

Advanced Neuroanatomy 2025

1,5 hours | 40 points total | 17 questions (2 - 4 points each)

Q1 General Concepts (2P)

1. What is the difference between commissural and associational fibers?
2. Give an example for each.

Annotation

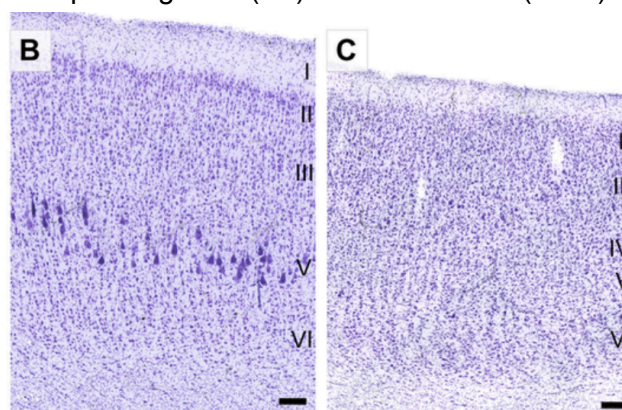
- **Q2-Q6 Multiple coronal sections (sheep). Myelin and Nissl.**
→ from the MSU sheep brain atlas.
 - How is the indicated structure called?
 - Can we see the LGN and Crus Cerebri in this section?
 - Which staining method was used here, explain.
- **Q7 Dorsal View of Brainstem (human)**
- **Q8 Mid-sagittal view (sheep)**
- **Q9 Ventral View of Brain (sheep)** - indicate where the cranial nerves I-VI would be
- **Q10 Ventral view of rabbit brain** - identify structures (e.g. olfactory bulb, optic nerve, piriform cortex, cranial nerves...)
- **Q11 Lateral View of human brain:** indicate the four lobes and primary areas (S1, M1, A1, V1)

Q12 Draw a coronal schematic of the internal capsule, components of the basal ganglia, thalamus, external capsule

Q13 Anterograde Tracer question:

- **Tracer was injected into which region?** → Hippocampus
- **What two things are indicated?** → pre- and post-commissural fornix
- **Where do they project to?** → Pre-commissural Fornix to Basal Forebrain Nuclei (Medial Septum); Post-commissural Fornix to Mammillary Bodies

Q14 Identify M1 and V1 from Nissl staining (from new species → leopard). Motivate your answer. Also shortly explain an additional experiment how else you could make sure to correctly identify the corresponding area (2P) - Johnson et al. (2016)



Q15 Pyramidal tract - Draw it (4P)

Where does it run in the midbrain, what is it called (draw sketch of coronal midbrain and indicate the structure)

- Where are the neurons
- Where is the decussation
- Which spinal nerves

Q16 Multiple short statements - are they right or wrong - explain your answer

Statements were along these lines: (4P)

- The LGN is a high-order thalamic nucleus.
- You can see the pyramidal tract on the dorsal side of the brainstem.
- The pituitary gland is part of the epithalamus.
- The Nucleus of the Trochlear nerve sits more medially in the brainstem.
- The first synapse of the dorsal columns is in the dorsal horn of the spinal cord.
- ...

Q17 Draw either spino-thalamic OR dorsal column pathway.

Where does it run in the midbrain? (4P)

- Where are the neurons (first, second, third order)
- Where is the decussation
- Which spinal nerve