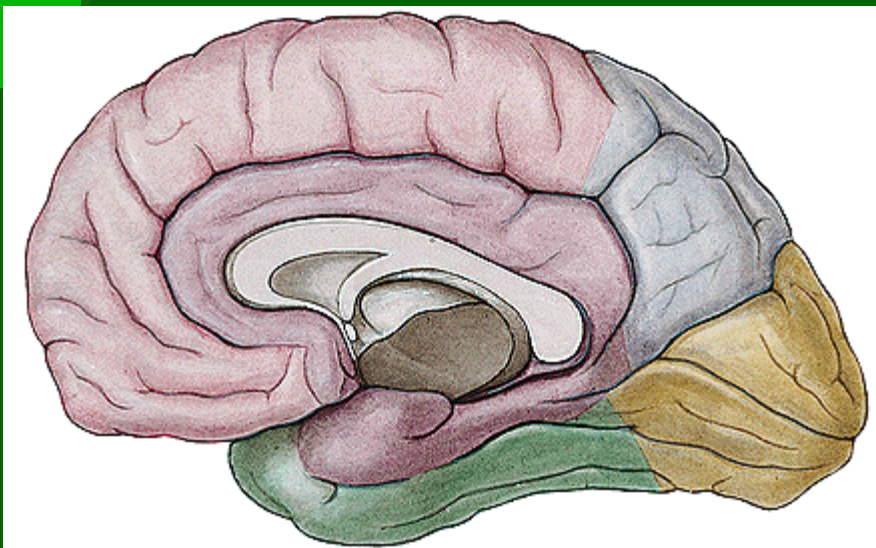
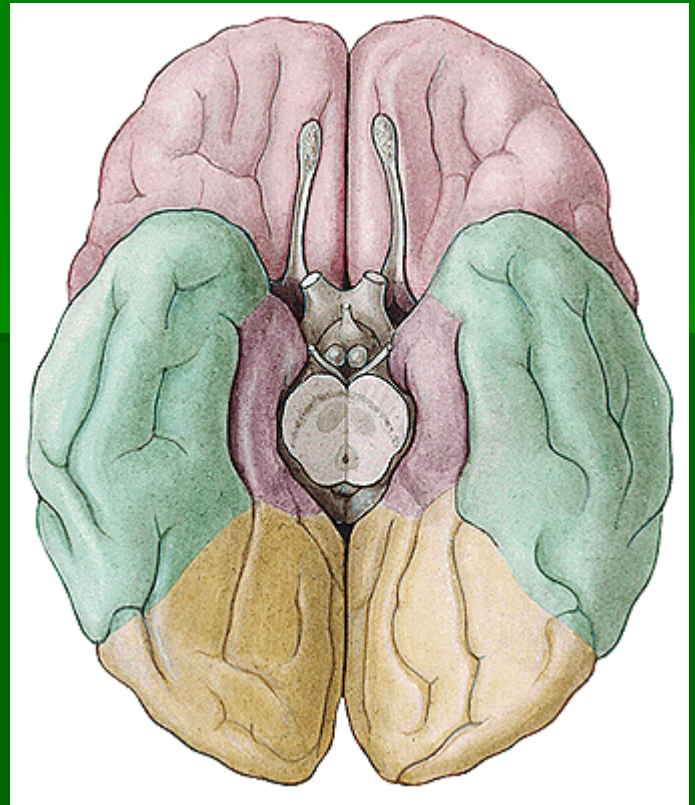
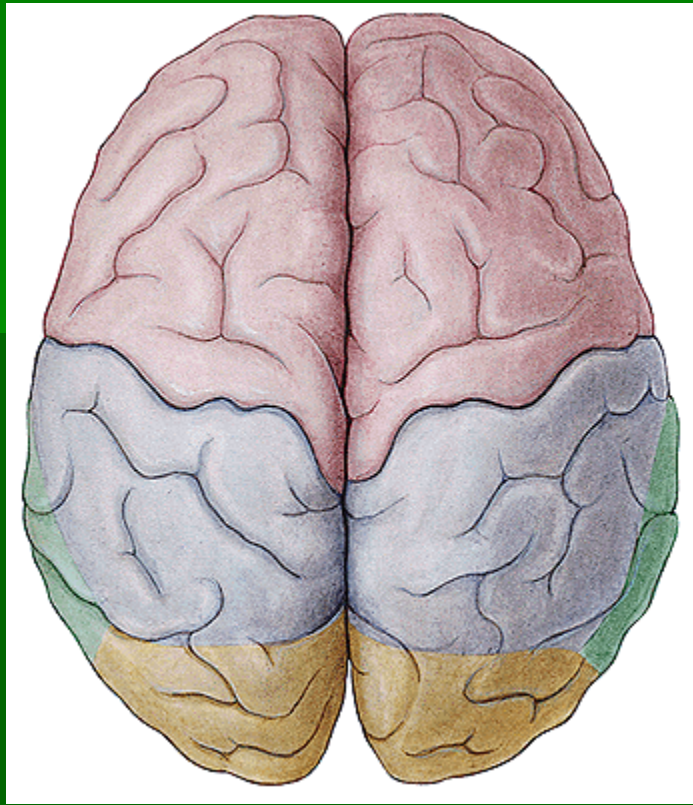
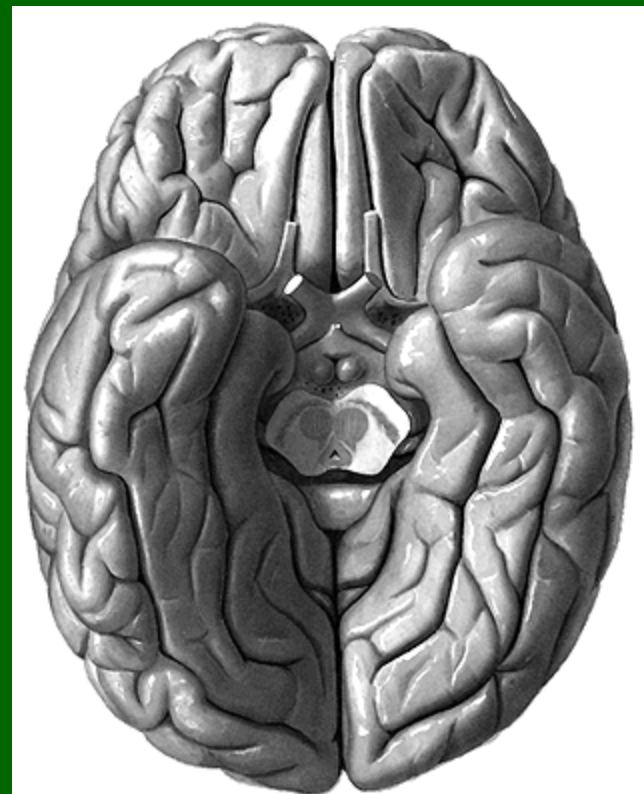
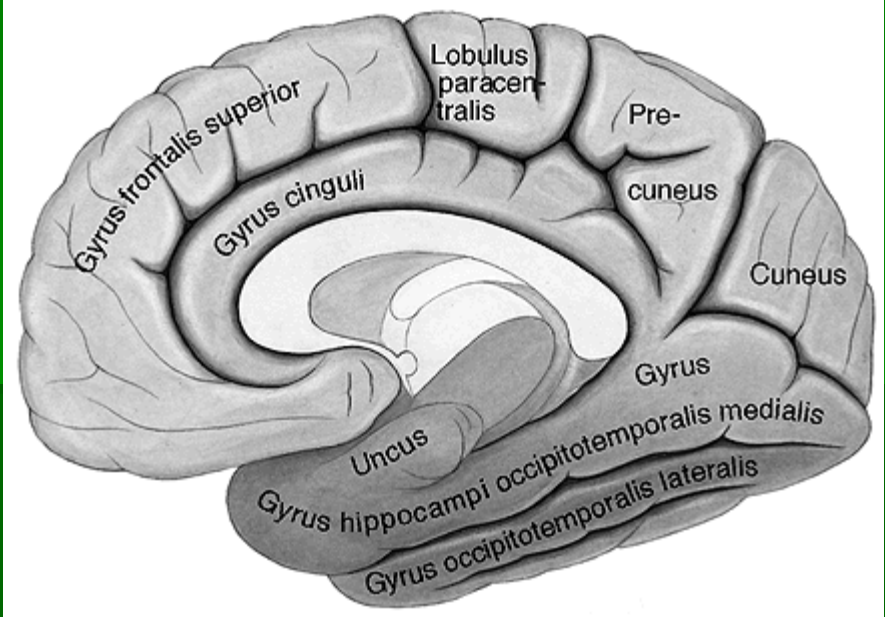
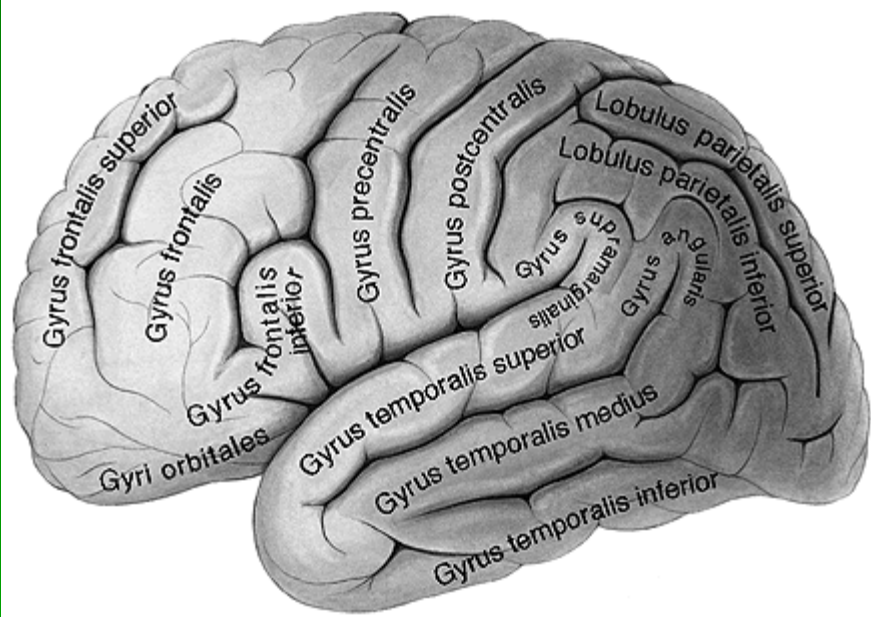


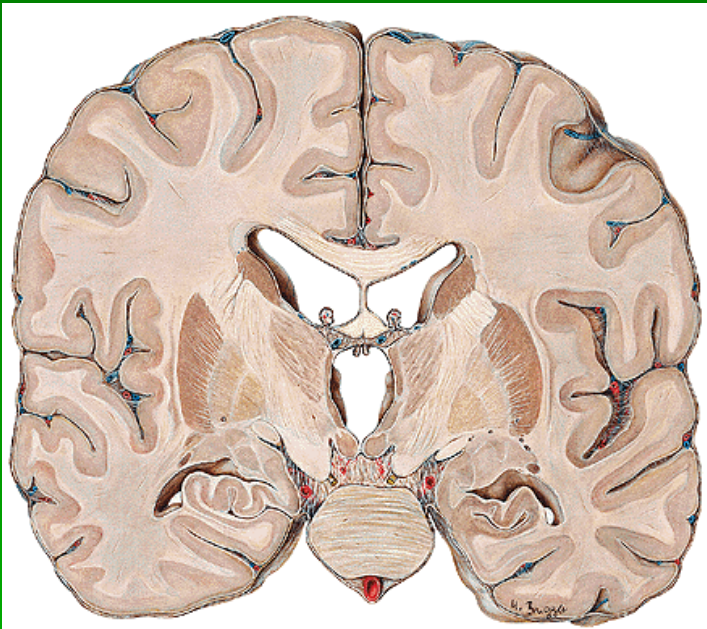
Telencephalon







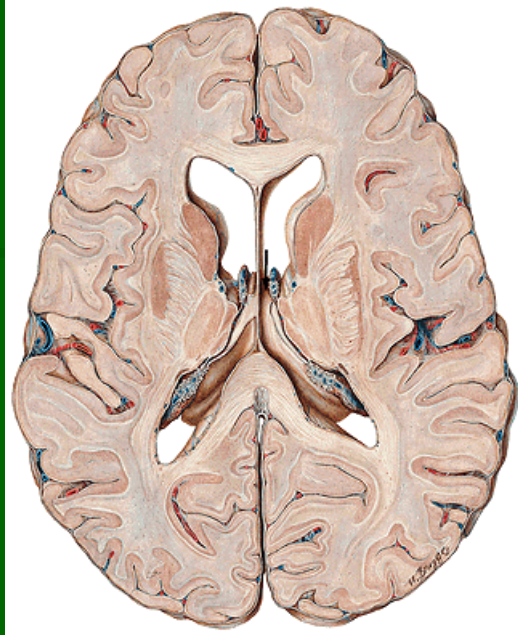
Structure of telencephalon



Gray matter

Cortex (pallium)

Basal ganglia (striatum)



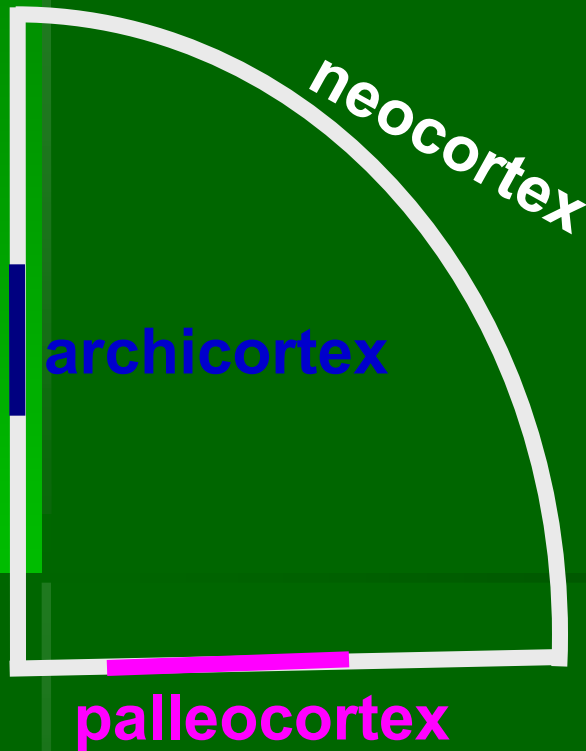
White matter -
pathways

Projection

Commissural

Association

Cerebral cortex



ALLOCORTEX

3-5 layers

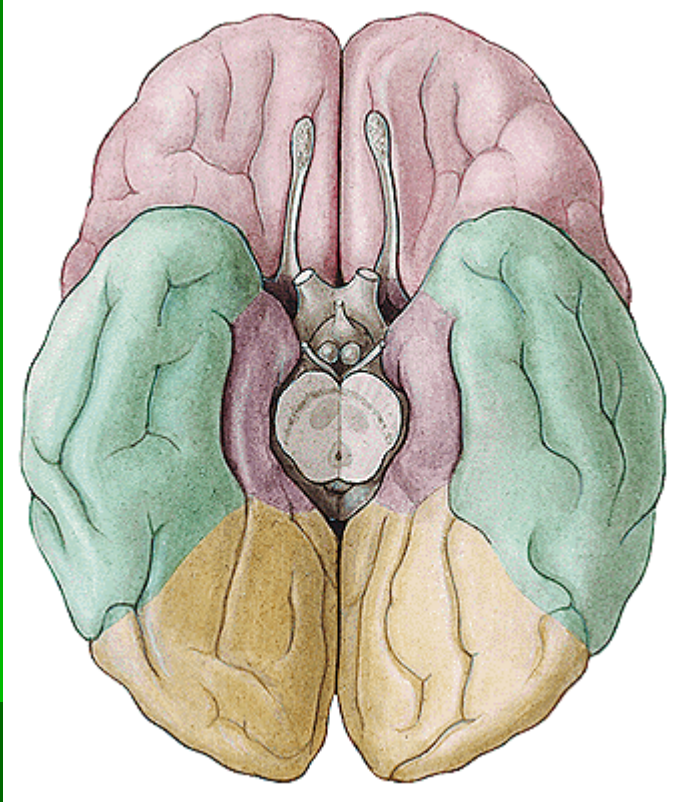
- a) **paleocortex** (rhinencephalon)
- b) **archicortex** (limbic system)

MESOCORTEX =
peripaleocortex, periarchicortex

NEOCORTEX (ISOCORTEX)

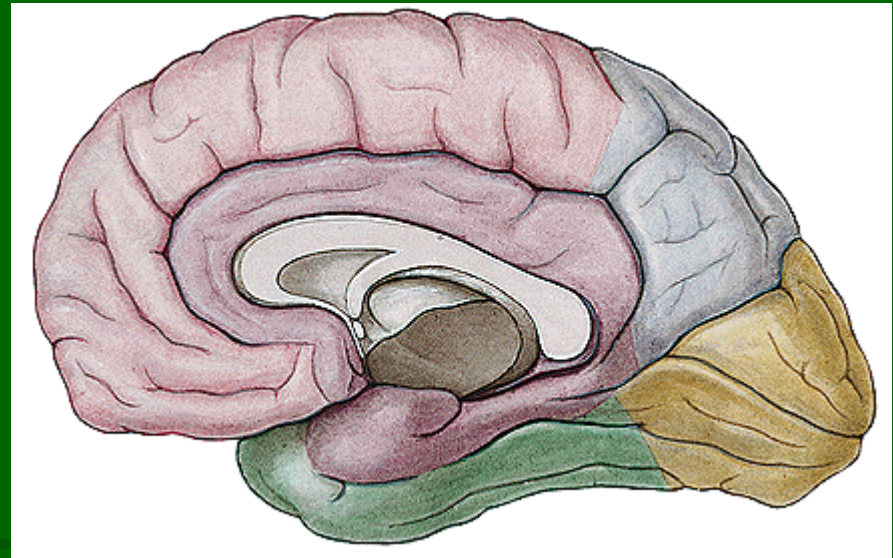
6 layers

Rhinencephalon



Bulbus olfactorius
Tractus olfactorius
Tuberculum olf.
Stria olf. med. et lat.

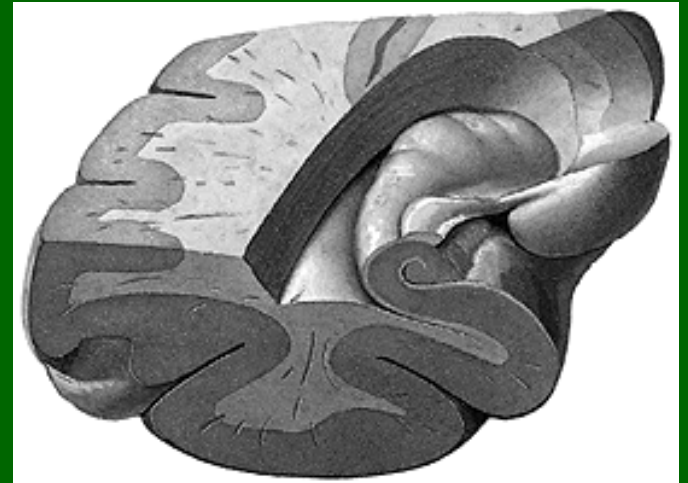
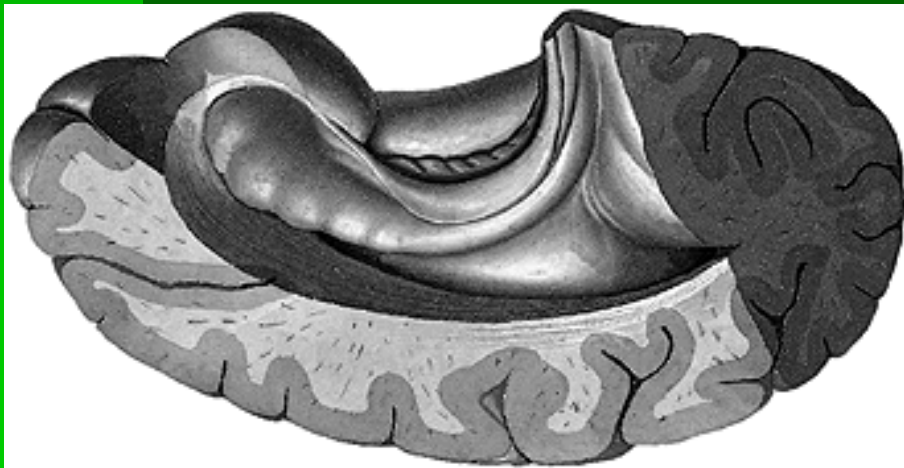
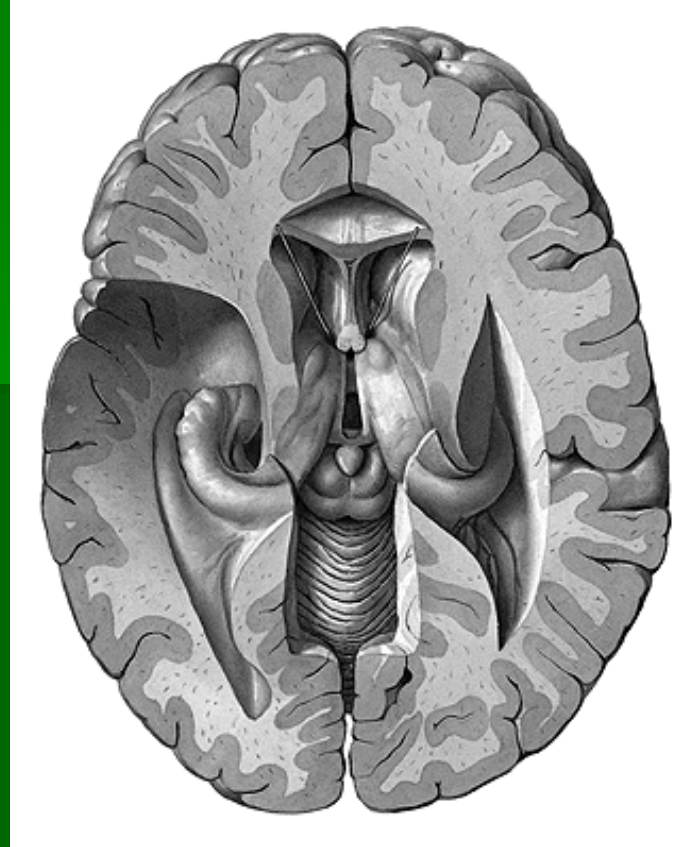
Limbic lobe

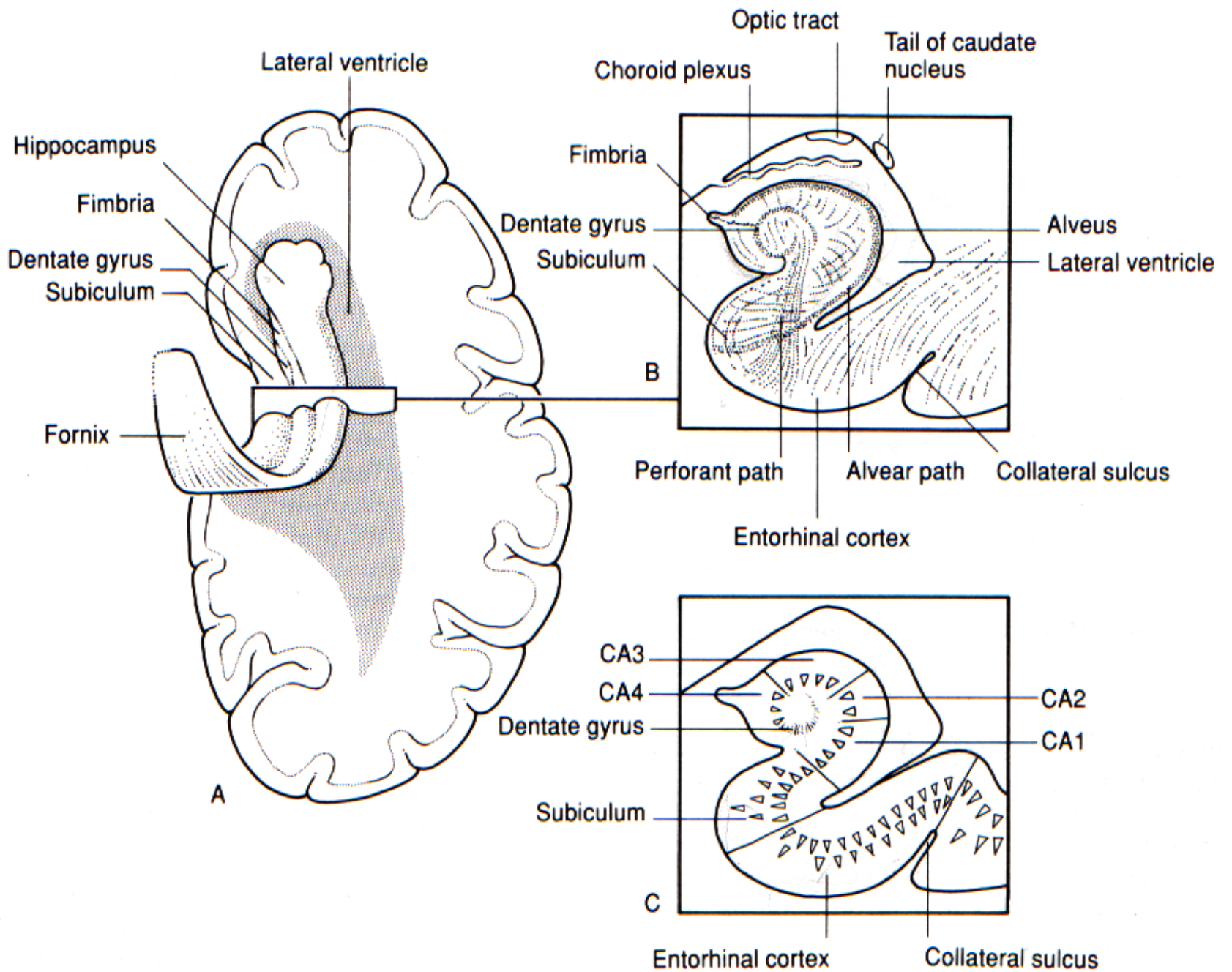


Gyrus cinguli
Gyrus parahippocampalis
Indusium griseum

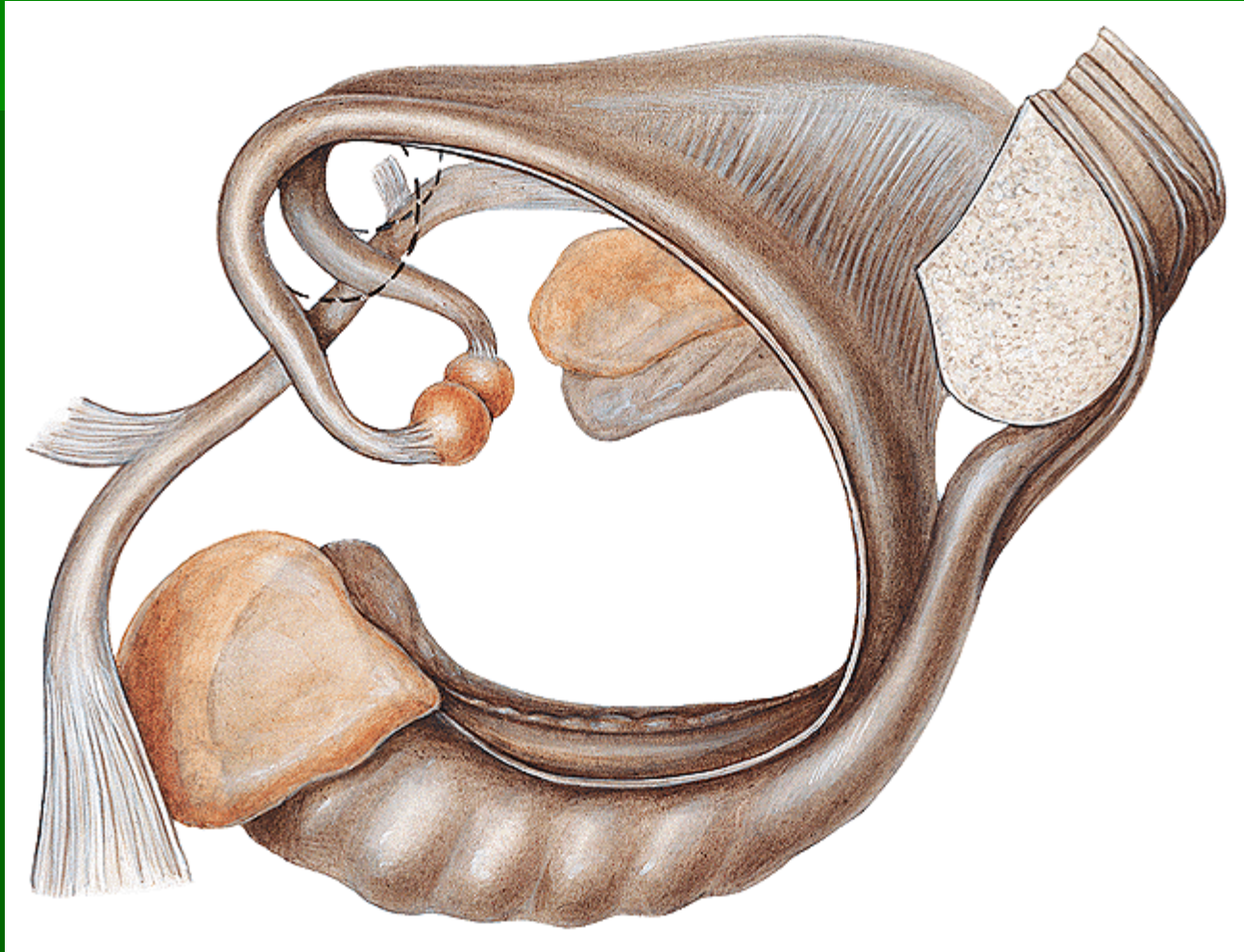
Hippocampal complex:

Hippocampus
(cornu ammonis, CA)
Gyrus dentatus
Subiculum





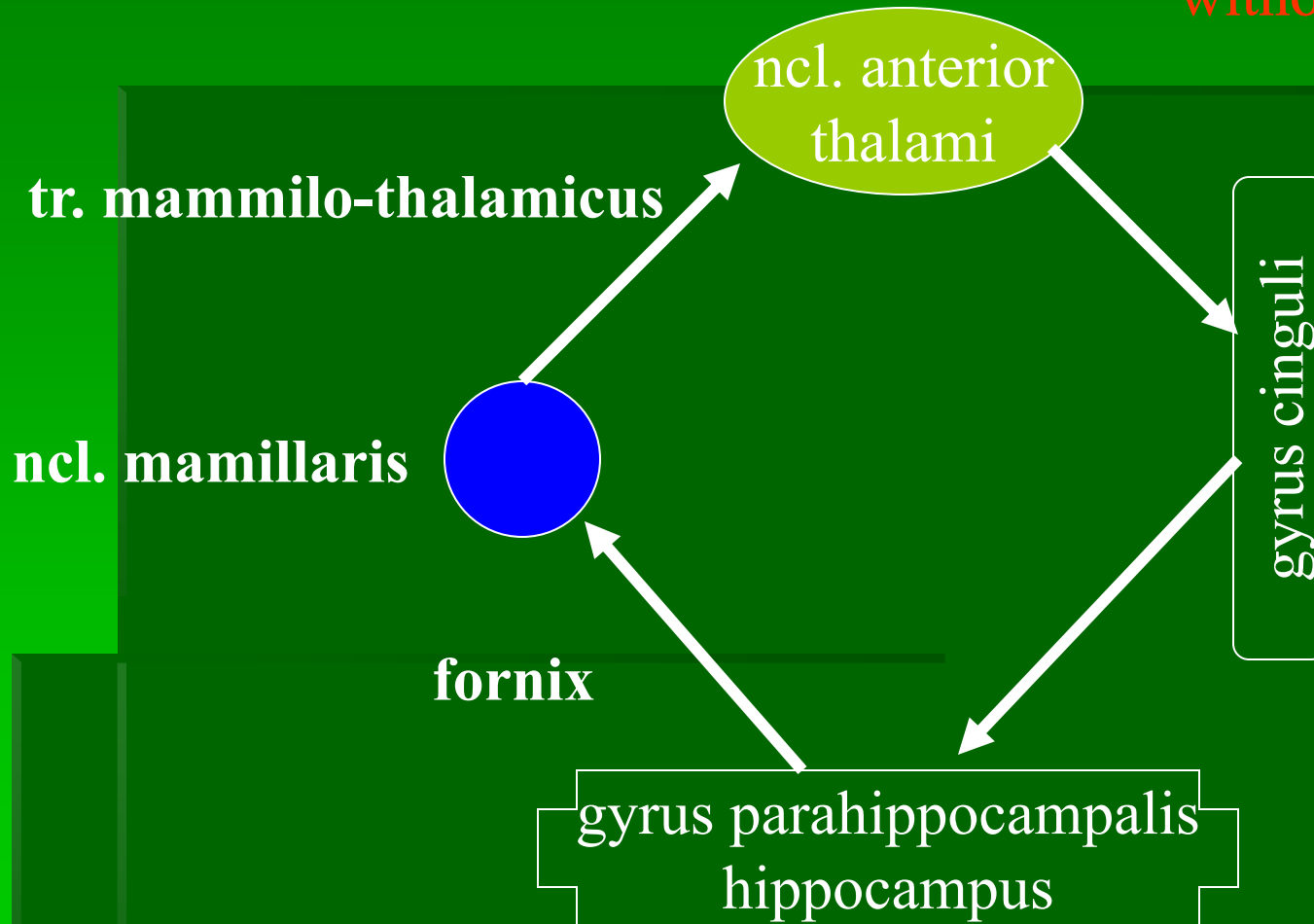
Fornix



limbic system – classic conception

Papez's circuit (James Papez 1939)

without specific function



RECENT CONCEPTION OF LIMBIC FOREBRAIN

- basomedial telencephalon, structures of diencephalon and mesencephalon for emotion and motivation of our behavior

Regular structures

- g. cinguli, g. parahippocampalis, hippocampus, insular cortex, neocortical regions of forebrain - basal frontotemporal regions, orbital cortex
- area septalis, amygdalar ncl., ventral striatum (pallidum)
- ncl. anterior et medialis dorsalis thalami, habenulla
- hypothalamus (ncl. mammillaris)

Limbic system – classic conception

Papez's circuit (James Papez 1939)

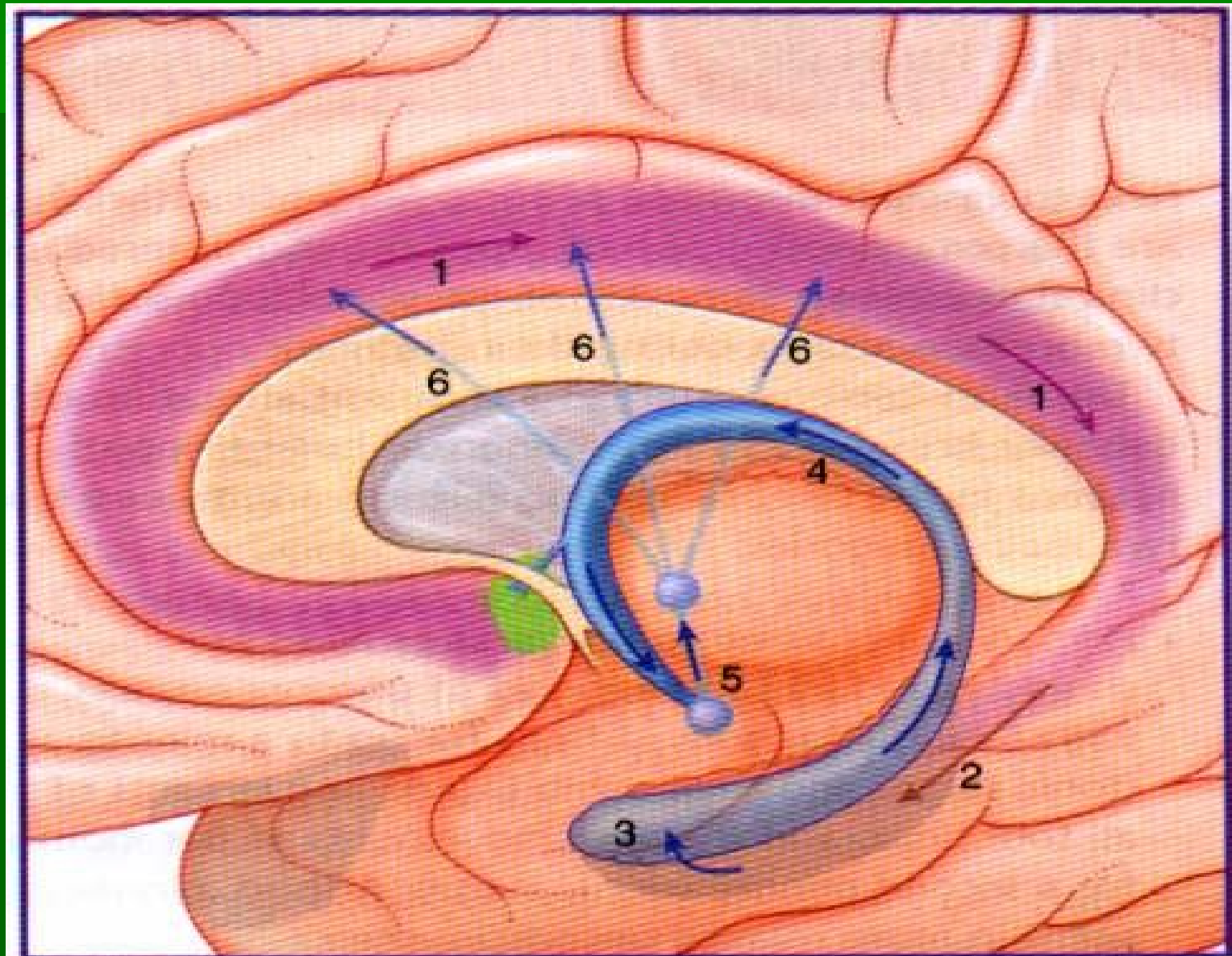


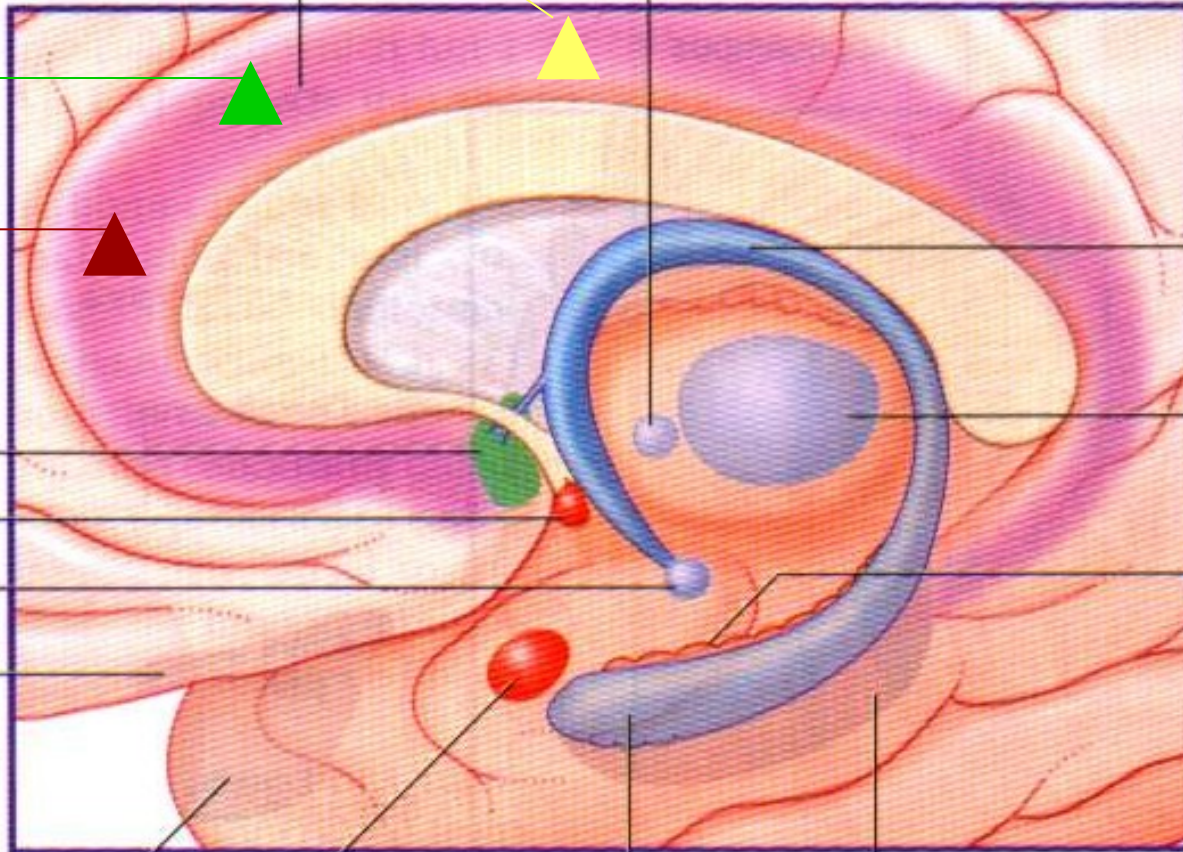
Image of tooth pain

Image of fear

Reminiscence of music hearing

Cingulate gyrus

Anterior nucleus of thalamus



Fornix

MDN

Dentate gyrus

Septal area

Nucleus accumbens

Mammillary body

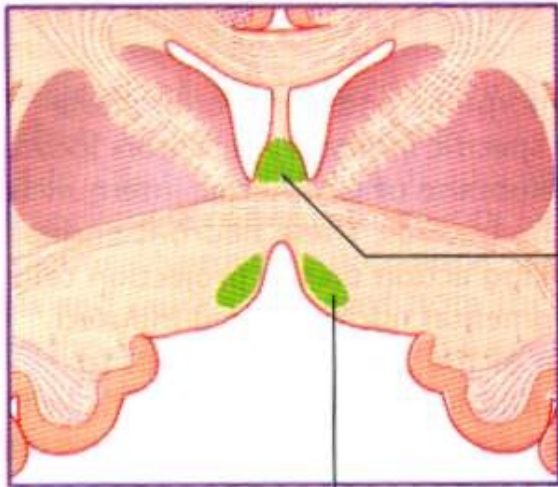
Orbital cortex

Temporal polar cortex

Amygdala

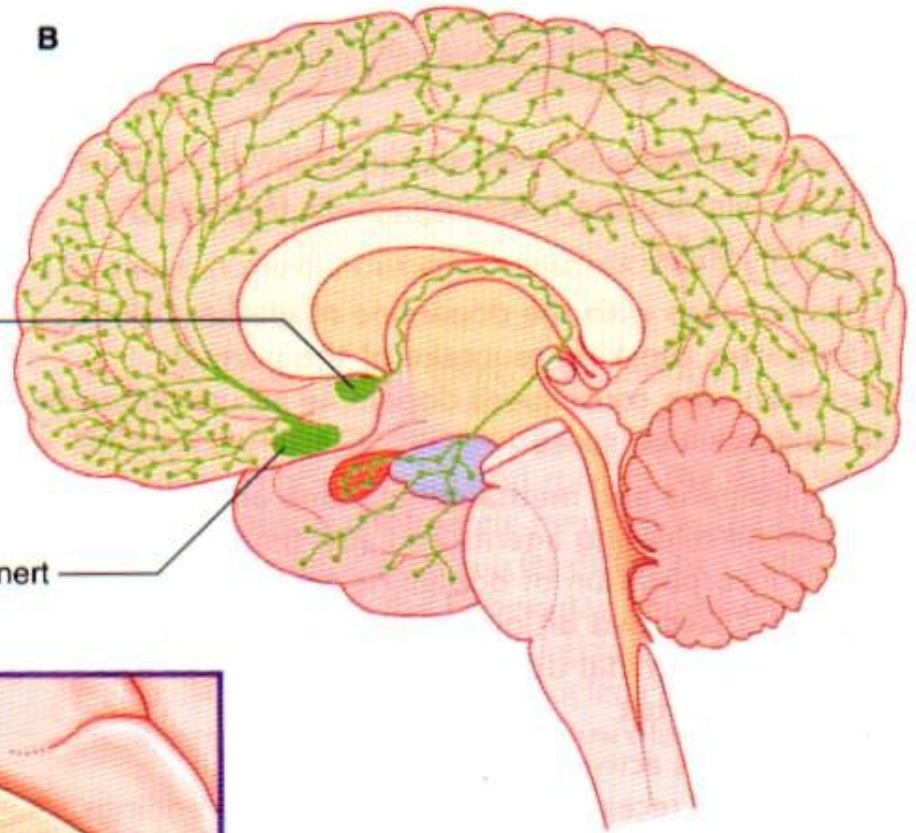
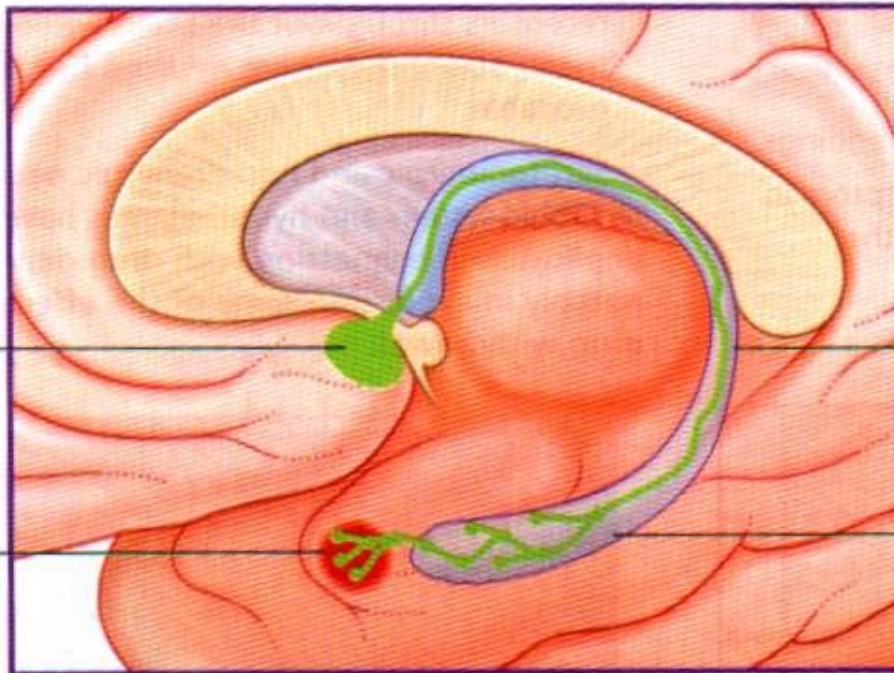
Hippocampus

Entorhinal cortex

A

Septal nuclei

Basal nucleus of Meynert

B**C**

Septal nuclei

Fornix

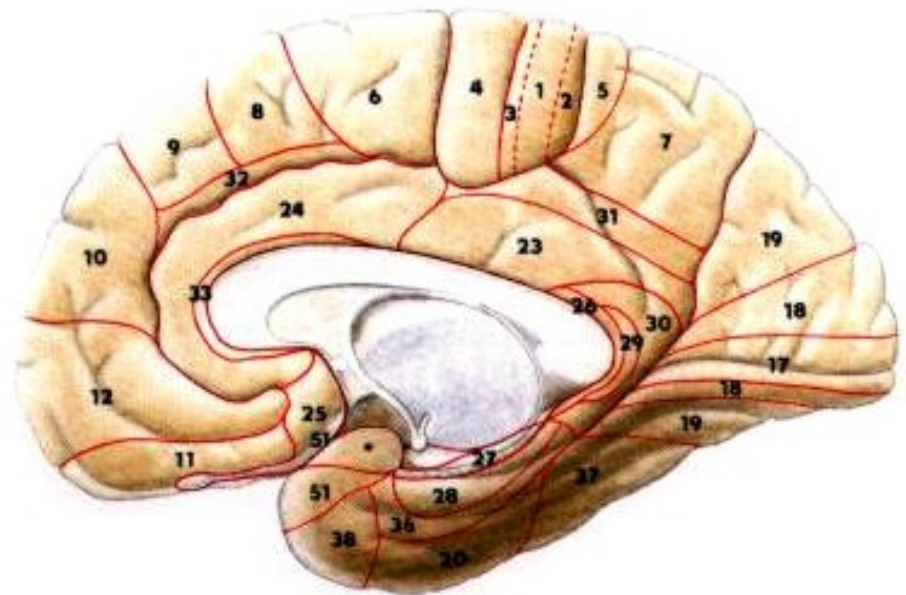
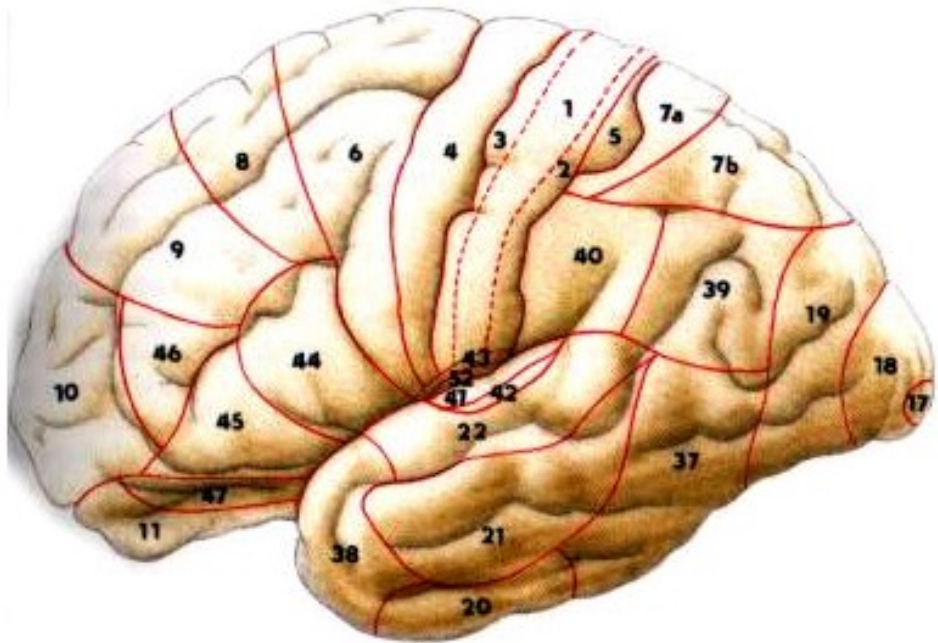
Amygdala

Hippocampus

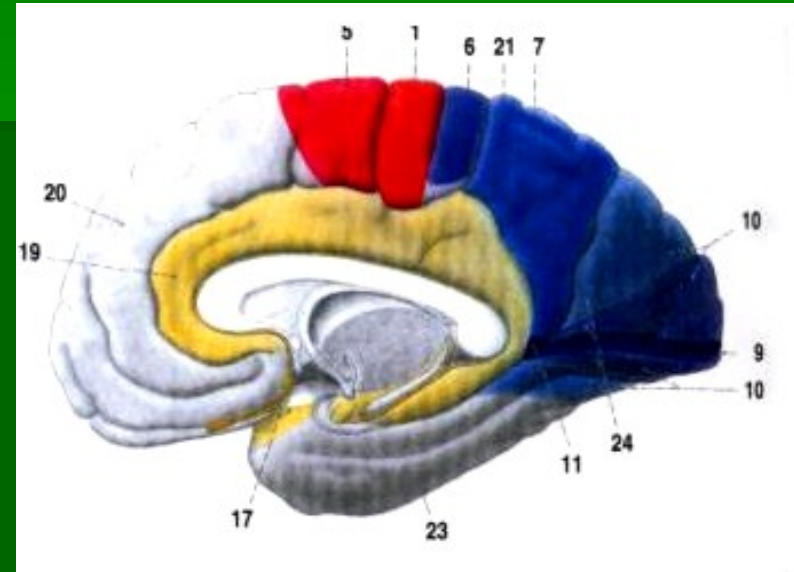
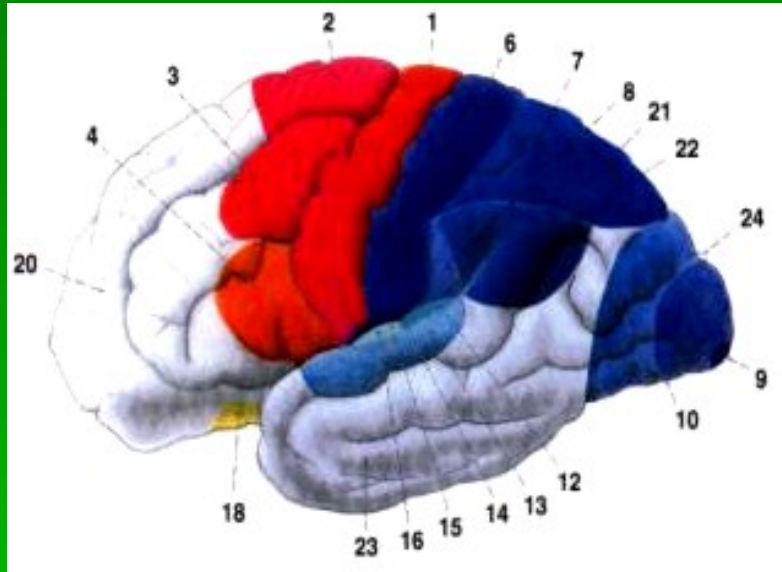
Brodman's map (cytoarchitectonic map of cortex)

11 regiones

52 areae



Functional regions of cortex

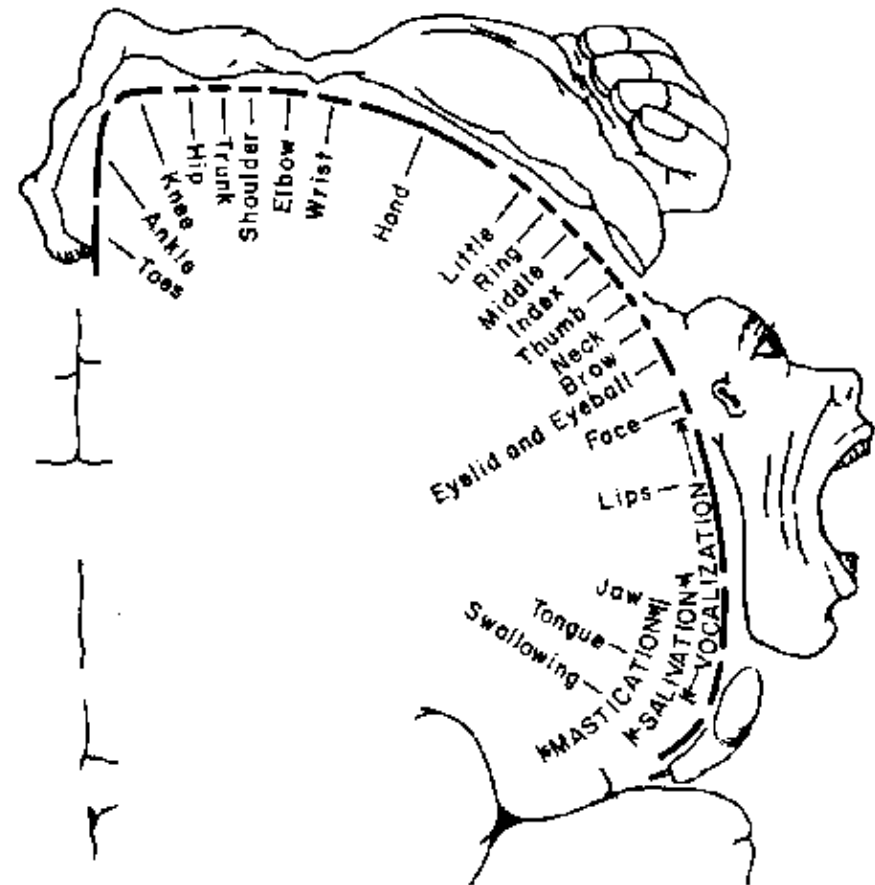
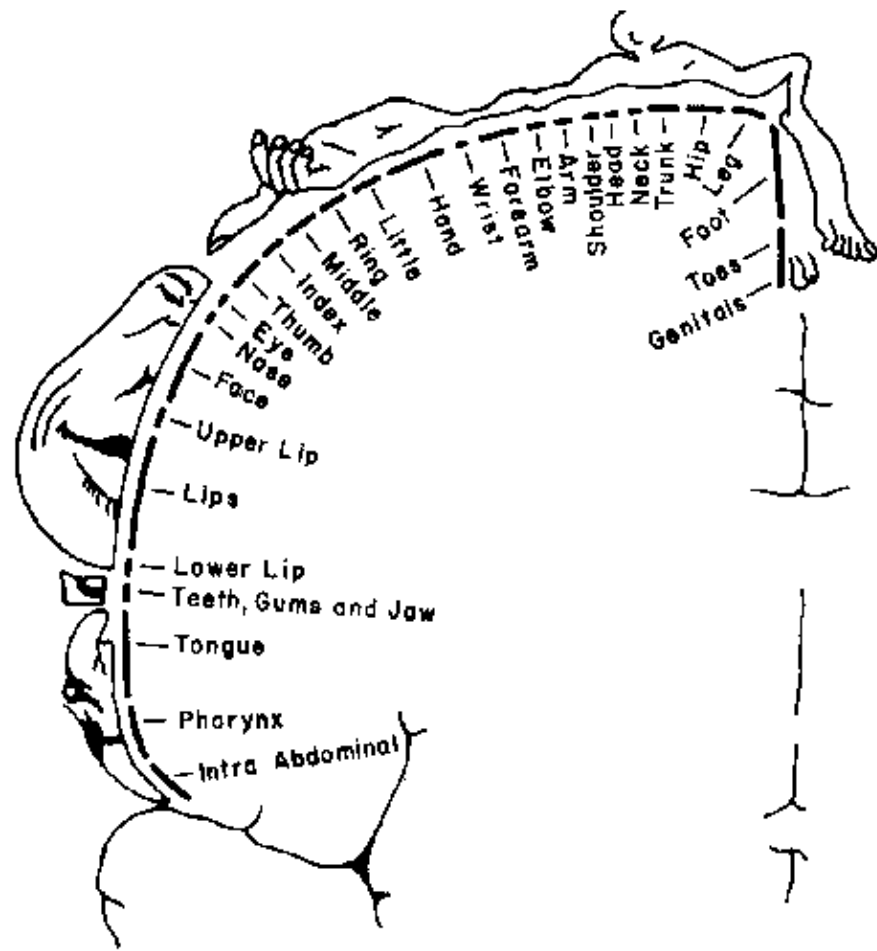


Primary motor c. (a 4), **primary somatic sensory c.** (a 3,1,2), **primary visual c.** (a 17), **primary auditory c.** (a 41,42)

Secondary and association areas

SOMATOSENSORY „HOMUNCULUS“

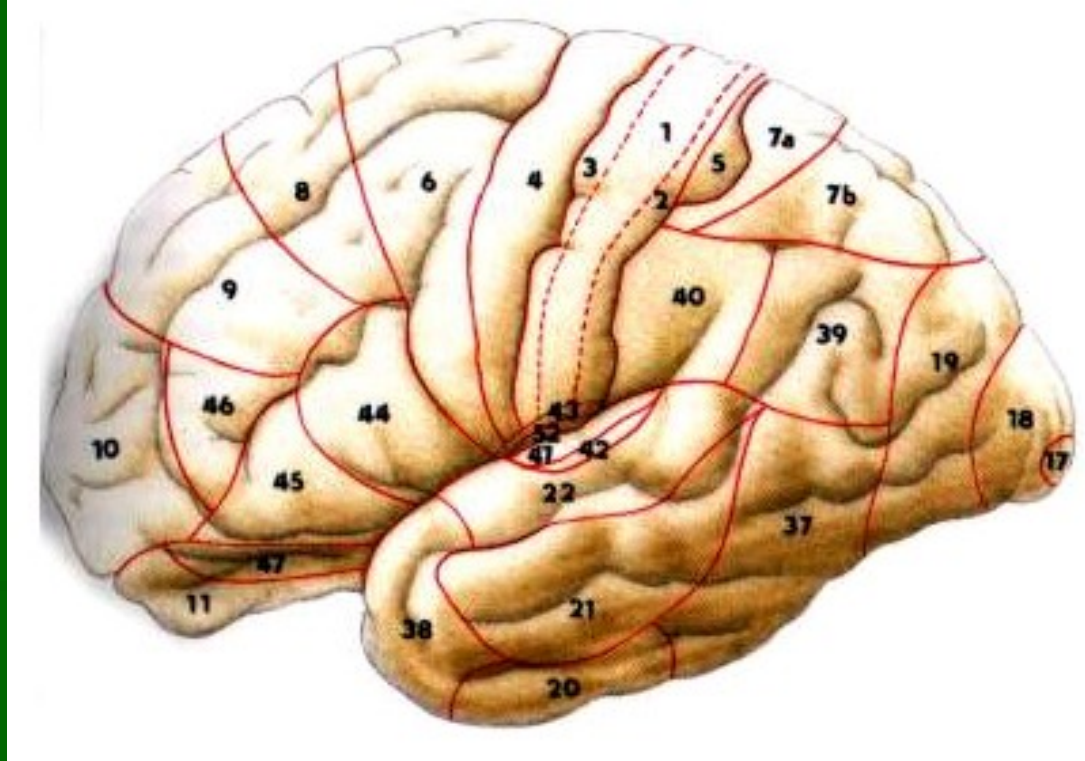
MOTOR „HOMUNCULUS“



CORTICAL AREAS FOR SPEECH - I

Broca's (motor) cortical area - g. front. inf. a44, 45

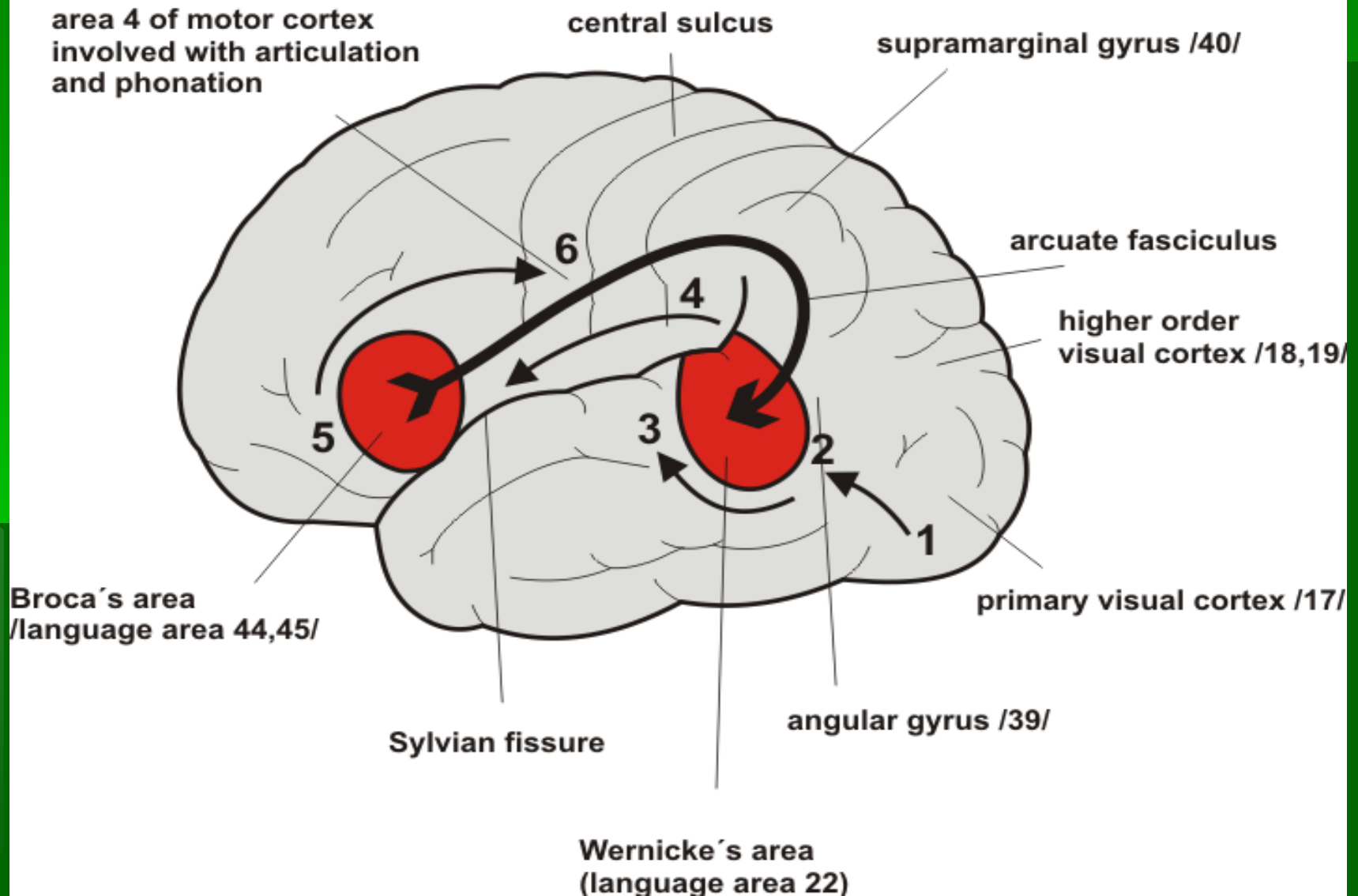
lesion - expressive aphasia – the lack of speech, but understanding is OK



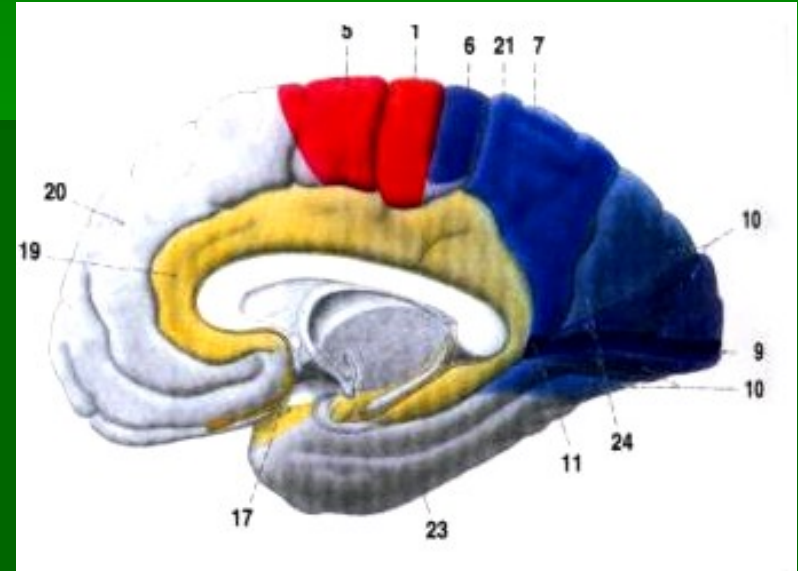
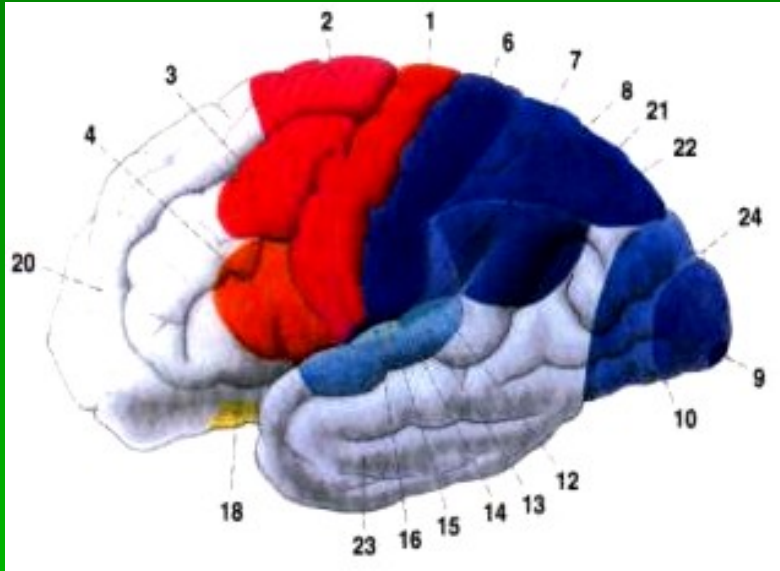
Wernicke's (sensory) cortical area - a 22,39,40 in dominant hemisphere

• lesion - receptive aphasia – the lack of understanding

CORTICAL AREAS FOR SPEECH - II



Functional regions of cortex



Secondary and association areas

BASAL GANGLIA AND RELATED STRUCTURES

ncl. caudatus, putamen, globus pallidus (ext. + int. segment),

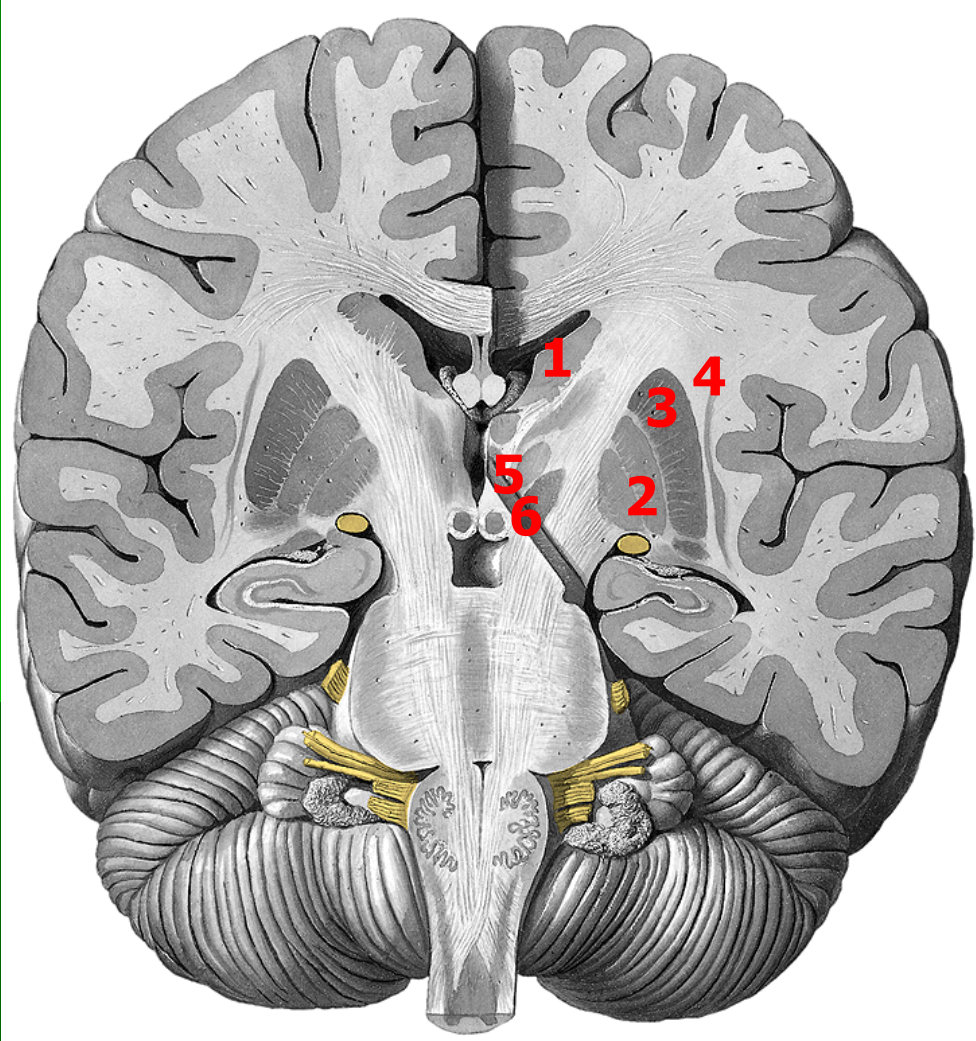
claustrum and amygdalar ncll.

Functionally: + thalamus, substantia nigra, ncl. subthalamic,

ventral tegmental area (VTA)

globus pallidus + putamen = **ncl. lentiformis**

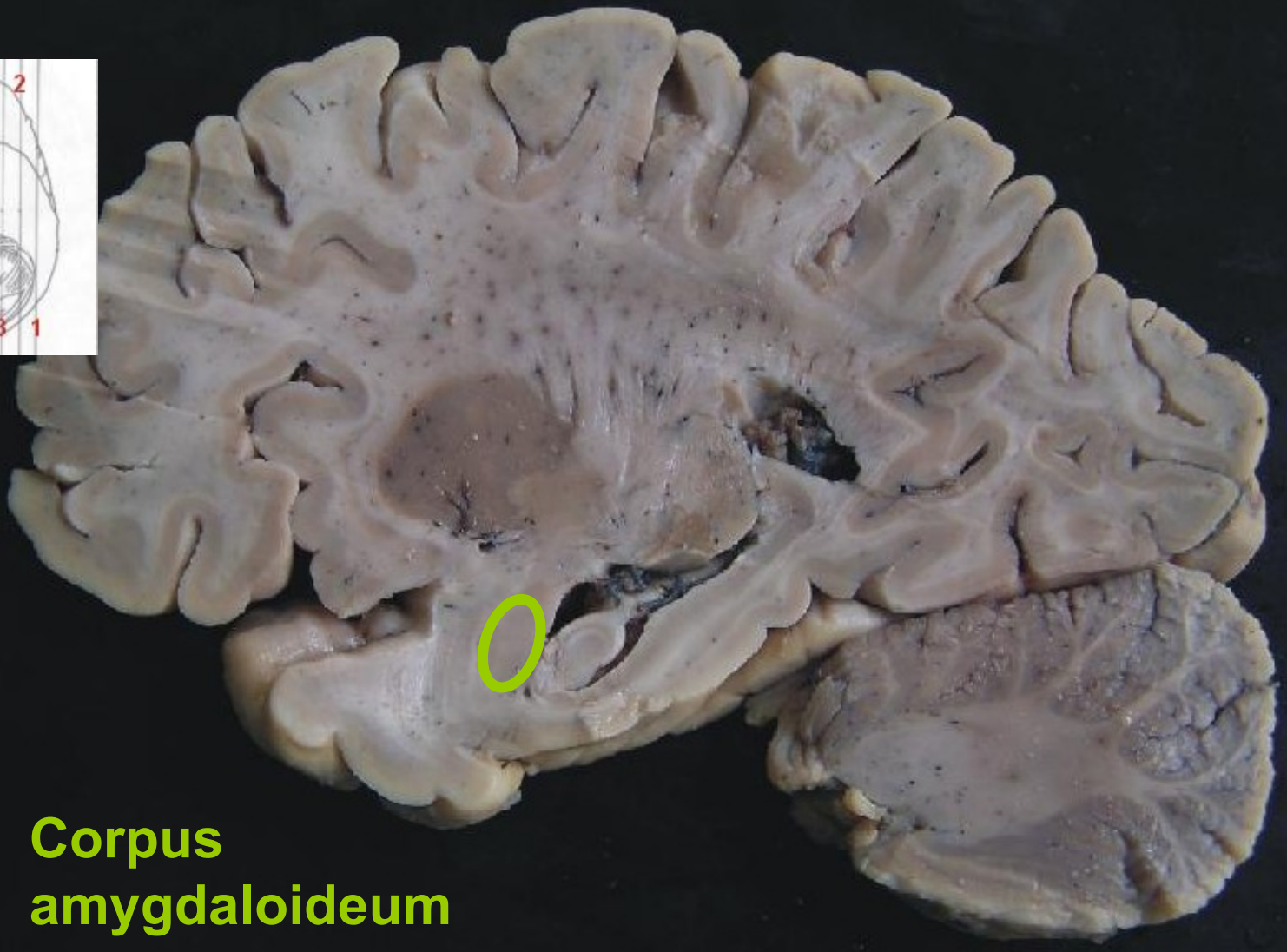
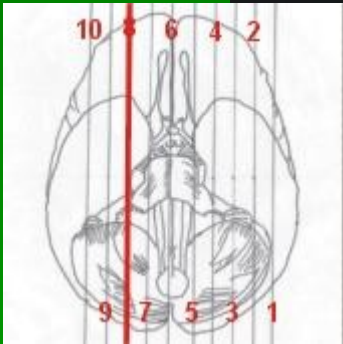
Basal ganglia



- 1 ncl. caudatus
- 2 globus pallidus
- 3 putamen
- 4 claustrum
corp. amygdaloideum

Functionally

- 5 ncl. subthalamicus
- 6 substantia nigra



Corpus amygdaloideum

- 1) behavior for preservation of self
- 2) learning
- 3) emotion processing

Development of BG

Neostriatum (striatum)

ncl. caudatus, putamen – dorsal striatum

ncl. accumbens – ventral striatum

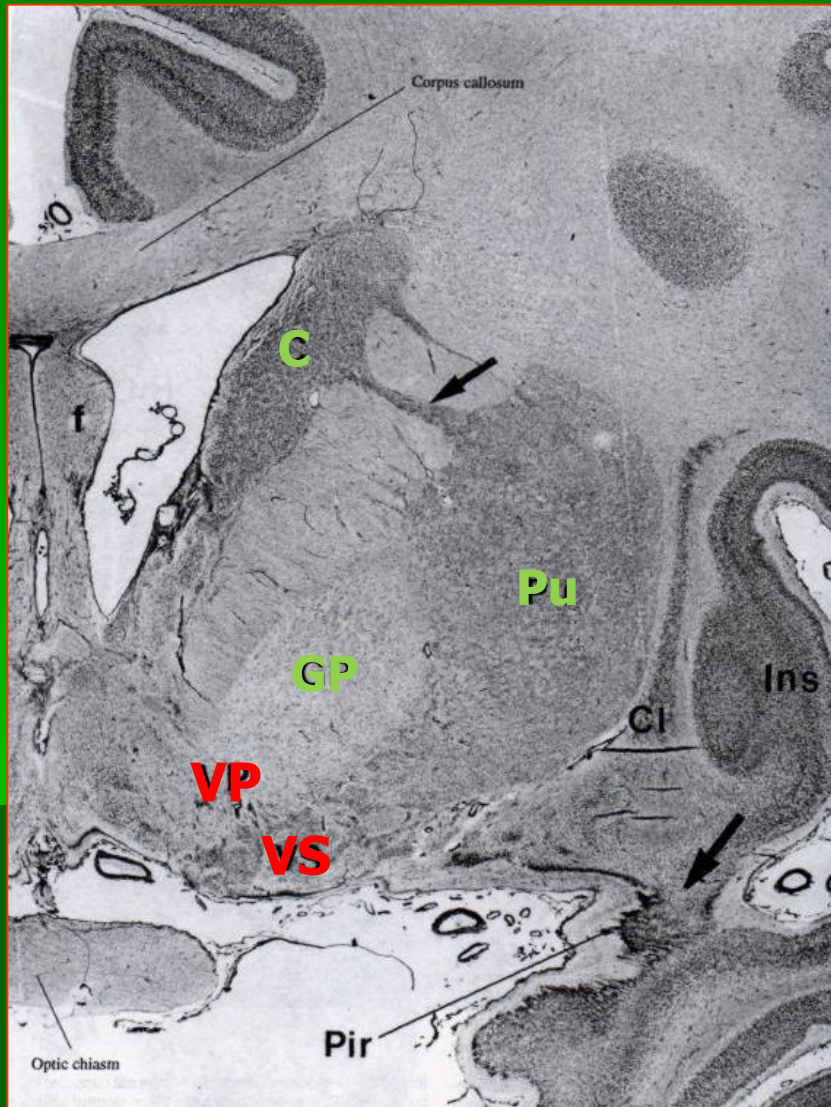
Palleostriatum (pallidum) = globus pallidus

lat. + med. segment – dorsal pallidum

ventral pallidum

Archistriatum

corpus amygdaloideum



Ncl caudatus + putamen
= dorsal striatum

Globus pallidus
= dorsal pallidum

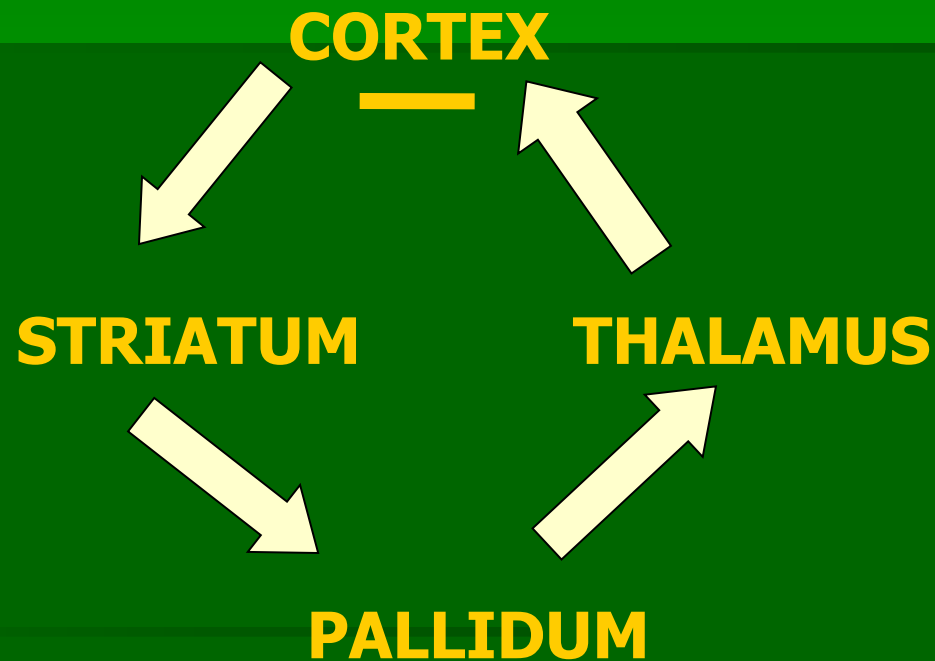
Substantia innominata:

VS = ventr. striatum (ncl. accumbens septi)

VP = ventral pallidum

Ncl. basalis Meynerti

Functional connections of BG



Function of BG

inhibition of cortical and subcortical motor functions

NCL. CAUDATUS

- **obsessive compulsive disorder (OCD)**
- **attention deficit disorder (ADD)**
- **depression**
- **schizophrenia**
- **PAP syndrome**
- **Huntington's disease**

PUTAMEN

- **Tourette's syndrome**

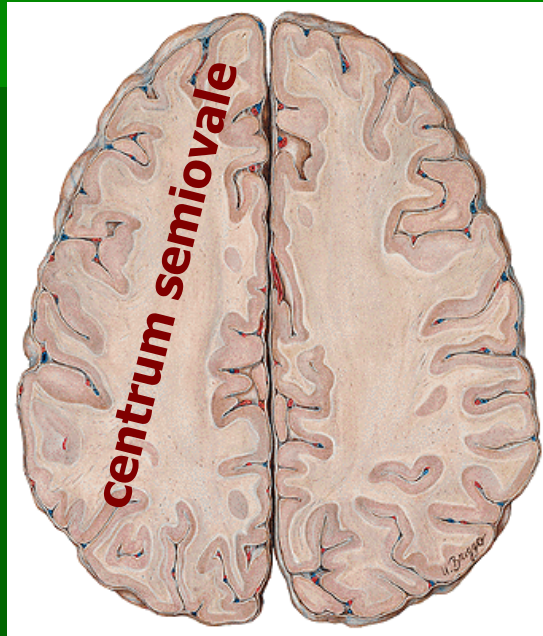
NCL. BASALIS

- **Alzheimer's disease**

SUBSTANTIA NIGRA

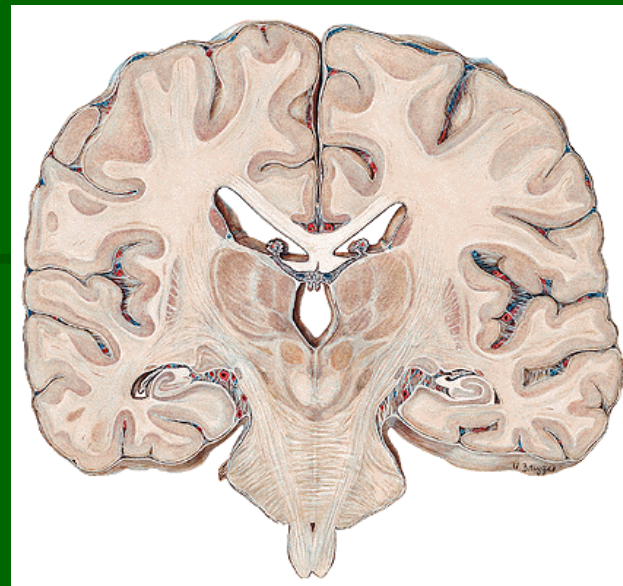
- **Parkinson's disease**

White matter of the telencephalon - **corpus medullare**

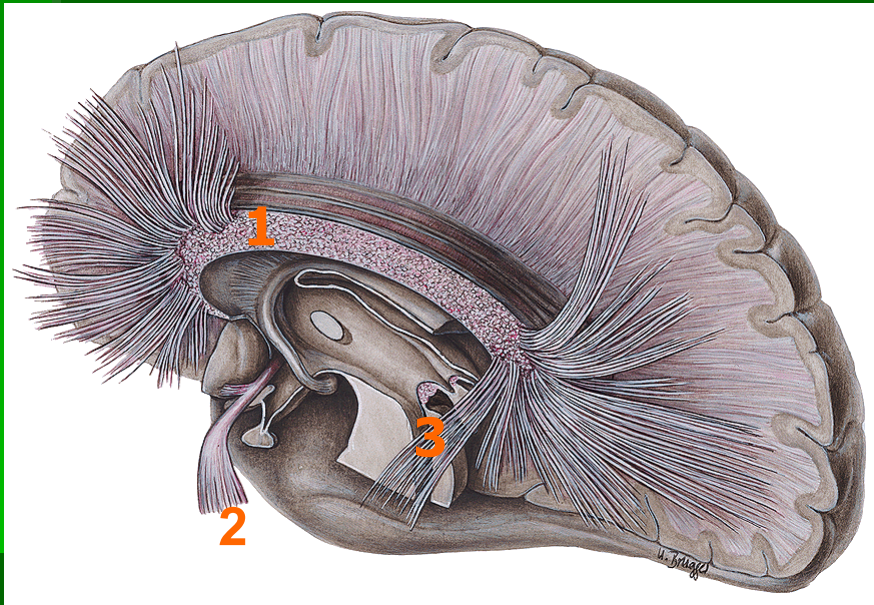


Fibers

commissural
projection
association



Commissural fibers



1 corpus callosum
neocortex

2 commissura ant.
pars ant.- paleocortex
pars post. - neocortex

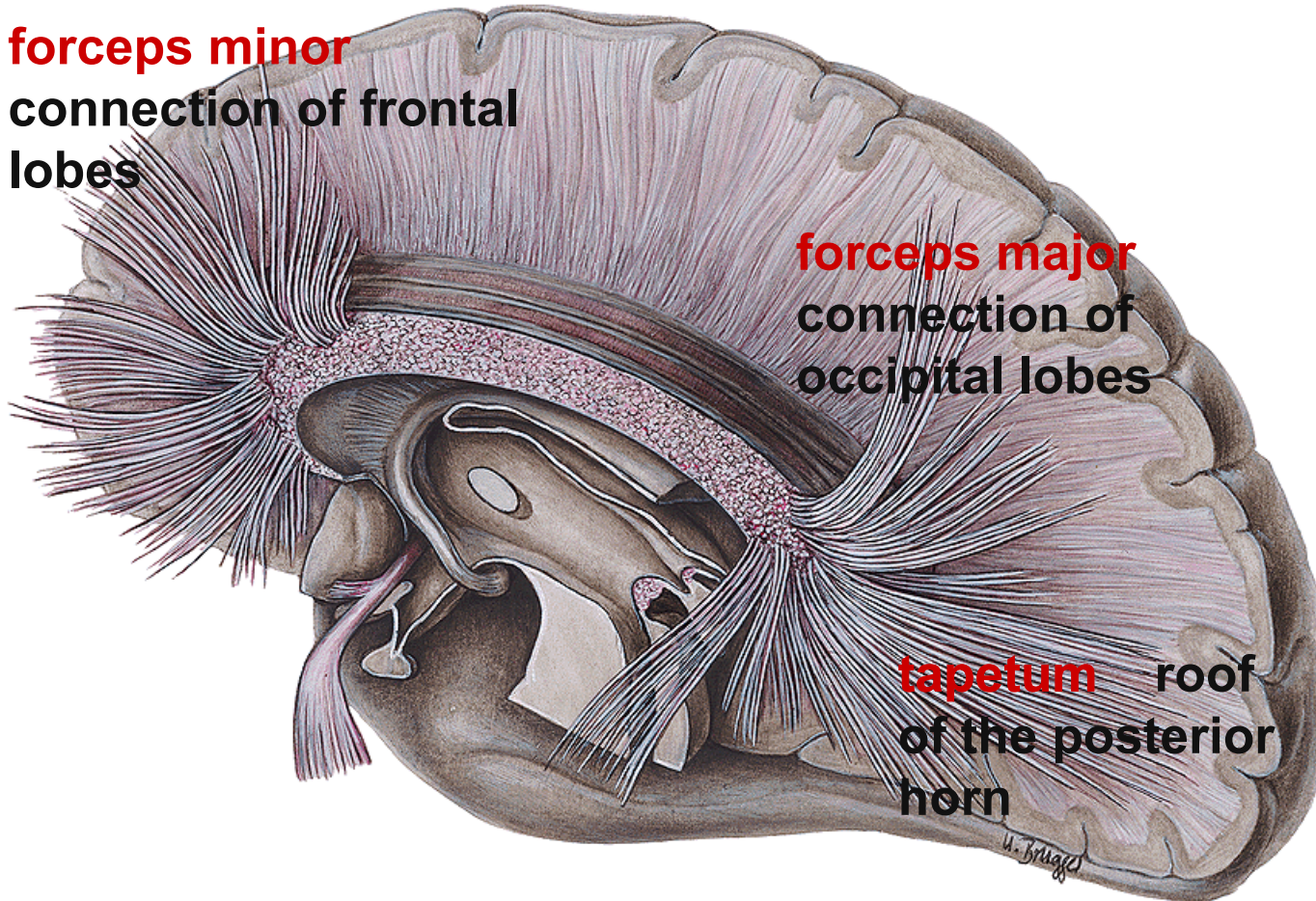
3 commissura fornicis
archicortex

Corpus callosum - 300 million fibers

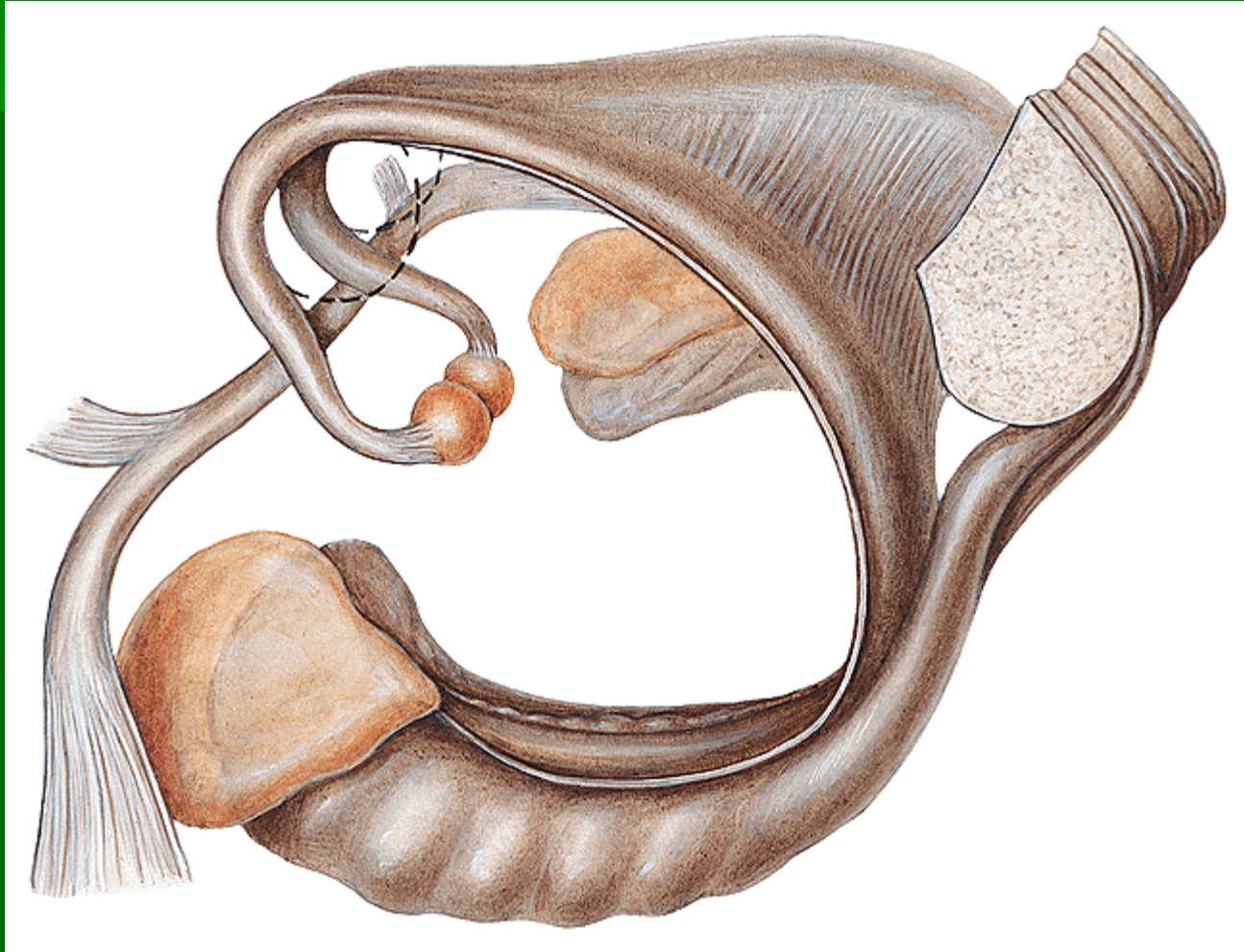
forceps minor
connection of frontal
lobes

forceps major
connection of
occipital lobes

tapetum roof
of the posterior
horn



Commissura fornicis et anterior



Projection fibers

short

connections between
cortex and BG

reciprocal connections
between cortex and
thalamus

long

tr. co-sp

tr. co-ncl

tr. co-ret

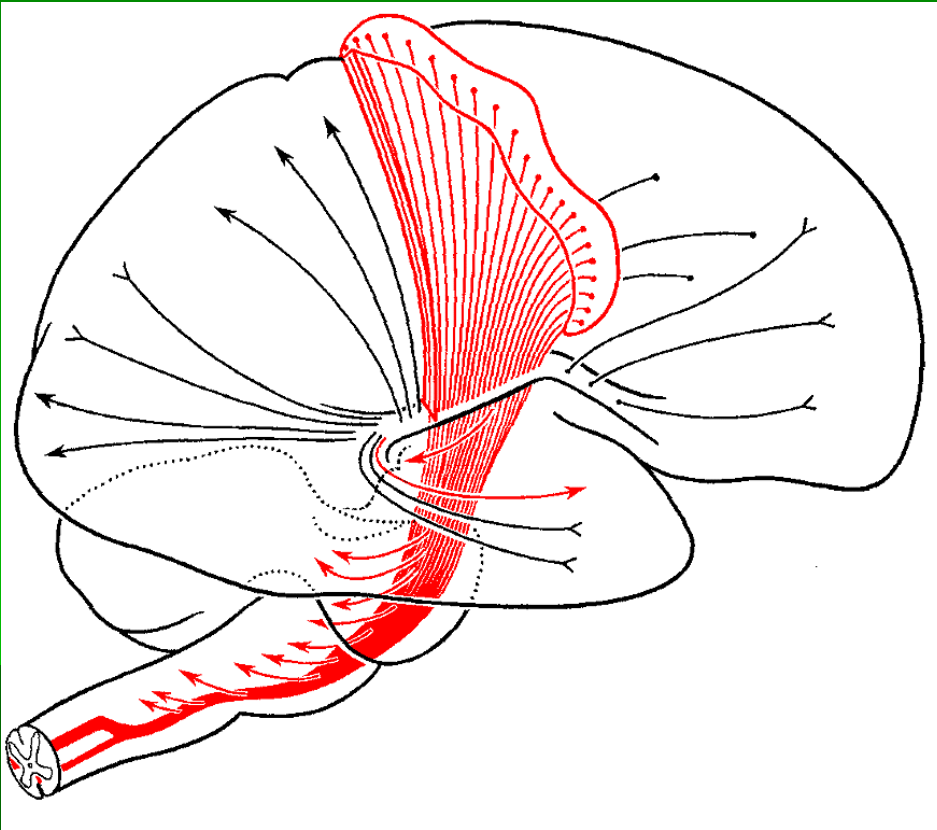
tr. co-tec

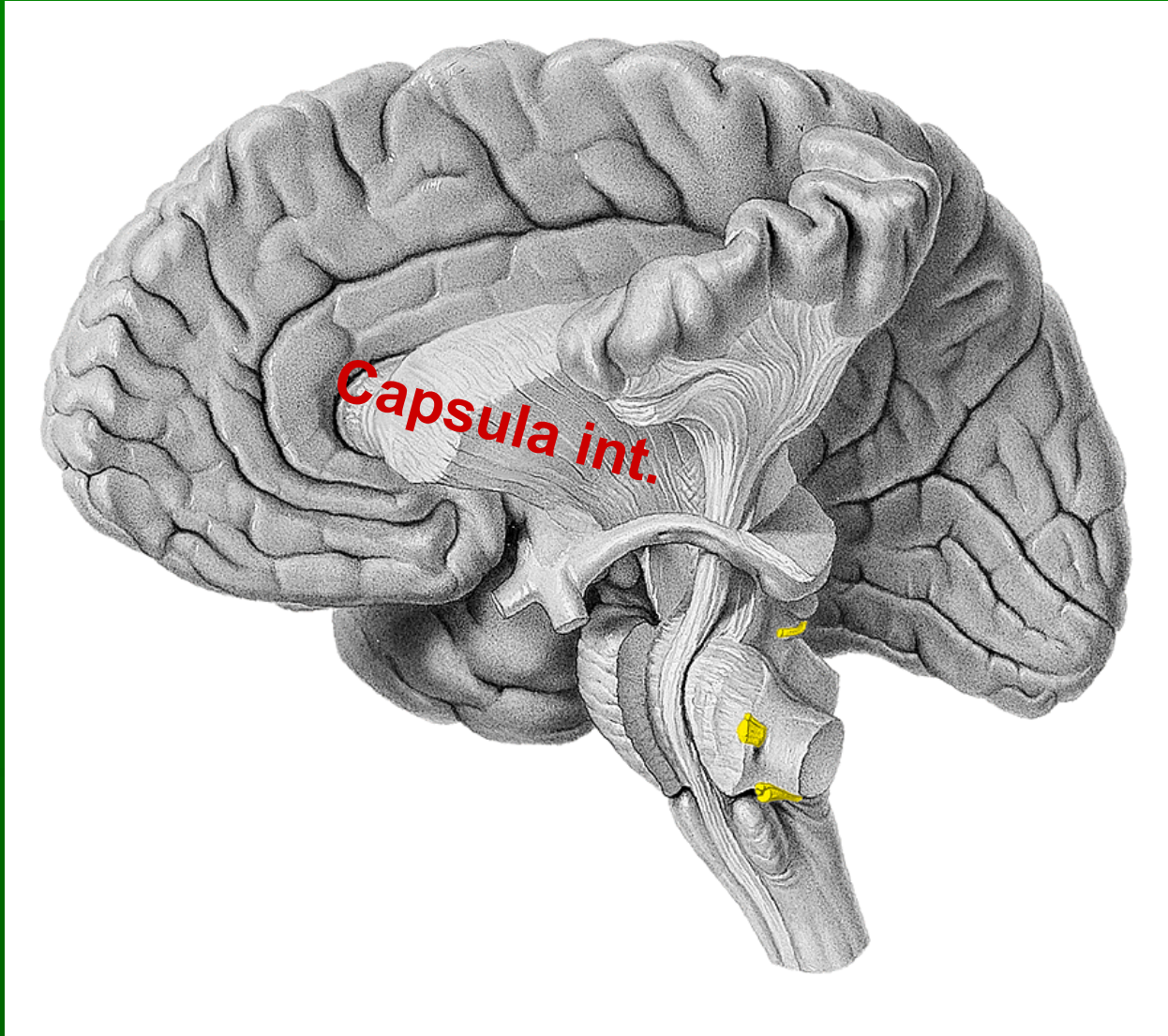
tr. co-ru

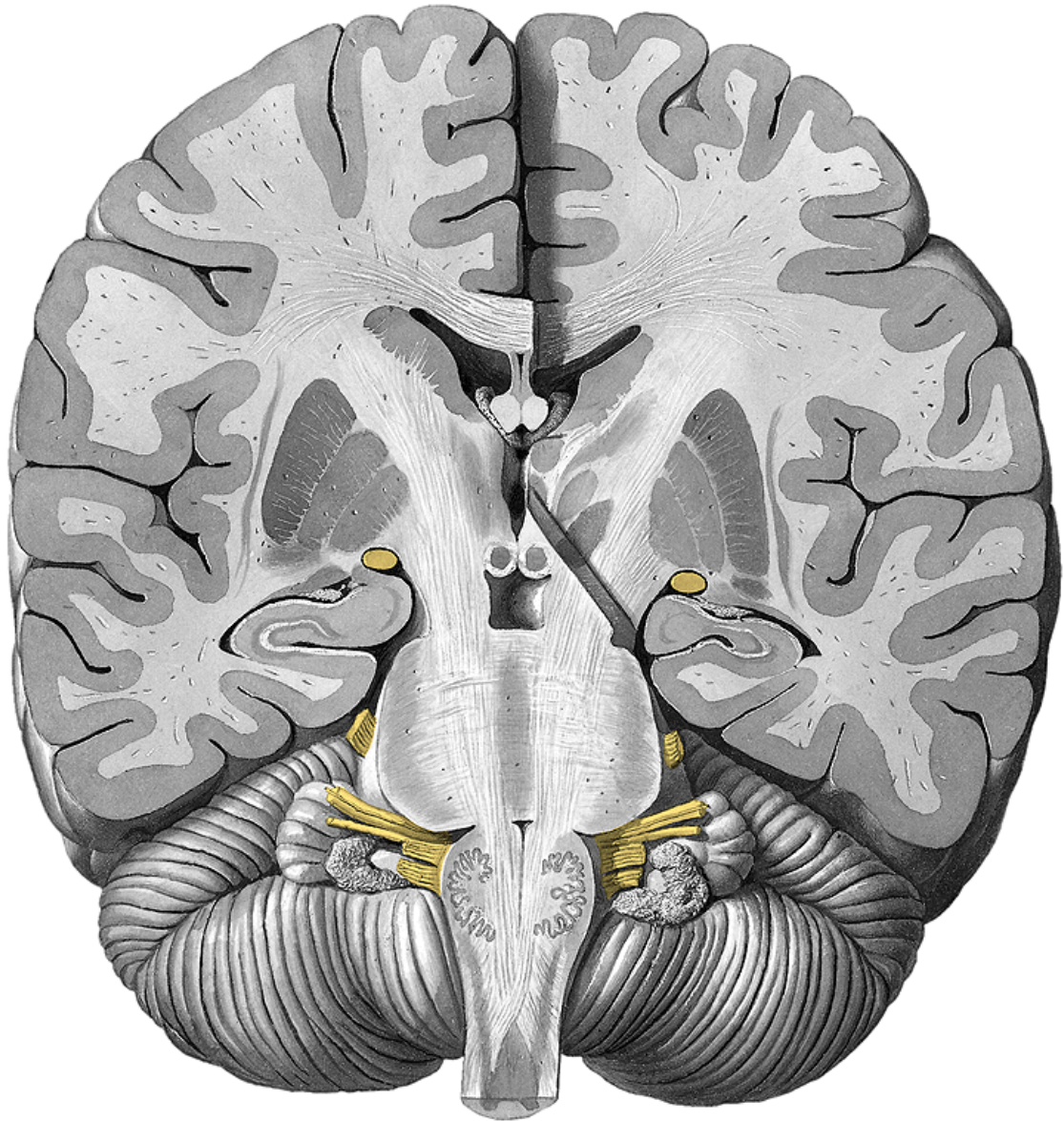
tr. co-bulb

tr. co-po

**capsula
interna**





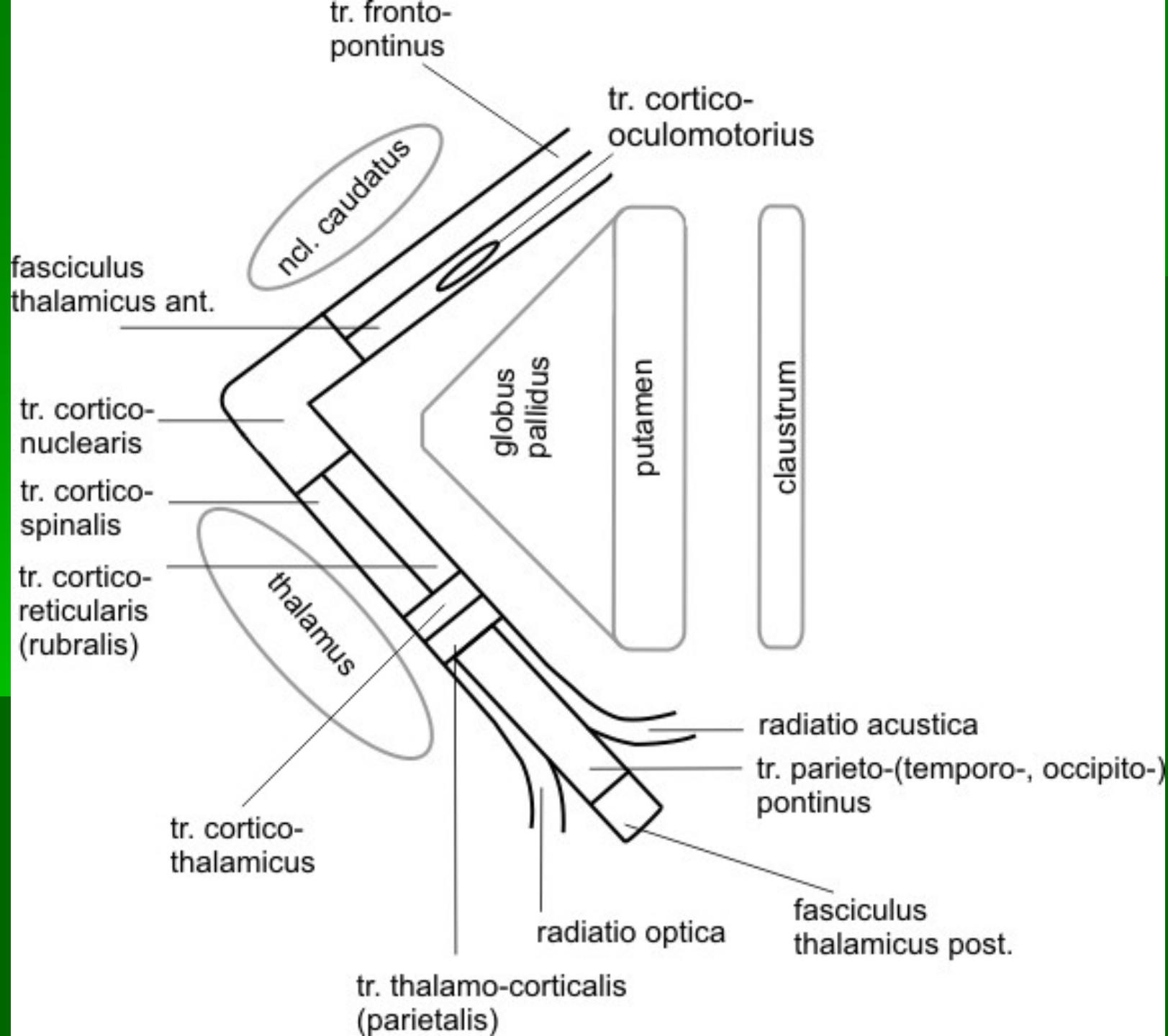


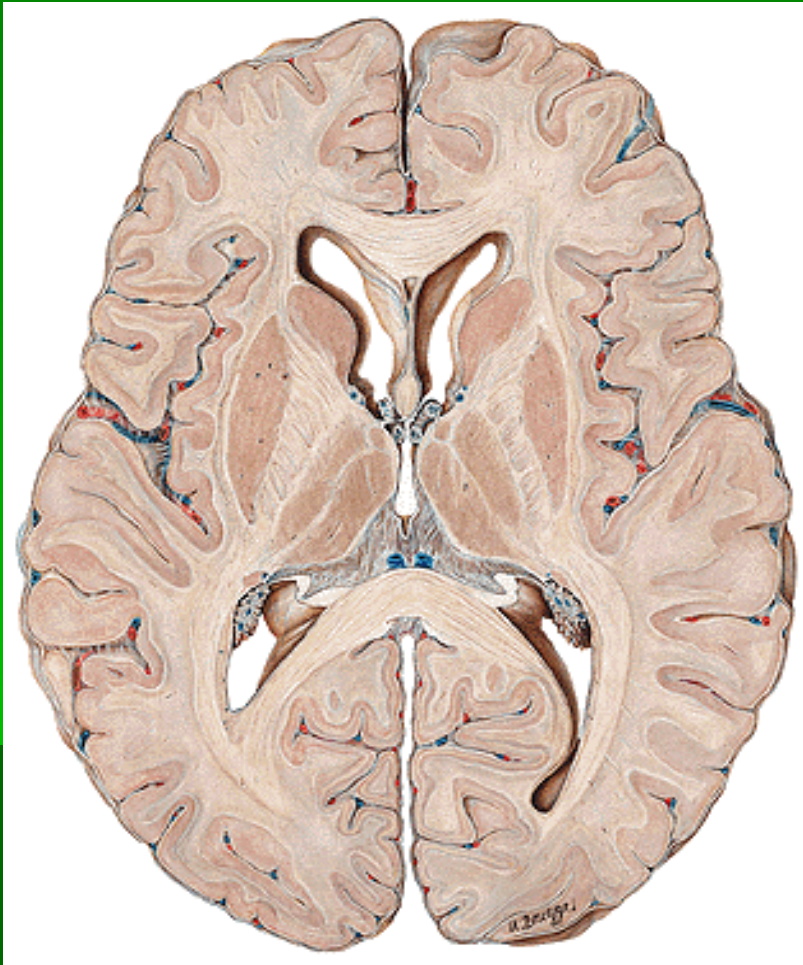
CAPSULA INTERNA

crus anterior – tr. thalamo-corticalis ant. and tr. fronto-pontinus

genu - tr. cortico-nuclearis (from area 4 to contralateral motoneurons of cranial nerves)

crus posterior - tr. cortico-spinalis (somatotopic arrangement), tr. cortico-reticularis and tr. cortico-rubralis, tr. thalamo-corticalis posterior (somatosensory information to parietal cortex), tr. parieto-, temporo-, occipito-pontinus, radiatio optica, radiatio acustica





crus ant.

fr-po

genu

co-ncl

co-sp,
ru,re

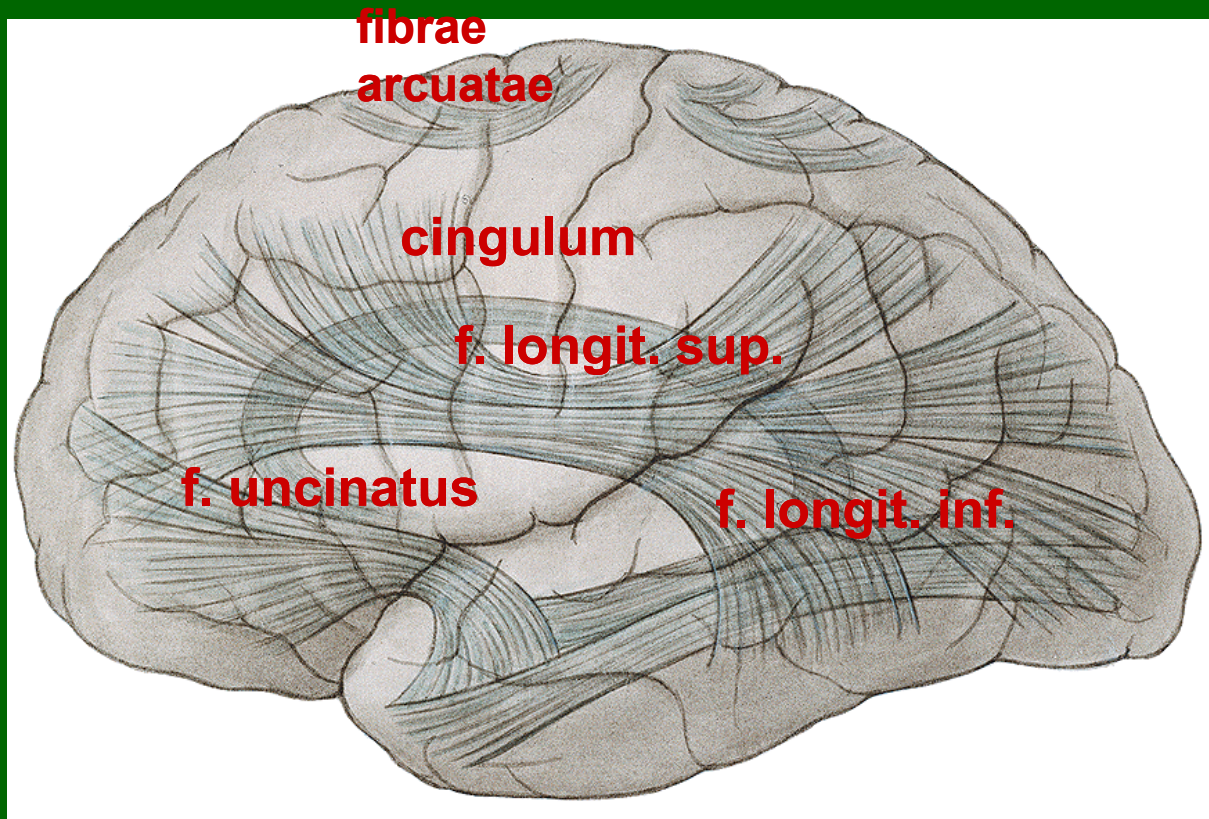
crus post.

p,o,t
-po

radiatio
optica

radiatio
acustica

Association fibers: short (fibrae arcuatae), long (fasciculus longitudinalis sup. et inf., fasciculus occipitofrontalis sup., fasciculi occipitales verticales, fasciculus uncinatus, cingulum)



- Illustrations were copied from:
- **Atlas der Anatomie des Menschen/
Sobotta. Putz,R., und Pabst,R. 20.
Auflage. München: Urban &
Schwarzenberg, 1993**
- **Netter: Interactive Atlas of Human
Anatomy. Windows Version 2.0**