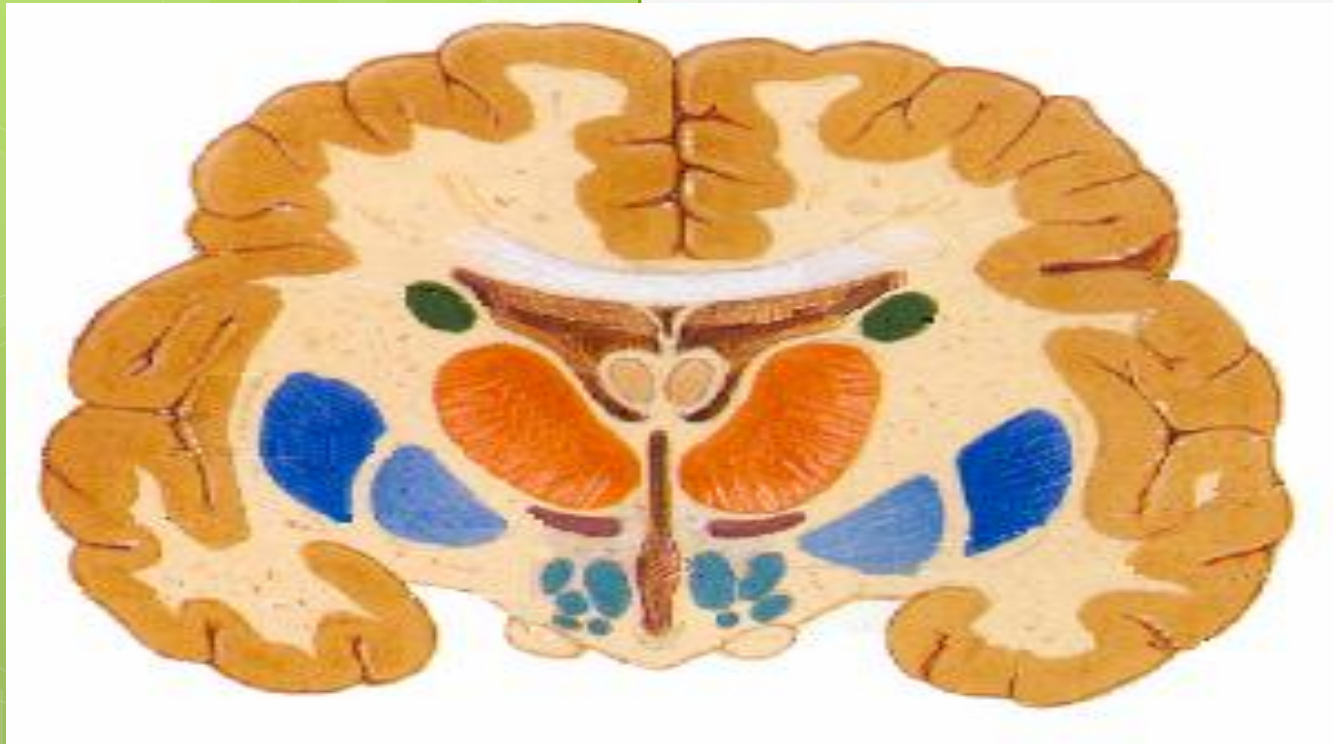


# White matter of cerebrum

Dr Nawal .M.Abdullah



# Objectives:

- To determine the types of fibers forming the white matter
- To connect their anatomy to clinical background

# Underlies the cortex

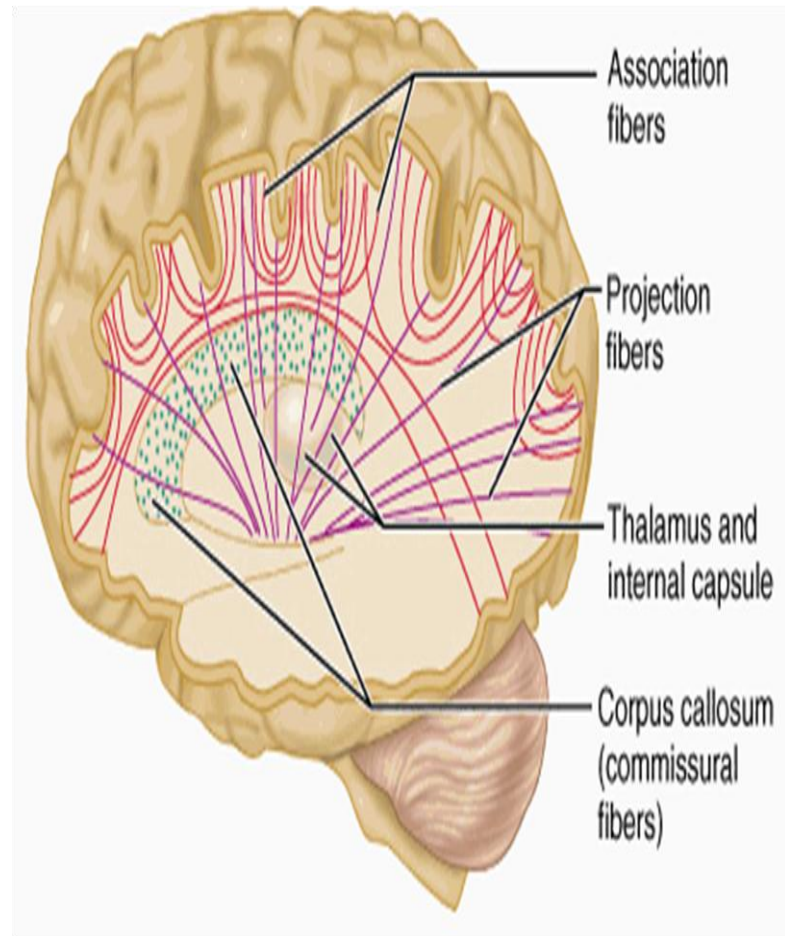
**Nerve fibers**

(predominantly myelinated)

**Neuroglia**

**Blood vessels**

\*\*The nerve fibers originate, terminate or sometimes both, within the cortex

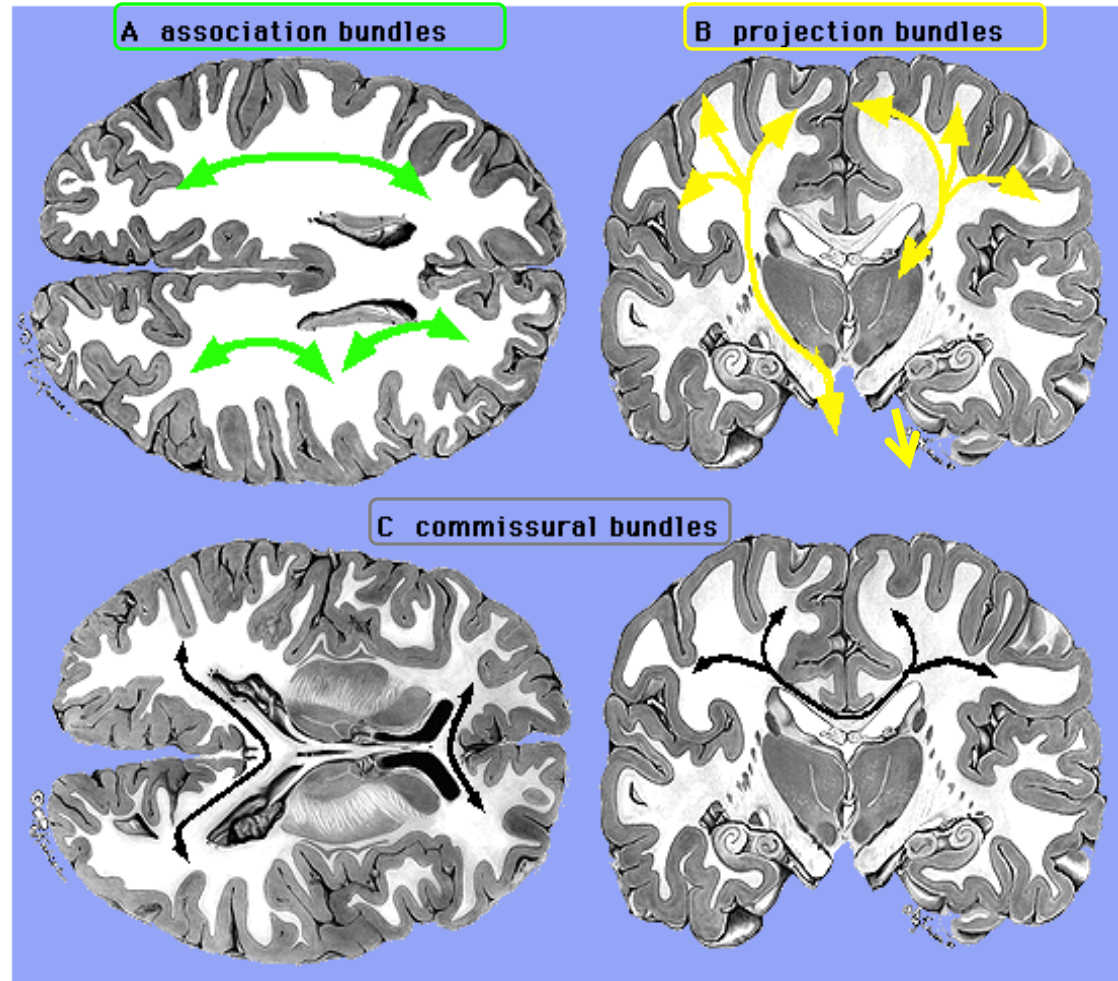


- Depending on their **origin** & **termination**, these nerve fibers are classified into three types:

**A. Association**

**B. Projection**

**C. Commissural**

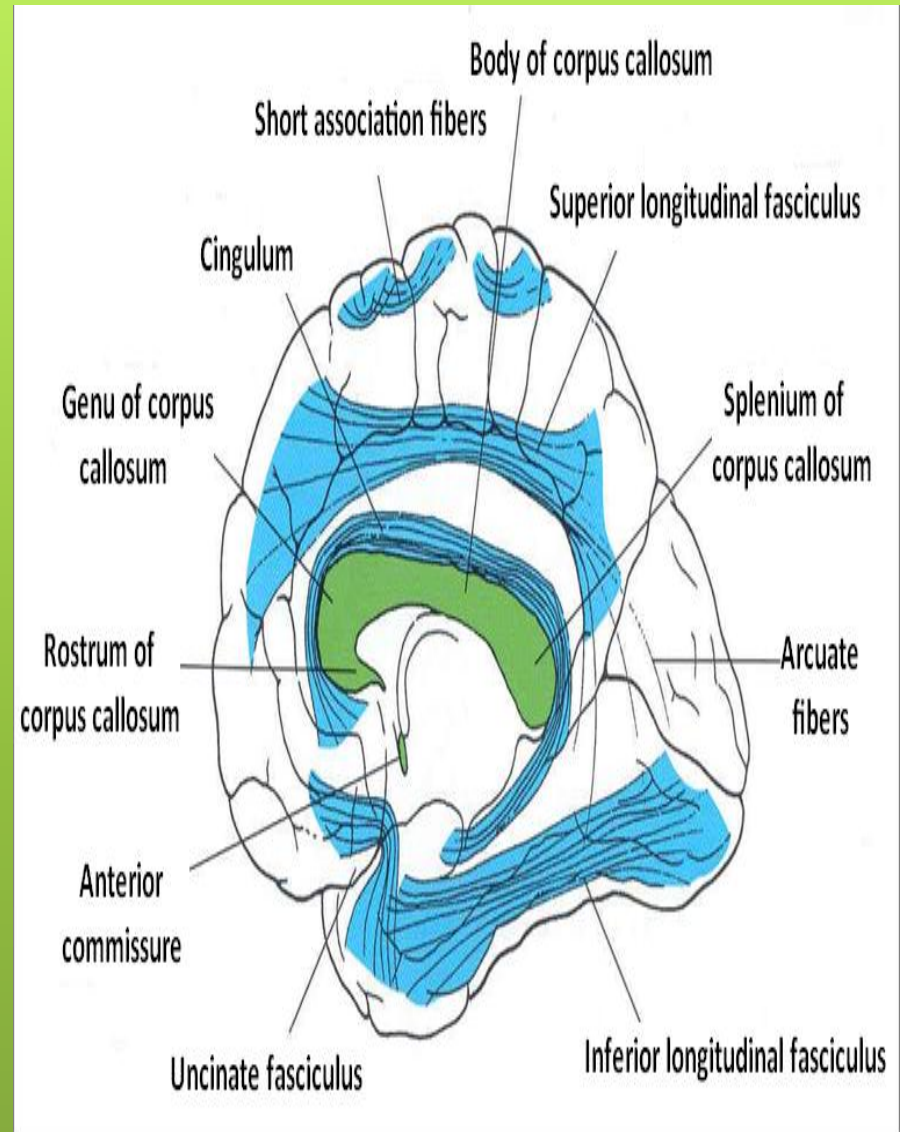


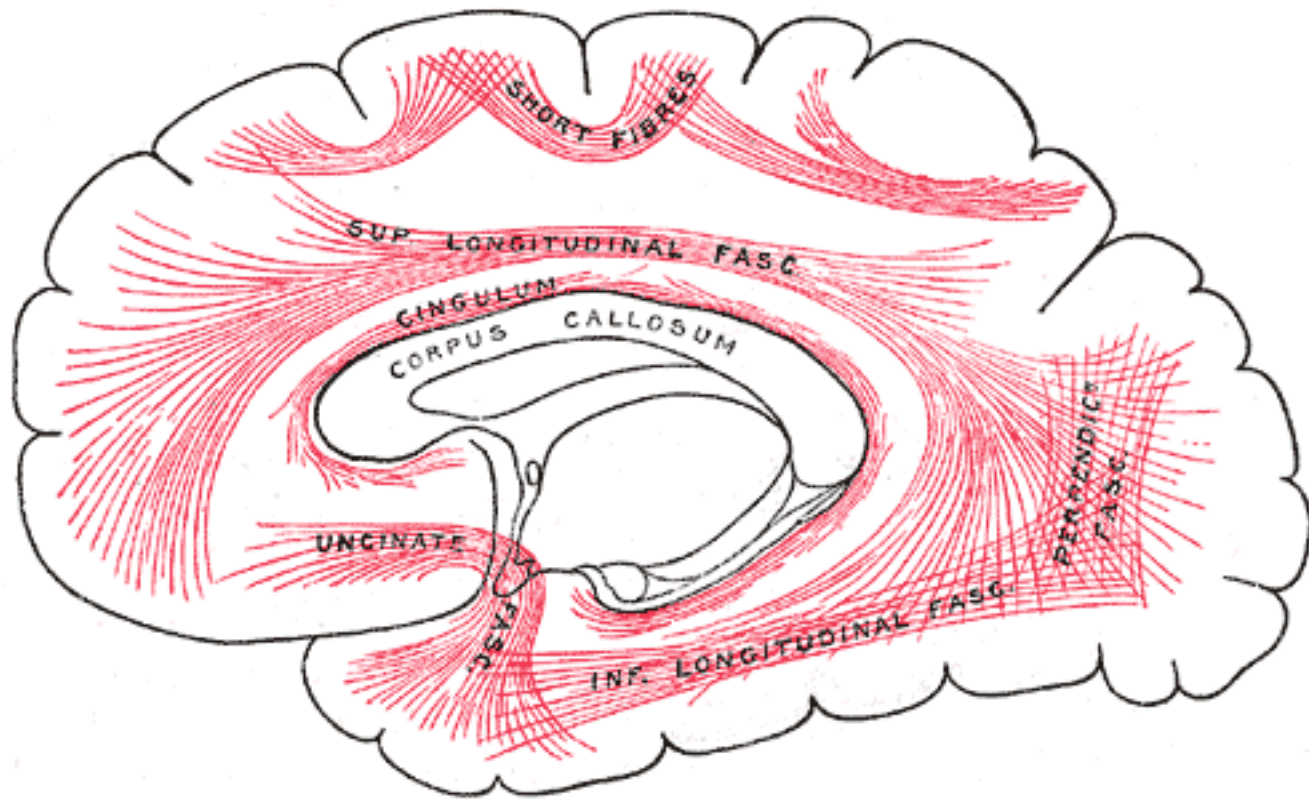
# Association Fibers

\*Connect different parts of same hemisphere

\*two kinds:

- 1- **Short association fibers:** those connecting adjacent gyri,
- 2- **Long association fibers:** those connecting more distant gyri



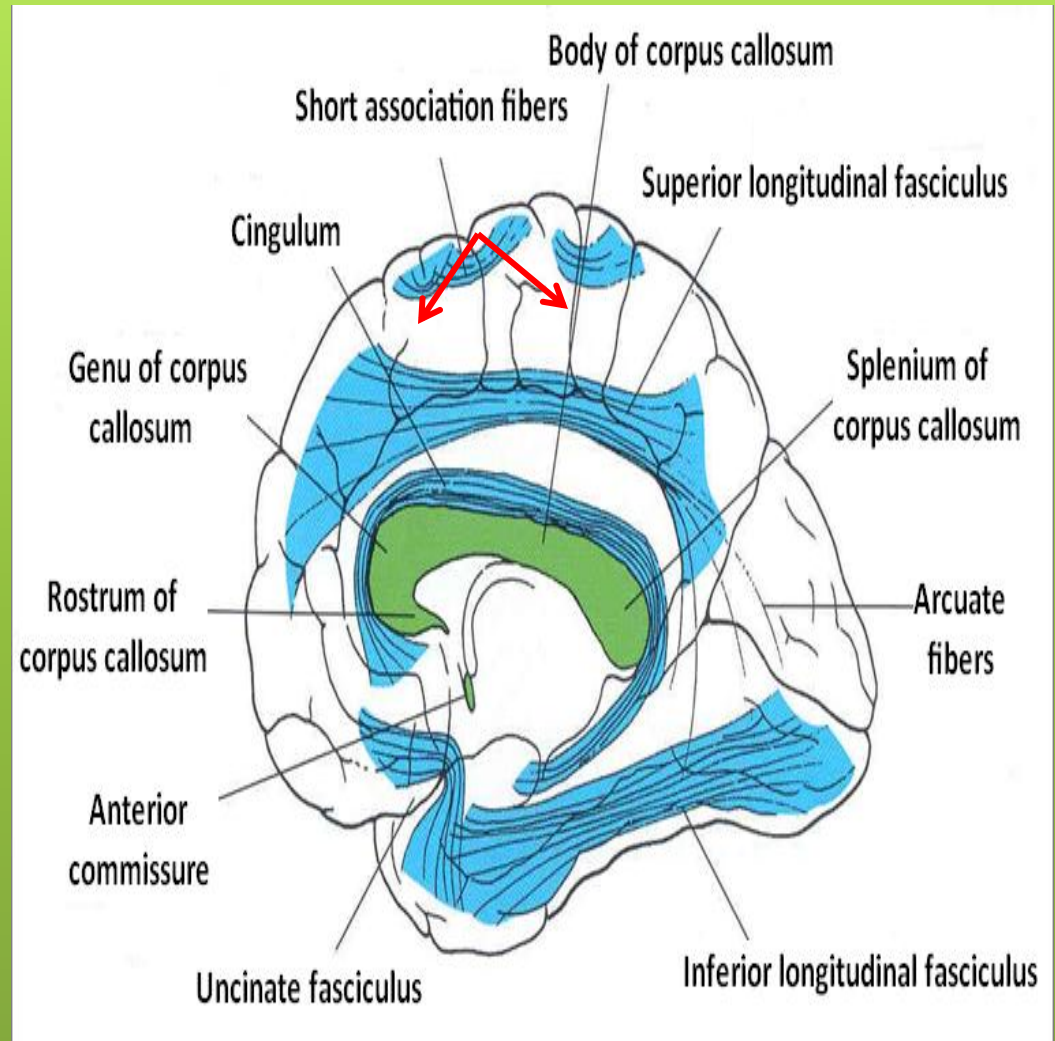


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**Association fibers do not leave the cerebral hemisphere, and can be classified as either long or short.**

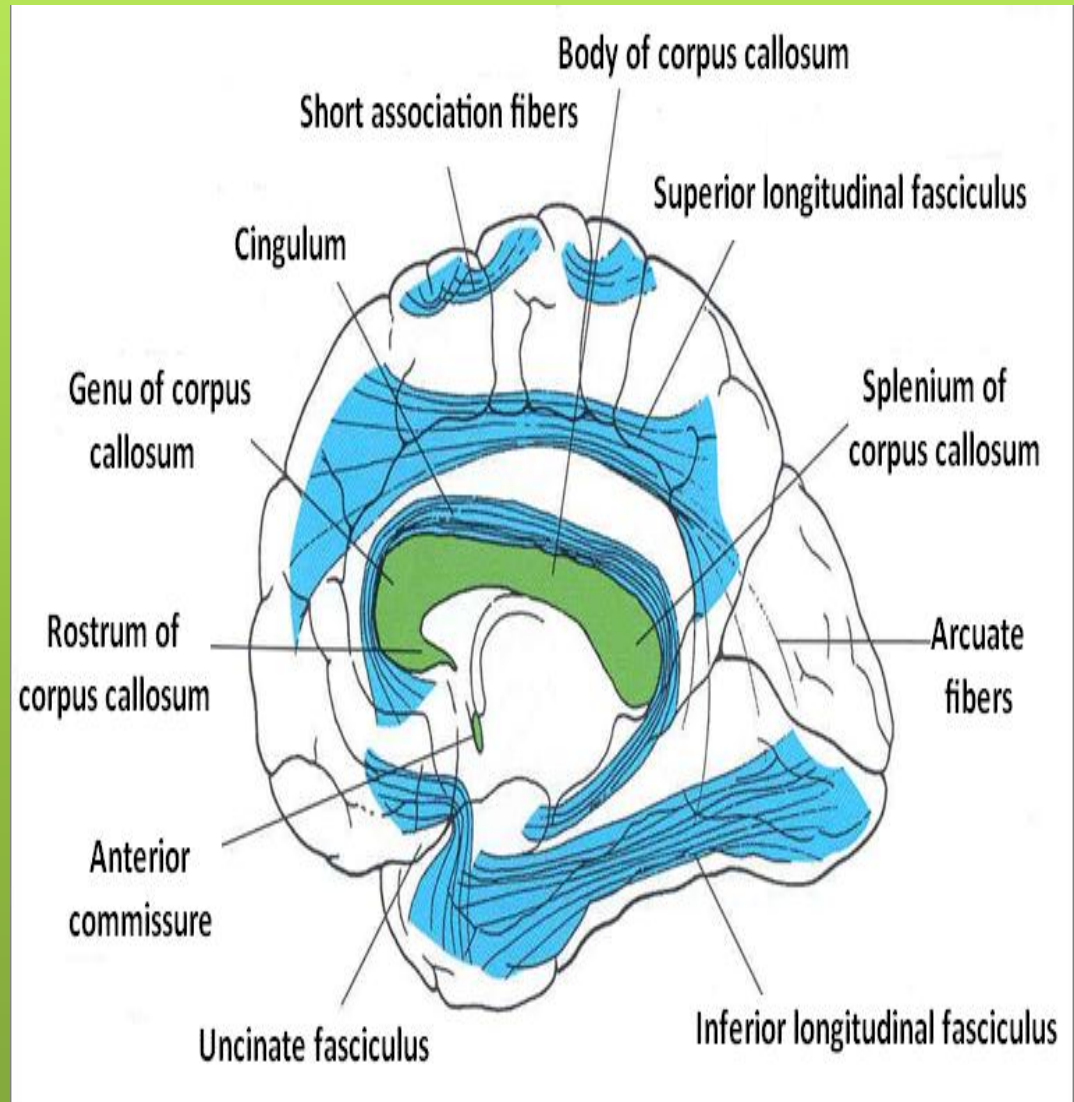
# Short Association Fibers

- Lie immediately beneath the gray substance of the cortex
- Connect together the adjacent gyri.



# Long Association Fibers

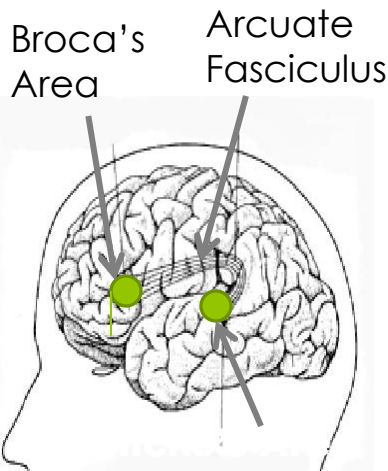
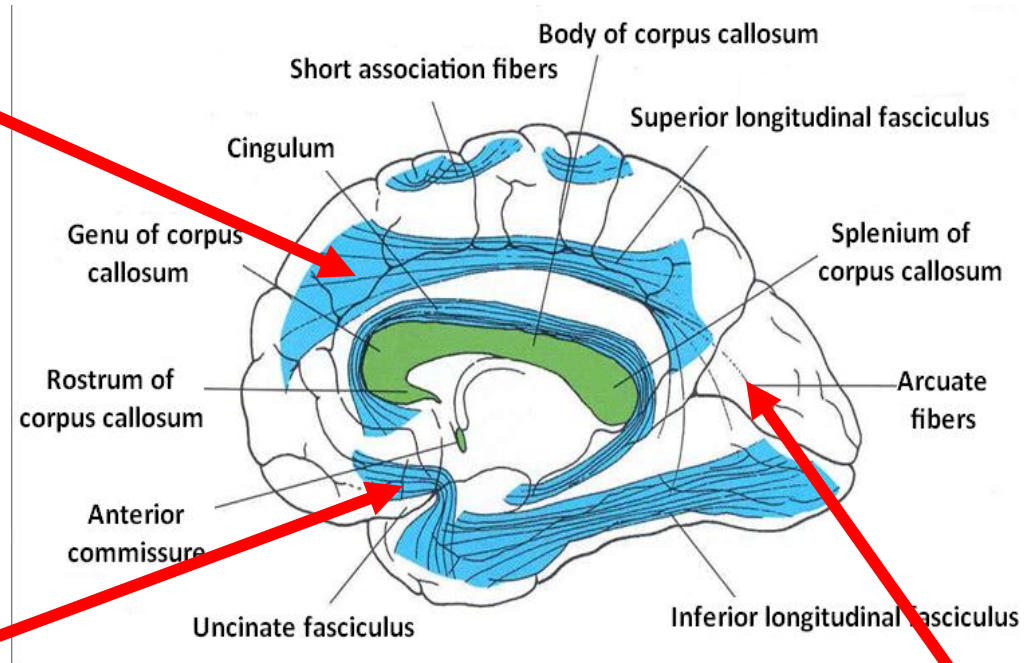
- Long fibers extend through white matter to **connect distant areas** of cerebral cortex
- E.g:
- Link the **primary sensory areas** in parietal, temporal and occipital lobes to the **association areas** of the cerebral cortex,
- and to each other





**Superior longitudinal fasciculus:** connects the frontal, parietal, temporal and occipital lobes

**Uncinate fasciculus:** connects frontal to temporal lobe, contributing to the regulation of behavior



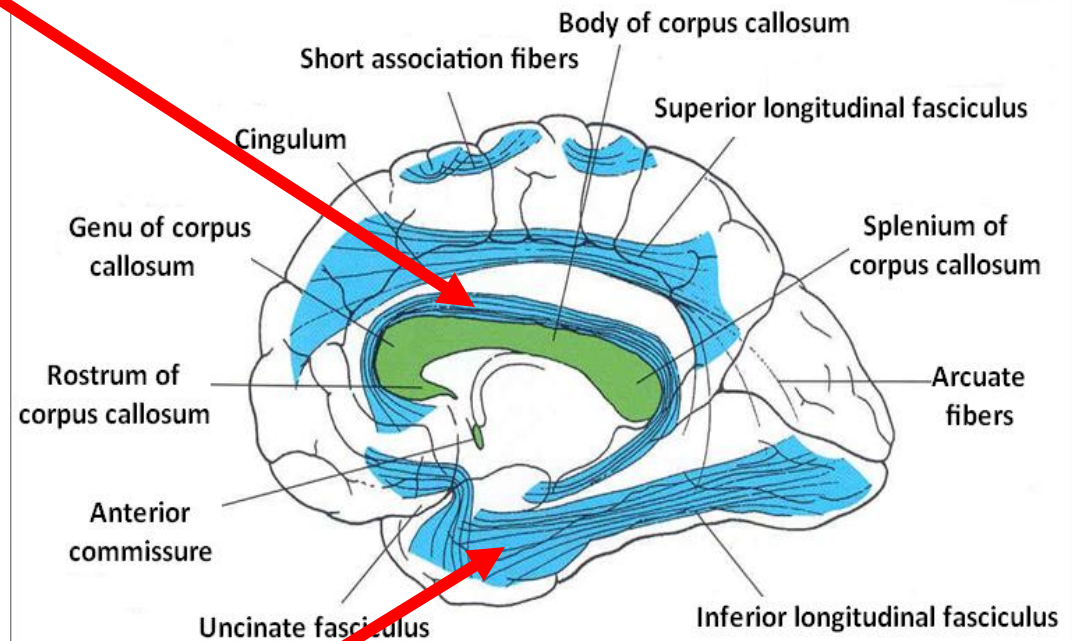
**Arcuate fasciculus:** connect gyri in frontal to temporal lobes, important for language function

## Cingulum:

connects frontal & parietal lobes to the para-hippocampal gyrus and adjacent temporal gyri

## Inferior longitudinal fasciculus:

connects occipital to temporal pole & contributes to visual recognition



# Commissural Fibers

- Connect the corresponding regions of the two hemispheres

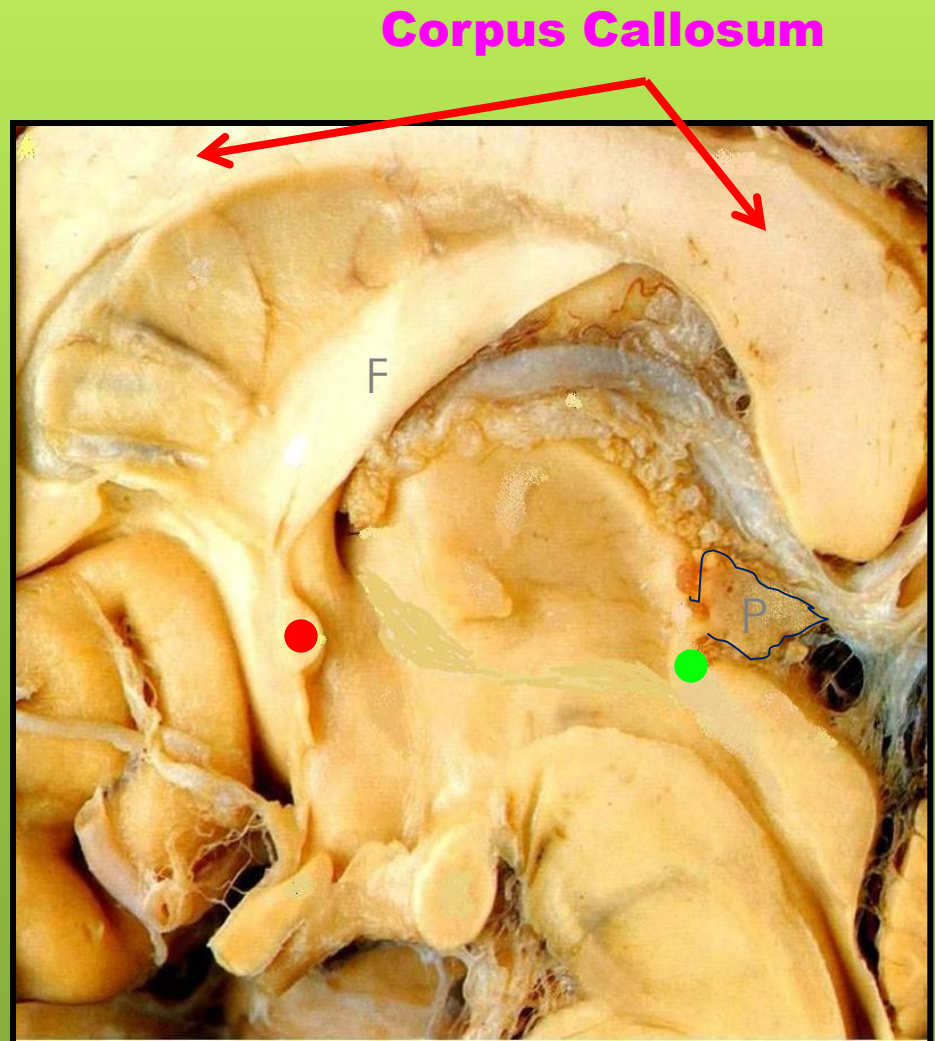
Include:

Corpus callosum

Anterior commissure

Hippocampal commissure  
(commissure of fornix)

(Posterior commissure, not a cerebral commissure)



# Corpus Callosum

Def:

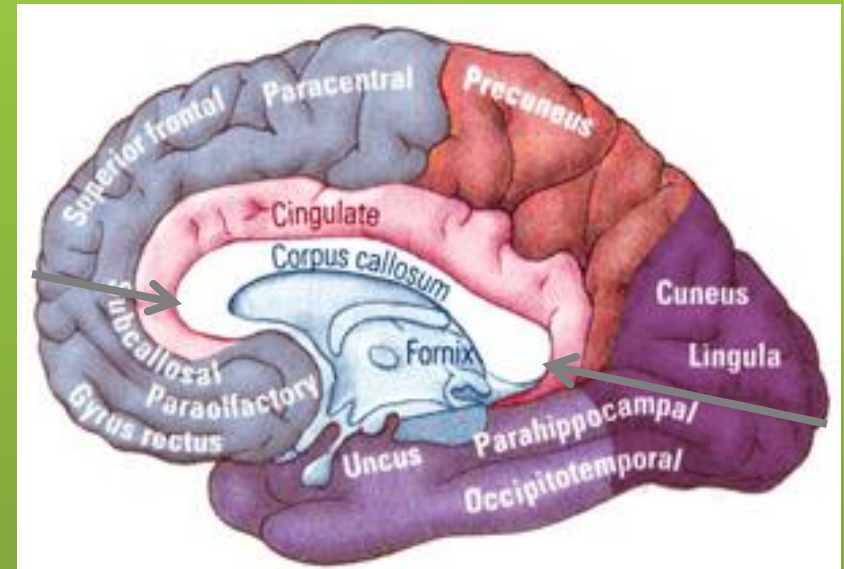
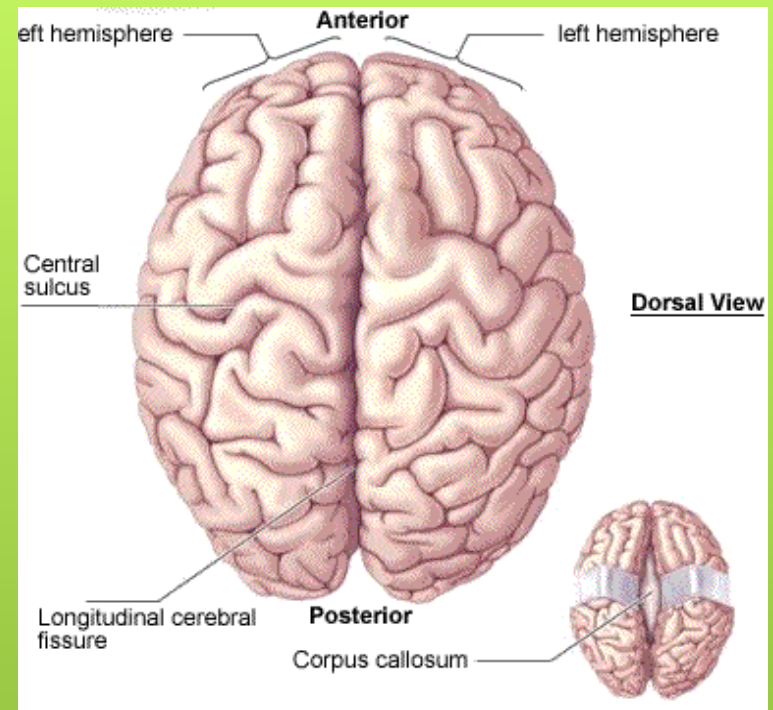
Is a **fibrous bridge** located in the depth of the **median longitudinal fissure**

Connects the two cerebral hemispheres together

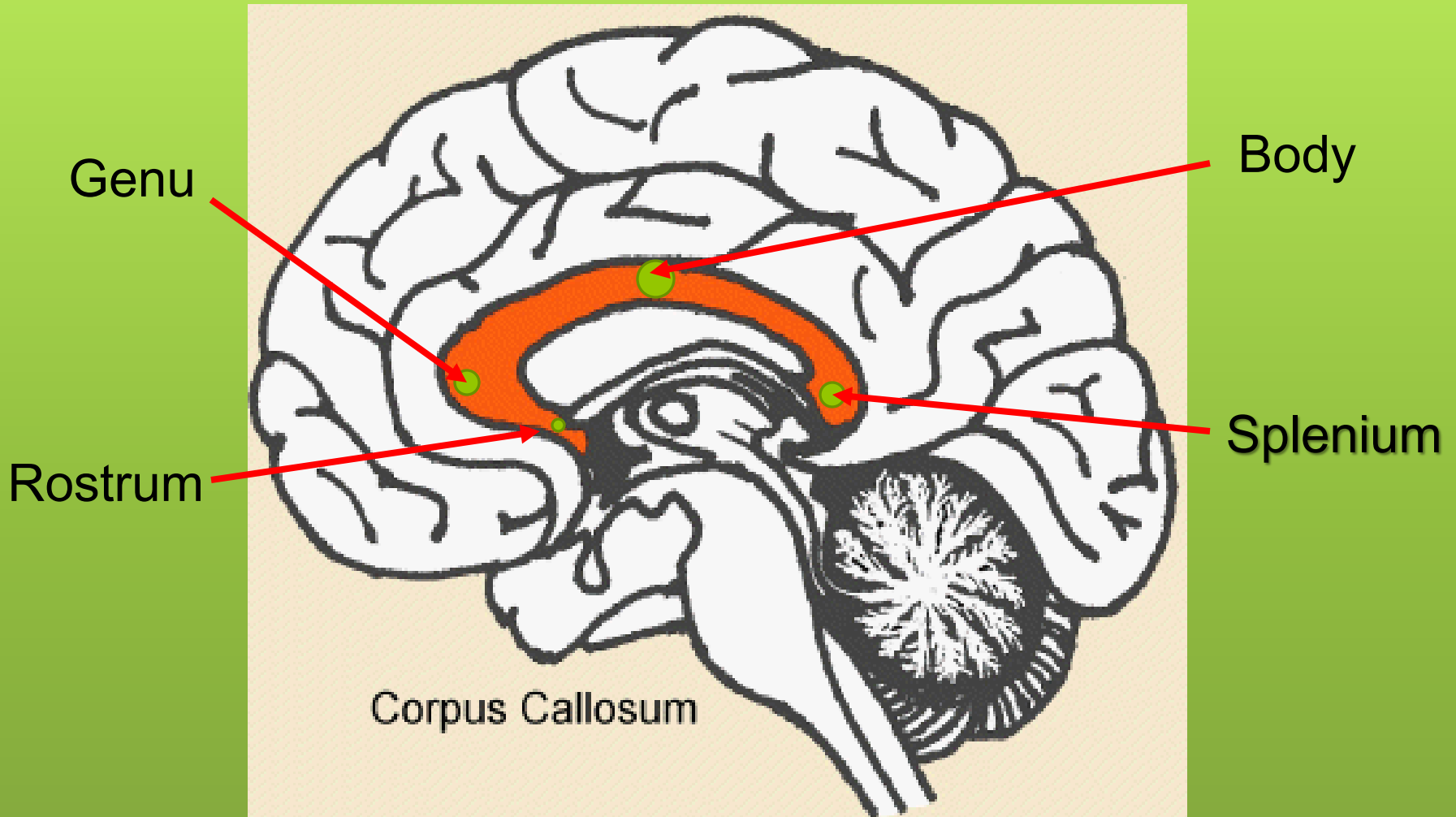
**Shorter** craniocaudally than is the hemisphere

Cranial end is nearer to the frontal pole

caudal end to the occipital pole



# Parts of Corpus Callosum



## Commissural Fibers

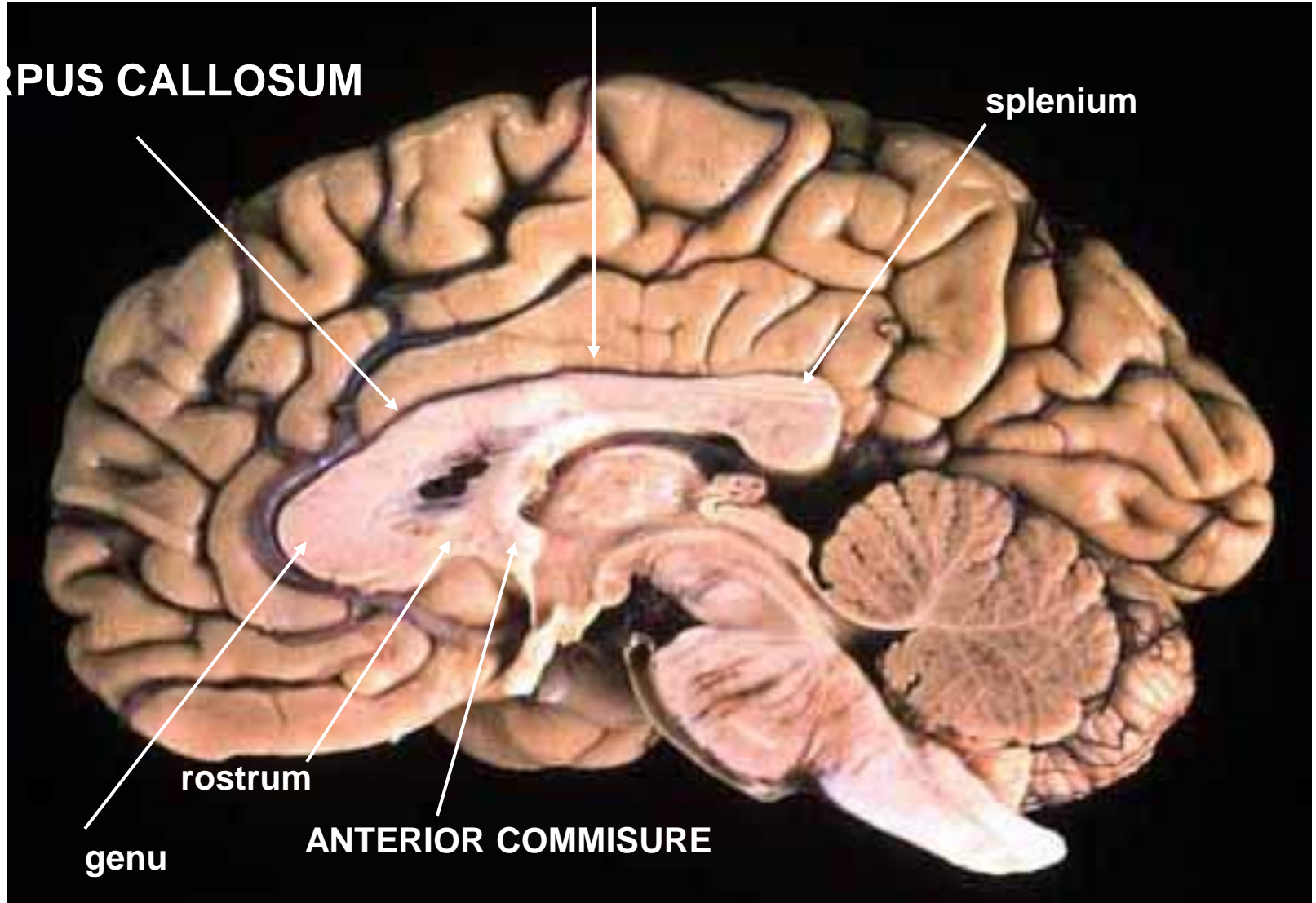
CORPUS CALLOSUM

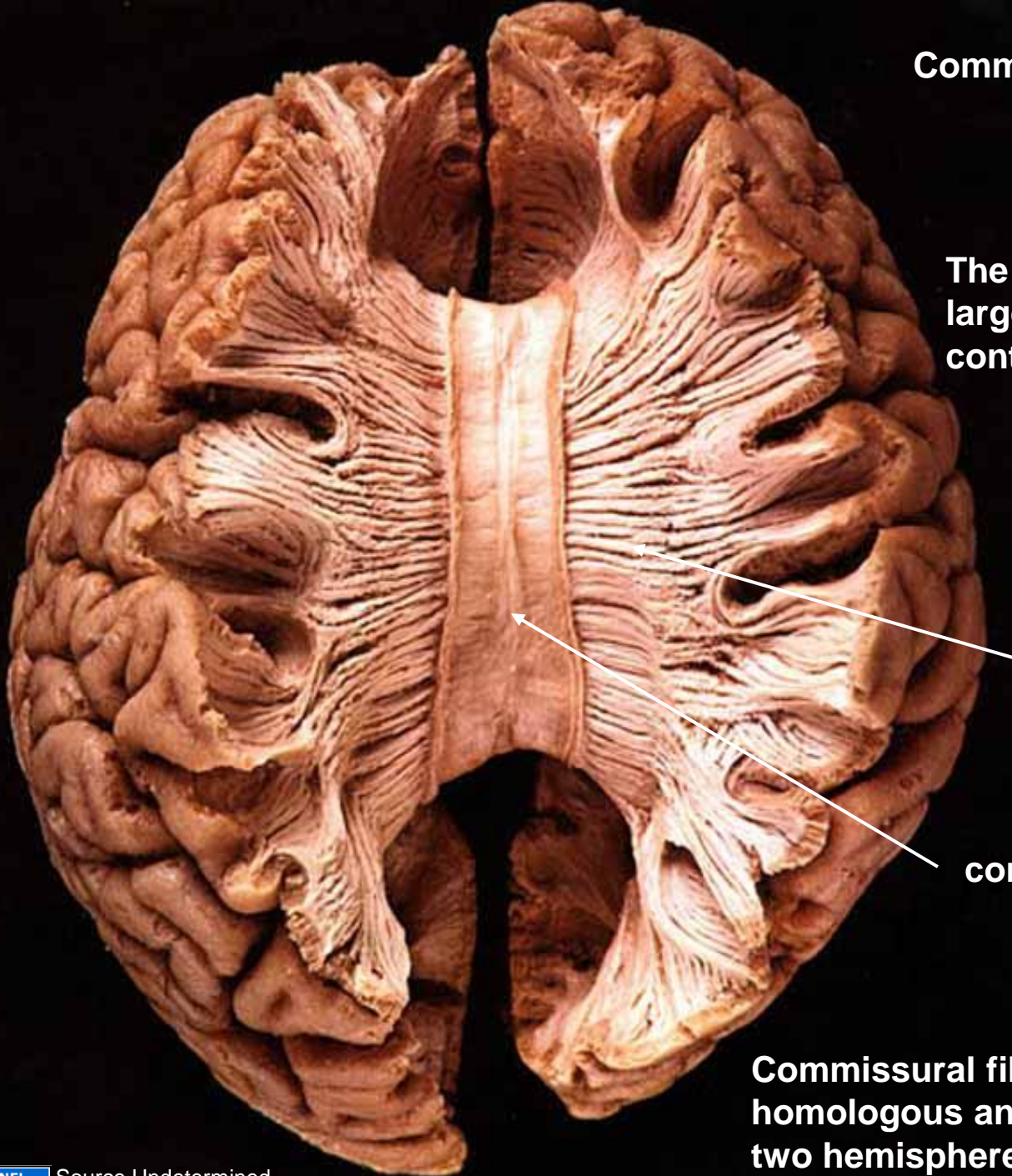
splenium

rostrum

ANTERIOR COMMISURE

genu





Commissural Fibers

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larg  
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that

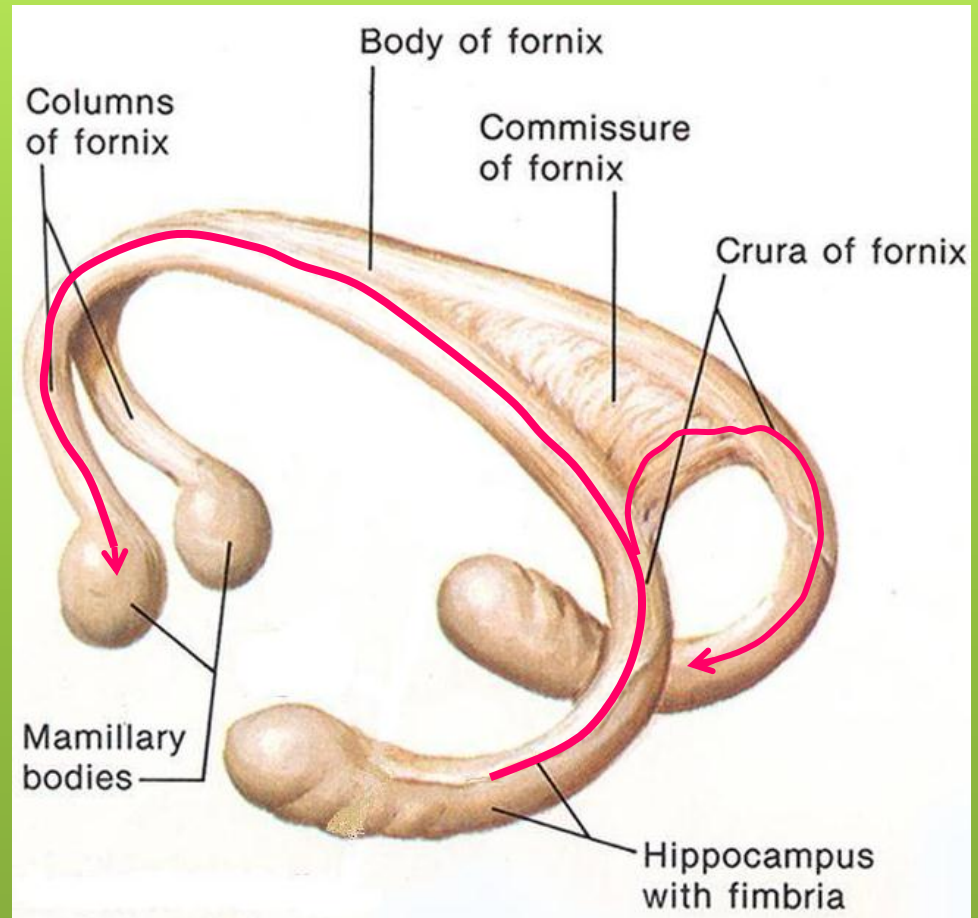
con

Commissural fibers connect homologous areas of the two hemispheres.

the

# Hippocampal Commissure

- Bundle of fibers runs transversely between the crura of the fornix
- Connect the **two hippocampi** with each other
- (note that hippocampo-mamillary fibers do not cross)





# Posterior commissure

Rounded band of white fibers

Crossing the midline on the dorsal aspect of the upper end of the cerebral aqueduct (located between superior colliculus & pineal body)

Connects the **left and right midbrain**. **Plays important role in the bilateral pupillary reflex**

