Unit 4 Pictures

BIOL 212 Online Lab PowerPoint

<u>Hint:</u> Slides with colored backgrounds help to divide content into different days.

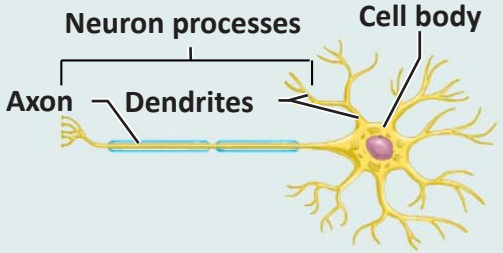
Use the following pictures to help you identify terms from the lab term handout.

Another good resource is the Olexik website: http://faculty.montgomerycollege.edu/wolexik/204_histology_page.htm

Nervous Histology

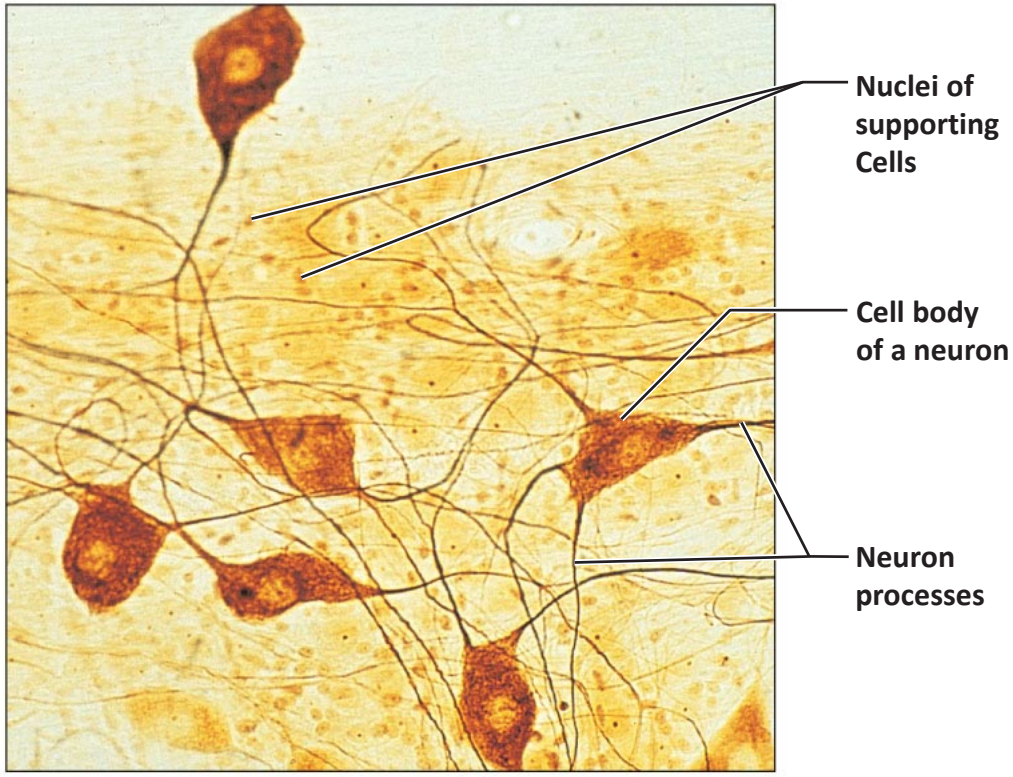
Nervous tissue

Description: **Neurons are branching cells; cell processes that may be quite long extend from the nucleus-containing cell body; also contributing to nervous tissue are nonirritable supporting cells (not illustrated).**

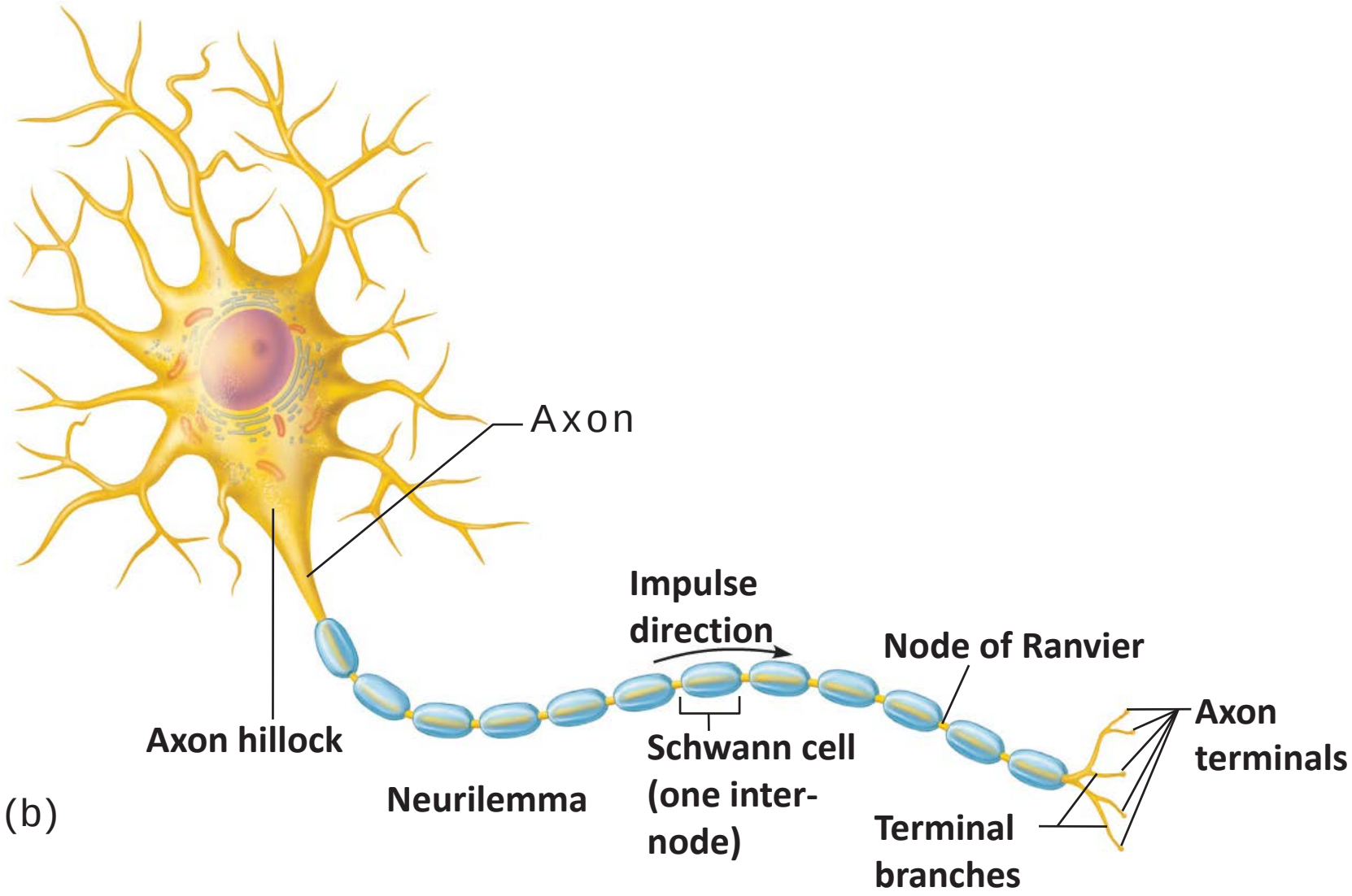


Function: **Transmit electrical signals from sensory receptors and to effectors (muscles and glands) which control their activity.**

Location: **Brain, spinal cord, and nerves.**

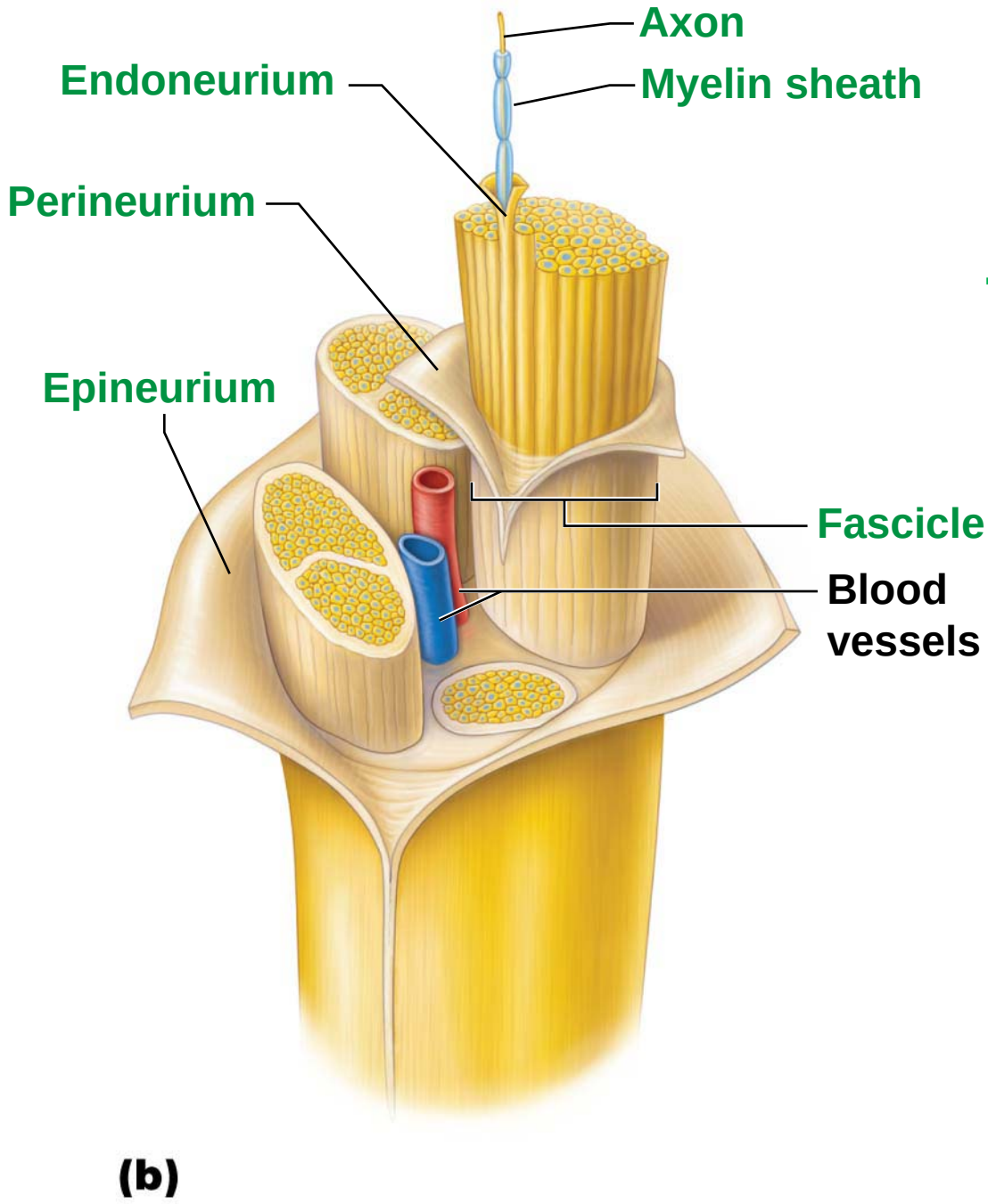


Photomicrograph: **Neurons (350x)**

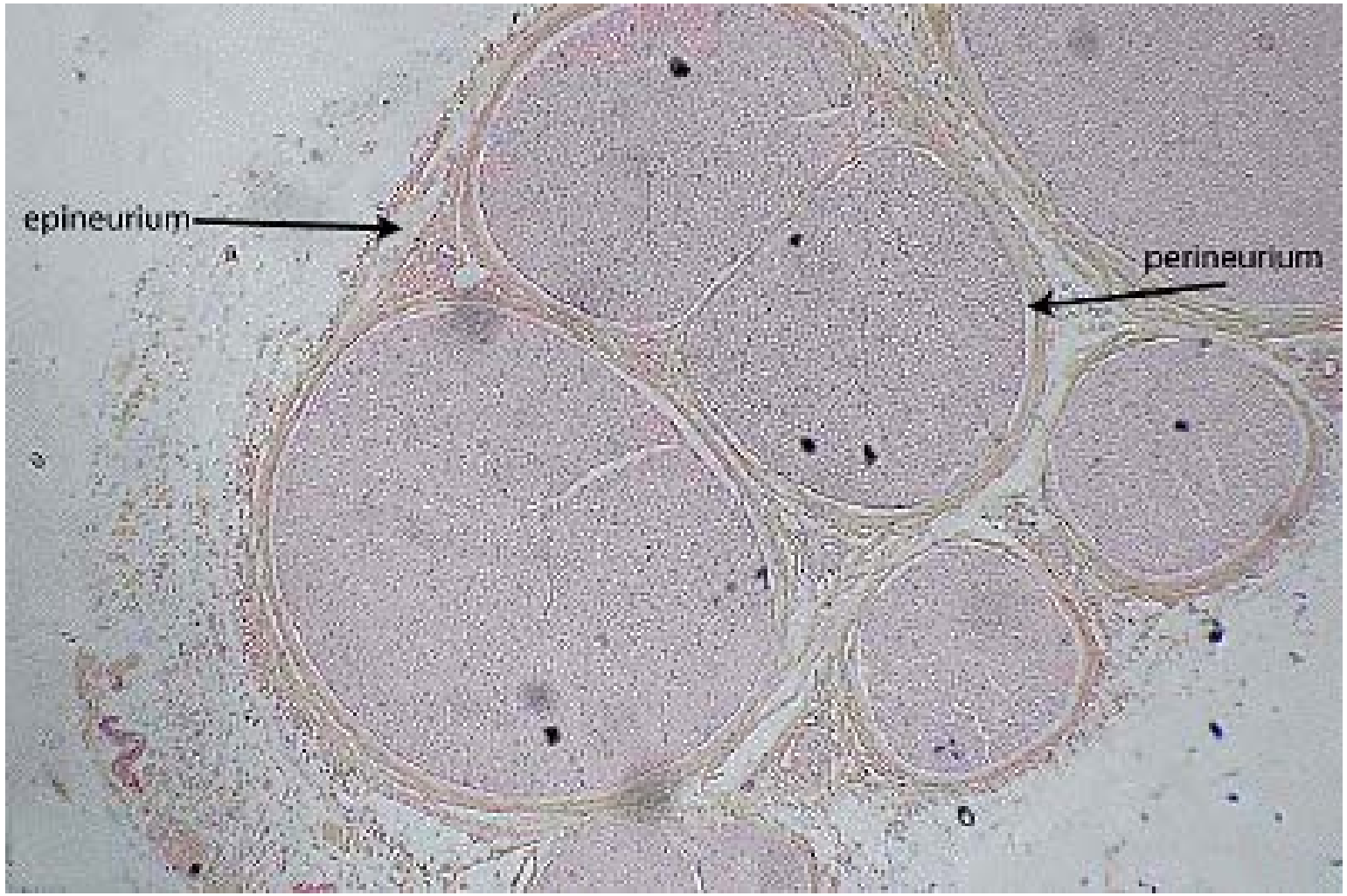

Axon
Impulse direction
Node of Ranvier
Axon terminals
Axon hillock
Schwann cell (one inter-node)
Neurilemma
Terminal branches
(b)

Marieb

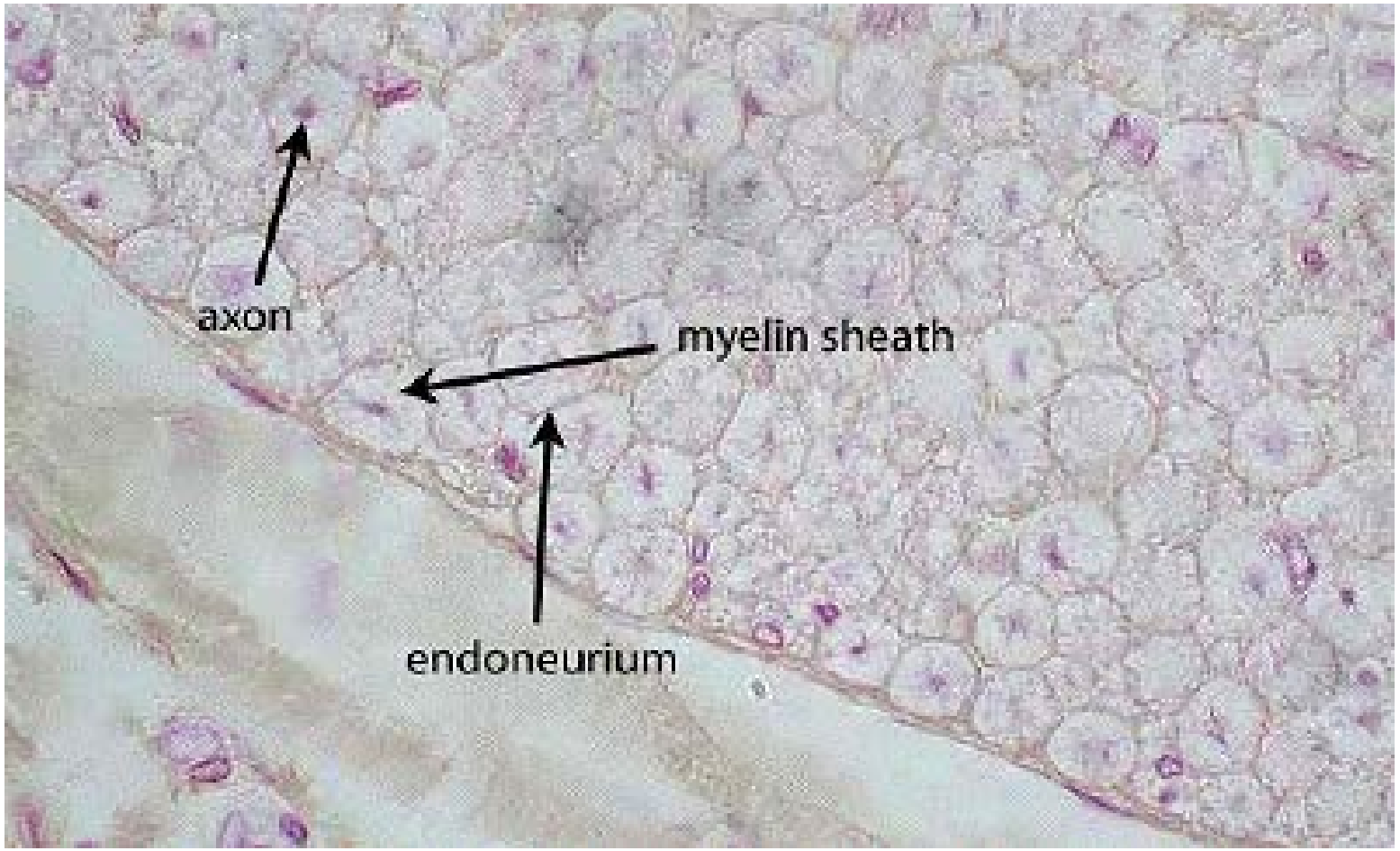
Figure 13.4b Structure of a nerve.



Nerve Fiber Anatomy


epineurium
perineurium

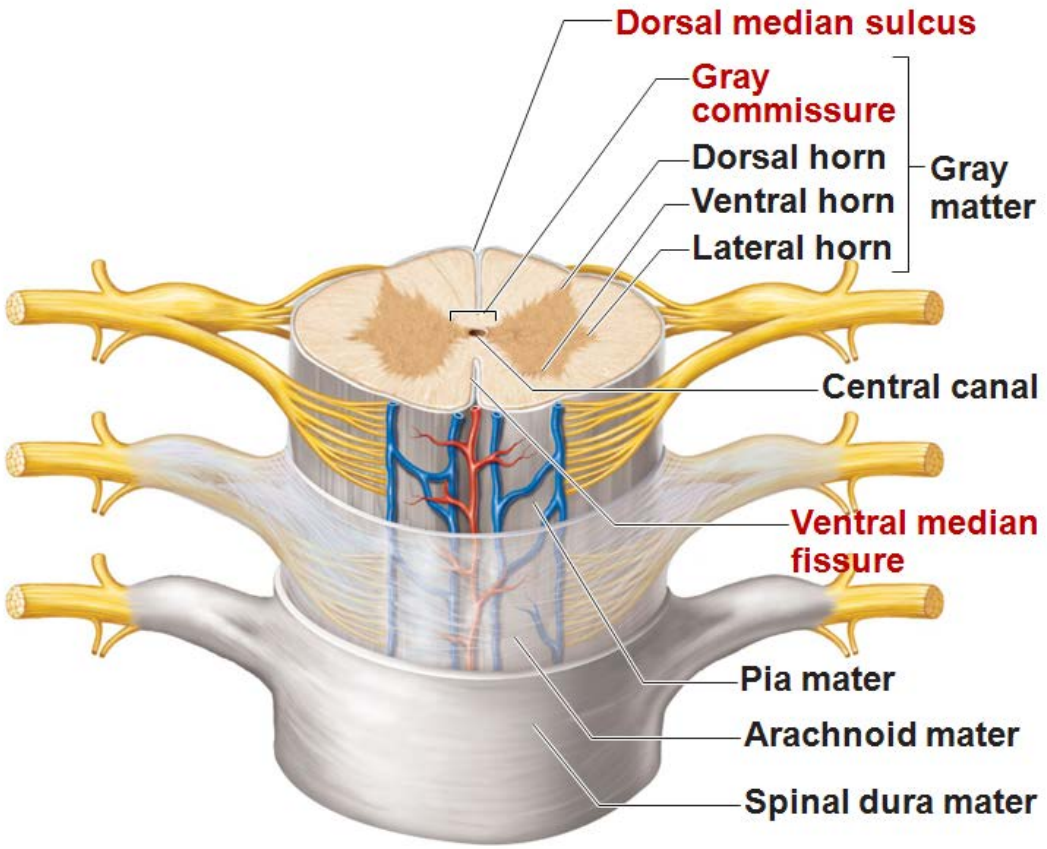

perineurium


axon
myelin sheath
endoneurium

Spinal Cord

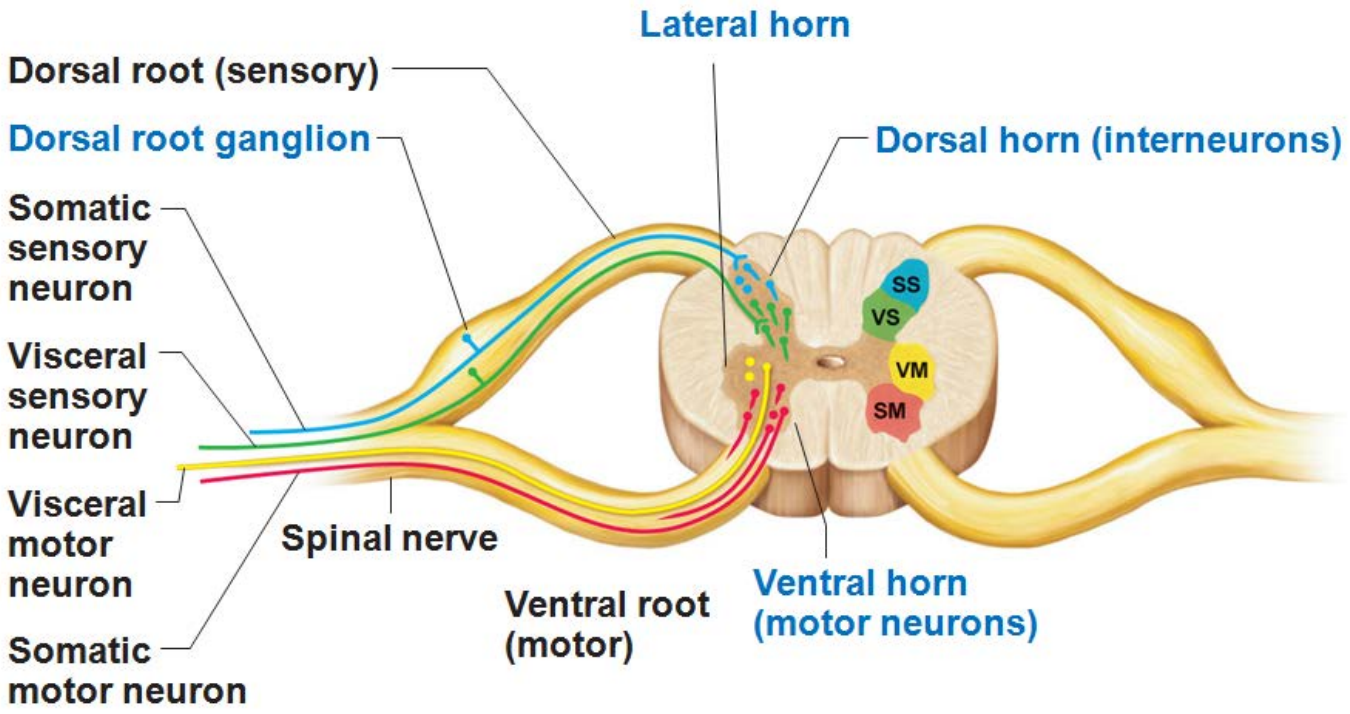
Cross-Sectional Anatomy

- Two lengthwise grooves divide cord into right and left halves
  1. Ventral median fissure (anterior)
  2. Dorsal median sulcus (posterior)
- **Gray commissure**— connects masses of gray matter; encloses central canal



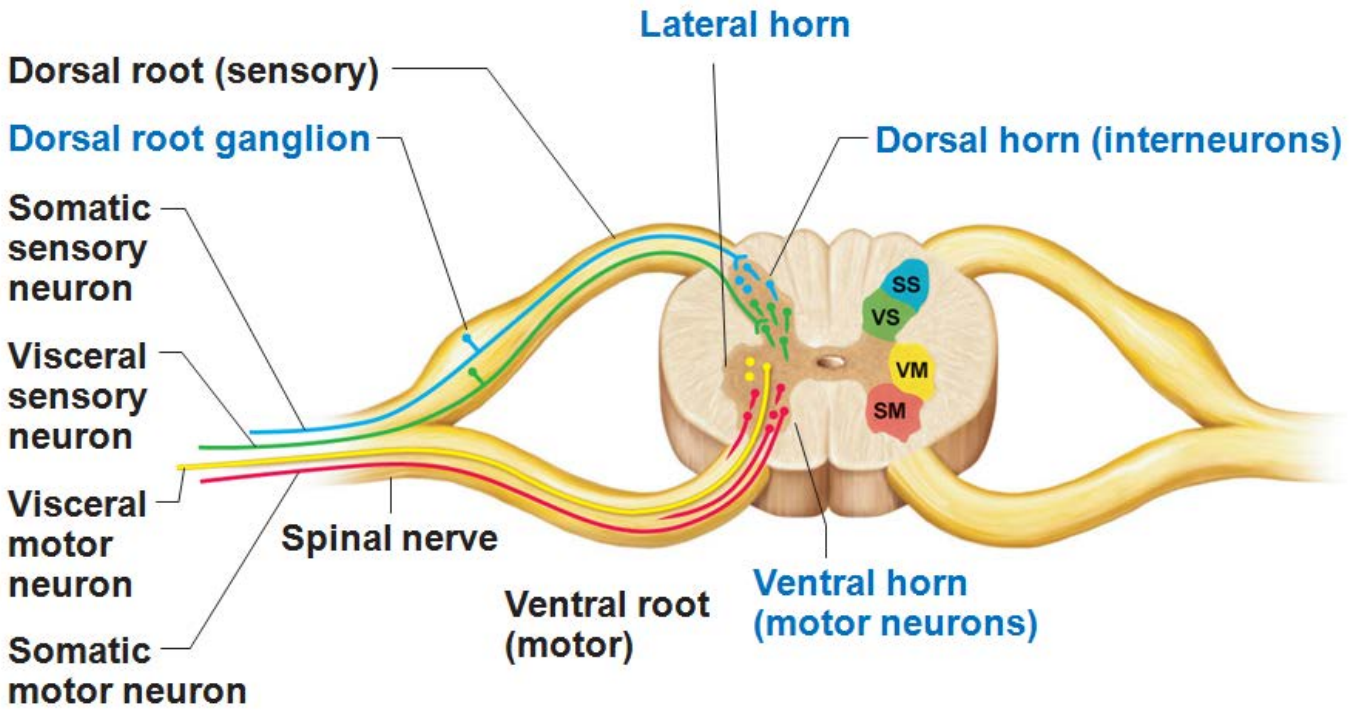
Gray Matter

- **Dorsal horns**—interneurons that receive somatic and visceral sensory input
- **Ventral horns**—somatic motor neurons whose axons exit the cord via ventral roots



Gray Matter

- **Lateral horns** (only in thoracic and lumbar regions) – sympathetic neurons (ANS mobilization)
- **Dorsal root (spinal) ganglia**—contain cell bodies of sensory neurons



Marieb

White Matter

- 3 Tracts:
  - mostly of ascending (sensory) and descending (motor) tracts
  - transverse tracts (commissural fibers) cross from one side to the other

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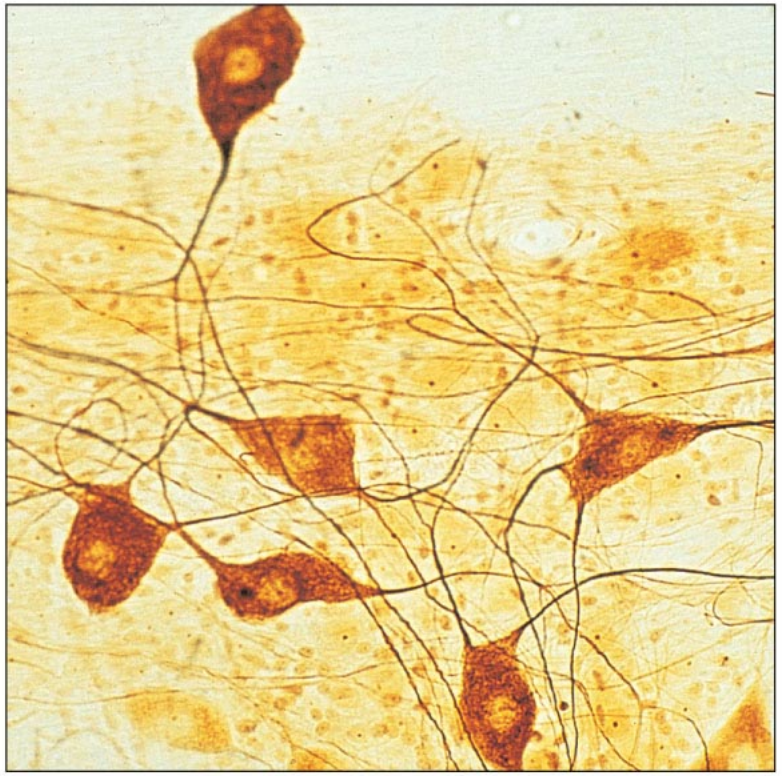
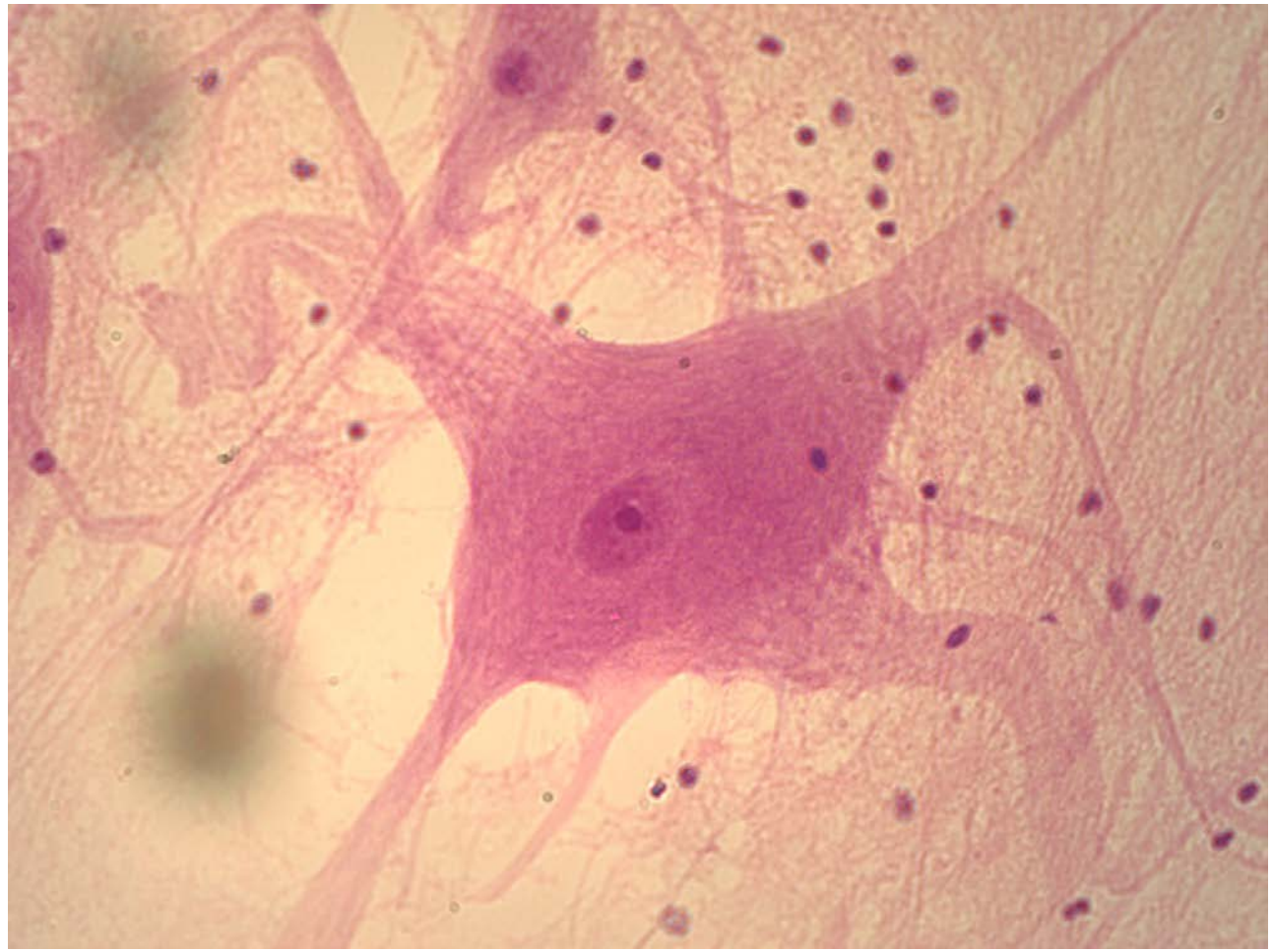
  - transverse tracts (commissural fibers) cross from one side to the other
- Tracts are located in 3 white columns (**funiculi**) on each side—dorsal (posterior), lateral, and ventral (anterior)
- Each spinal tract is composed of axons with similar functions

Use the following pictures to help you practice finding the terms from the lab term handout on unlabeled images.

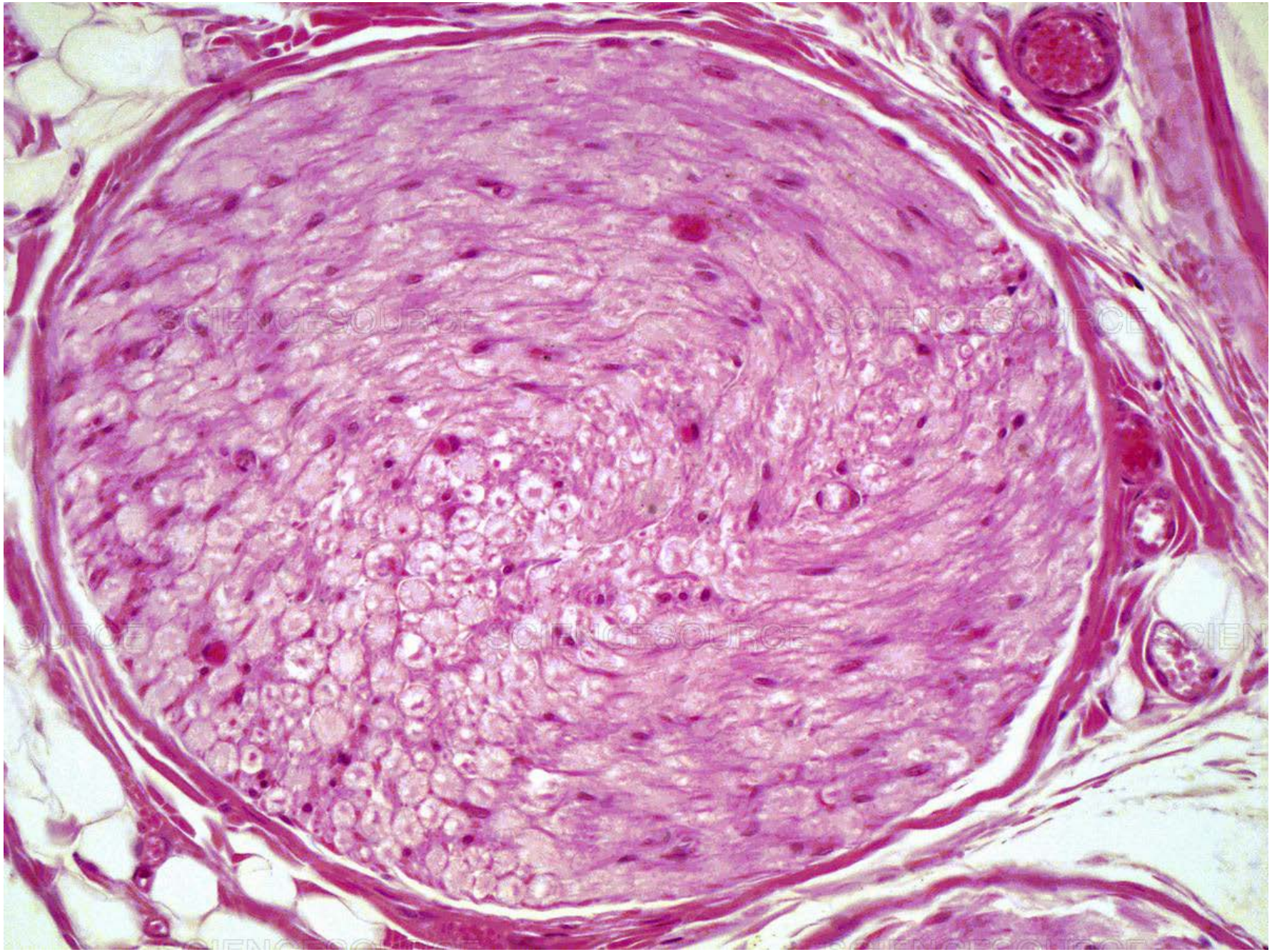
- Remember, you won't learn them if you don't take plenty of time to practice!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the nervous histology and spinal cord quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

Nervous Histology

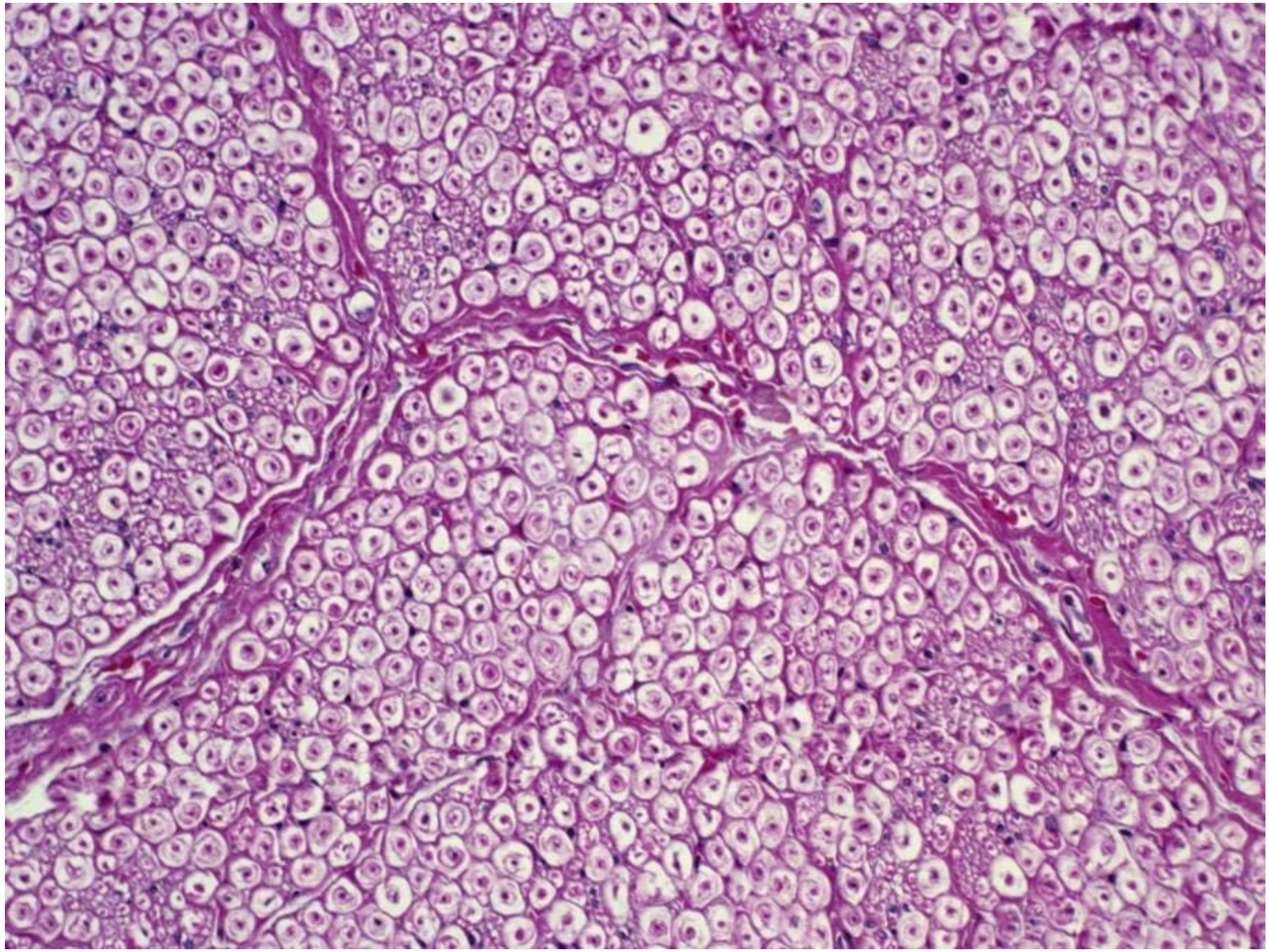




4X
Objective

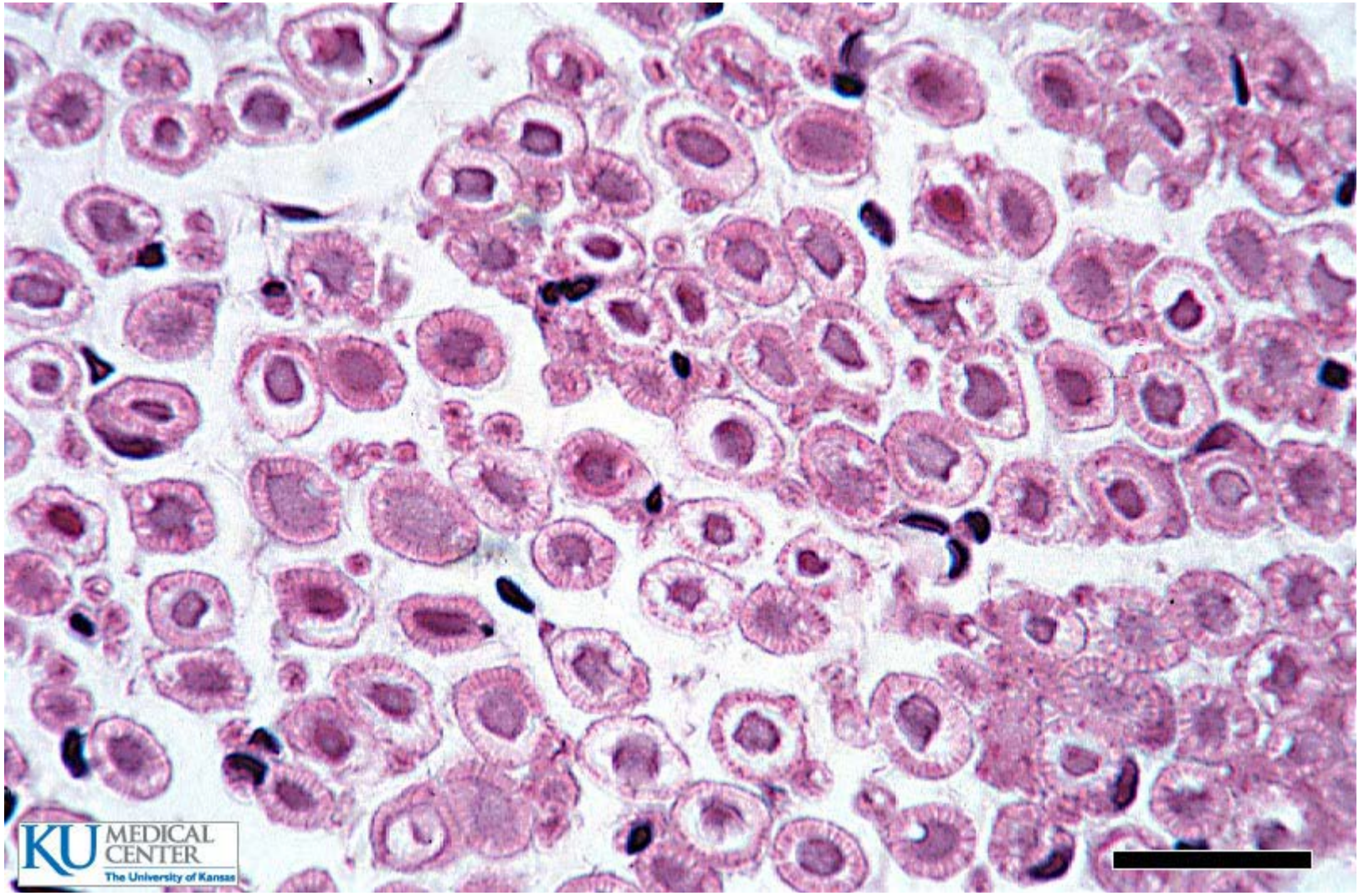


40X
Objective

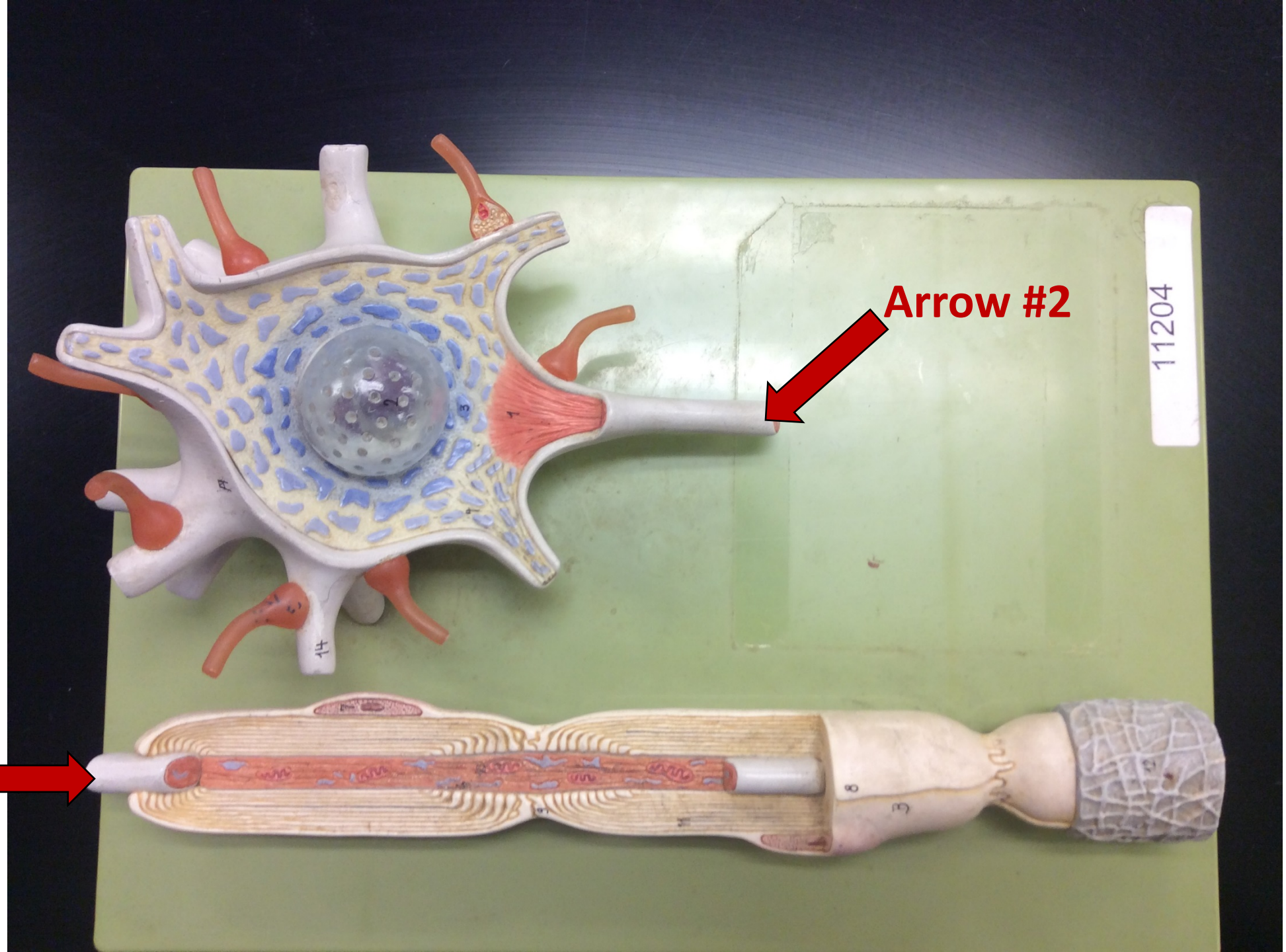


40X
Objective

100X
Objective



Neurons are HUGE so this point actually connects to Arrow #2.



Spinal Cord

2X
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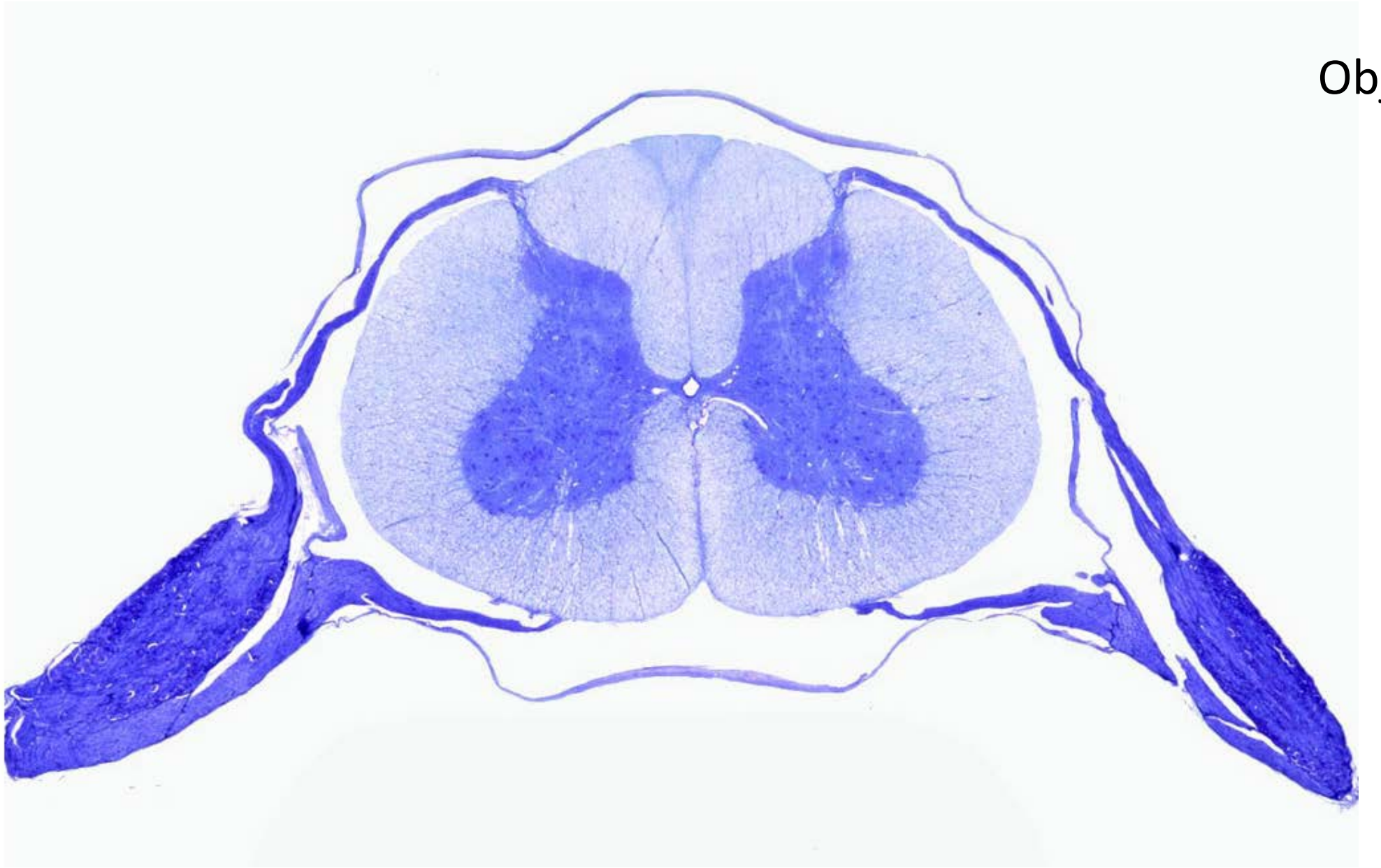

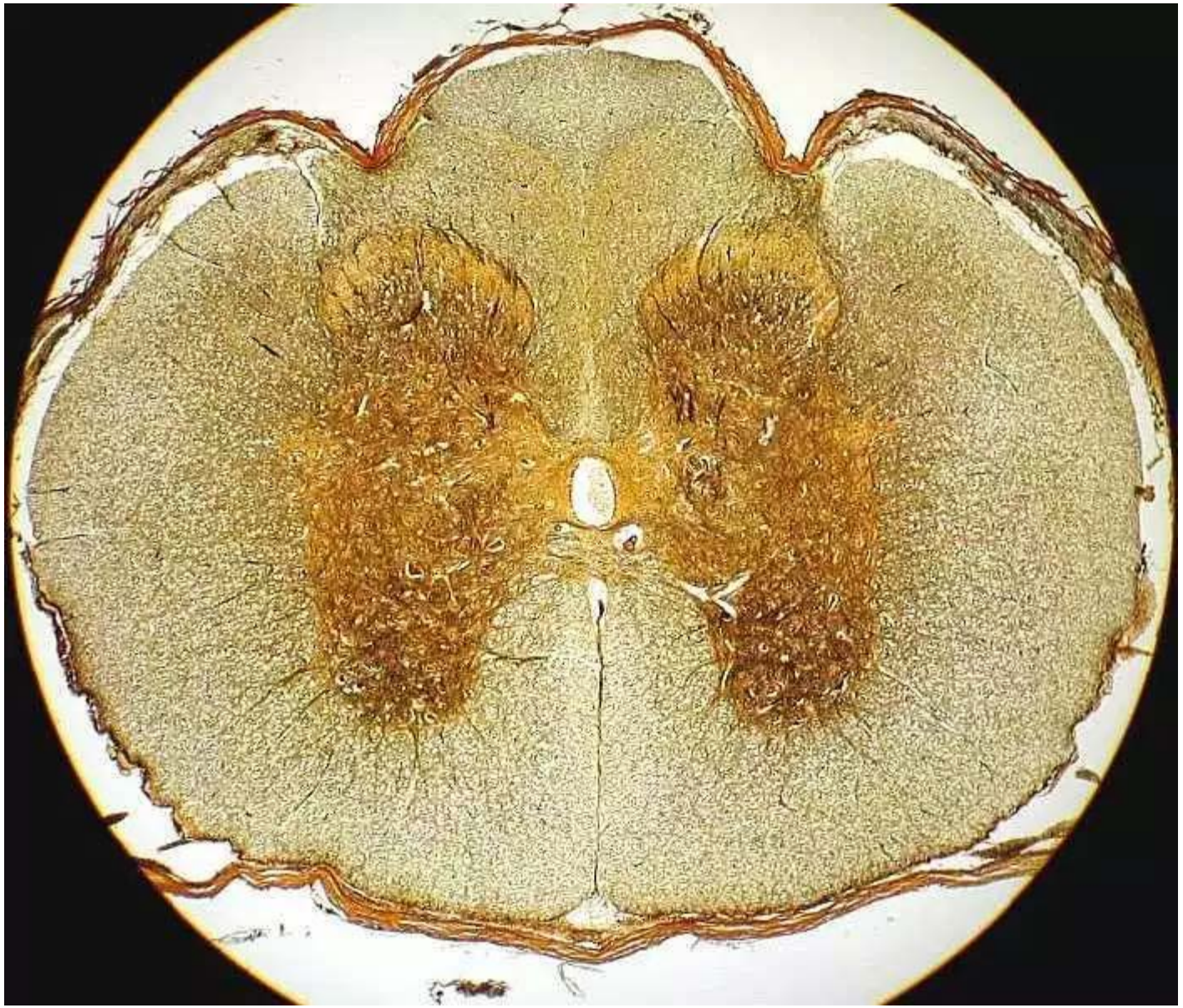

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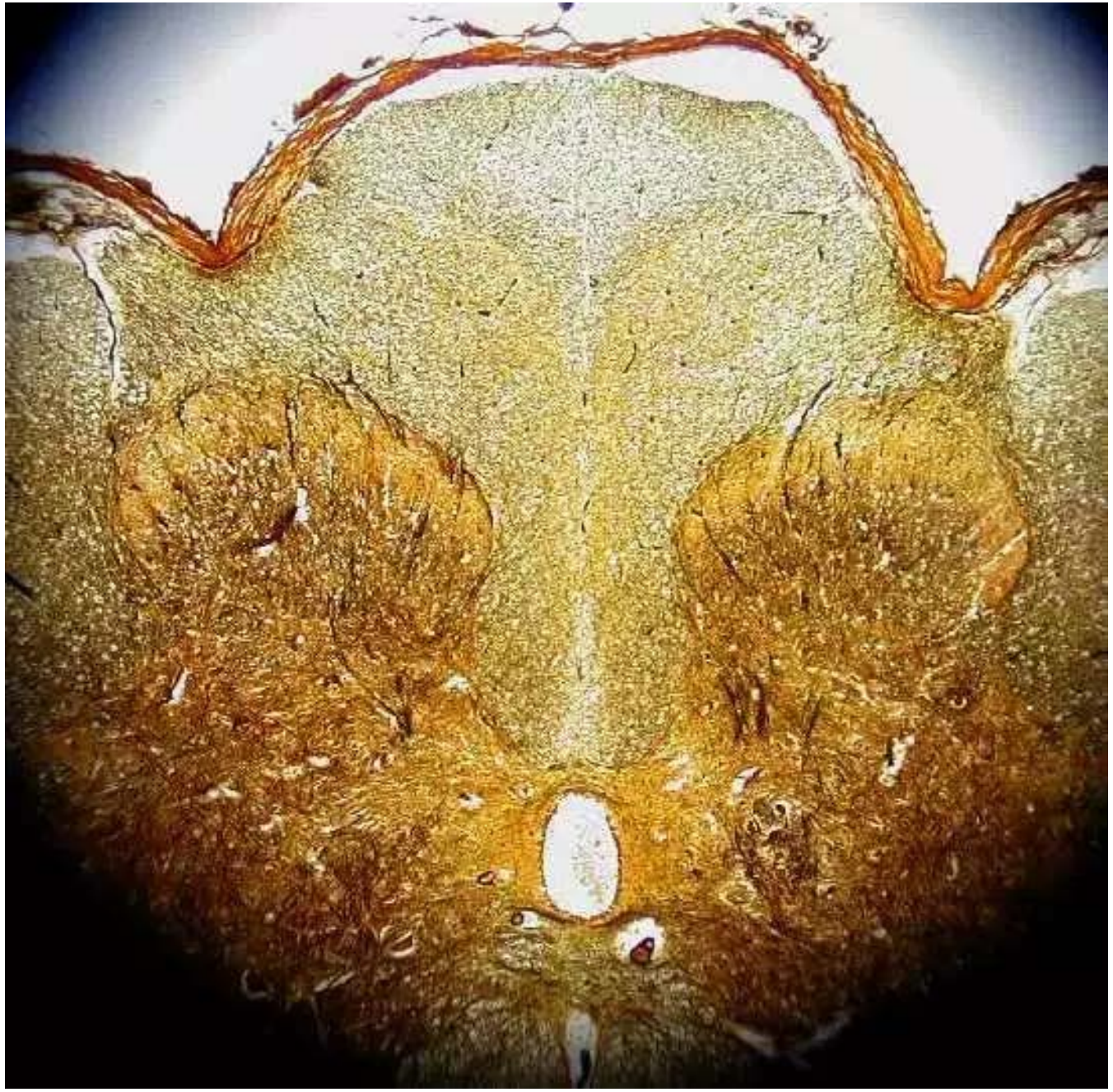

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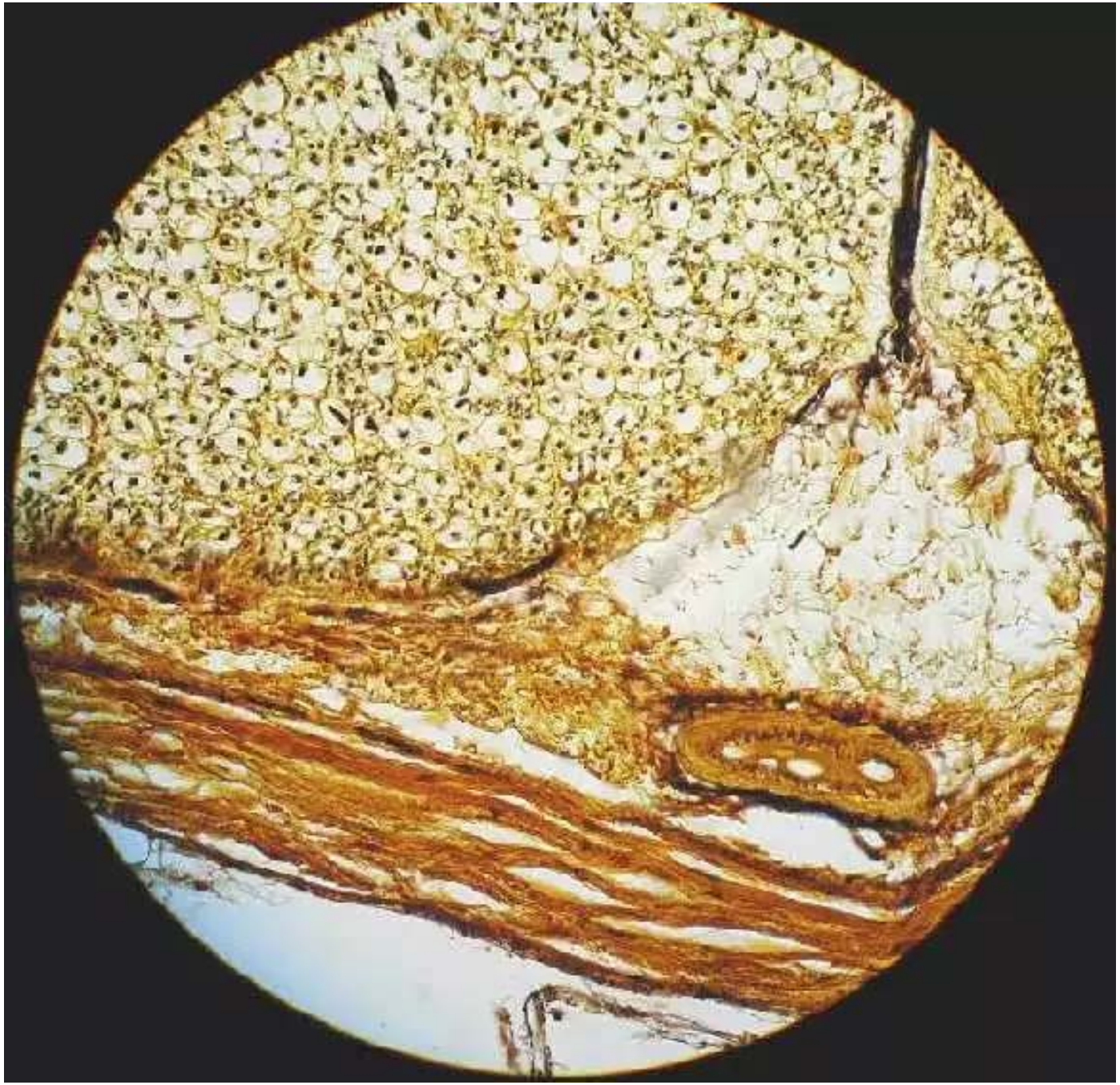

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Objective


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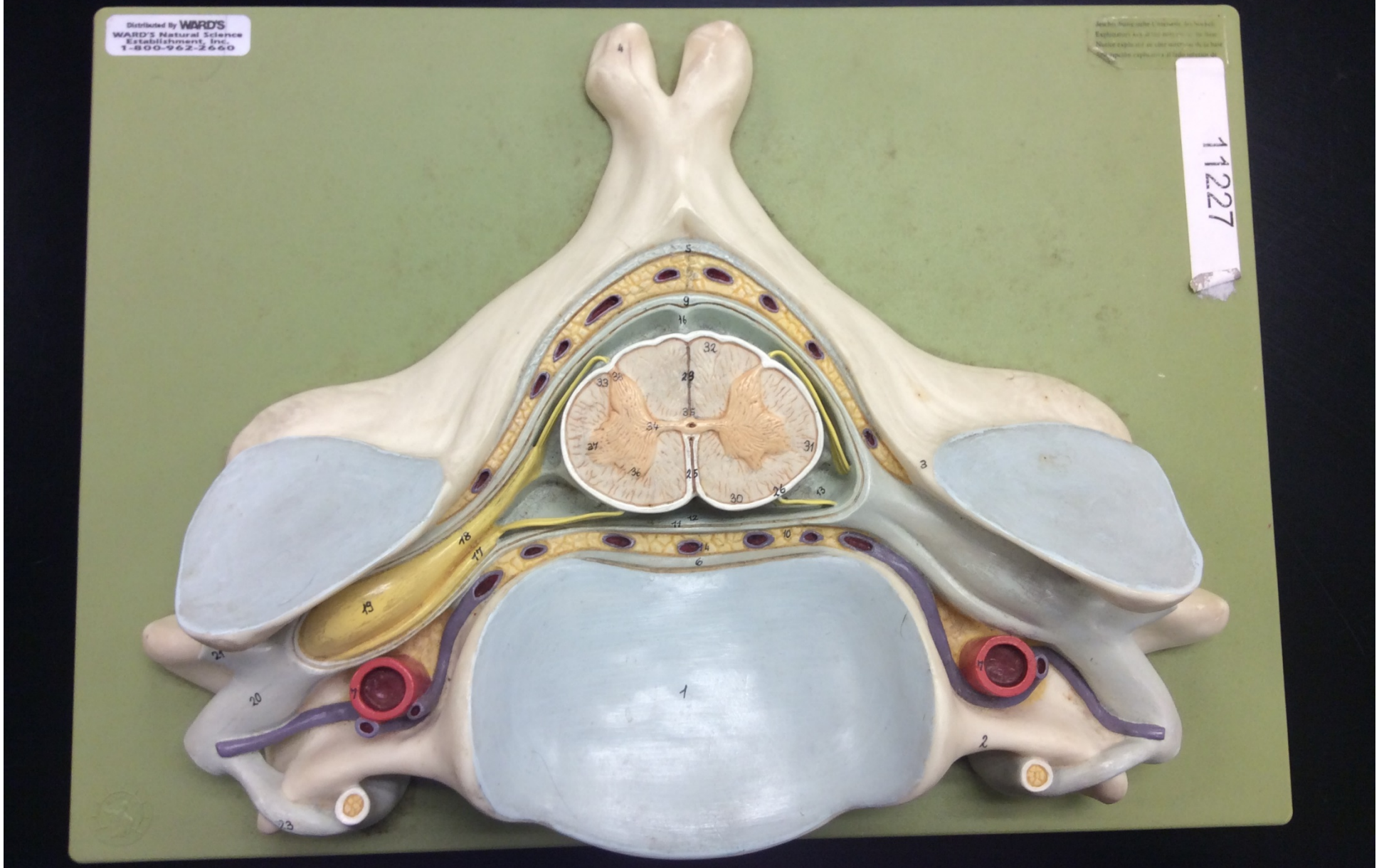
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Use the following pictures to help you identify terms from the lab term handout.

Another good resource is the Visible Body ATLAS app: http://atlas.visiblebody.com

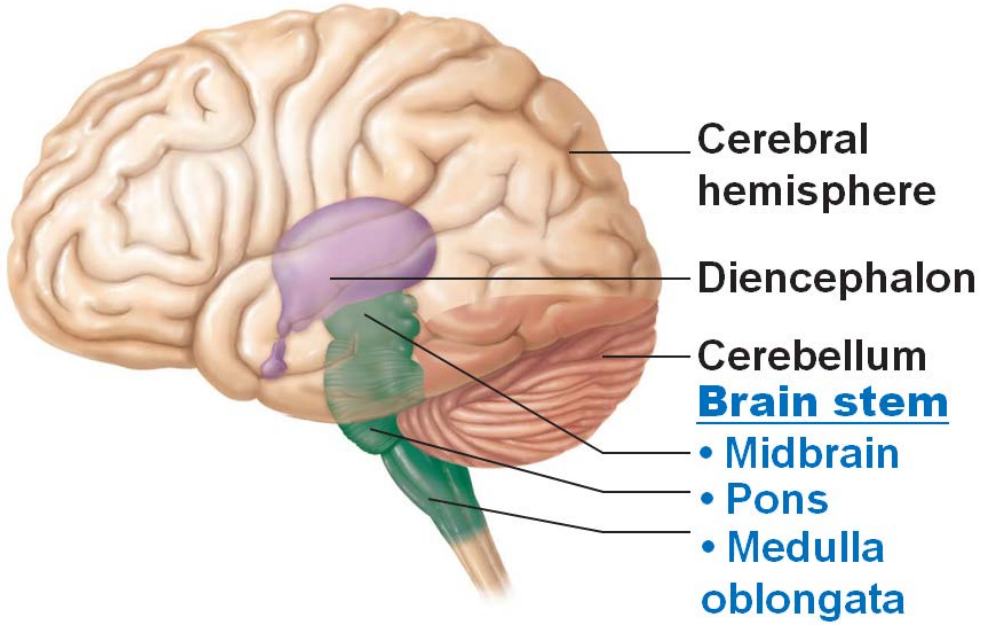
Don’t forget that to use the link to download to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

Brain Anatomy

Regions and Organization of the CNS

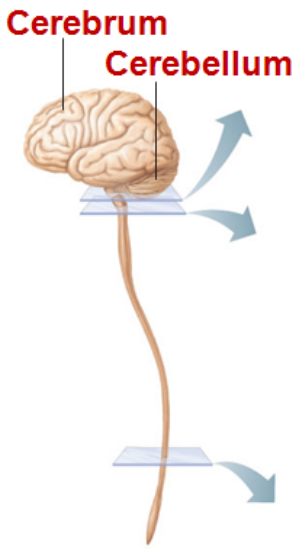
Adult brain regions

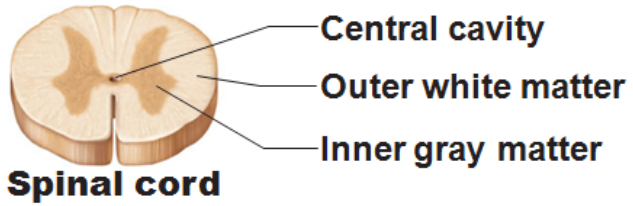
1. Cerebral hemispheres
2. Diencephalon
3. Brain stem (midbrain, pons, and medulla)
4. Cerebellum



Regions and Organization of the CNS

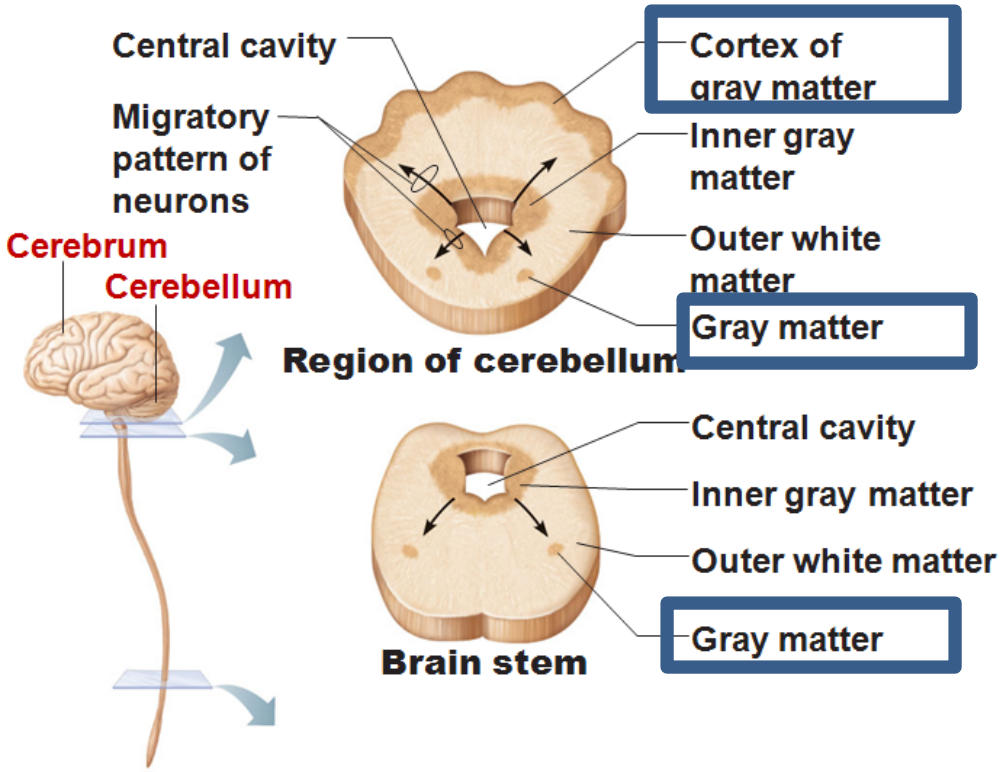
- Spinal cord
  - Central cavity surrounded by gray matter (cell bodies)
  - External white matter (myelinated fiber tracts)



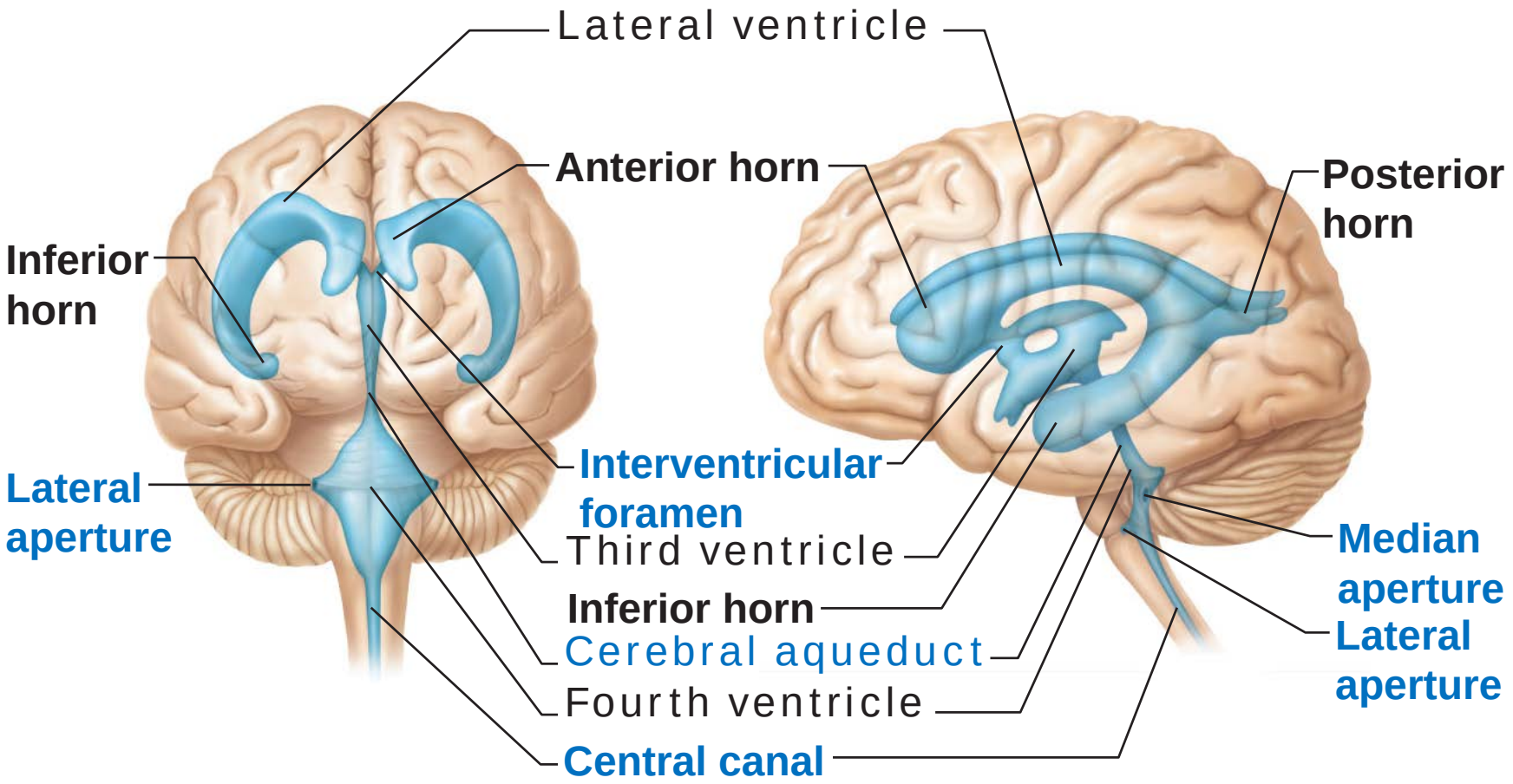


Regions and Organization of the CNS

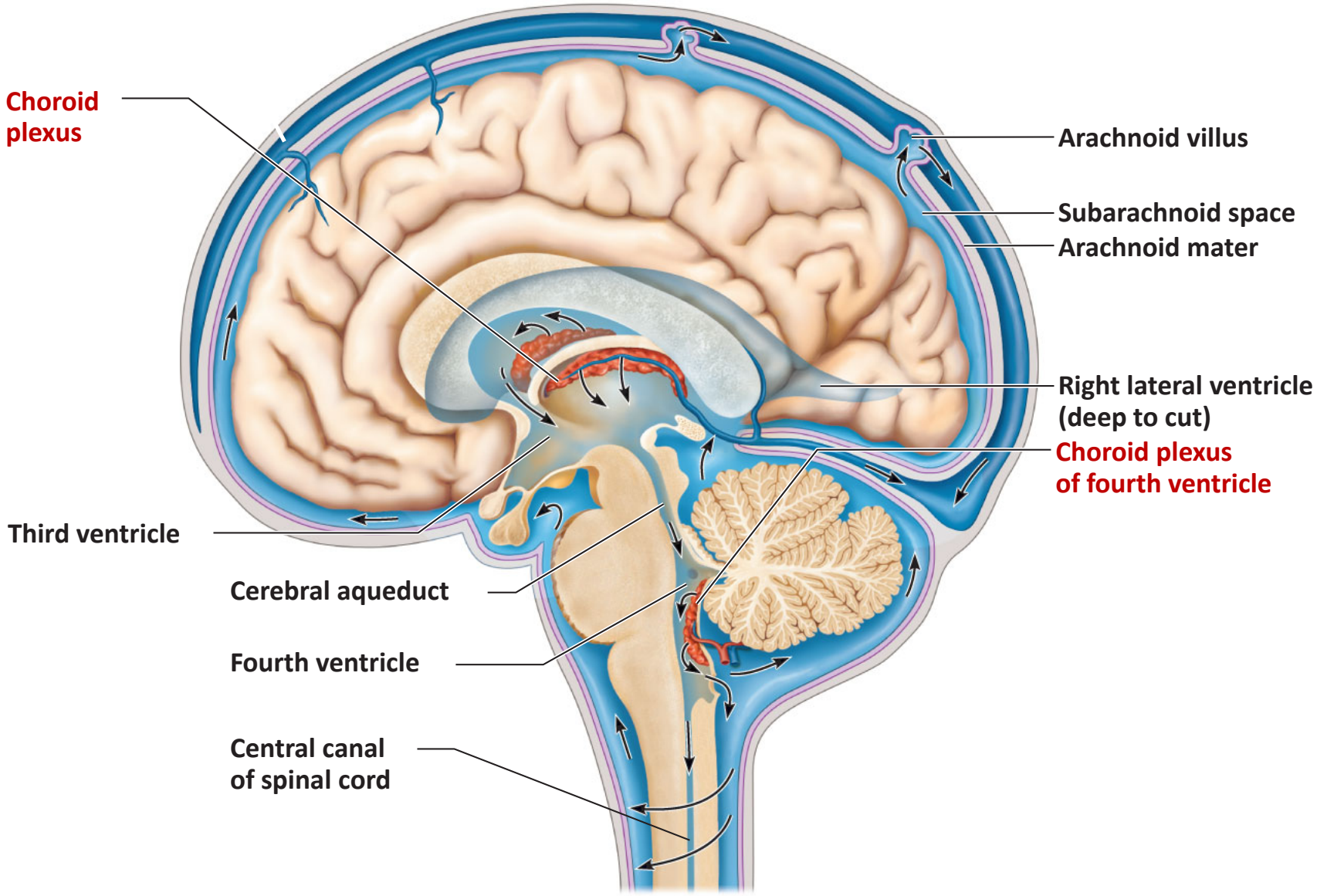
- Brain
  - Similar pattern with additional areas of gray matter



Open Spaces – Ventricles and their connections



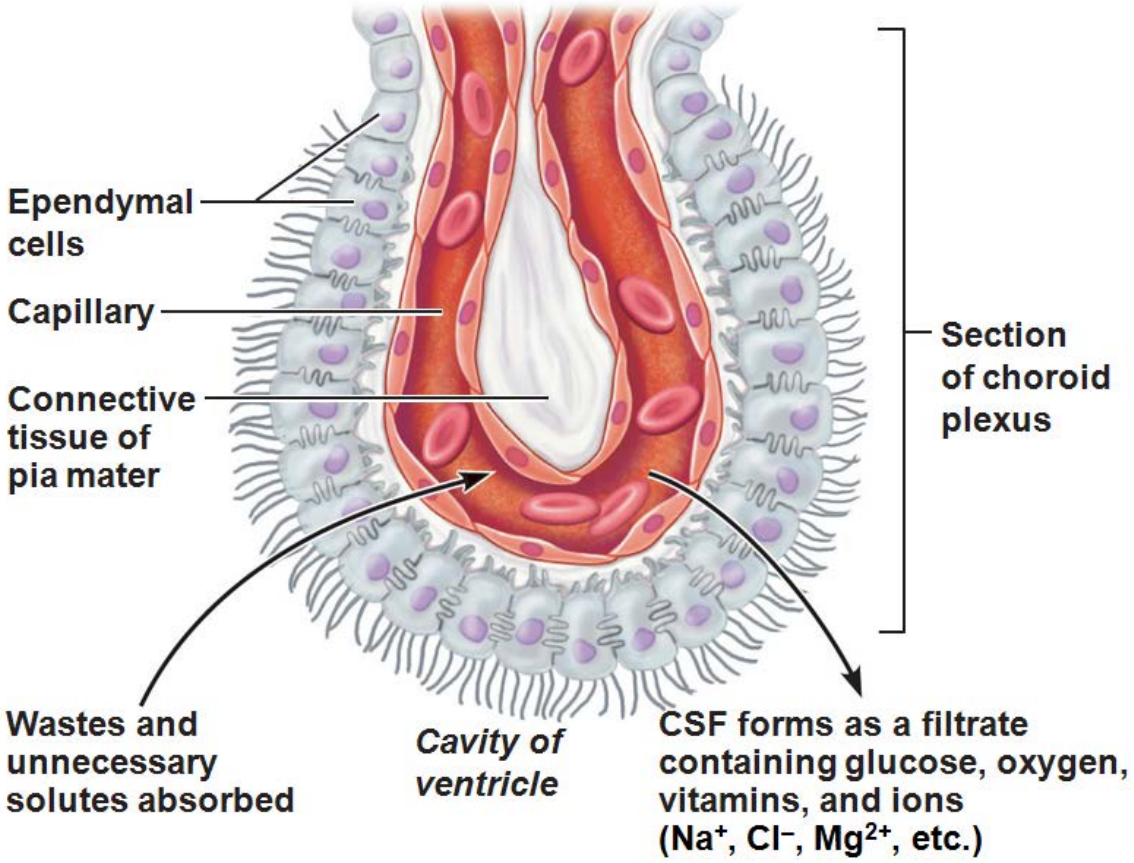
Choroid Plexuses – make CSF



Marieb

Choroid Plexuses

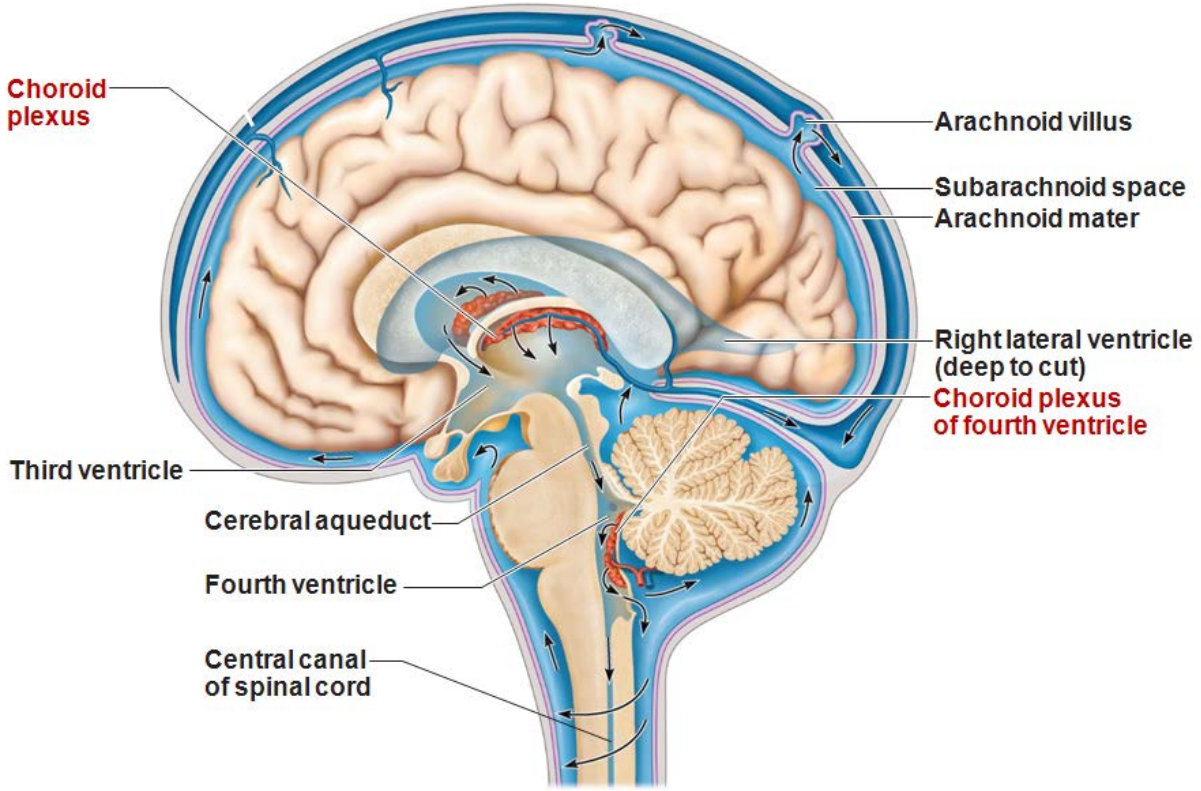
- Clusters of capillaries enclosed by pia mater + a layer of ependymal cells



Marieb

Choroid Plexuses

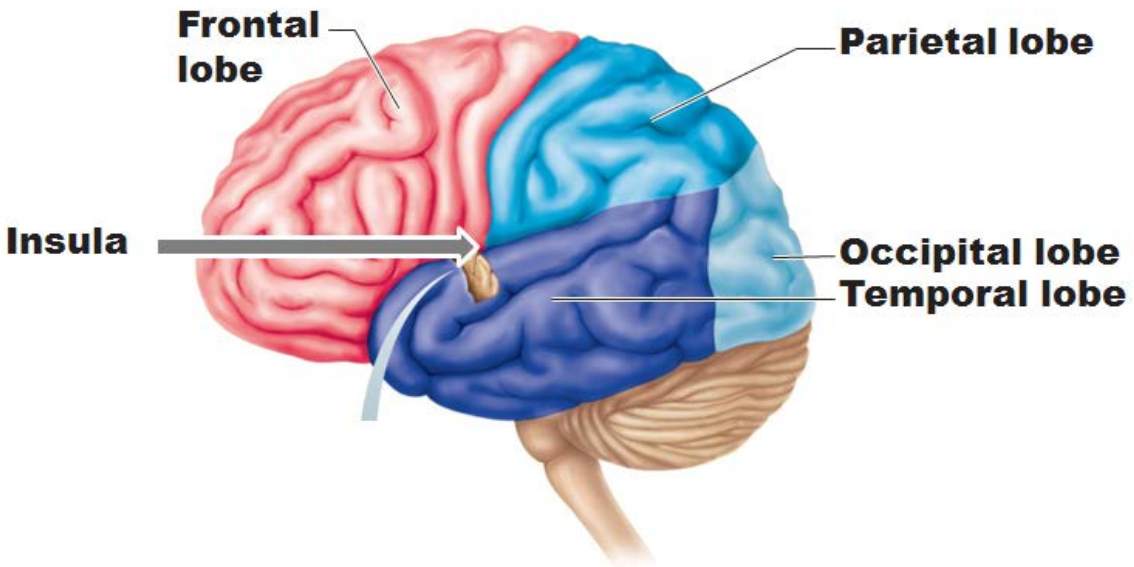
- Clusters of capillaries enclosed by pia mater + a layer of ependymal cells
  - Hang from the roof of each ventricle

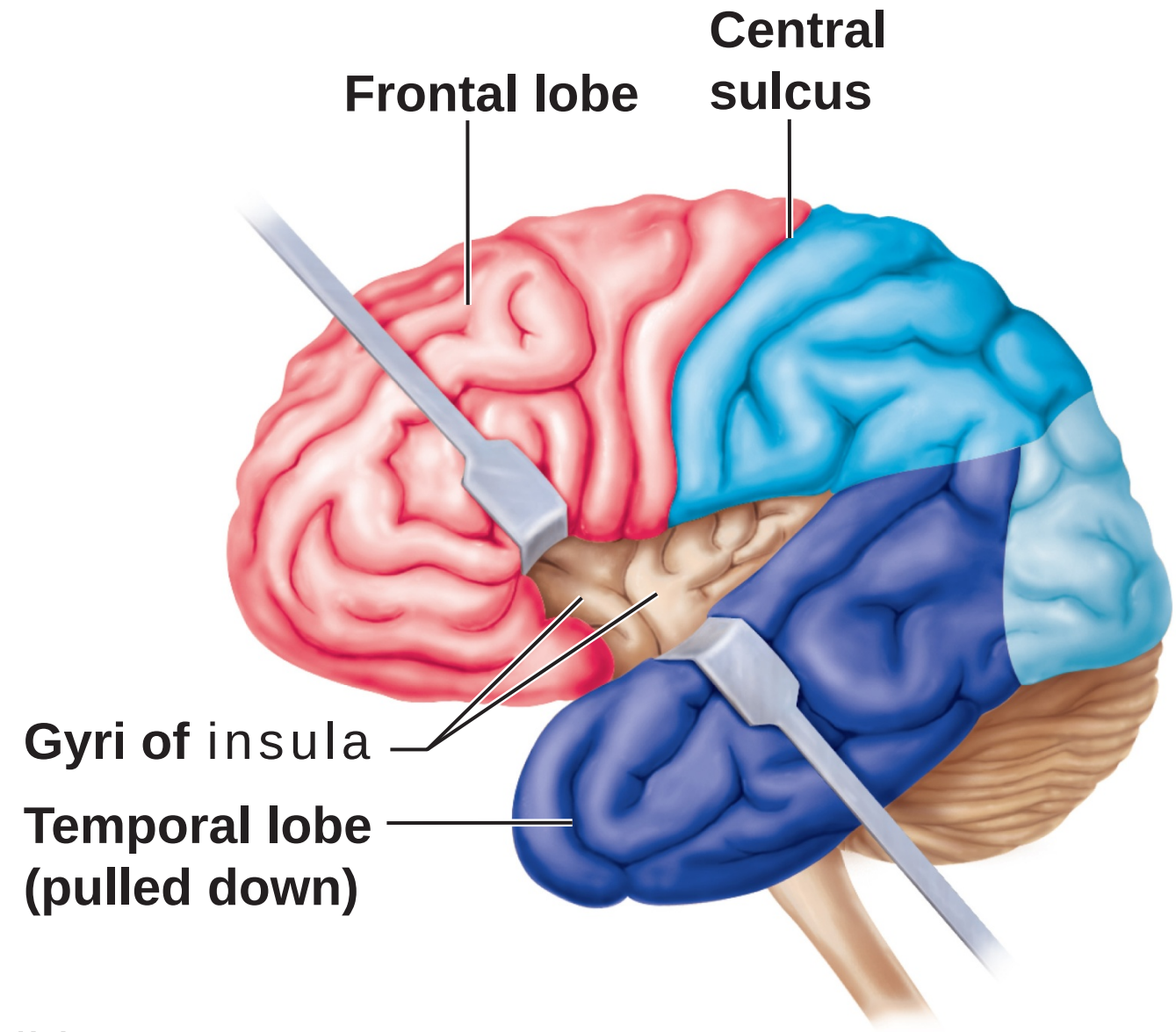


Marieb

Cerebral Hemispheres

- Surface markings
  - Ridges (**gyri**), shallow grooves (**sulci**), and deep grooves (**fissures**)
  - Five lobes
    1. Frontal
    2. Parietal
    3. Temporal
    4. Occipital
    5. Insula

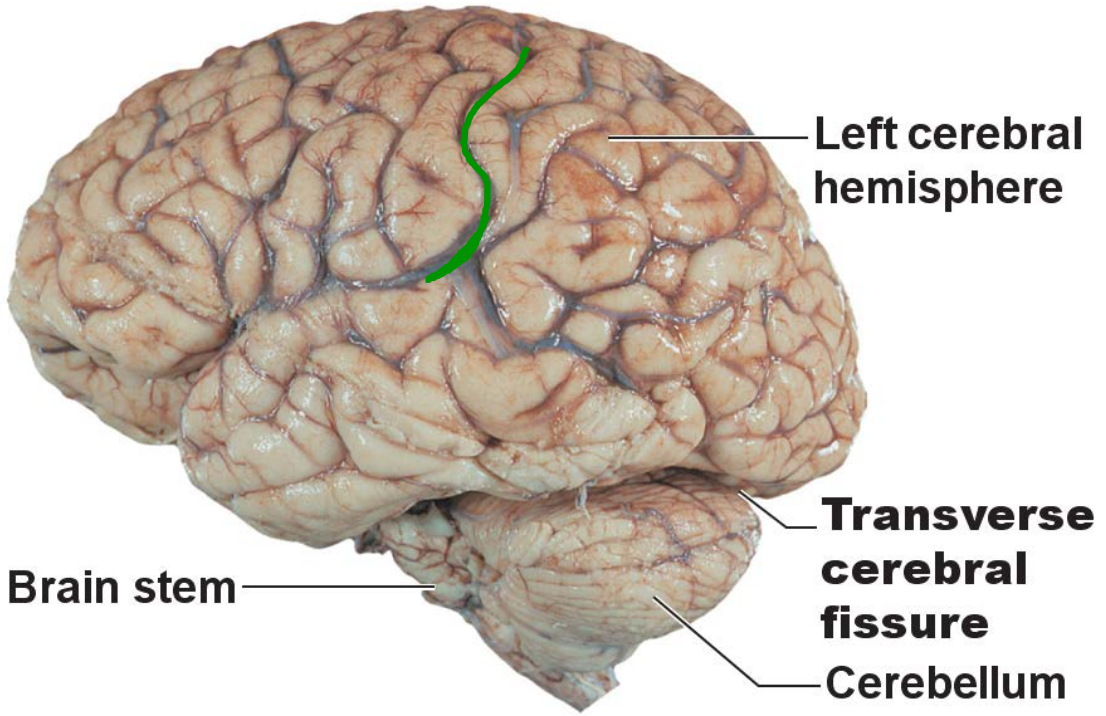



Frontal lobe
Central sulcus
Gyri of insula
Temporal lobe (pulled down)

(b)

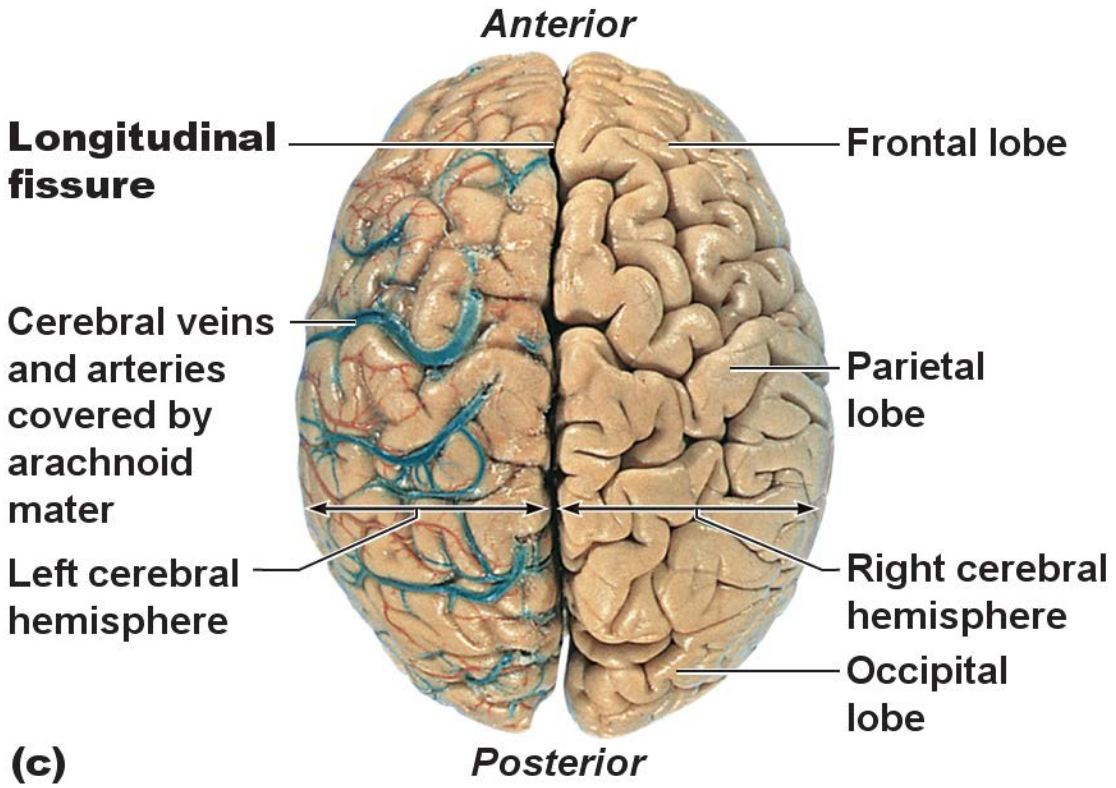
Cerebral Hemispheres

- Surface markings
  - Central sulcus
    - Separates the frontal lobe and the parietal lobe



Cerebral Hemispheres

- Surface markings
  - Longitudinal fissure
    - Separates the two hemispheres



Cerebral Hemispheres

- Surface markings
  - Transverse cerebral fissure
    - Separates the cerebrum and the cerebellum

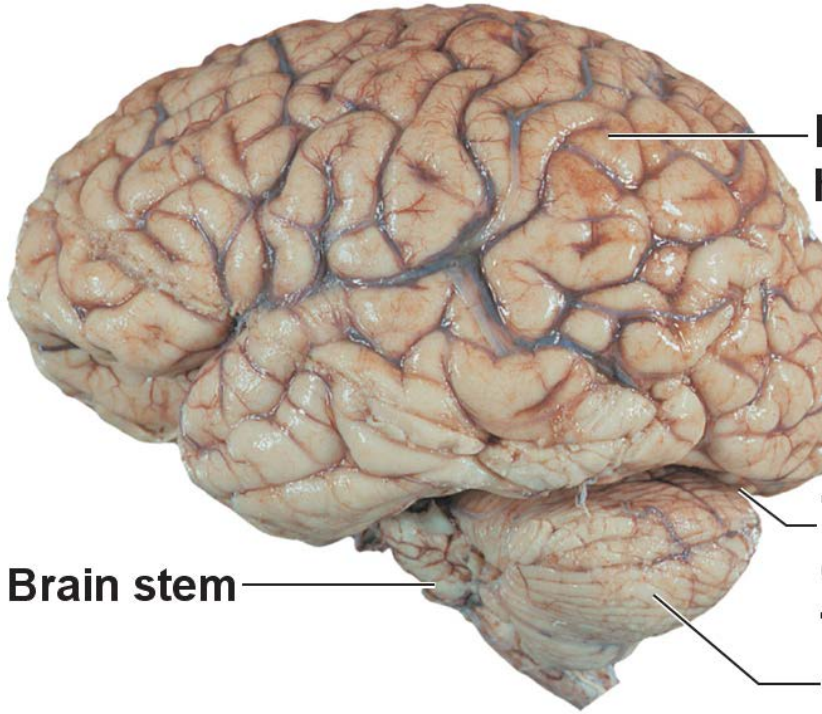
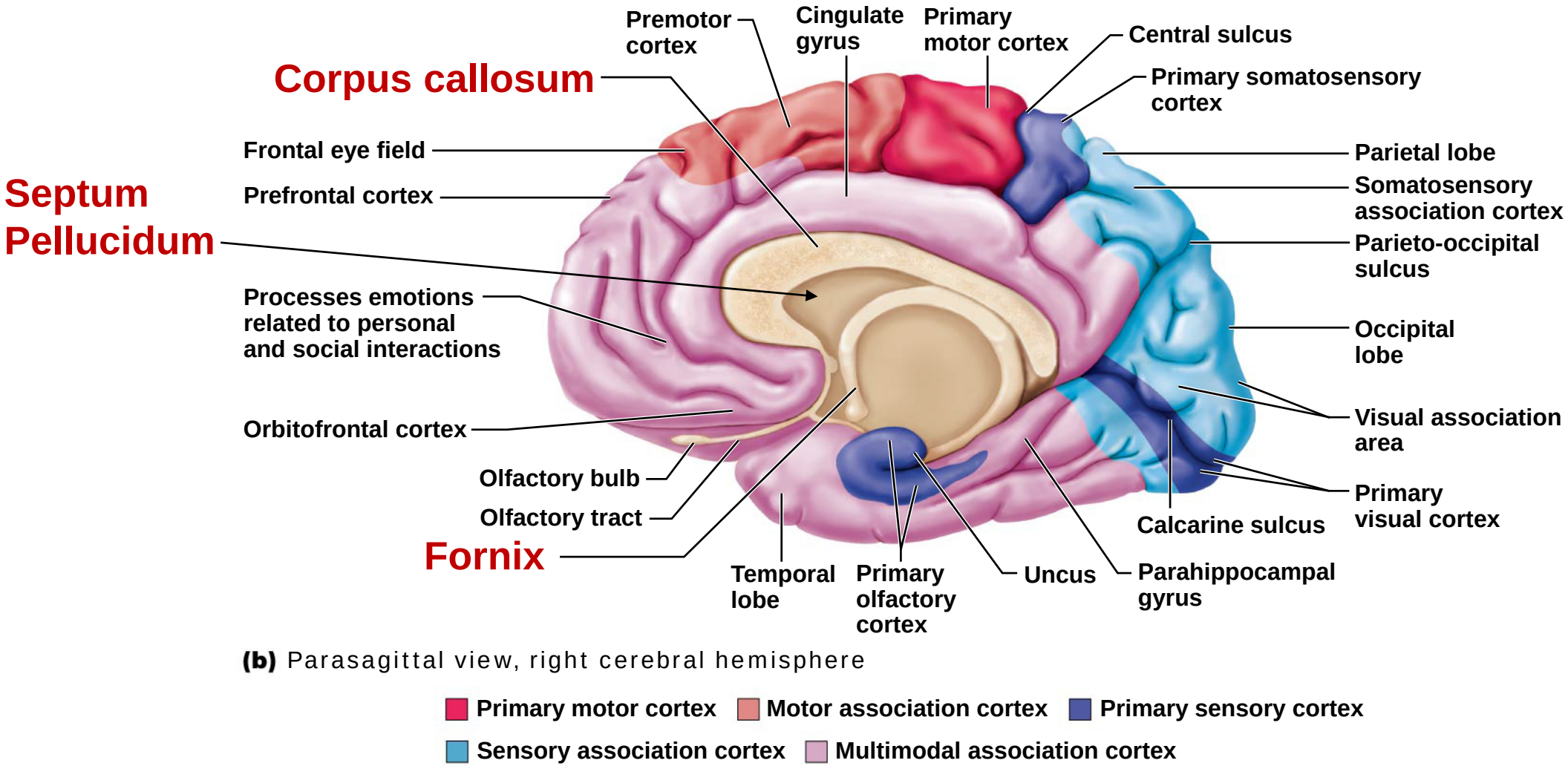
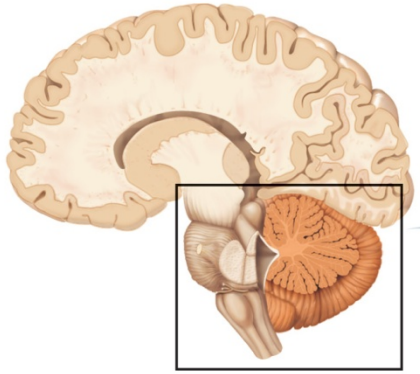


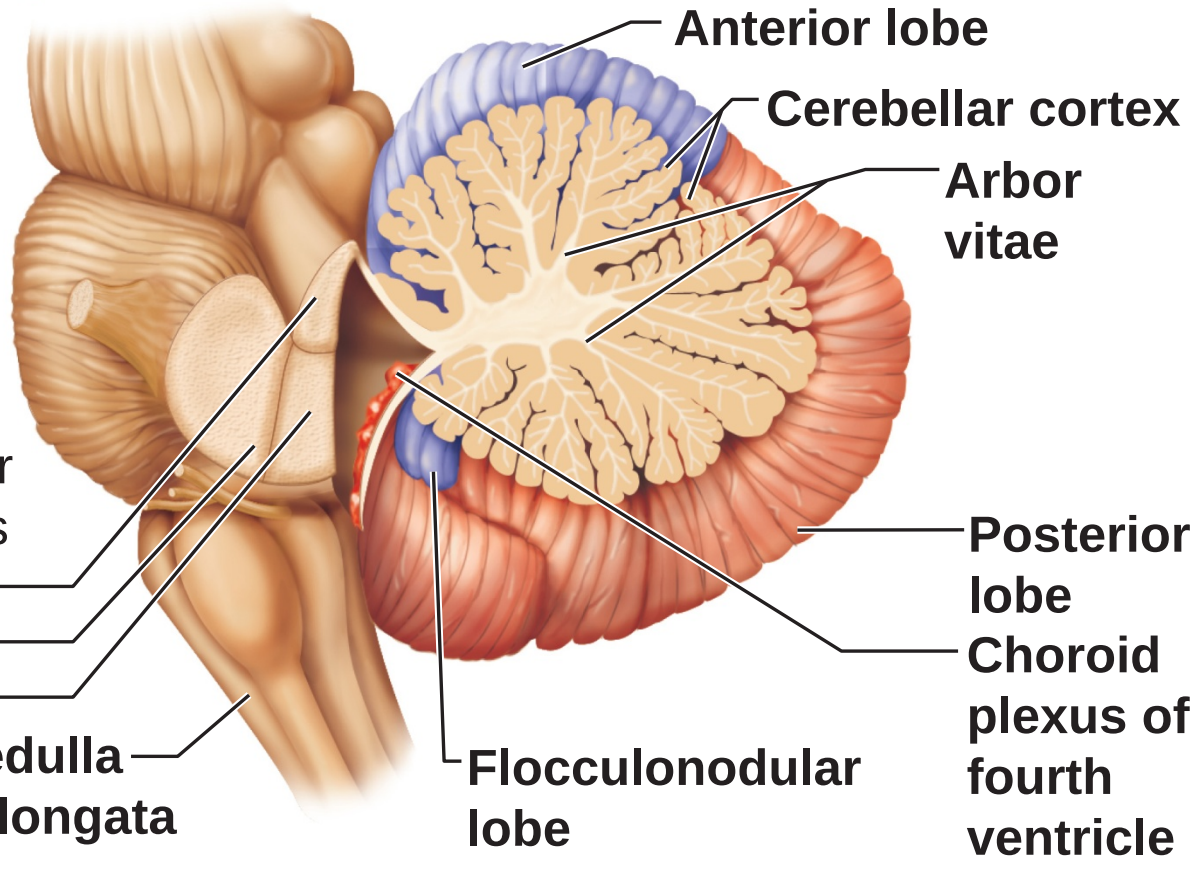
Figure 12.7b Functional and structural areas of the cerebral cortex.



The Cerebellum



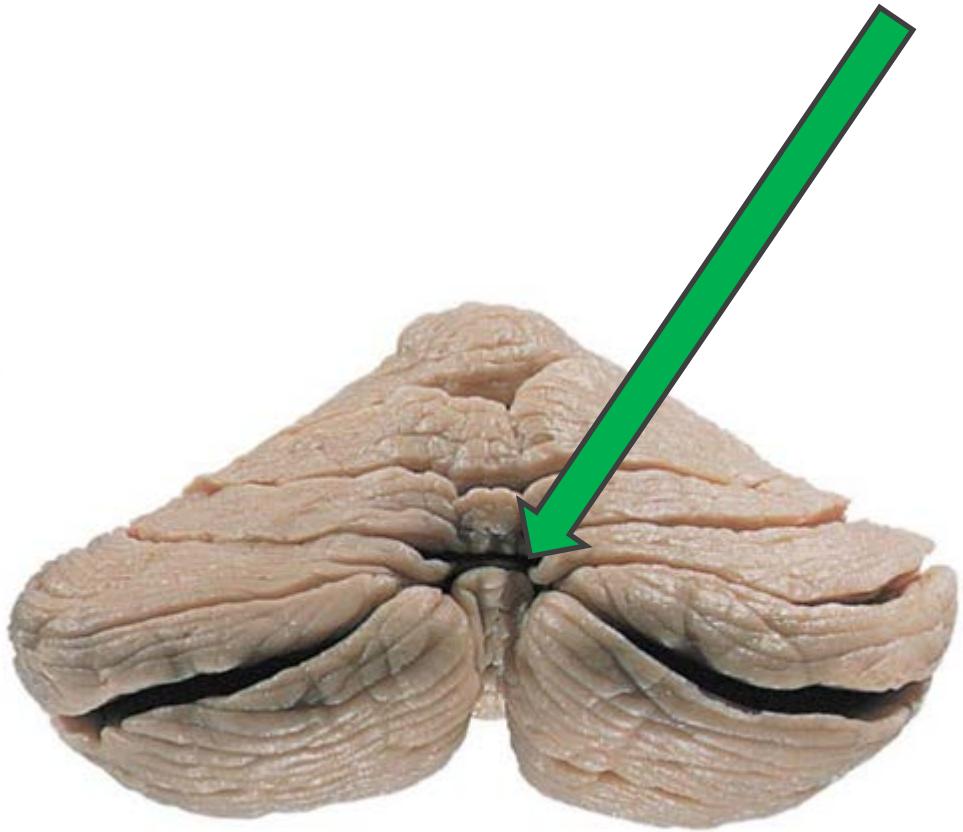
Subconsciously provides precise timing and appropriate patterns of skeletal muscle contraction.



Marieb

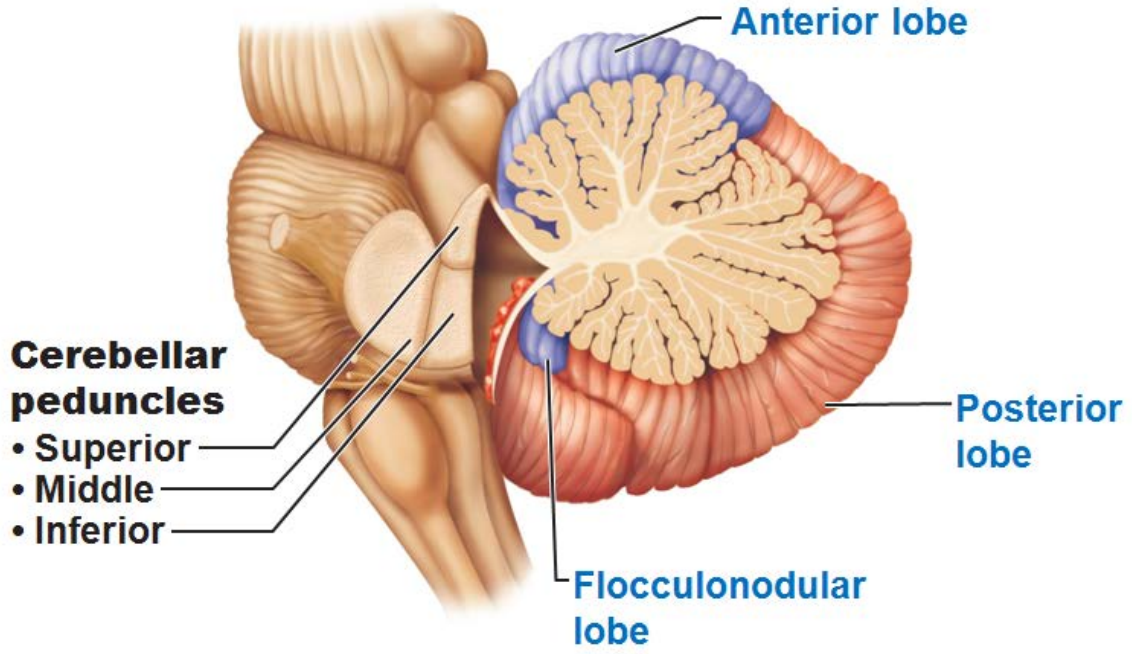
Anatomy of the Cerebellum

- Two hemispheres connected by vermis



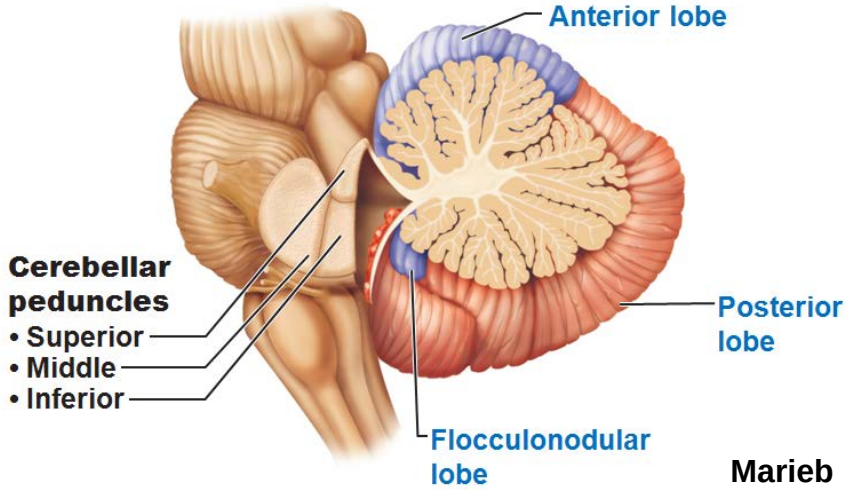
Anatomy of the Cerebellum

- Two hemispheres connected by vermis
- Each hemisphere has three lobes
  - **Anterior**, **posterior**, and **flocculonodular**

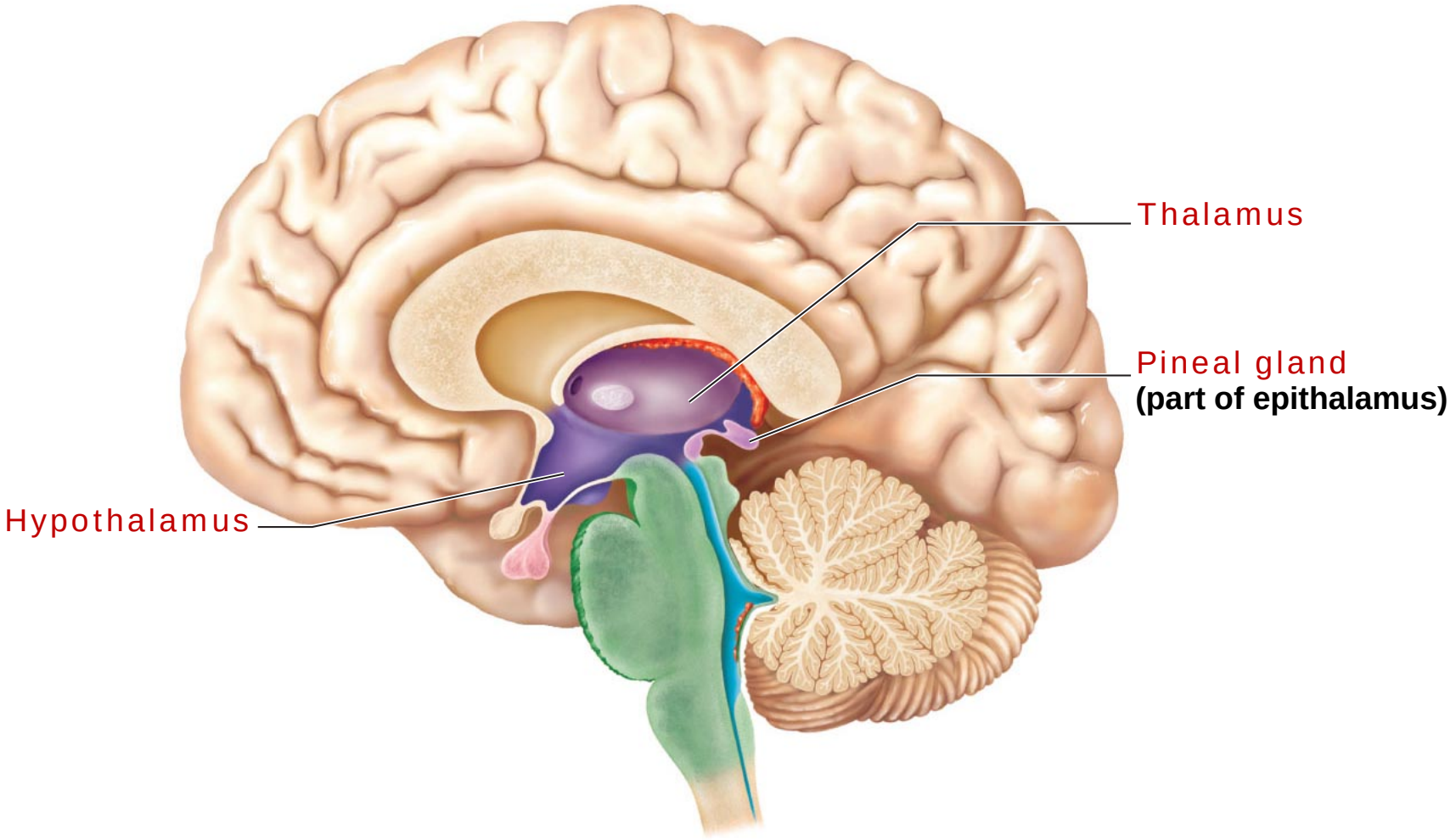


Anatomy of the Cerebellum

- Two hemispheres connected by vermis
- Each hemisphere has three lobes
  - **Anterior**, **posterior**, and **flocculonodular**
- **Arbor vitae**—distinctive treelike pattern of the cerebellar white matter

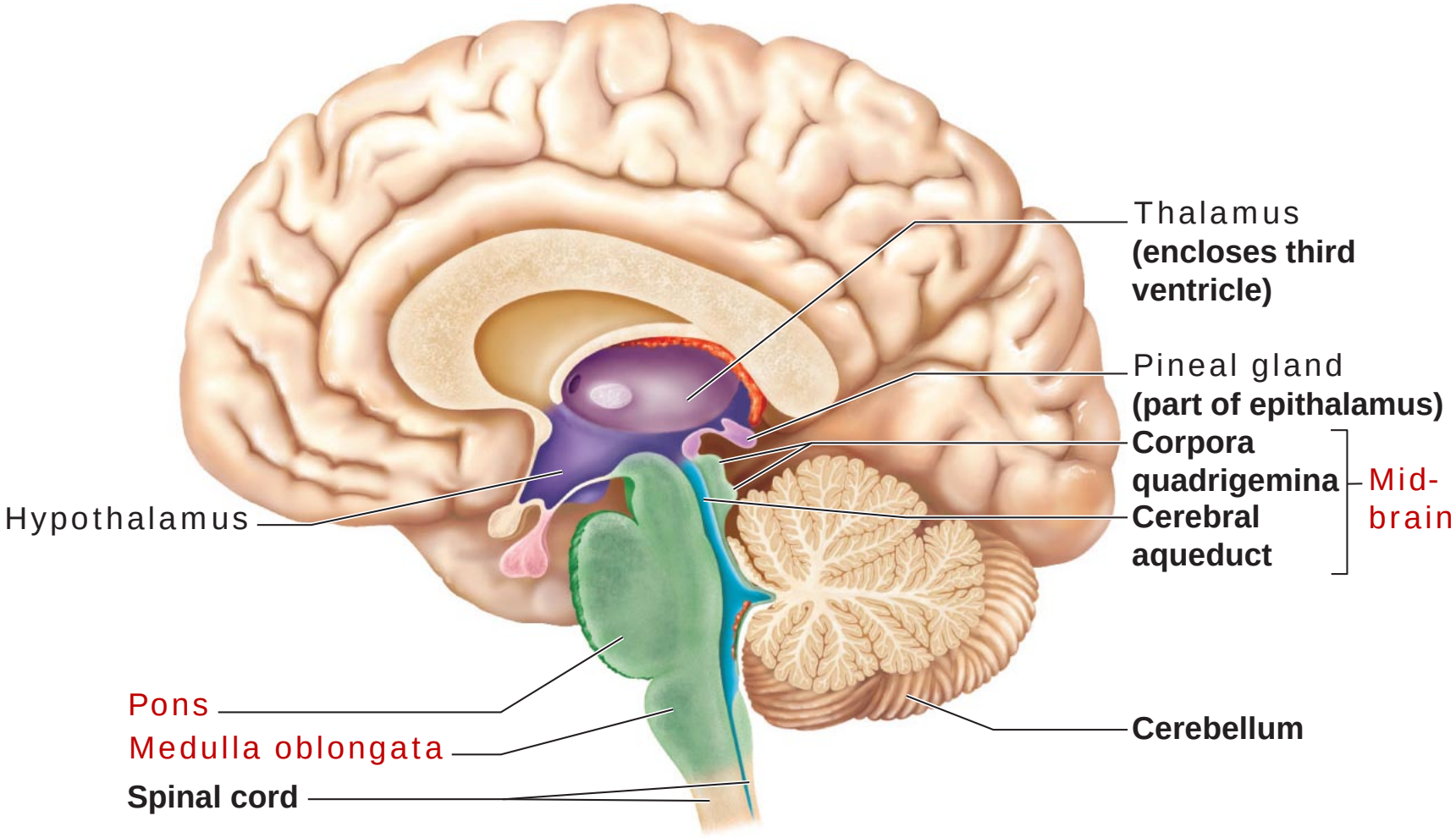


Diencephalon



Marieb

Brain Stem



Marieb

"Oh Once One Takes The Anatomy Final, Very Good Vacations Are Heavenly"

Cranial nerves I – VI	Sensory function	Motor function	PS* fibers
I Olfactory	Yes (smell)	No	No
II Optic	Yes (vision)	No	No
III Oculomotor	No	Yes	Yes
IV Trochlear	No	Yes	No
V Trigeminal	Yes (general sensation)	Yes	No
VI Abducens	No	Yes	No

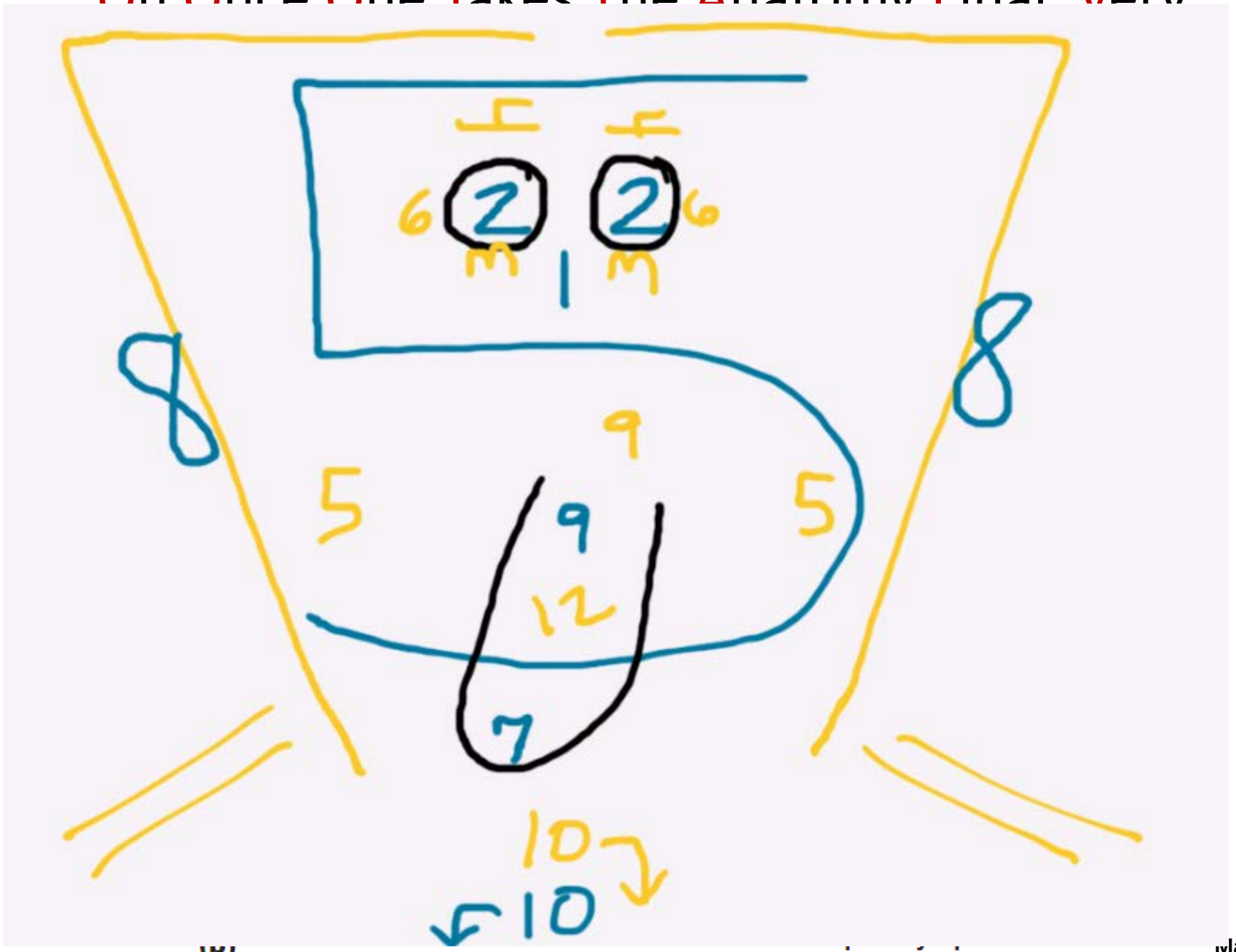
Cranial nerves VII – XII	Sensory function	Motor function	PS* fibers
VII Facial	Yes (taste)	Yes	Yes
VIII Vestibulocochlear	Yes (hearing and balance)	Some	No
IX Glossopharyngeal	Yes (taste)	Yes	Yes
X Vagus	Yes (taste)	Yes	Yes
XI Accessory	No	Yes	No
XII Hypoglossal	No	Yes	No

(b)

*PS = parasympathetic

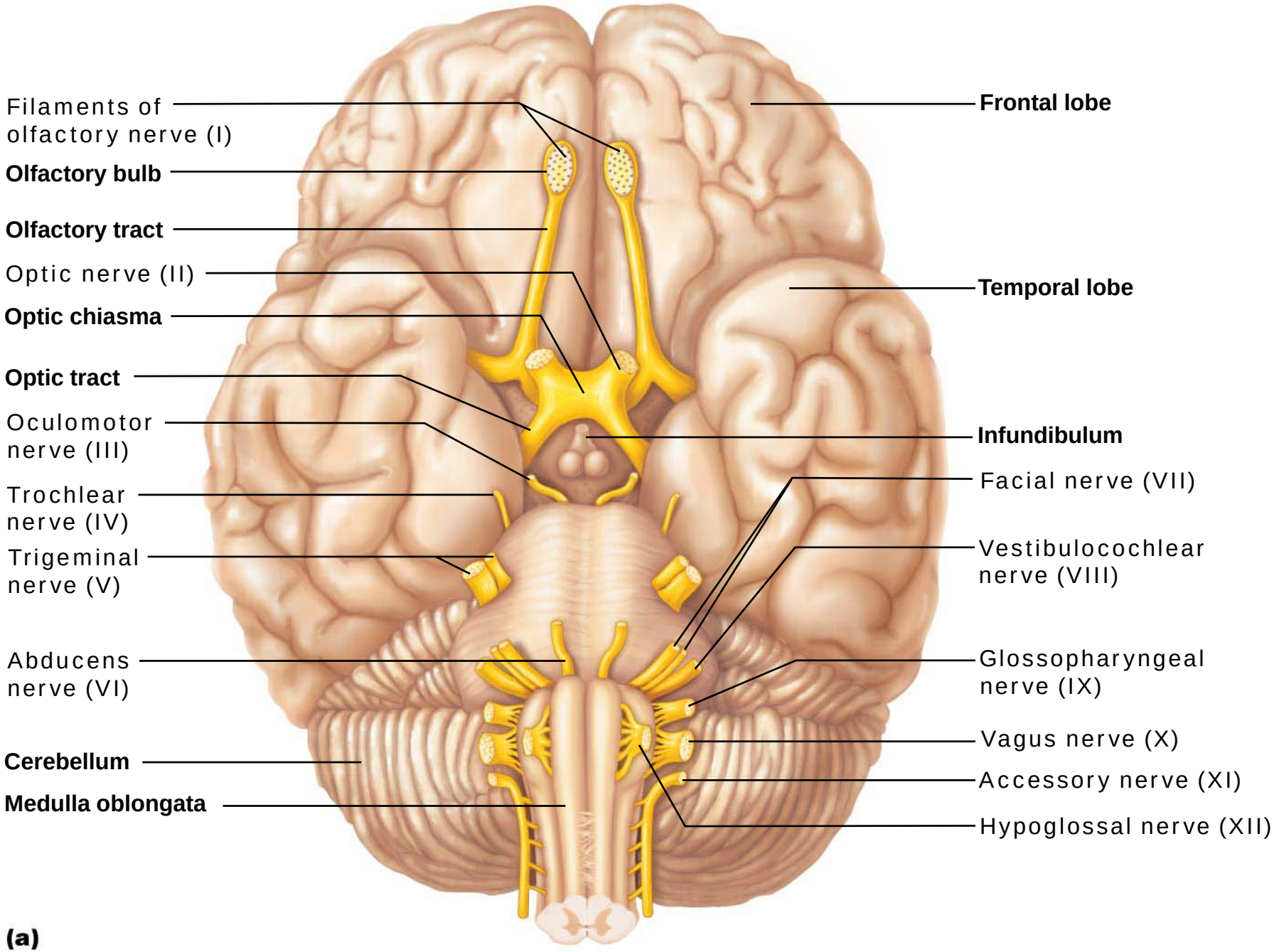
Marieb

“Oh Once One Takes The Anatomy Final, Very



Marieb

Figure 13.6a Location and function of cranial nerves.



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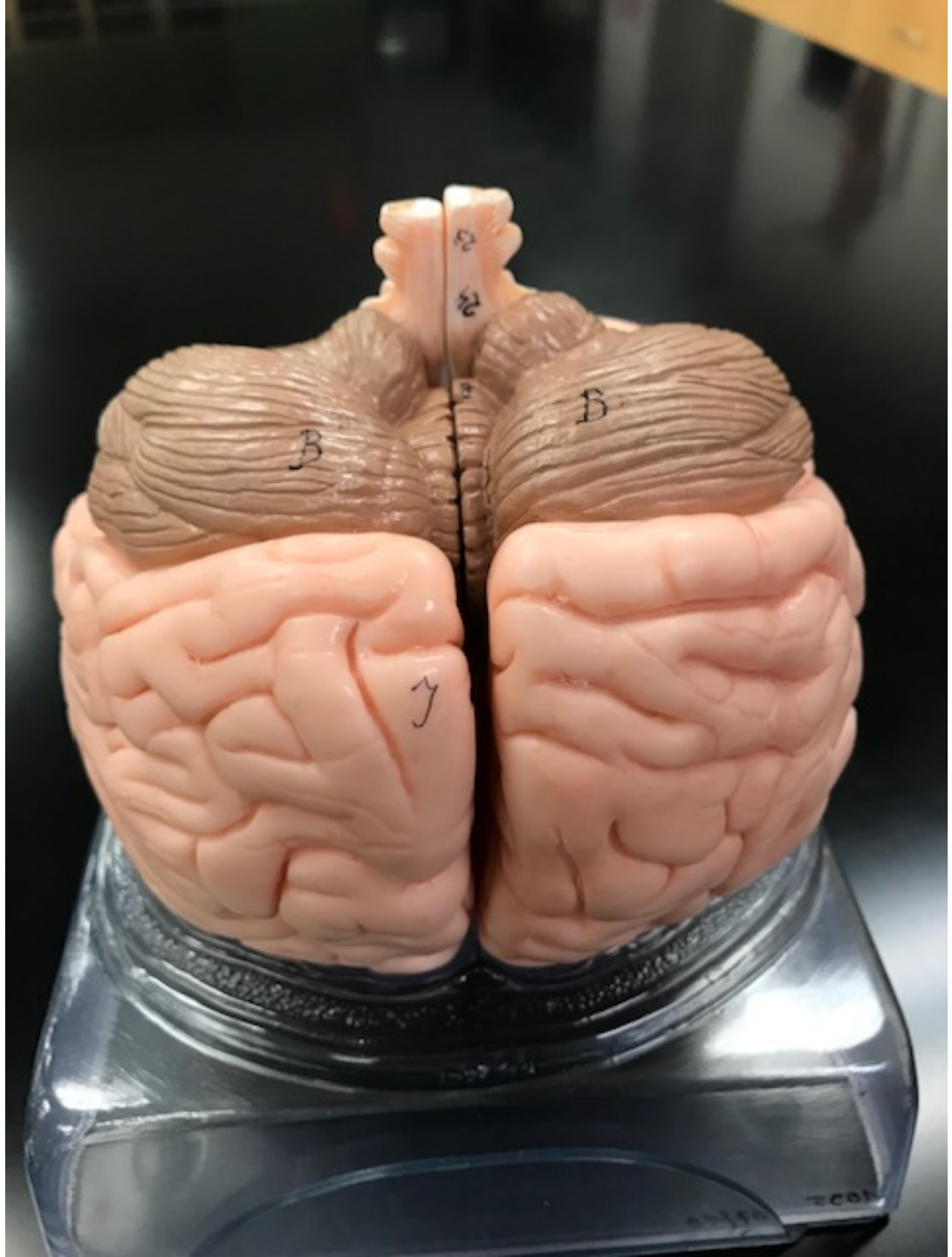
- Over the weekend, once you are feeling confident with the pictures here, do the brain model quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

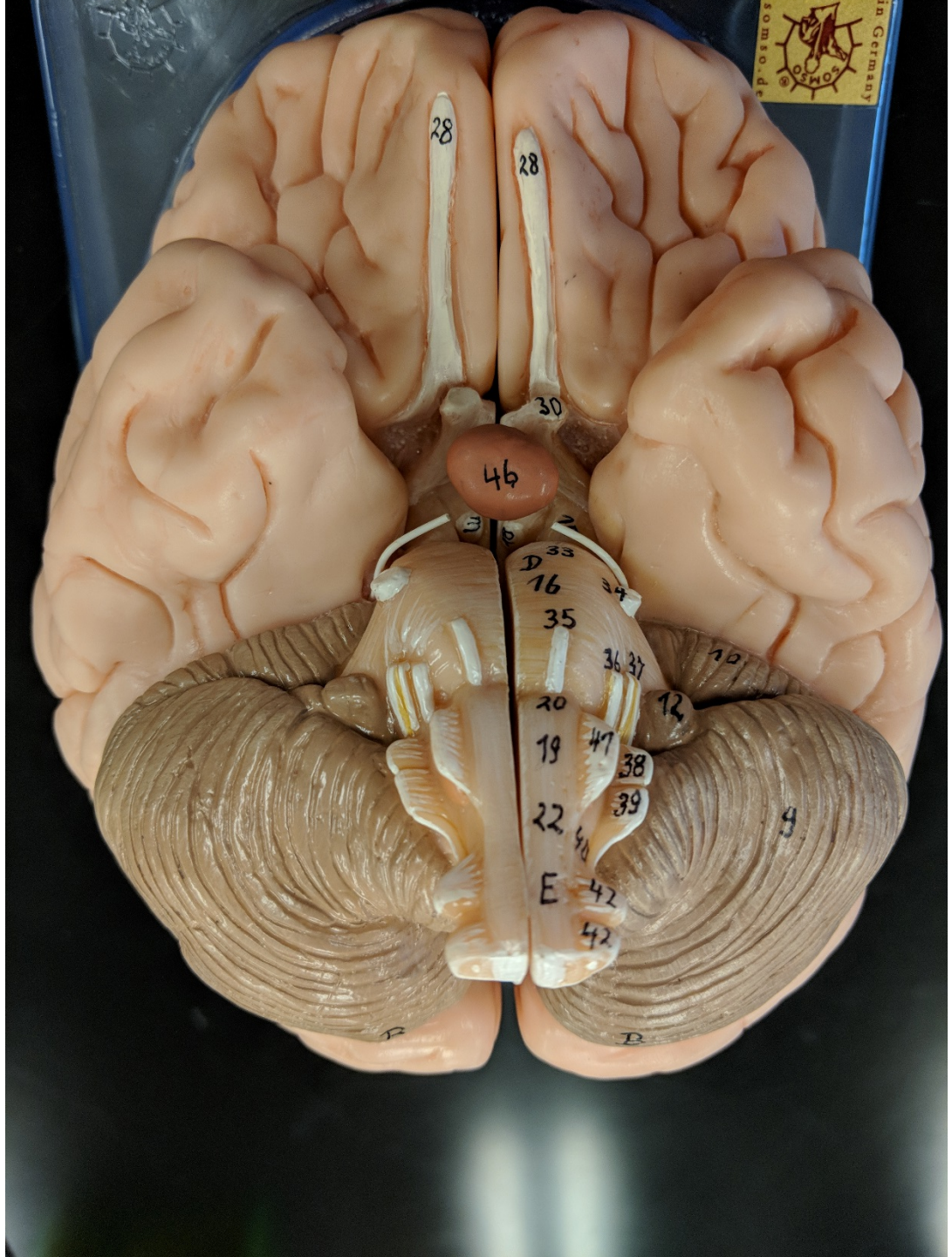
Brain Anatomy

**There are two several brain models so there is a lot of repetition, but it is good to practice with all of the pictures.

This model can only be midsagitally sectioned.

It's open spaces are empty so it will be easier to find open spaces on the model that has clear/blue plastic representing the CSF (starting on Slide #72).

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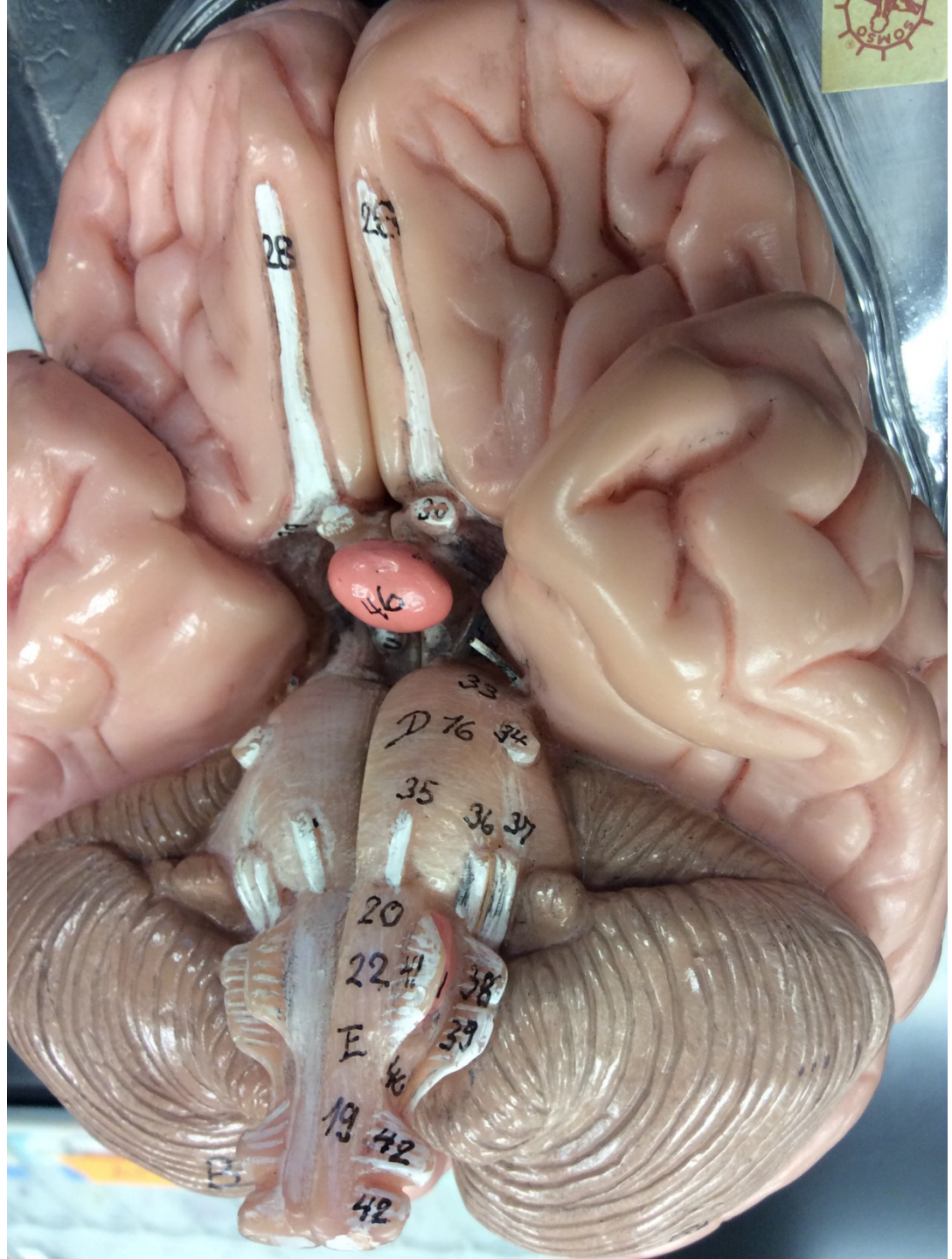
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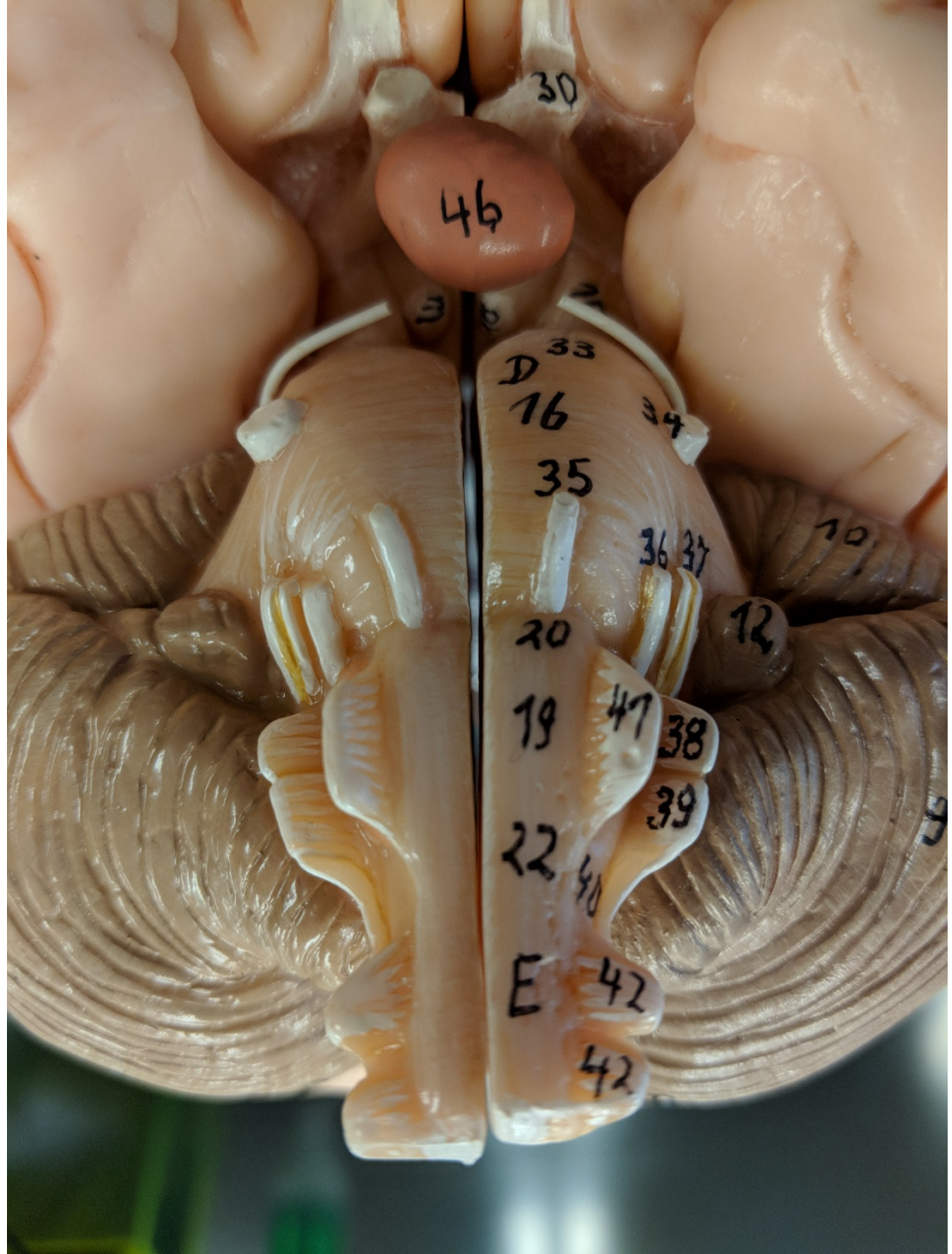
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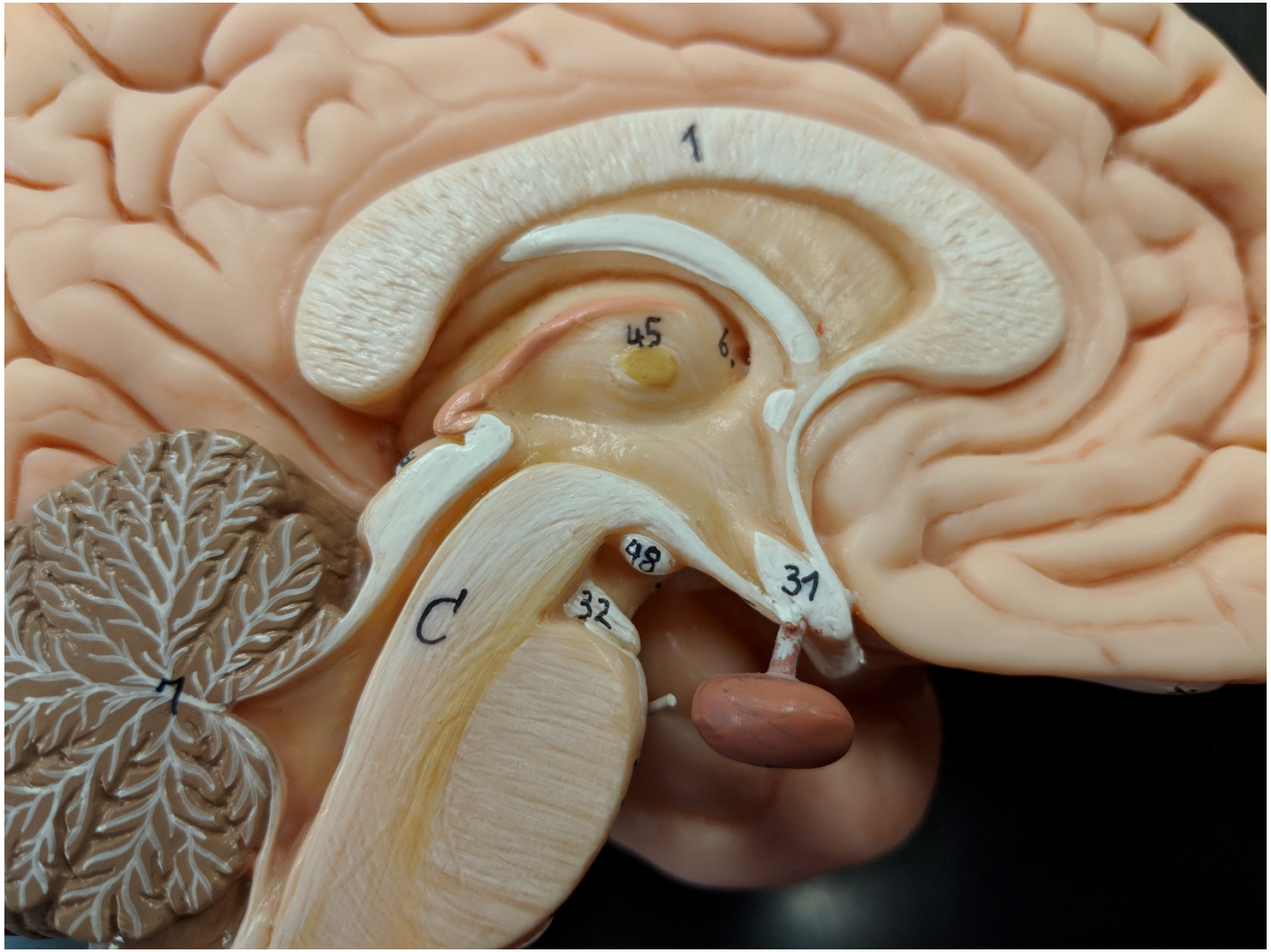
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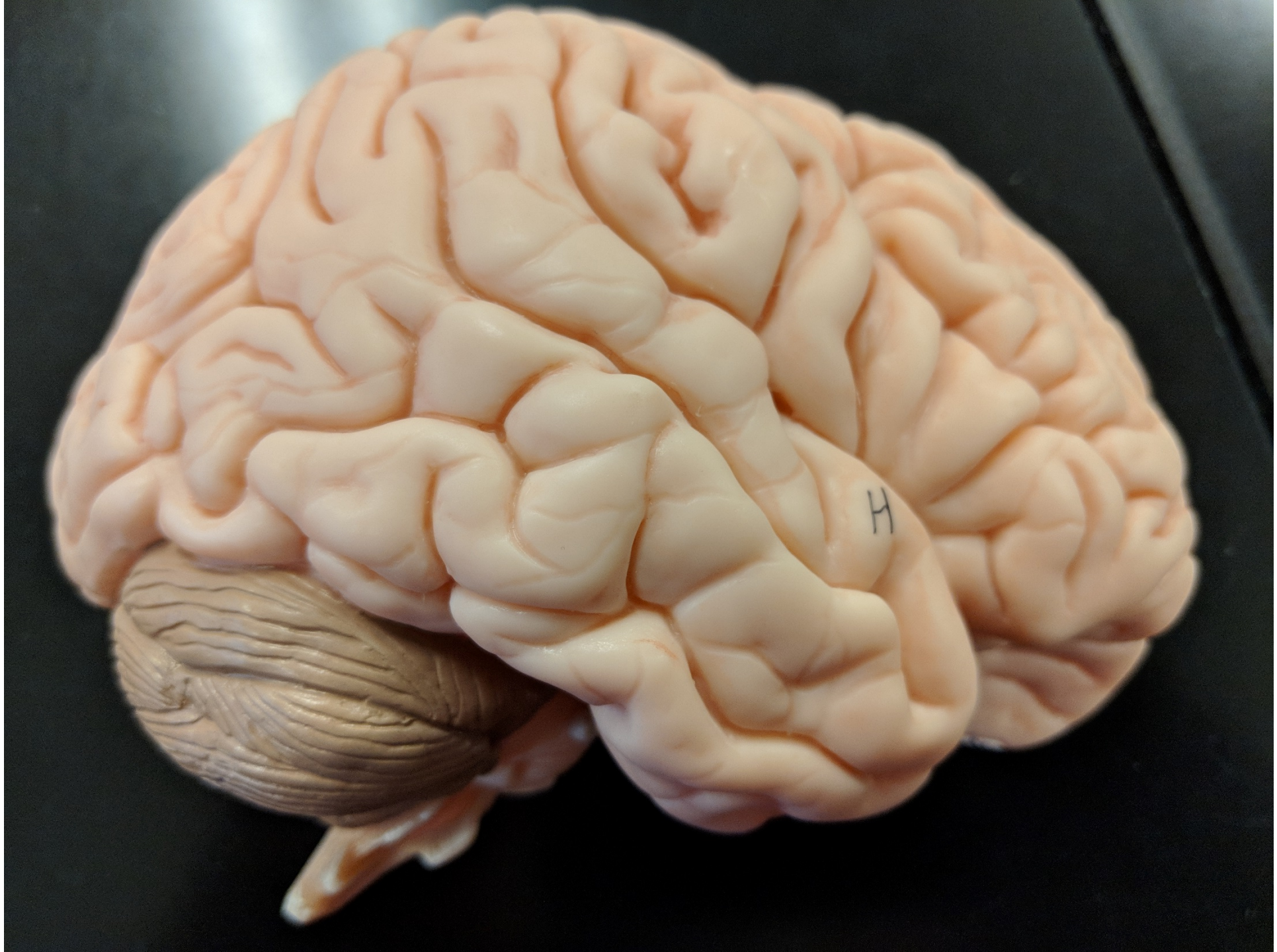
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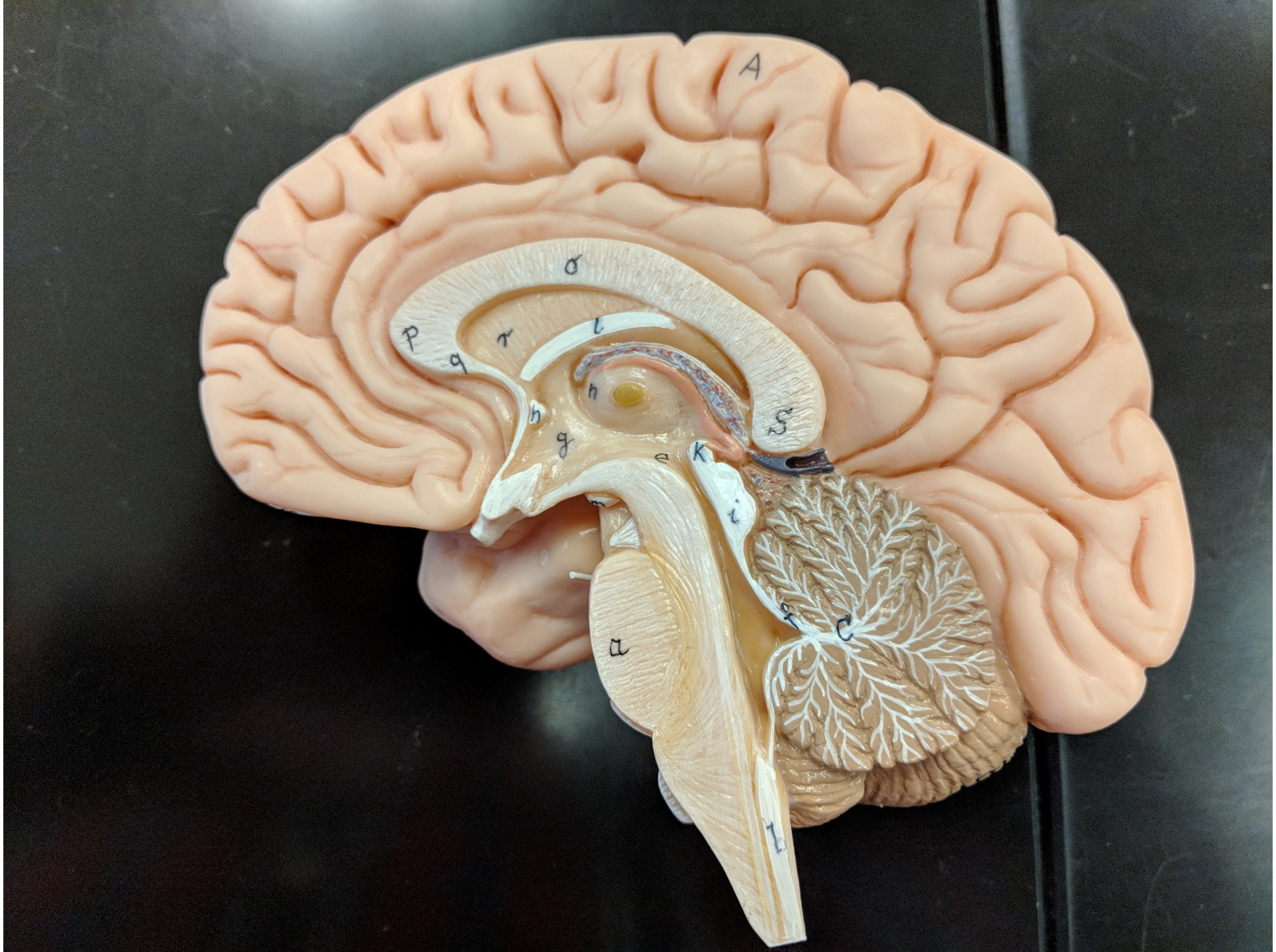
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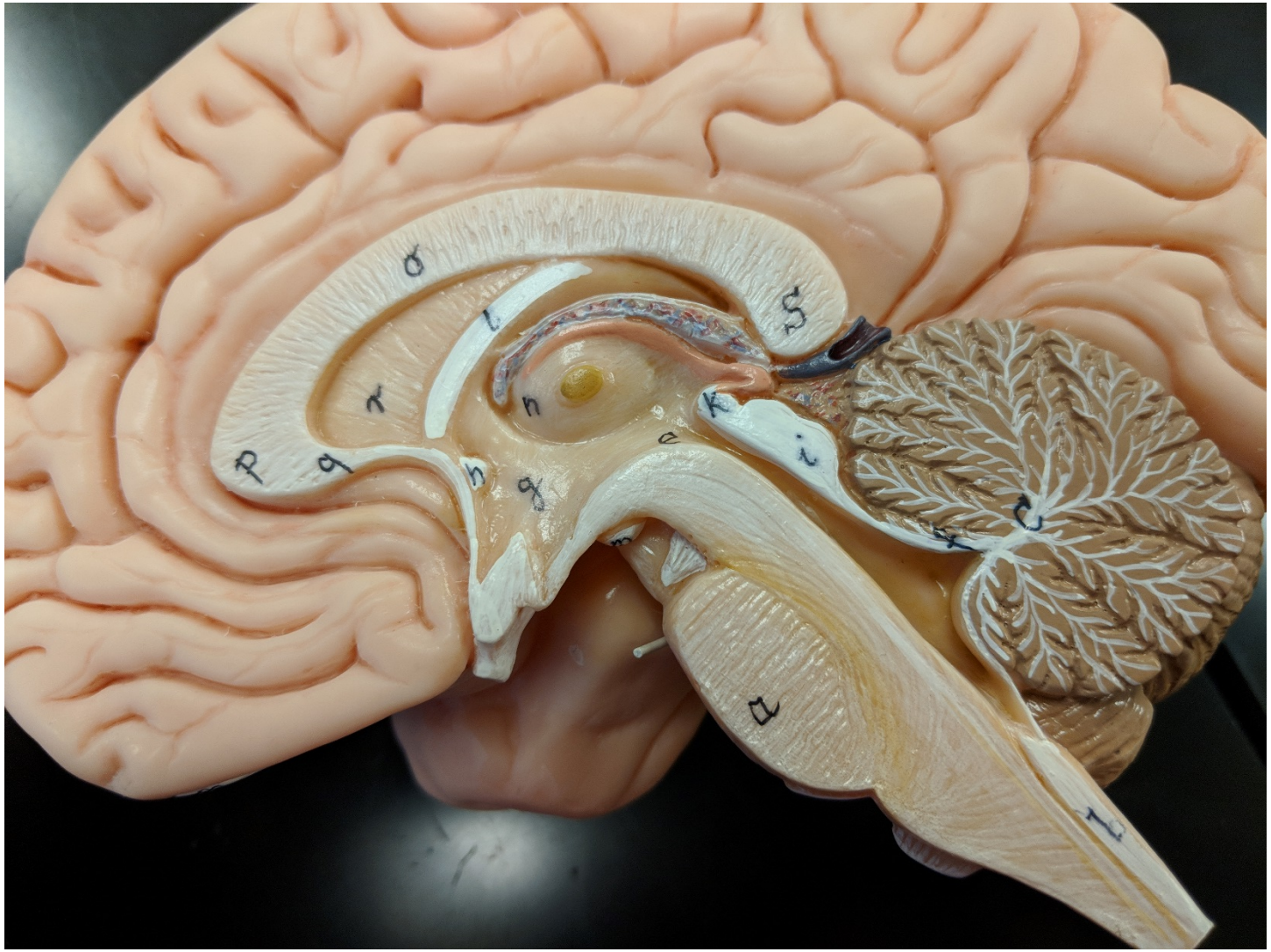
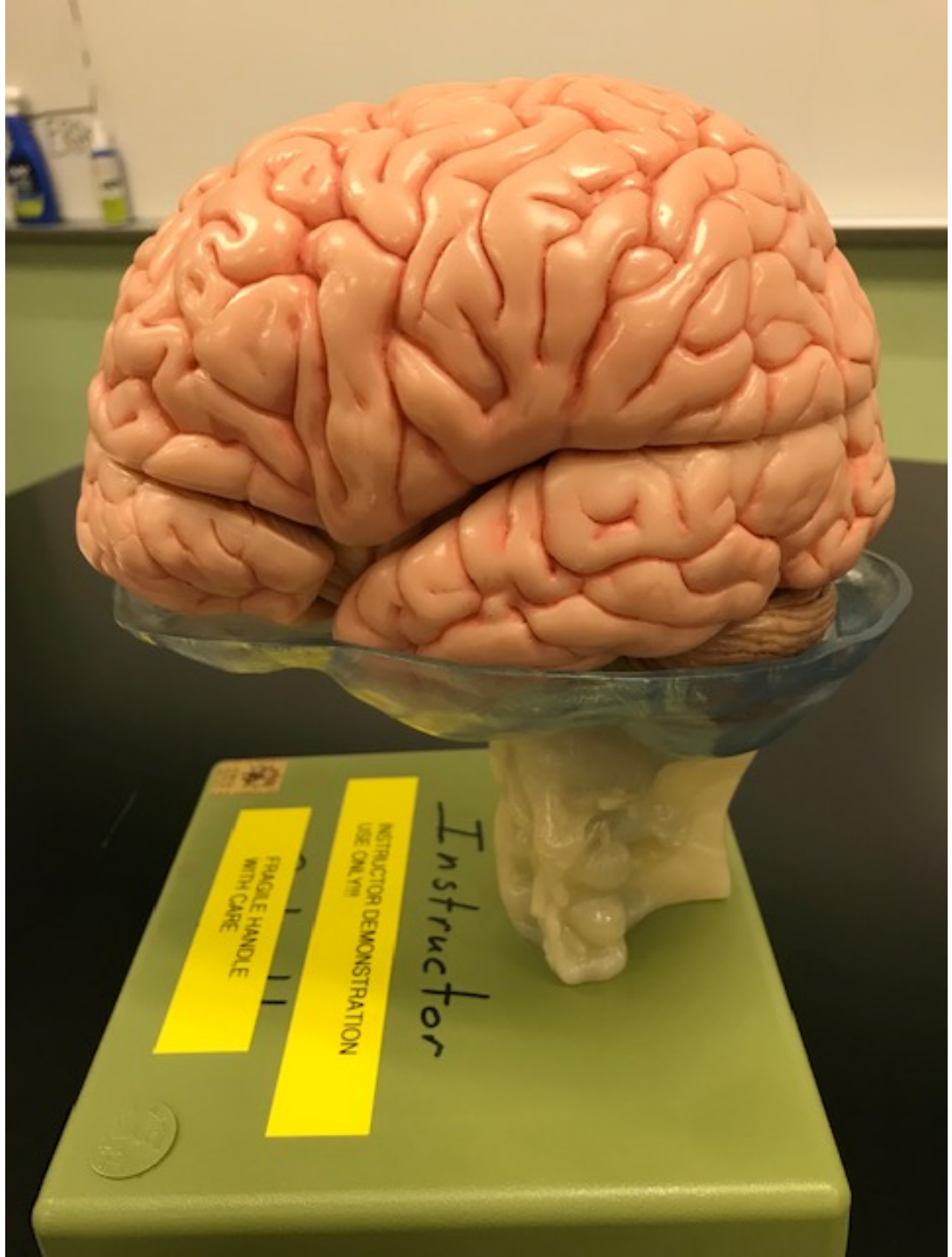
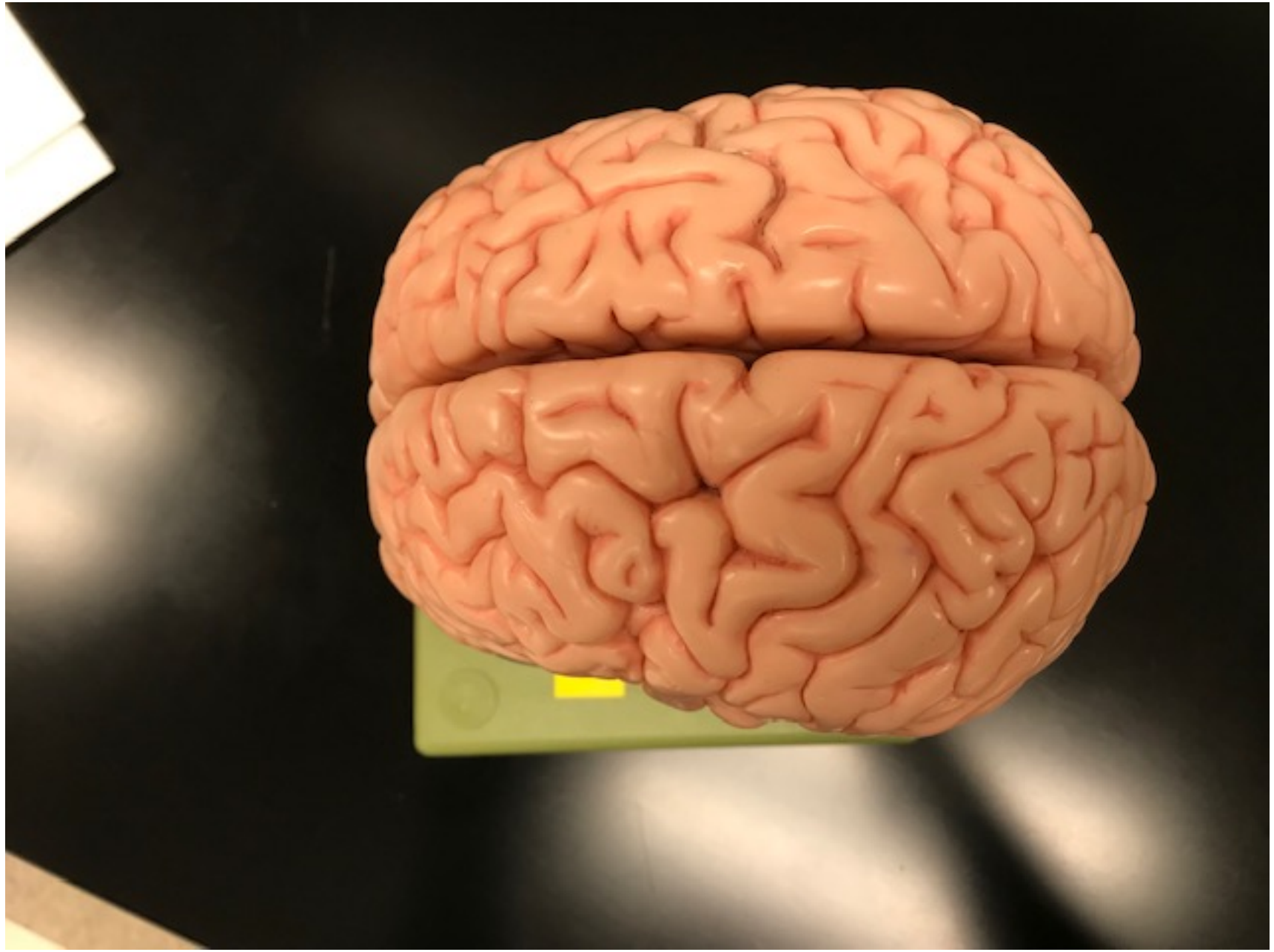
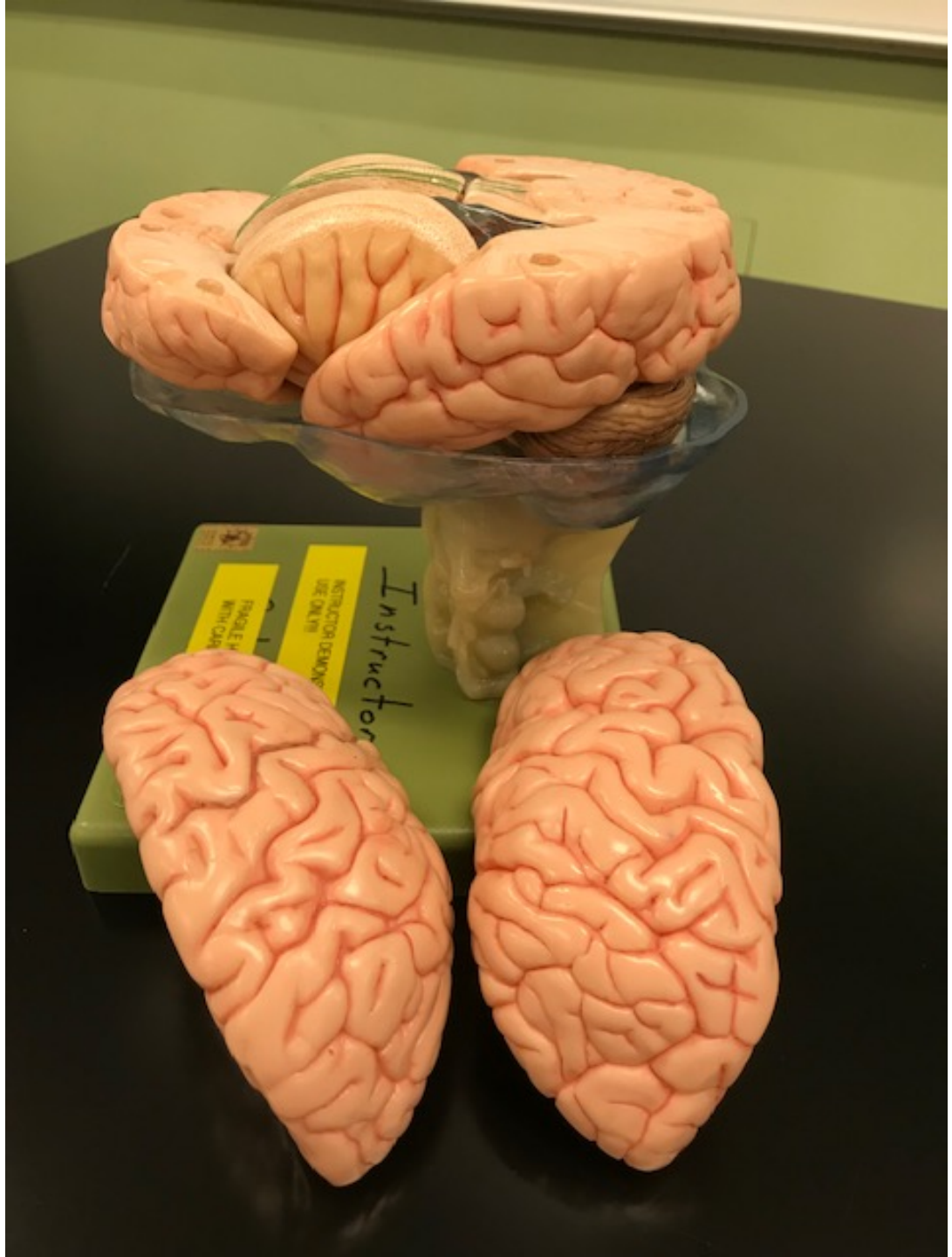


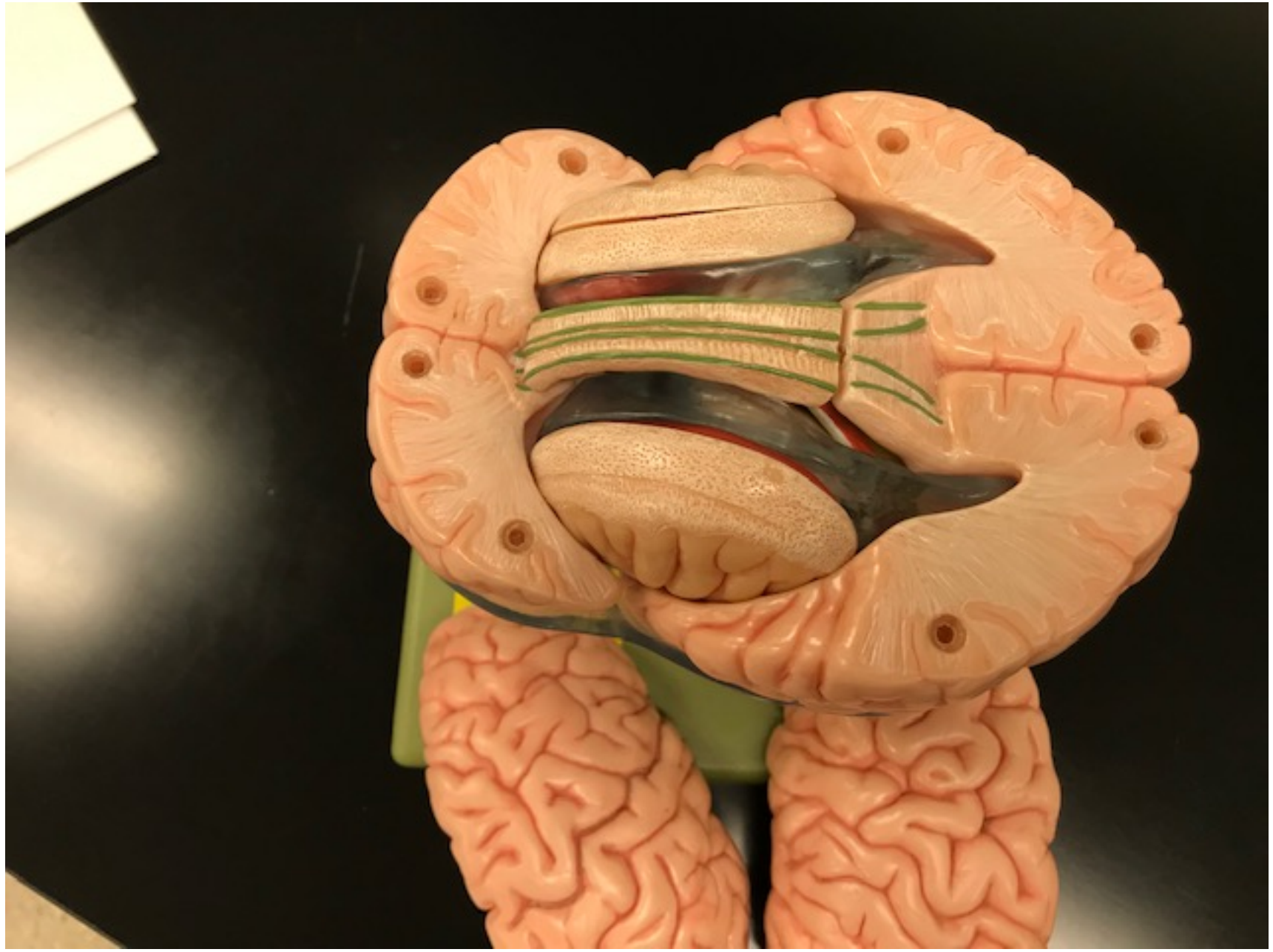
Take care, this model comes apart in more pieces!!



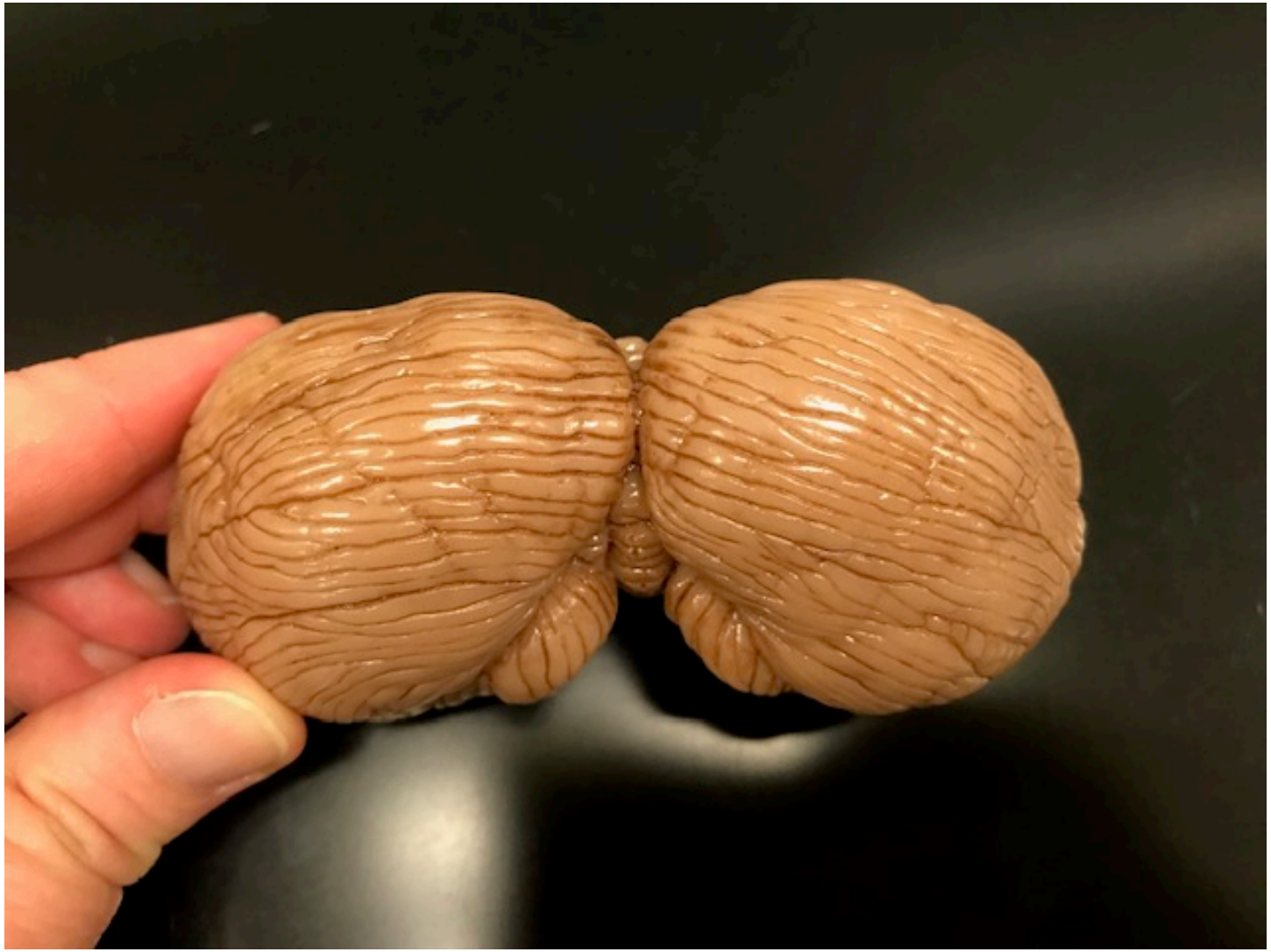


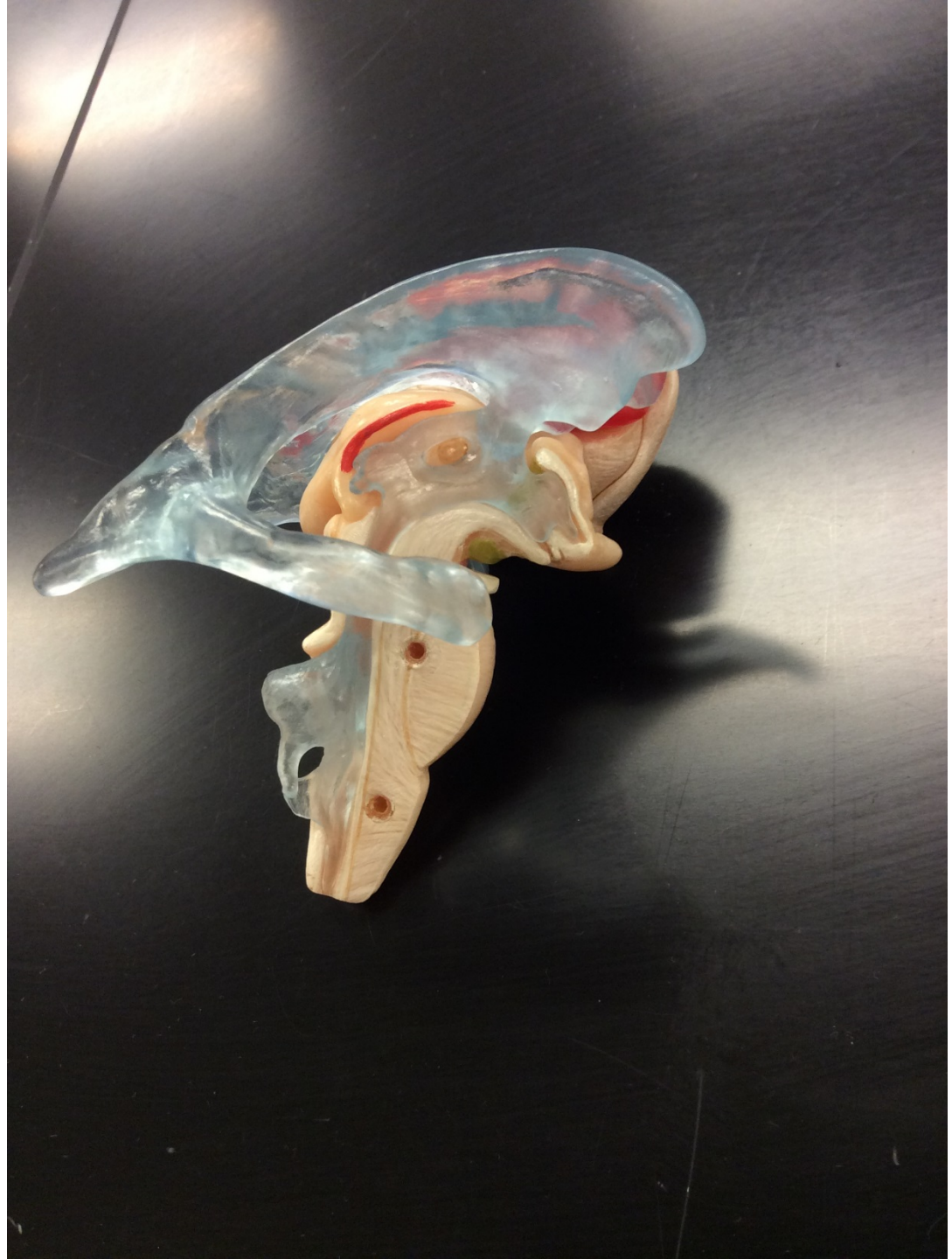
Superior portion of cerebrum removed.

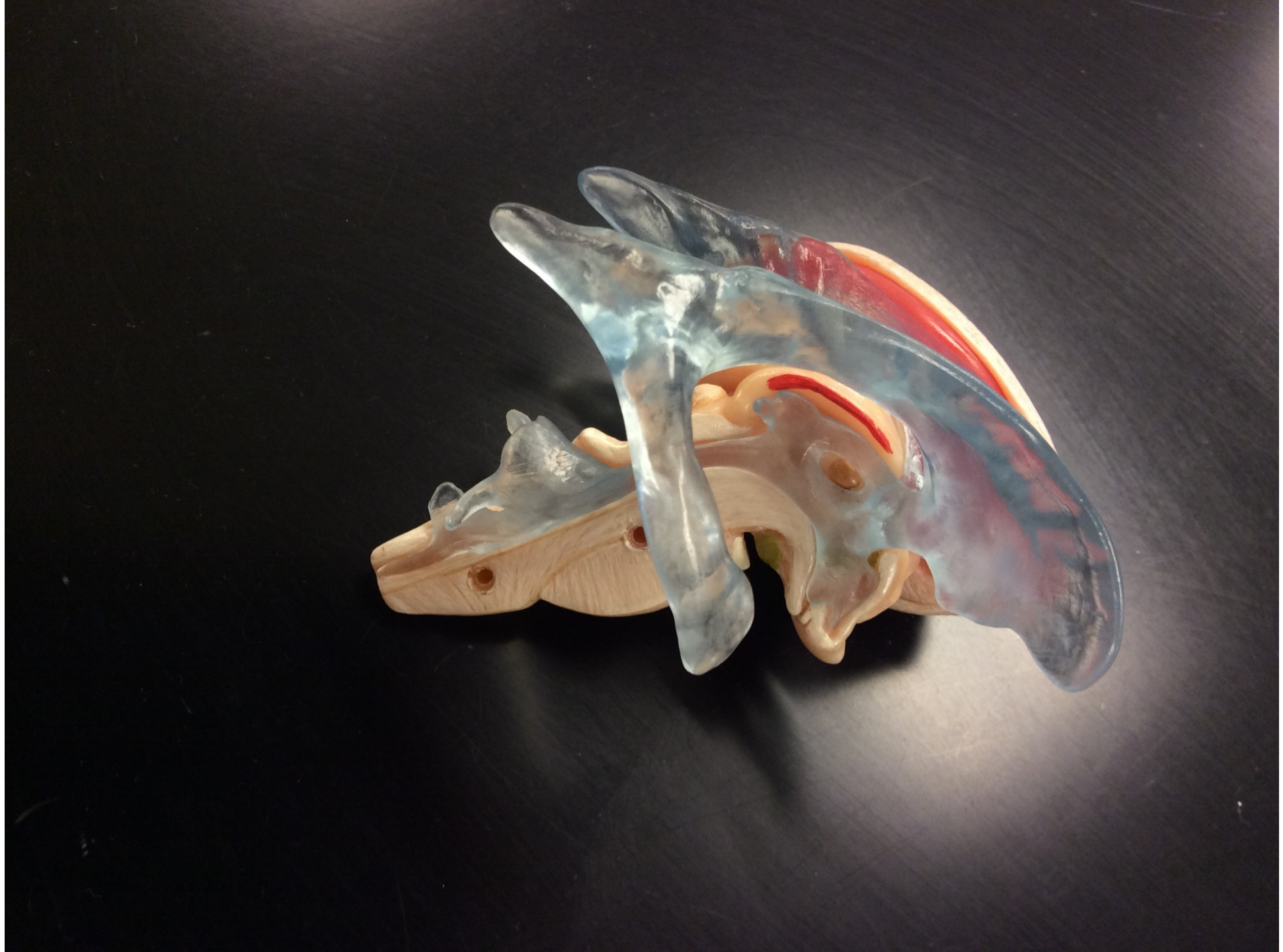




Cerebrum sectioned into 4 major pieces with deep lobes still in surrounding diencephalon. All other major regions in tact.

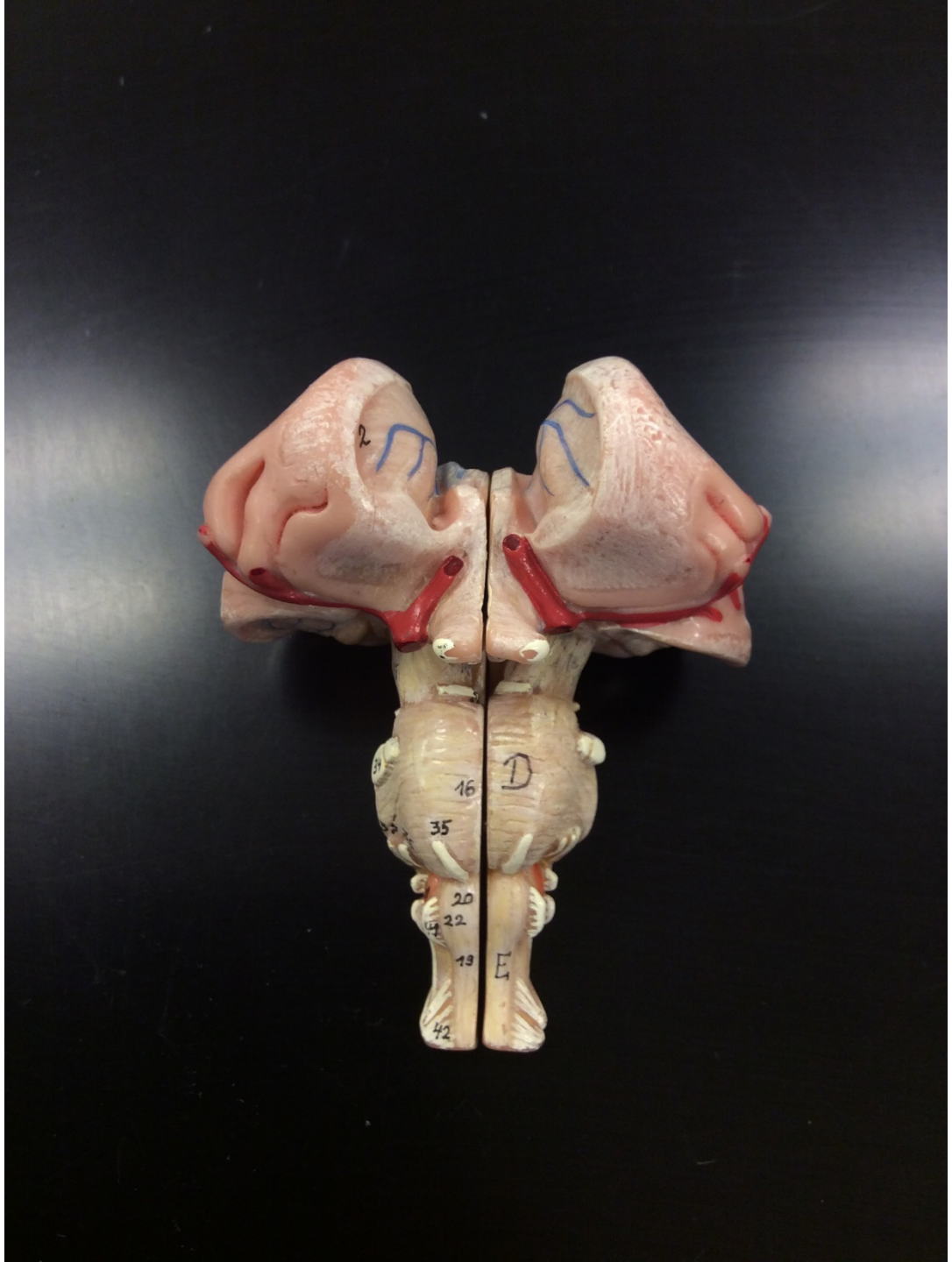


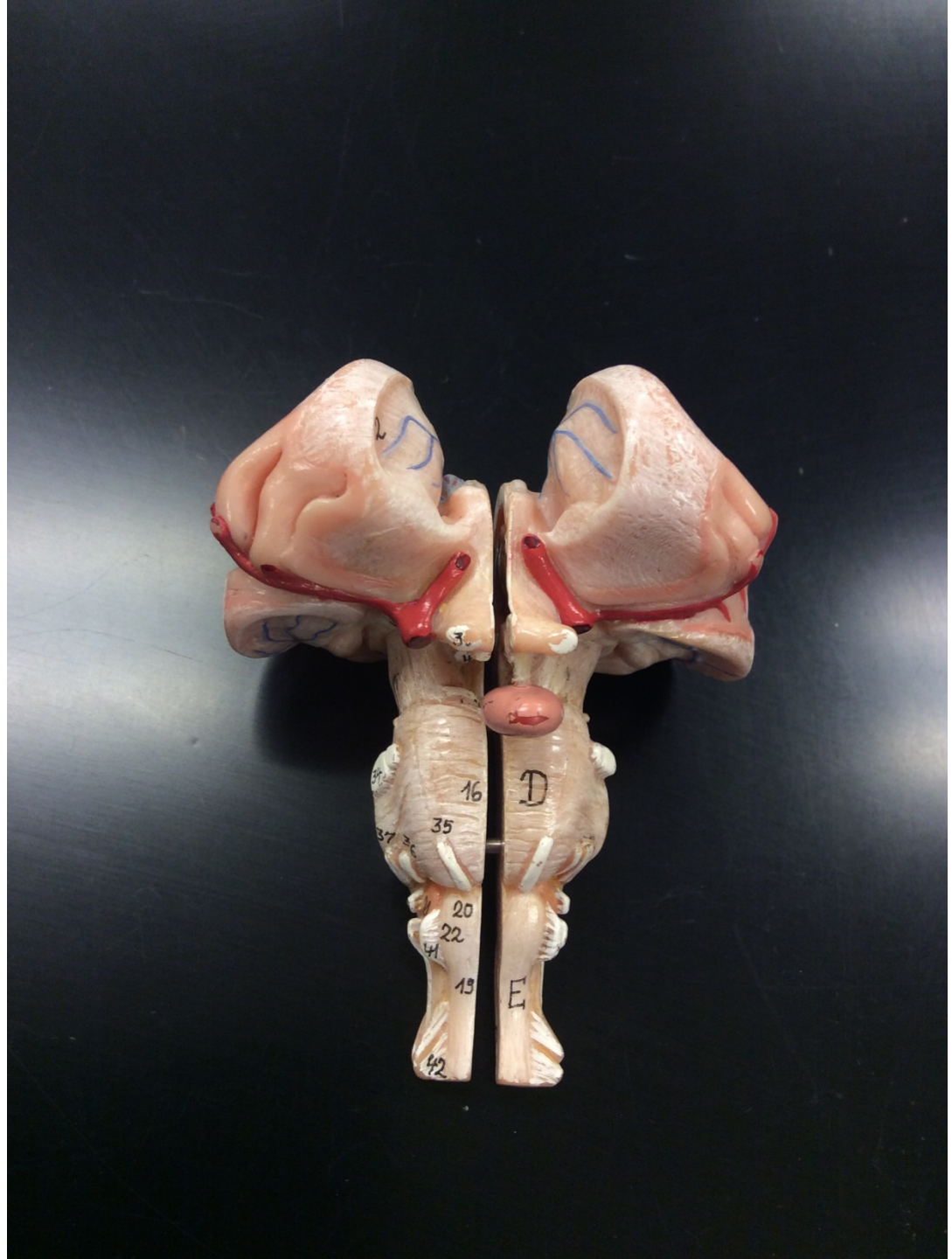




This model is very similar to the picture in Slide #83.

The only difference is that the open spaces are not filled with clear/blue plastic to represent CSF.

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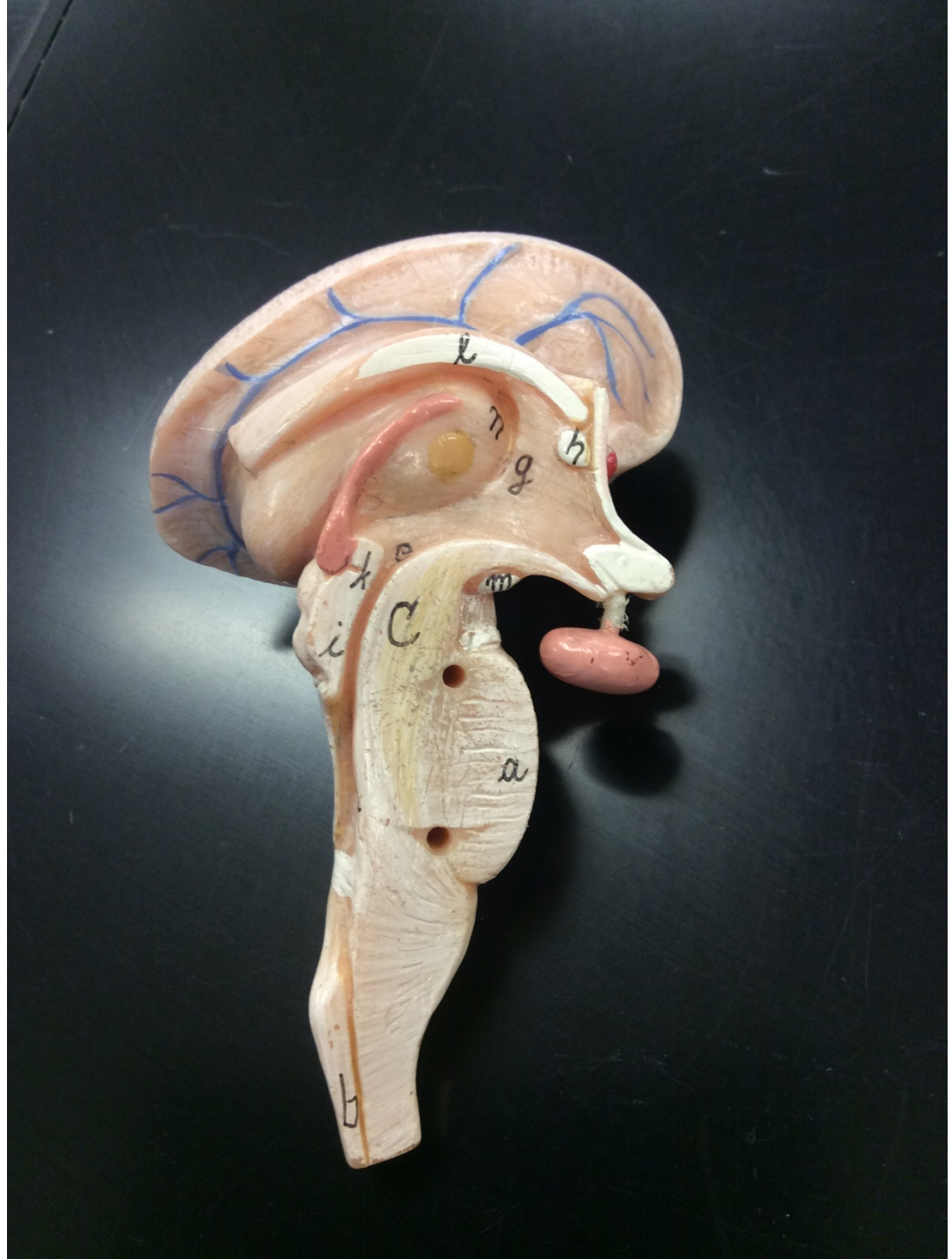
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Use the following pictures to help you identify terms from the lab term handout.

Don’t forget that to watch the videos first!! See Unit 4 Lab Terms handout for details.

Sheep Brain Virtual Dissection

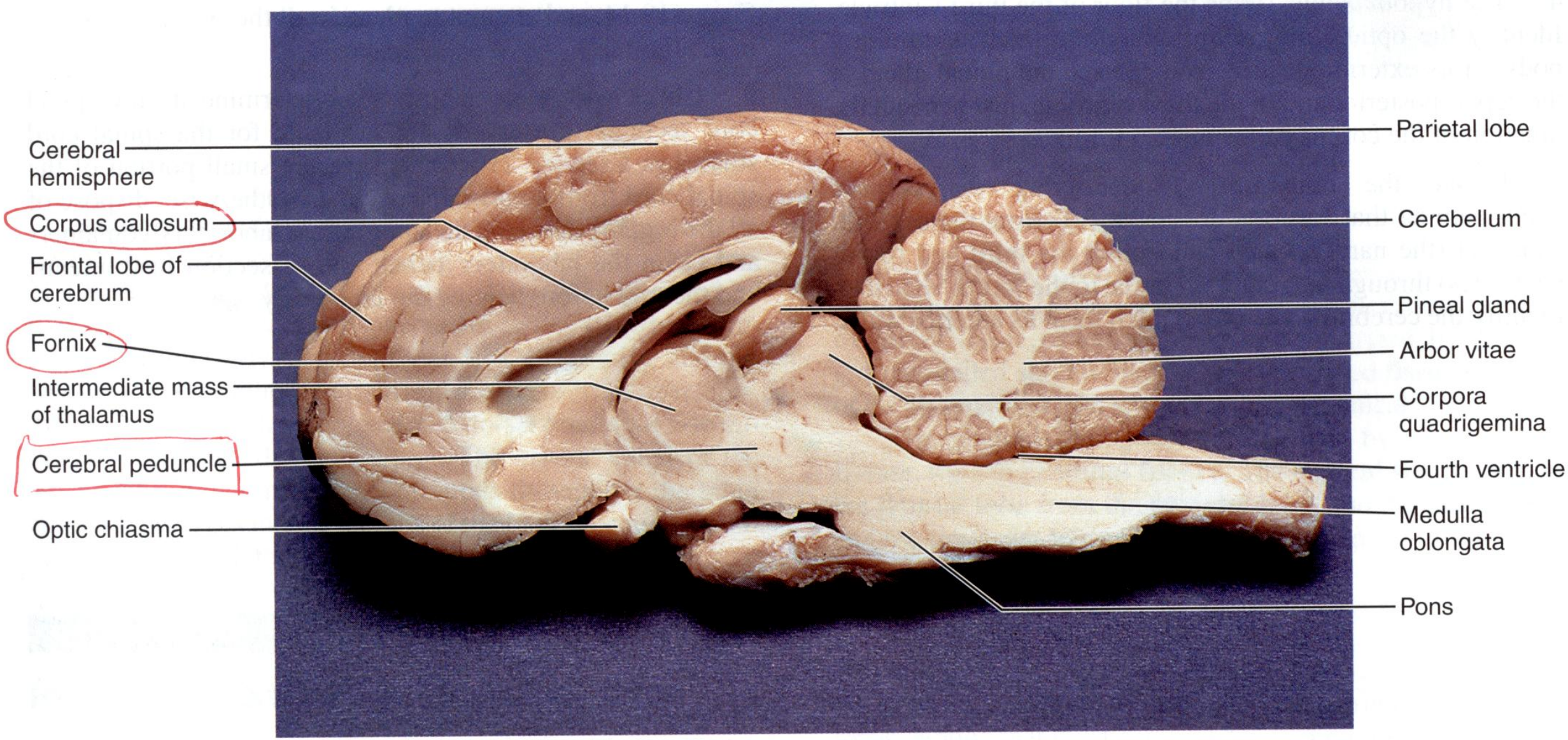
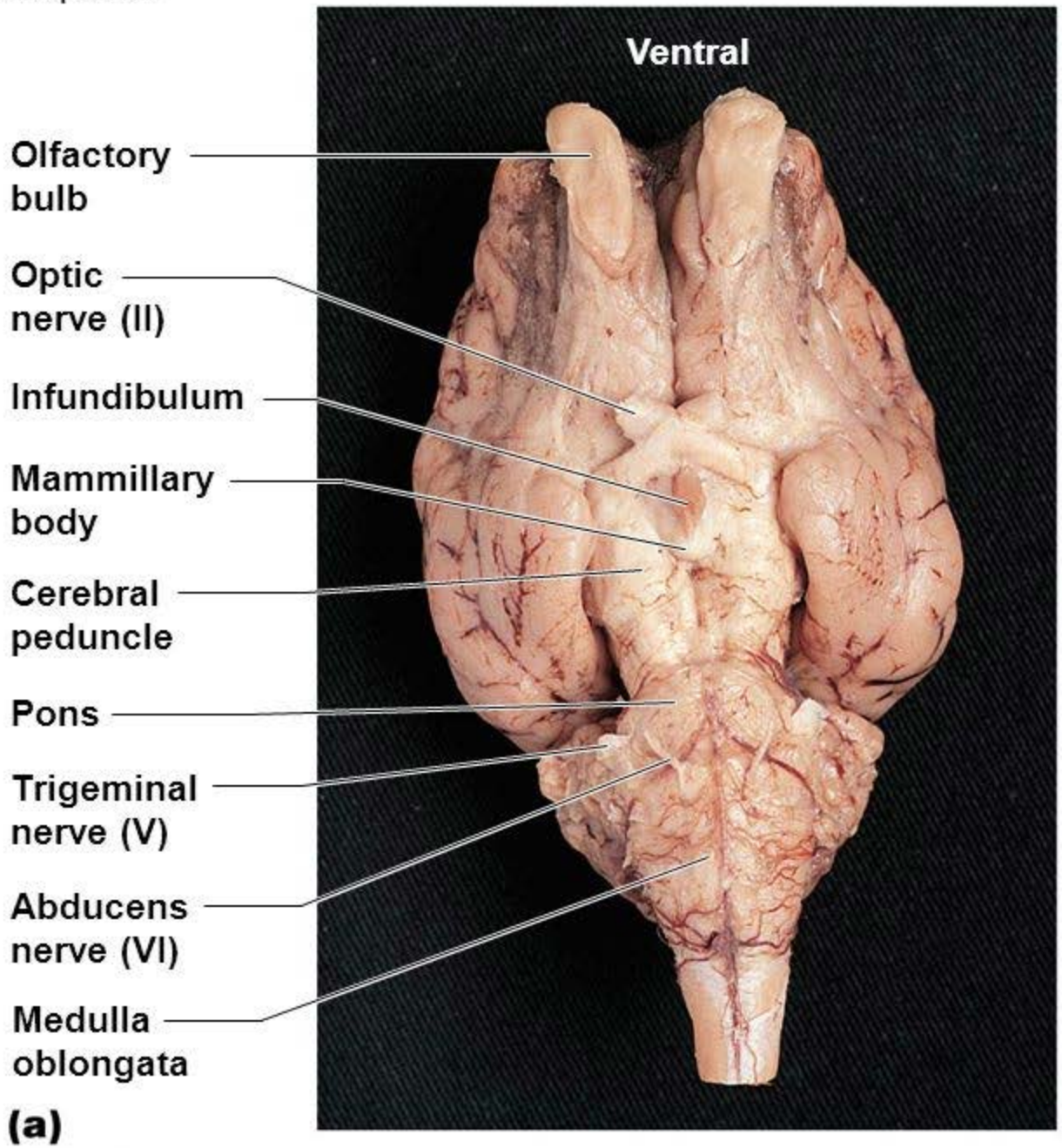


FIGURE 19.13 Photograph of sagittal section of the sheep brain showing internal structures.

Figure 17-11a Intact sheep brain.



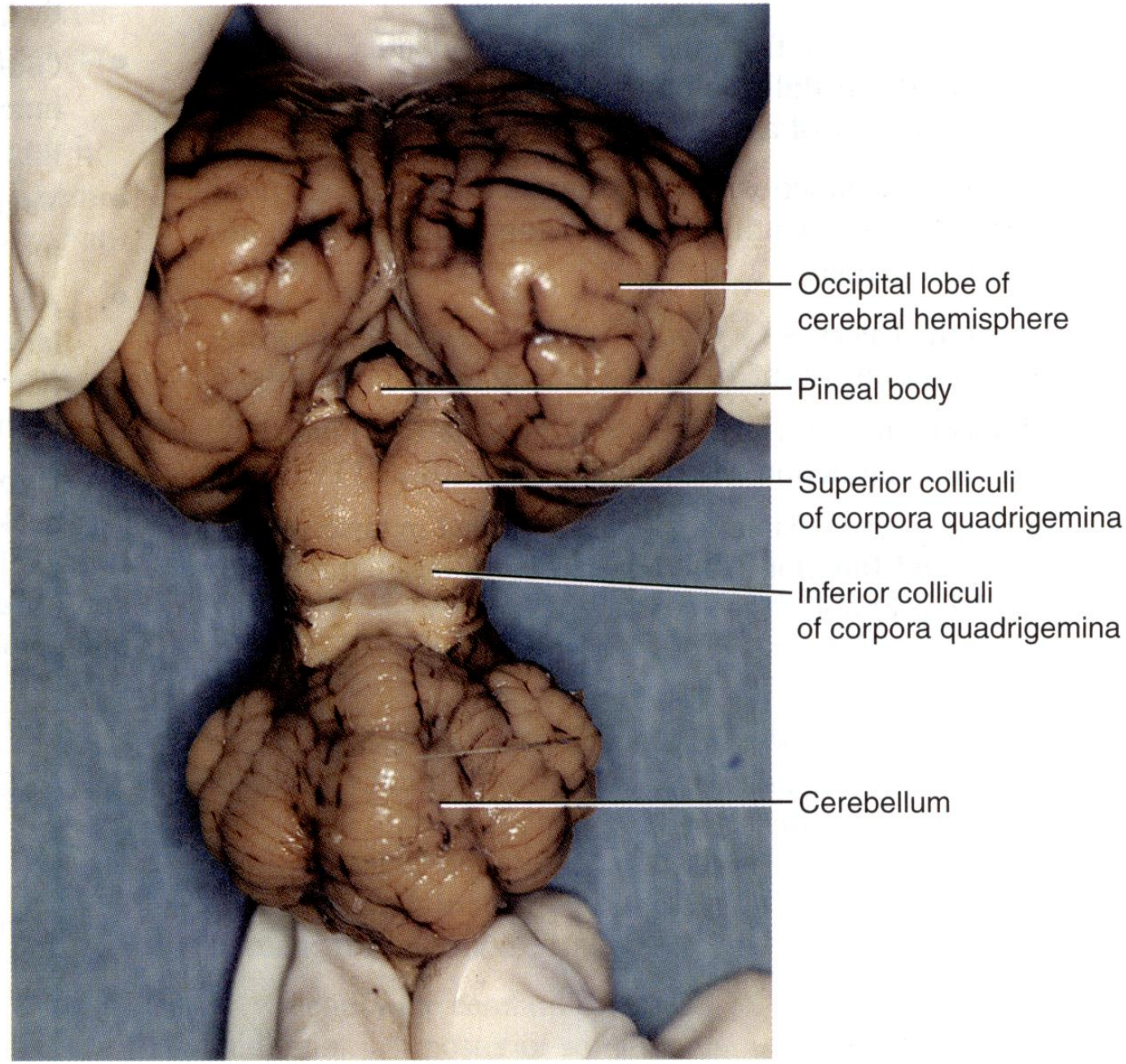
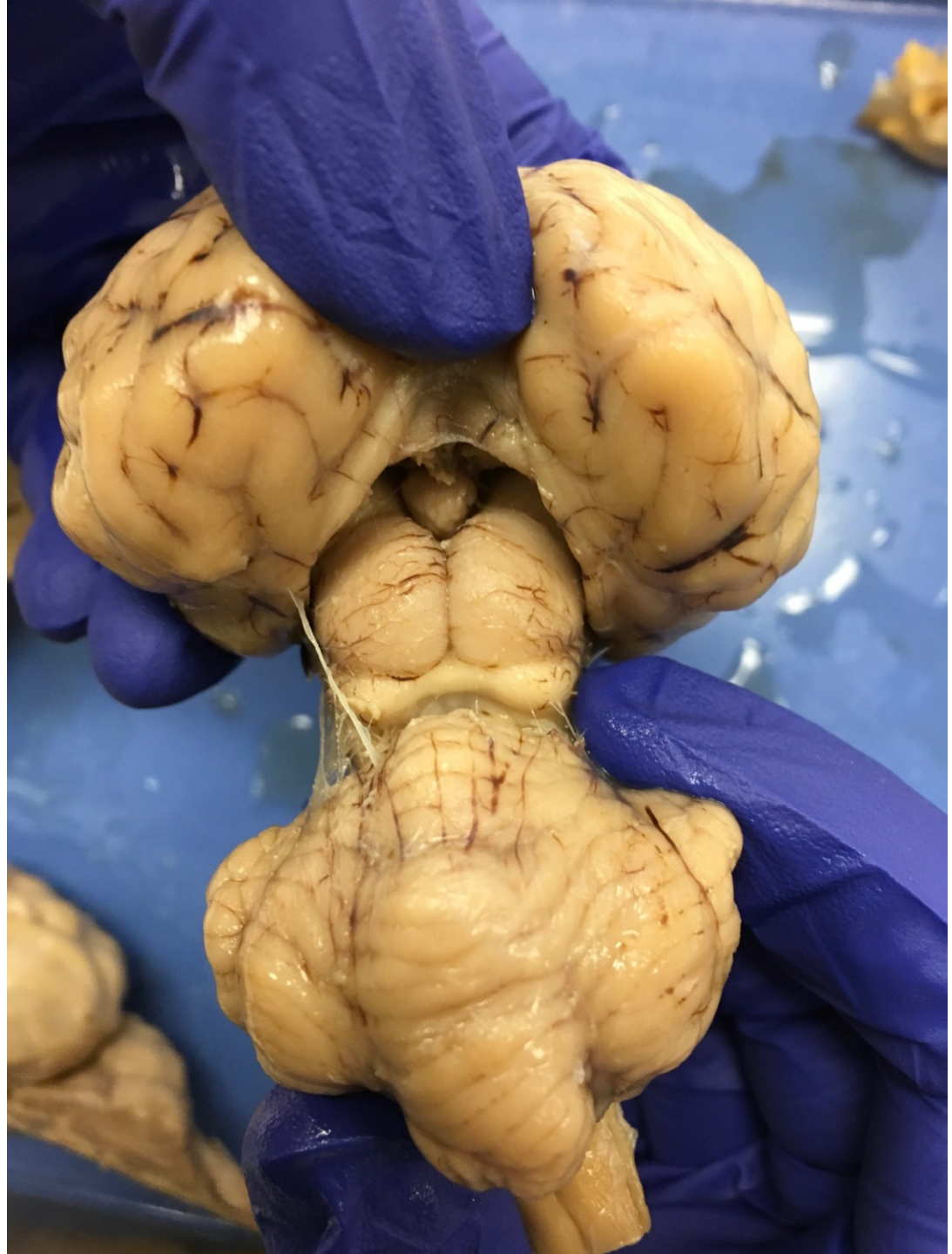


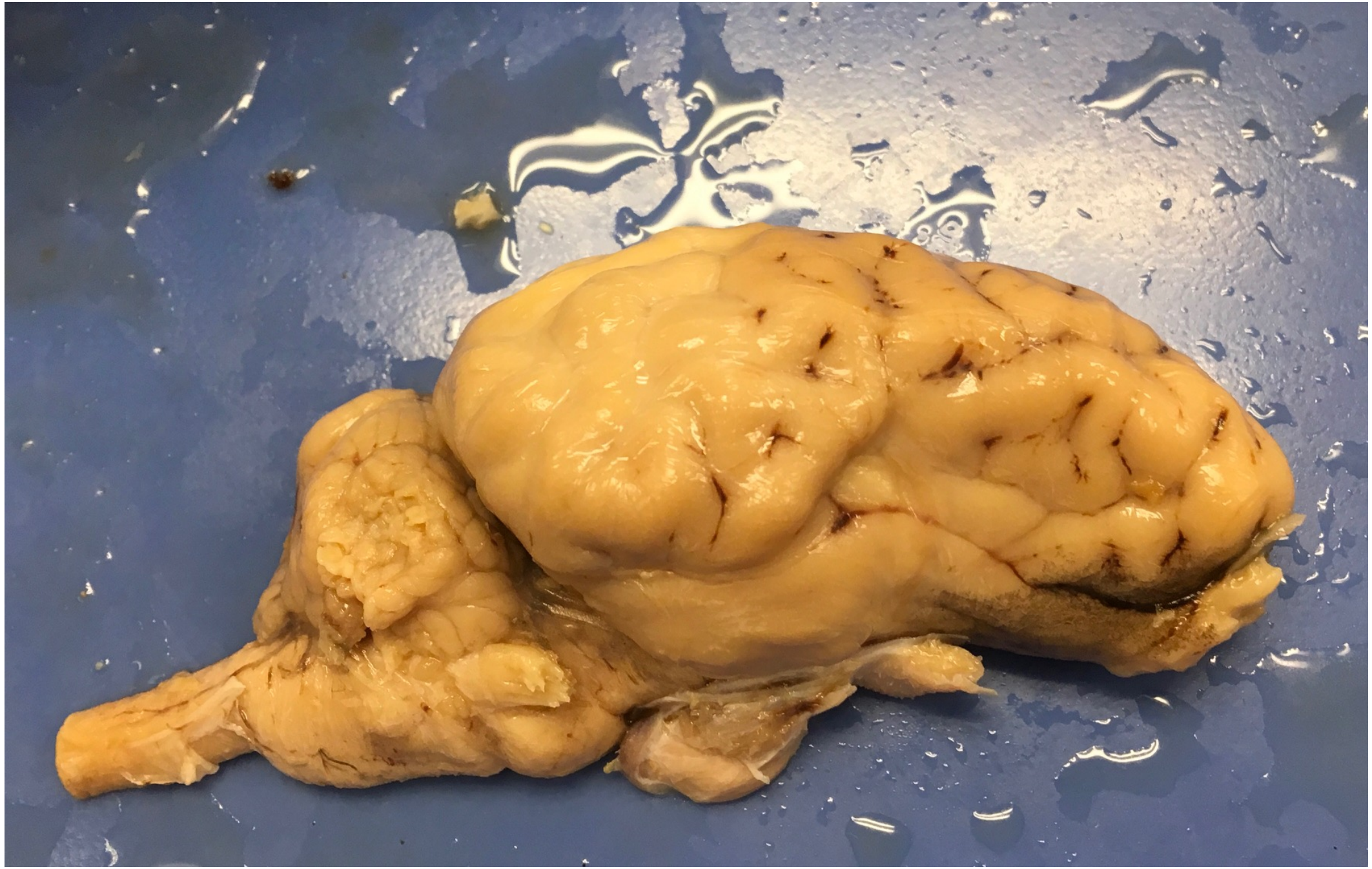
FIGURE 19.12 **Means of exposing the dorsal midbrain structures of the sheep brain.**

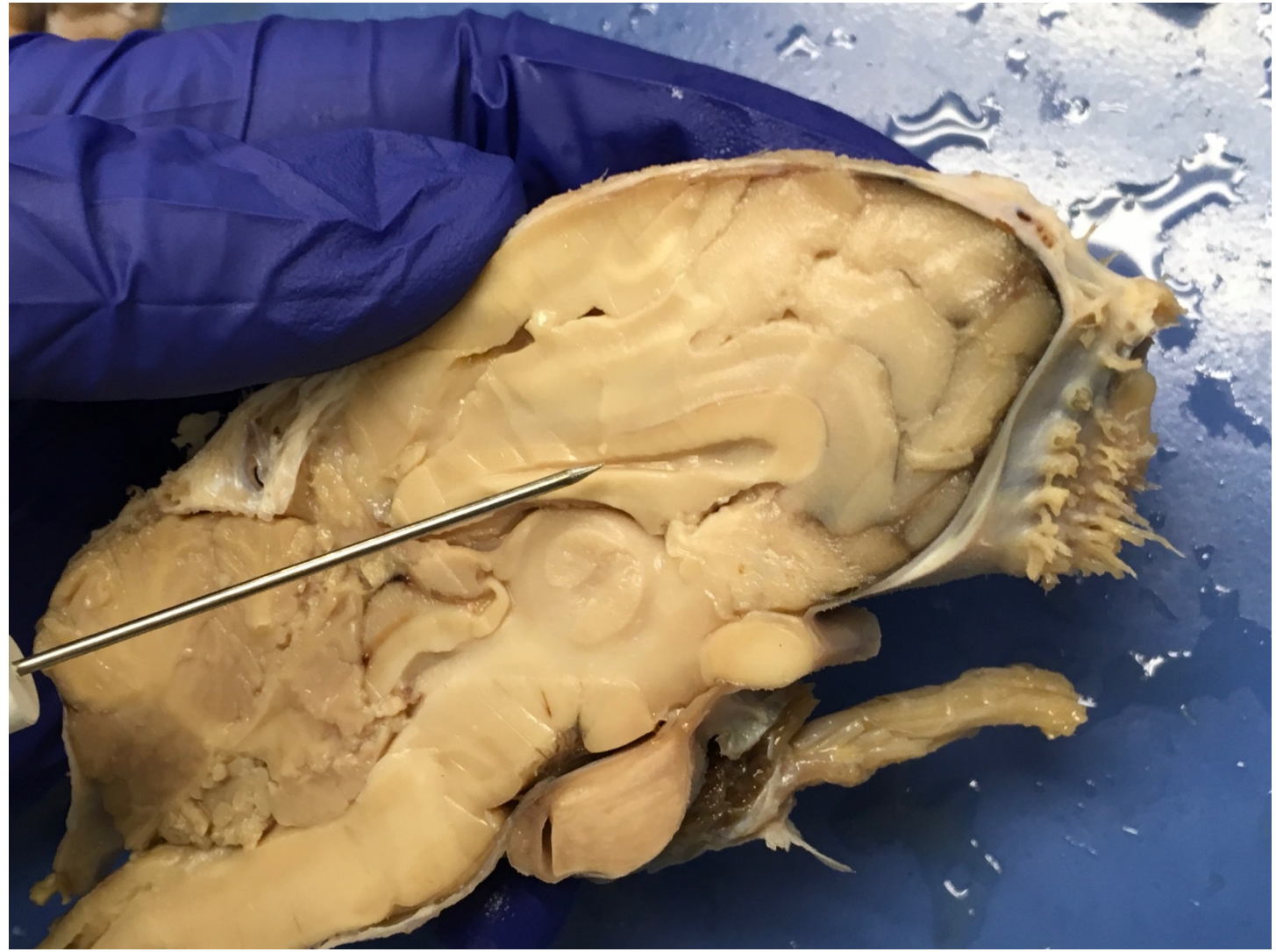
Use the following pictures to help you practice finding the terms from the lab term handout on unlabeled images.

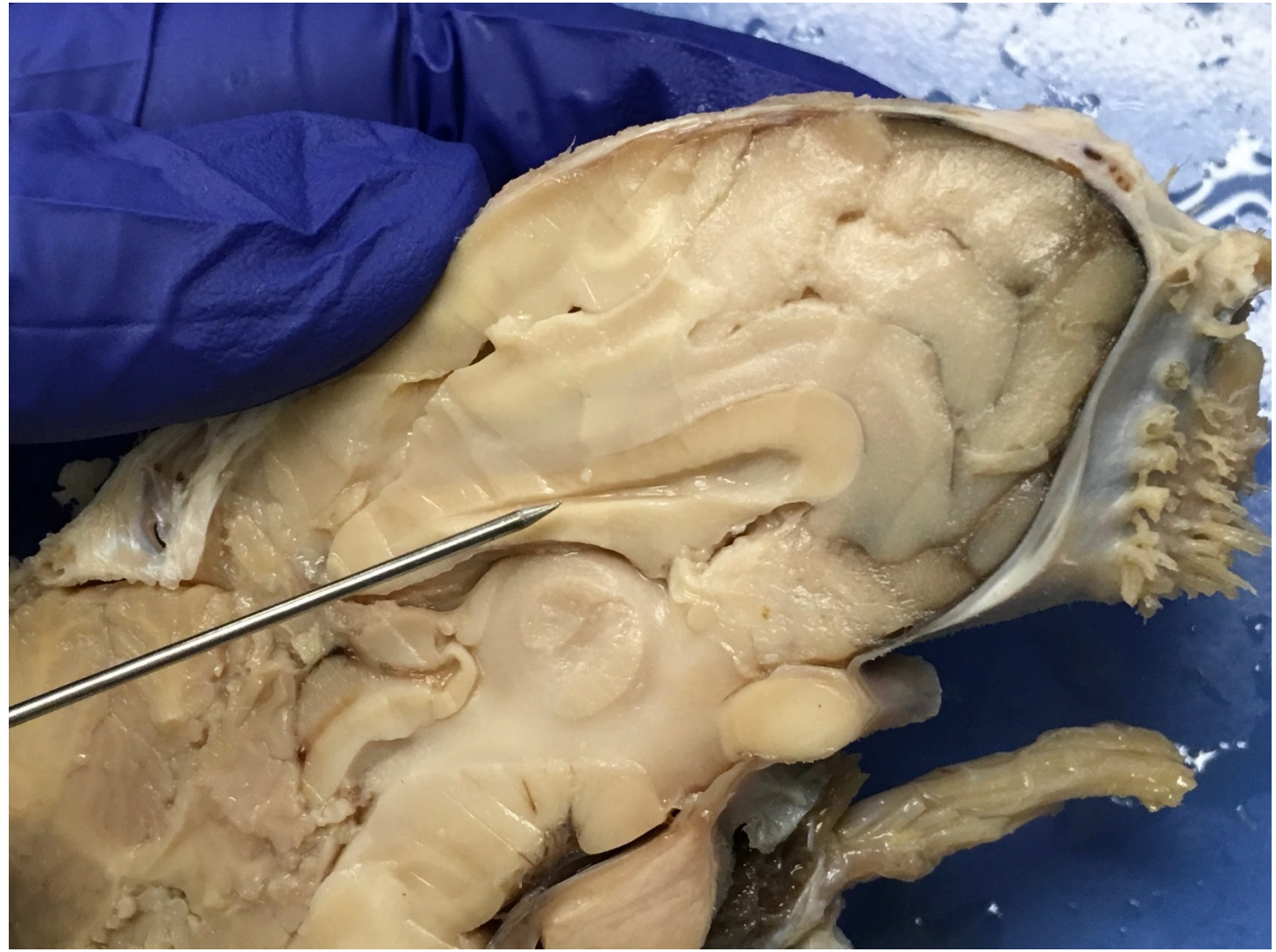
- Remember, you won't learn them if you don't take plenty of time to practice!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the "Cat (including sheep organs…)" nervous system quiz in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

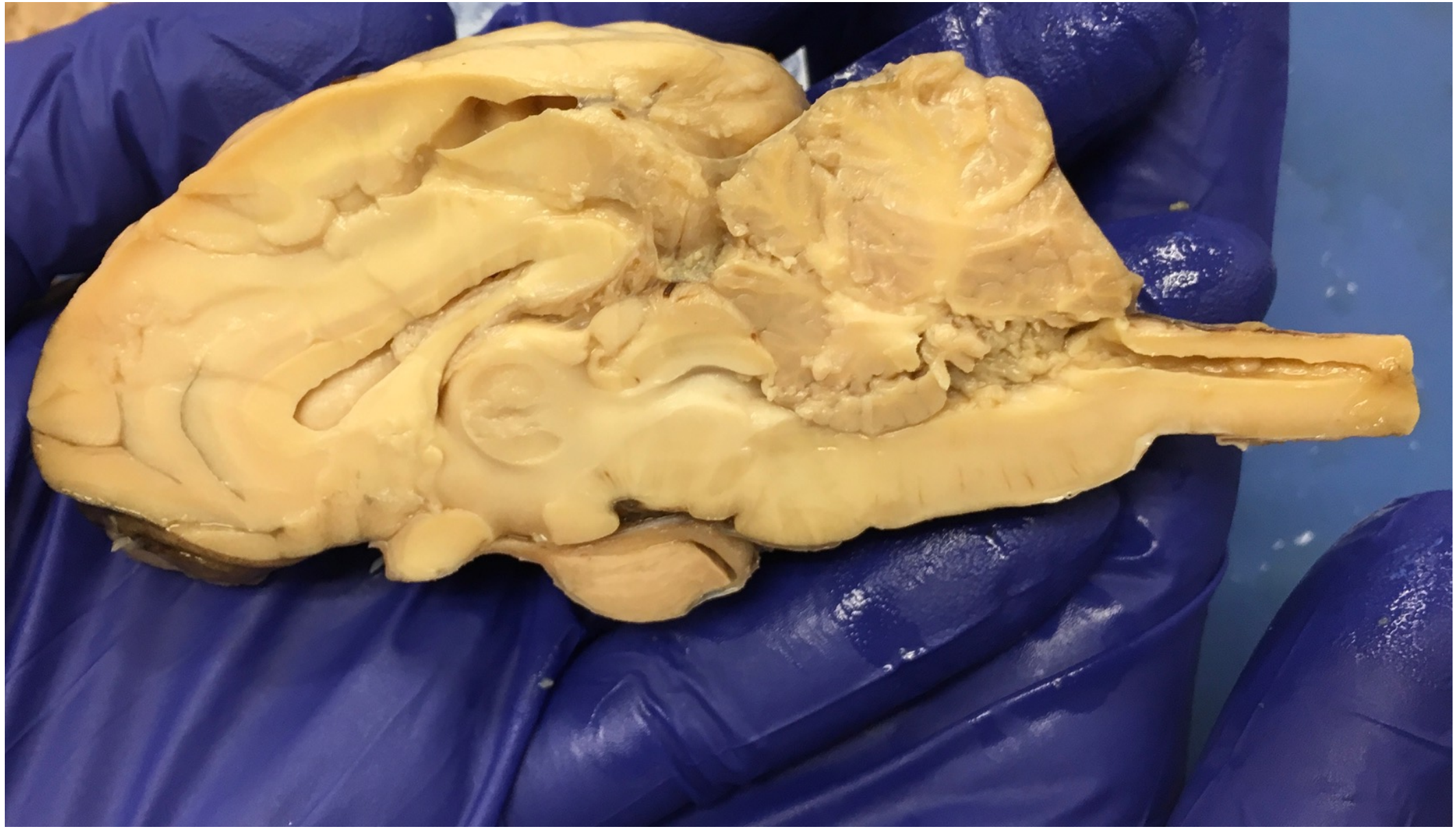
Sheep Brain Virtual Dissection

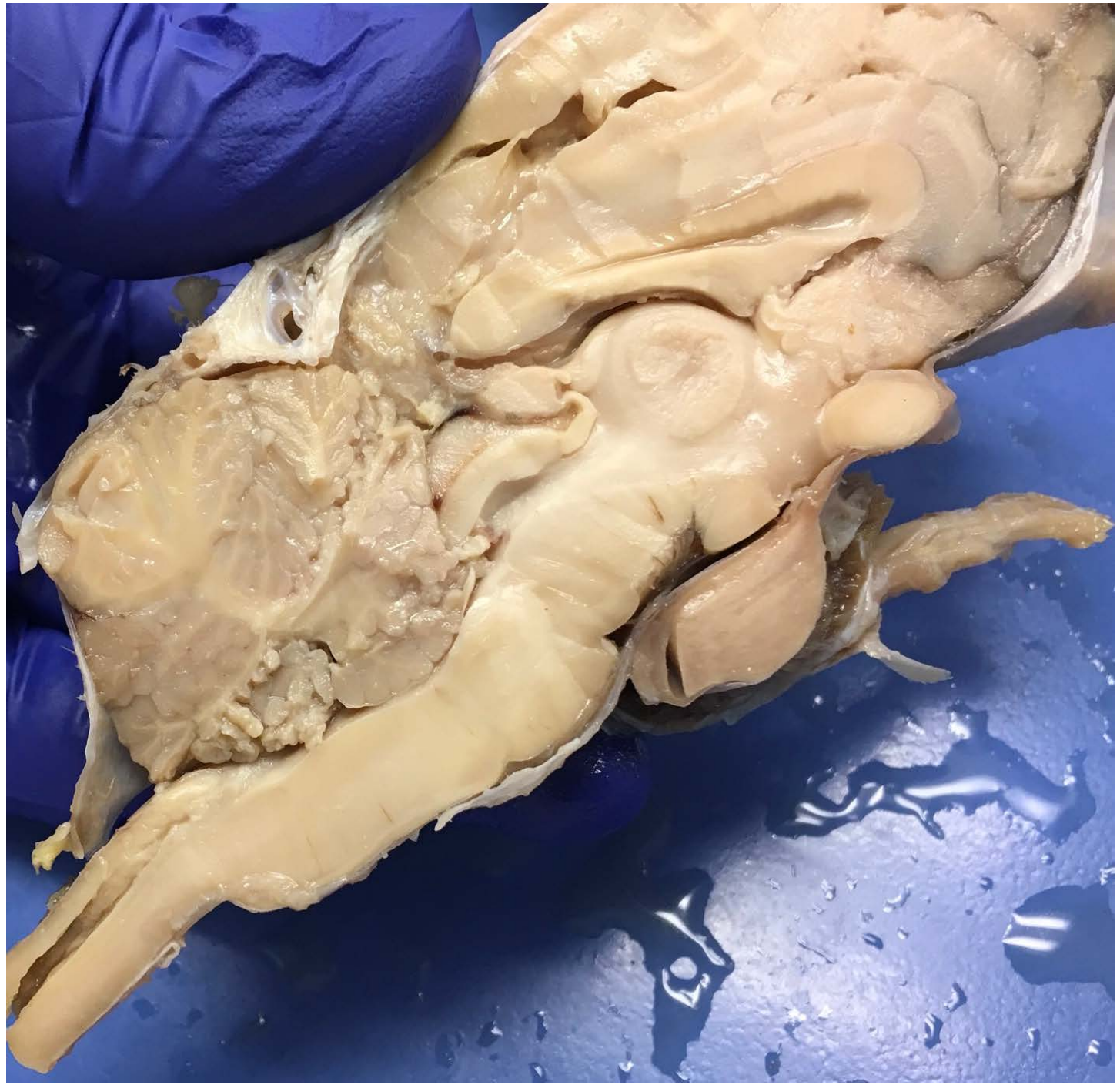












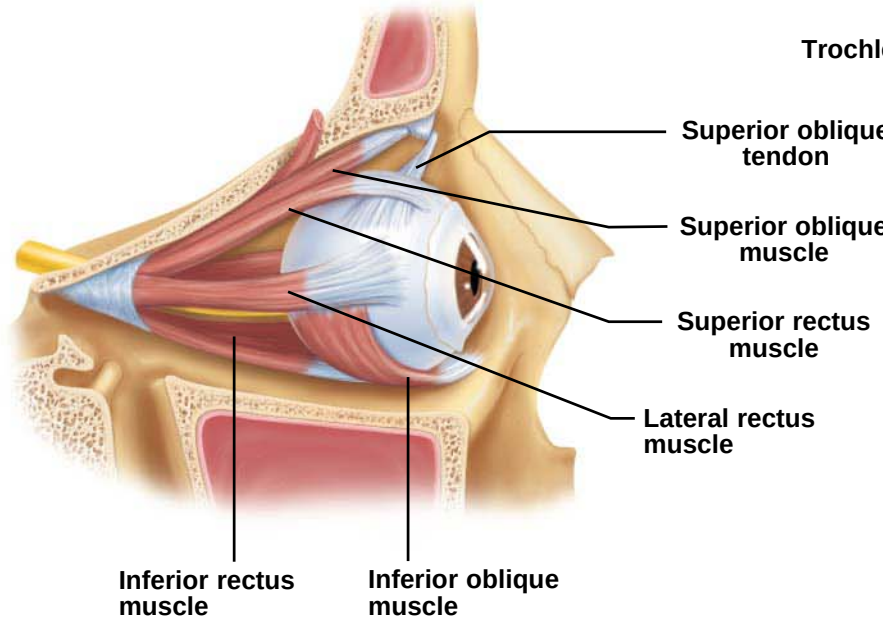
Use the following pictures to help you identify terms from the lab term handout.

Another good resource is the Visible Body ATLAS app: http://atlas.visiblebody.com

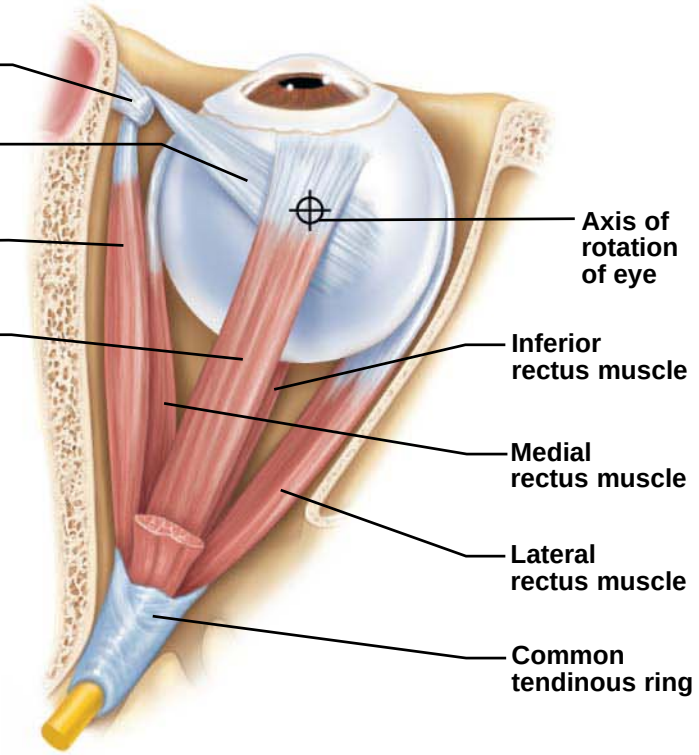
Don’t forget that to use the link to download to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

Sensory Anatomy

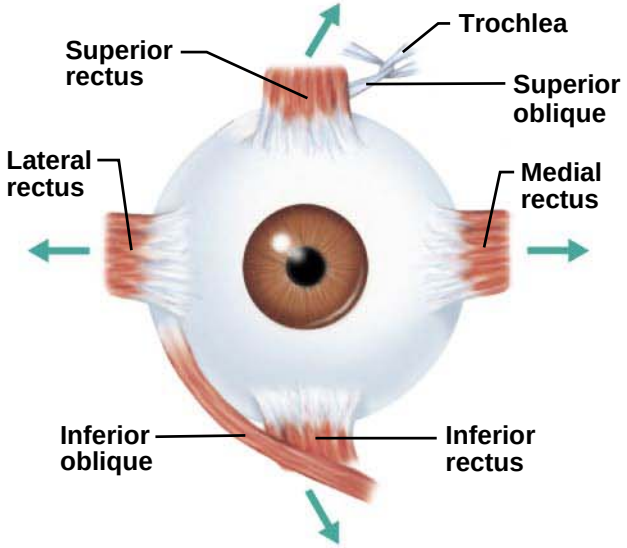
Figure 15.3 Extrinsic eye muscles.



(a) Lateral view of the right eye



(b) Superior view of the right eye

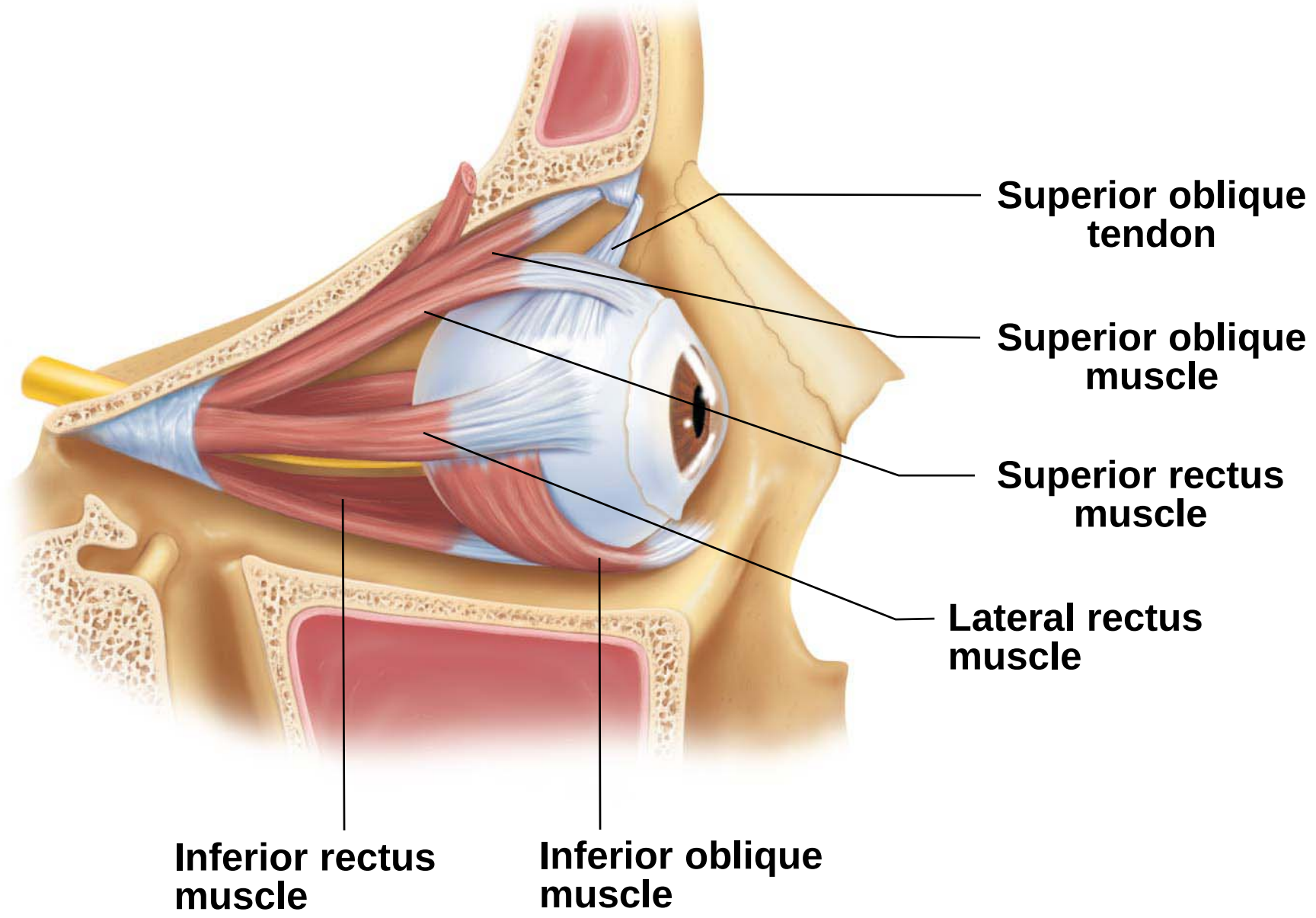


(c) Anterior view of the right eye

Muscle	Action	Controlling cranial nerve
Lateral rectus	Moves eye laterally	VI (abducens)
Medial rectus	Moves eye medially	III (oculomotor)
Superior rectus	Elevates eye and turns it medially	III (oculomotor)
Inferior rectus	Depresses eye and turns it medially	III (oculomotor)
Inferior oblique	Elevates eye and turns it laterally	III (oculomotor)
Superior oblique	Depresses eye and turns it laterally	IV (trochlear)

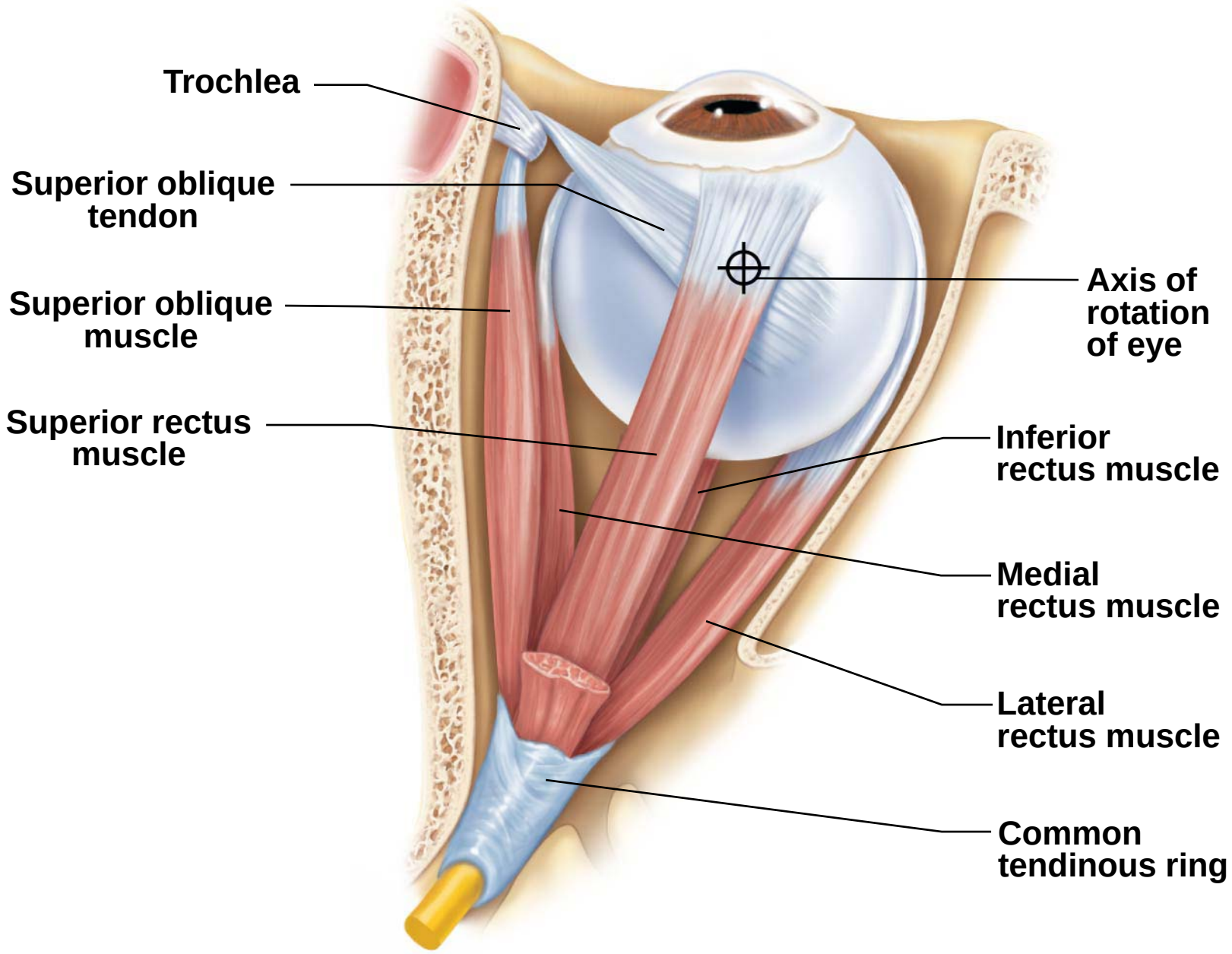
(d) Summary of muscle actions and innervating cranial nerves

Figure 15.3a Extrinsic eye muscles.



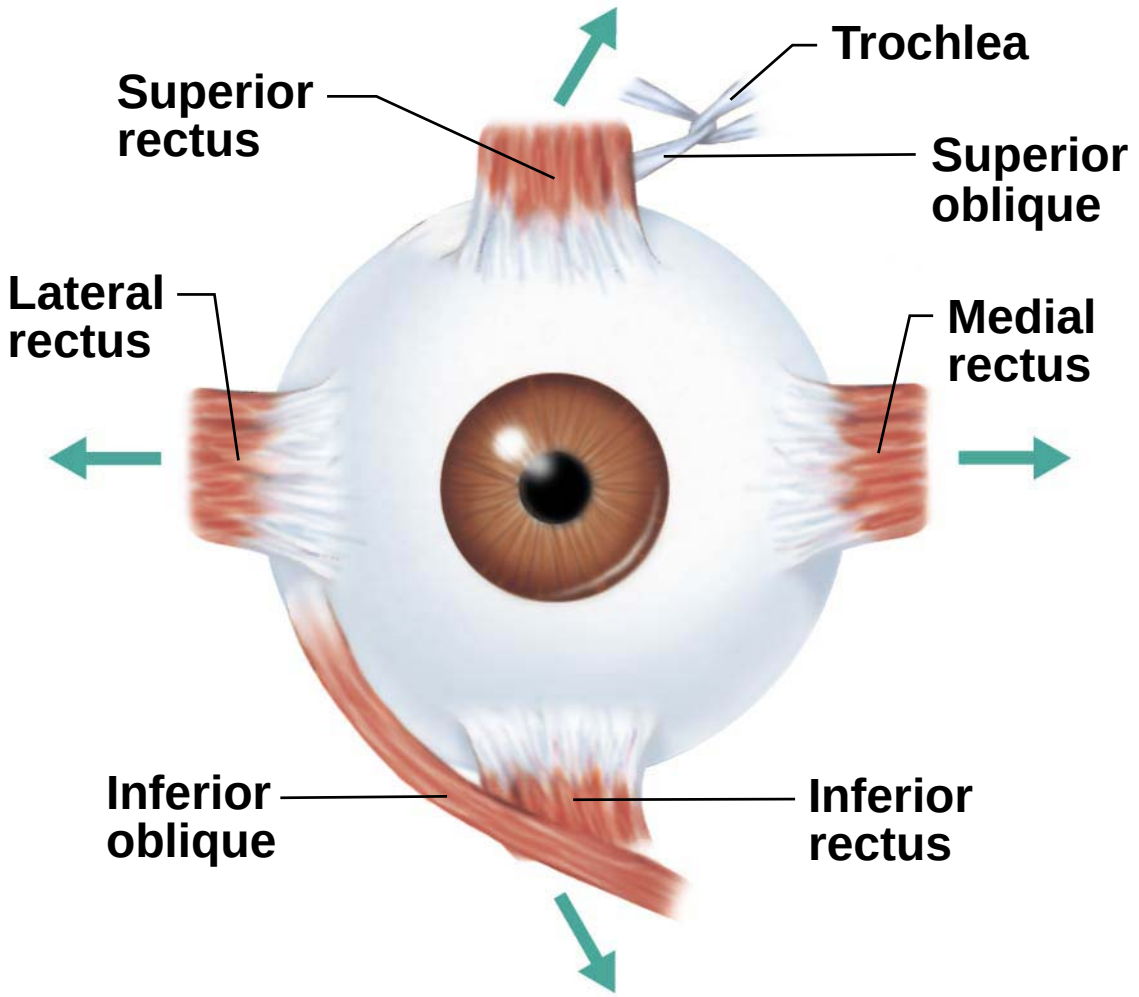
(a) Lateral view of the right eye

Figure 15.3b Extrinsic eye muscles.



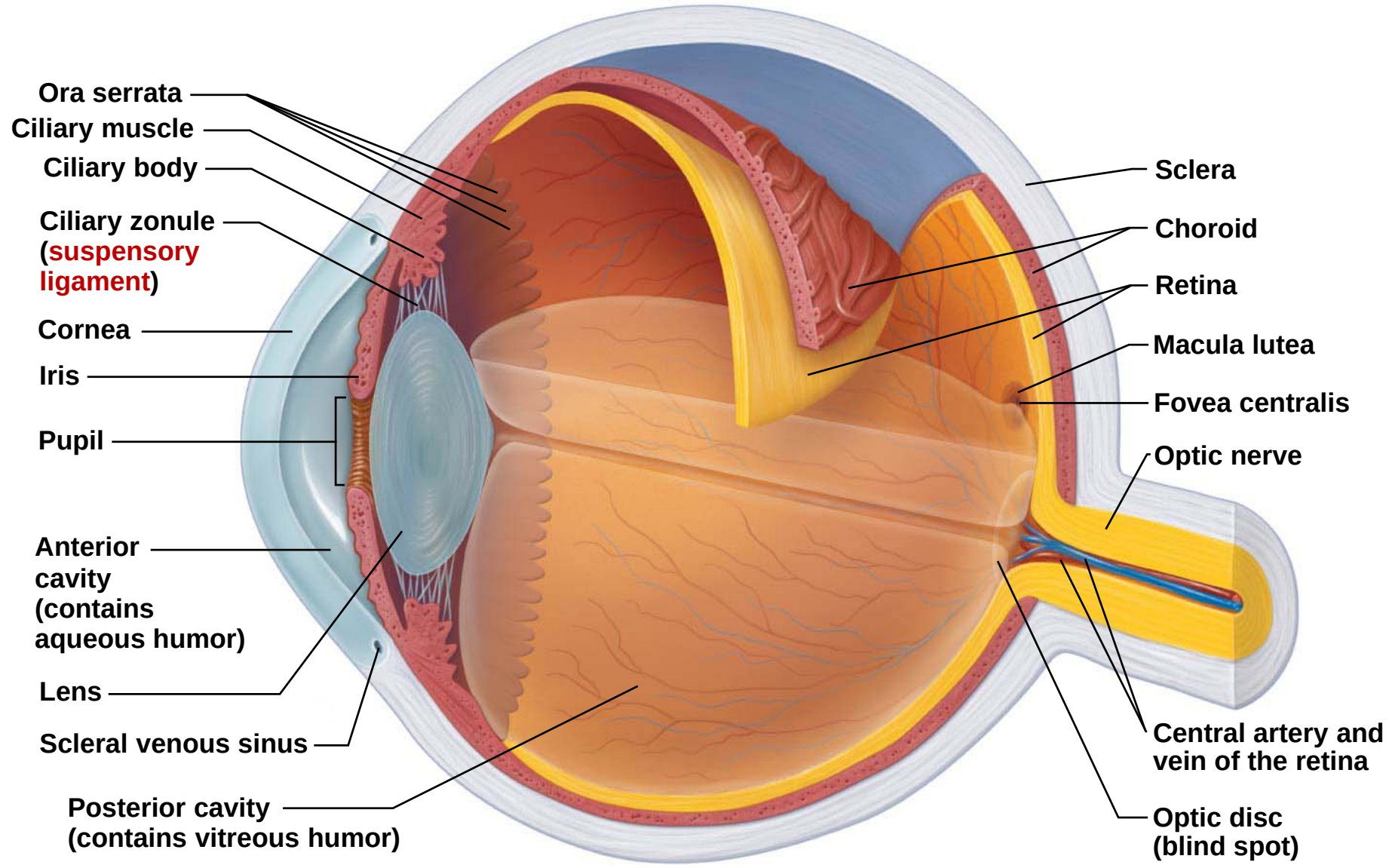
(b) Superior view of the right eye

Figure 15.3c Extrinsic eye muscles.



(c) Anterior view of the right eye

Figure 15.4a Internal structure of the eye (sagittal section).



(a) Diagrammatic view. **The vitreous humor is illustrated only in the bottom part of the eyeball.**

Figure 15.6a Microscopic anatomy of the retina.

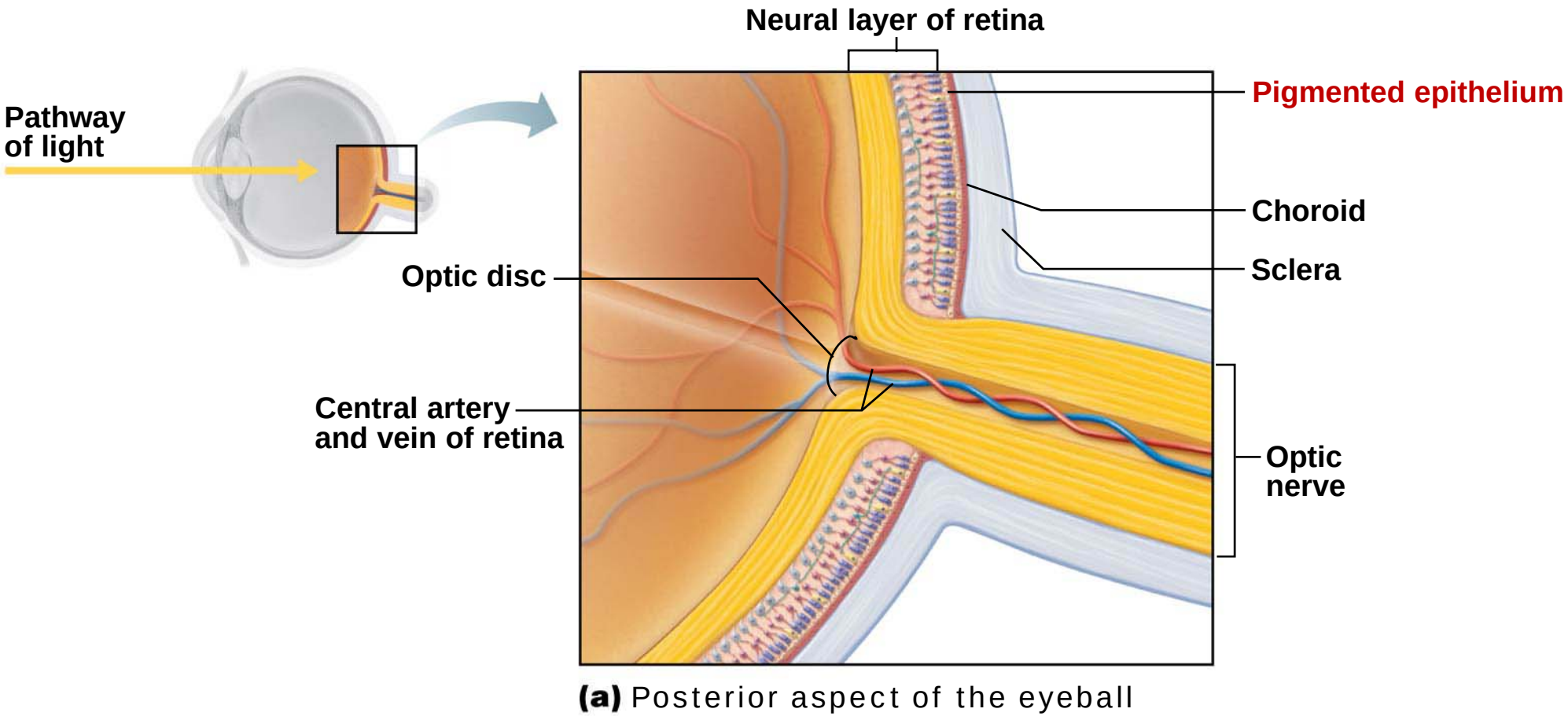
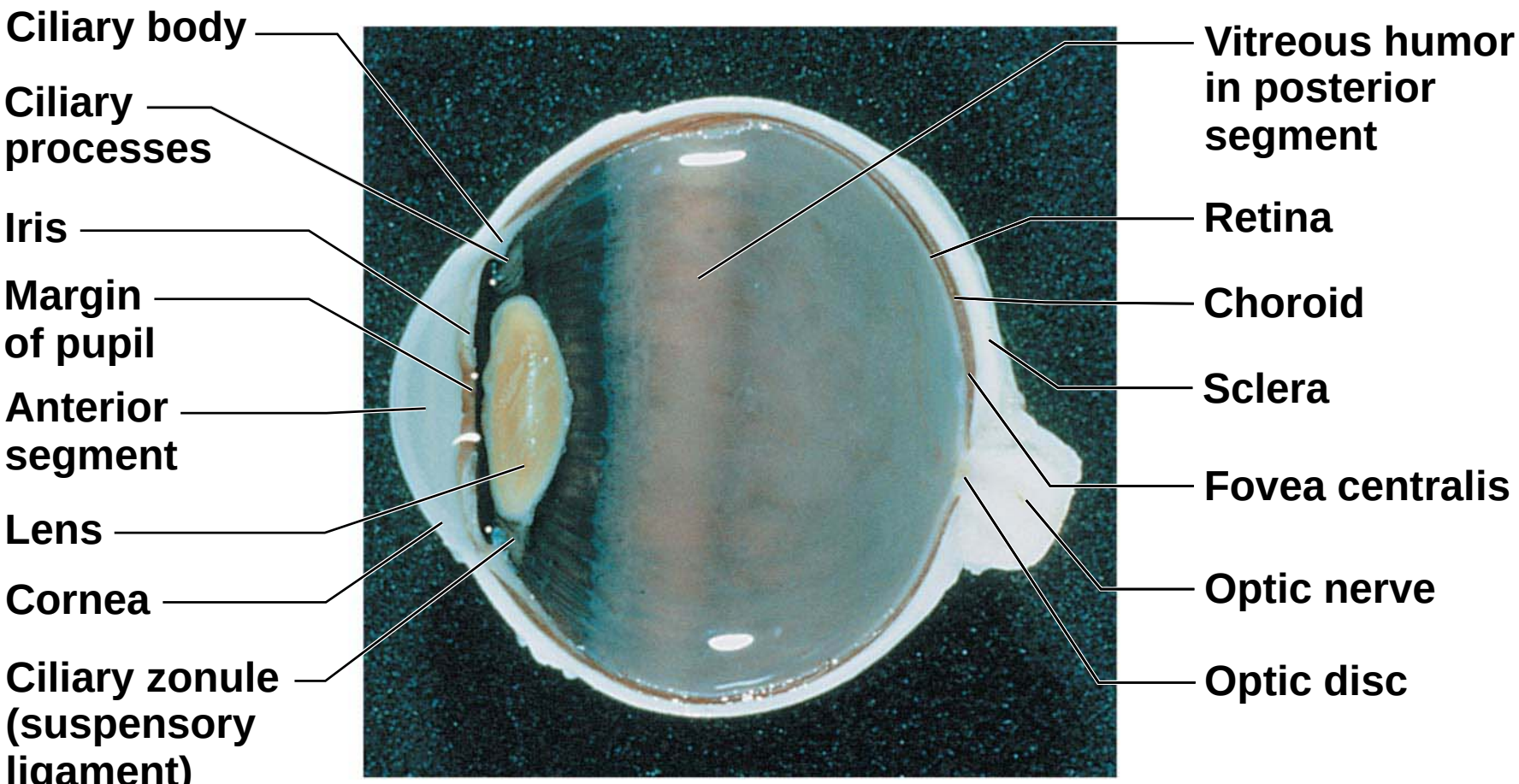


Figure 15.4b Internal structure of the eye (sagittal section).



(b) Photograph of the human eye.

Figure 15.8 Circulation of aqueous humor.

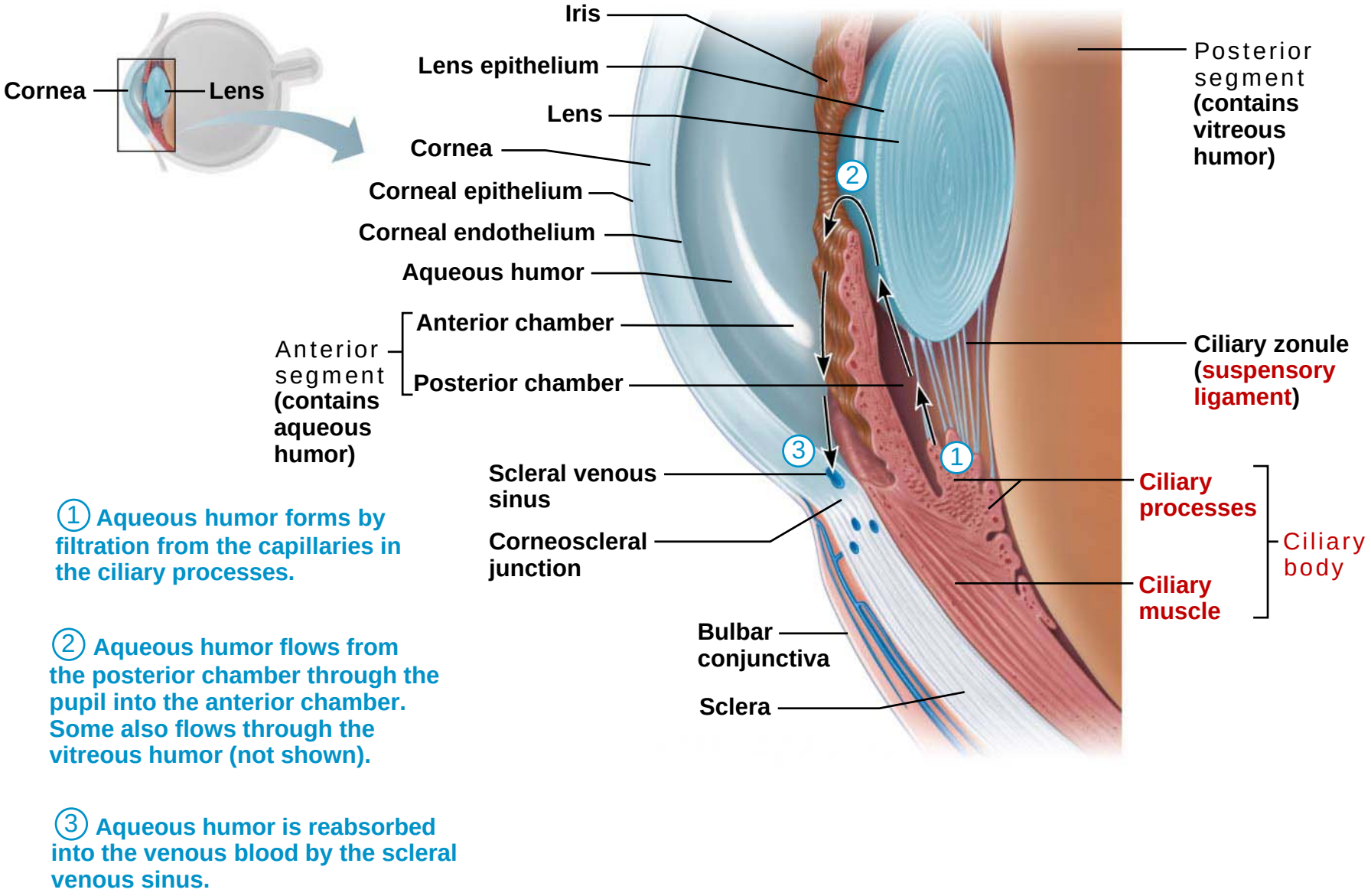


Figure 15.24a Structure of the ear.

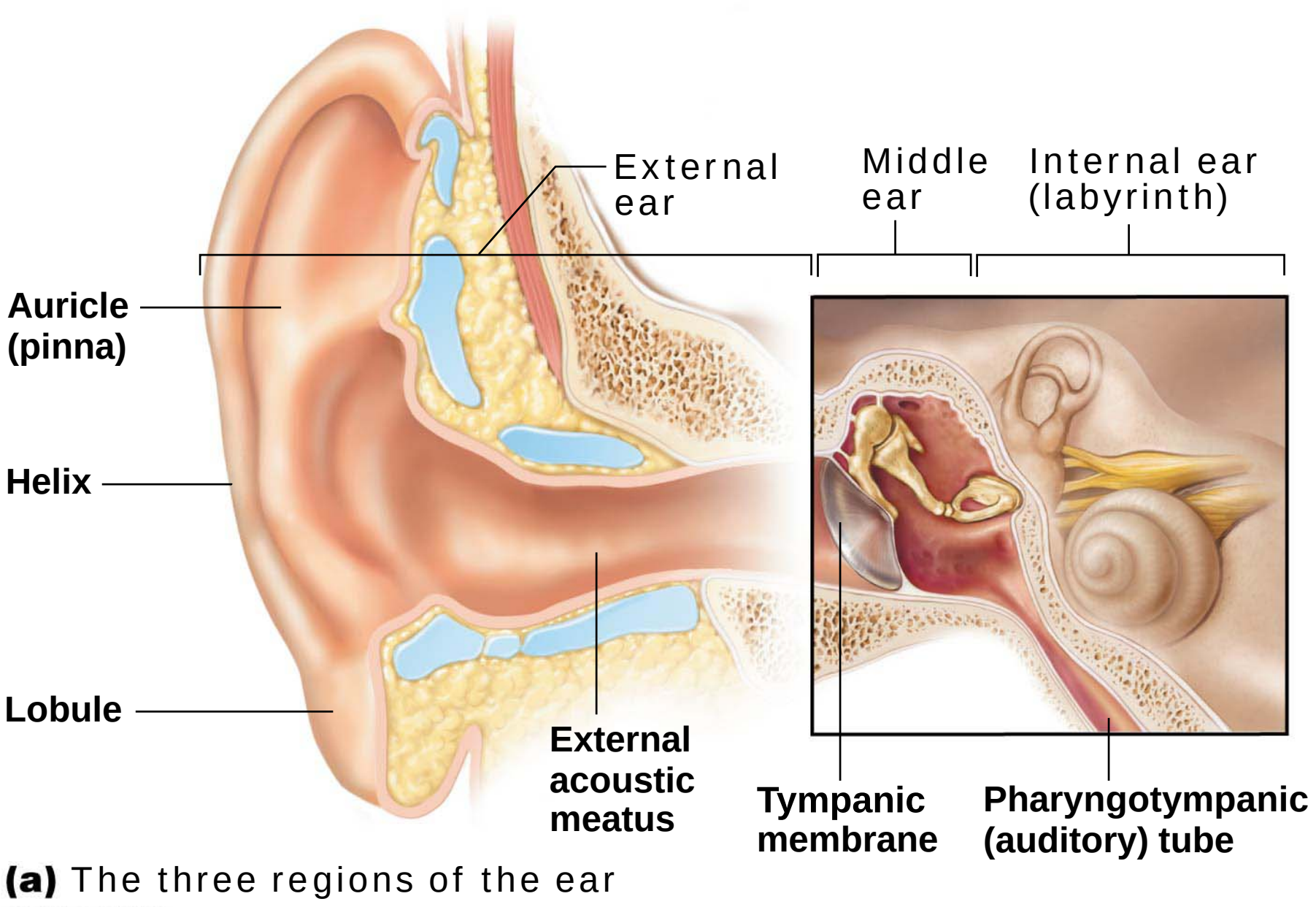
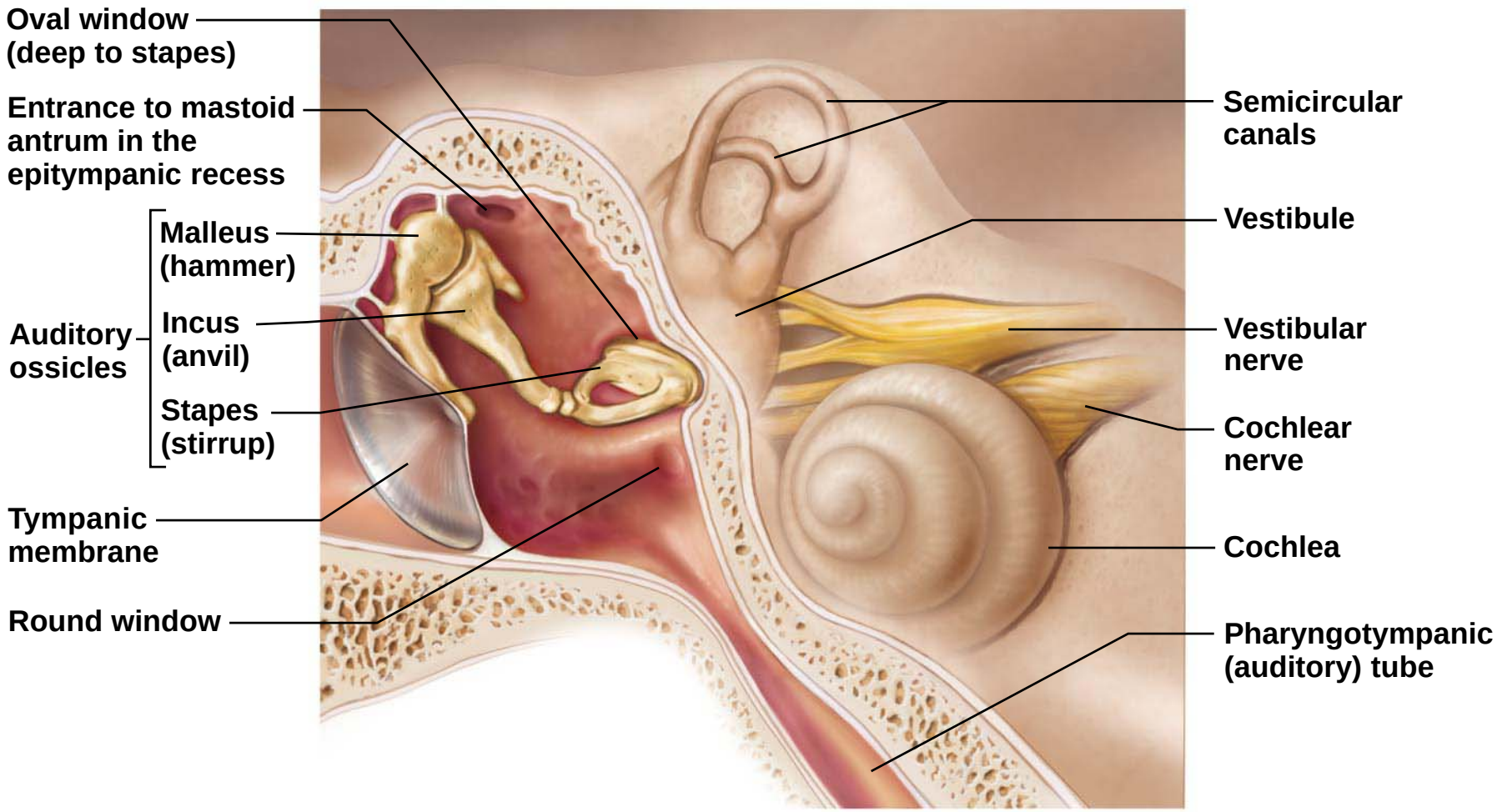
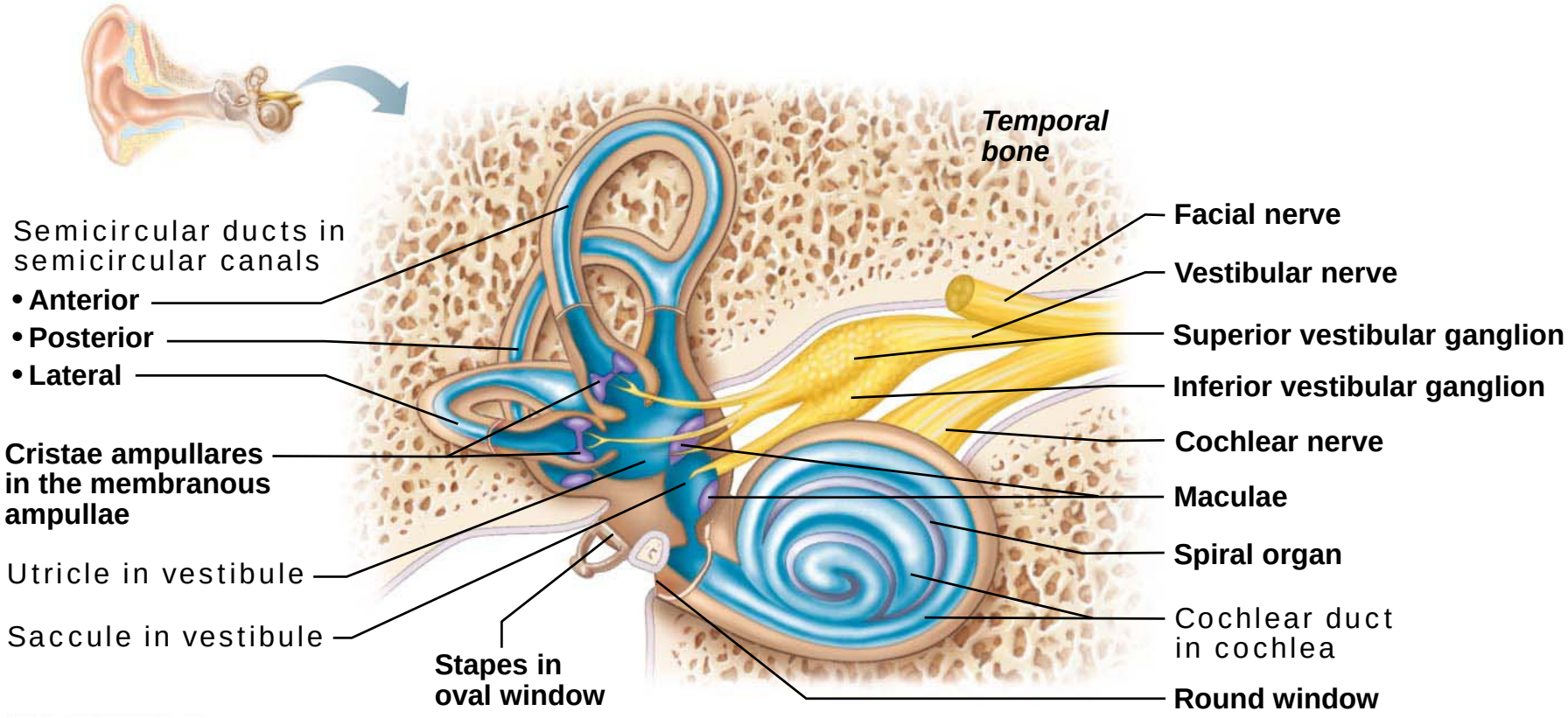


Figure 15.24b Structure of the ear.



(b) Middle and internal ear

Figure 15.26 Membranous labyrinth of the internal ear.



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- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the sensory model quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

Sensory Anatomy

**There are two different eye models so there is a lot of repetition, but it is good to practice with all of the pictures.


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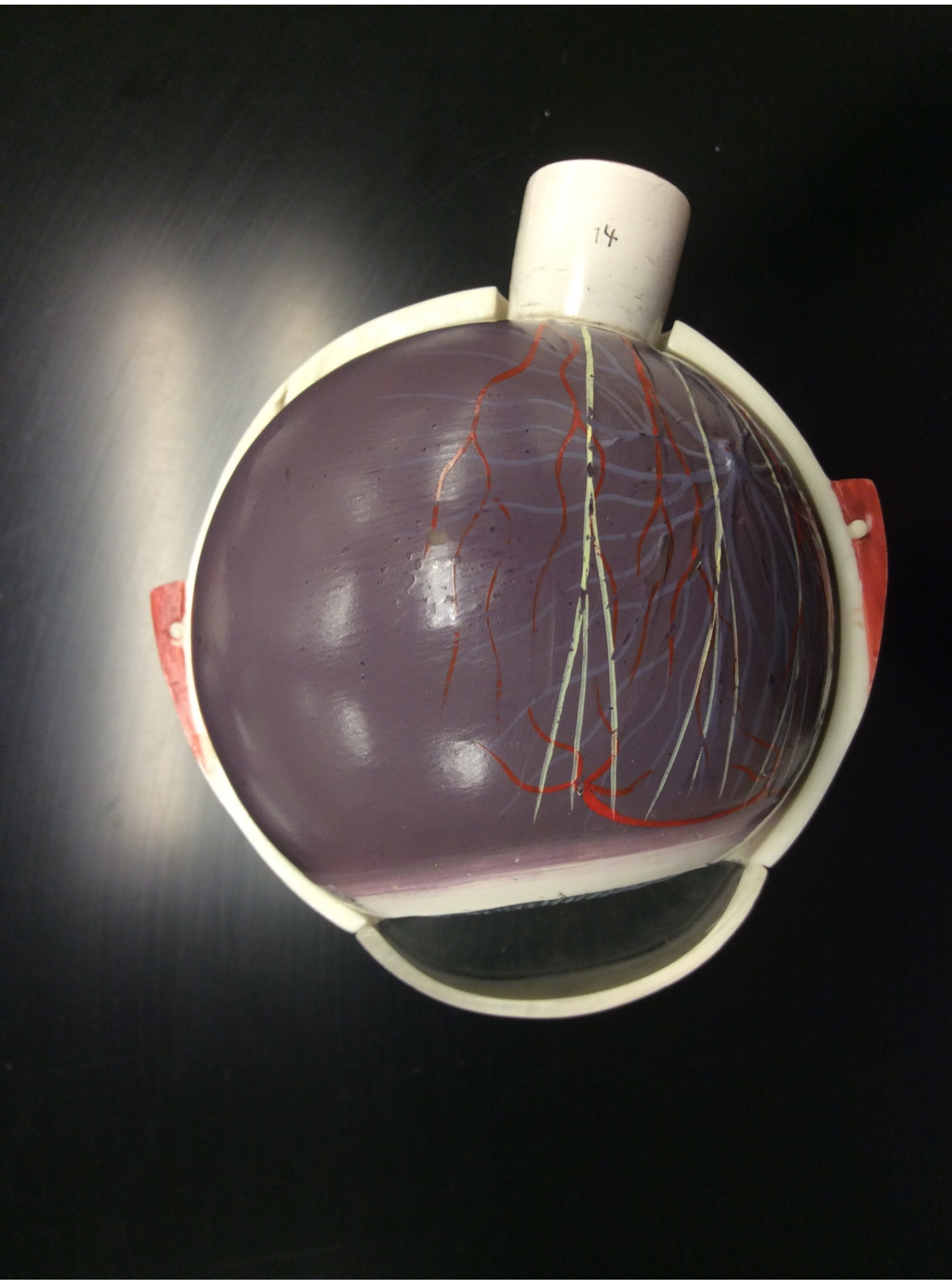
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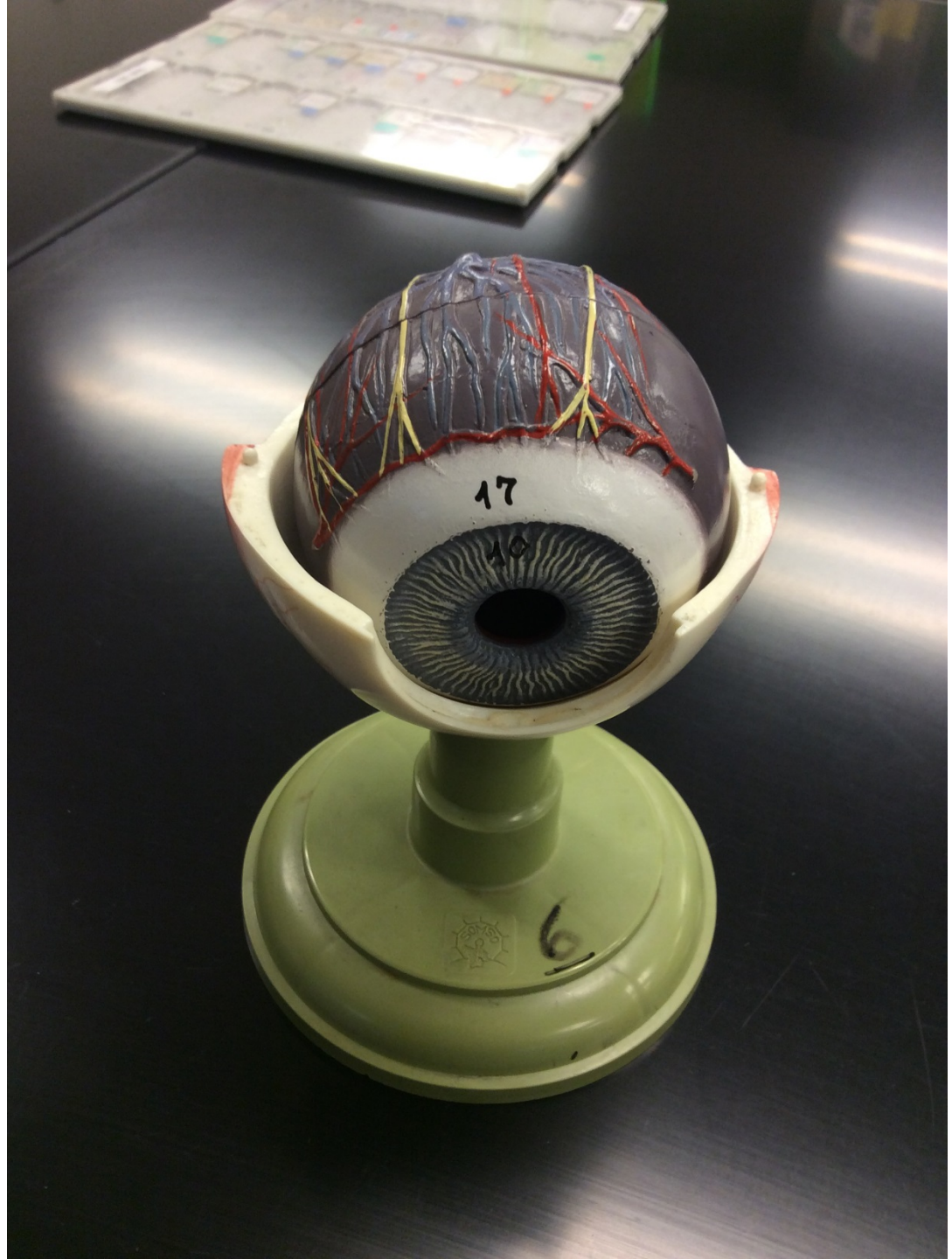
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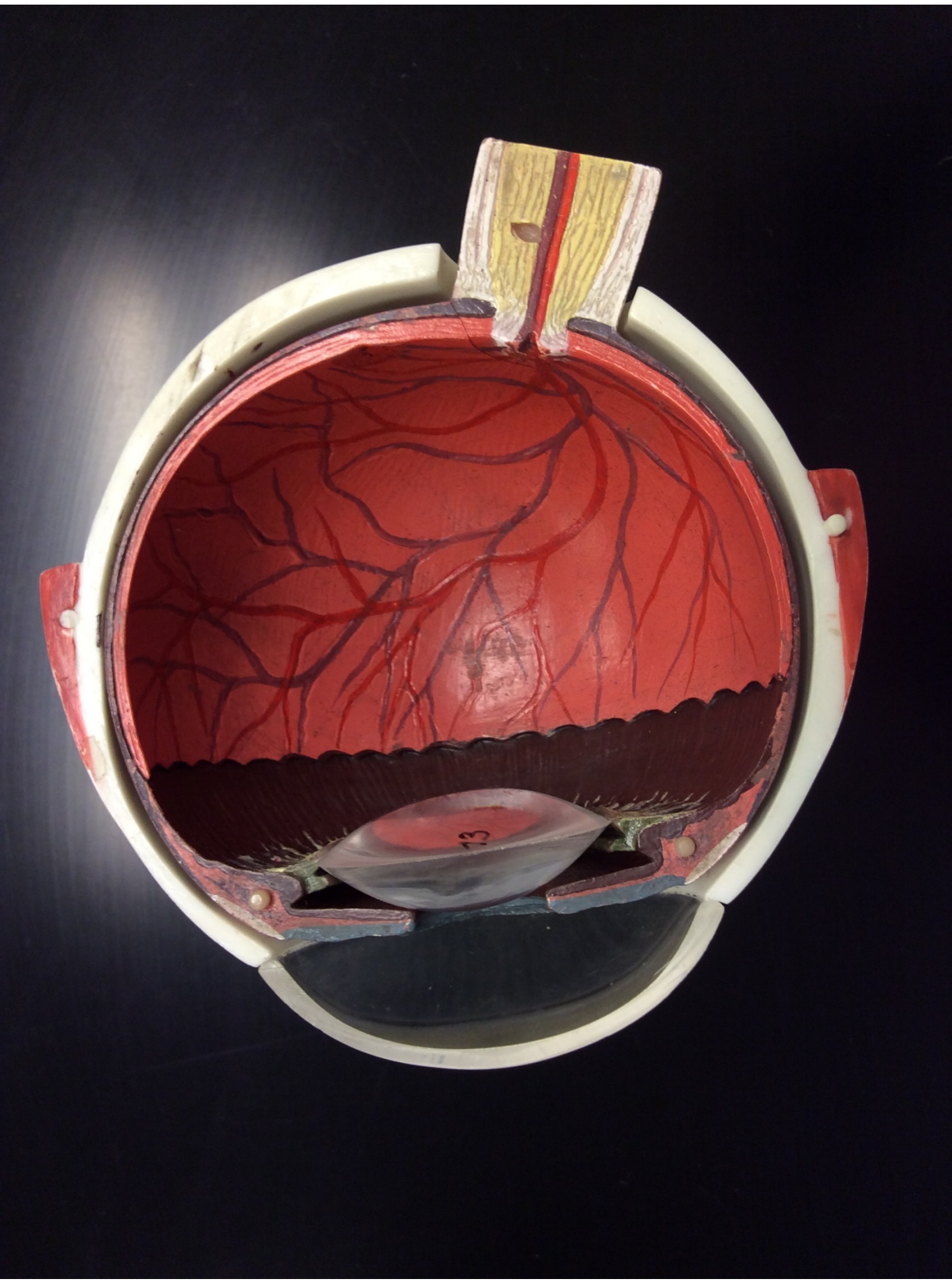

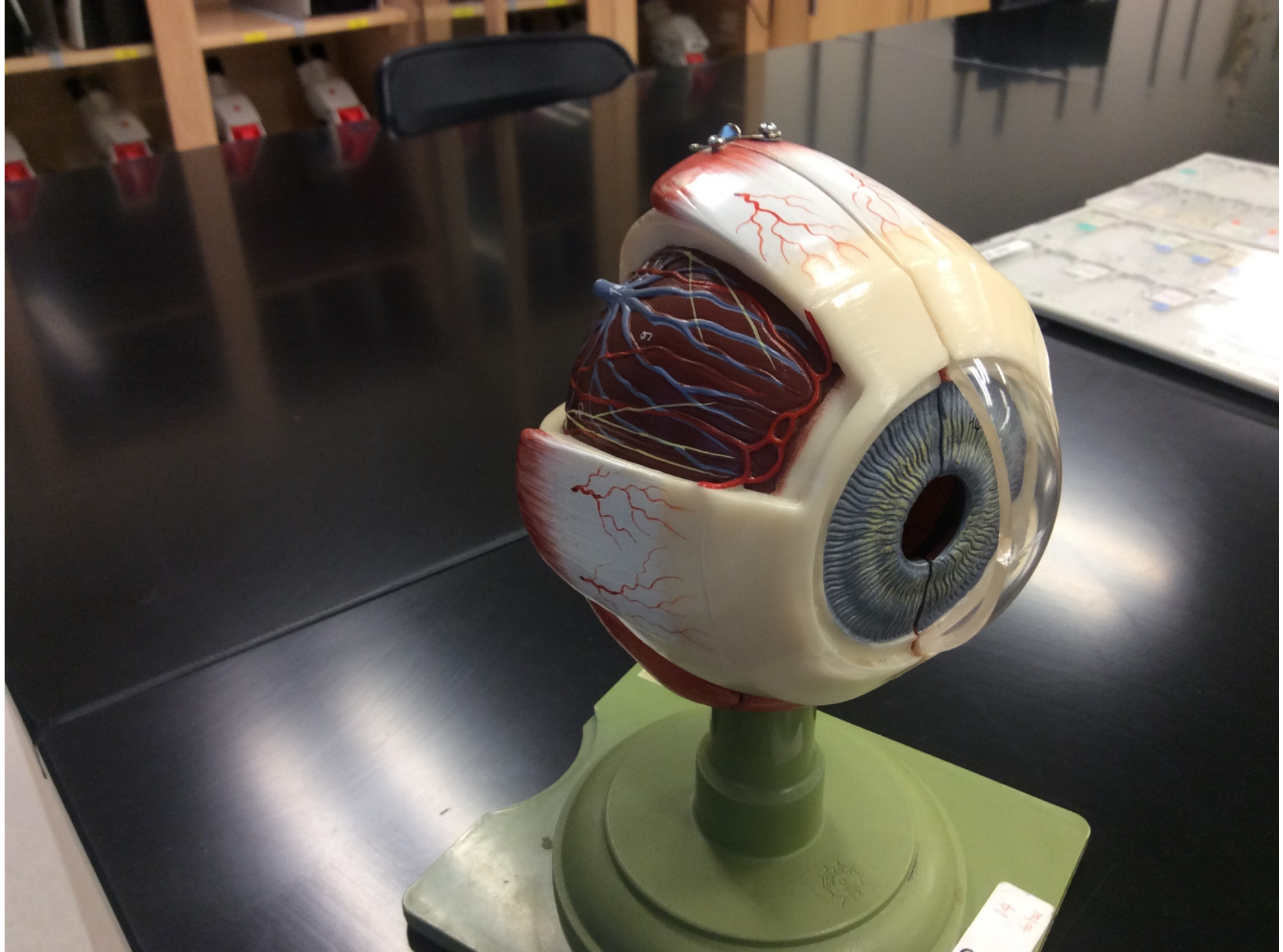

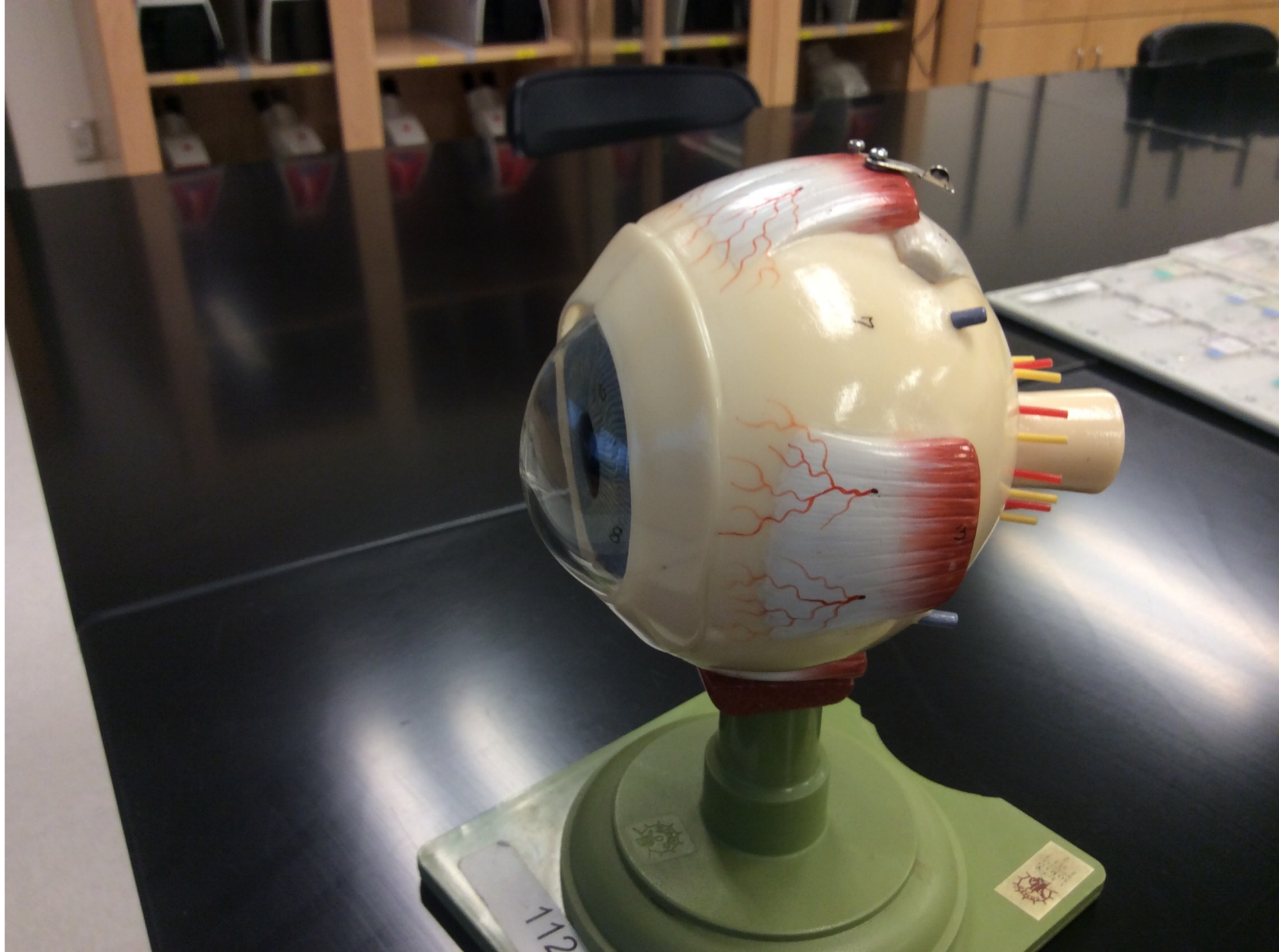


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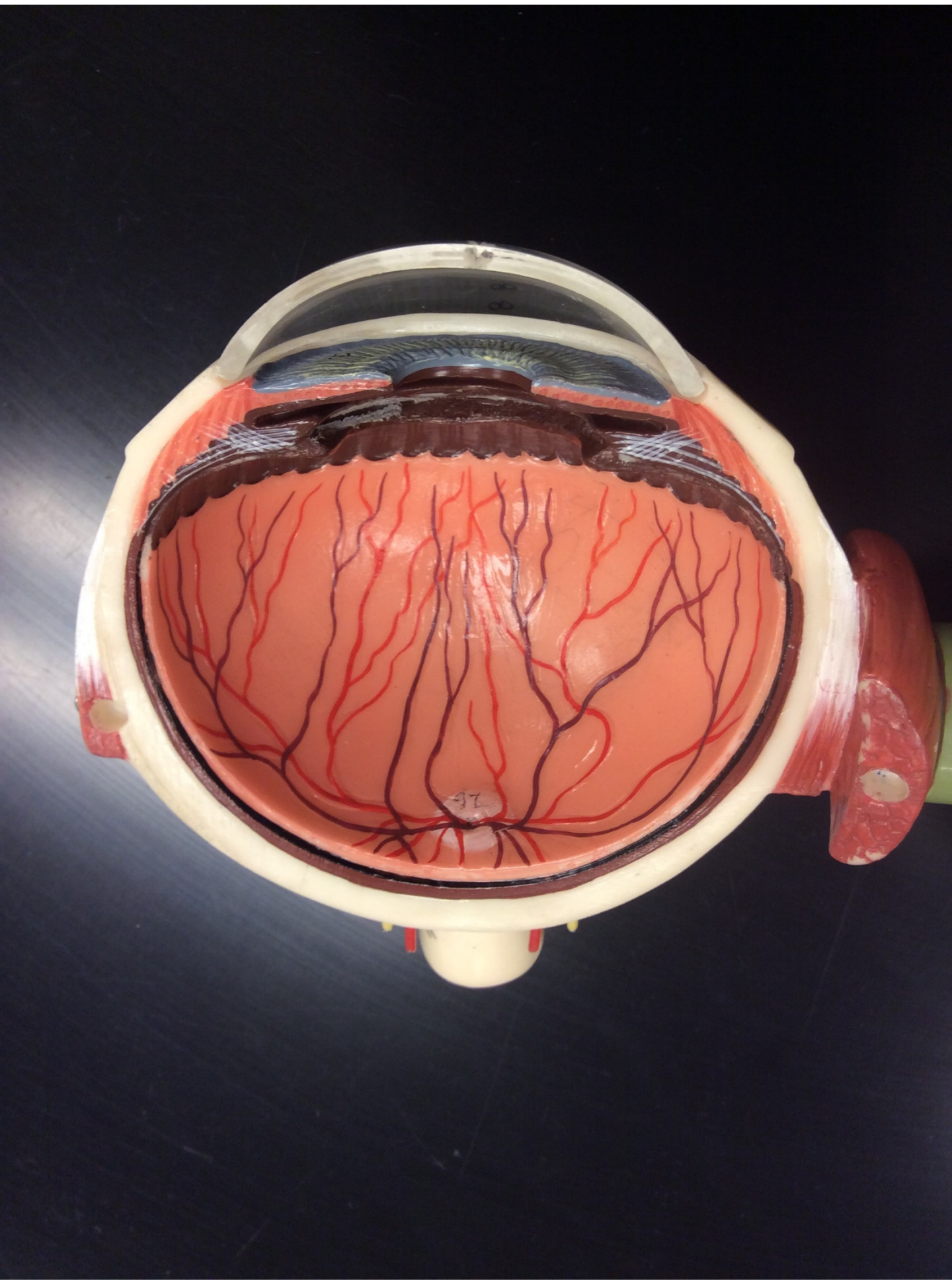

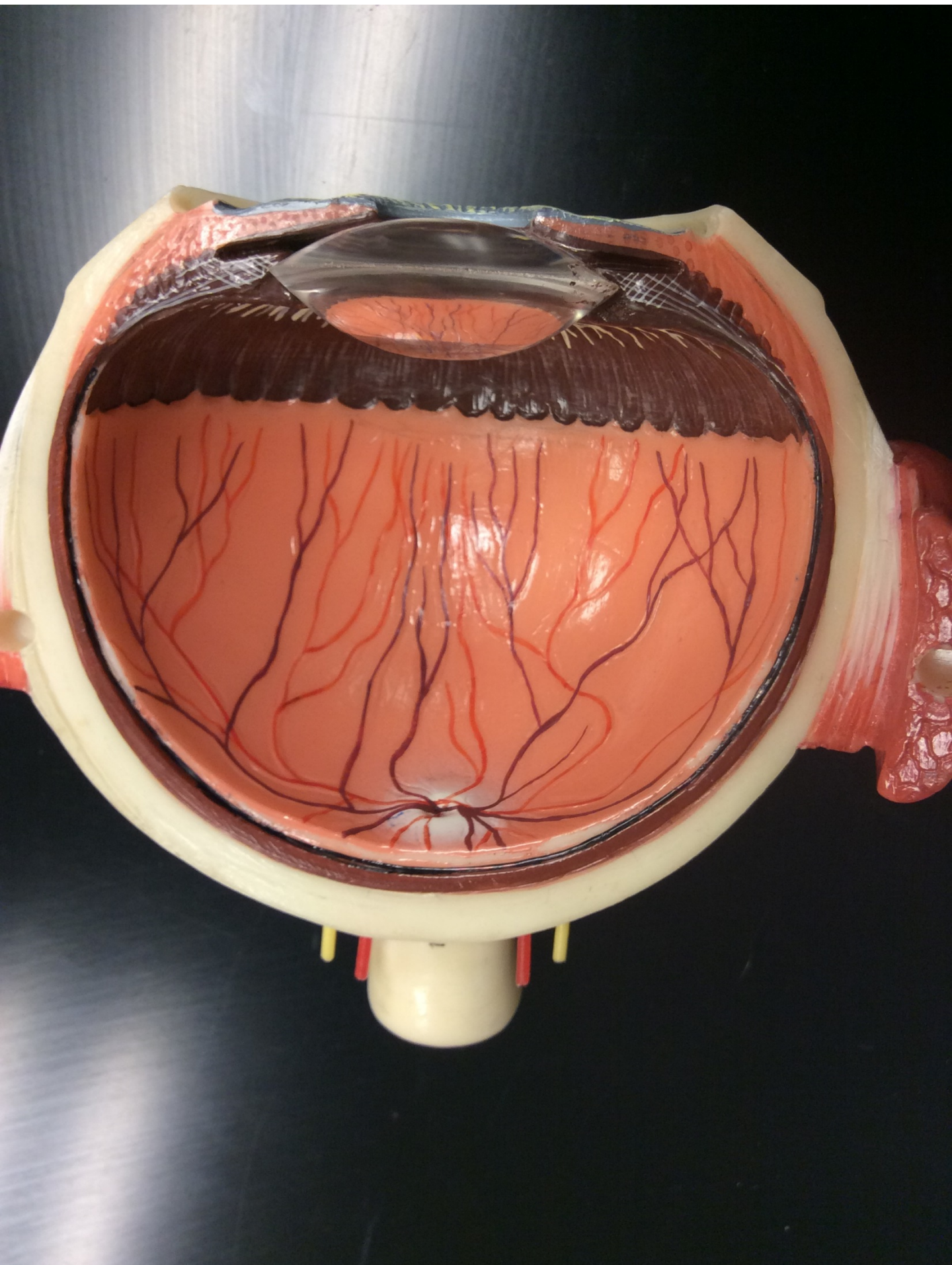


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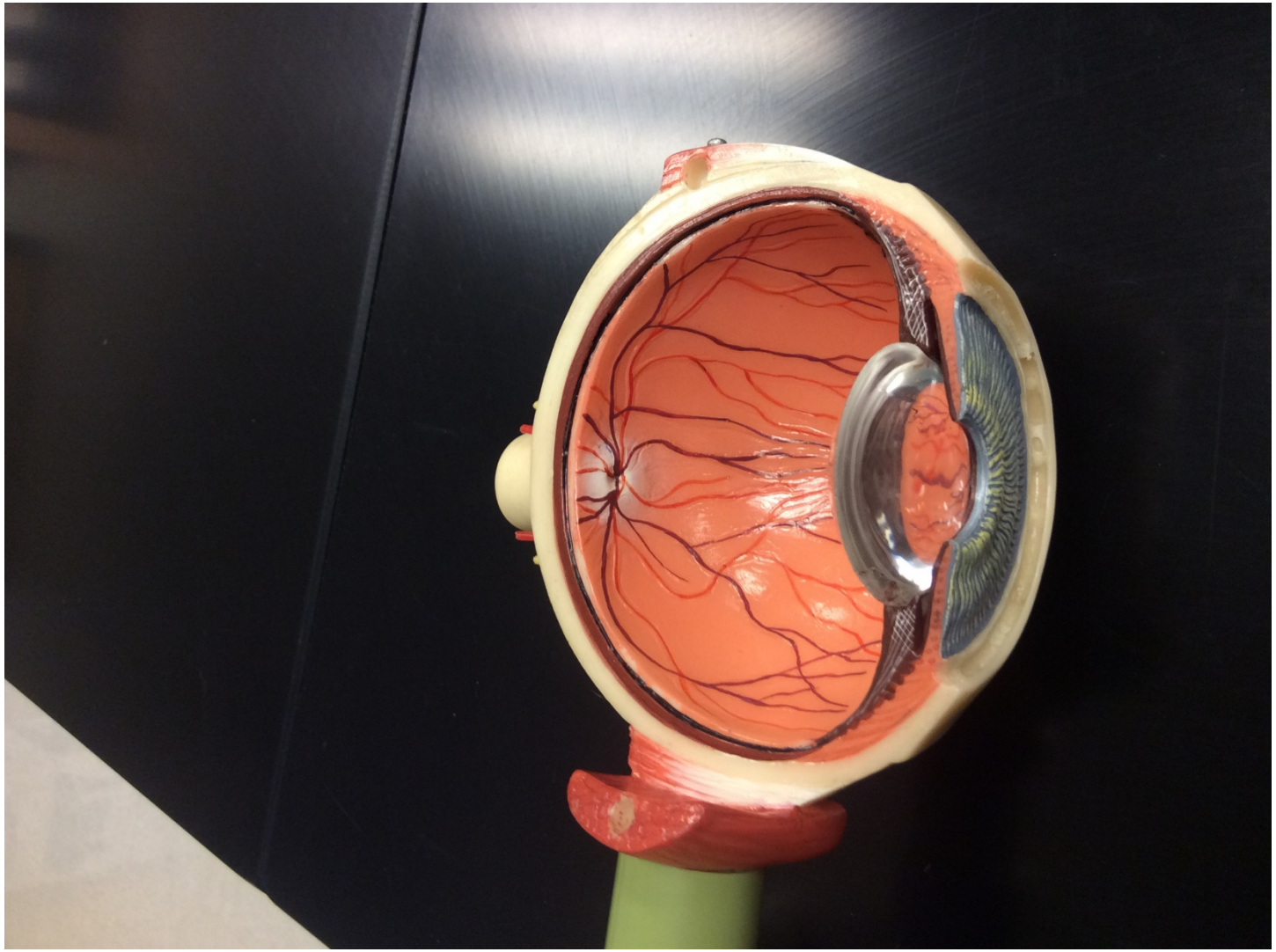

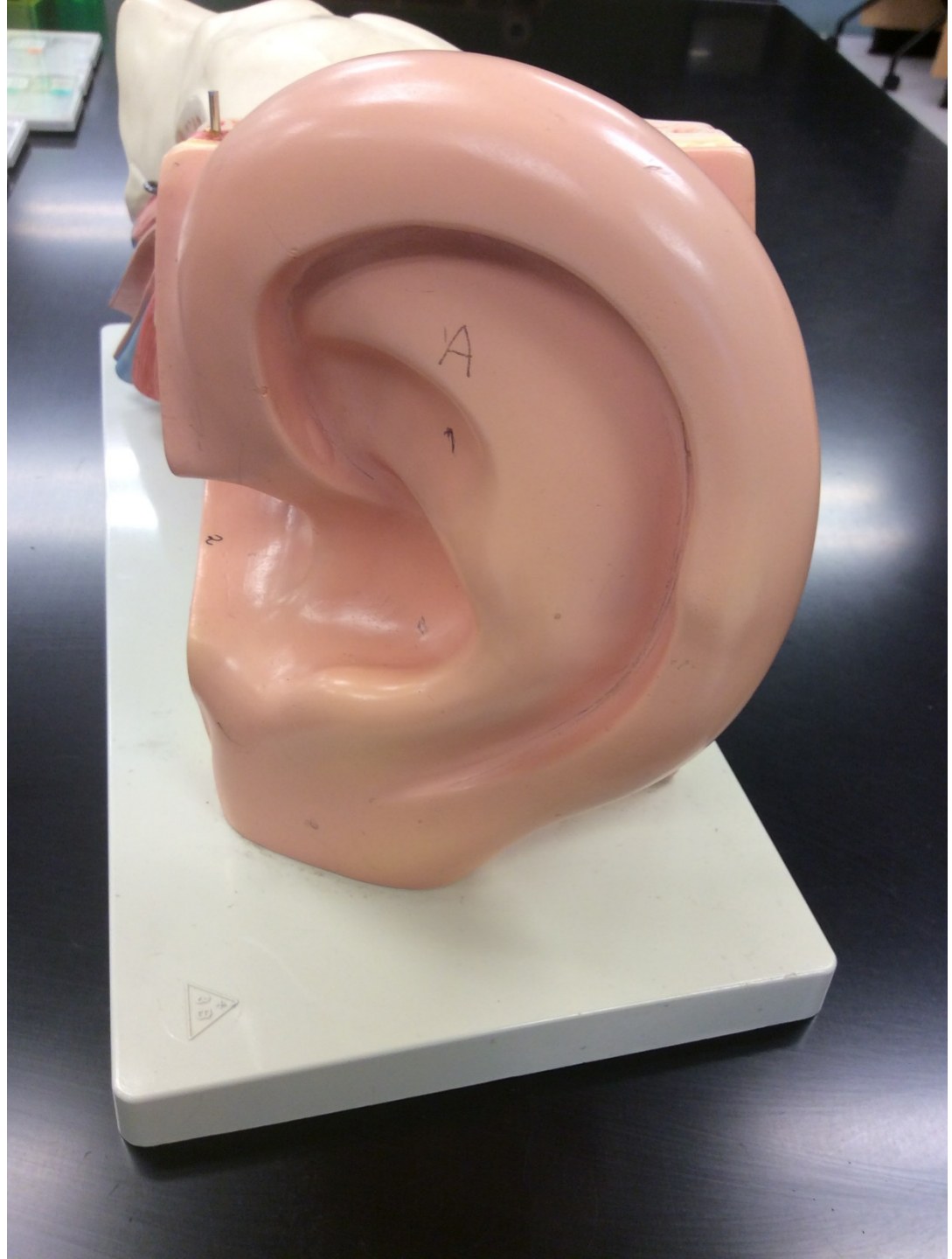
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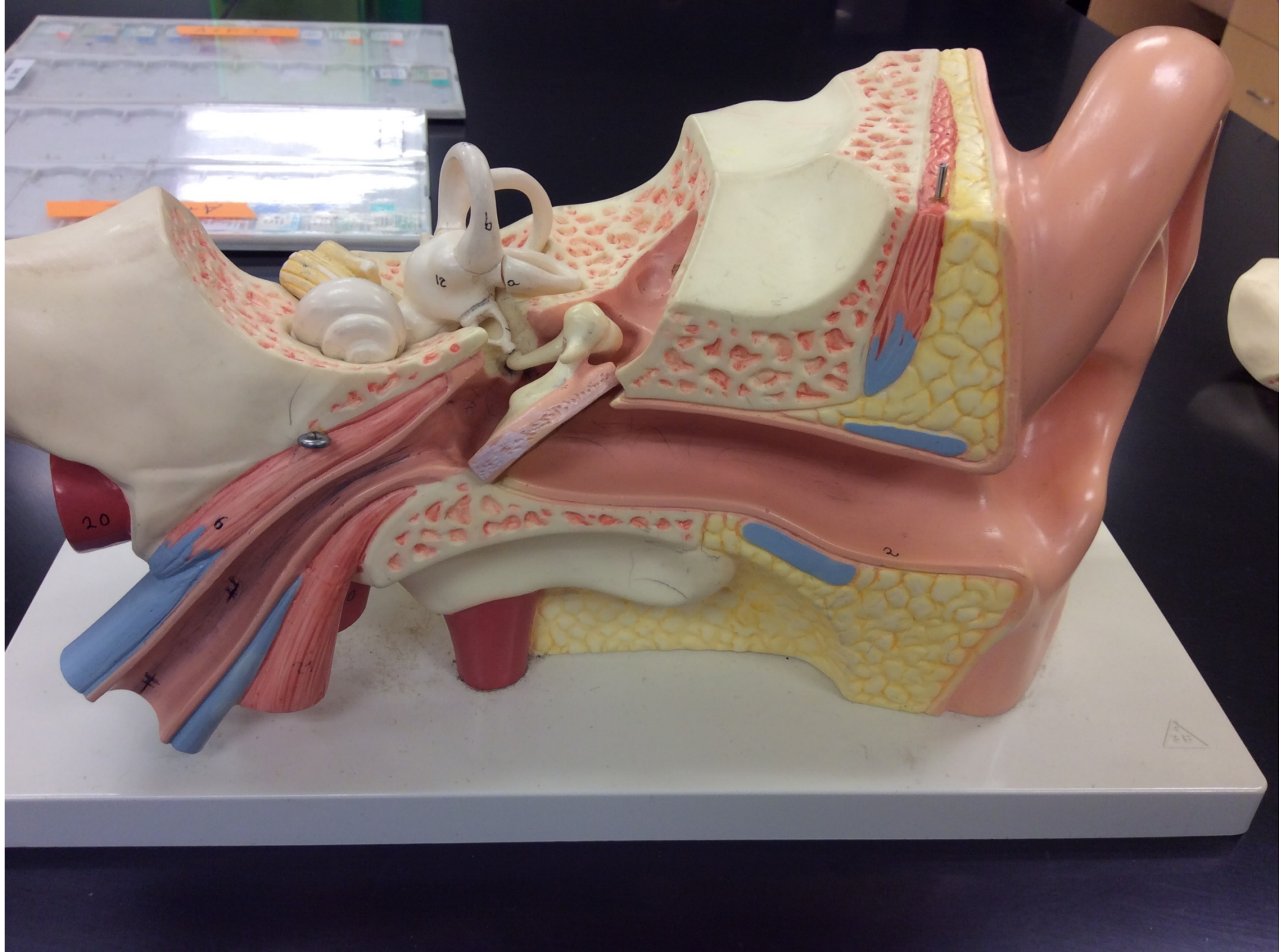
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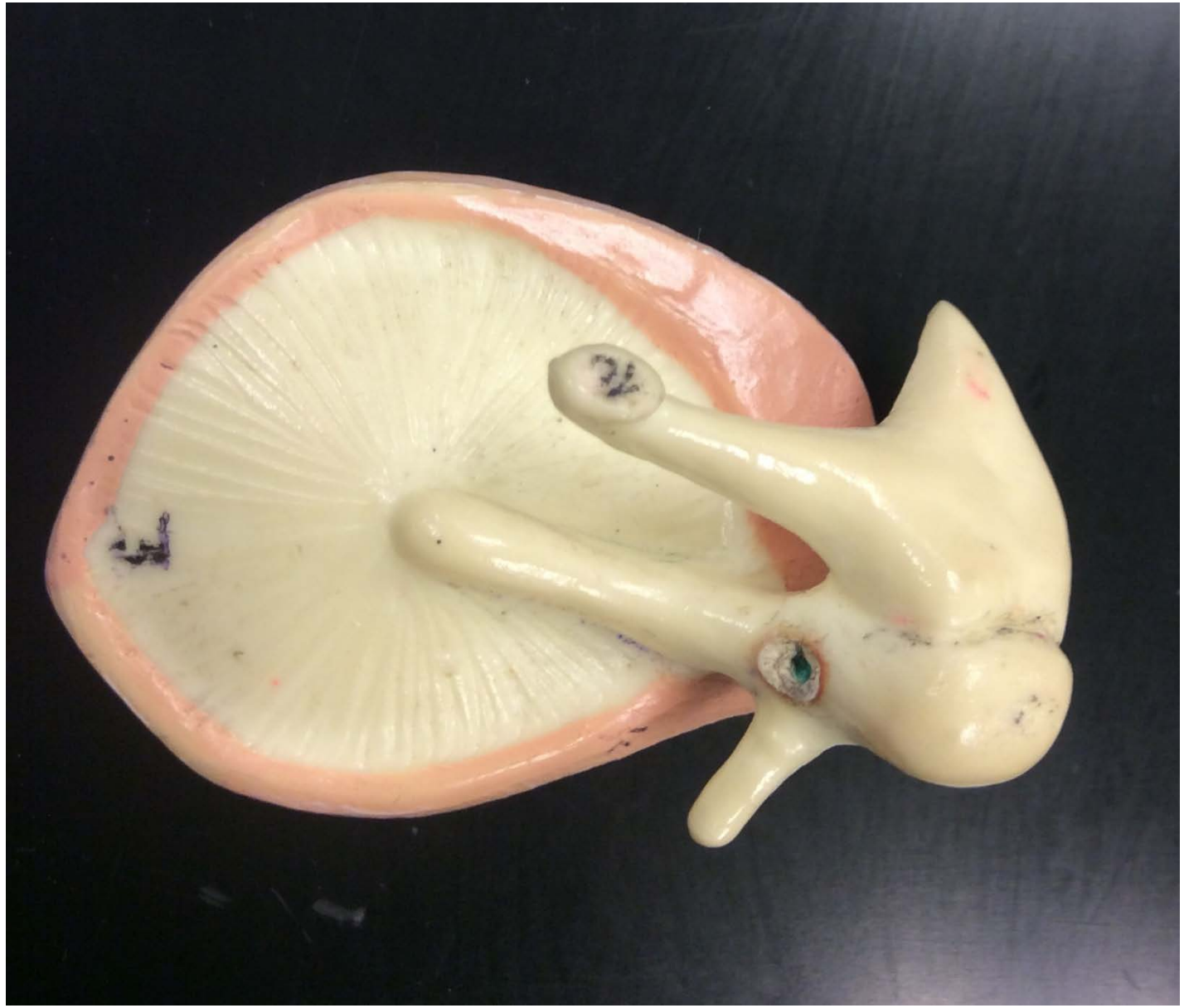

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