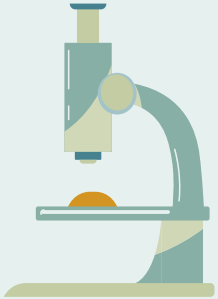
MED439
KING SAUD UNIVERSITY

Revised & Approved

Abdullah Alsubaihi
Rania Almutiri

جامعة الملك سعود
King Saud University
1957



CNS OSPE

Histology Team
439

Color index:

Slides

Important

Doctors notes

Extra

Editing file

Important notes:

- There'll be 2 Histology stations in the exam:

    1- Spinal cord (Identify the section + 2, 3 Features **or** i**dentify labels**)

    2- Neuron (Identify the section + Sites)

- As always, Write the full name and don't use shortcuts.

For Med439:

-This OSPE is papered exam

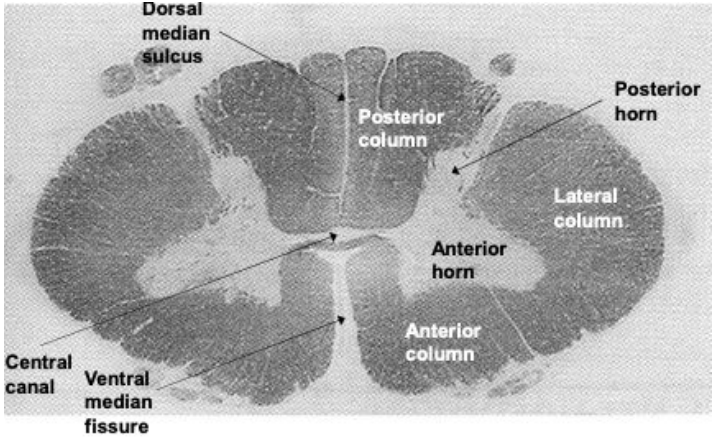
- You should study the original file first, this file is for revision only and it's made by students

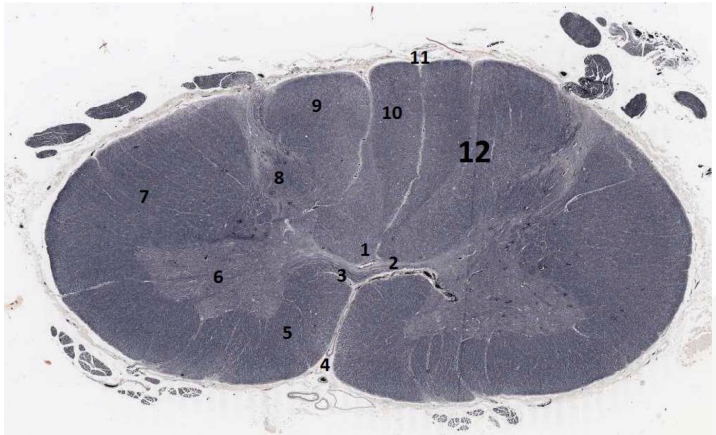
★ Q1/ Identify the structure?

Cervical region of spinal cord

★ Q2/ What are the features of the structure?

1. The section is oval.
2. The central canal is anterior in position.
3. There are 4 horns of gray matter:
    a) Two thin & diverging posterior horns.
    b) Two thick anterior horns.
4. Two important tracts occupy the posterior column of the white matter. These are the gracile and the cuneate tracts.





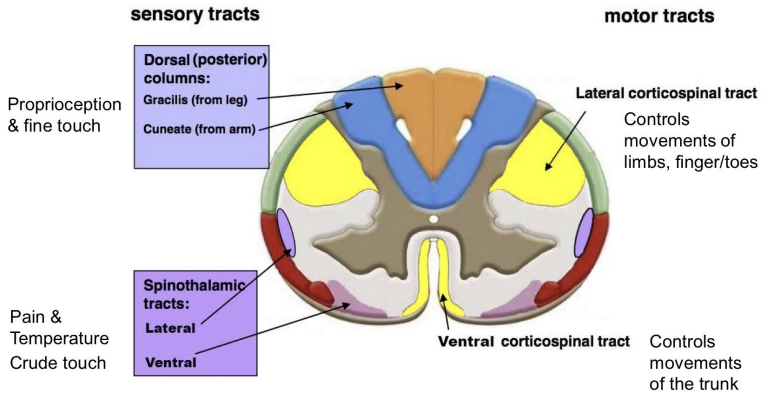
★ Q3/ Identify the labels?

1- central canal
2- gray commisure
3- anterior white commisure
4- ventral median fissure
5- anterior white column
6- anterior gray horn
7- lateral white column
8- posterior gray horn
9- cuneate tract
10-gracile tract
11- dorsal median sulcus
12- posterior white column

“Memorize the other photo as well”

Q1/ Identify the structure?

Cervical region of spinal cord



Q2/ Mention some of motor (descending) tracts in this section?

- Lateral corticospinal:
  controls movements of the distal region of the body (limbs, fingers/toes).
- Ventral corticospinal:
  controls movements of the axial region of the body (trunk).

*you need to memorize the picture, it may comes in the exam as **" identify the tract in the arrow?"** or **"what is the function of the pointed tract?" etc..**

Q3/ Mention some of sensory (ascending) tracts in this section?

- Gracile: proprioception and fine touch from lower half of the body.
- Cuneate: proprioception and fine touch from upper half of the body.
- Lateral spinothalamic: pain and temperature.
- Ventral spinothalamic: crude touch.

★ Q1/ Identify the structure?

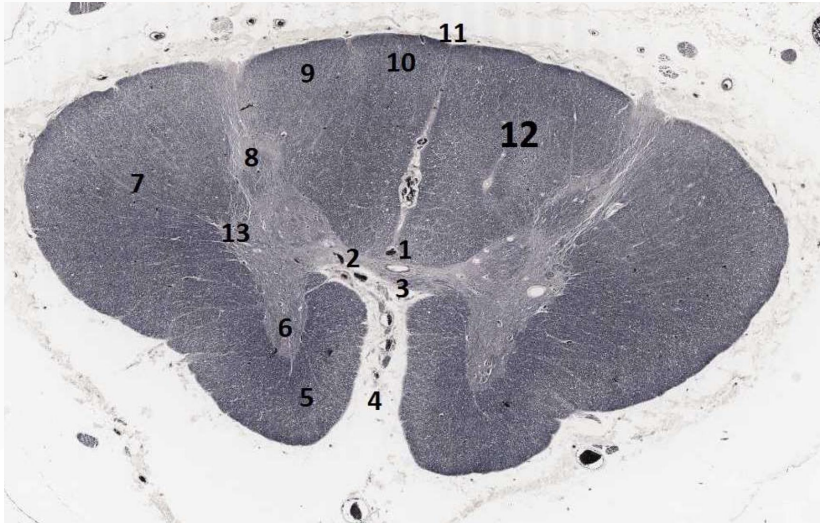
Thoracic region of spinal cord

★ Q2/ What are the features of the structure?

1. The section is less oval than the cervical region.
2. The central canal is more posterior in position than in the cervical region.
3. There are 6 horns of gray matter:
    a) Two thin & diverging posterior horns.
    b) Two small lateral horns.
    c) Two thin anterior horns.

Q3/ Mention 2 tracts in the dorsal column?

- Fasciculus gracilis
- Fasciculus cuneatus "will be absent in the lower thoracic region"

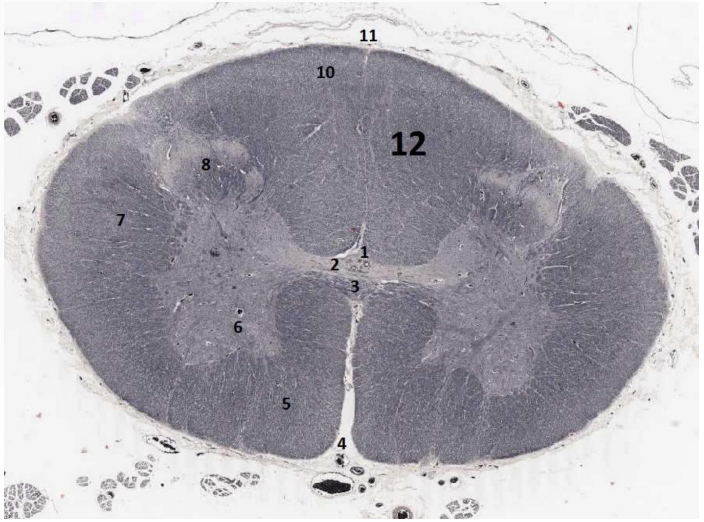


★ Q4/ Identify the labels?

1- central canal
2- gray commisure
3- anterior white commisure
4- ventral median fissure
5- anterior white column
6- anterior gray horn
7- lateral white column
8- posterior gray horn
9- cuneate tract
10- gracile tract
11- dorsal median sulcus
12- posterior white column
13- lateral gray horn

★ Q1/ Identify the structure?

Lumbar region of spinal cord



★ Q2/ What are the features of the structure?

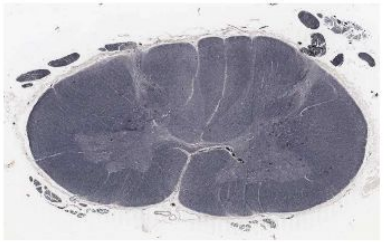
1. The section is relatively round.
2. The central canal is central in position.
3. There are 4 horns of gray matter:
    a) Two thick & almost parallel posterior horns.
    b) Two thick anterior horns.

Q3/ what is the tract present in the dorsal column?

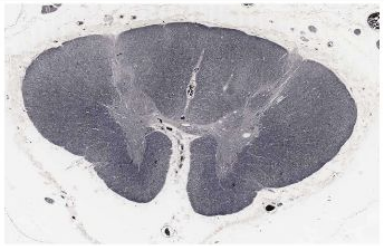
- Fasciculus gracilis, while Fasciculus cuneatus is absent

★ Q4/ Identify the labels?

1- central canal
2- gray commisure
3- anterior white commisure
4- ventral median fissure
5- anterior white column
6- anterior gray horn
7- lateral white column
8- posterior gray horn
9- cuneate tract "not found at this level"
10- gracile tract
11- dorsal median sulcus
12- posterior white column



Cervical Spinal Cord



Thoracic Spinal Cord

Lumbar Spinal Cord

The easiest and most consistent way to differentiate between the 3 levels is to look first at the posterior horns.

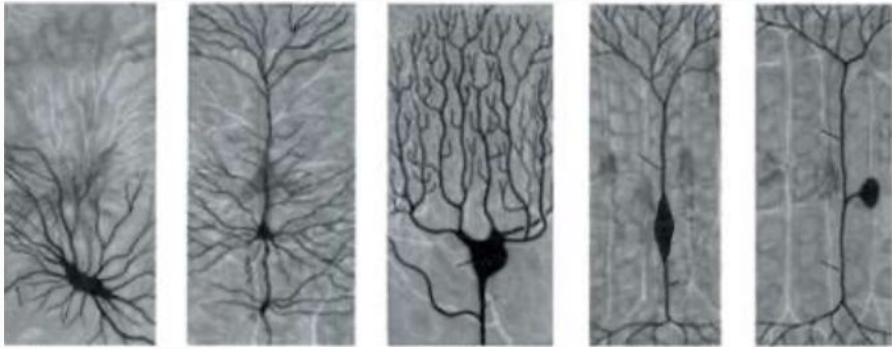
1-If they are thick and almost parallel, then it's lumbar.

2-If the posterior horns are thin and diverging, it could be either cervical or thoracic. Look at the anterior horns.
A-If they are thin, it's thoracic.
B-If they are thick, it's cervical.

	Cervical	Thoracic	Lumbar
Outline	Oval	Less oval than cervical	Relatively round
Central canal	Anterior	More posterior	Central
Horns	4	6	4
2 posterior horns	thin & diverging	thin & diverging	thick & almost parallel
2 Lateral horns	no	yes, small	no
2 anterior horns	Thick	Thin	Thick
White matter amount	greater than any other level	great	less than cervical
Overall size	larger than thoracic	smaller than cervical	relatively large

Q1/ Identify the structure?

A: Stellate neuron
B: pyramidal neuron
C: pyriform neuron
D: Bipolar neuron
E: Unipolar neuron



A B C D E

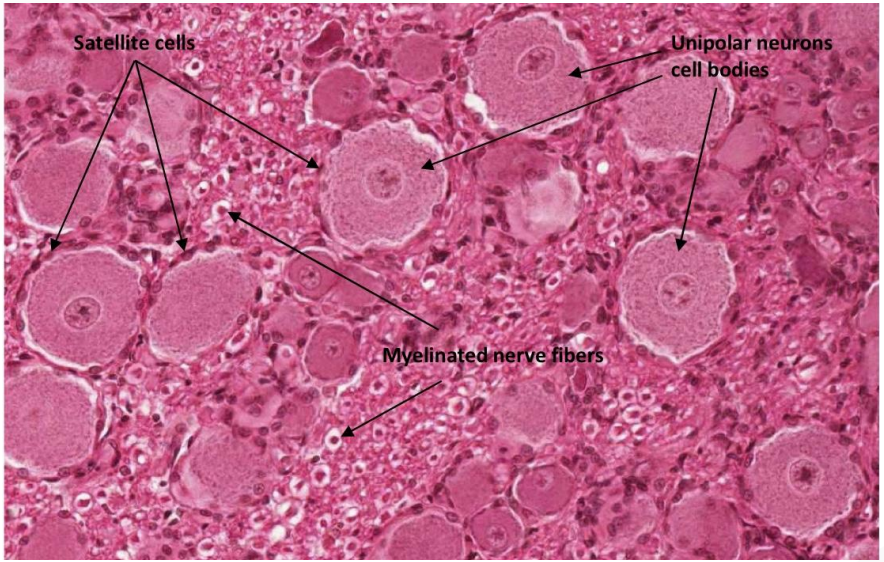
Q2/ Where they can be found?

- Stellate neuron: anterior horn cells of the spinal cord
- Pyramidal neuron: in motor area 4 of the cerebral cortex.
- Pyriform neuron: Purkinje cells of cerebellar cortex
- Bipolar neuron: retina & olfactory epithelium.
- Unipolar neuron: Mesencephalic nucleus of trigeminal nerve & dorsal root (spinal) ganglion.

Unipolar Neurons (in spinal ganglion)

★ Q1/ Identify the structure (type of the neuron)?

Unipolar or Pseudo-unipolar Neuron



★ Q2/ Where is the structure located?

- Spinal ganglia.
- Mesencephalic nucleus of trigeminal nerve

Q3/ What are the features of this structure ?

- Rounded.
- Variable in size.
- Capsules of satellite cells around them.
- Nuclei vesicular

Bipolar Neurons
(Olfactory cells in olfactory epithelium)

★ Q1/ Identify the structure (type of the neuron)?

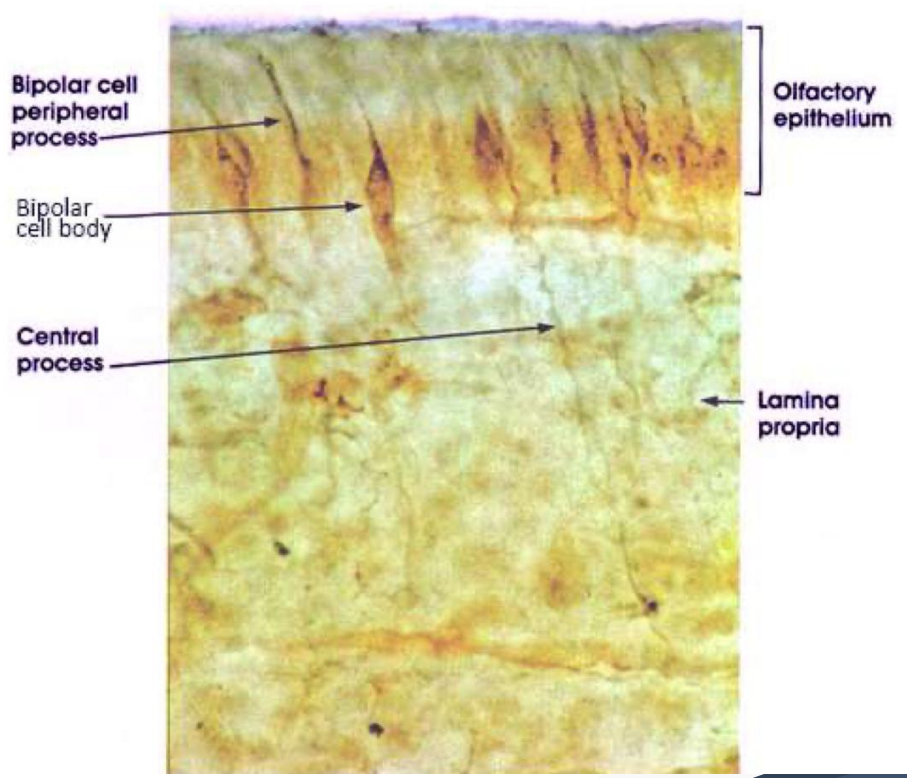
Bipolar neurons in olfactory epithelium (In this site they are also called olfactory cells)

★ Q2/ Where is the structure located?

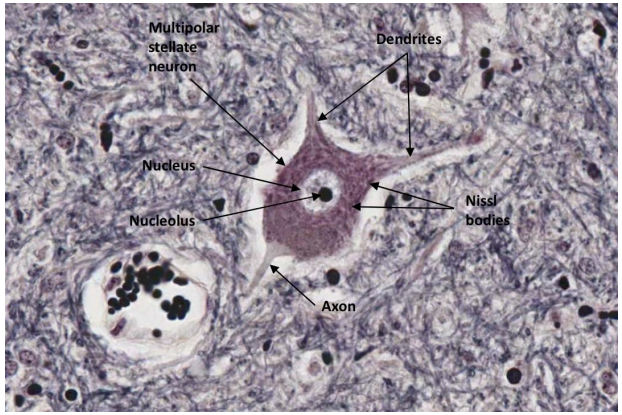
- Olfactory epithelium
- Retina
- Inner ear

Q3/ What are the features of this structure ?

- Fusiform
- Two processes; one from either pole of the cell body



Multpolar Stellate Neurons
(anterior horn cells of the spinal cord)

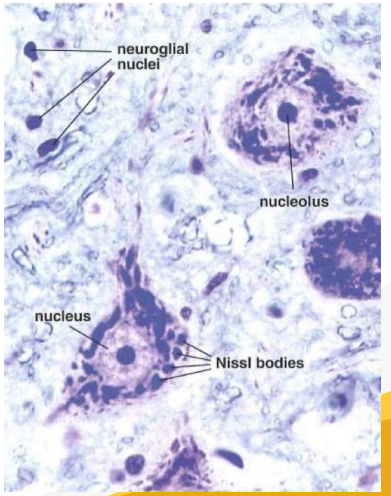


★ Q1/ Identify the structure (type of the neuron)?

Multipolar stellate neuron

★ Q2/ Where is the structure located?

- The commonest type of neurons
- Distributed in most areas of CNS, e.g.:
  - Anterior horn cells in the anterior horn of the spinal cord



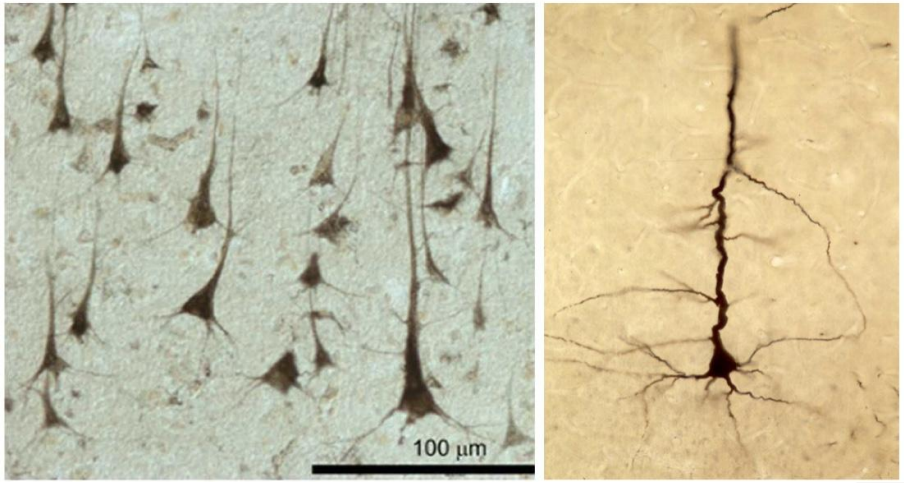
Q3/ What are the features of this structure ?

- Polygonal or star-shaped
- One axon and multiple dendrites
- Nissl bodies
- Vesicular nucleus

Multipolar Pyramidal Neurons
(In the cerebral cortex)

★ Q1/ Identify the structure (type of the neuron)?

Multipolar pyramidal neurons



★ Q2/ Where is the structure located?

Motor area 4 of the cerebral cortex

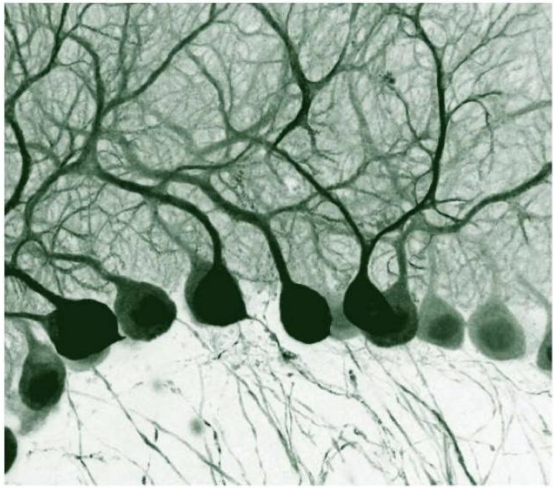
Q3/ What are the features of this structure ?

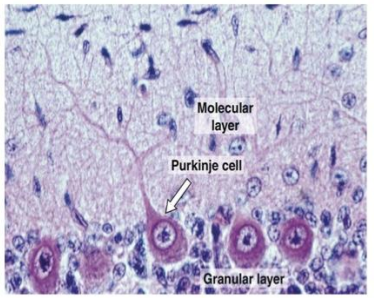
- Pyramidal or triangular in shape
- One axon and multiple dendrites
- Has one large apical and multiple basal dendrites

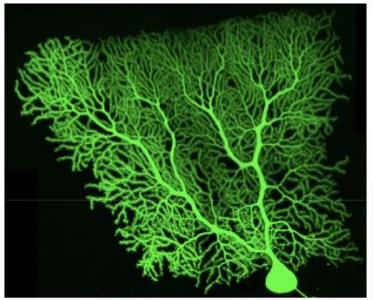
Multipolar Pyriform Neurons (Purkinje cells of cerebellum)

★ Q1/ Identify the structure (type of the neuron)?

Multipolar pyriform neurons







★ Q2/ Where is the structure located?

Cerebellar cortex

Q3/ What are the features of this structure ?

- Pyriform in shape or pear -or flask shaped
- Very large cell body
- One axon and multiple dendrites
- Extensively branching dendritic system like a tree

Team leaders

Mariam Alruhaimi

Mohamed Albabtain

Team members

Abdullah Alburikan

Fayez AlTabbaa

Mohammad Benhjji

Nawaf Alshahrani

Yazeed Alomar

Afnan AlMohsen

Joud Alarifi

Maha Alqahtani

Nourah Alklaib

Rania Almutairi

Sumo Abdulrahman

Histology439team@gmail.com