

# Cerebellum (histology)

The **cerebellum** is made up of gray and white matter. Gray matter is divided into two systems, namely the cortex and nuclei. The white matter fills the space between the cortex and the nuclei. On the section, it creates a typical image called an *arbor vitae*.

## Grey matter - cortex

The cerebellar cortex is divided into three layers. The upper layer – *stratum moleculare*, the middle layer – *stratum gangliosum* and the deepest layer – *stratum granulosum*. Each of these layers is characterized by the presence of cell bodies and nerve fibers.

### Stratum moleculare

The surface layer of the cerebellar cortex. It contains a small amount of cells - basket and small stellate neurons.

**Stellate cells** are more likely to be found in the upper layers. Their dendrites run **perpendicular** to the folia cerebelli (the same as the dendrites of Purkinje cells). Axons form synapses with dendrites of Purkinje cells (inhibitory).

**Goblet cells** are stored rather deeper. Their dendrites have the same direction as stellate cell dendrites. Axons terminate on Purkinje cell bodies (inhibitory).

Among the fibers present here are **parallel fibers**, which are axons of granule cells. They branch into the letter T. They run perpendicular to the dendrites of Purkinje and stellate cells. It ends with synapses on basket, stellate and Purkinje cells. It has an activating effect. Other fibers are **climbing fibers**, which come from the brainstem and olivary nuclei. It has an activating effect on the dendrites of Purkinje cells.

There are also projections of **Bergmann glia** (modified astrocytes).

### Stratum gangliosum

The middle layer of the cortex. **Purkinje cells** (multipolar neurons) are found here, the dendrites of which multiply multiply into the *stratum moleculare*. Typical of these cells is that they branch in **one plane**. Axons run through the *stratum granulosum* and white matter to the cerebellar nuclei.

There are also **basket** weaves - axosomatic synapses (between the axon and the body). Collateral of axons of basket cells and Purkinje cells

### Stratum granulosum

The deepest layer of the cerebellar cortex. It contains **granule cells**, which are tiny neurons. Their dendrites branch and form synapses with mossy fibers nearby in places called *glomeruli cerebellares* (groups of cells in the eosinophilic substance). Their axons penetrate into the *stratum moleculare*, where they activate Purkinje, stellate and basket cells.

Other cells in this layer are **Golgi cells**, which are slightly larger neurons than granule cells.

The fibers found here are the **collaterals of the axons of the Purkinje cells** and **the mossy fibers**, which are the axons of the spinal cord nuclei.

## Links

### Related Articles

- Cerebellum (preparation)
- Cerebellum

### Source

- JARKOVSKÁ, Daniela. *Centrální nervový systém* [lecture for subject Histologie a embryologie, specialization Zubní lékařství, Všeobecné lékařství, 1.lékařská fakulta Univerzita Karlova]. Praha. 23.11.2011.

### References

- KONRÁDOVÁ, Václava – UHLÍK, Jiří – VAJNER, Luděk. *Funkční histologie*. 2. edition. H & H, 2000. 291 pp. ISBN 80-86022-80-3.

