روانشناسی فیزیولوژیک و نوروپسیکولوژی(جلسه اول)

کلیاتی پیرامون بنیان زیستی رفتار و افکار، روانشناسی فیزیولوژیک و نوروپسیکولوژی

PRINCIPLE:
There are biological correlates of behavior

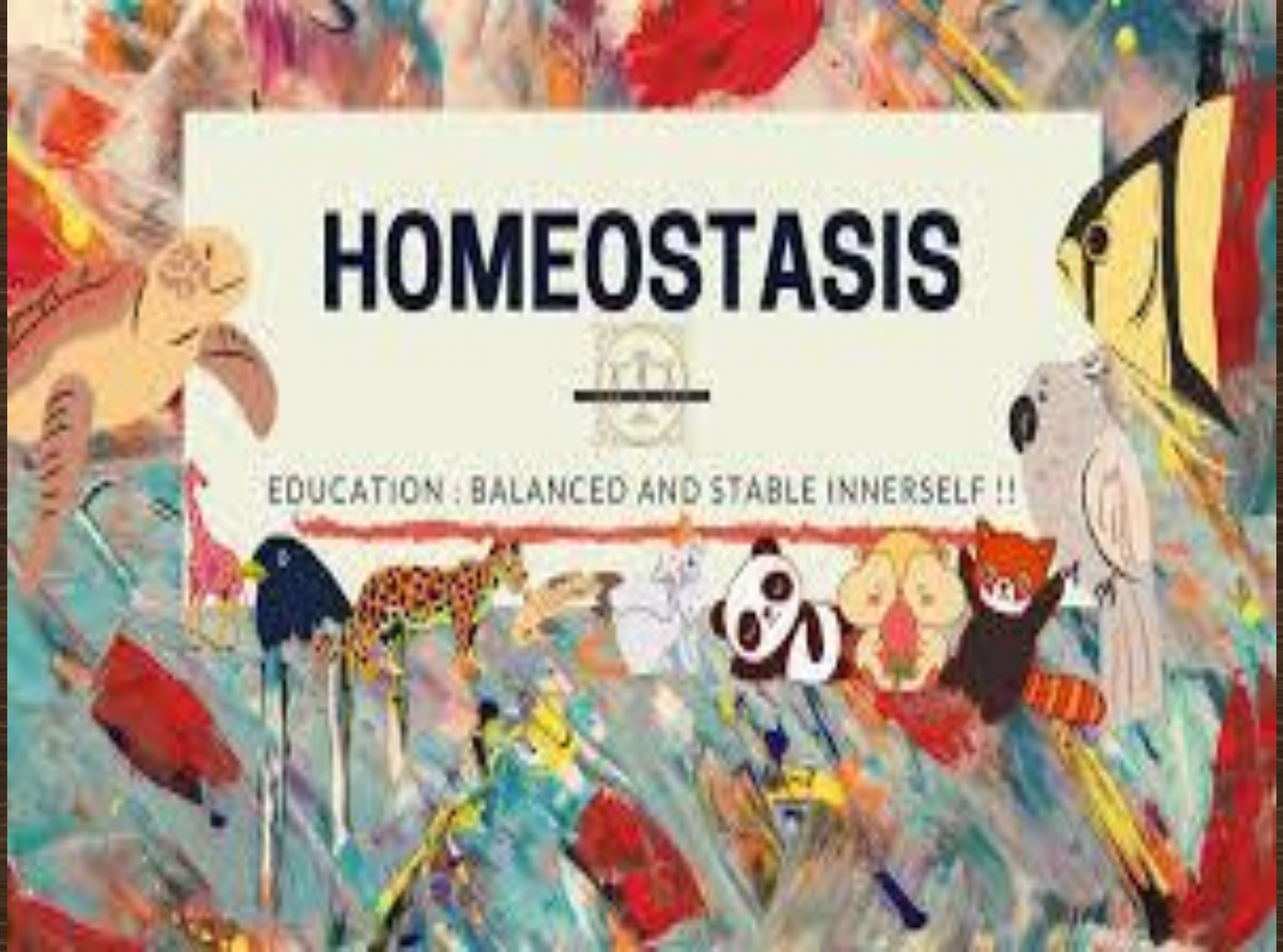
Physiological Psychology

Morgan (1943), p. 1

"[P]hysiological psychology… [is] the study of the relation between the organism's physiological processes and its behavior; or, since behavior is the outcome of physiological events, we may say that physiological psychology is the study of the *physiological mechanisms of behavior*."

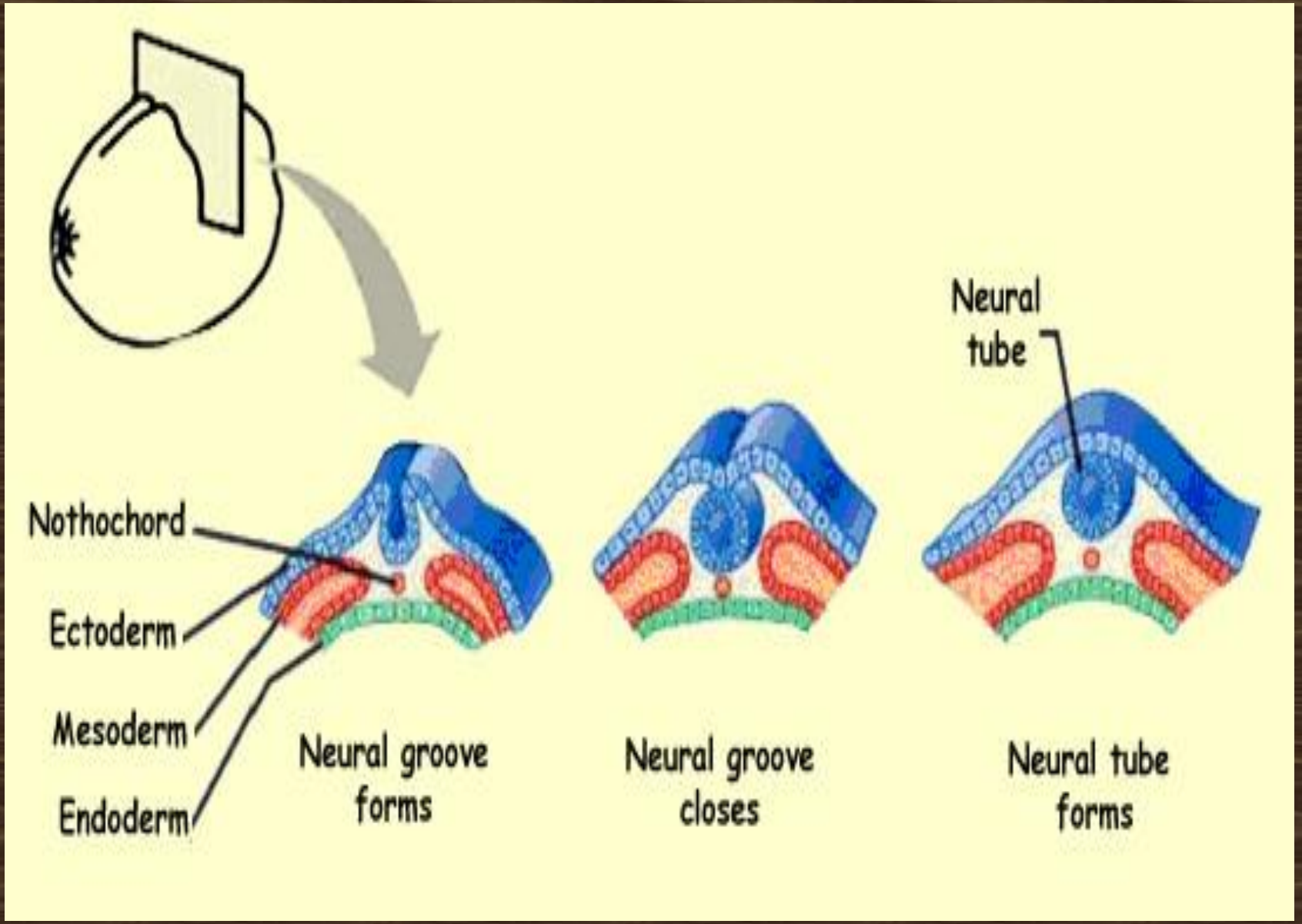
Definition

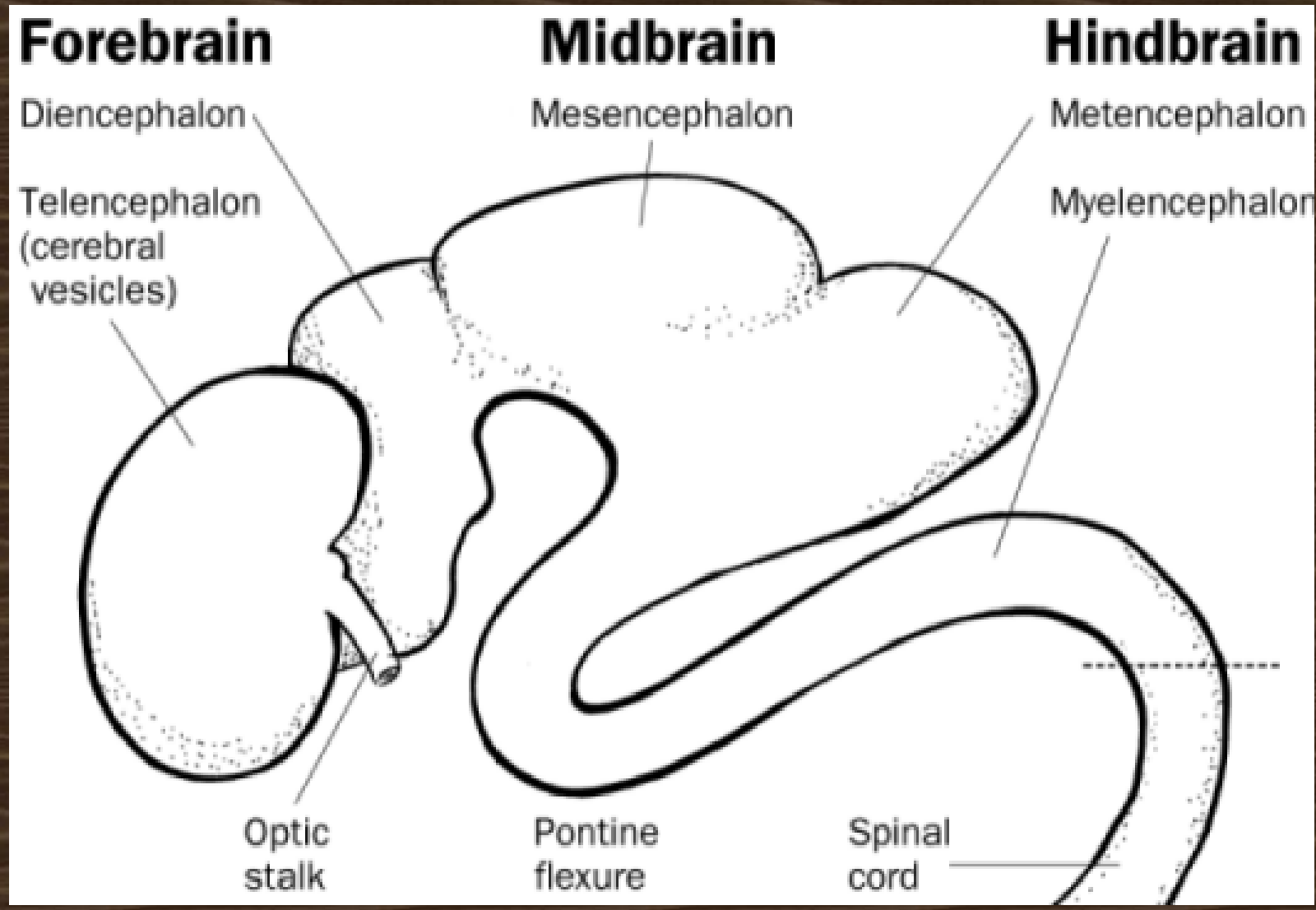
- The study of the relation between brain function & behavior.
- Deals with the understanding, assessment, & treatment of behaviors directly related to the functioning of the brain

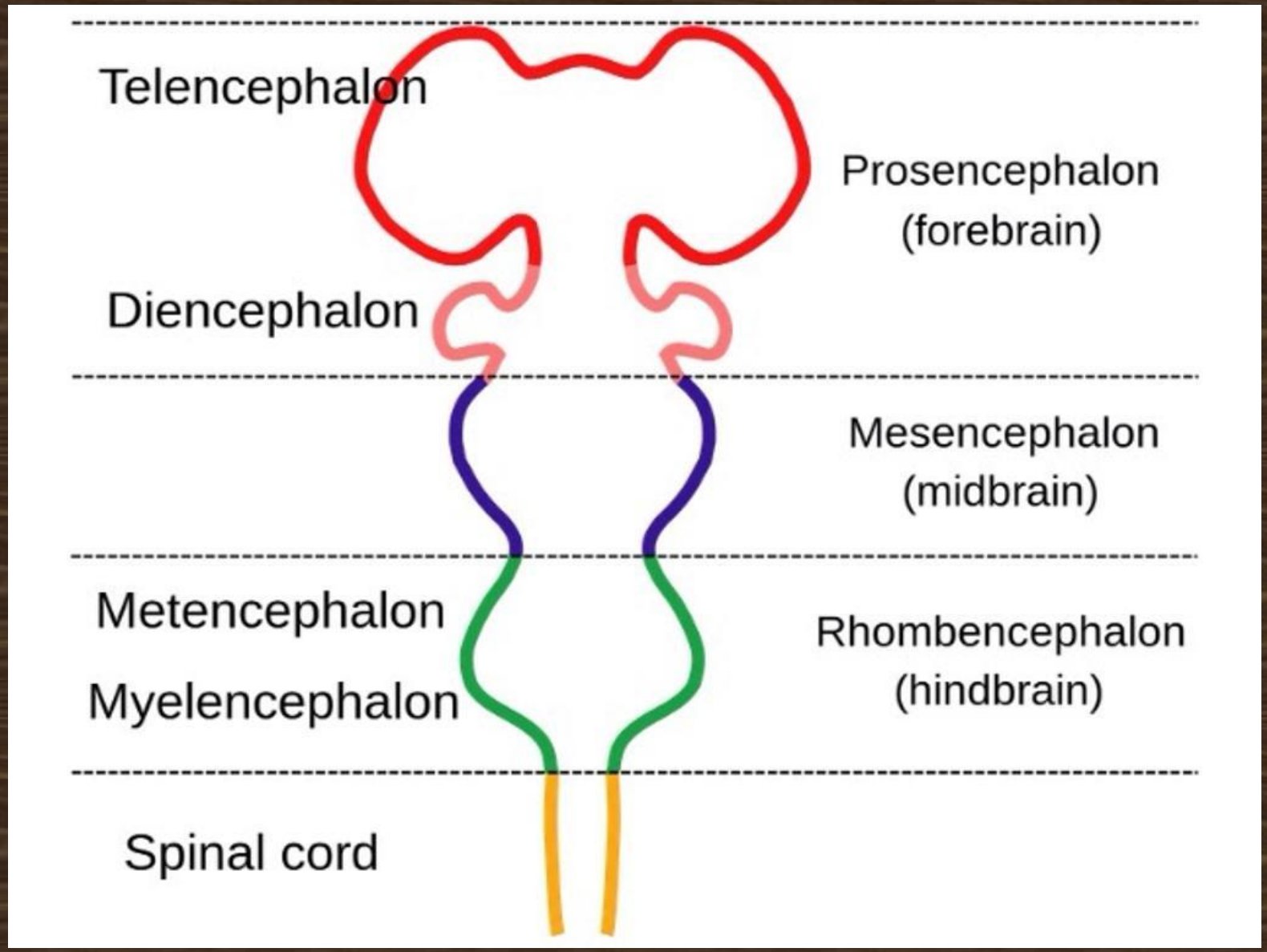

HOMEOSTASIS
EDUCATION : BALANCED AND STABLE INNERSELF !!

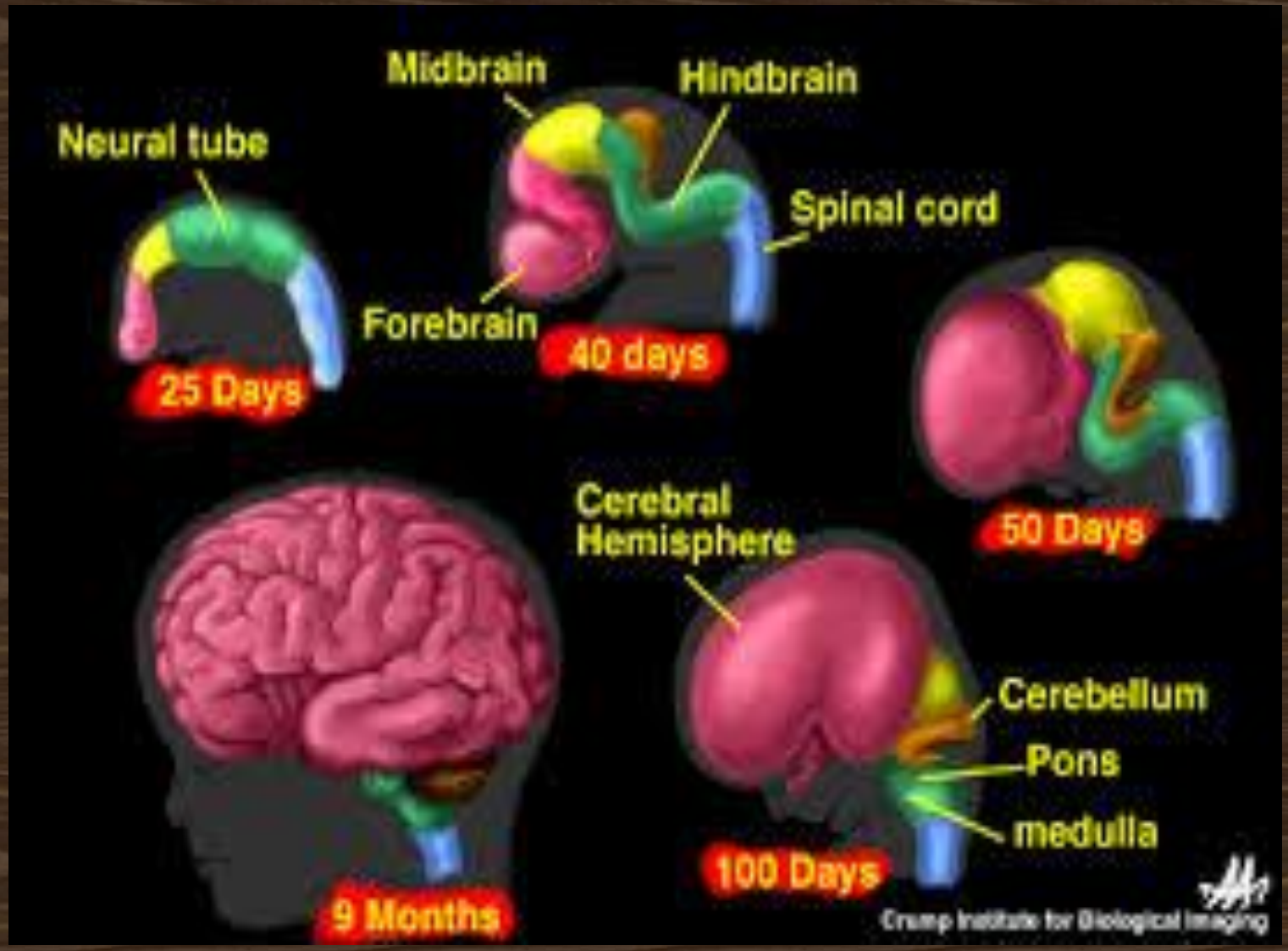
روانشناسی فیزیولوژیک و نوروپسیکولوژی(جلسه دوم)

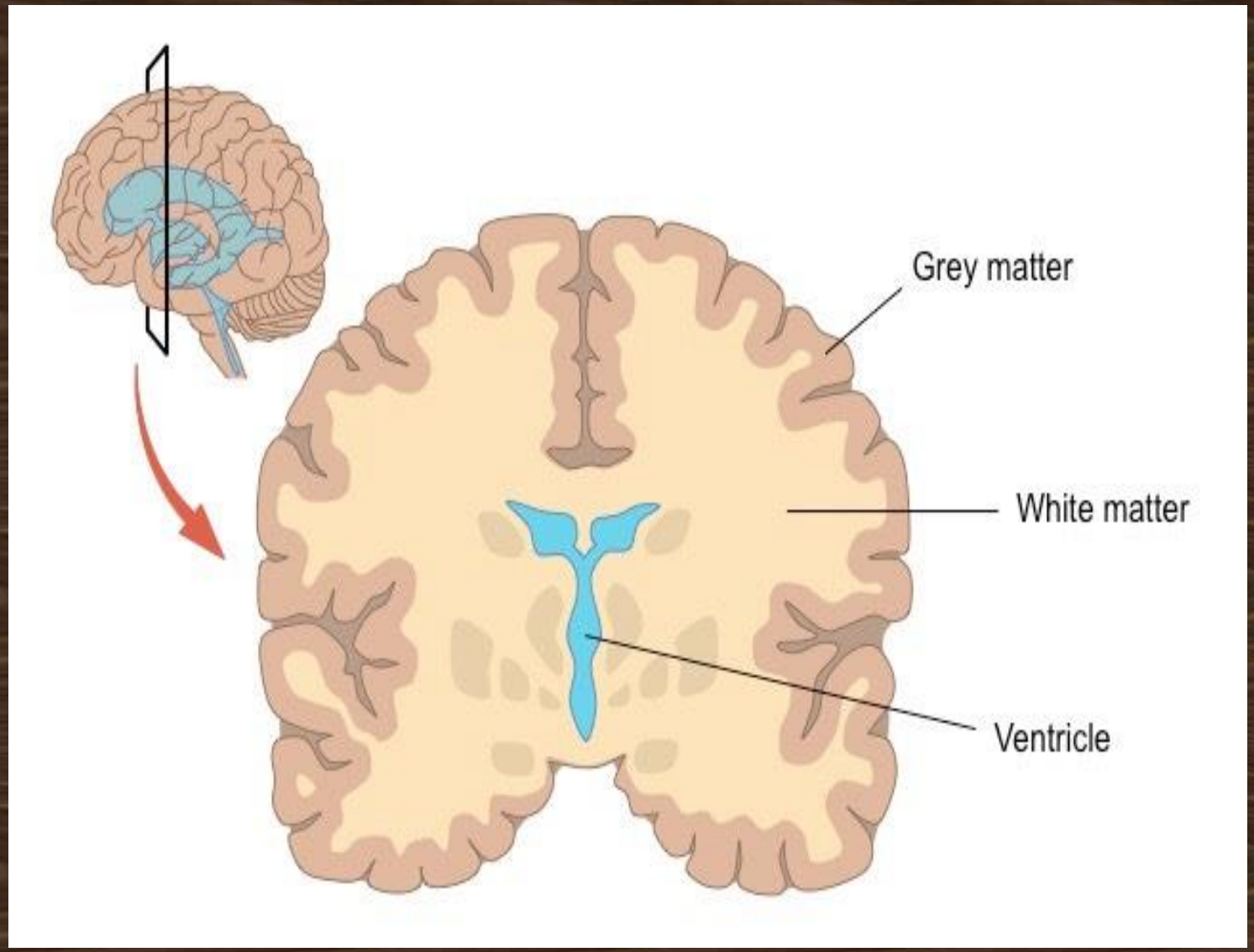
مروری بر تکامل جنینی مغز
و
تشریح میکروسکوپیک و ماکروسکوپیک آن(قسمت اول)

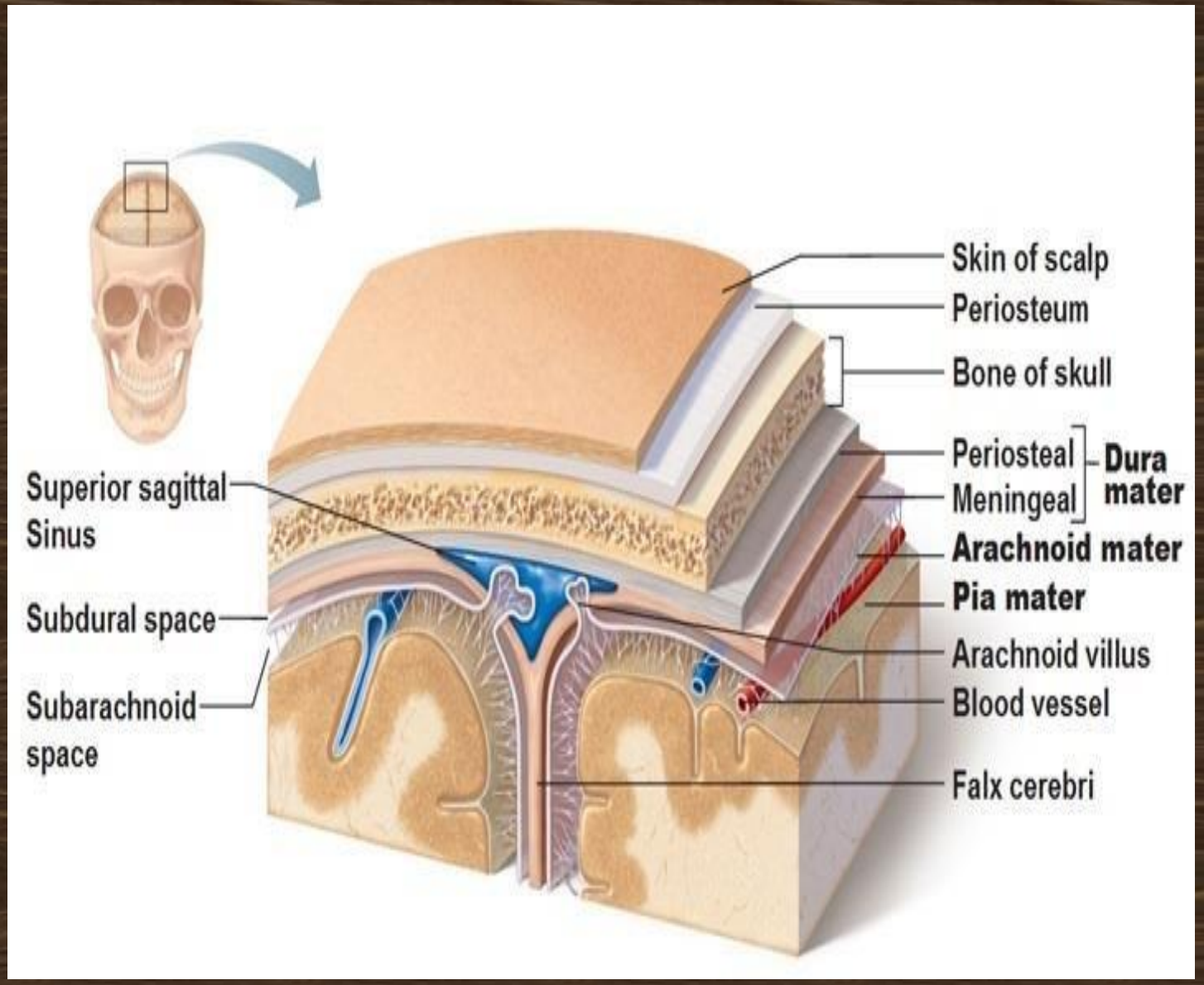

Neural tube
Nothochord
Ectoderm
Mesoderm
Endoderm
Neural groove forms
Neural groove closes
Neural tube forms

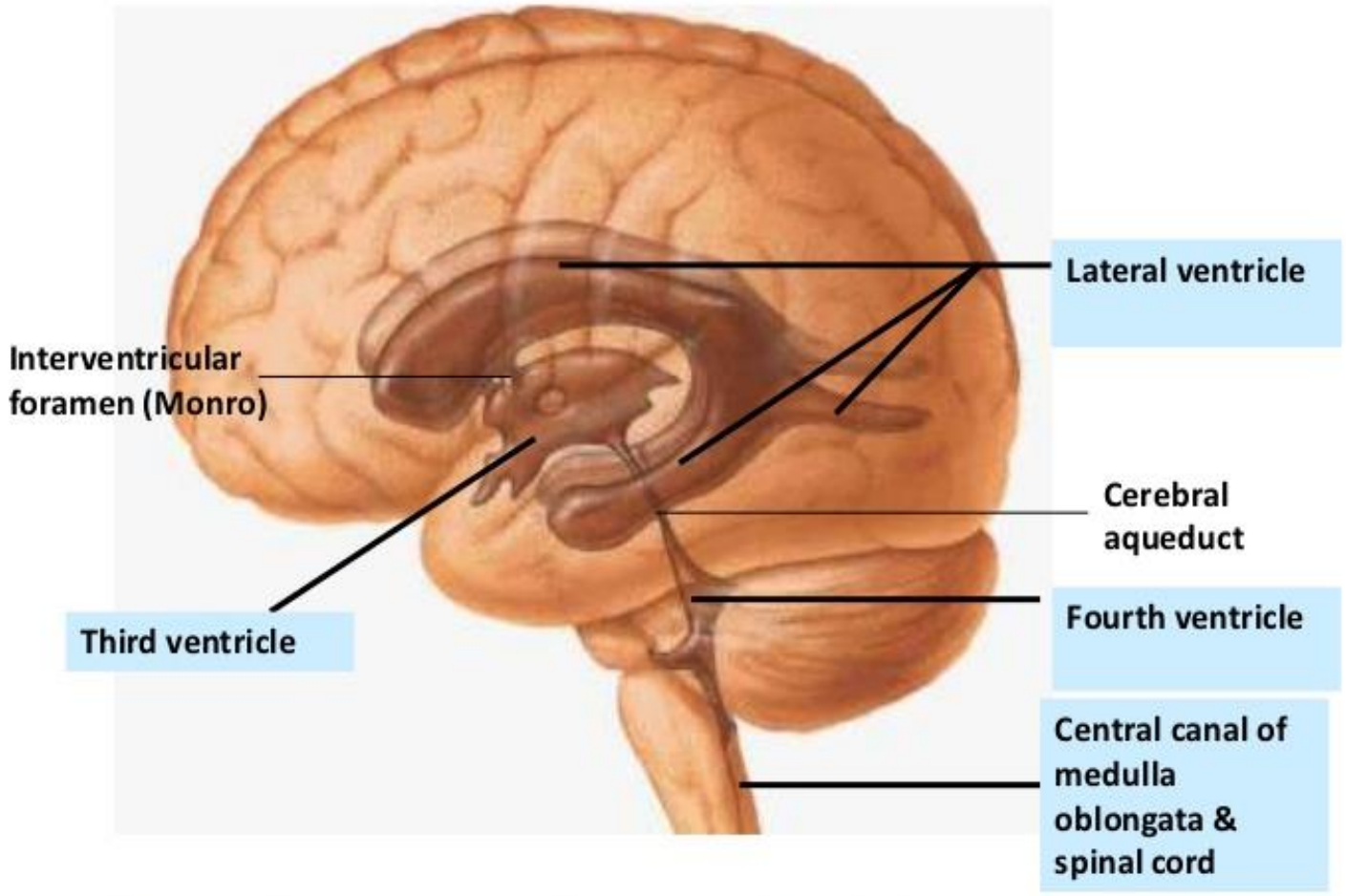

Forebrain
Midbrain
Hindbrain
Diencephalon
Mesencephalon
Metencephalon
Telencephalon (cerebral vesicles)
Myelencephalon
Optic stalk
Pontine flexure
Spinal cord


Telencephalon
Diencephalon
Prosencephalon
(forebrain)
Mesencephalon
(midbrain)
Metencephalon
Myelencephalon
Rhombencephalon
(hindbrain)
Spinal cord

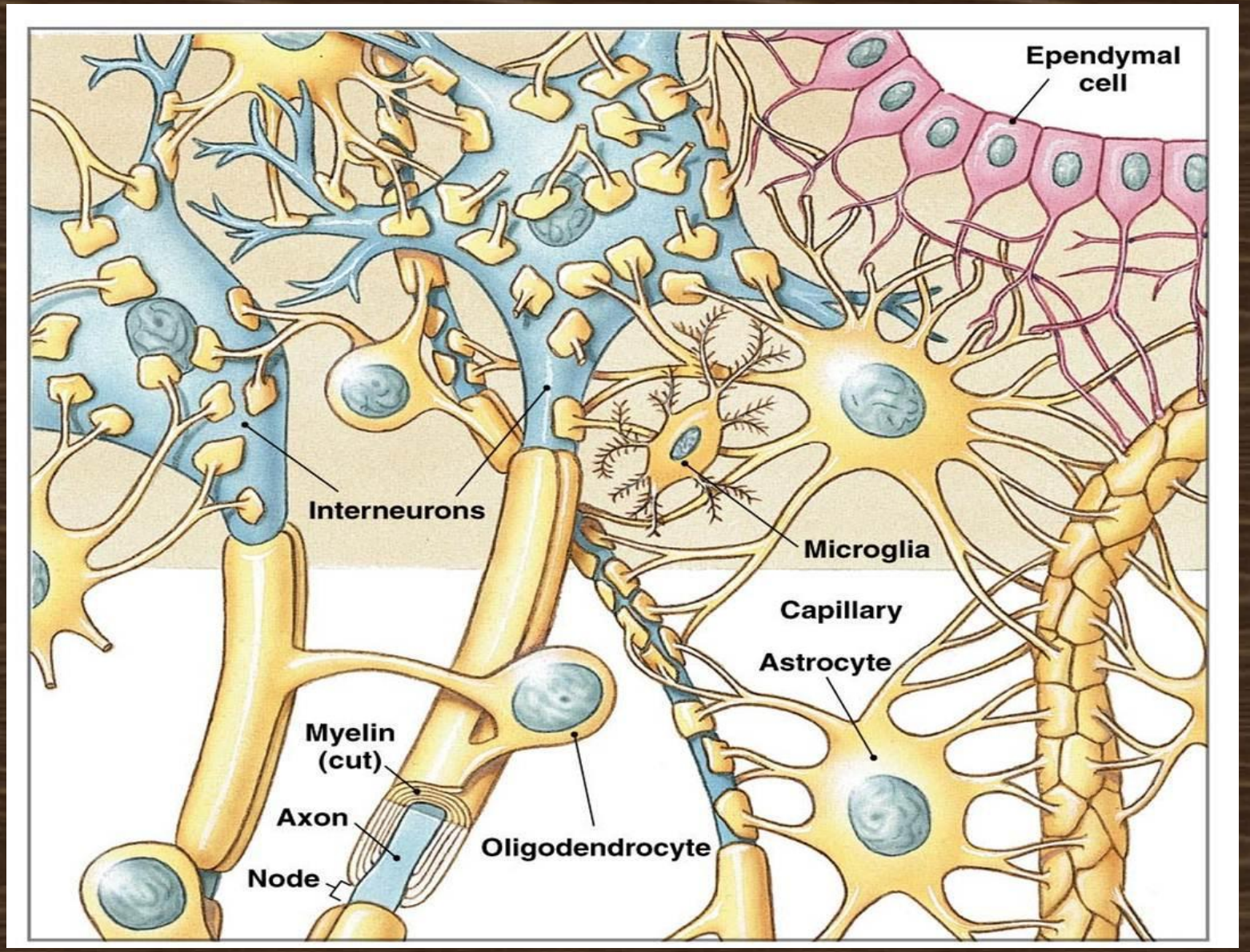

Midbrain
Hindbrain
Neural tube
Spinal cord
Forebrain
40 days
25 Days
50 Days
Cerebral Hemisphere
Cerebellum
Pons
medulla
100 Days
9 Months
Crump Institute for Biological Imaging


Grey matter
White matter
Ventricle


Skin of scalp
Periosteum
Bone of skull
Periosteal
Meningeal
Dura mater
Arachnoid mater
Pia mater
Arachnoid villus
Blood vessel
Falx cerebri
Superior sagittal Sinus
Subdural space
Subarachnoid space



Lateral view to show the ventricular system of the CNS


Ependymal cell
Interneurons
Microglia
Capillary
Astrocyte
Myelin (cut)
Axon
Node
Oligodendrocyte

روانشناسی فیزیولوژیک و نوروپسیکولوژی(جلسه سوم)

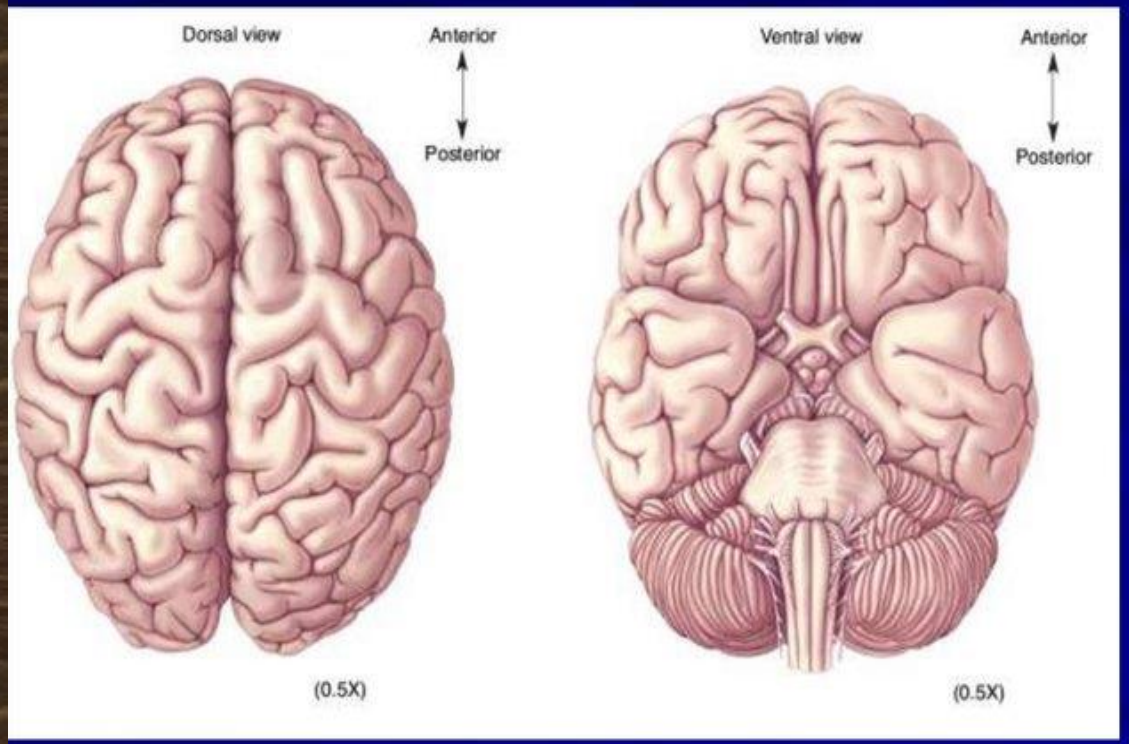
مروری بر تکامل جنینی مغز

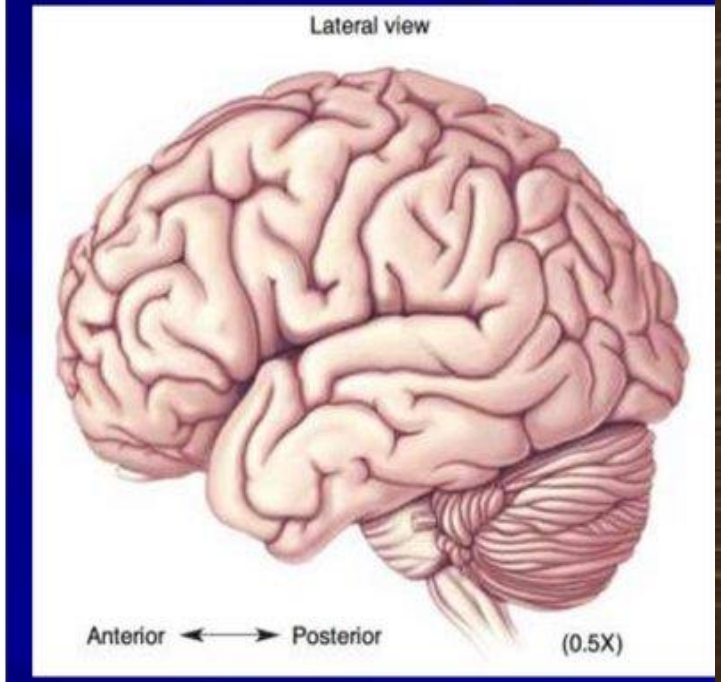
و

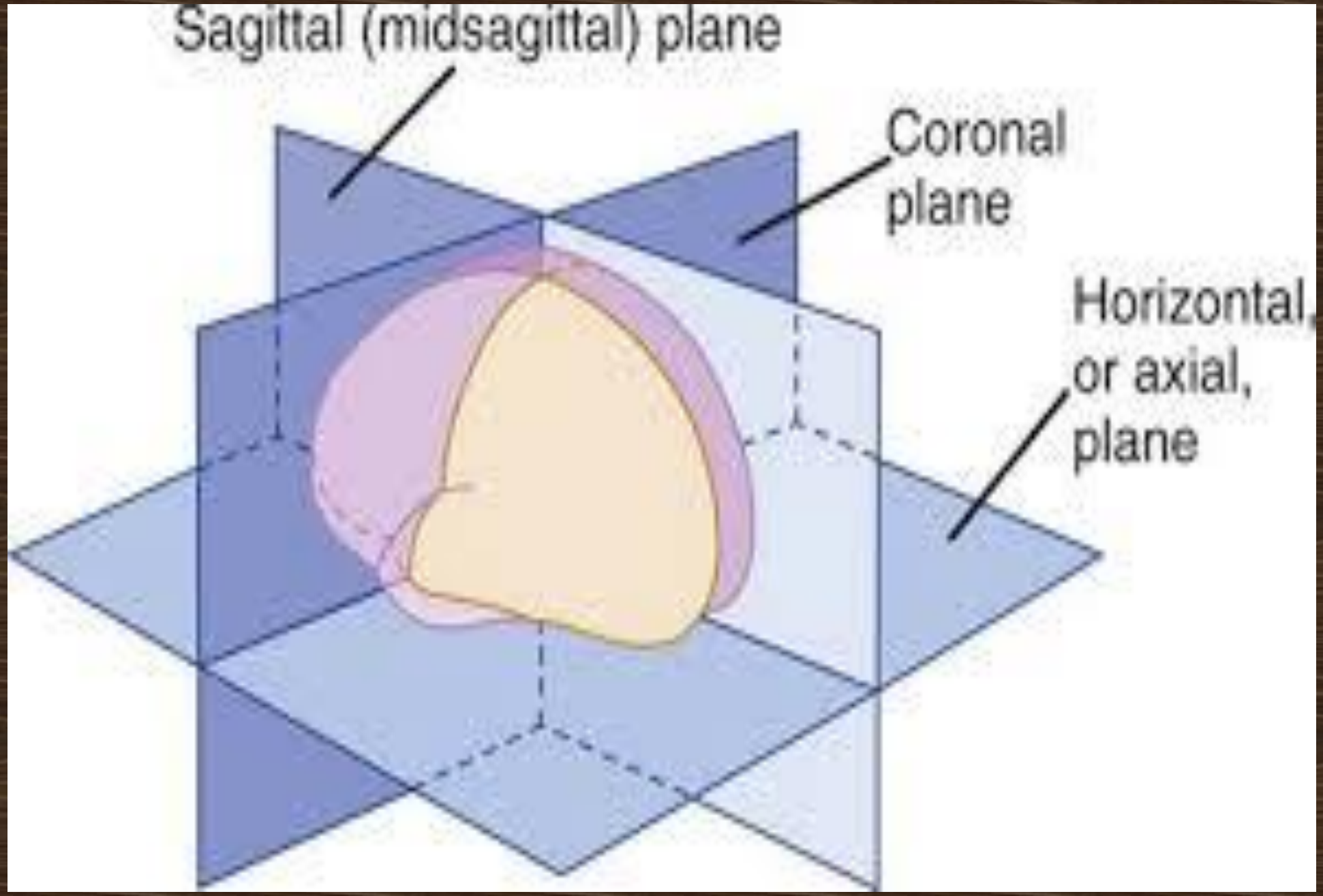
تشریح میکروسکوپیک و ماکروسکوپیک آن(قسمت دوم)

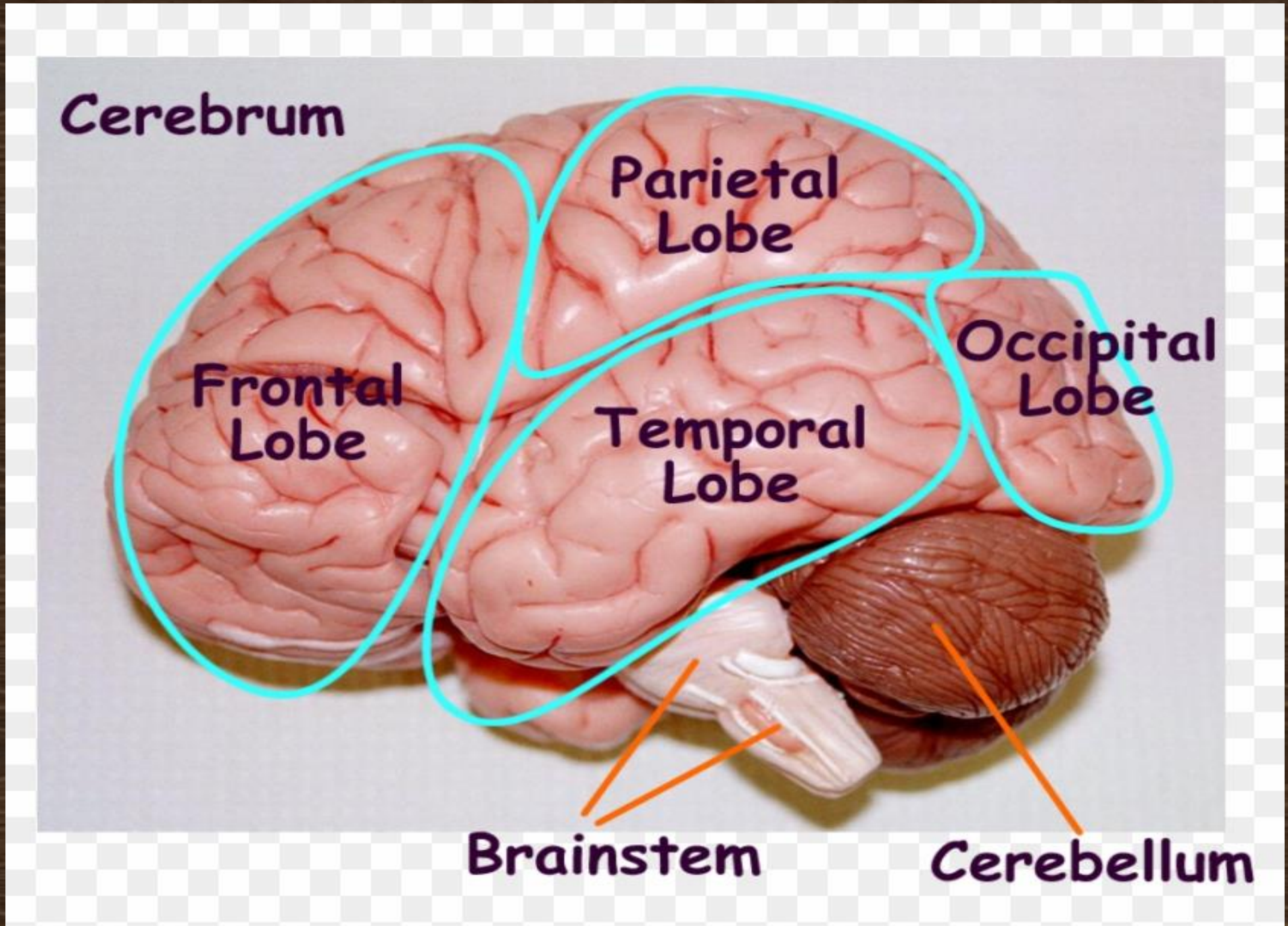
Anatomy of the human brain

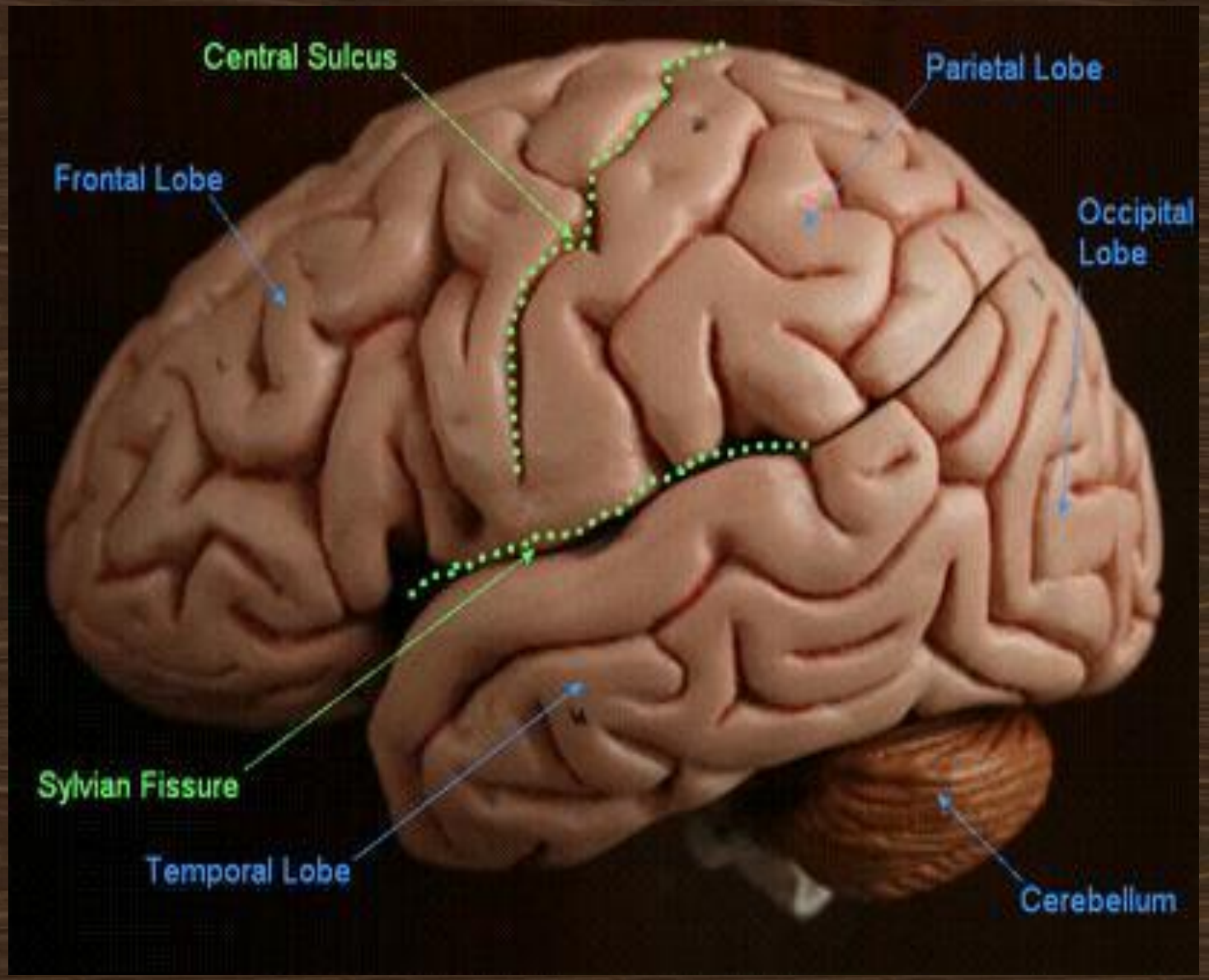
- Surface anatomy of the brain

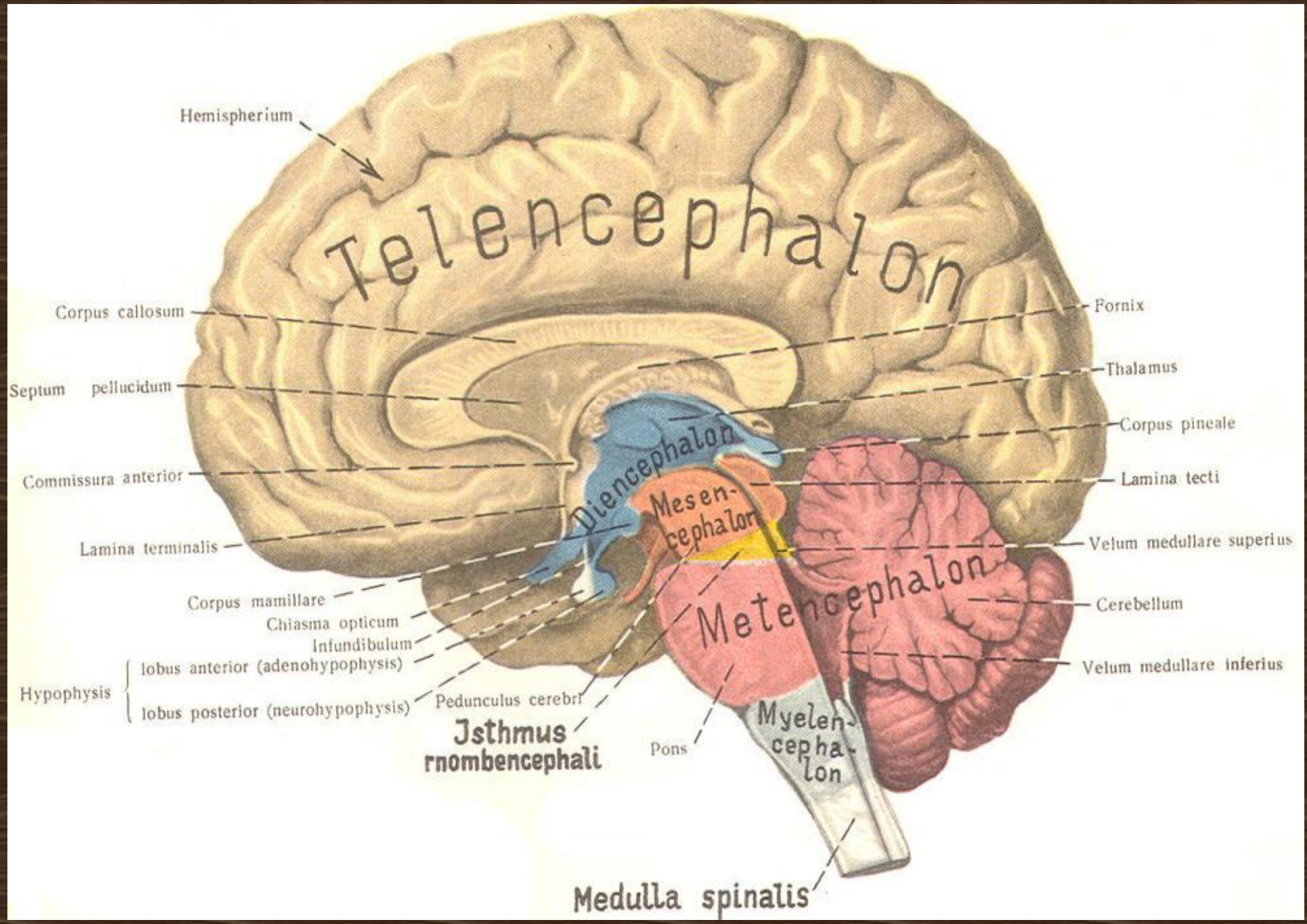




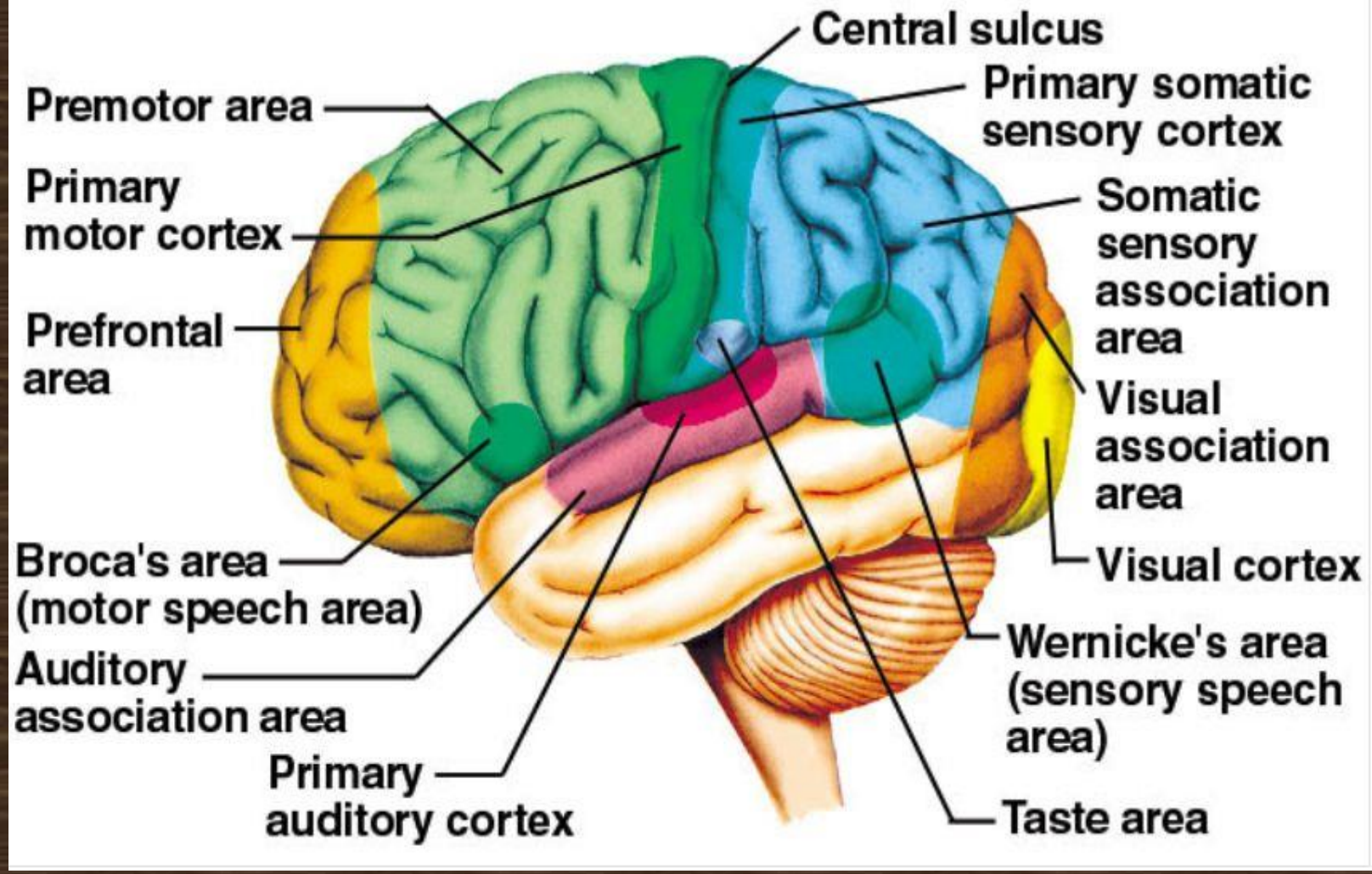

Sagittal (midsagittal) plane
Coronal plane
Horizontal, or axial, plane

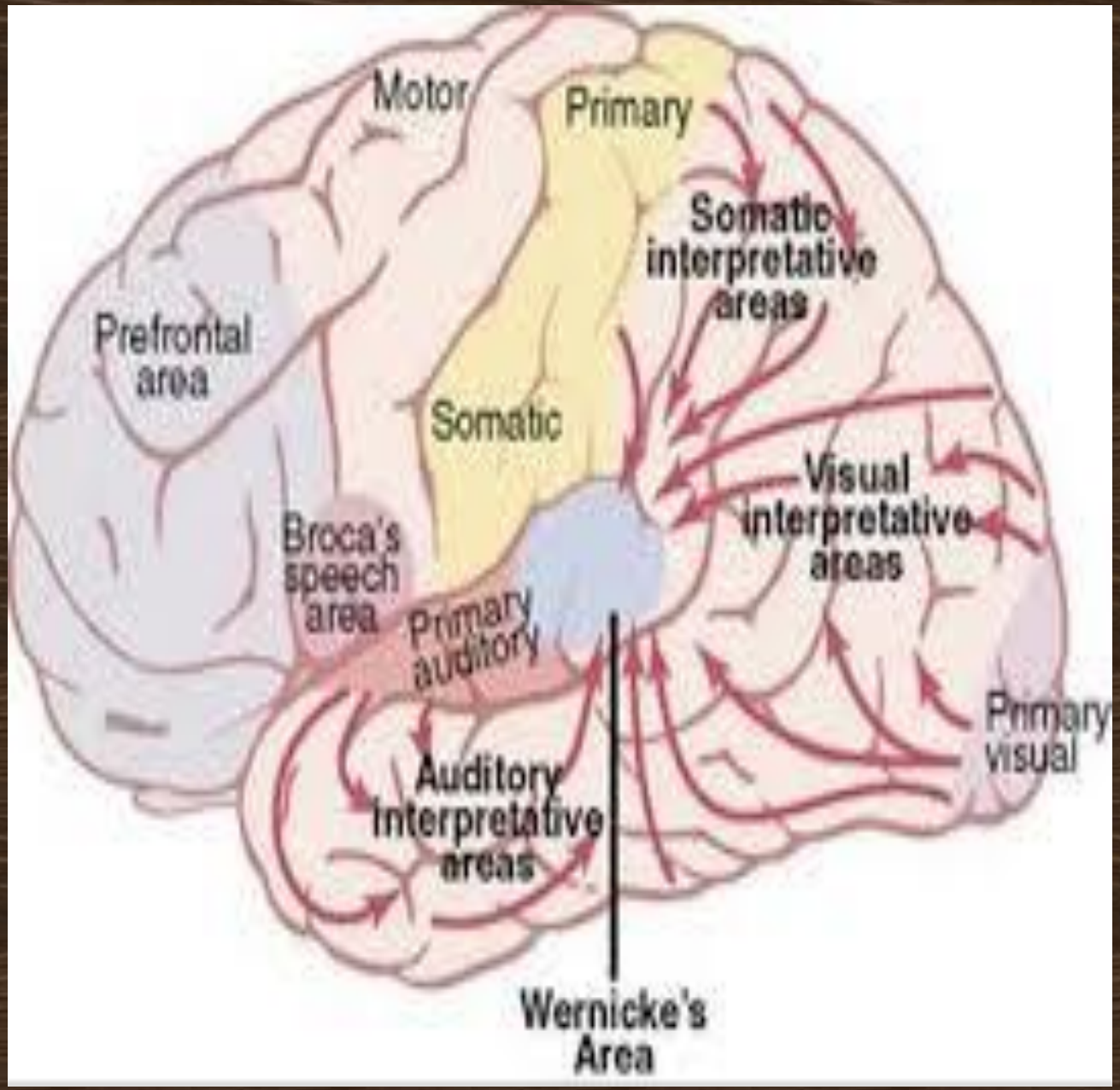

Cerebrum
Parietal Lobe
Occipital Lobe
Frontal Lobe
Temporal Lobe
Brainstem
Cerebellum

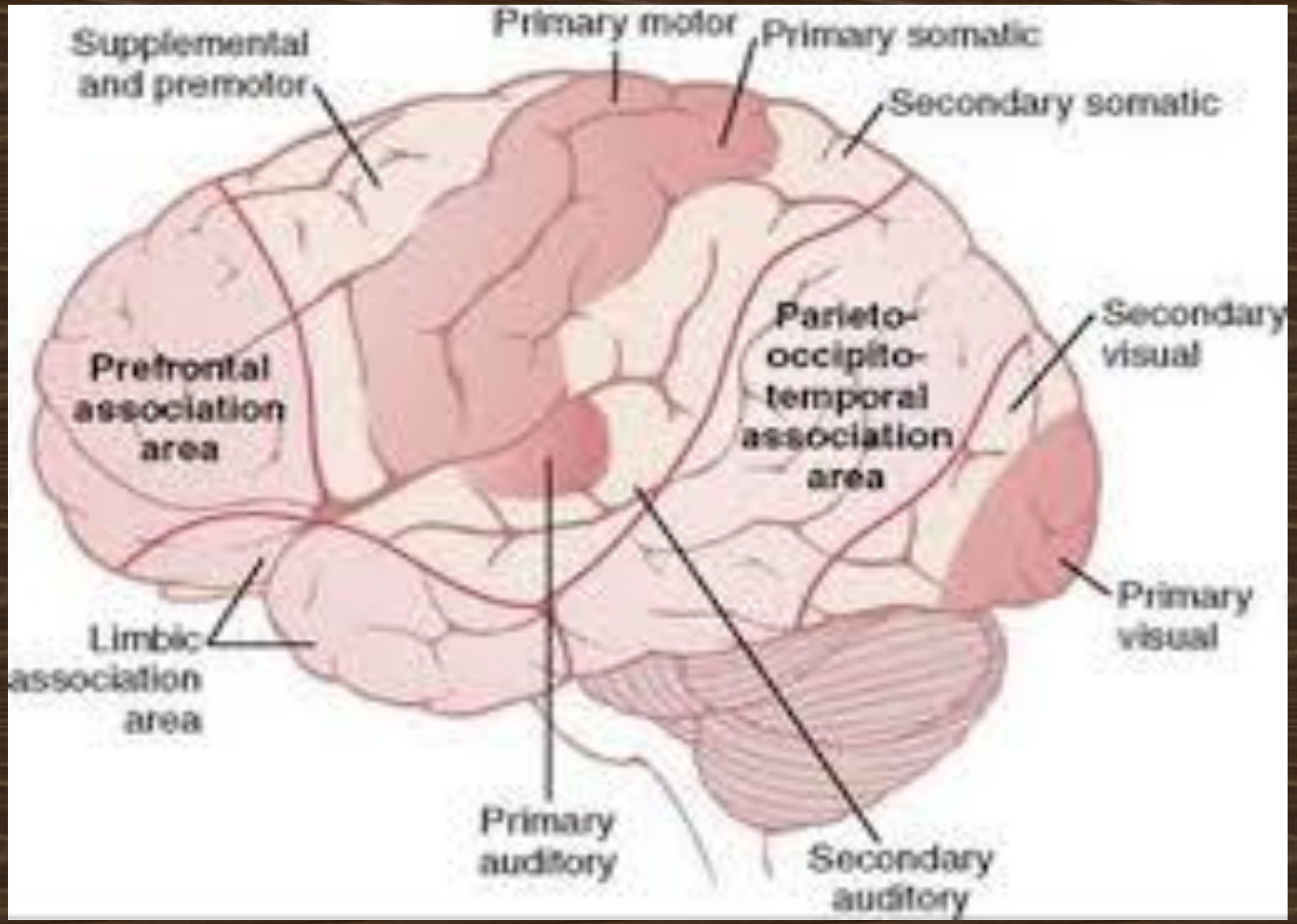

Central Sulcus
Parietal Lobe
Frontal Lobe
Occipital Lobe
Sylvian Fissure
Temporal Lobe
Cerebellum

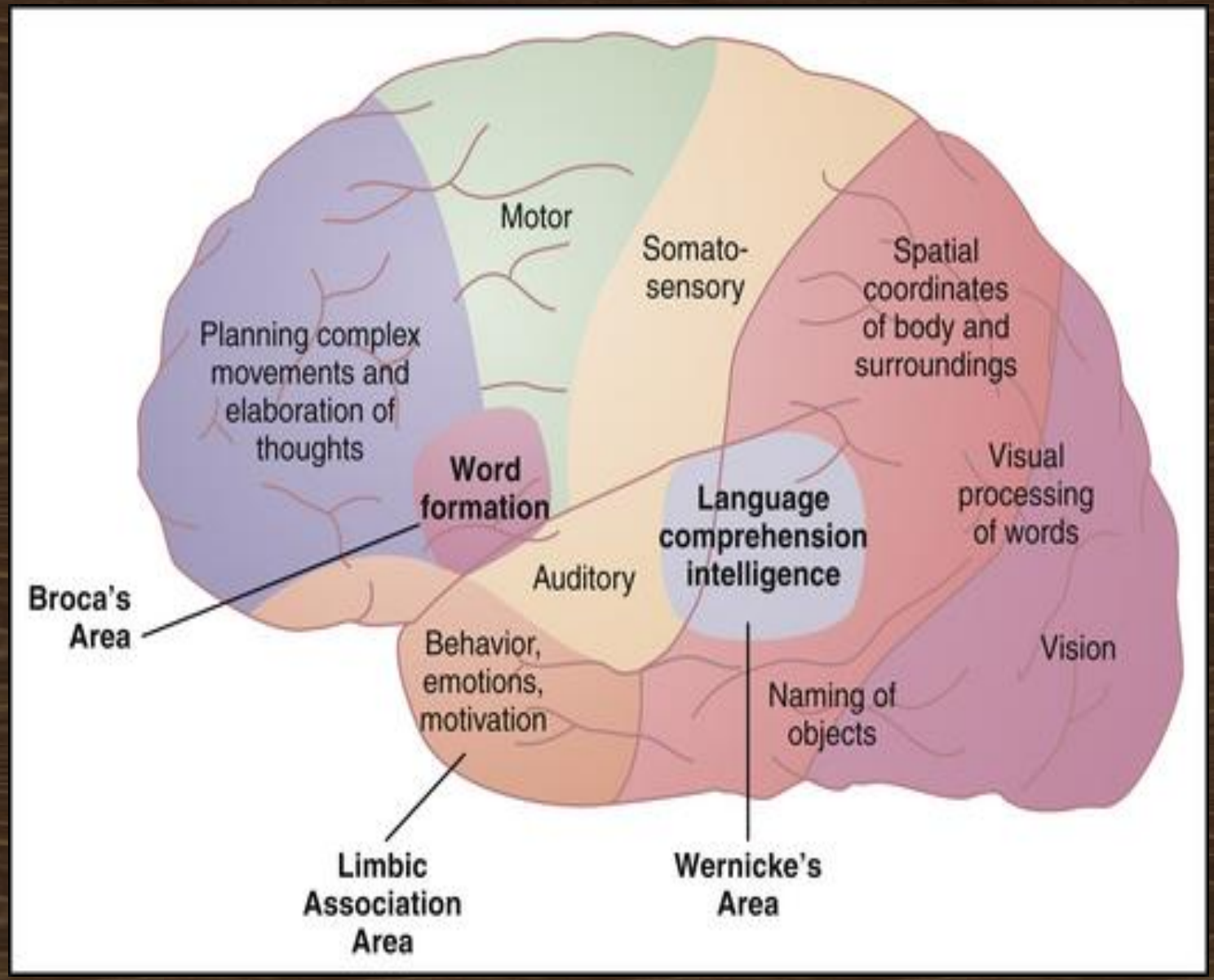

Hemispherium
Telencephalon
Corpus callosum
Septum pellucidum
Commissura anterior
Lamina terminalis
Corpus mamillare
Chiasma opticum
Infundibulum
Hypophysis
lobus anterior (adenohypophysis)
lobus posterior (neurohypophysis)
Pedunculus cerebri
Isthmus rhombencephali
Diencephalon
Mesencephalon
Metencephalon
Myelencephalon
Pons
Medulla spinalis
Fornix
Thalamus
Corpus pineale
Lamina tecti
Velum medullare superius
Cerebellum
Velum medullare inferius

Some Functional Areas of the Lateral Side of the Left Cerebral Cortex

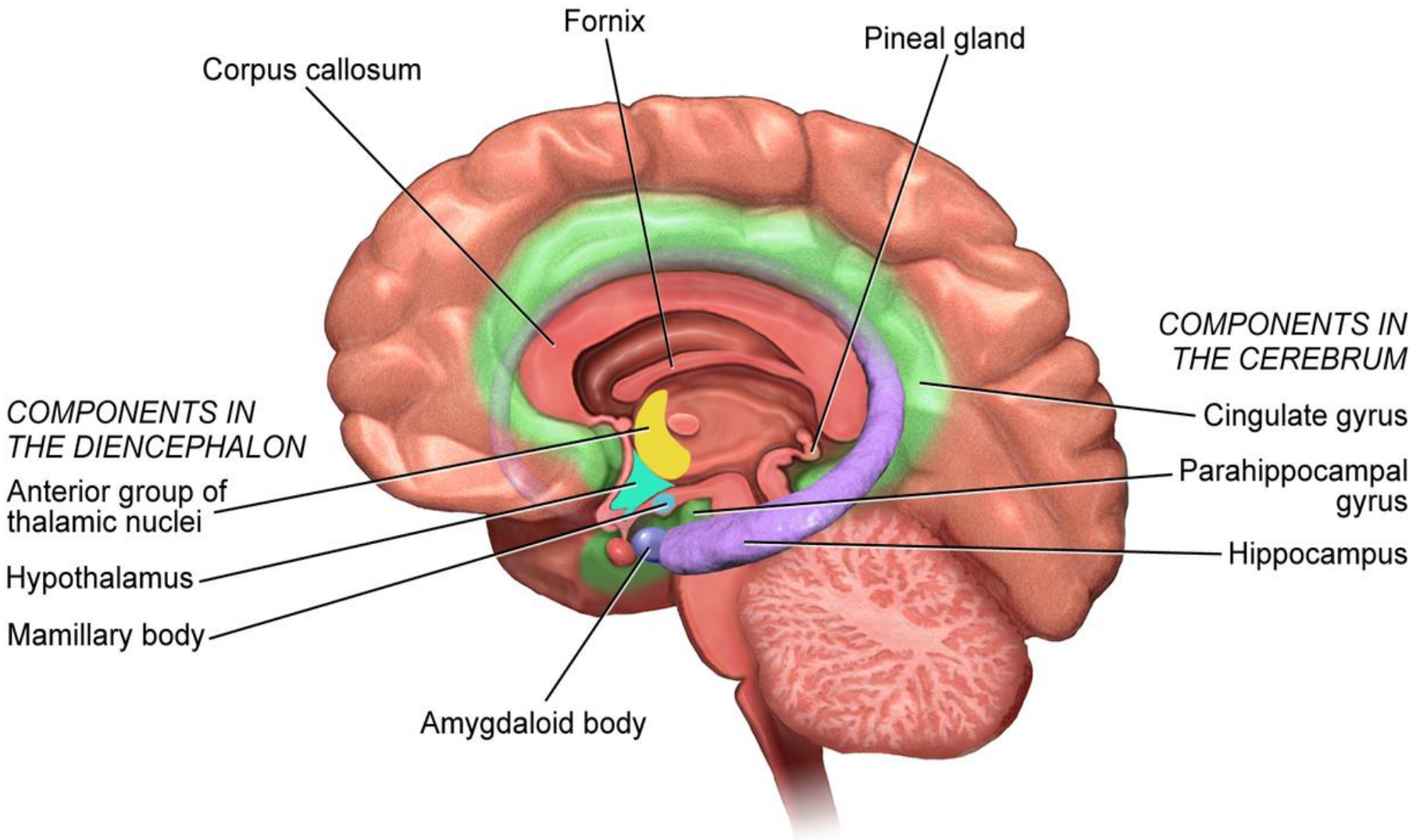



Motor
Primary
Somatic interpretative areas
Prefrontal area
Somatic
Visual interpretative areas
Broca's speech area
Primary auditory
Primary visual
Auditory interpretative areas
Wernicke's Area


Supplemental and premotor
Primary motor
Primary somatic
Secondary somatic
Prefrontal association area
Parieto-occipito-temporal association area
Secondary visual
Primary visual
Limbic association area
Primary auditory
Secondary auditory


Motor
Somato-
sensory
Spatial
coordinates
of body and
surroundings
Planning complex
movements and
elaboration of
thoughts
Word
formation
Language
comprehension
intelligence
Visual
processing
of words
Broca's
Area
Auditory
Behavior,
emotions,
motivation
Vision
Naming of
objects
Limbic
Association
Area
Wernicke's
Area

The Limbic System

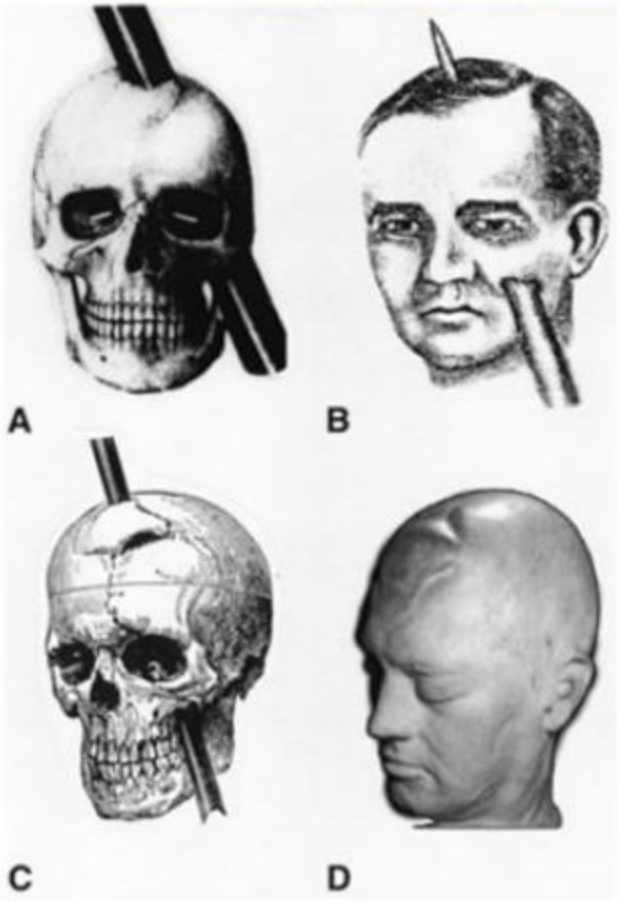


روانشناسی فیزیولوژیک و نوروپسیکولوژی(جلسه چهارم)

روش های مطالعات نوروپسیکولوژیکی

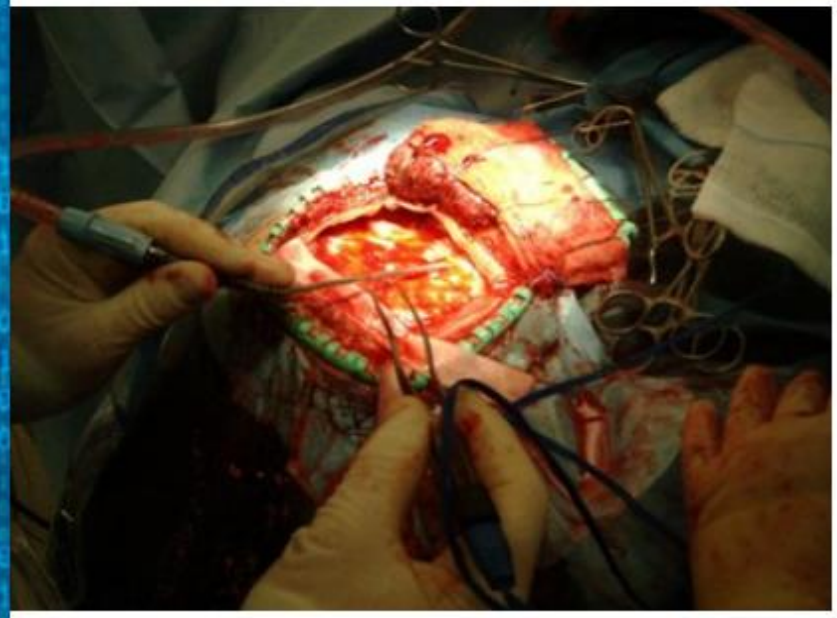
Methods and Tools for Studying the Brain

Ways to study the Brain!!!



- Accidents : damage to brain regions can tell us about their functions
- Phineas Gage.

Lesions: tissue destruction



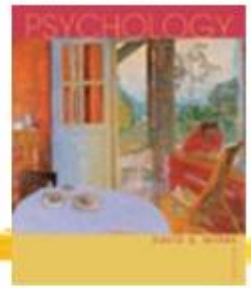
Cutting into the brain and looking for change.

Brain tumors also lesion brain tissue.

Less Invasive ways to study the Brain

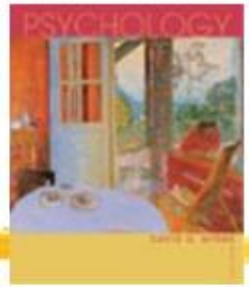
- Electroencephalogram (EEG)
- Computerized Axial Tomography (CAT)
- Positron Emission Tomography (PET)
- Magnetic Resonance Imaging (MRI)
- Functional MRI

Electroencephalogram (EEG)



- Electrodes placed on the scalp create an amplified recording of the waves of electrical activity that sweep across the brain's surface

CT scan



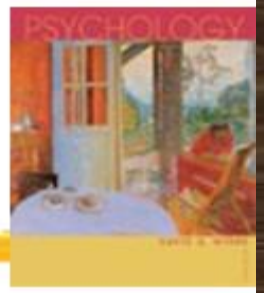
- CT (computed tomography) Scan
  - a series of x-ray photographs taken from different angles and combined by computer into a composite representation of a slice through the body; also called CAT scan

During a computerized tomography (CT) scan, a thin X-ray beam rotates around an area of the body, generating a 3-D image of the internal structures

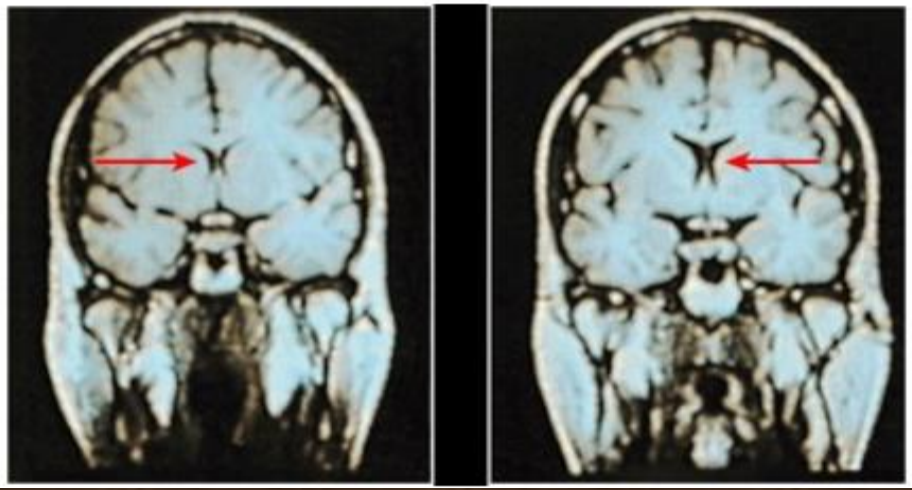
PET Scan

- PET (positron emission tomography) Scan
  - a visual display of brain activity that detects where a radioactive form of glucose goes while the brain performs a given task

MRI Scan



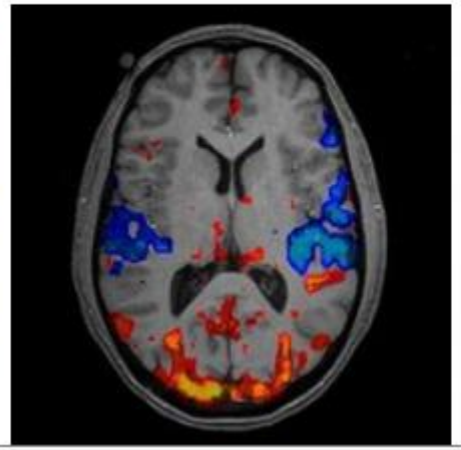
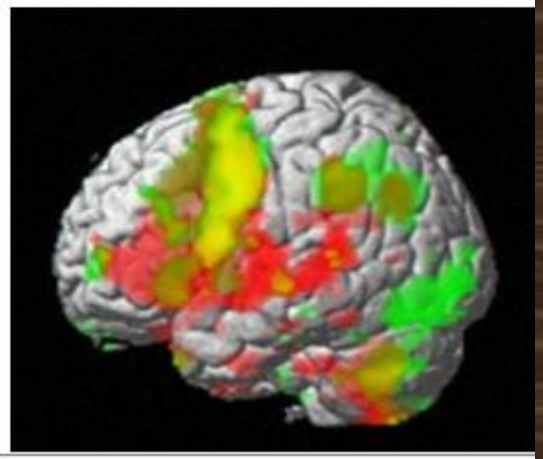
- MRI (magnetic resonance imaging)
  - a technique that uses magnetic fields and radio waves to produce computer-generated images that distinguish among different types of soft tissue; allows us to see structures within the brain



MRI scan of a healthy individual (left) and a person with schizophrenia (right) Note the enlarged fluid - filled brain region in the image on the right.

fMRI Scan

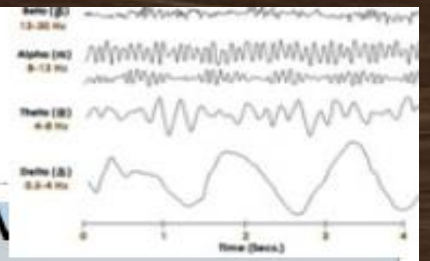
- Functional MRI
- Reveals blood flow, and therefore, brain activity by comparing successive MRI scans.
- "Reading Your Mind" – 60 Minutes

Microelectrode Techniques

- Very small electrodes inserted into individual neurons
- Used to study activity of a single neuron

Macroelectrode Techniques



- Used to get a picture of overall activ brain
- EEG (Electroencephalogram) uses electrodes placed on a person's scalp to measure an amplified recording of the electrical waves sweeping across the brain's surface.
  - Non-invasive

ical activity on surfac
tion than structure

TMS (Transcranial Magnetic Stimulation)

- Applies strong and quickly changing magnetic fields to enhance or interrupt brain function
  - Can infer causation
  - Depression
  - Auditory hallucinations