



Control movement and posture , motor function of cerebellum and brain

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Cerebellum function

- ▶ Balance

- ▶ Equilibrium

vestibular cerebellar tract

- ▶ Muscle tone

Proprioceptors (position in joints, golgi tendon..)

spinocerebellum

- ▶ Coordination

Primary somatosensory cortex, primary motor cortex, supplementary motor area , premotor cortex

Upper motor neuron to lower motor neuron

Preprogrammed plan basal ganglia

- ▶ Motor learning

Lateral and posterior view of cerebellum

Lateral view

- ▶ Posterior cranial fossa of the skull
- ▶ Separated from cerebrum by dural septa called tentorium cerebelli
- ▶ Fissure separate the cerebellum into structural lobes

Primary fissure (anterior from posterior) and posterior lateral fissure (posterior from flocculonodular lobe)

Flocculonodular lobe (primitive lobe)

Vestibular cerebellum

➤ Posterior view

Posterior lobe

Lateral hemisphere

cerebrocerebellum

Anterior lobe (spinocerebellum)

Vermal (homunculus trunk, neck and the head)

paravermal area (limbs and lateral aspect of the head)

Deep cerebellar nucleus

- ▶ Dentate nucleus

Lateral hemisphere

- Interposed nucleus

Vermal and paravermal area

Emboliform

Globose

- ▶ Vestibular nucleus

Flocculonodular lobe and vermis

Cerebellar cortex

- ▶ Molecular
- ▶ Purkenji
- ▶ Granular
- ▶ DCN

Neural sharpening (right amount of signaling)

Inferior olives (climbing fibers)....

Aspartate (neurotransmitter) ...DCN...brain stem

Aspartate Purkenji.....Gaba...DCN



Mossy fibers (sensory pathway)

Glutamate.....DCN.....granular layer(granular and Golgi)

Granular cells..... Purkinje fibers

Granular cells..... Molecular (stellate and basket cells)....inhibit Purkinje

Granule cells.....Golgi cells inhibit granule cells

Golgi cells.... Inhibit granular cells

Neuropathway

► Superior peduncle

Efferent

Dentate nucleusred nucleus (midbrain) rubro spinal pathway
....thalamus (dento rubro thalamic pathway)

Dentate nucleusthalamus Brain cortex (Dento- thalamic pathway)

Interposed nucleus.... Red nucleus

Purkenji fibersvestibular nuclei.....extensor and antigravity

Purkenji fibers Medial longitudinal fasciculus (iii,iv,vi) extraocular movement



▶ Afferent

Ventral spinocerebellar tract (below L2 and L3)

Rostral cerebellar tract (cervical region)

Tecto cerebellar tract (visual and auditory)

➤ Middle cerebellar peduncles

Afferent

Cortico-ponto -cerebellar fibers

➤ Inferior cerebellar peduncles

Afferent

Dorsal spinocerebellar tract c8-L2 and L3

Cuneocerebellar tract above C8

Vestibulocerebellar tract

olivocerebellar tract

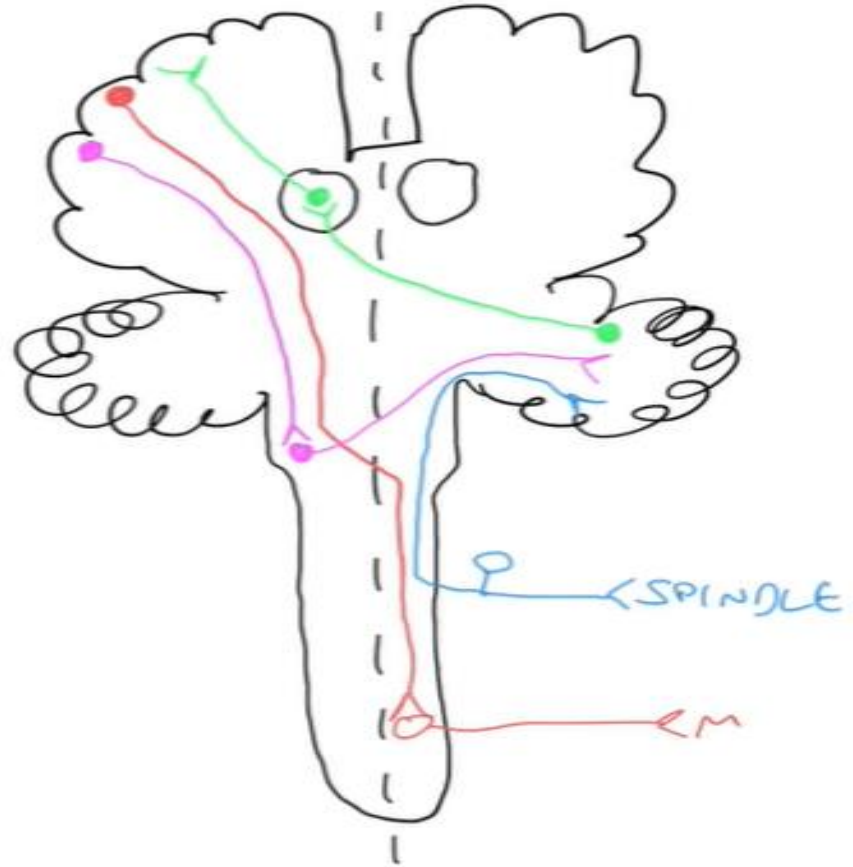
Reticulocerebellar tract

Efferent

Cerebelloreticular

Cerebellovestibular

Cerebellum



- Corticospinal pathway
- Corticopontocerebellar pathway
- Cerebello-thalamo-cortical pathway
- Spinocerebellar tract