



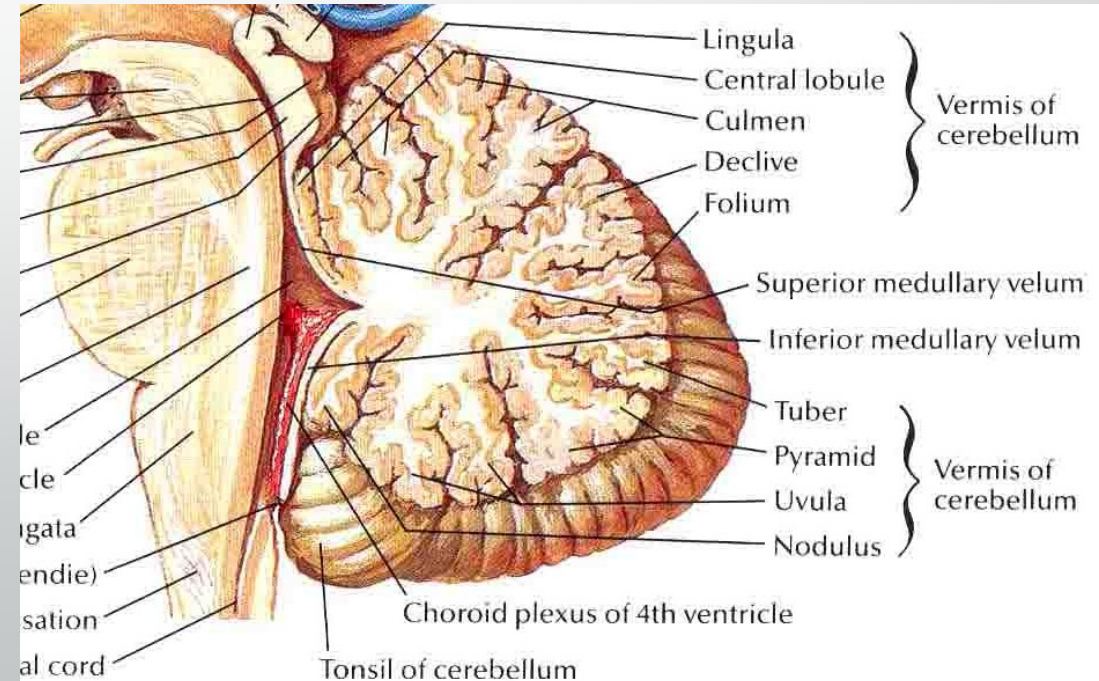
Cerebellum

MIMSA's Anatomy sessions 2013

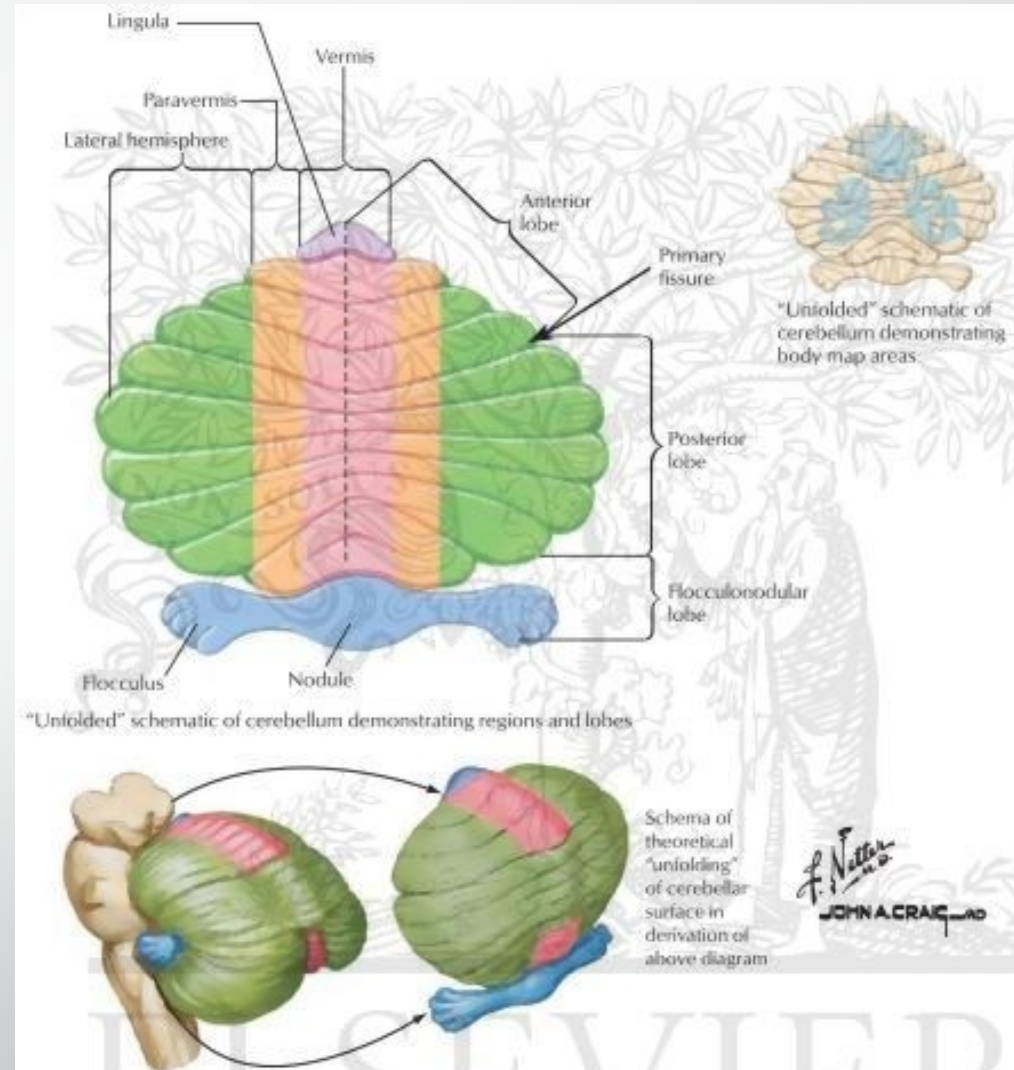
cerebellum

- Motor part of the brain
 - Coordination of movement
 - Regulation of muscle tone
 - Maintenance of equilibrium
 - Ensures that there is contraction of the proper muscle at the appropriate time and with the correct force

- Posterior cranial fossa
- Separated from the occipital lobes by the tentorium cerebellum
- Falx cerebelli placed deeply in the posterior cerebellar fissure
- Fastigium constitutes the roof of the 4th ventricle



- Longitudinally: 2 large bilateral hemispheres with vermis between them
- Transversally:
 - Flocculonodular: at the edge of inferior surface; composed of paired irregular-shaped masses – floccula- joined medially by the nodulus (part of the vermis)
 - Anterior: rostral to the primary fissure. ATTENTION! 2nd fissure to develop
 - posterior lobe: between primary and posterolateral fissures
- Posterolateral fissure – between flocculonodular and posterior lobes. 1st fissure to develop

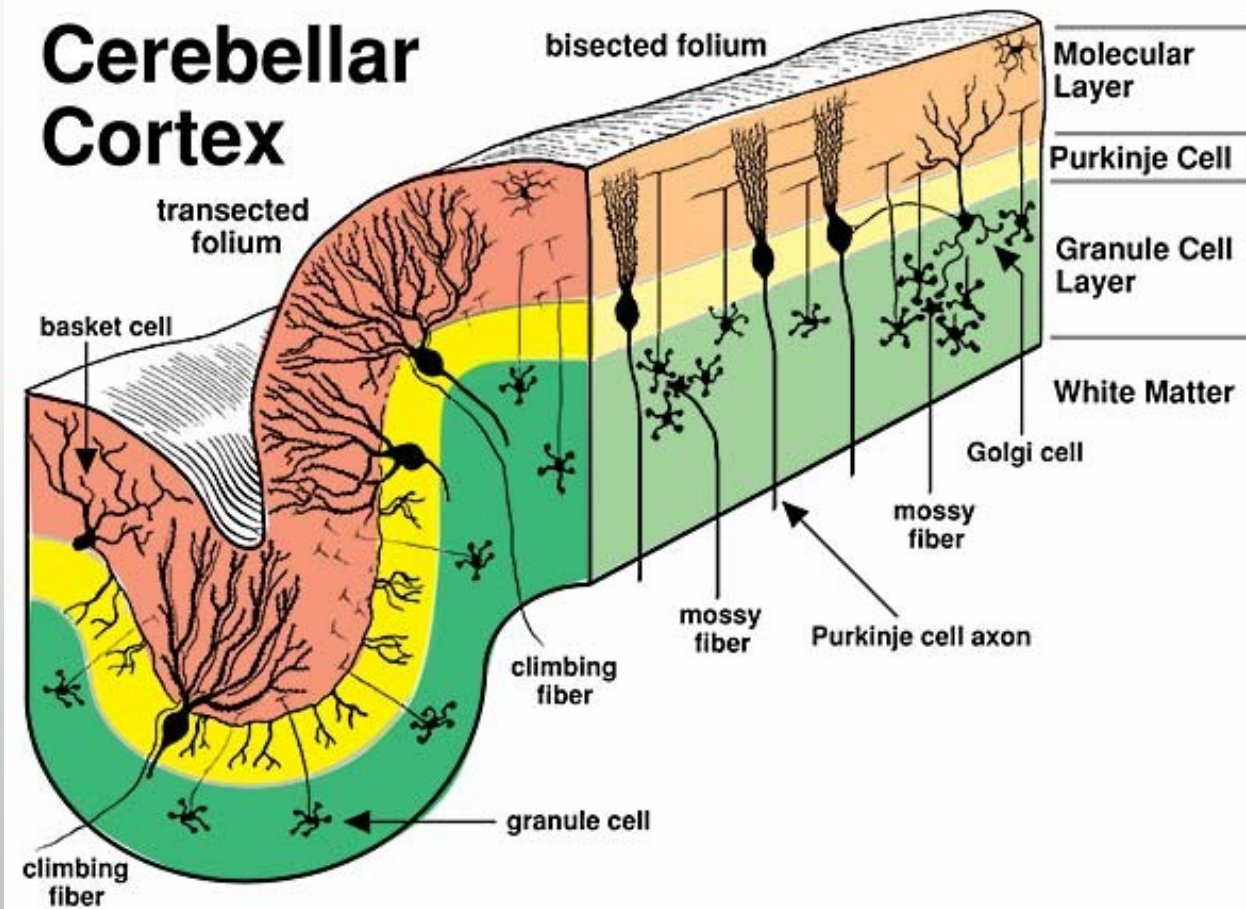


Gray and white matter

- Gray matter: cortex + 4 types of nuclei in each side
- White matter: medullary center + paired inferior, middle and superior cerebellar peduncles composed of afferent and efferent nerve fibers which connect the cerebellum with the medulla, pons and midbrain respectively

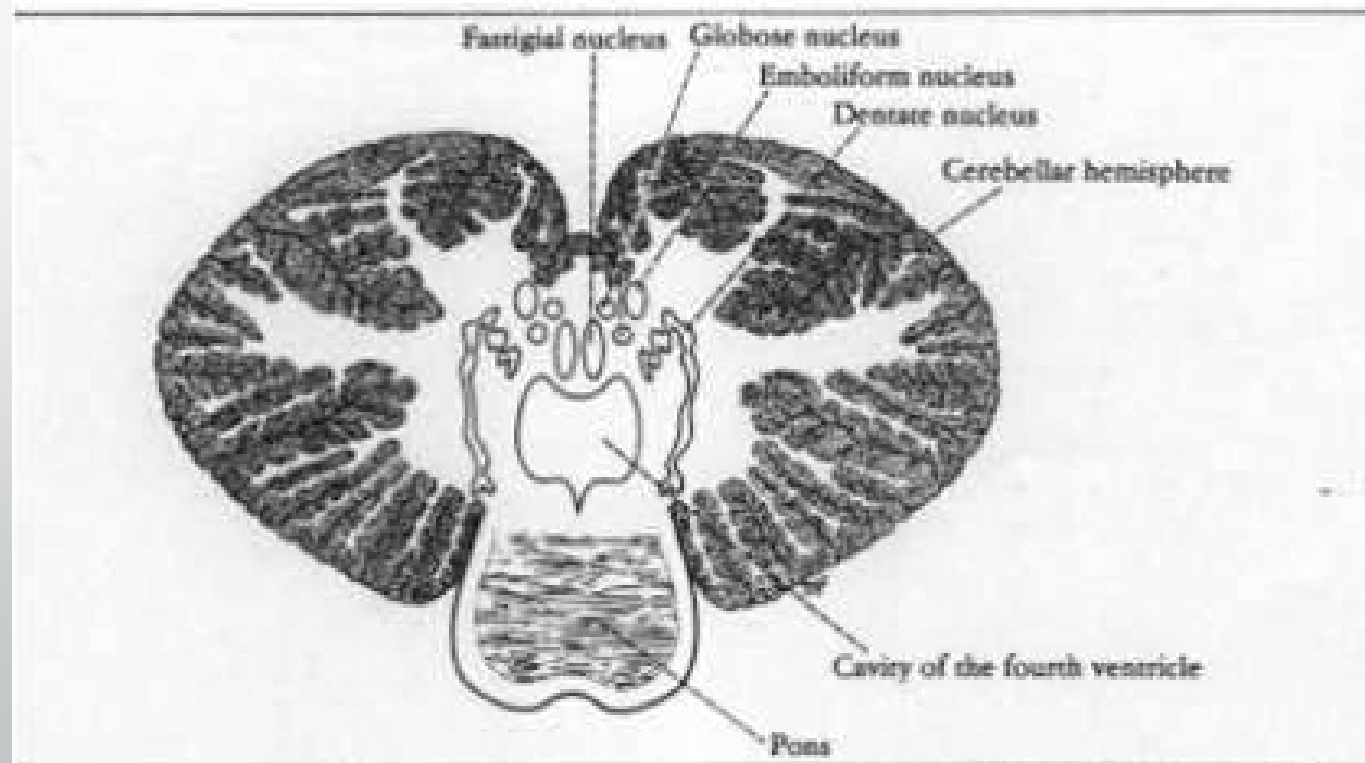
Cerebellar cortex

- Folia cerebelli
- 3 layers:
 - Molecular (stellate + basket)
 - Ganglionar (purkyne)
 - Granular (golgi cells + granular cells)
- Layers have 5 types of cells:
 - Stellate
 - Basket
 - Purkyne
 - Golgi
 - granule



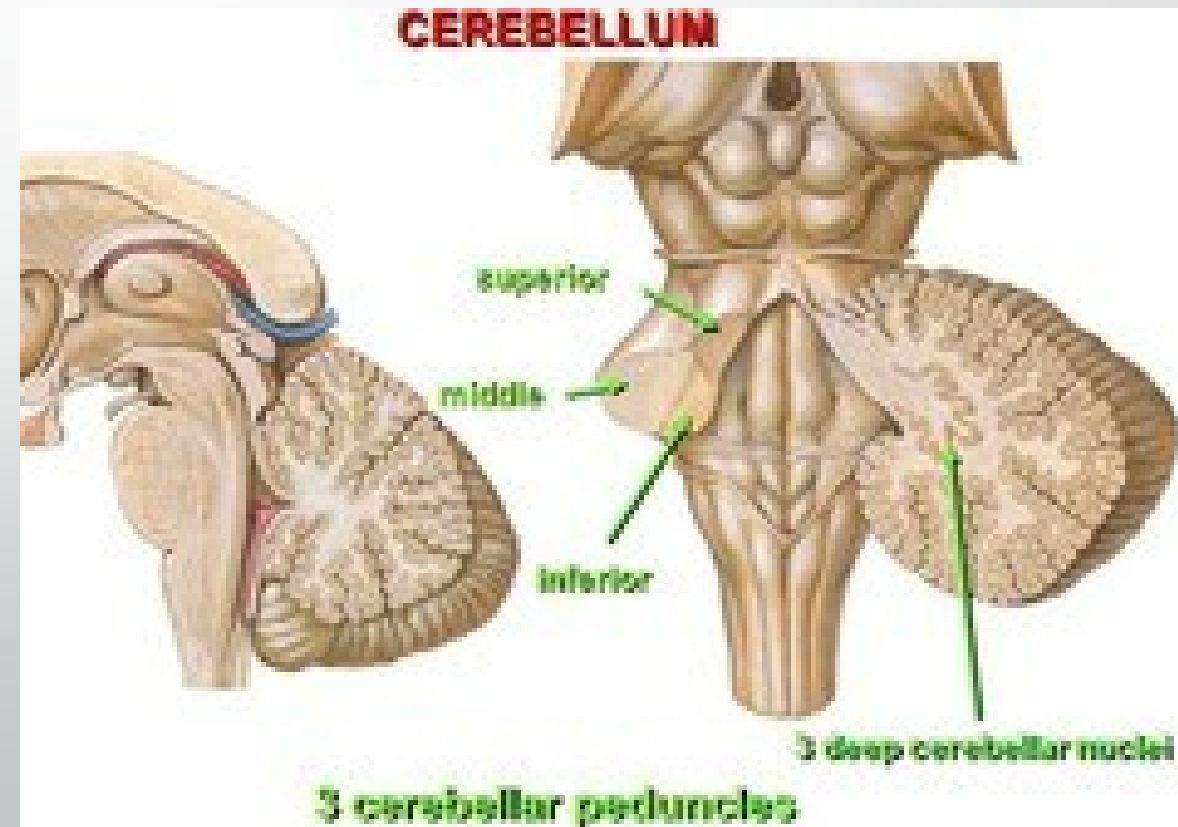
Cerebellar nuclei

- Transmit all output from the cerebellum
- Fastigial: close to the midline in contact with the fastigium
- globulose: 2 or 3 masses in each side
- Emboliform: oval shape
- Dentate: most prominent



White matter

- All the afferent (sensory) and efferent (motor) pathways pass through the peduncles.
- Inferior cerebellar peduncle
 - Fibers entering the cerebellum with predominant origin in the inferior olivary complex – olivocerebellar tract;
- Middle cerebellar peduncle
 - Fibers originating in the nuclei pontis / ponto cerebellar tract
- Superior cerebellar peduncles
 - Fibers from globulose, emboliform and dentate nuclei.
 - Afferent fibers: superior spinocerebellar + rubrocerebellar tracts



Phylogenetical development

- Archicerebellum – flocculonodular lobe: vestibular nuclei (major connection); function: posture and eye movement
- Paleocerebellum – superior vermis in the anterior lobe + part of inferior vermis in the posterior lobe; spinal cord (major connection); function: progressive movement
- Neocerebellum – cerebellar hemispheres + vermis in posterior lobe; cerebral cortex via ncl pontis (major connection); function: manipulative movement and speech

