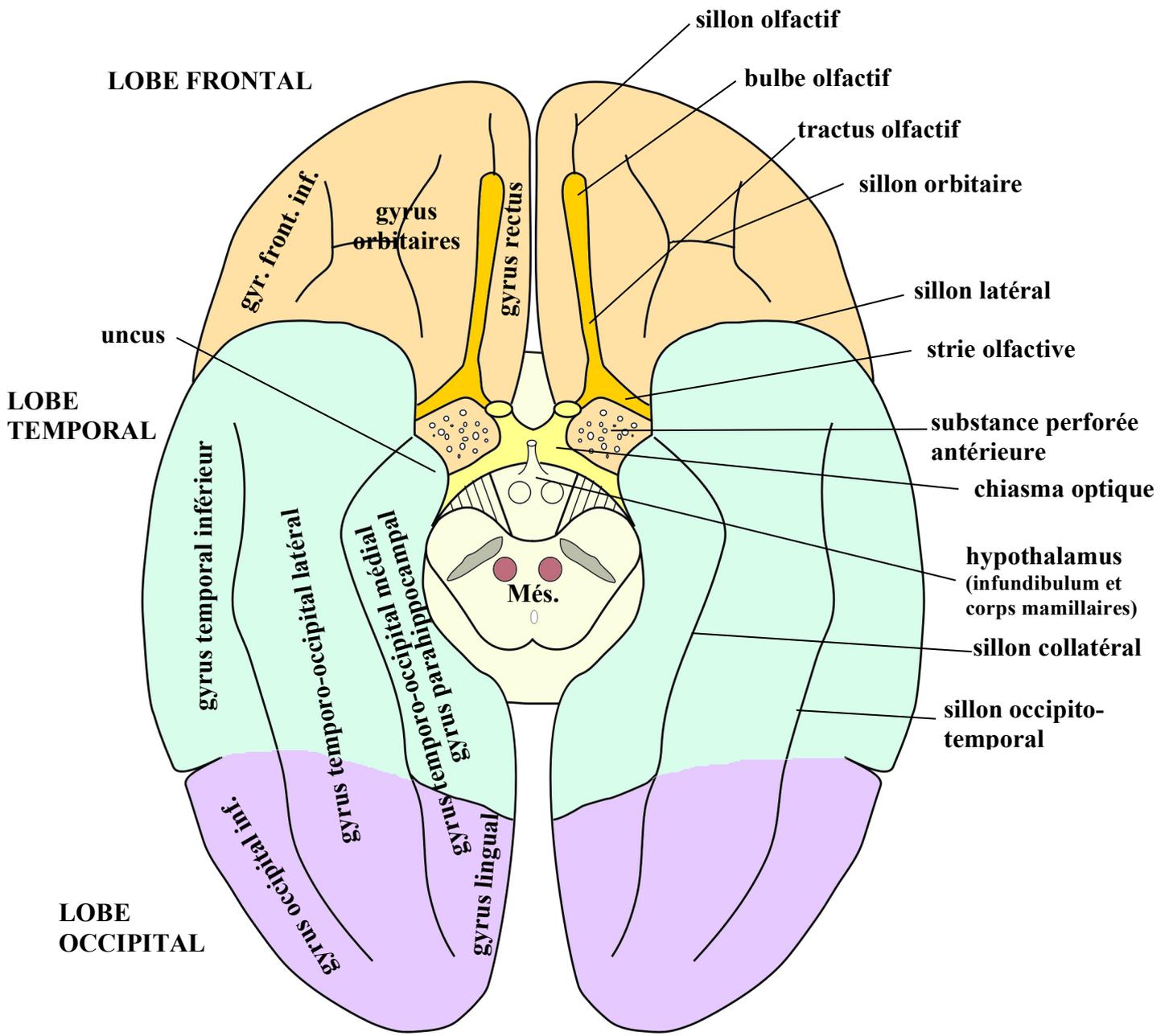
### Morphologie externe générale



**Face supéro-latérale de l'hémisphère gauche**

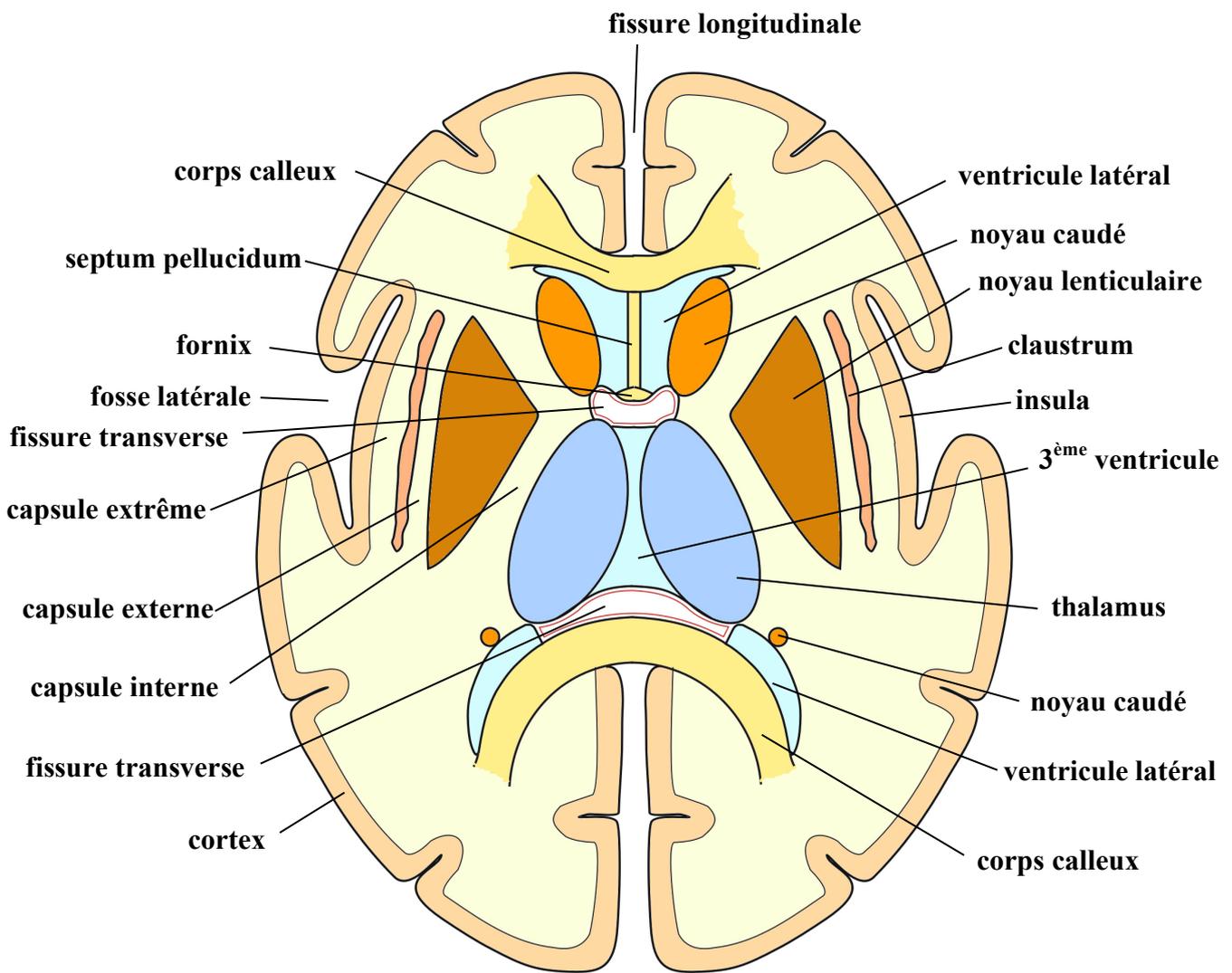
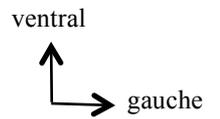
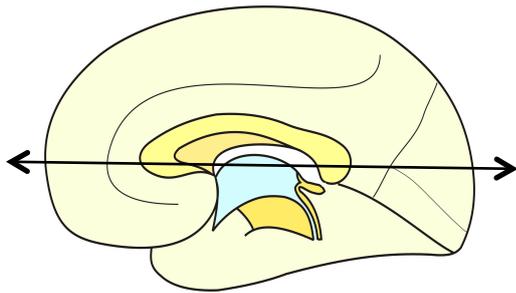


**L'insula (vue latérale et coupe frontale)**

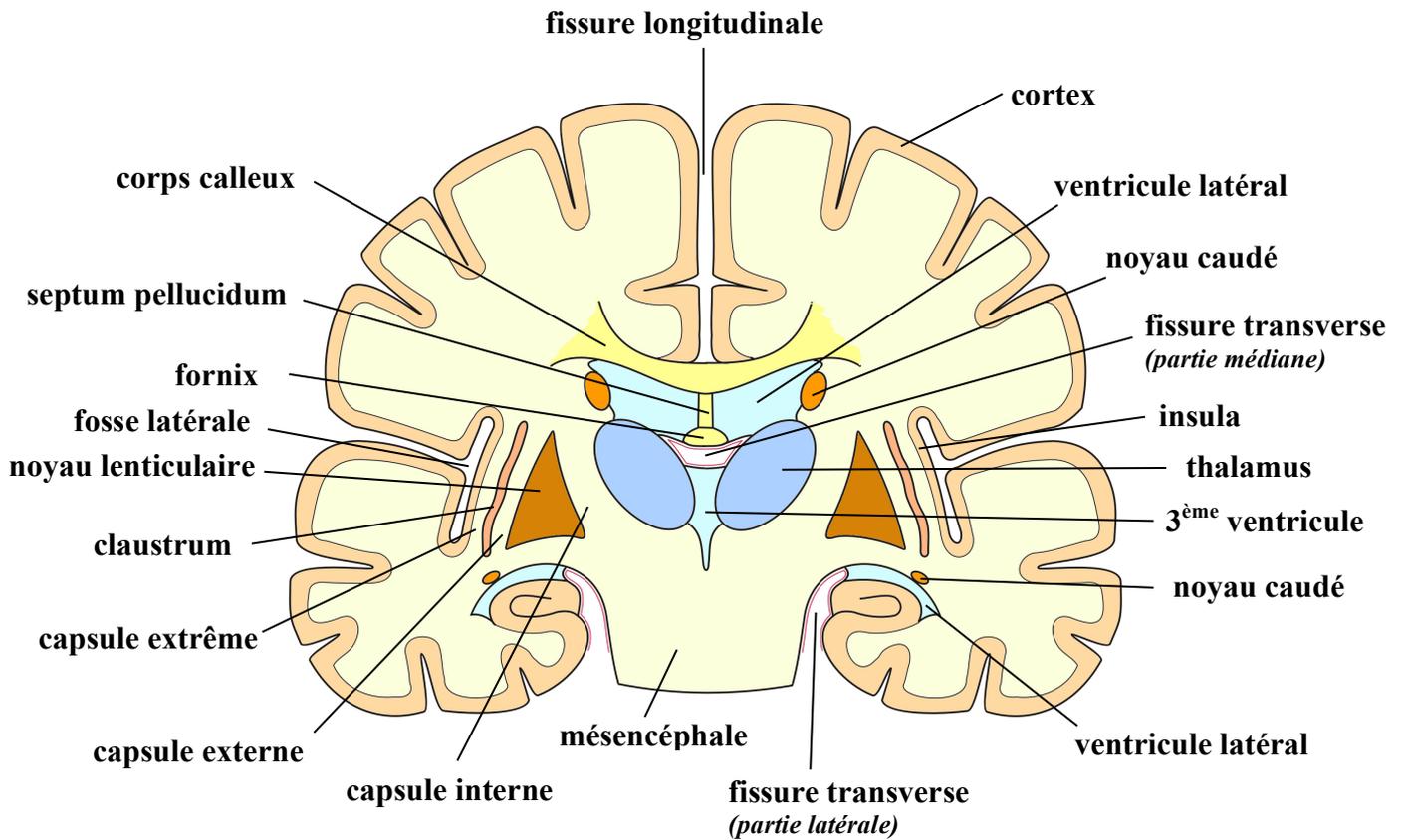
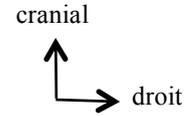
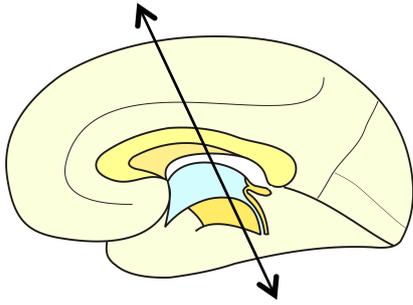


**Vue inférieure du cerveau**

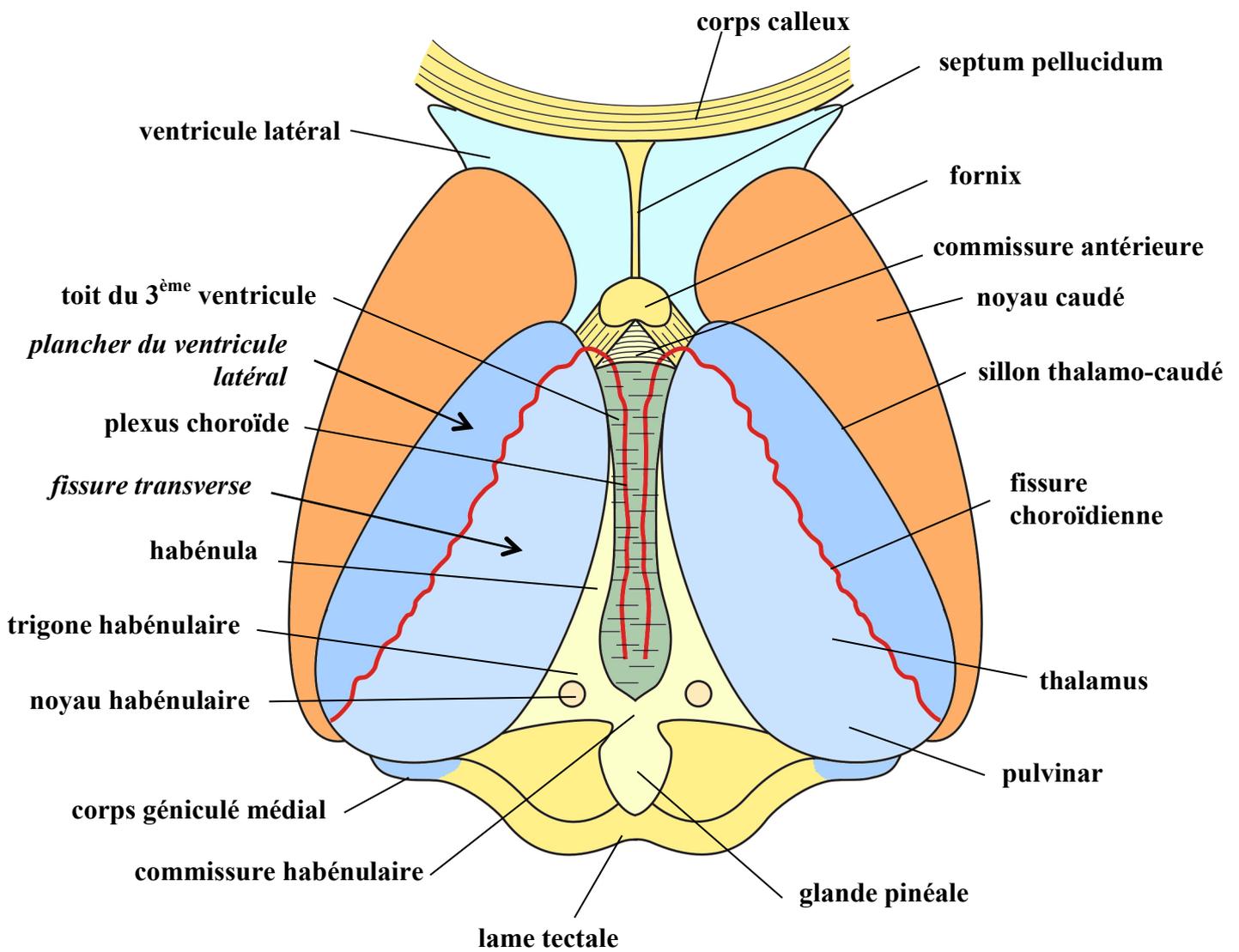
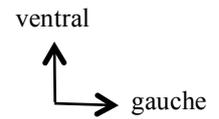
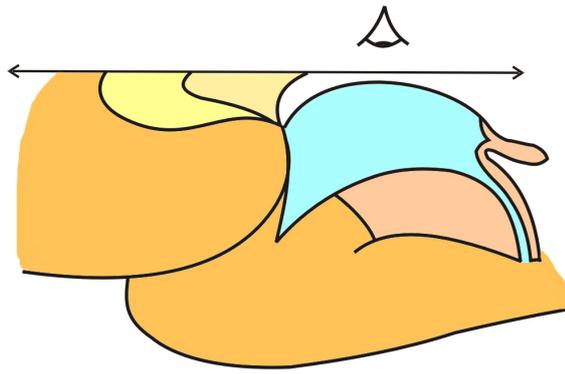




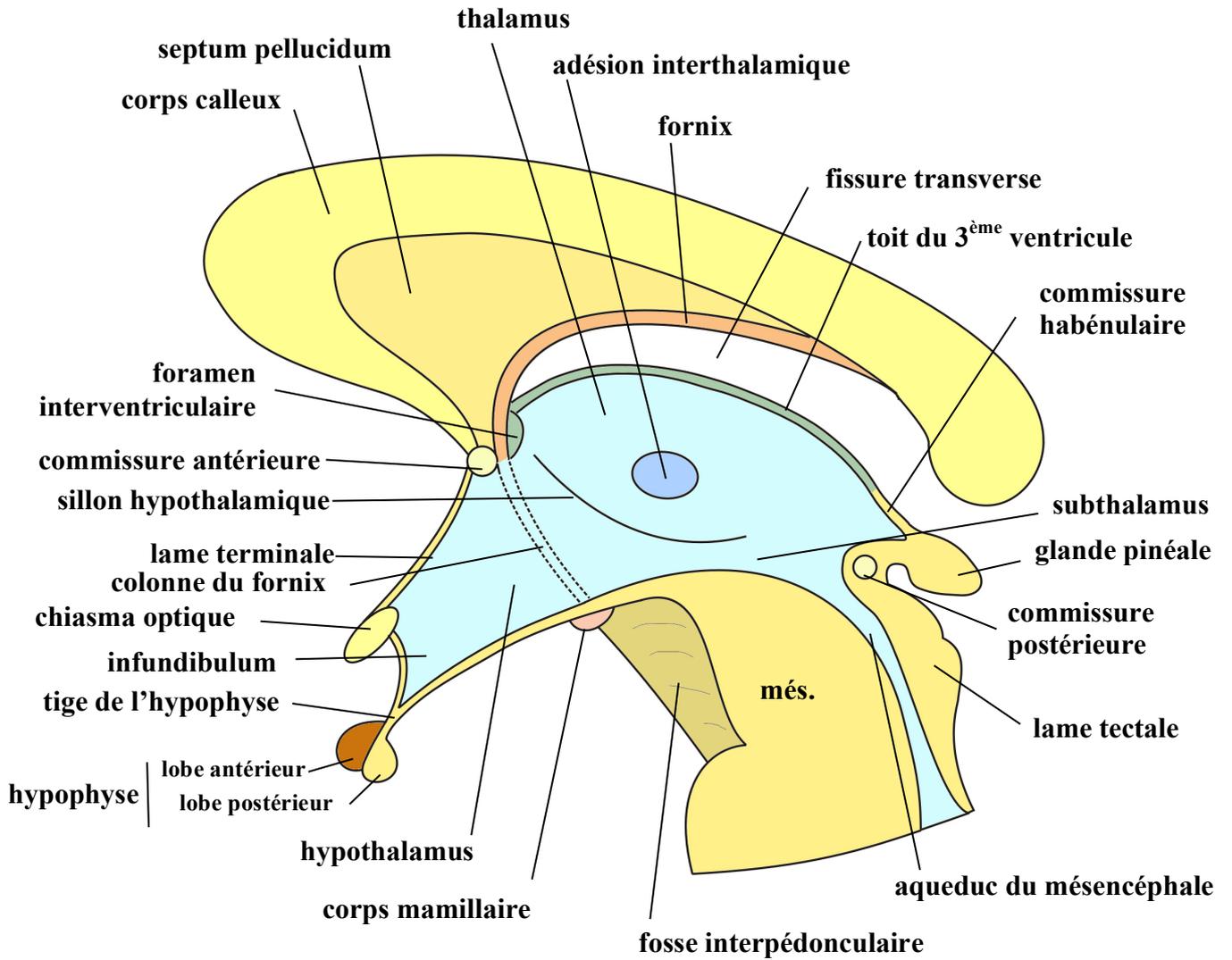
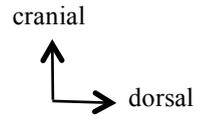
**Coupe horizontale du cerveau (coupe de Flechsig)**



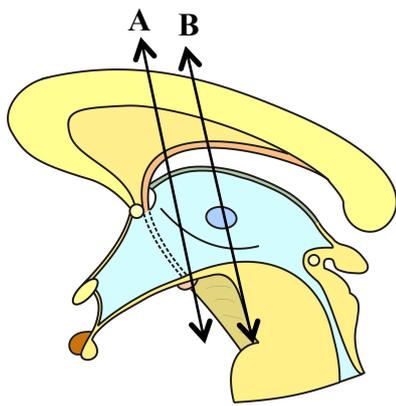
**Coupe frontale du cerveau (coupe de Charcot)**



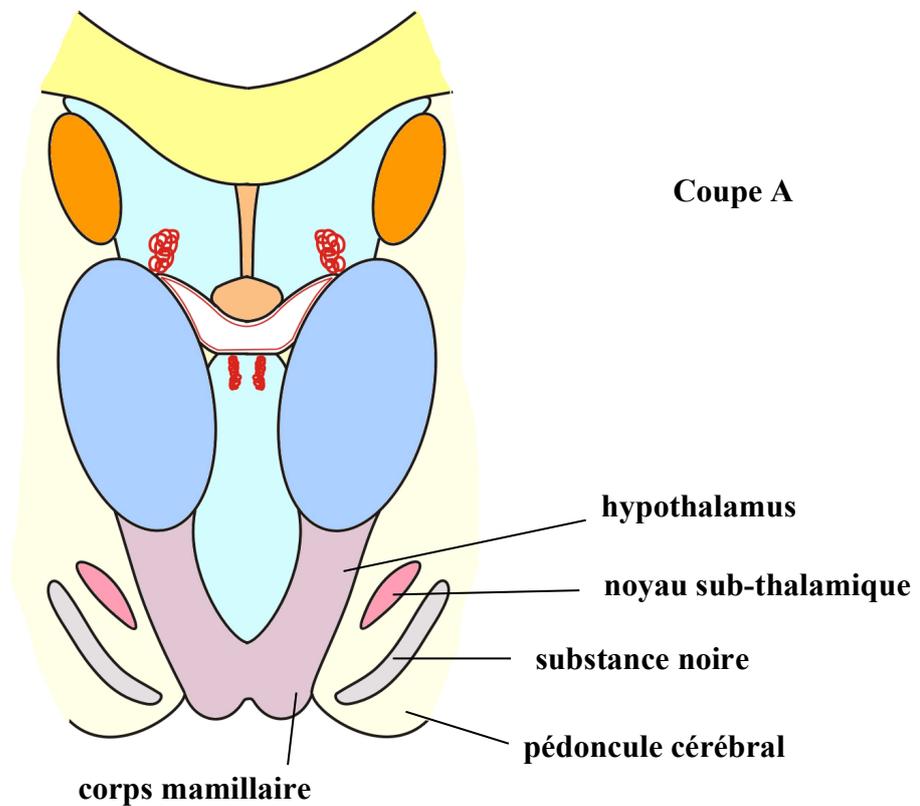
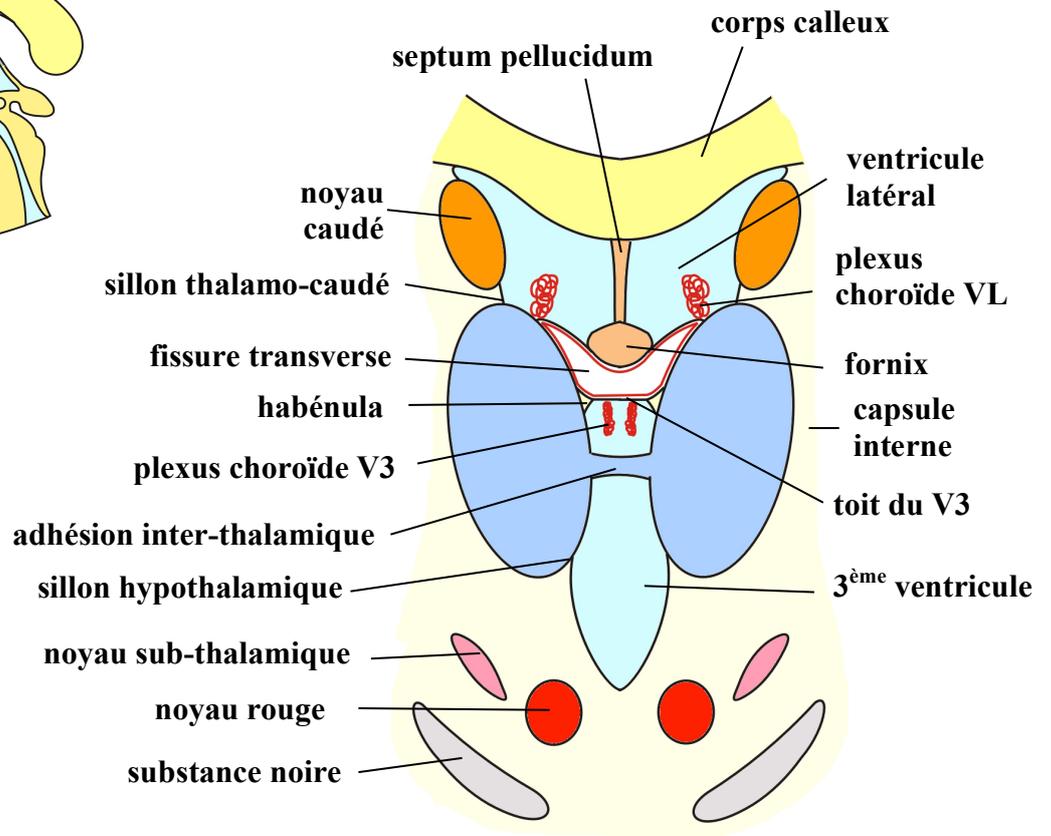
**Vue supérieure du diencephale**  
 (après ablation des structures situées au-dessus de la fissure transverse)



**Coupe sagittale médiane du diencephale**

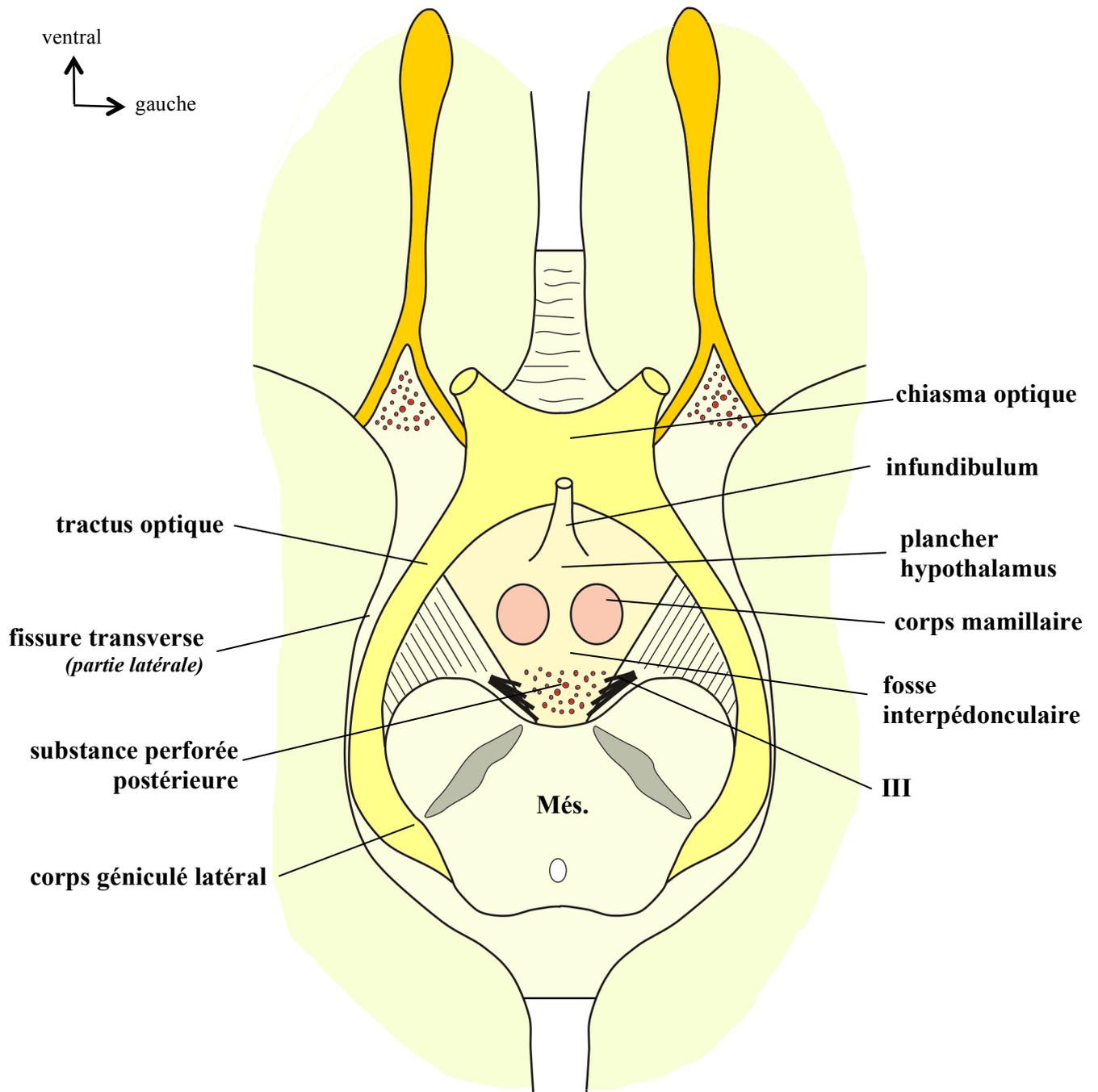


Coupe B

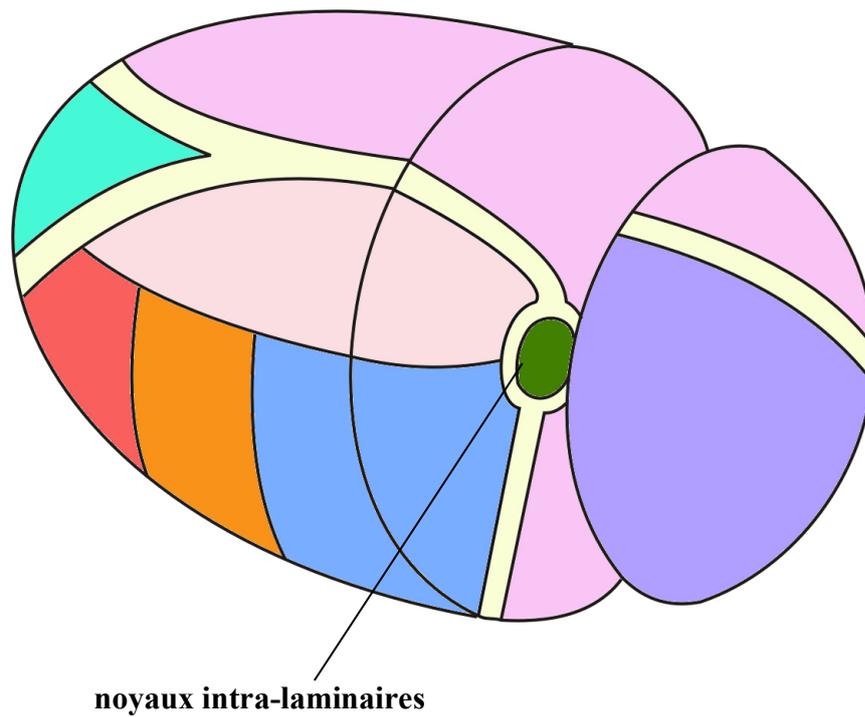
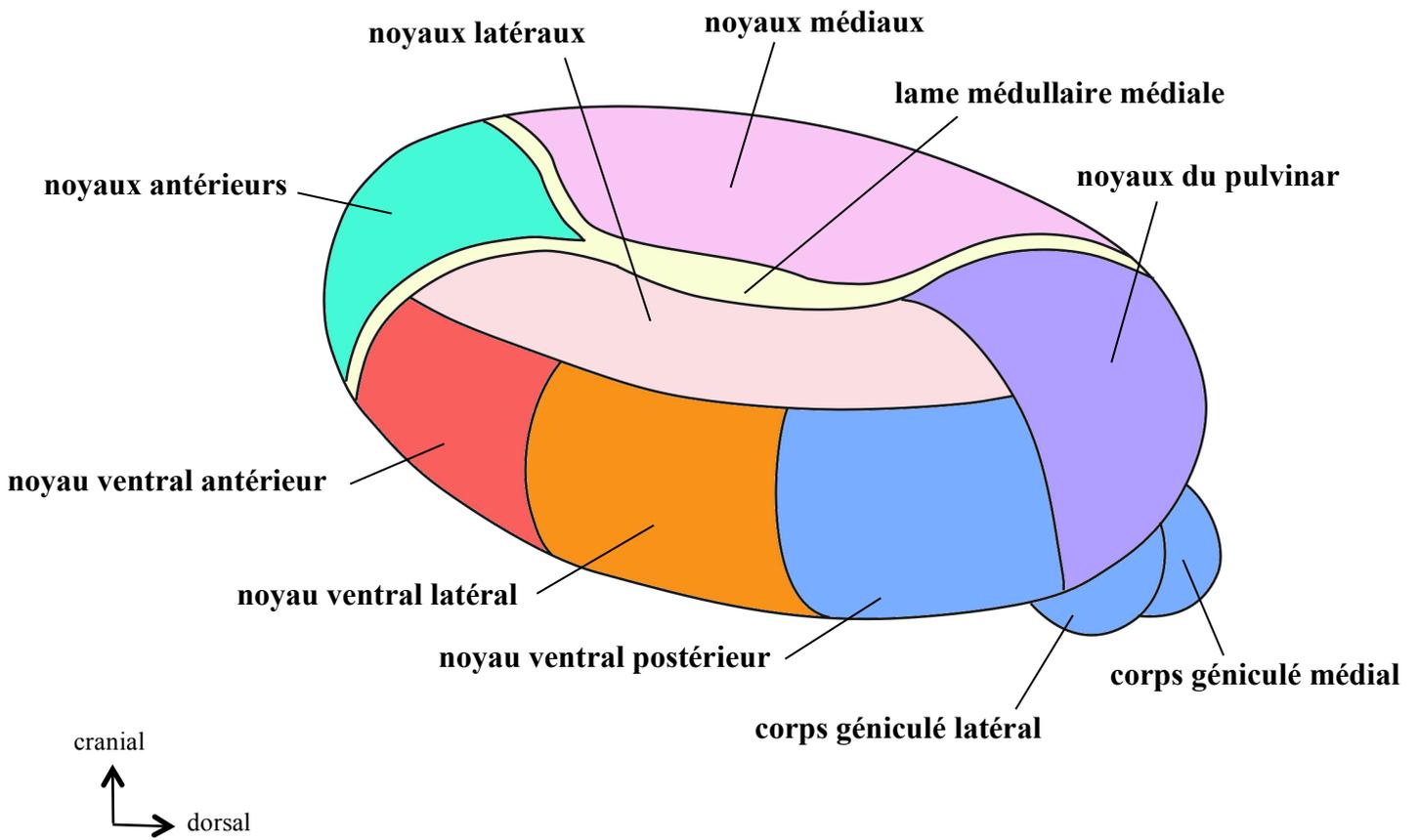


Coupe A

**Coupes frontales du diencéphale**

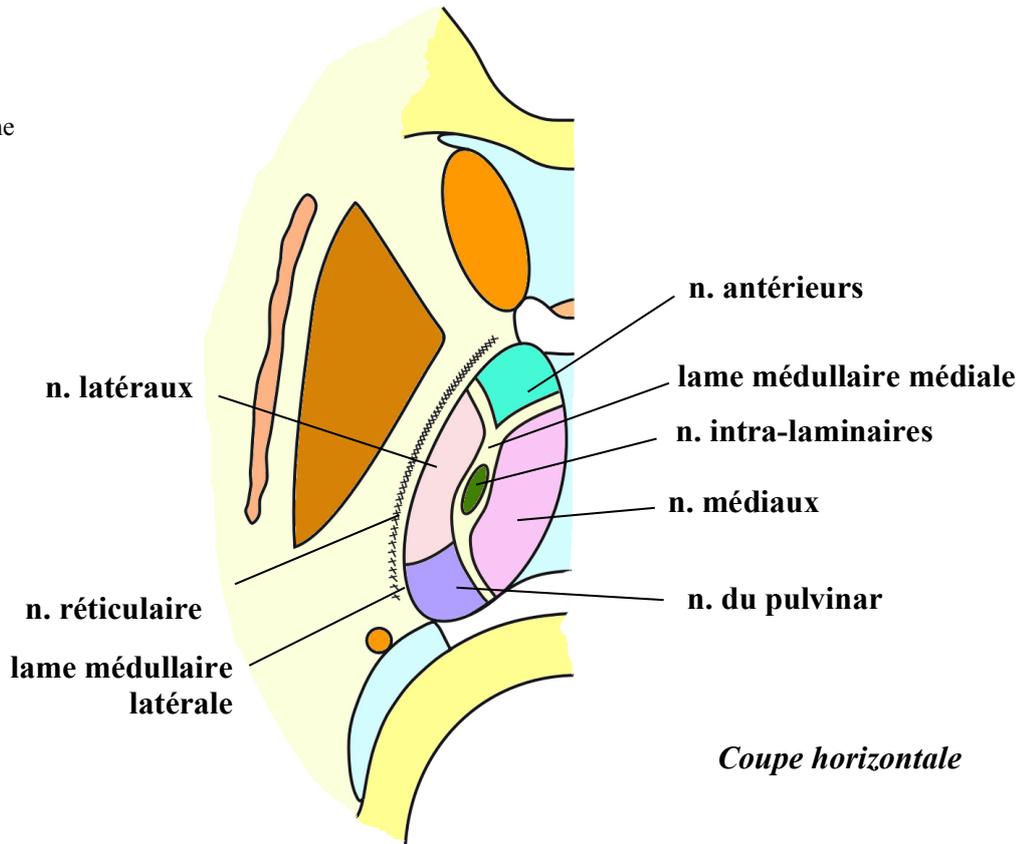


**Vue inférieure du diencephale**



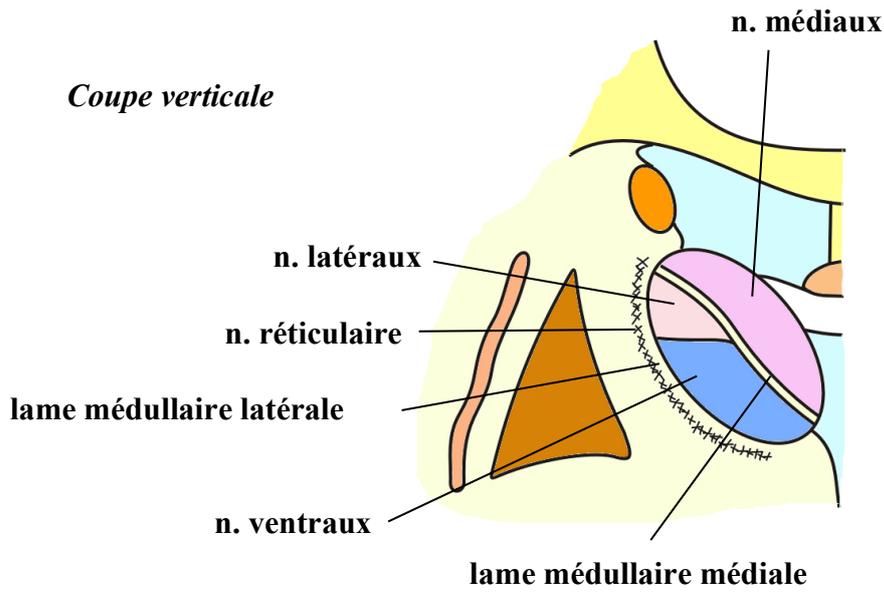
**Structure du thalamus**  
**Vues postéro-latérales du thalamus gauche**

ventral  
 ↑  
 gauche →



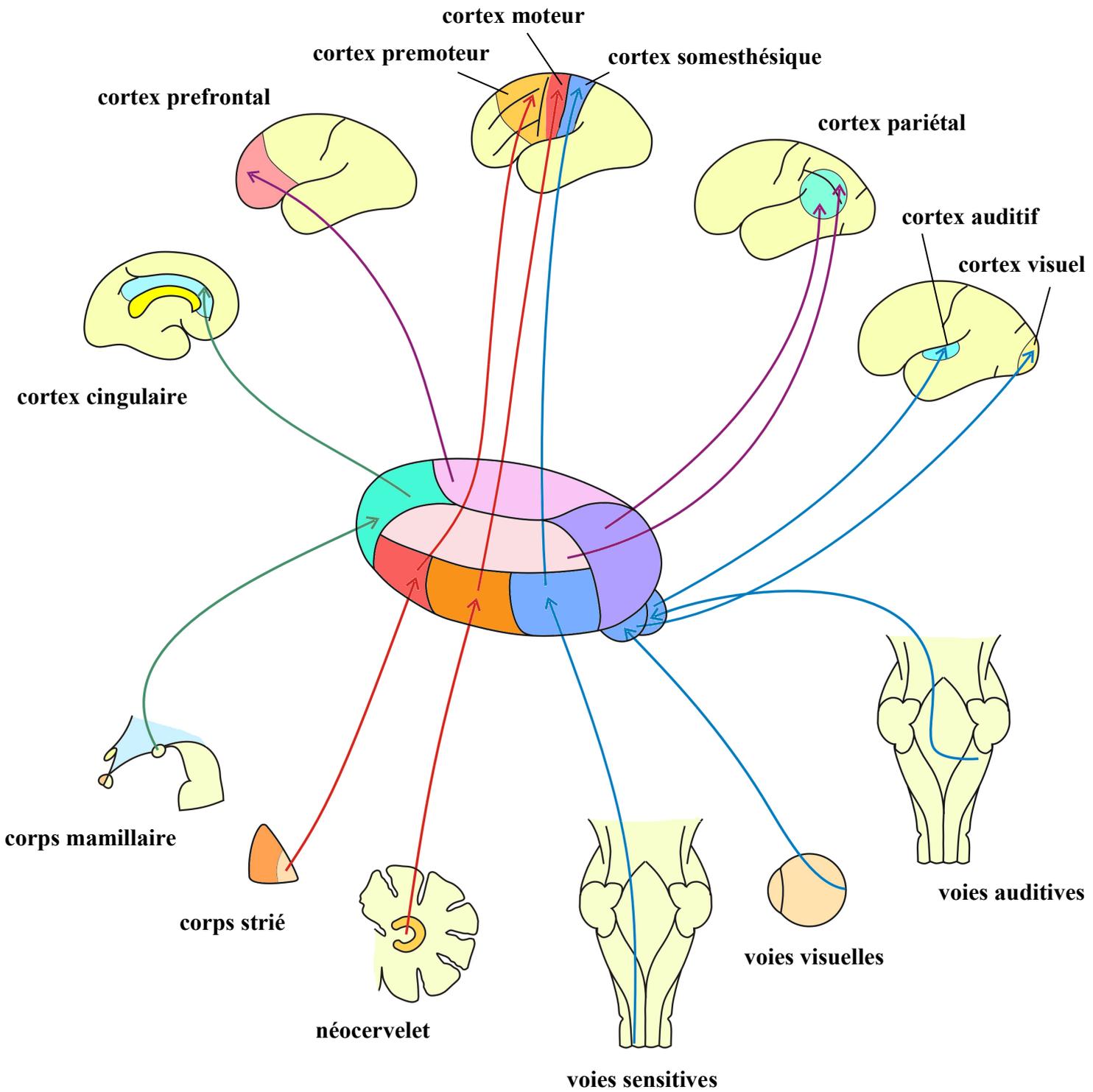
*Coupe horizontale*

cranial  
 ↑  
 gauche →

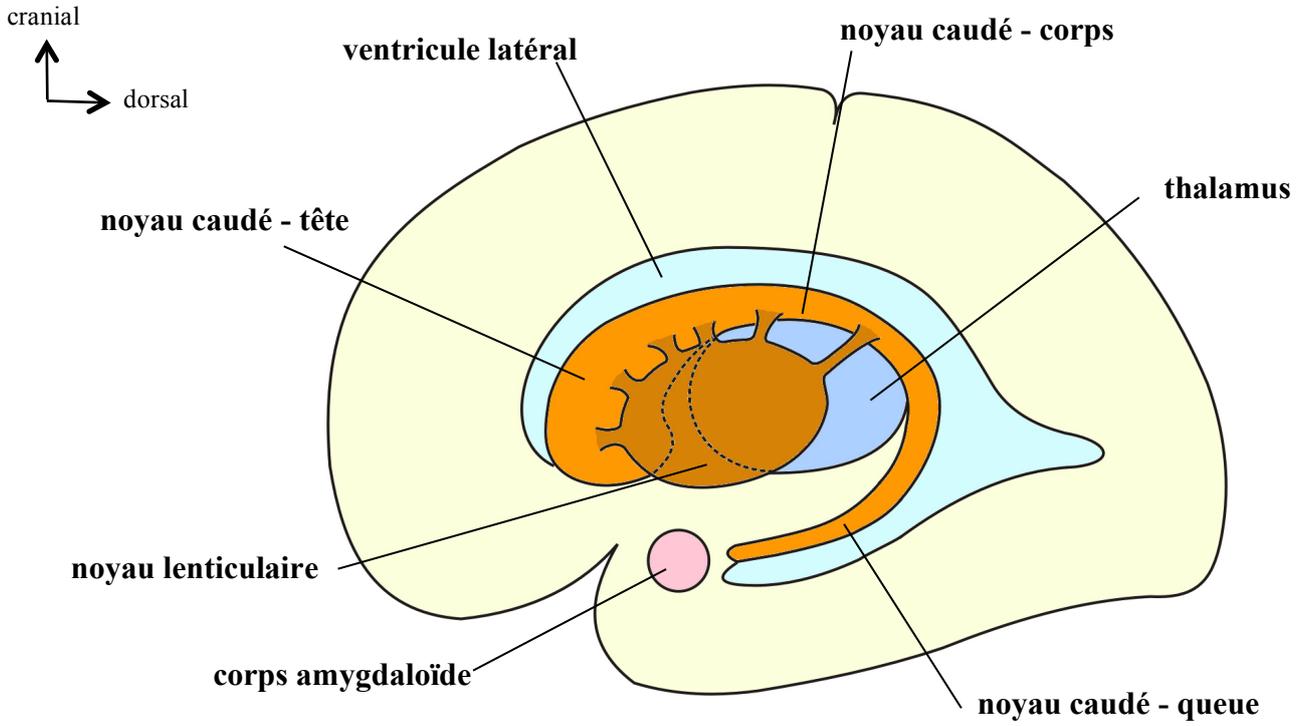


*Coupe verticale*

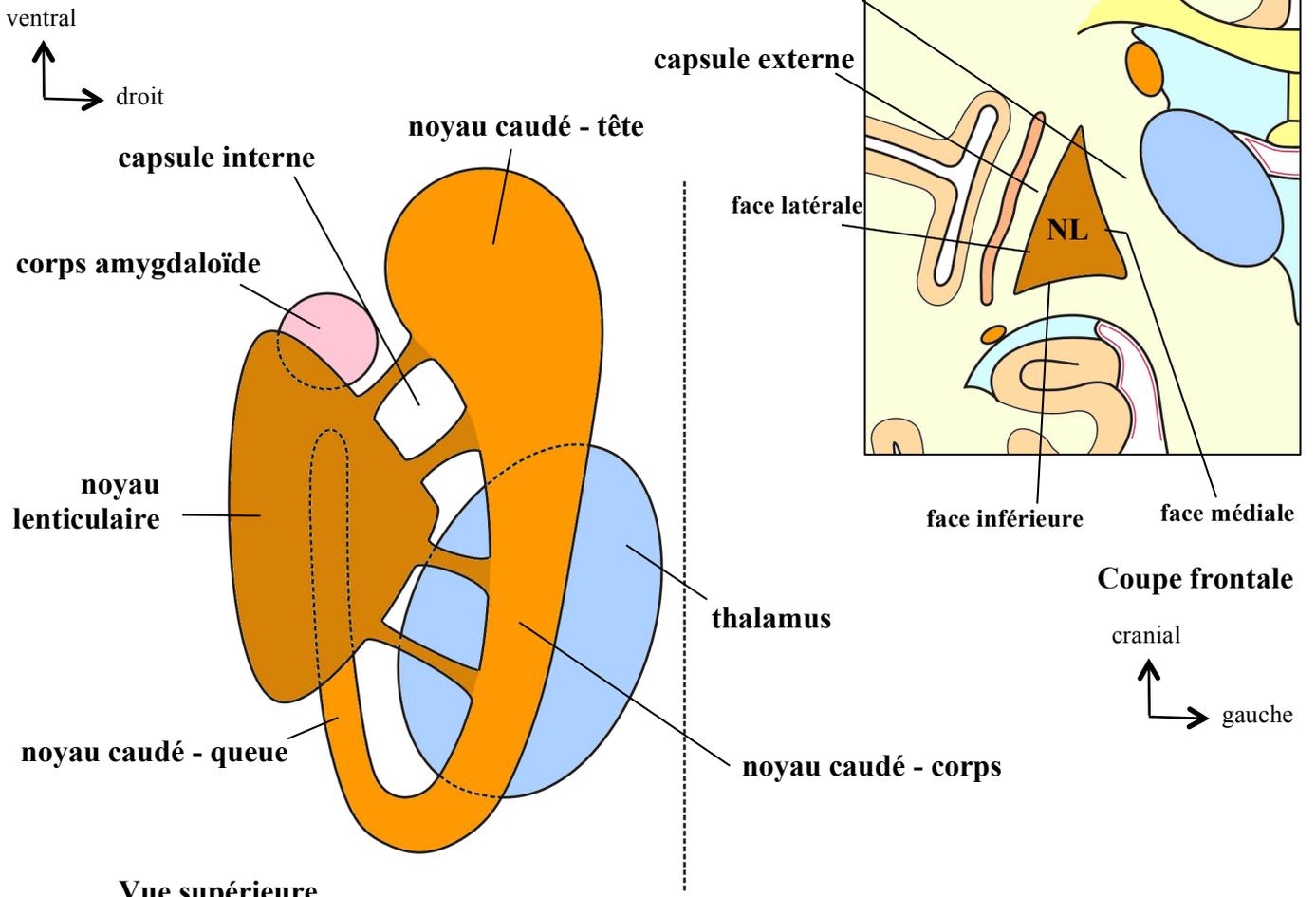
**Structure du thalamus**



**Systematisation des noyaux thalamiques**

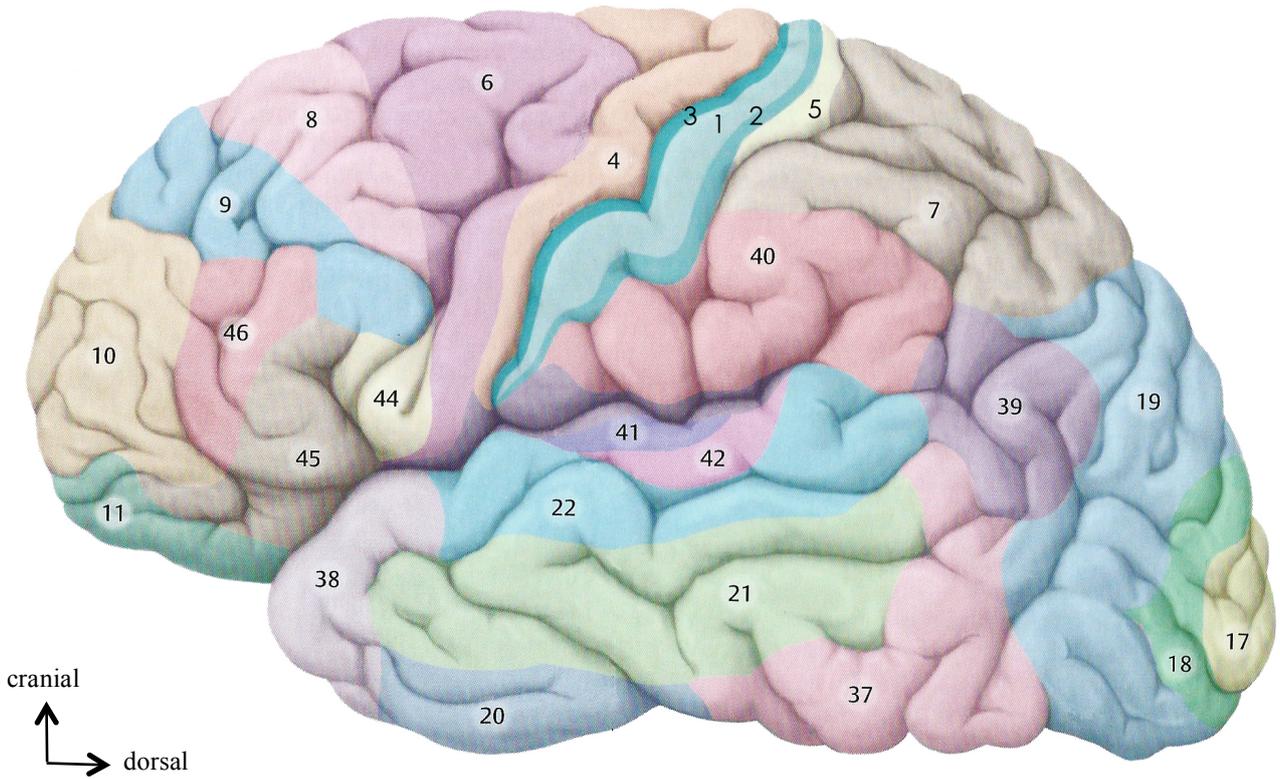


**Vue latérale**

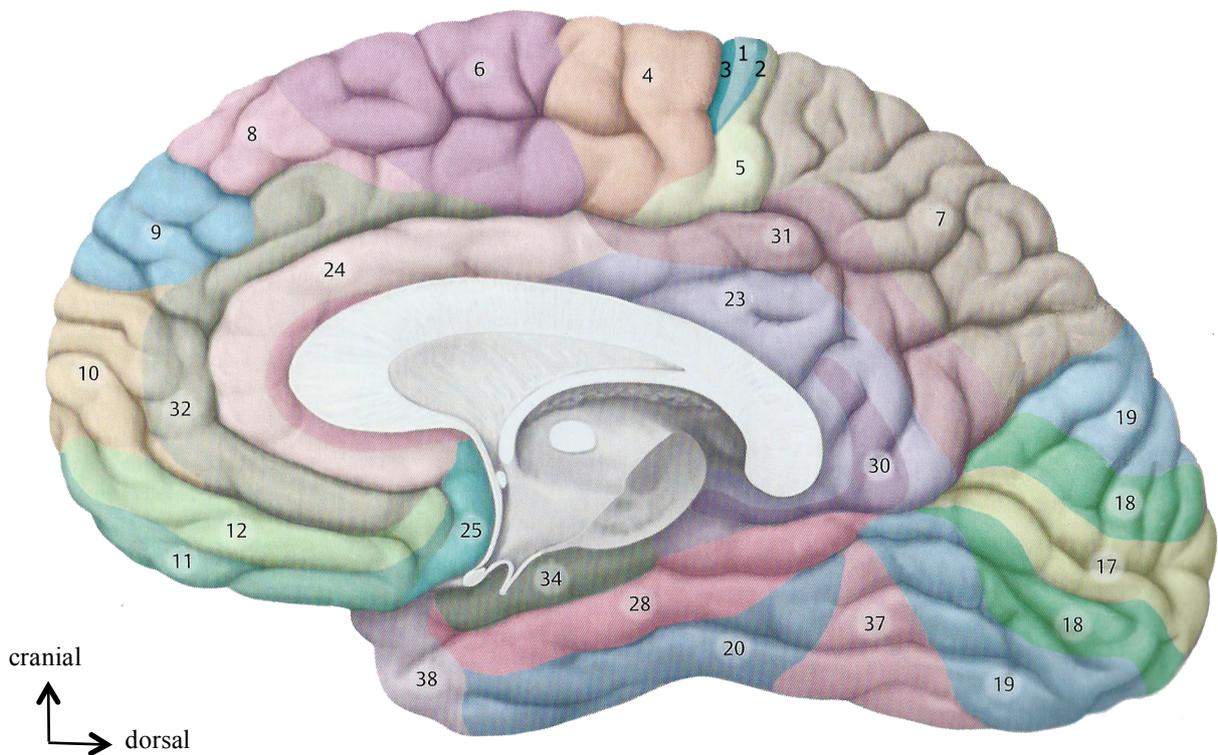


**Vue supérieure**

**Le corps strié**

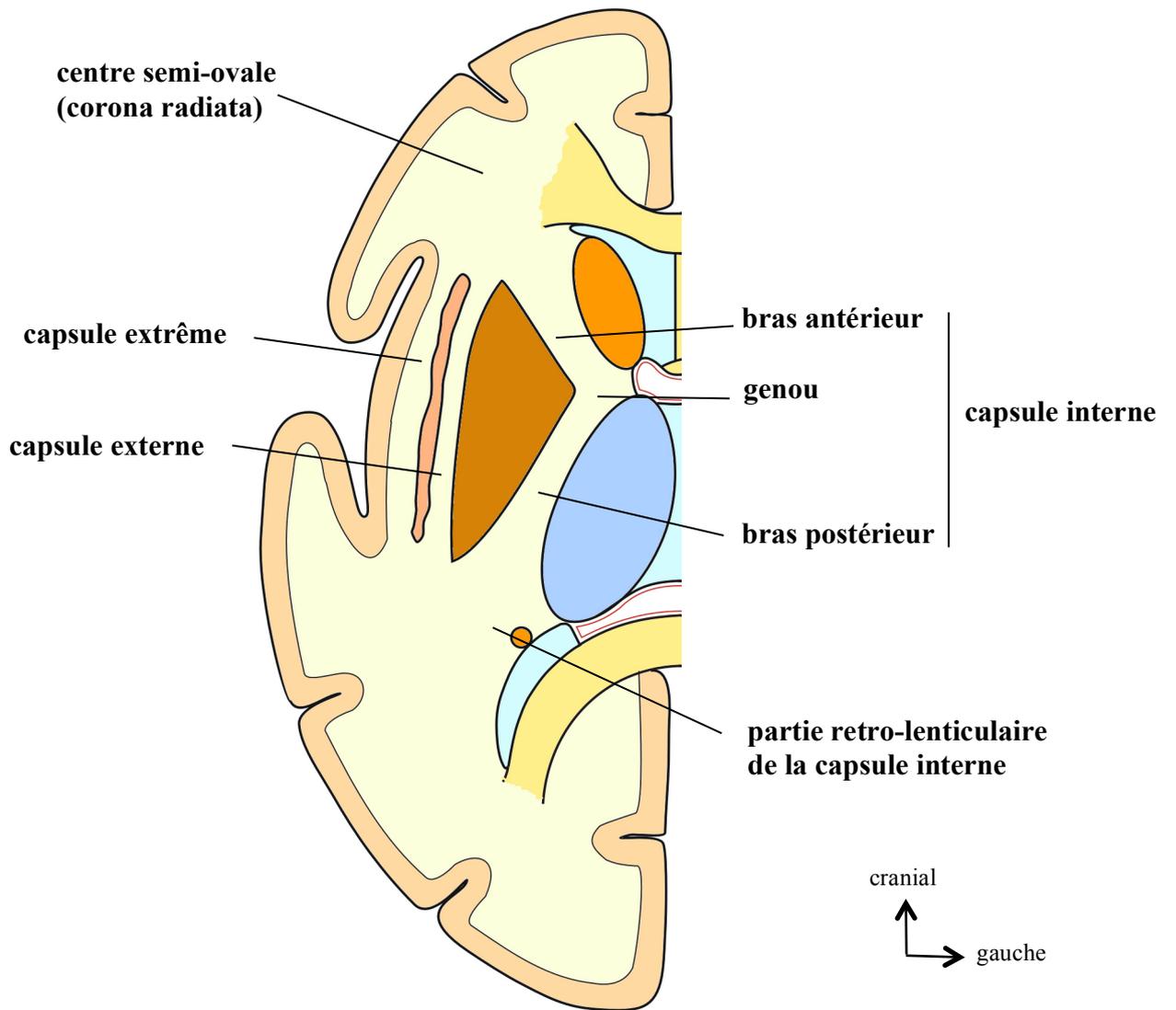


**Vue latérale de l'hémisphère gauche**

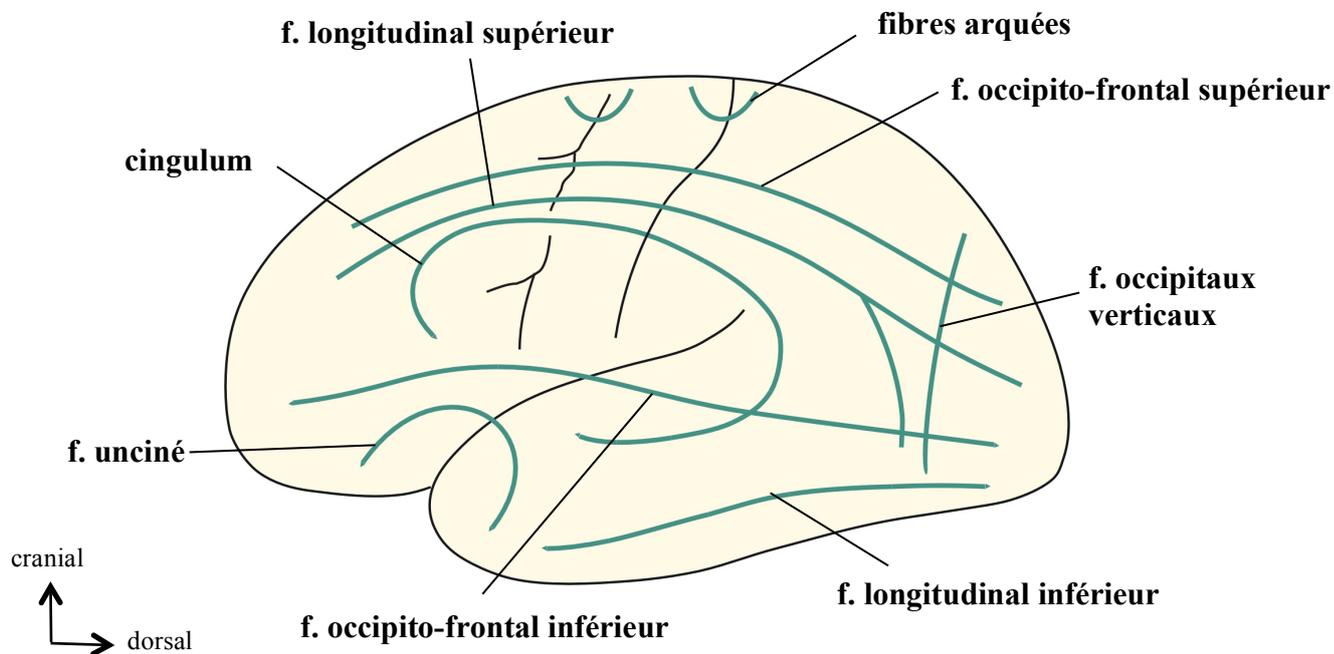
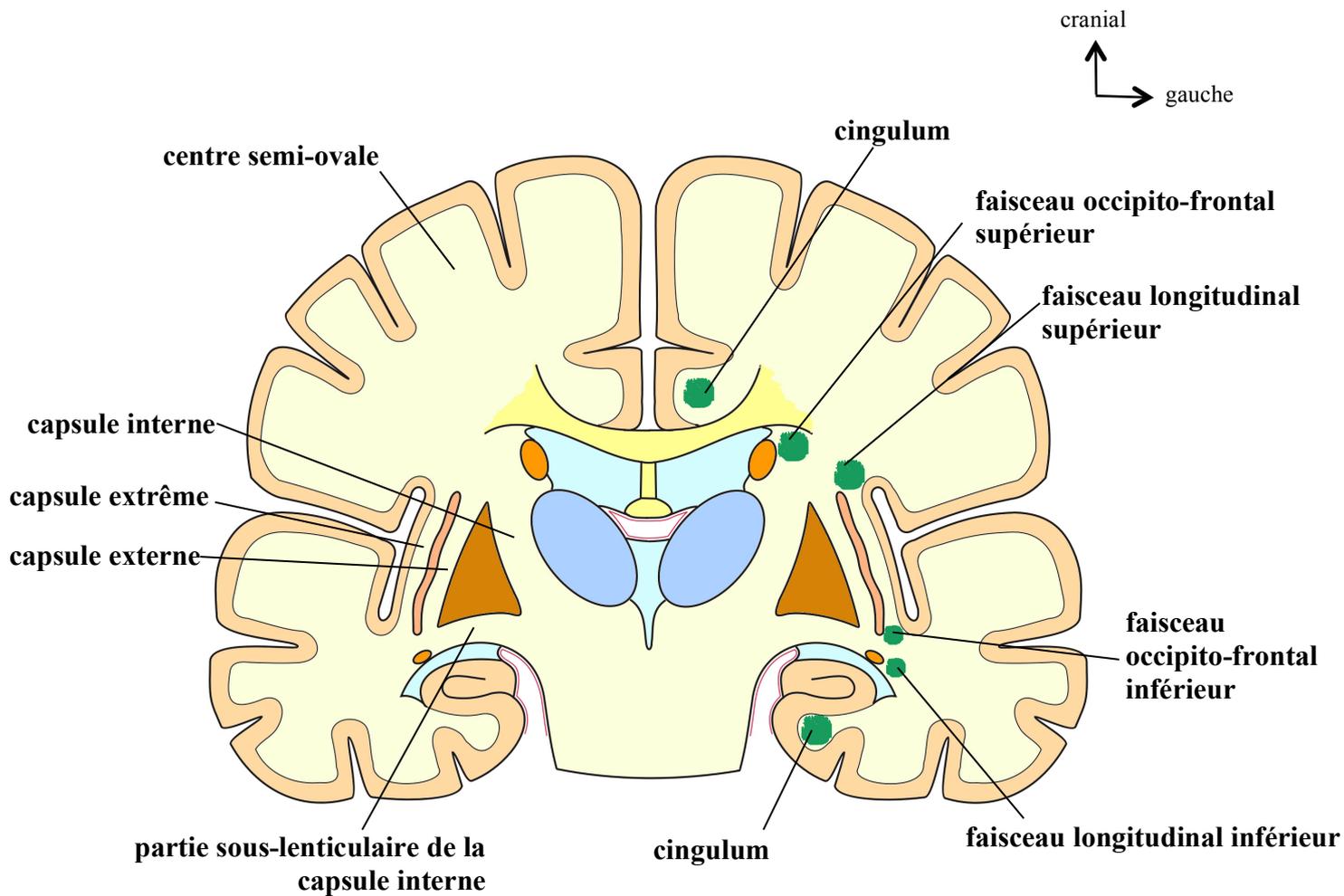


**Vue médiale de l'hémisphère droit**

**Les aires corticales de Brodmann (d'après Schunke)**

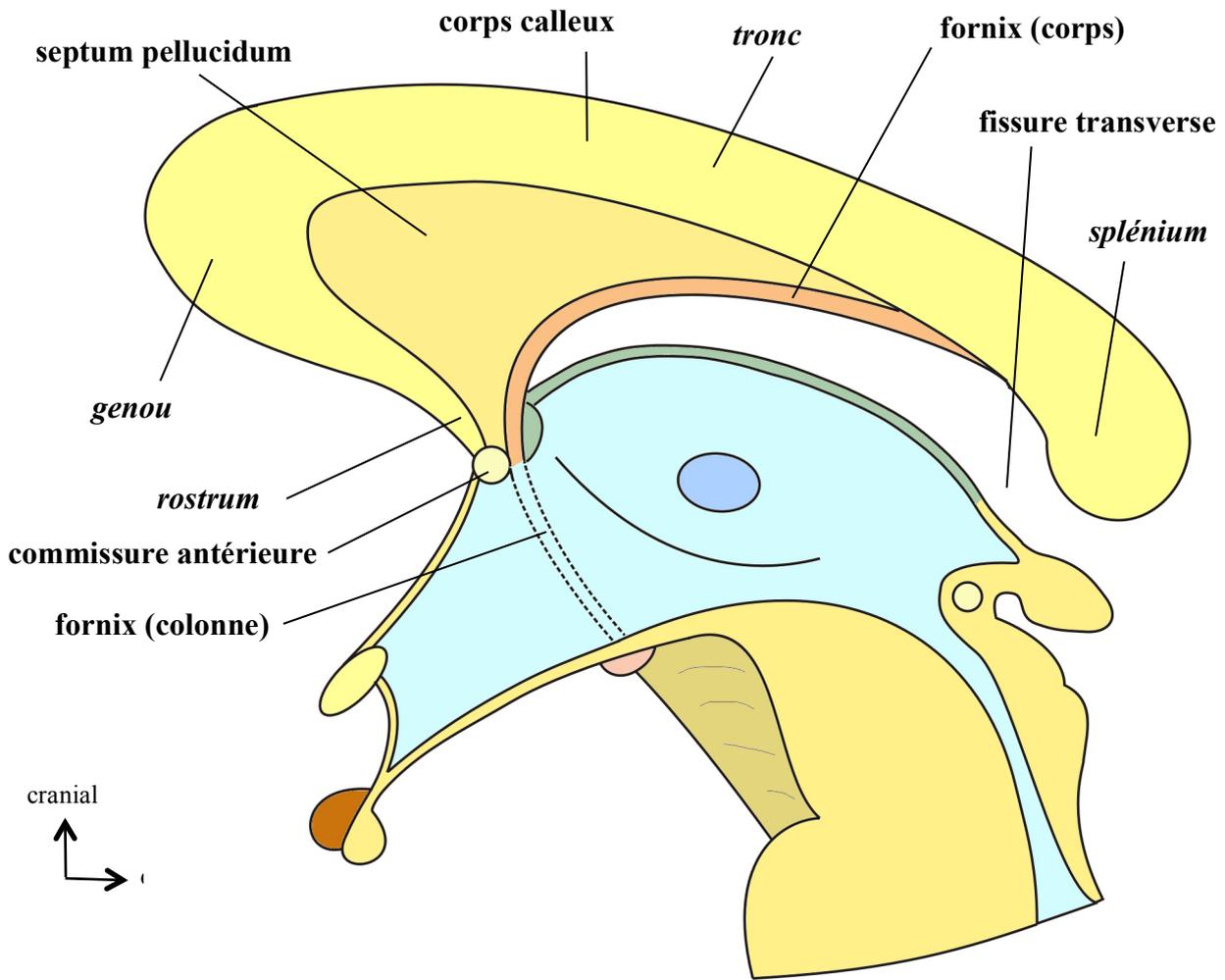


**La substance blanche des hémisphères  
 (coupe horizontale)**

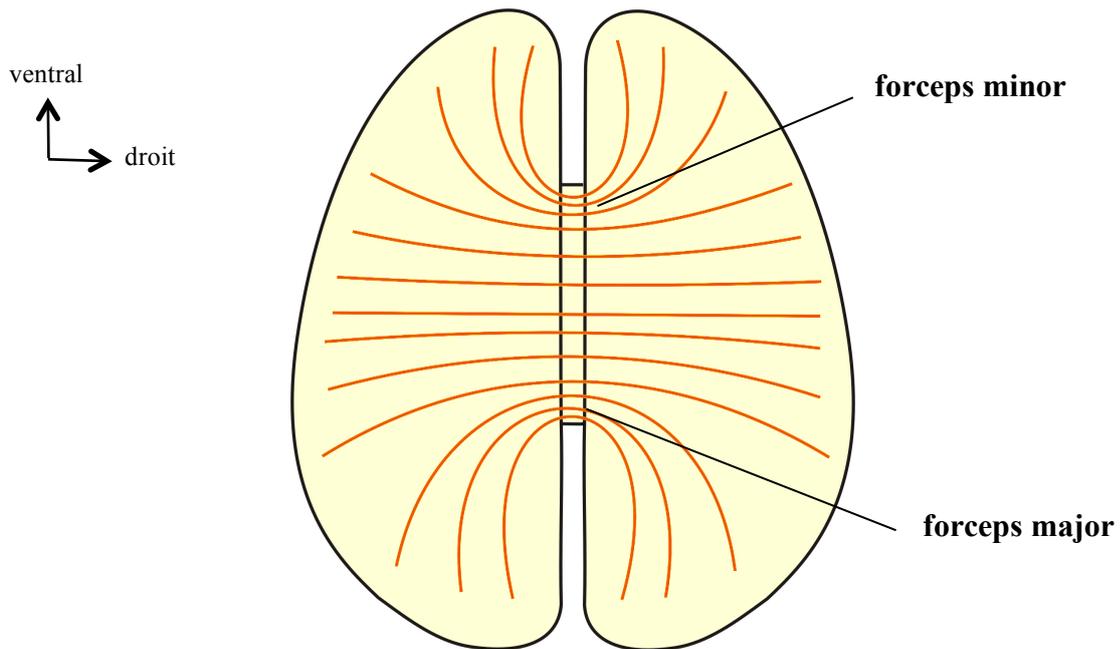


Les faisceaux d'association

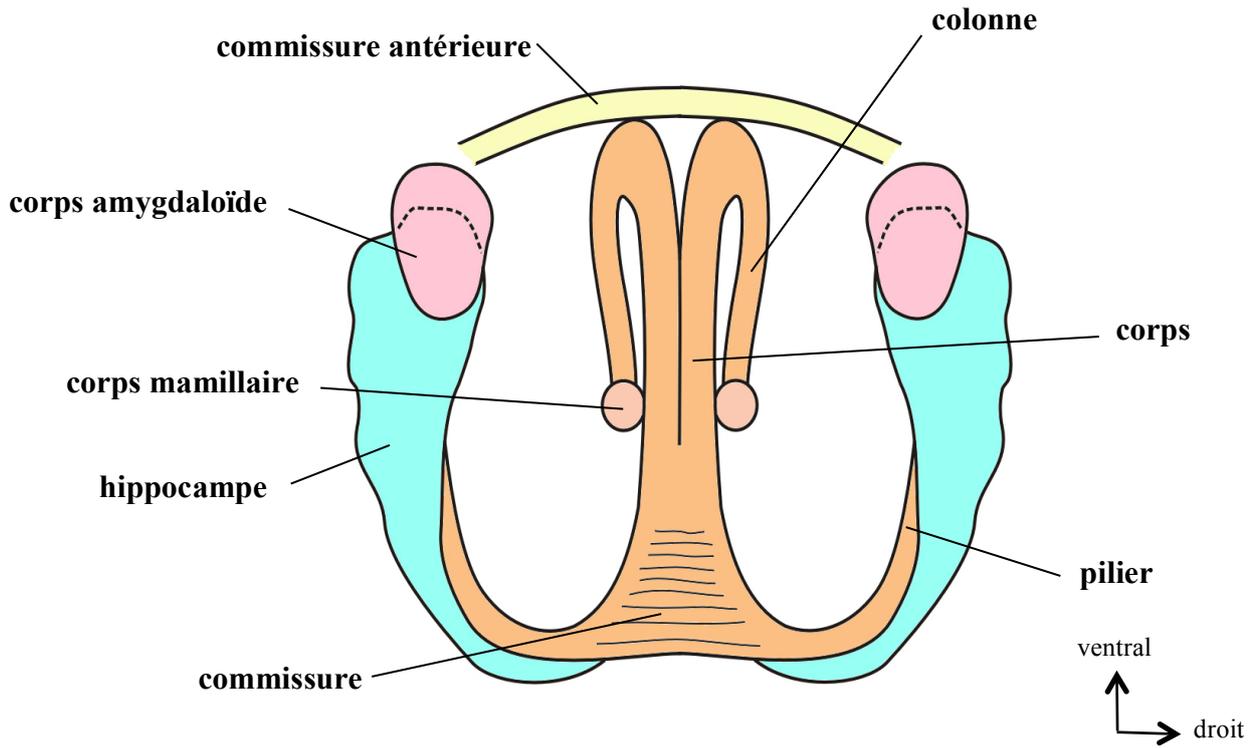
## La substance blanche des hémisphères



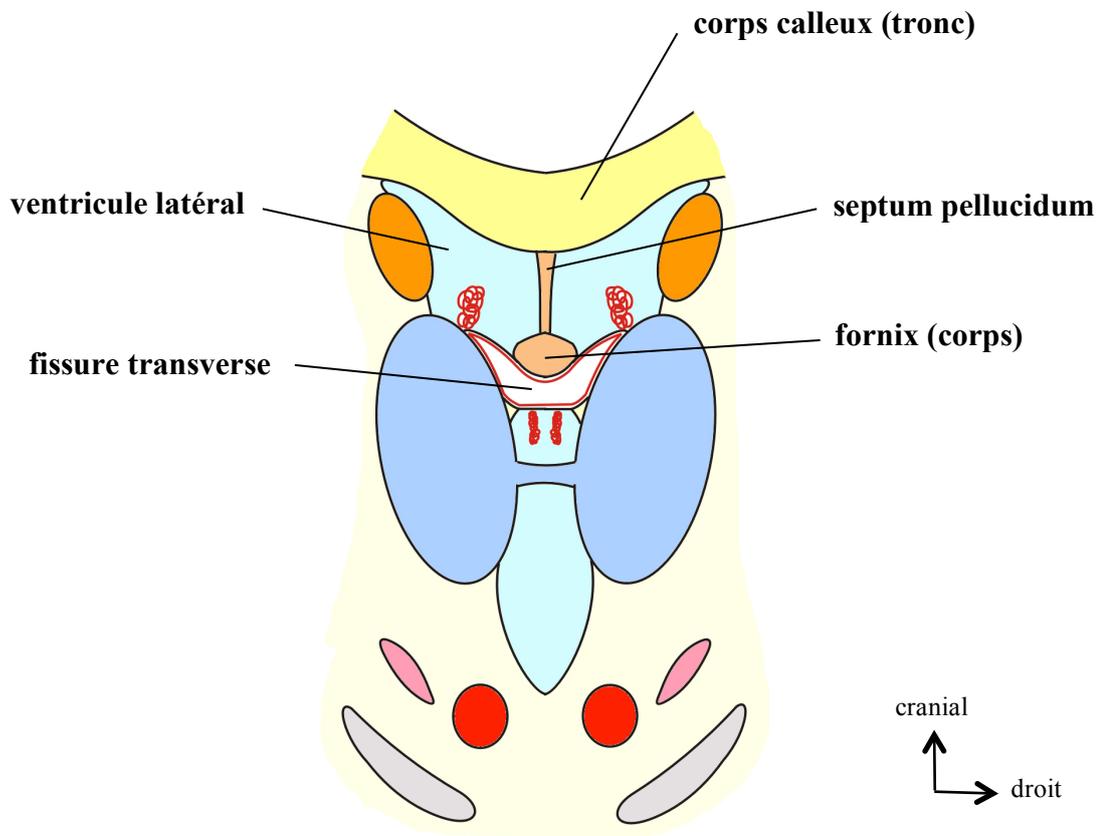
### Les commissures inter-hémisphériques



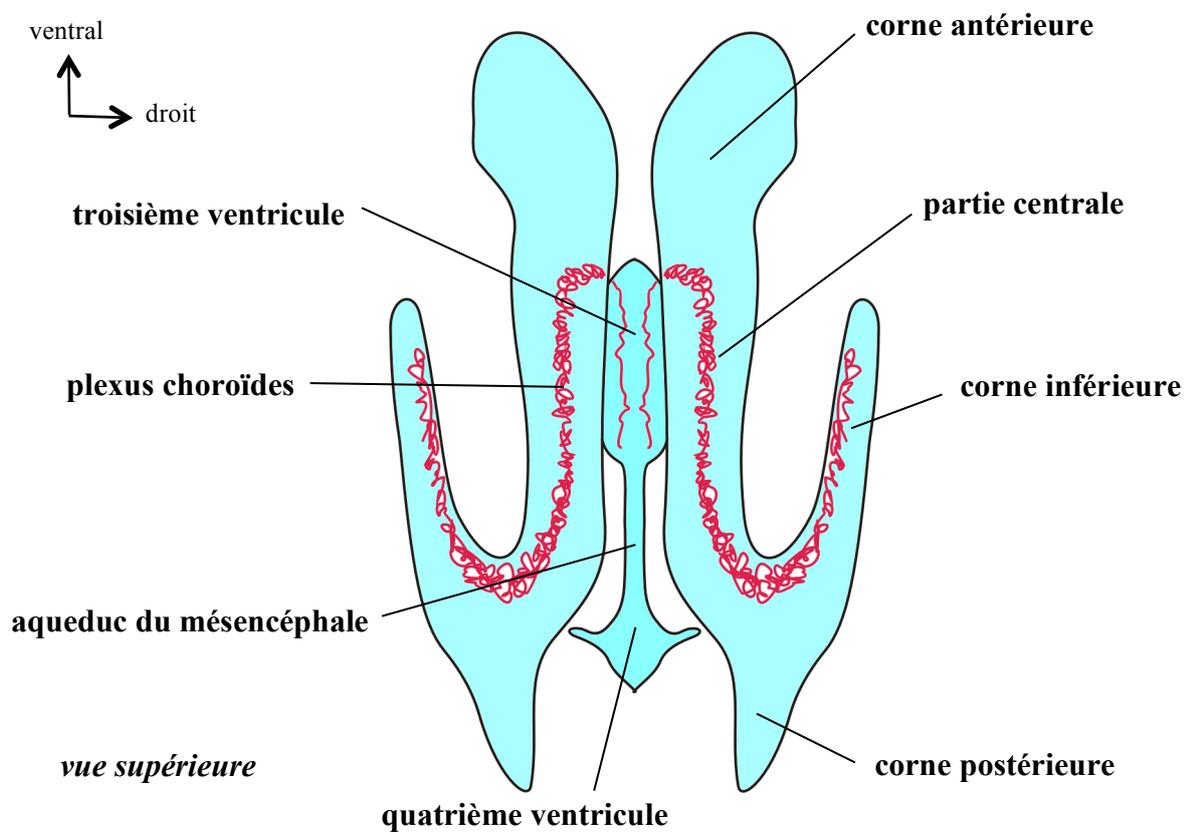
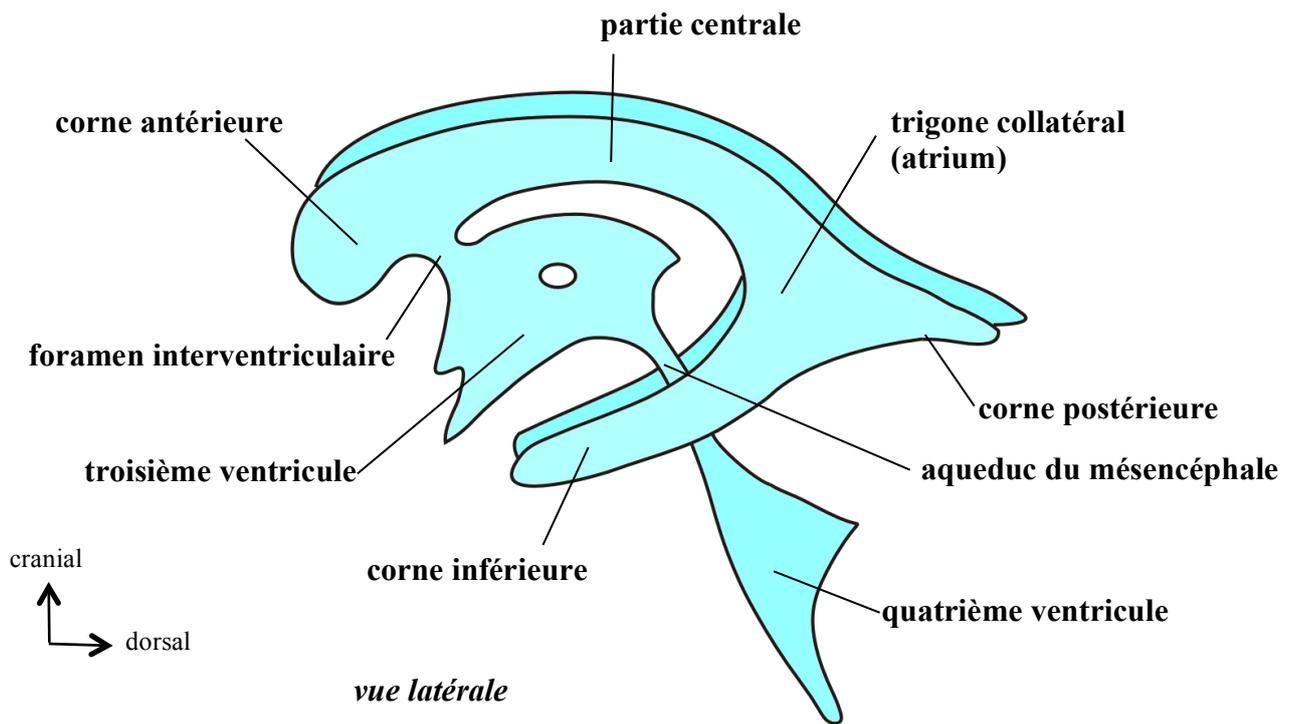
### Le corps calleux



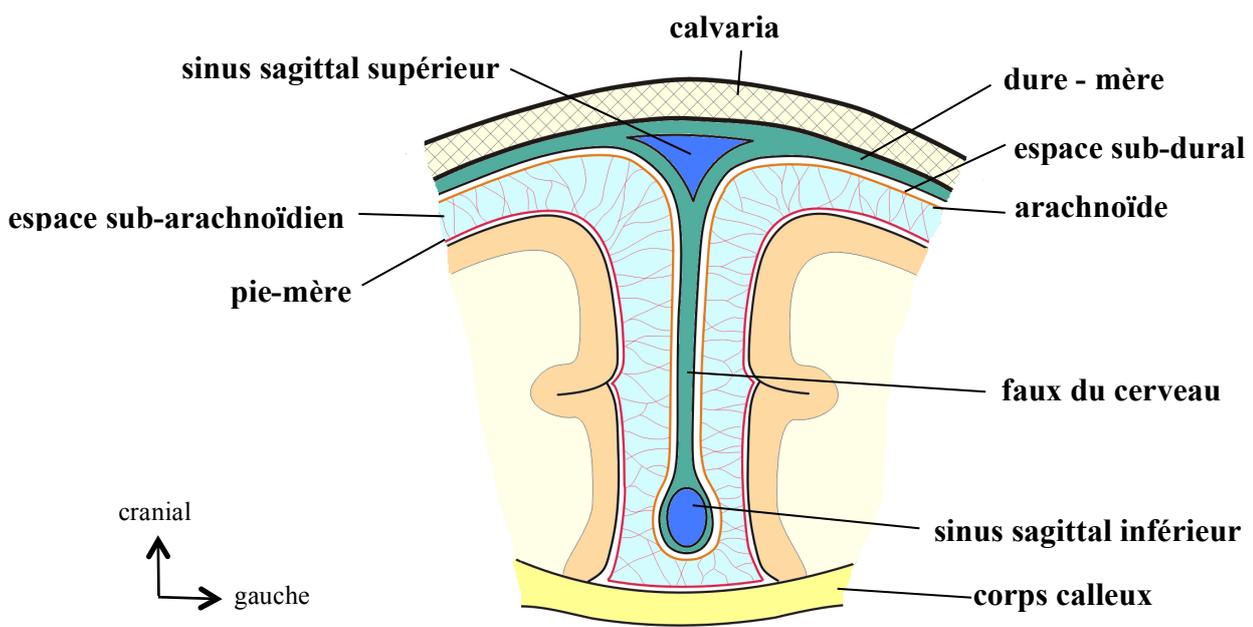
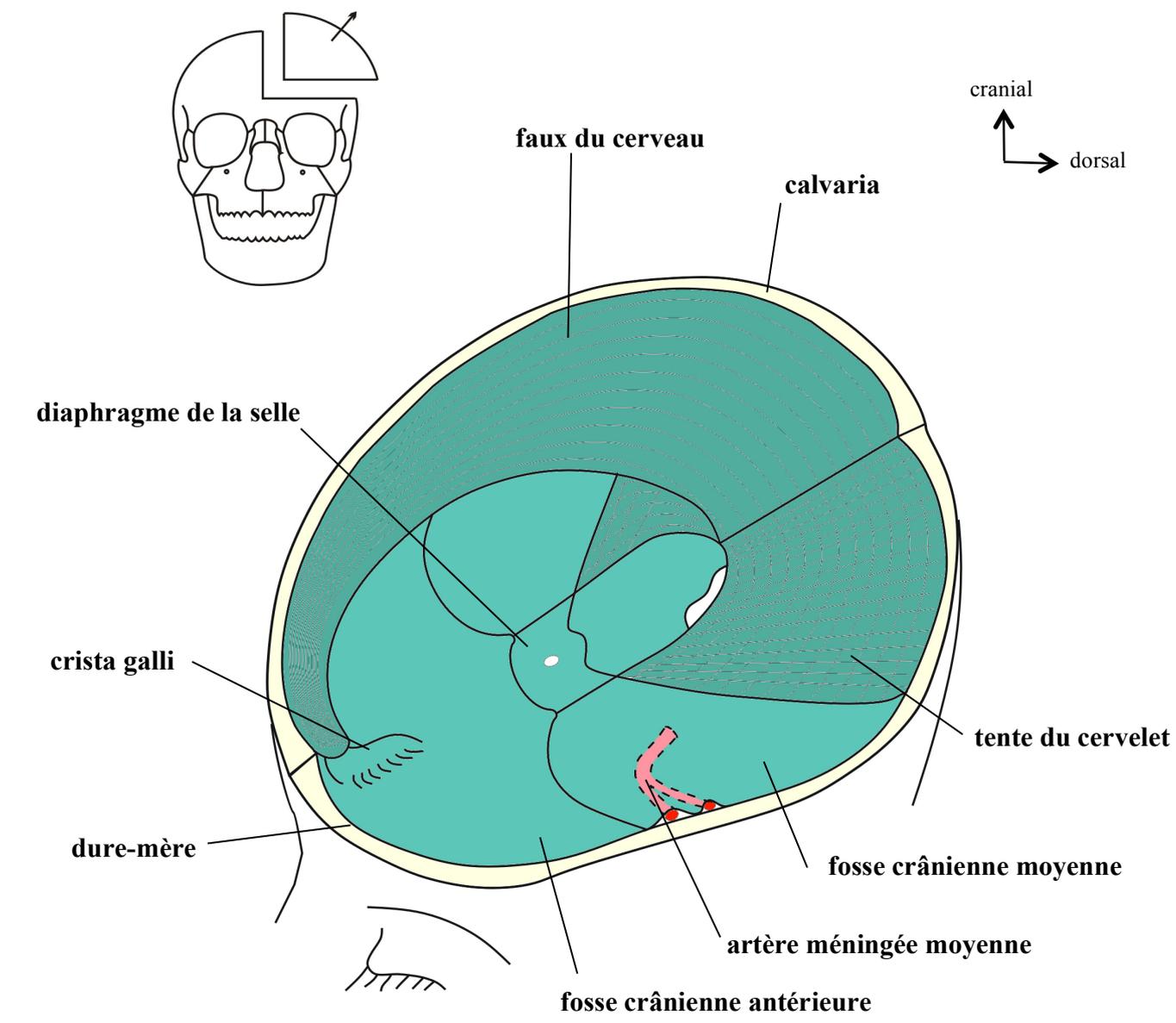
**Le fornix**



**Les commissures inter-hémisphériques  
(coupe frontale)**



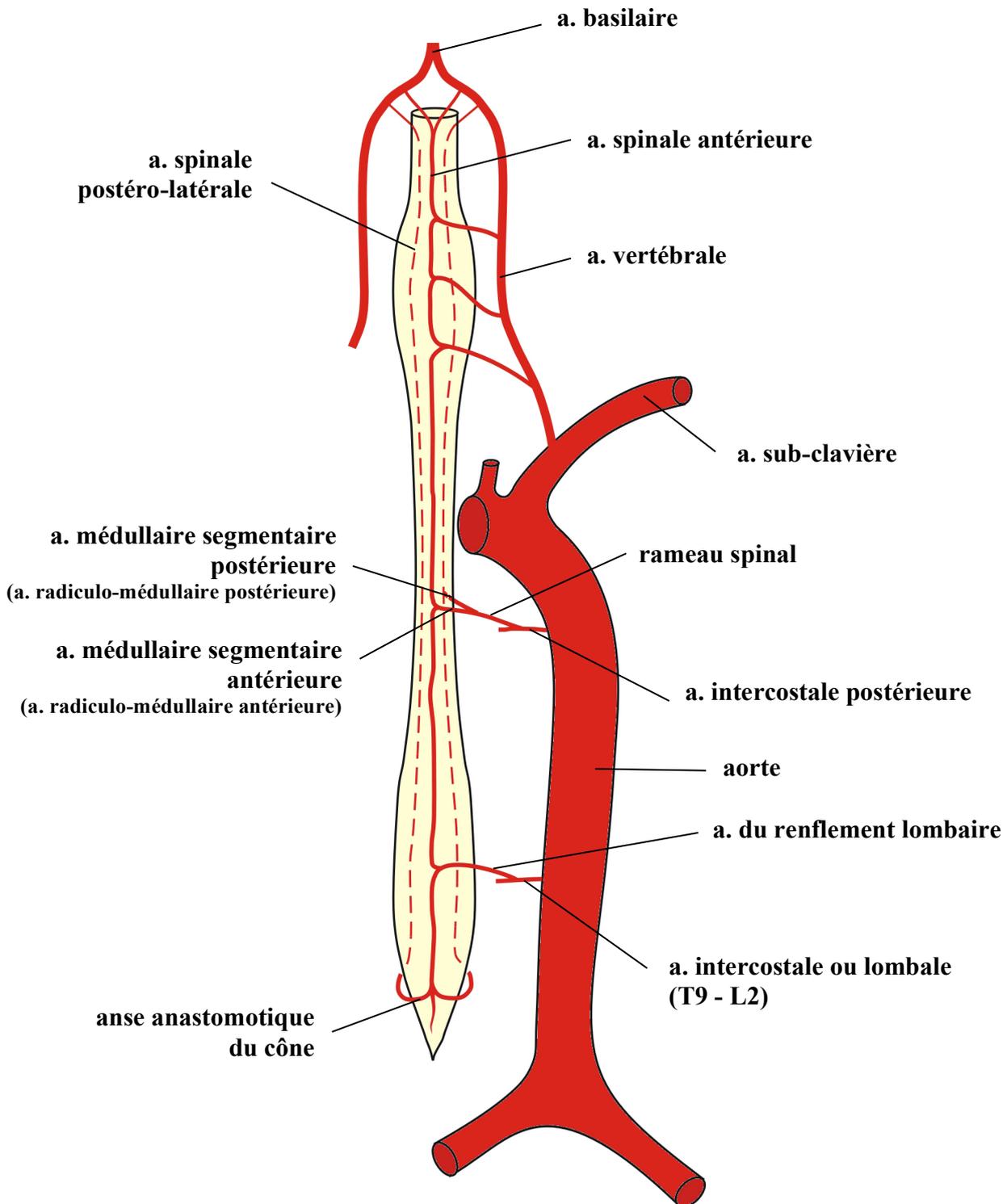
### Les ventricules latéraux



**Les rapports du cerveau**

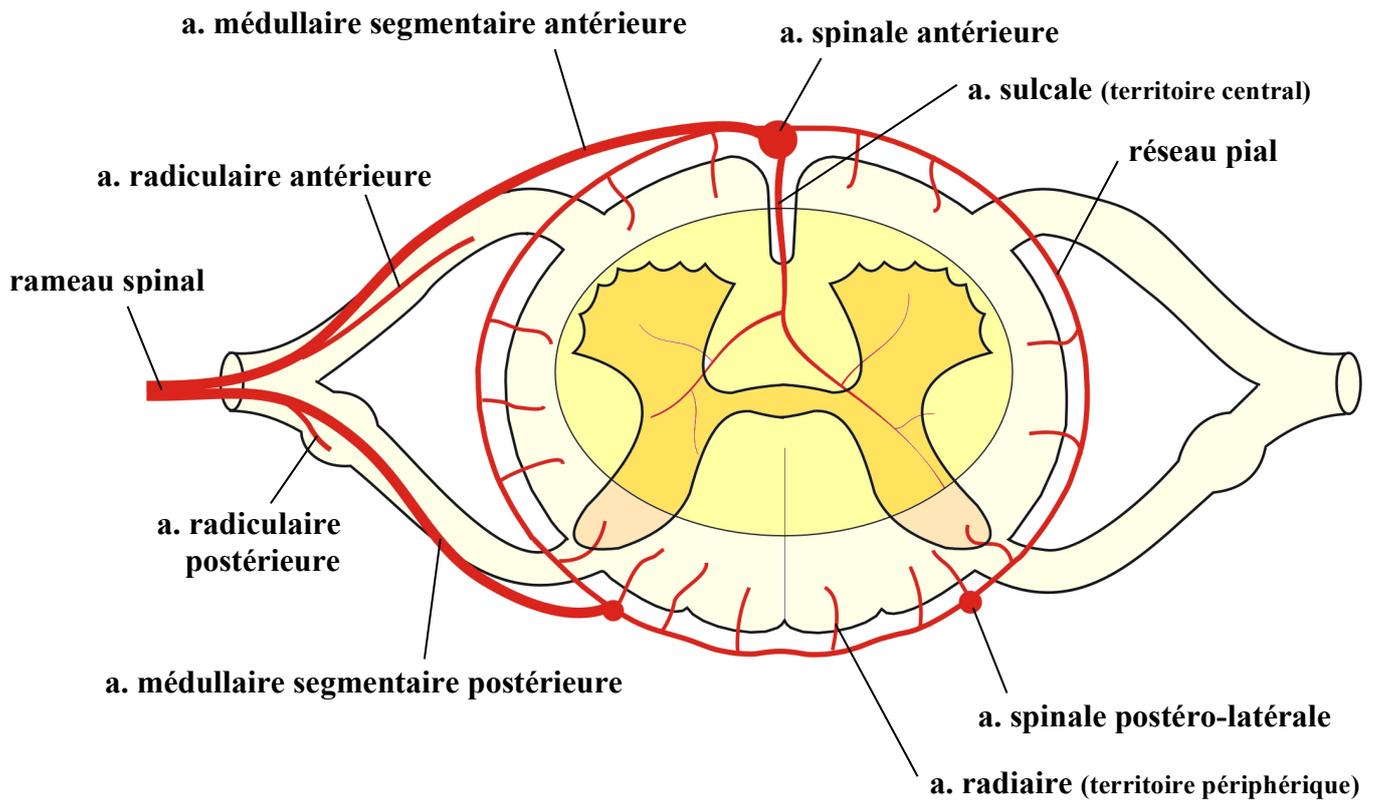
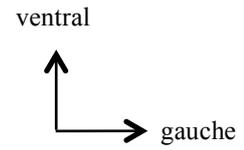
# **VASCULARISATION**

cranial  
 ↑  
 gauche →



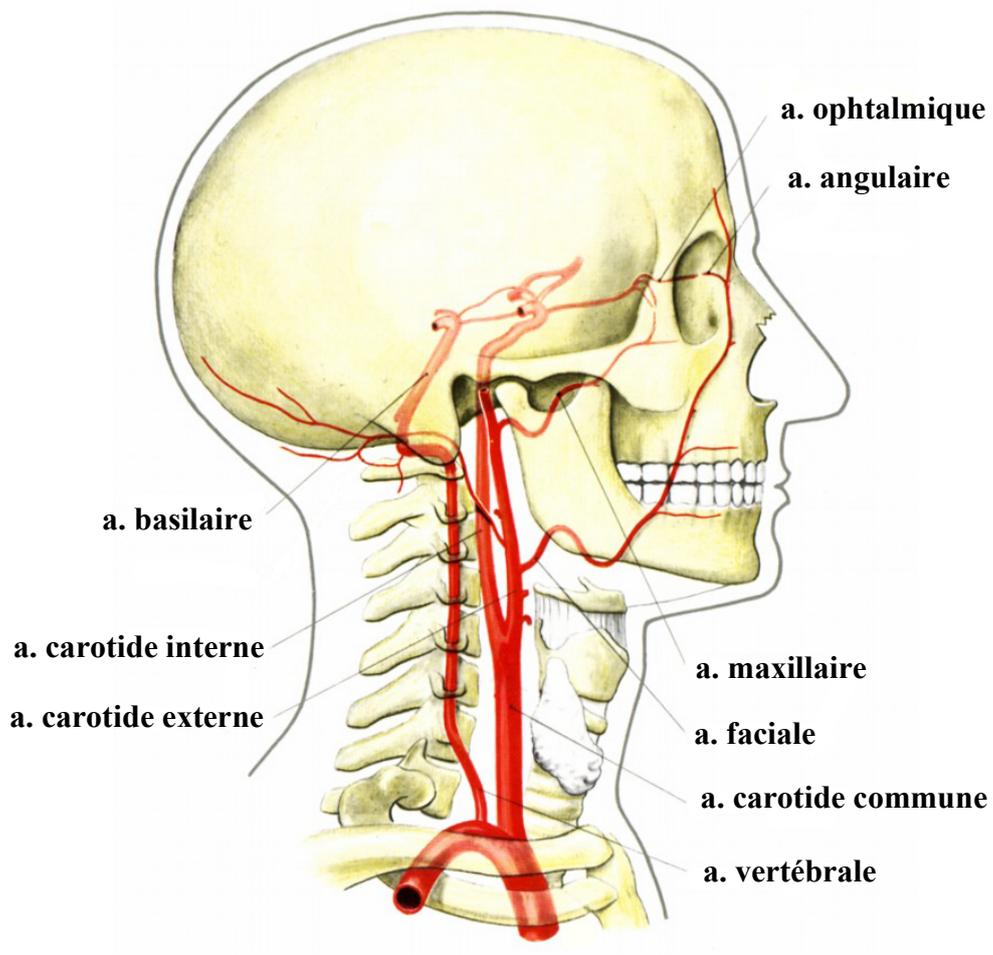
### Vascularisation artérielle de la moelle (vue ventrale)

*(Les artères médullaires segmentaires postérieures ne sont représentées qu'au niveau thoracique)*

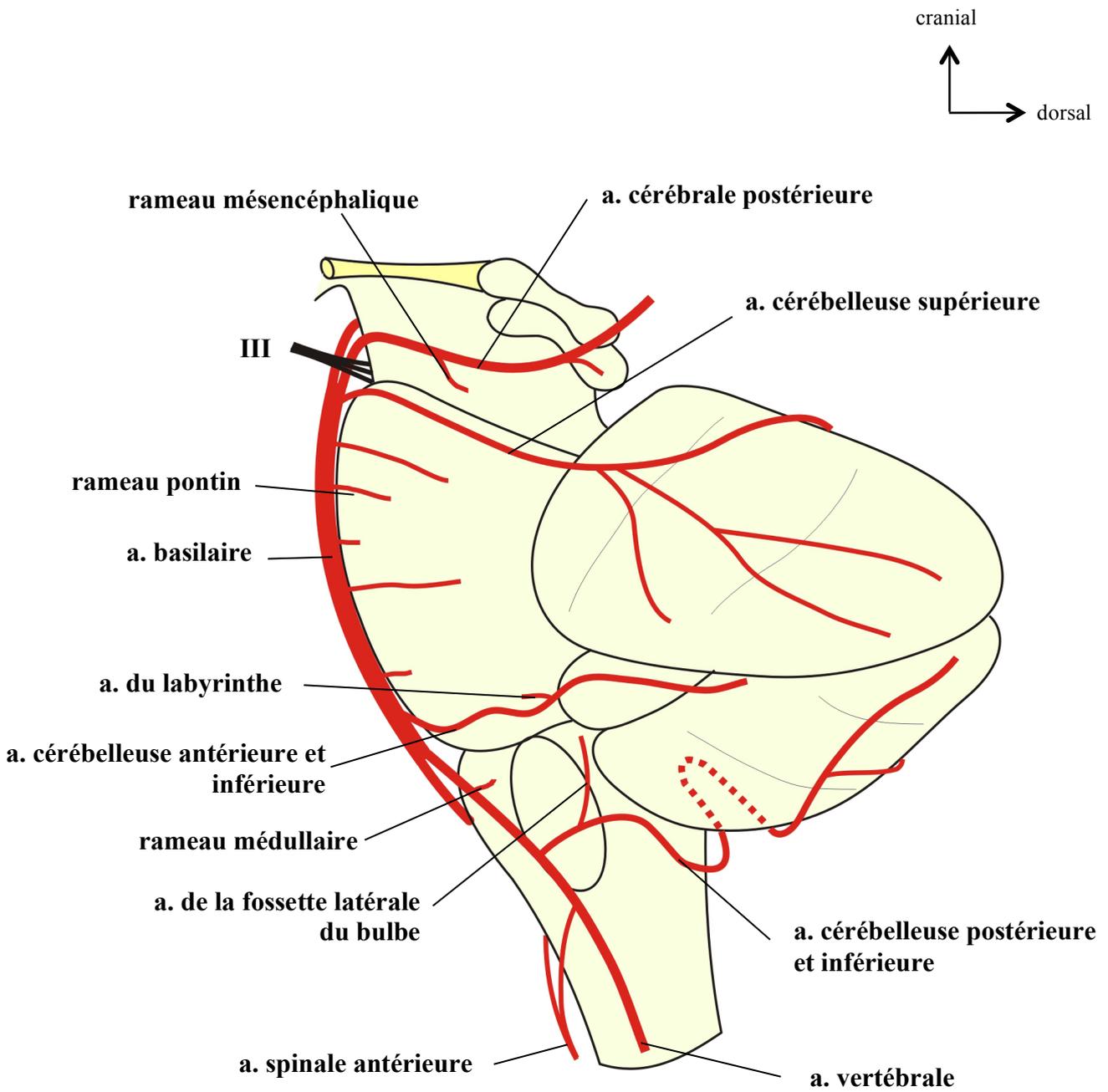


**Vascularisation artérielle de la moelle et territoires  
(Coupe horizontale)**

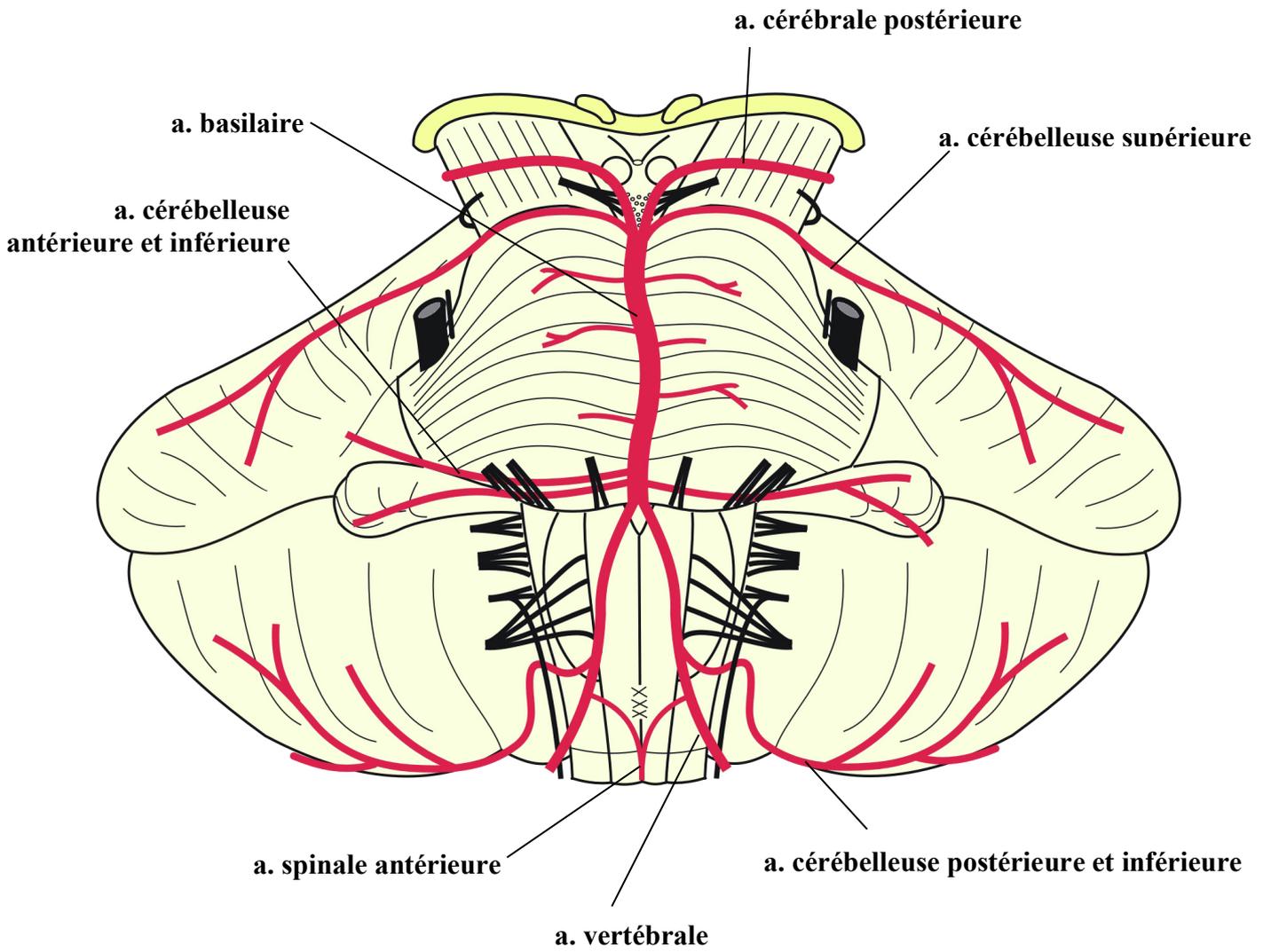
cranial  
↑  
↘ dorsal



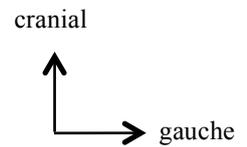
**Sources artérielles de la vascularisation de l'encéphale**  
*(d'après G. Lazorthes)*

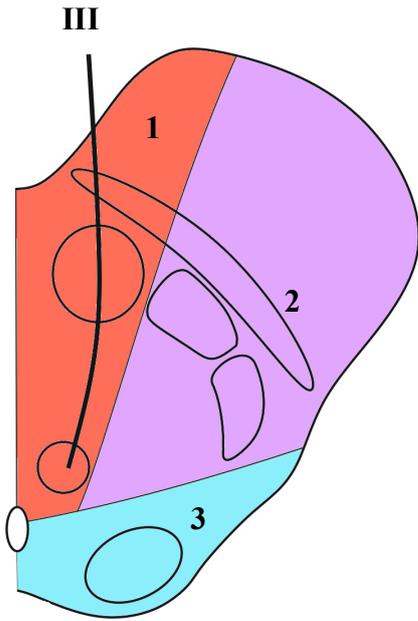


**Vascularisation du tronc cérébral et du cervelet  
(vue latérale)**



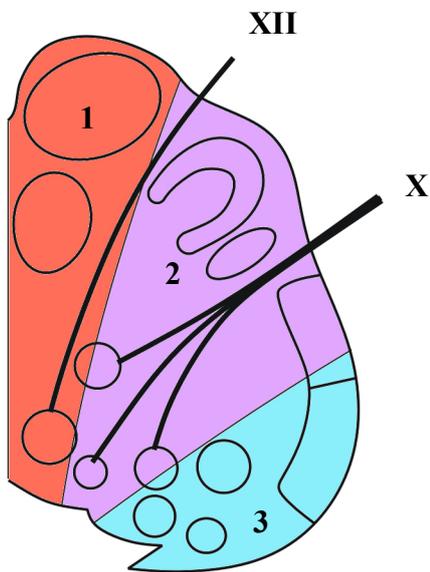
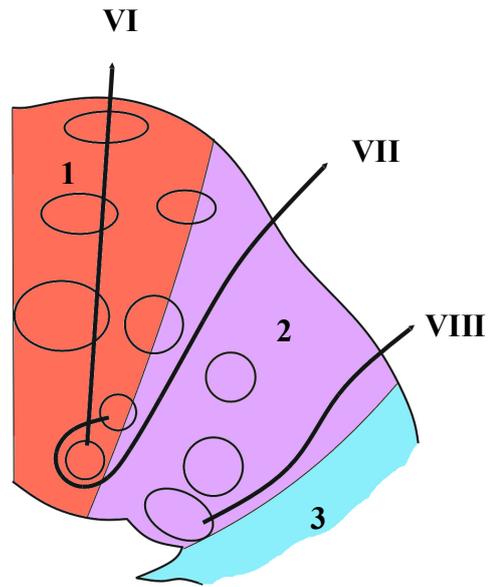
**Vascularisation du tronc cérébral et du cervelet  
(vue antérieure)**



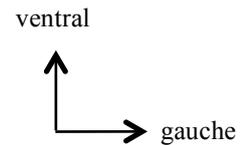


**Pont (coupe passant par le sillon bulbo-pontique)**

**Mésencéphale (coupe passant par le colliculus supérieur)**

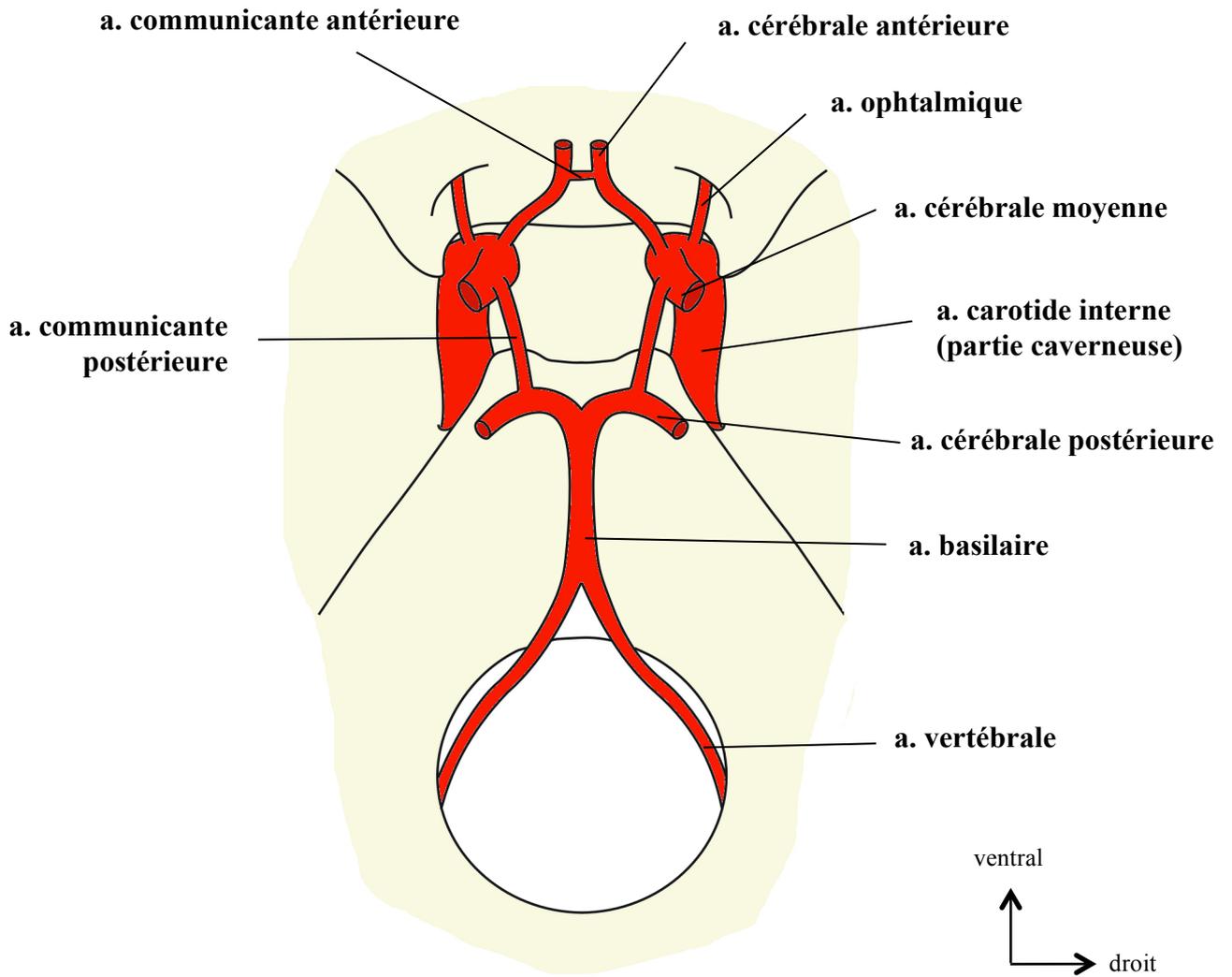


**Moelle allongée (coupe passant par l'olive)**

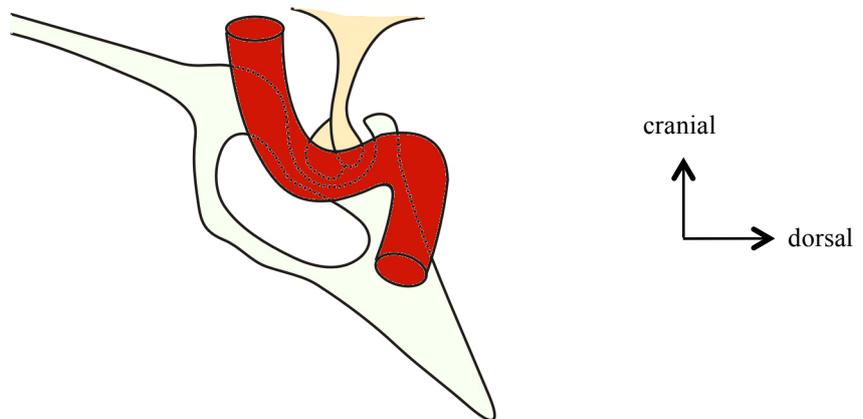


**Les territoires artériels du tronc cérébral**

- 1 : territoire antérieur
- 2 : territoire latéral
- 3 : territoire postérieur

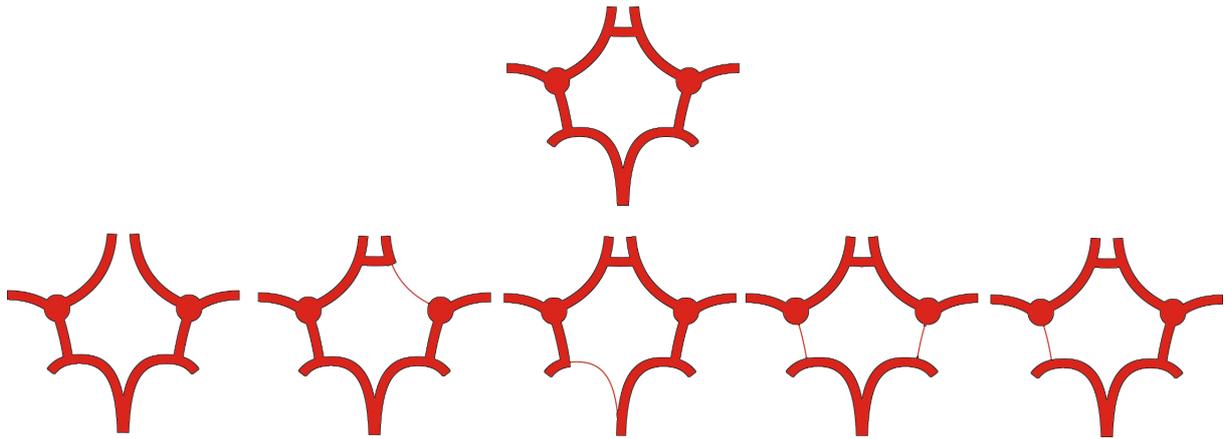


**Vue endocranienne de la base du crâne et sources artérielles de la vascularisation de l'encéphale**

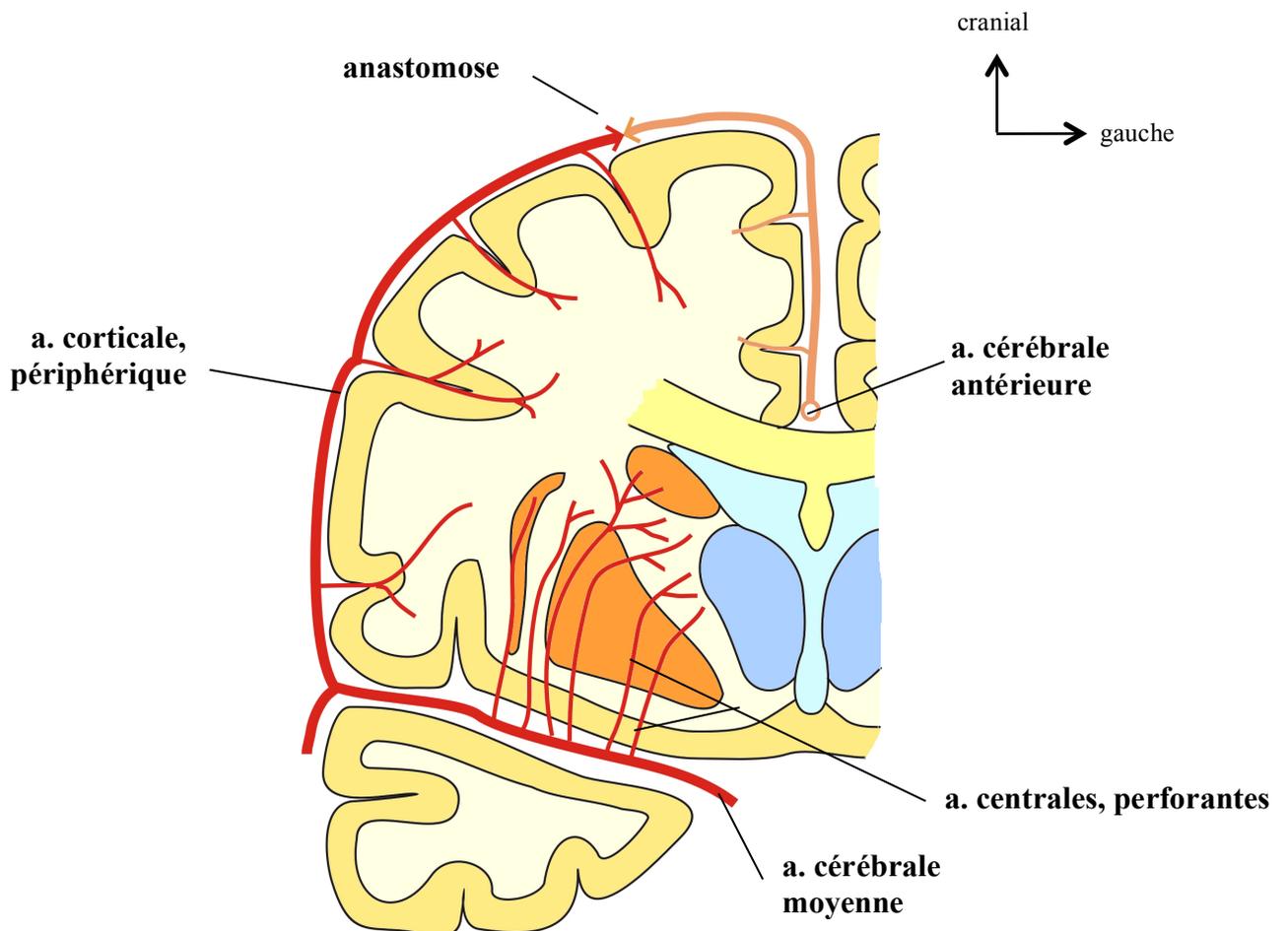


**Vue schématique du siphon carotidien à la face latérale du corps du sphénoïde**





**Quelques variations du cercle artériel avec absence ou hypoplasie de certains segments**

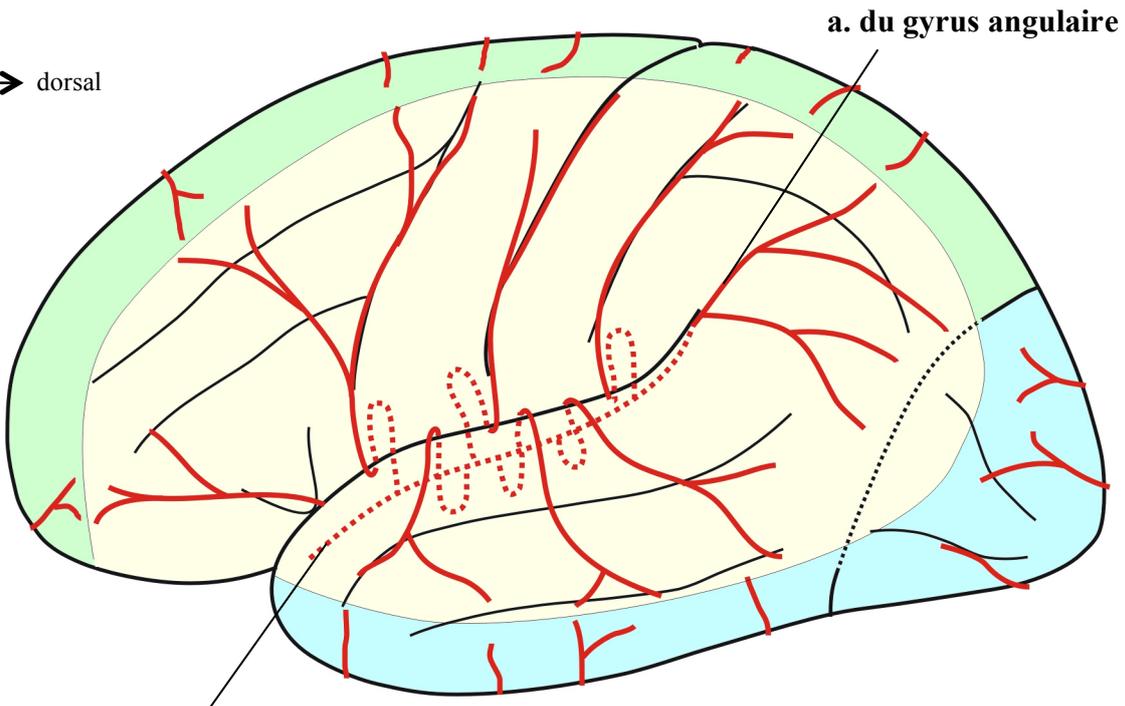


**Représentation schématique des artères cérébrales (coupe frontale du cerveau)**

cranial



dorsal



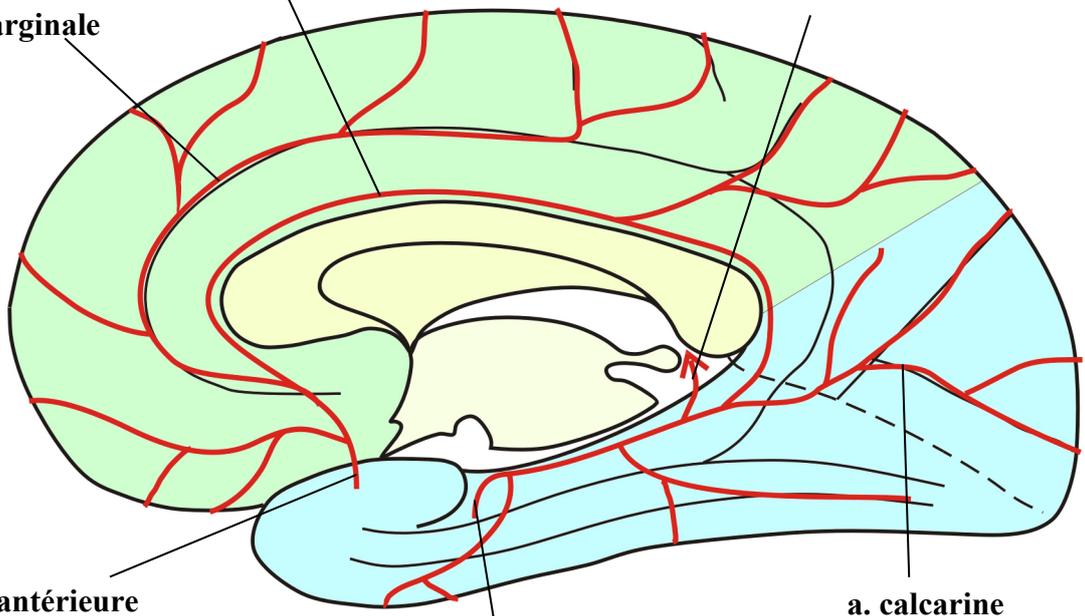
a. du gyrus angulaire

a. cérébrale moyenne

a. peri-calleuse

a. choroidienne postérieure

a. callosa-marginale

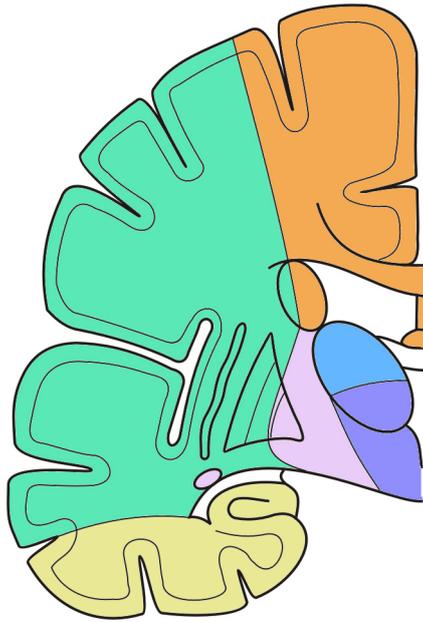


a. cérébrale antérieure

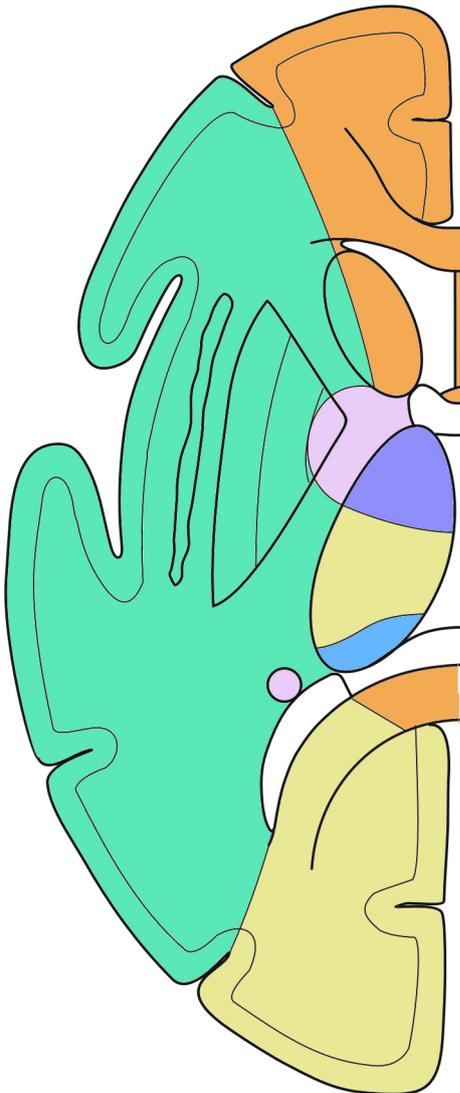
a. cérébrale postérieure

a. calcarine

### Les artères corticales, périphériques

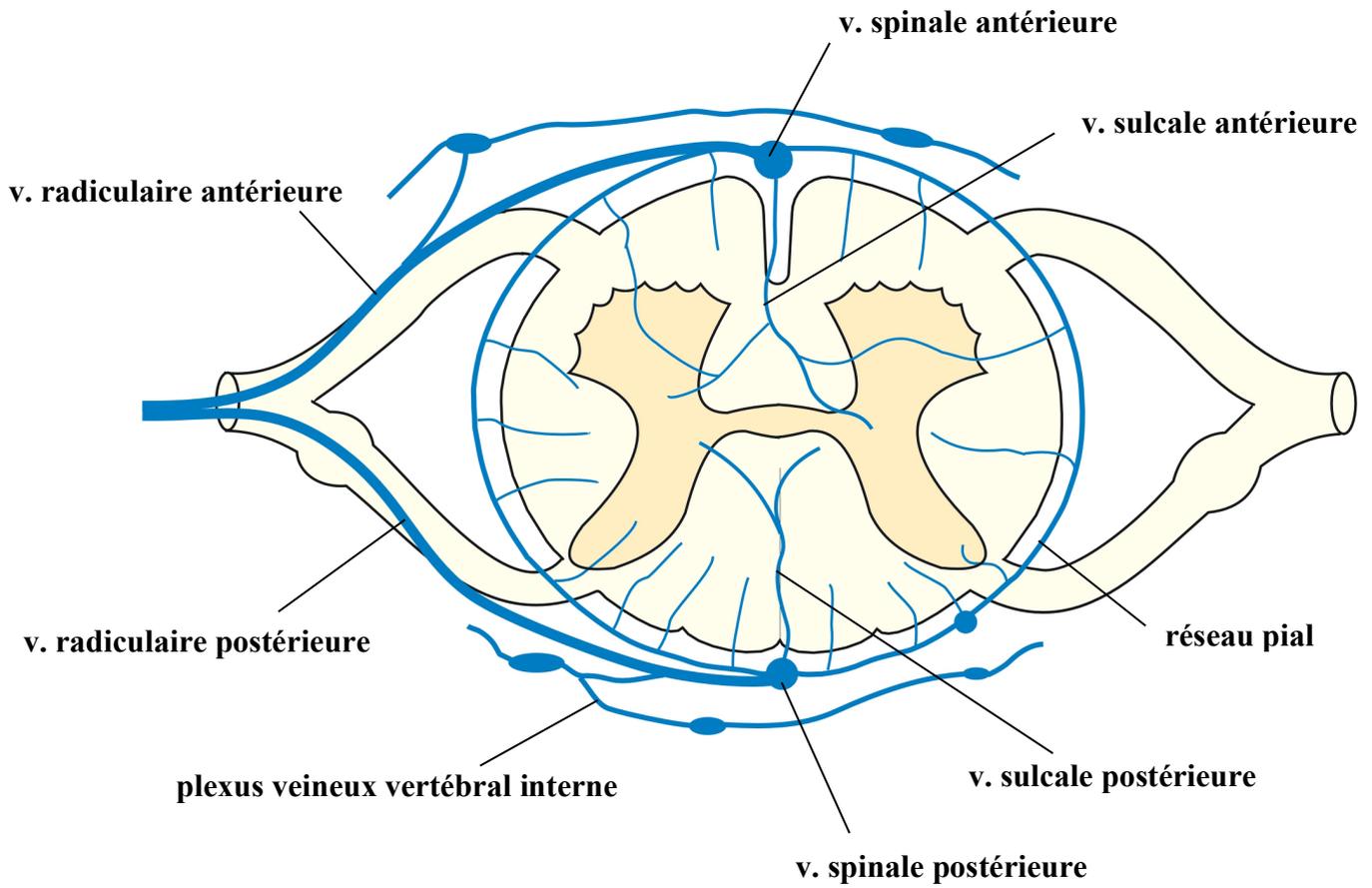


**coupe frontale**

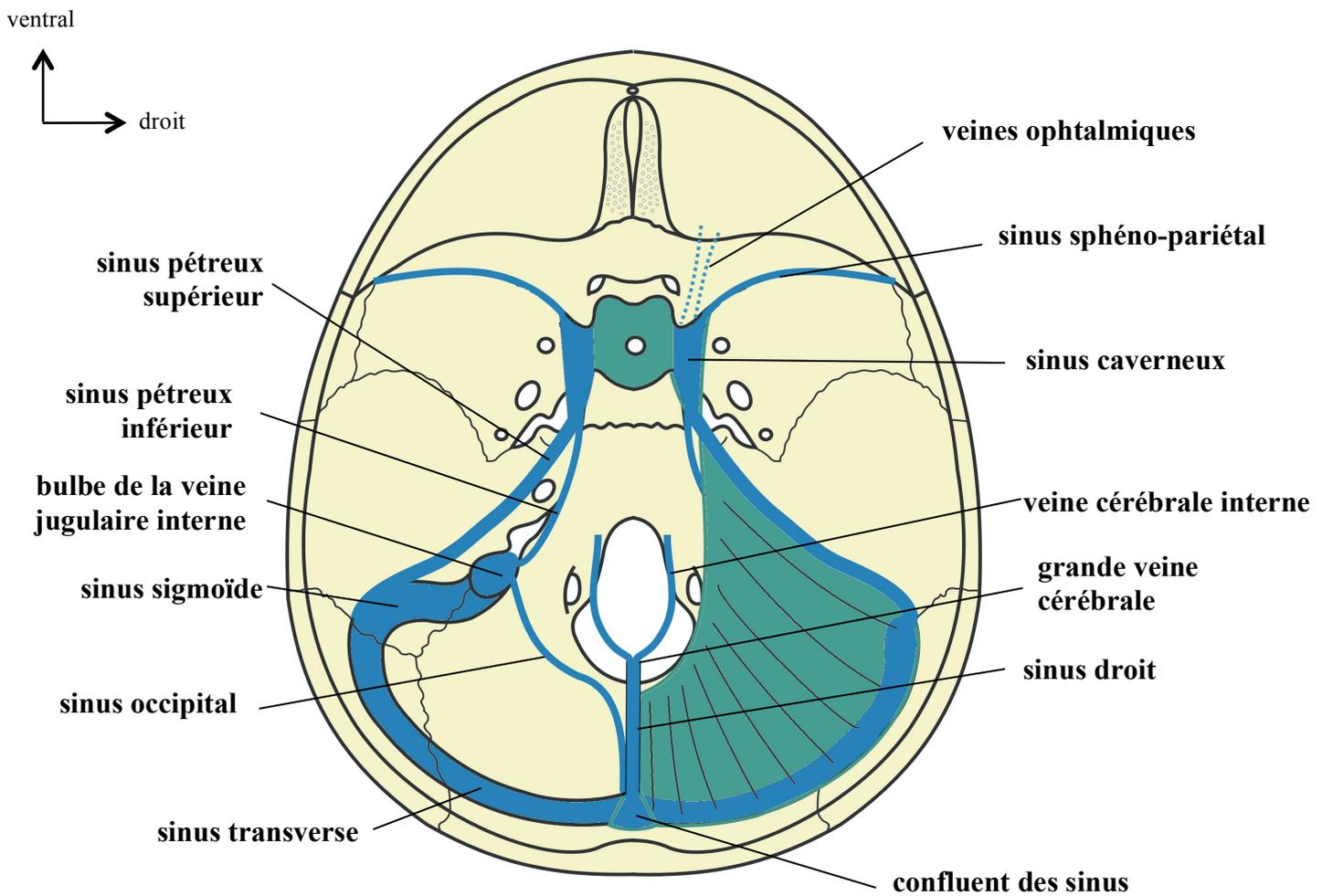
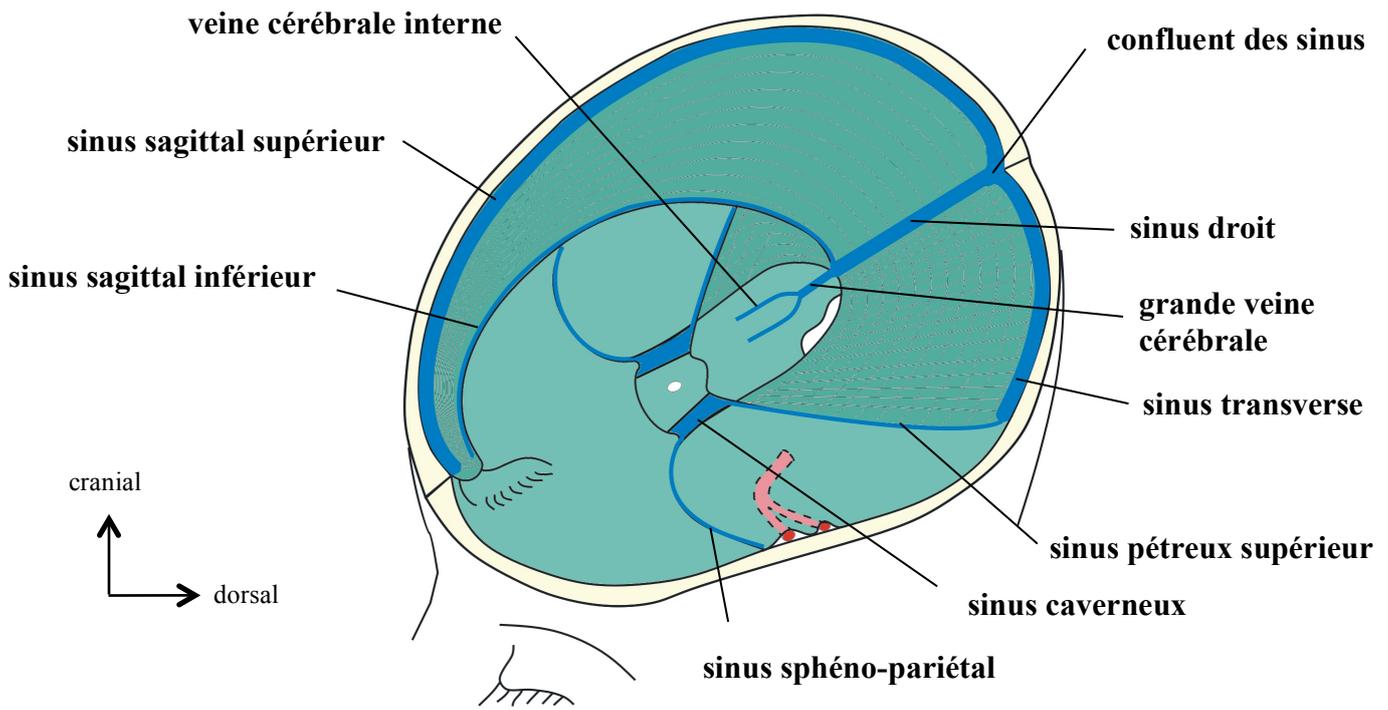


**coupe horizontale**

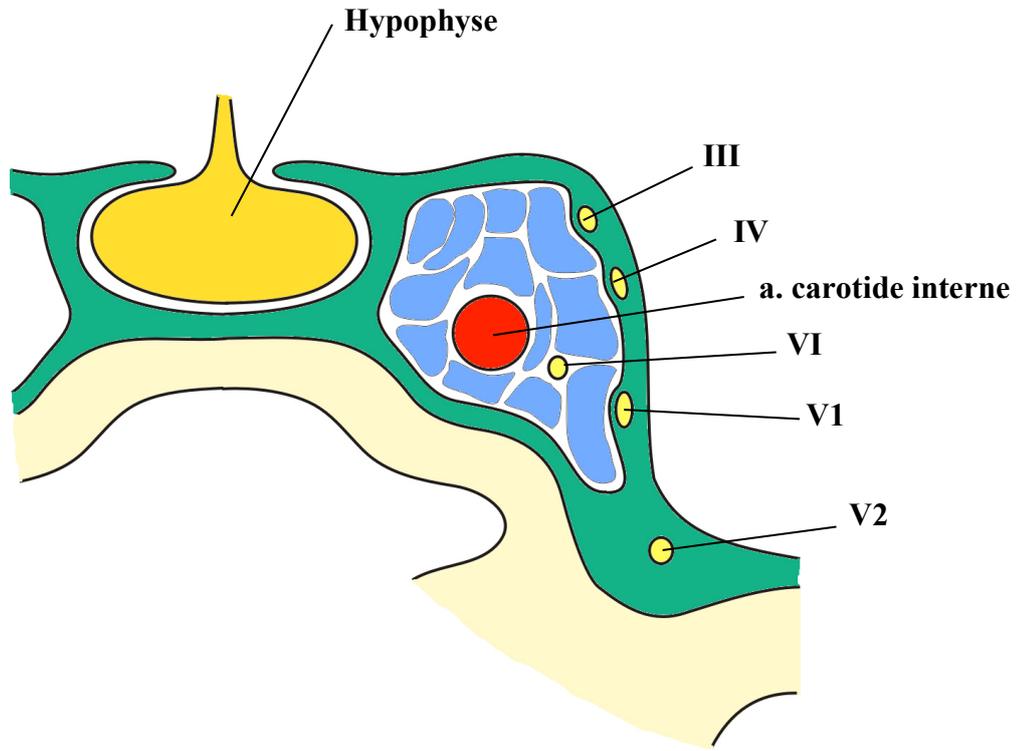
-  a. cérébrale antérieure
-  a. cérébrale moyenne
-  a. cérébrale postérieure
-  a. communicante postérieure
-  a. choroïdienne antérieure
-  a. choroïdienne postérieure



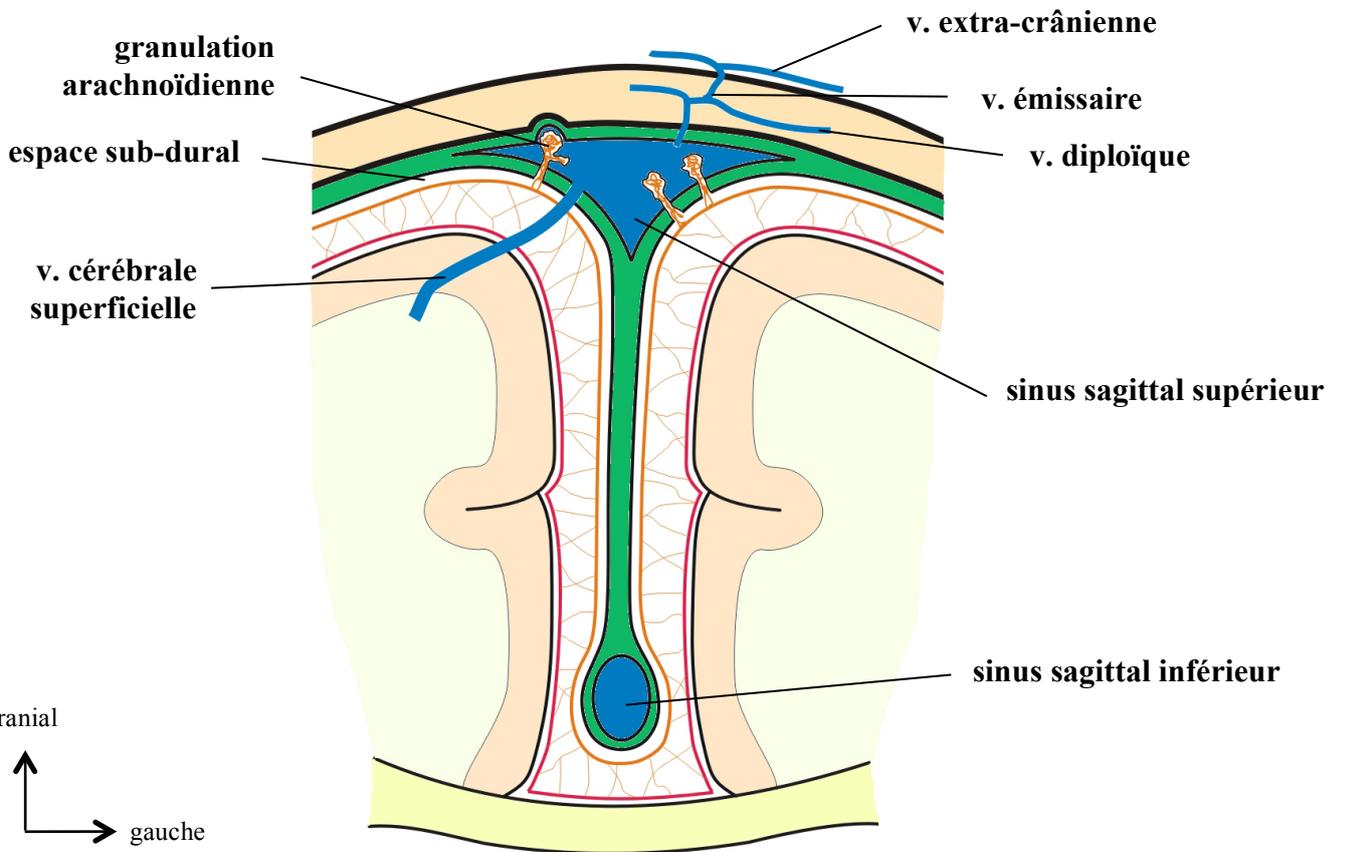
### Vascularisation veineuse de la moelle



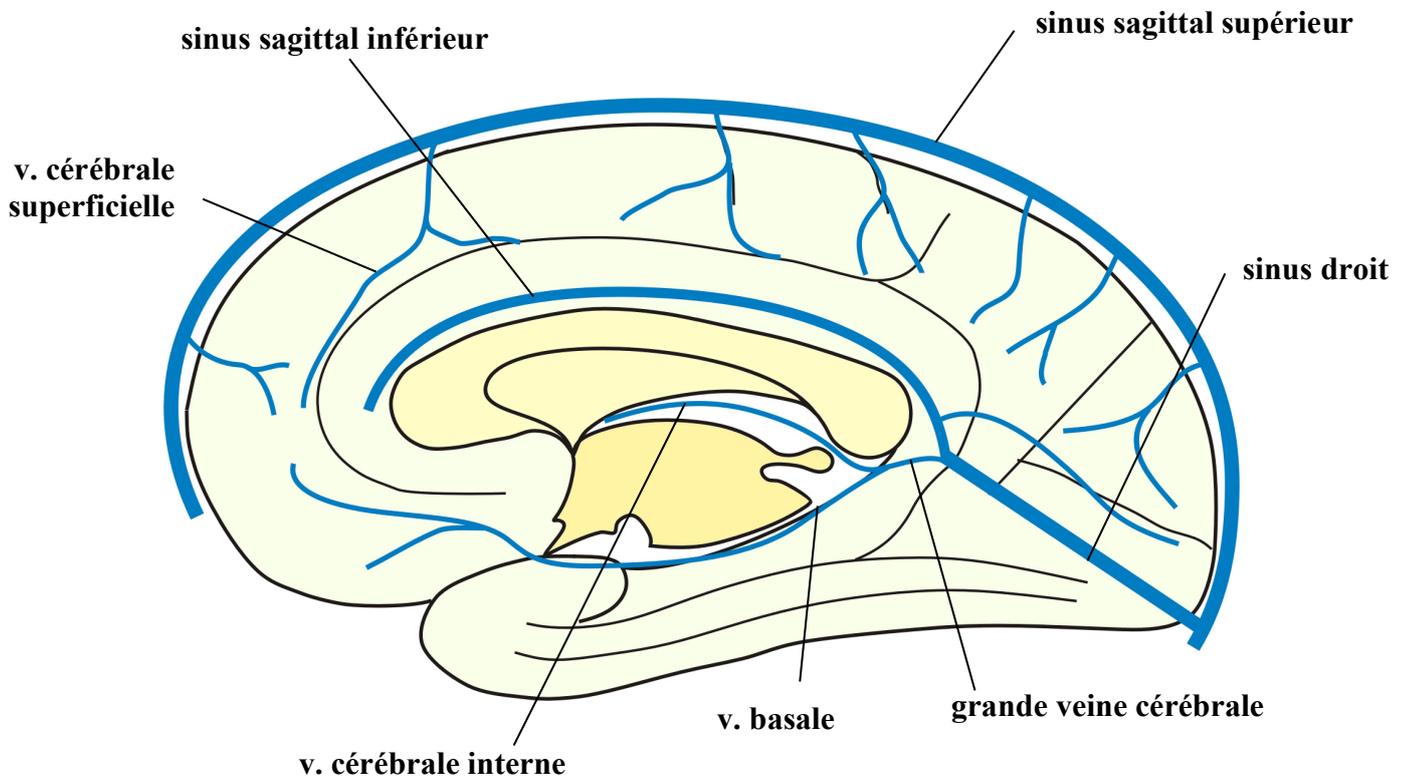
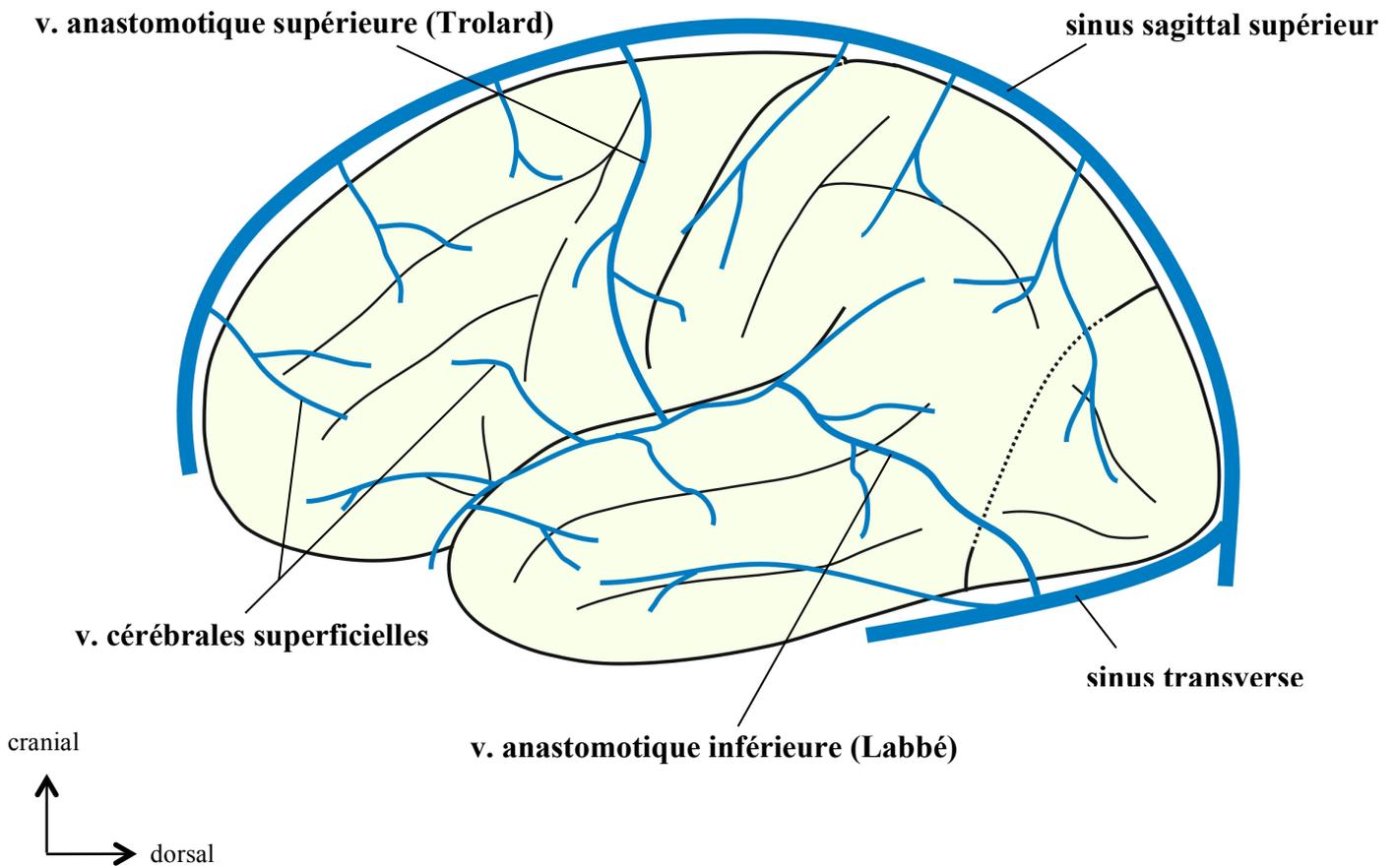
**Les sinus de la dure-mère**



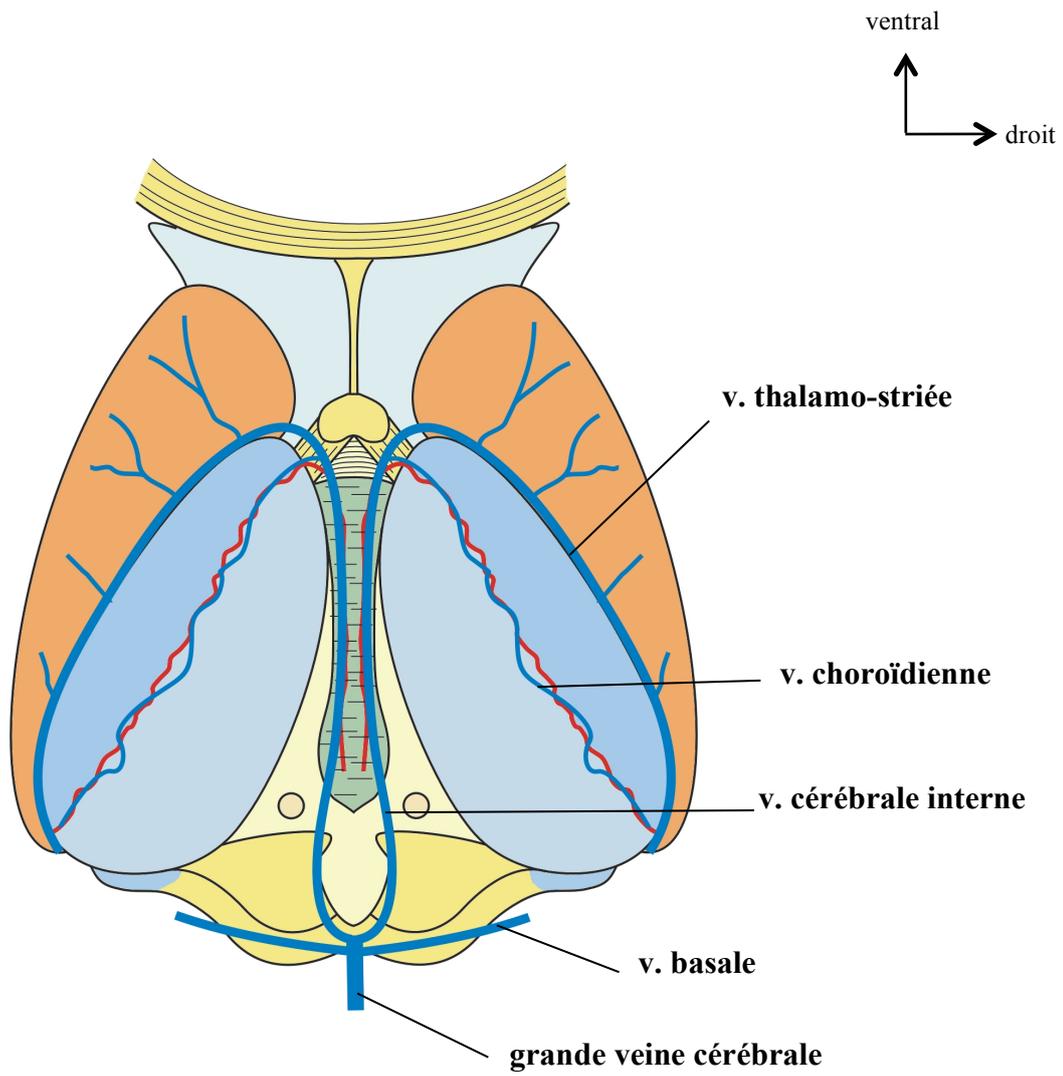
**Le sinus caverneux  
(coupe frontale)**



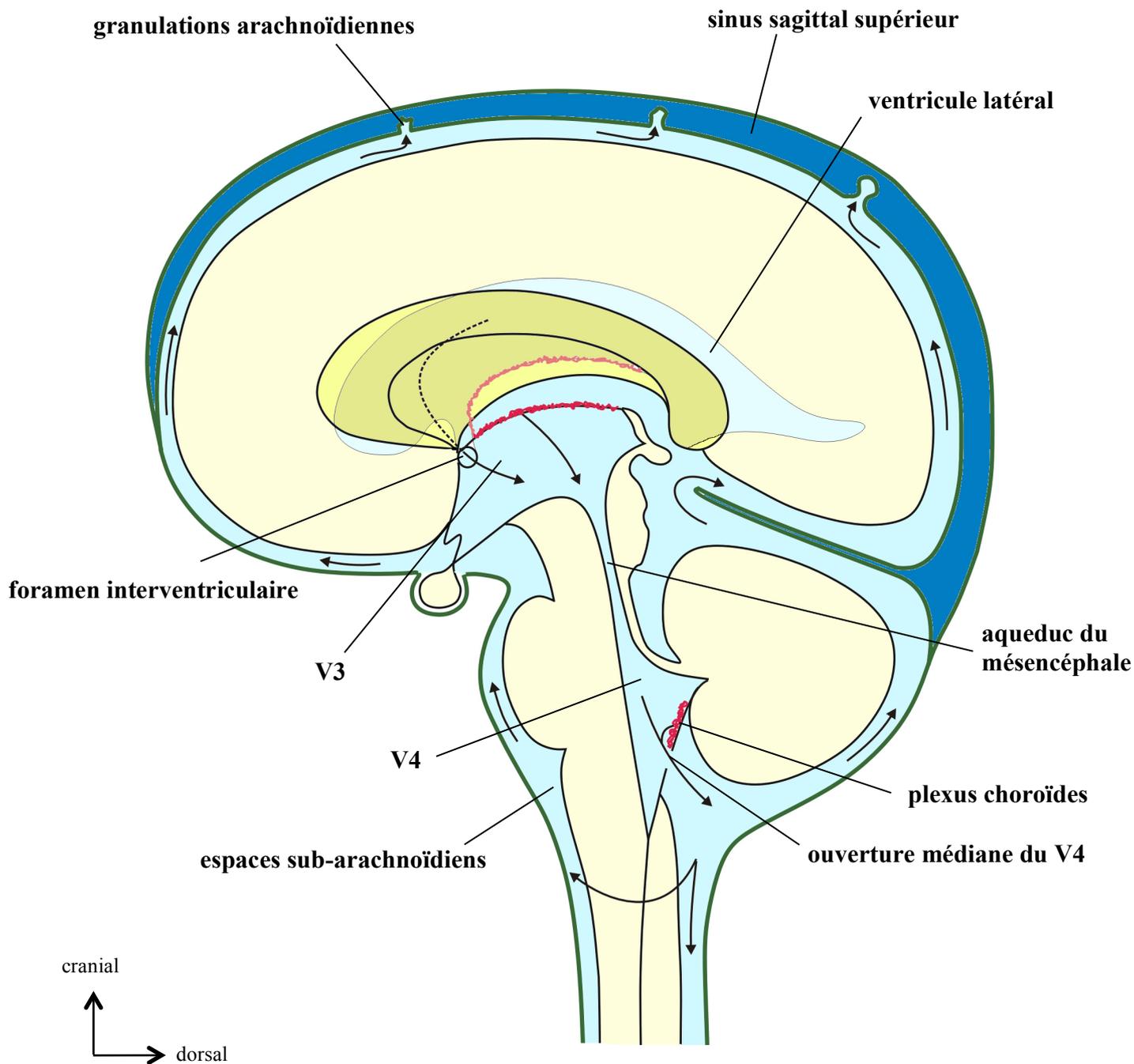
**Sinus sagittal supérieur**



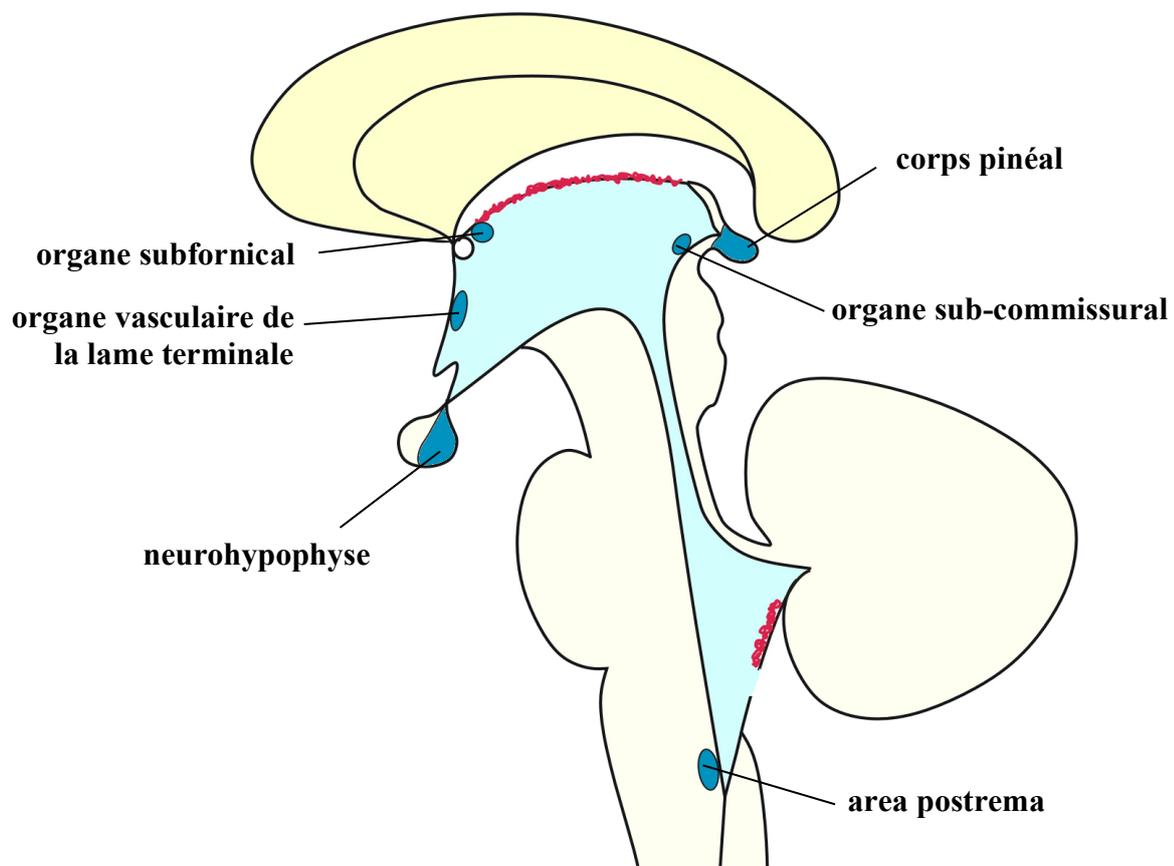
### Les veines cérébrales



**Les veines centrales dans la fissure transverse**



**Circulation du liquide cérébro-spinal**



### Les organes circumventriculaires