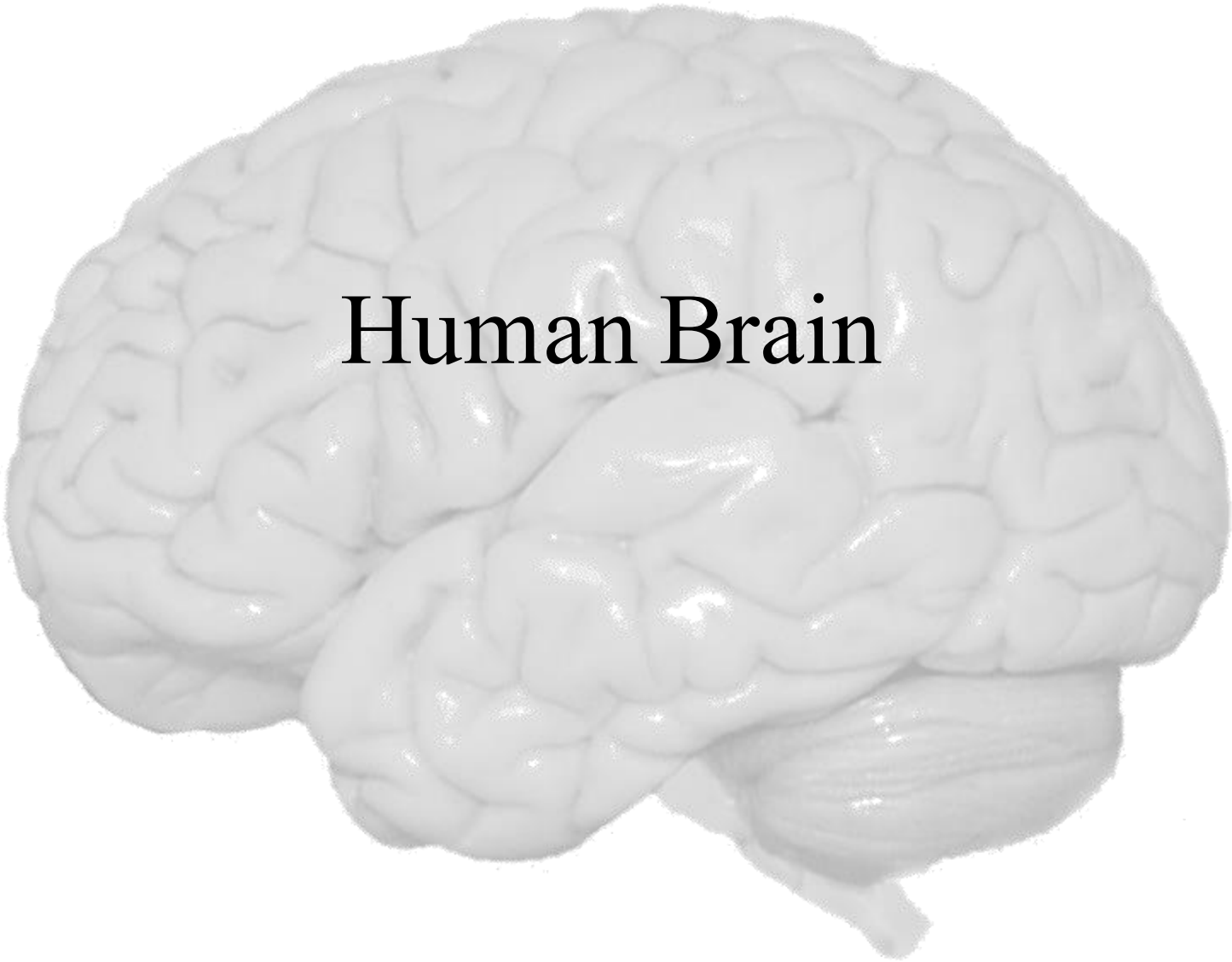
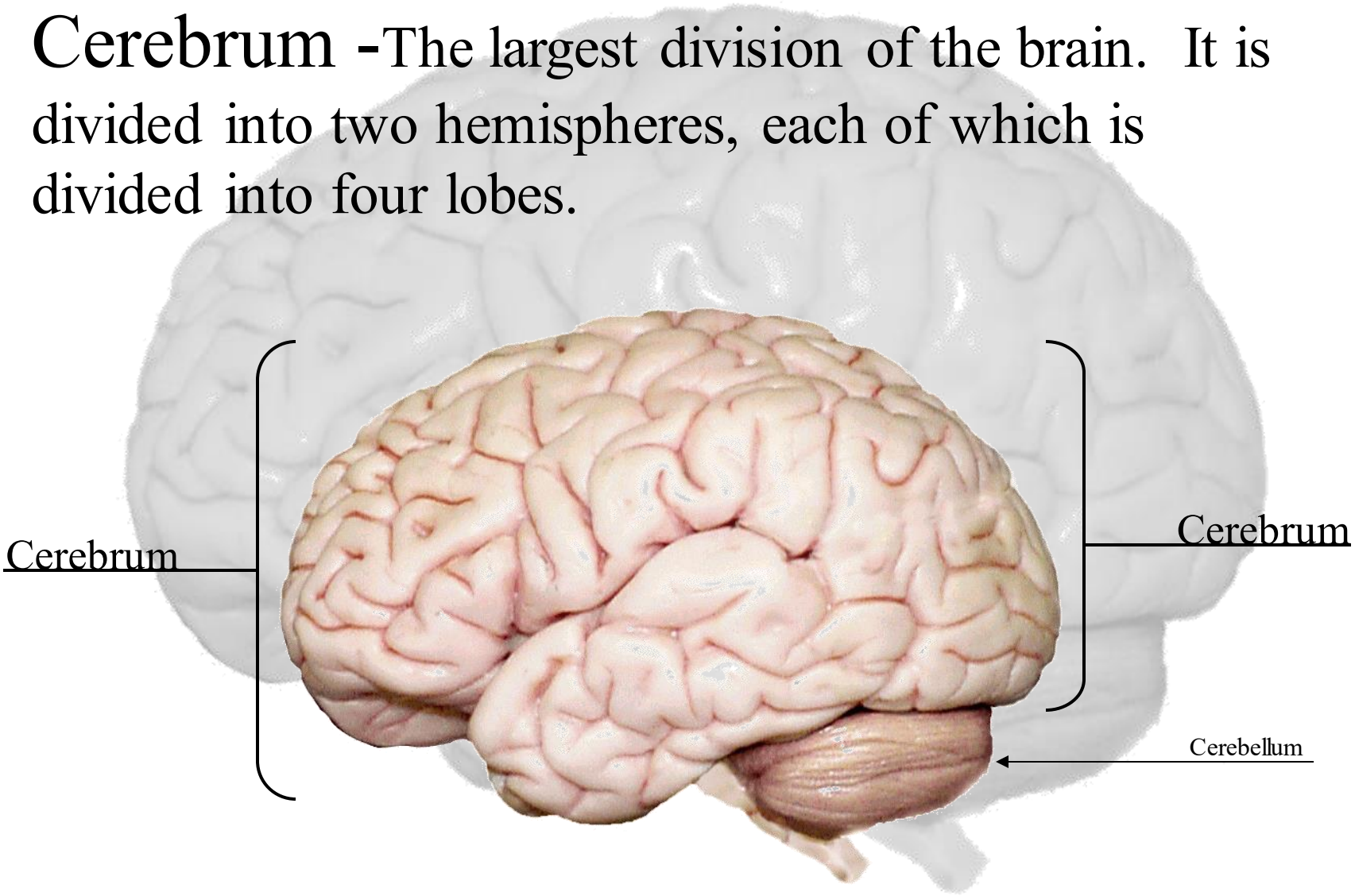

Human Brain

Objectives:

- To describe the general structure of the Cerebrum and Cerebral Cortex.

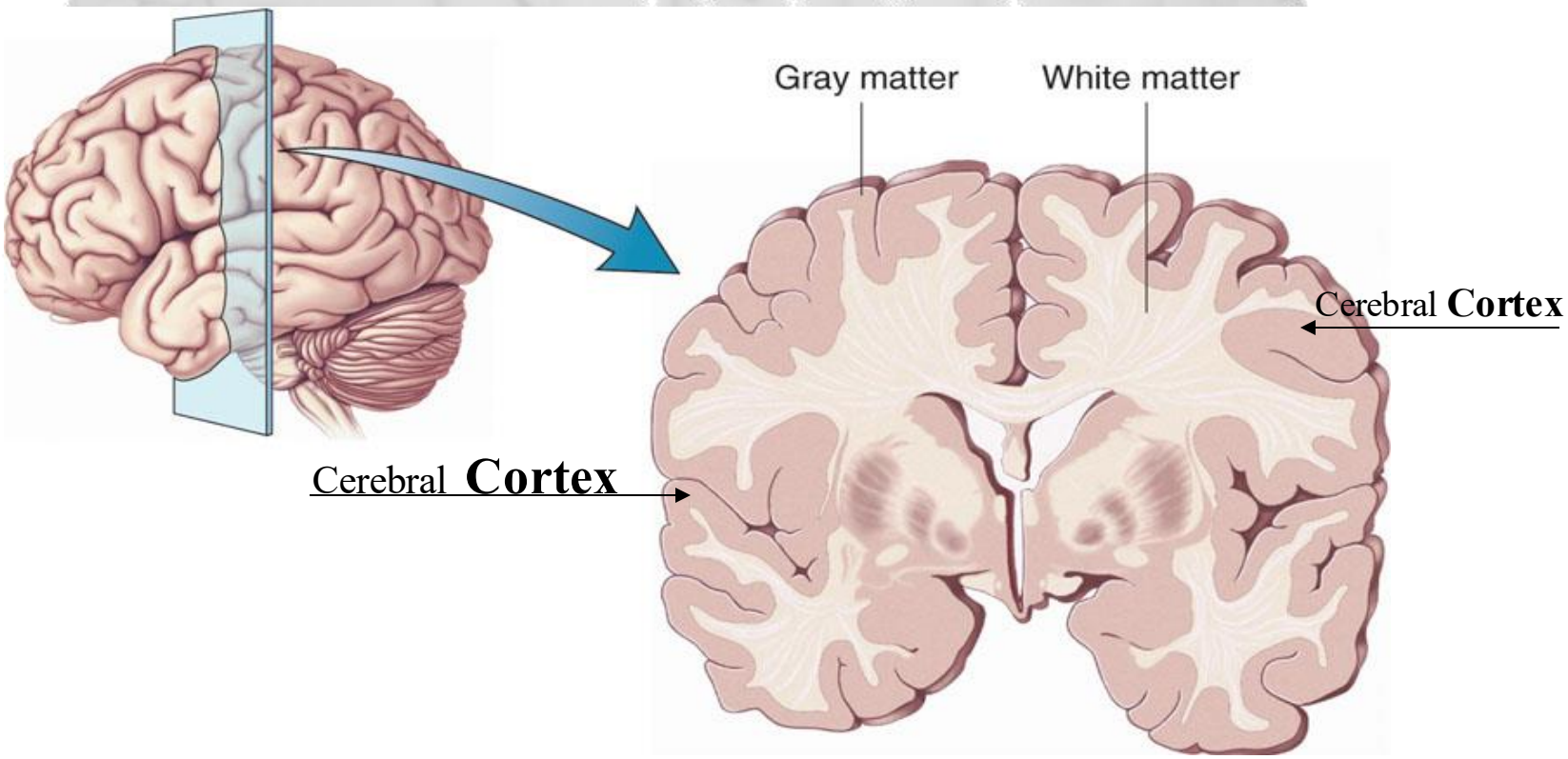
- To identify the Cerebrum, the Lobes of the Brain, the Cerebral Cortex, and its major regions/divisions.

Cerebrum -The largest division of the brain. It is divided into two hemispheres, each of which is divided into four lobes.



http://williamcalvin.com/BrainForAllSeasons/img/bonoboLH-humanLH-viaTWD.gif

Cerebral Cortex - The outermost layer of gray matter making up the superficial aspect of the cerebrum.



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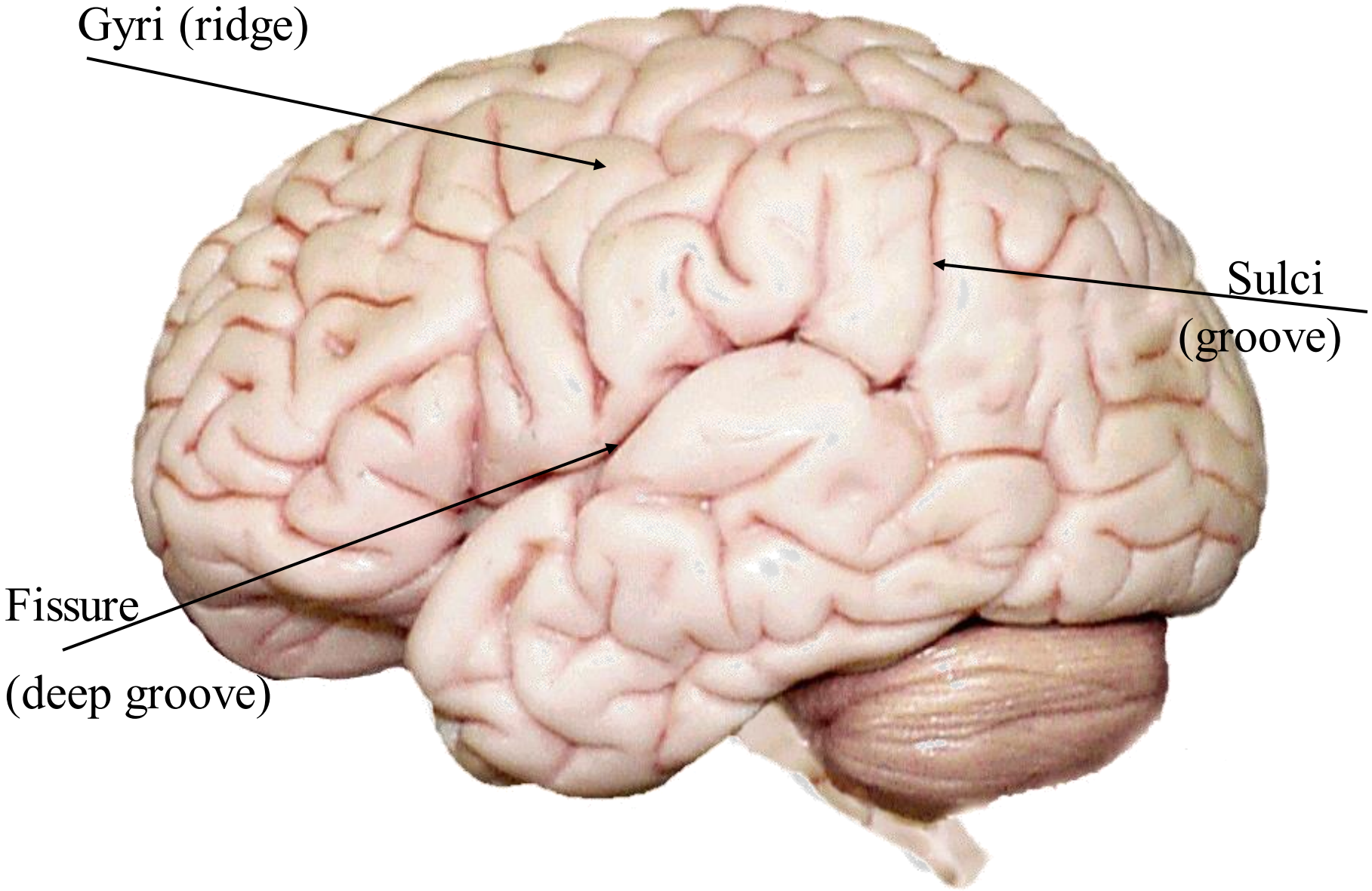

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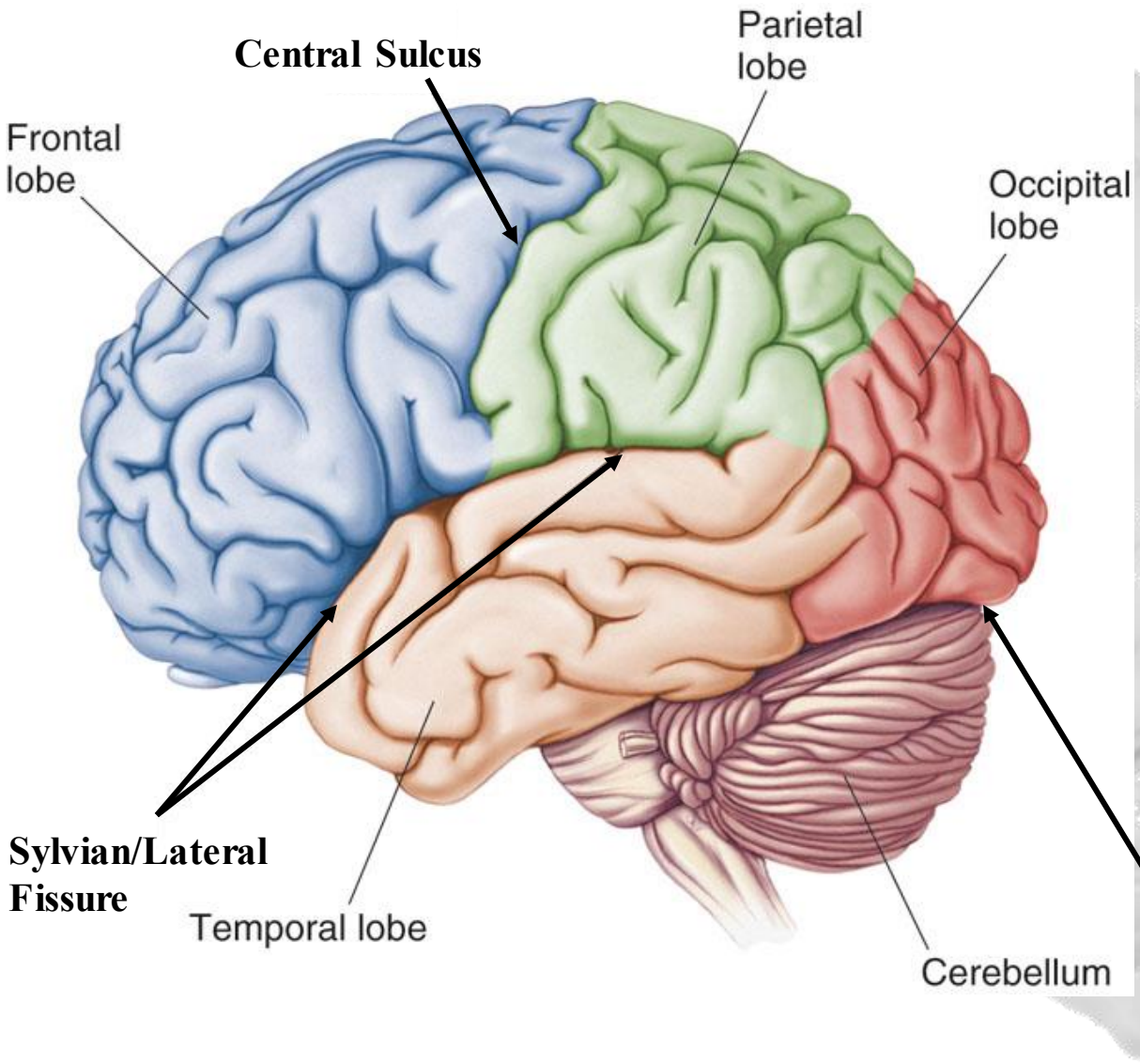
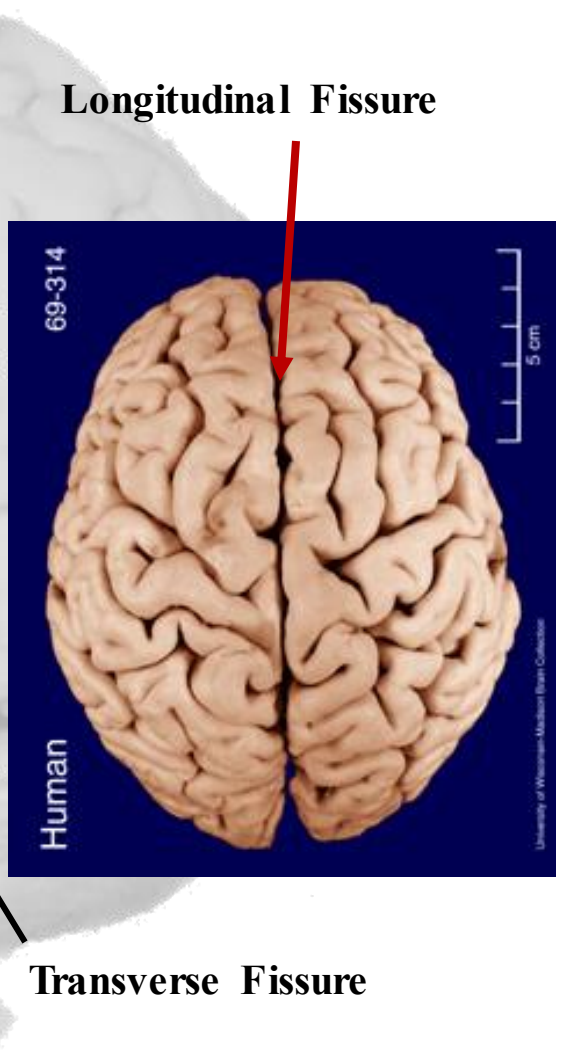
Specific Sulci/Fissures:





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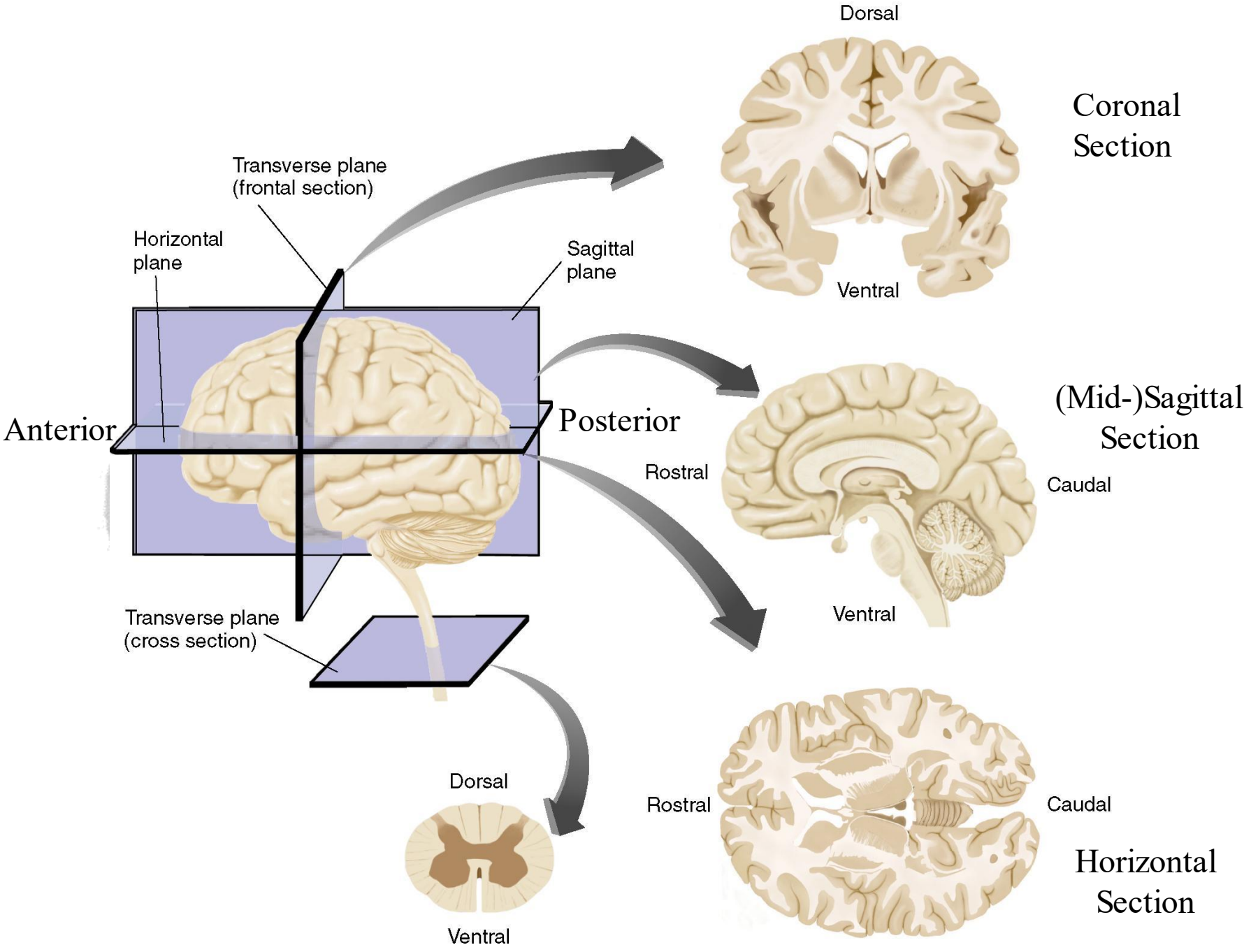

Transverse plane
(frontal section)
Horizontal
plane
Sagittal
plane
Anterior
Posterior
Transverse plane
(cross section)
Dorsal
Ventral
Coronal
Section
Rostral
Caudal
Ventral
(Mid-)Sagittal
Section
Dorsal
Ventral
Rostral
Caudal
Horizontal
Section

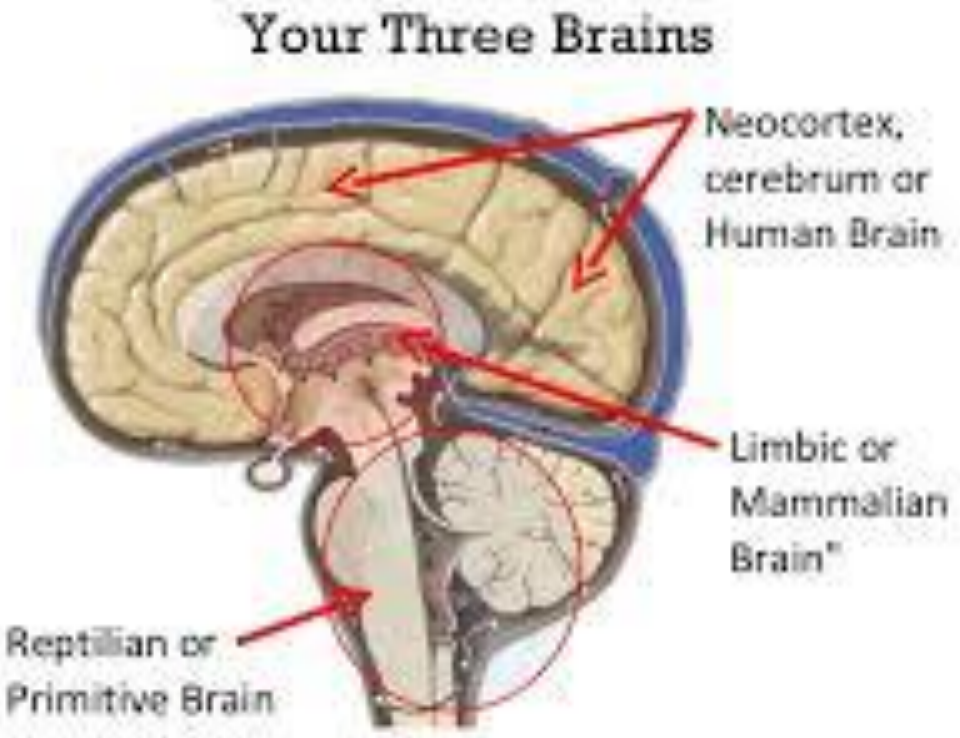
Human Brain

- 2% of the body weight, 3 pounds approx.
- 25% of body's oxygen
- 70% of glucose
- Never rests and its metabolic rate, during both day and night, is more or less the same.
- In dreams in fact, the metabolic rate increases slightly.

Hierarchical Brain: Structure & Functions

- Represents approx. 500 million yrs of evolutionary development and fine tuning.
- Core structures of brain are the same in all vertebrates
- They govern the physiological functions
- Built upon these are newer systems that involve complex functions – sensing, emoting, thinking, reasoning etc.
- Cerebral cortex is the one which makes us Human

Triune Brain



Paul MacLean (1990) Originally proposed in the 60's

Reptilian: Brain Stem & Cerebellum: Survival (Fight or Flight)

Paleomammalian: Limbic System: Emotions, Memories, Habits

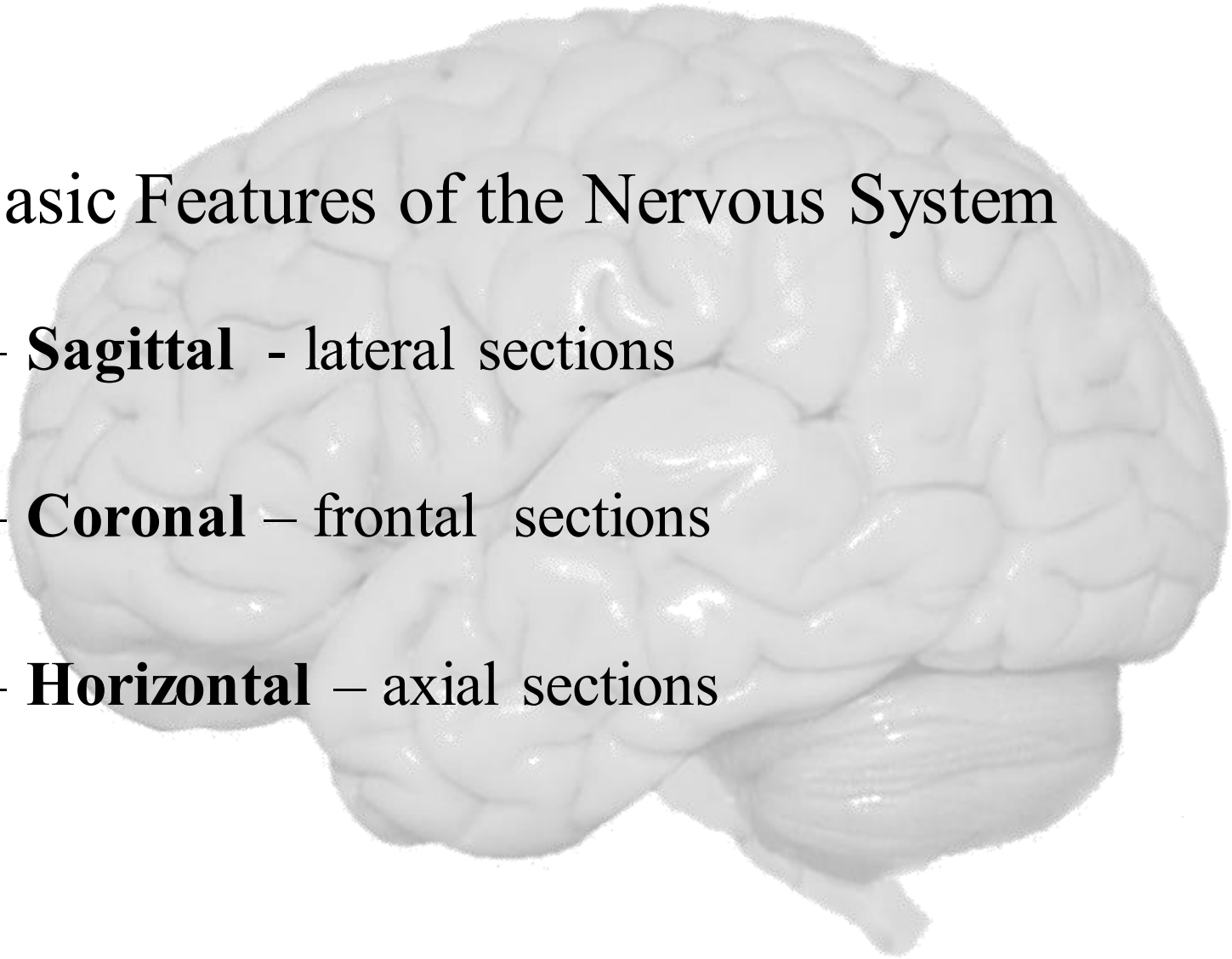
Neomammalian: Neocortex: Language, Abstract Thought, Imagination, Consciousness

- Basic Features of the Nervous System

  - **Anterior:**
    - With respect to the central nervous system, located near or toward the head.
  - **Posterior**:
    - With respect to the central nervous system, located near or toward the tail.
  - **Rostral**:
    - "Toward the "beak"; with respect to the central nervous system, in a direction along the neuraxis toward the front of the face.
  - **Caudal**:
    - "Toward the tail"; with respect to the central nervous system, in a direction along the neuraxis away from the front of the face.

- Basic Features of the Nervous System

  - **Dorsal:**
    - "Toward the back"; with respect to the central nervous system, in a direction perpendicular to the neuraxis toward the top of the head or the back.
  - **Ventral:**
    - "Toward the belly"; with respect to the central nervous system, in a direction perpendicular to the neuraxis toward the bottom of the skull or the front surface of the body. Lateral:
    - Toward the side of the body, away from the middle.
  - **Medial:**
    - Toward the middle of the body, away from the side.
  - **Ipsilateral:**
    - Located on the same side of the body.
  - **Contralateral**:
    - Located on the opposite side of the body.



- Basic Features of the Nervous System
  - **Sagittal** - lateral sections
  - **Coronal** – frontal sections
  - **Horizontal** – axial sections

Cerebral Features:

- **Gyri** – Elevated ridges "winding" around the brain.

- **Sulci** – Small grooves dividing the gyri

  – **Central Sulcus** – Divides the Frontal Lobe from the Parietal Lobe

- **Fissures** – Deep grooves, generally dividing large regions/lobes of the brain

  – **Longitudinal Fissure** – Divides the two Cerebral Hemispheres

  – **Transverse Fissure** – Separates the Cerebrum from the Cerebellum

  – **Sylvian/Lateral Fissure** – Divides the Temporal Lobe from the Frontal and Parietal Lobes