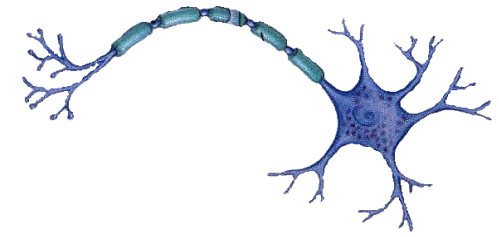
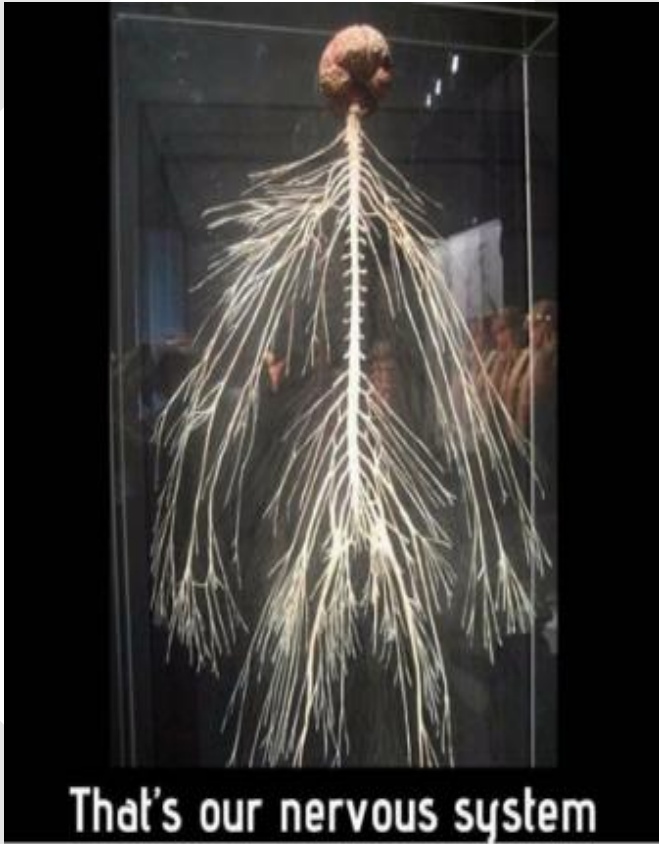
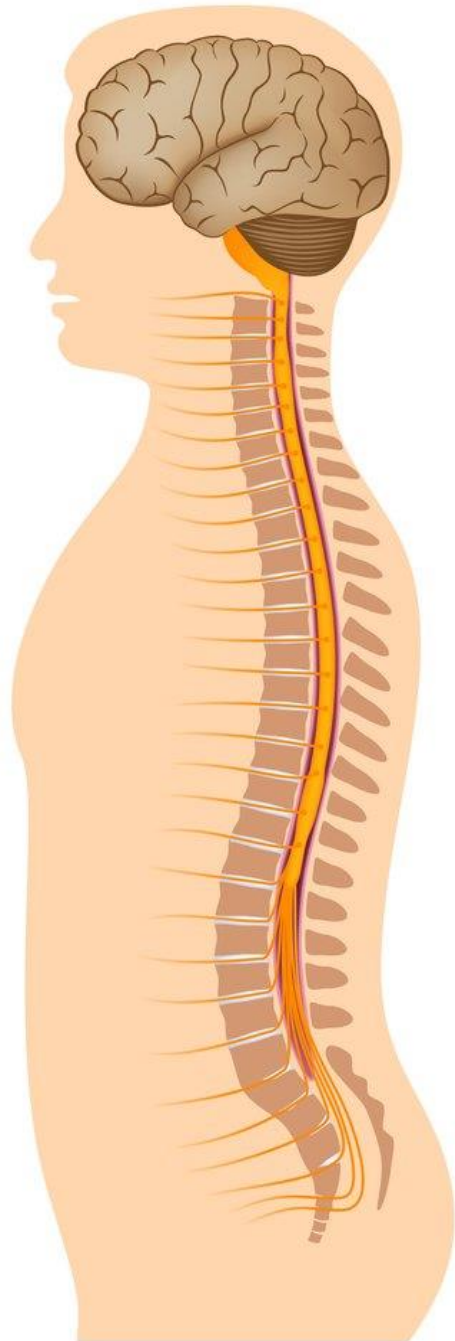


# Nervous System

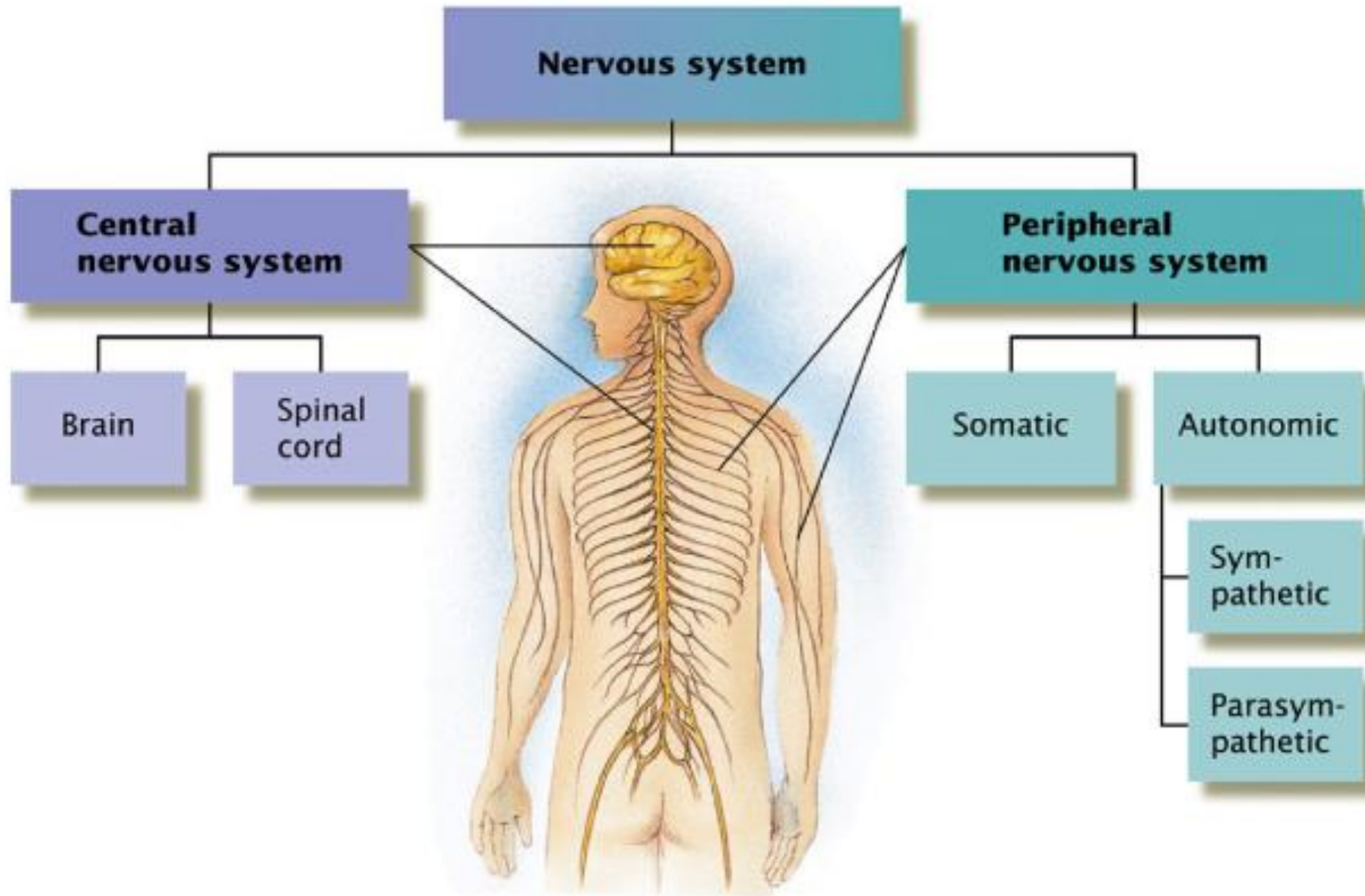




# THE NERVOUS SYSTEM

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- one of the 2 control systems of the body
- responsible for **coordinating the actions of the body.**
- all animals have a nervous system, the complexity of which varies with the organism
- humans have a dorsally located nerve cord encased in bone (**vertebrae**)
- the anterior end of the nerve cord is enlarged (**brain**) and is the dominant controller of the whole nervous system.



# 2 Main Groups/Systems of Nerves

Nerves and Internal Coordination of the Body (p.197)

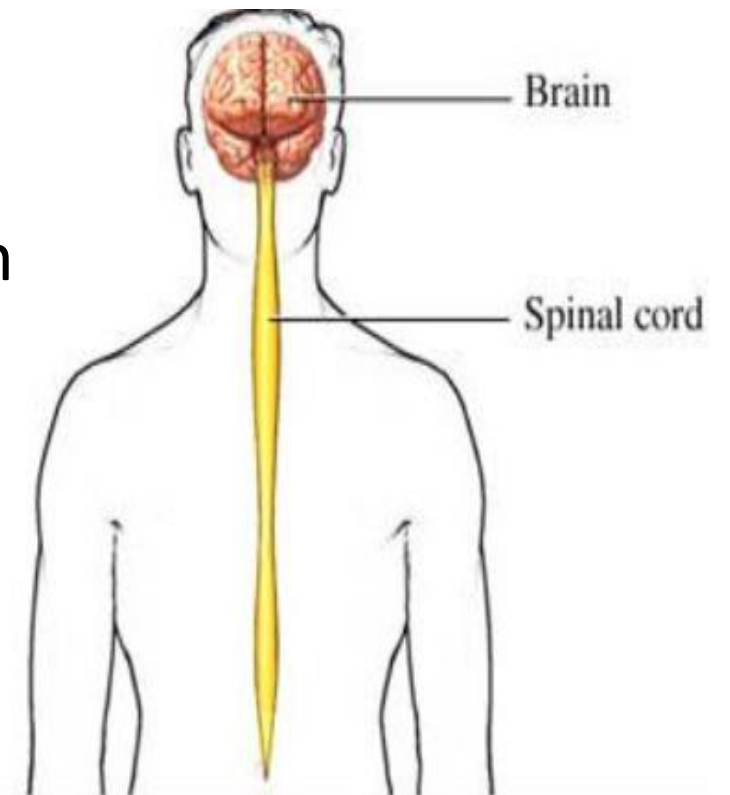
- there are two main groups or systems of nerves in the body:

1. Central Nervous System

2. Peripheral Nervous System

# A) Central Nervous System (CNS)

- contains the **brain** and **spinal cord**
- coordinates all incoming and outgoing information
- all of the nerves you can control  
ie.) **speaking, walking, eating**



## B) Peripheral Nervous System (PNS)

- communicates between the **CNS** and the **rest of the body**
- is further subdivided into:

### i) **Somatic Nervous System = voluntary control**

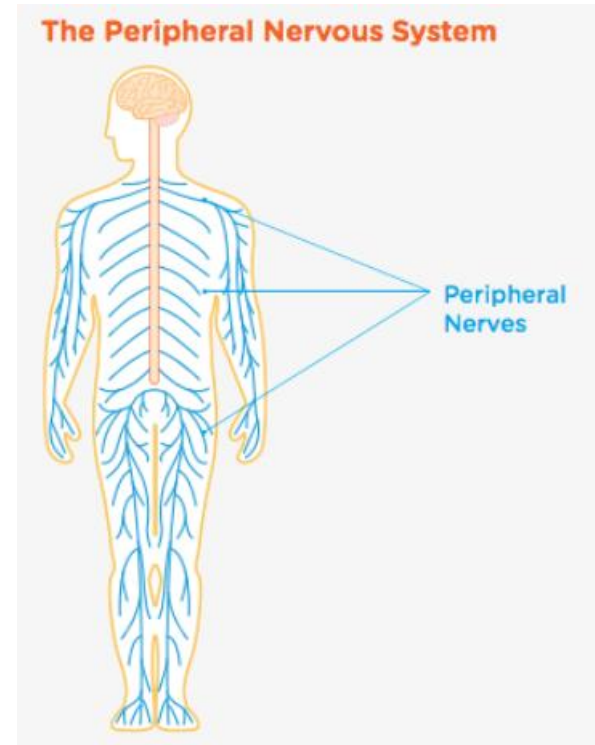
: contains nerves of the skin, skeletal muscle and bone

### ii) **Autonomic Nervous System= involuntary**

: nerves which control internal organs

: further divided into the **sympathetic & parasympathetic** systems

➤ complementary action



# PARASYMPATHETIC NERVES

"Rest and digest"

Constrict pupils

Stimulate saliva

Slow heartbeat

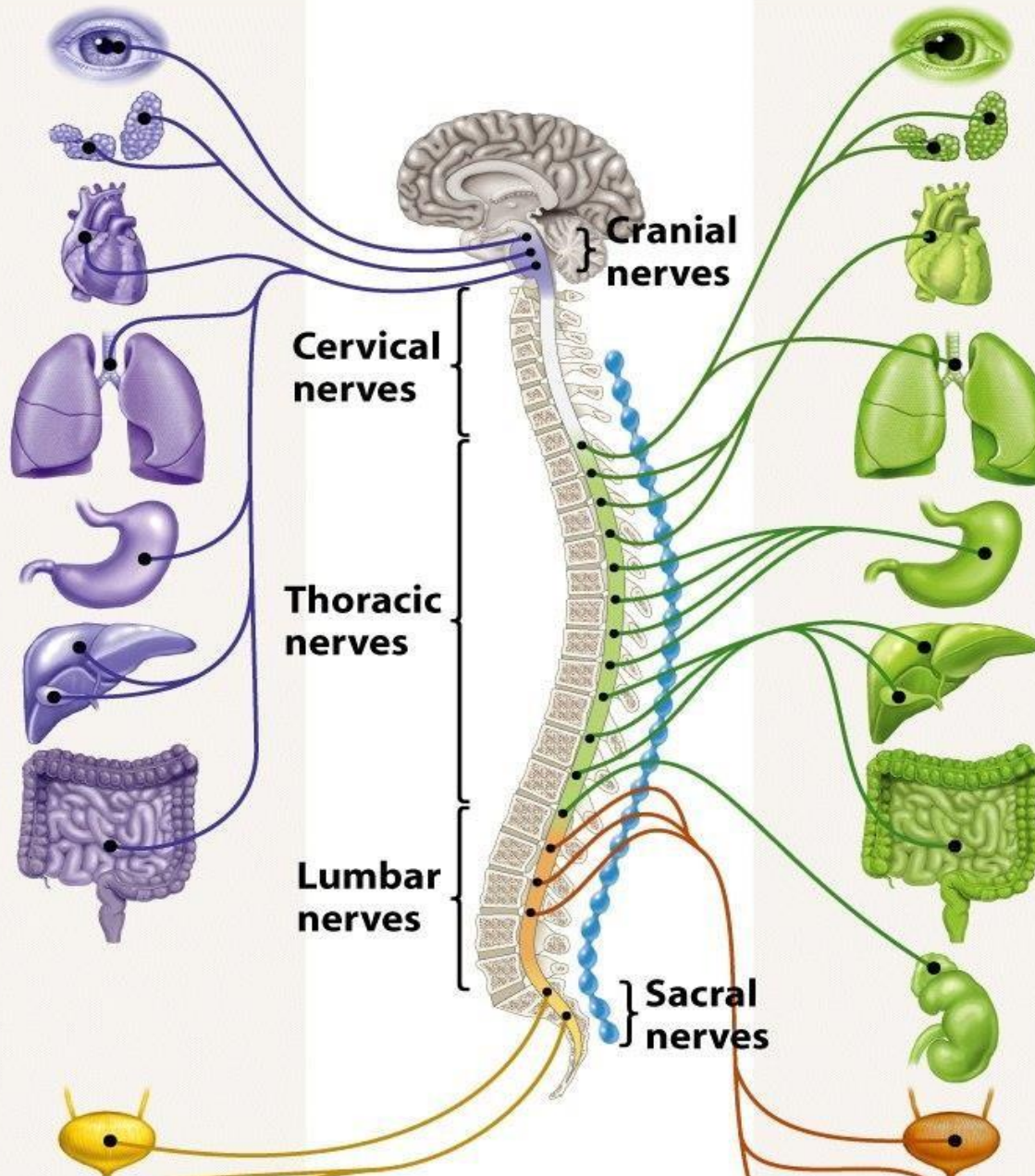
Constrict airways

Stimulate activity of stomach

Inhibit release of glucose; stimulate gallbladder

Stimulate activity of intestines

Contract bladder



# SYMPATHETIC NERVES

"Fight or flight"

Dilate pupils

Inhibit salivation

Increase heartbeat

Relax airways

Inhibit activity of stomach

Stimulate release of glucose; inhibit gallbladder

Inhibit activity of intestines

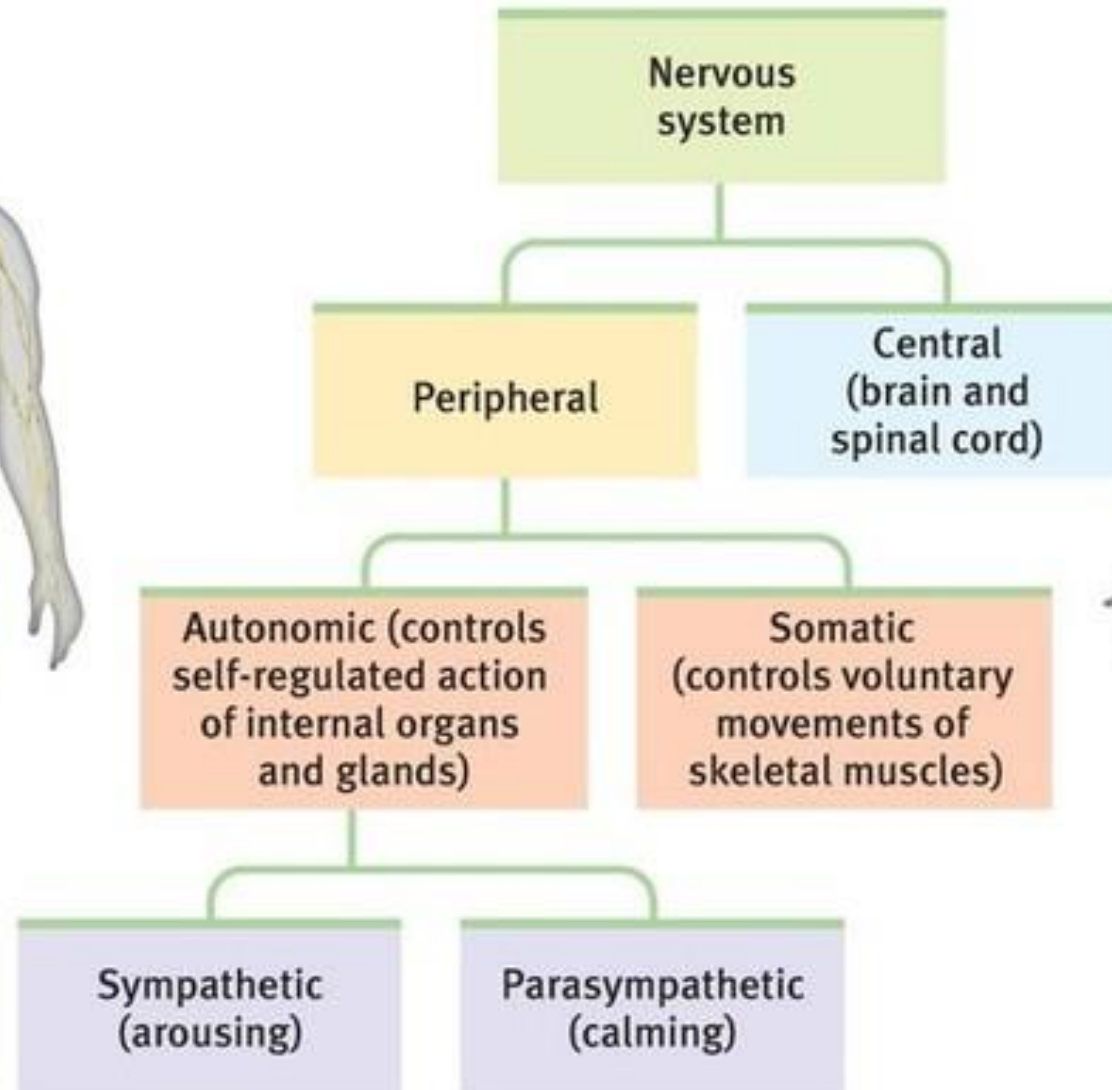
Secrete epinephrine and norepinephrine

Relax bladder

## Peripheral nervous system



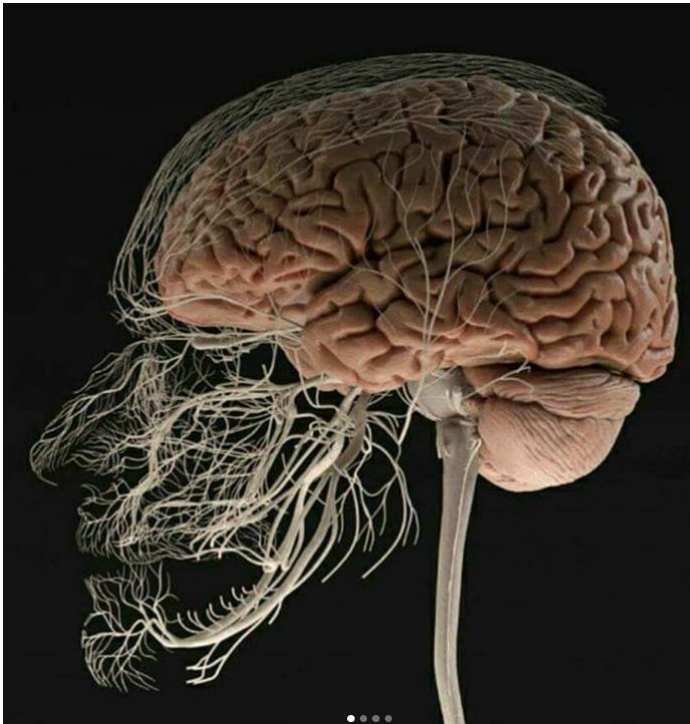
## Central nervous system



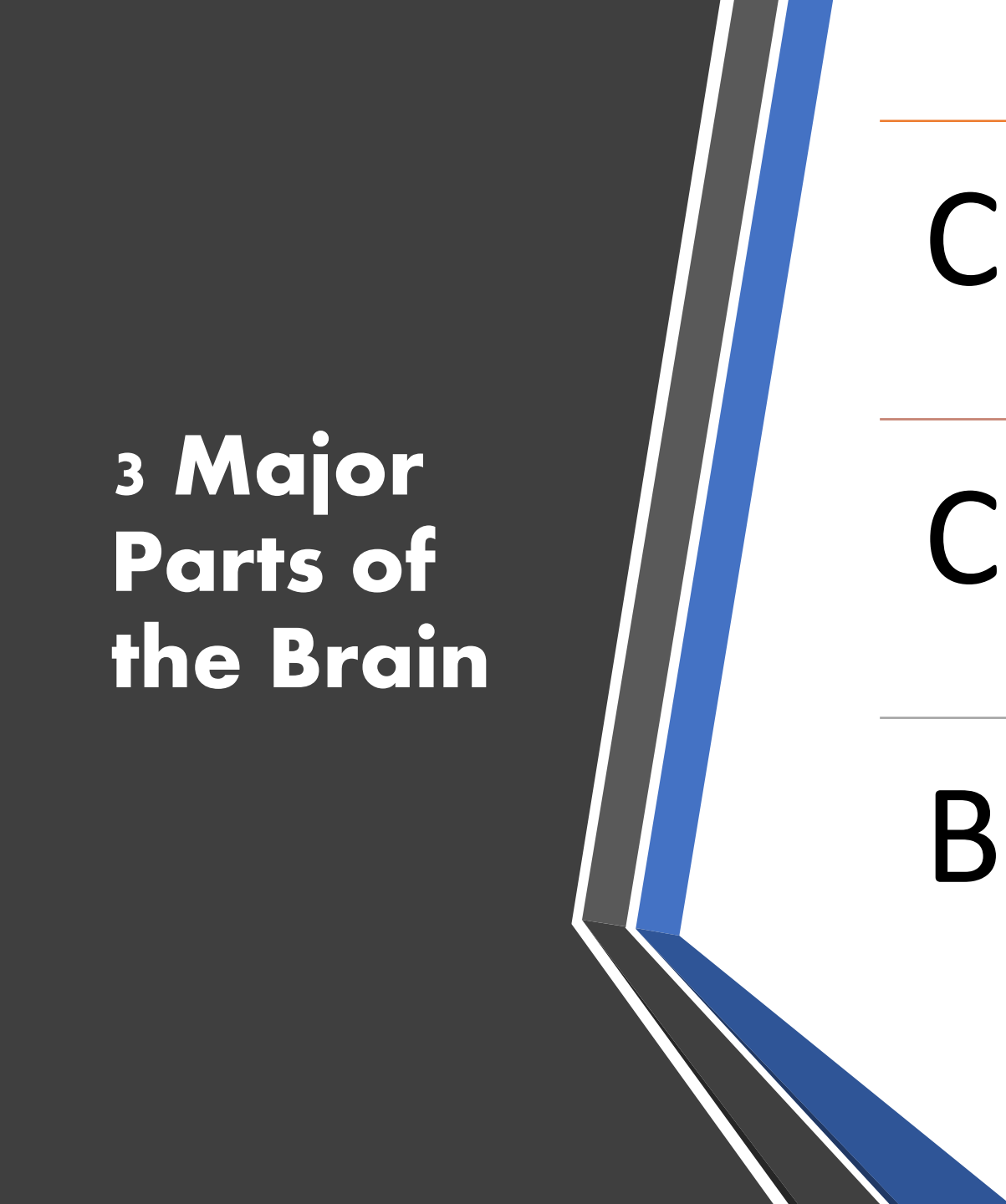


# The Brain

## -- King of the Nerves



- is a complex organ composed of a large cluster of neurons
- control center of an animal's body
- functions of the brain:
  - a) **receives, analyzes and stores information**
  - b) **controls the body**



**3 Major  
Parts of  
the Brain**

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Cerebrum

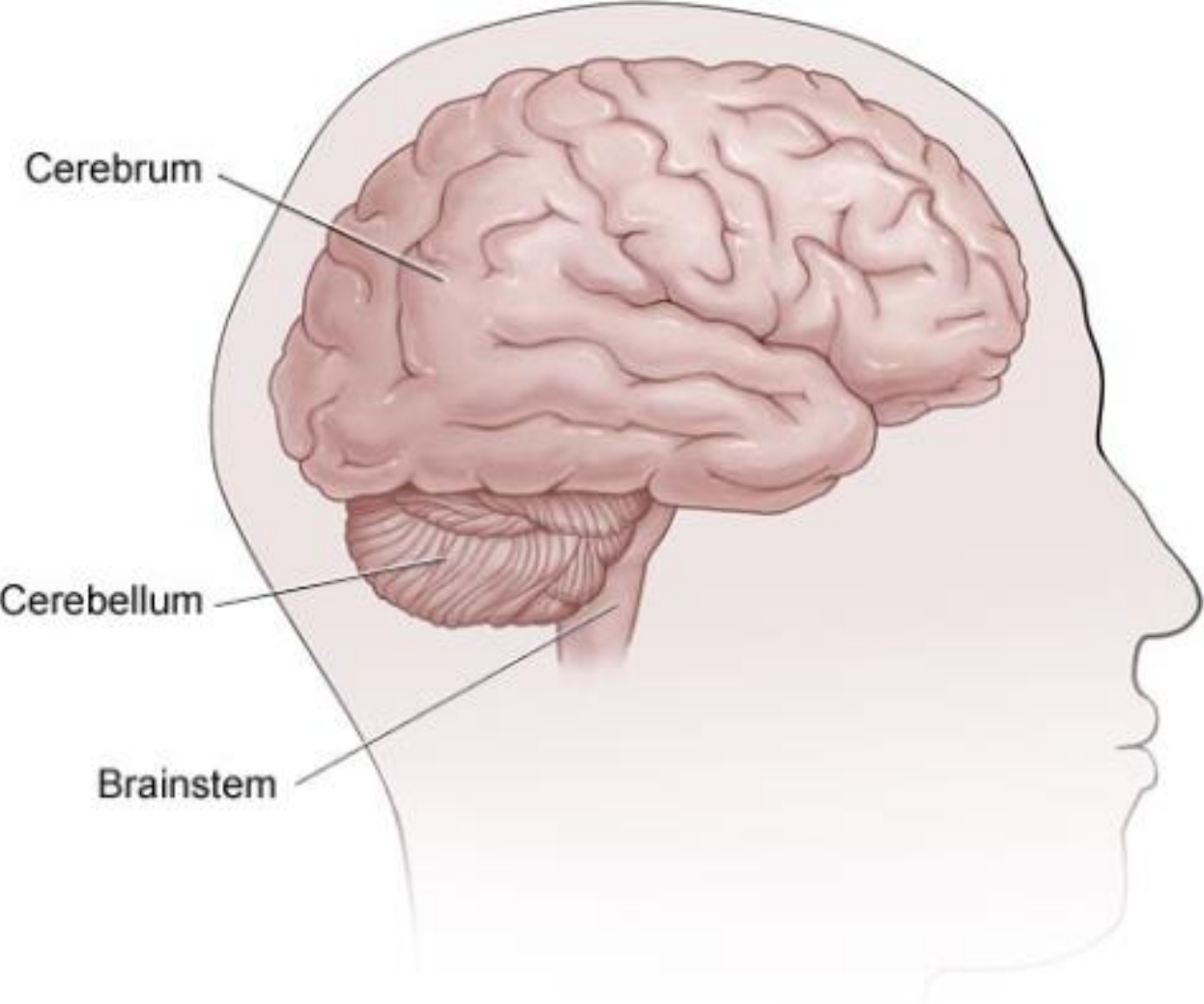
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Cerebellum

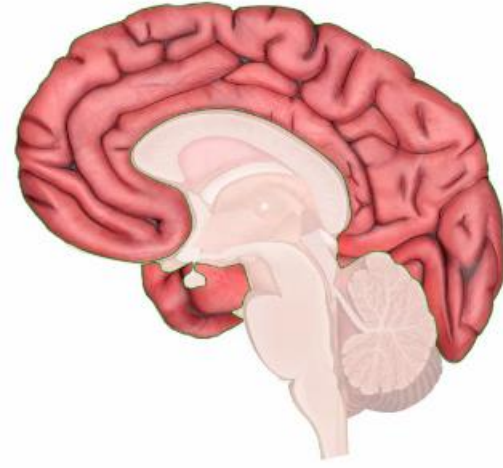
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Brain Stem

# Major Parts of the Brain



# 1) Cerebrum

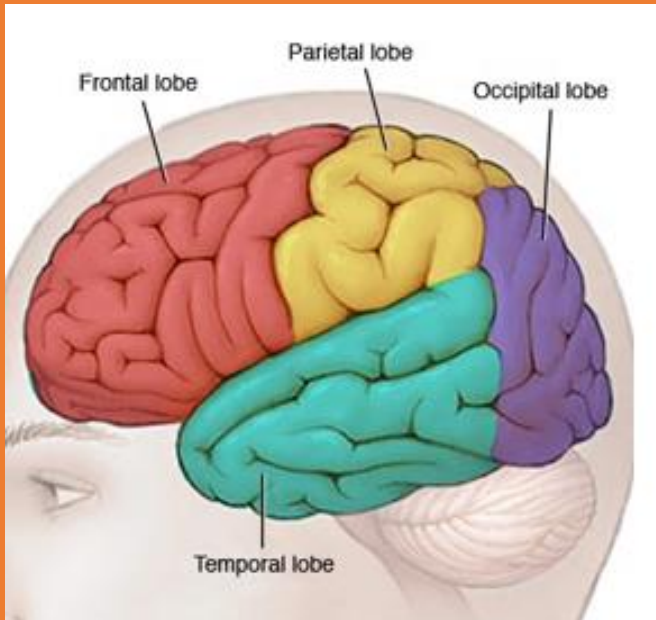


- the **largest part** of the brain
- responsible for:
  - interpreting sensory information
  - thinking and planning
  - controlling voluntary activities
- folded outer layer (cortex) increases surface area allowing for more reasoning power
- is divided into 2 hemispheres (halves) connected by the corpus collosum to allow communication via the thalamus (relay station)

**Left** Hemisphere = controls **language**, **math** and the right side of the body

**Right** Hemisphere = controls **emotions**, **creativity** and left side of the body

# 4 Lobes of the CEREBRUM



- **Frontal lobe**: responsible for voluntary movement, reasoning and judgment
- **Temporal lobe**: responsible for hearing, language, memory and emotions (*think of where your temples are*)
- **Parietal lobe**: sensory information and association
- **Occipital lobe**: vision and visual recognition (O...orbs...eyes)



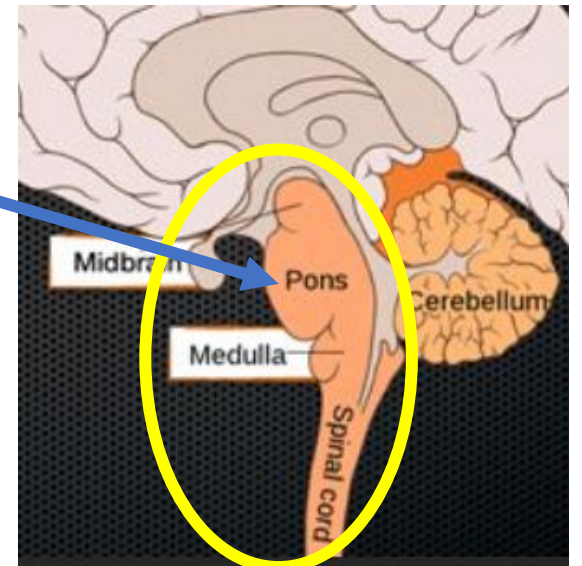
## 2) Cerebellum

- behind the cerebrum  
*(it's a bigger word but is a smaller part of the brain than the cerebrum)*  
*(cauliflower looking)*
- responsible for **balance, action of muscles and coordination of movement**



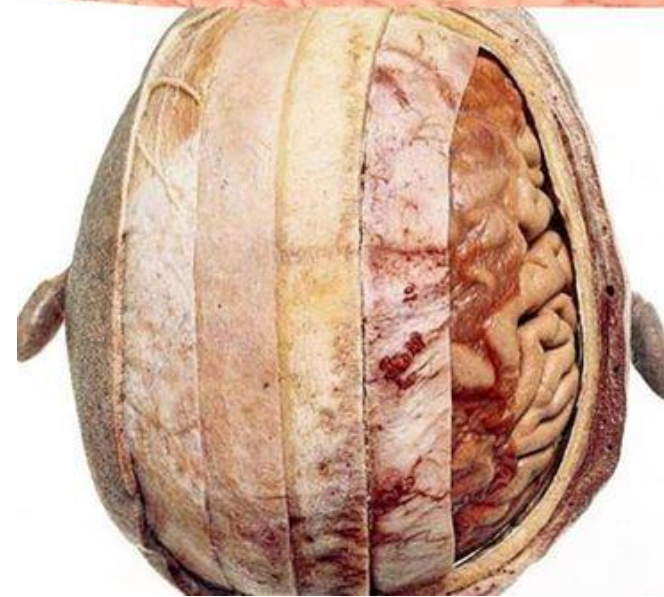
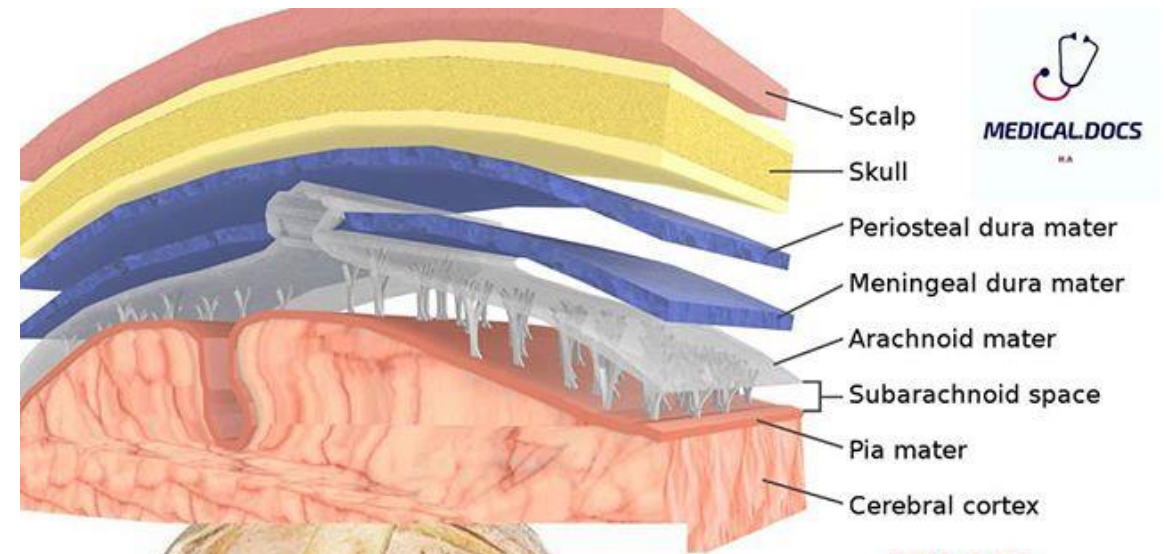
### 3) Brain Stem (Medulla Oblongata)

- **base of the brain; connects to the spinal cord**
- contains the **vagus nerve** which controls vital involuntary life processes such as breathing, heart rate, digestion
- **pons**: area of the brain stem responsible for relaying information between the PNS and CNS (*the bumpy part of the backwards P shape*)



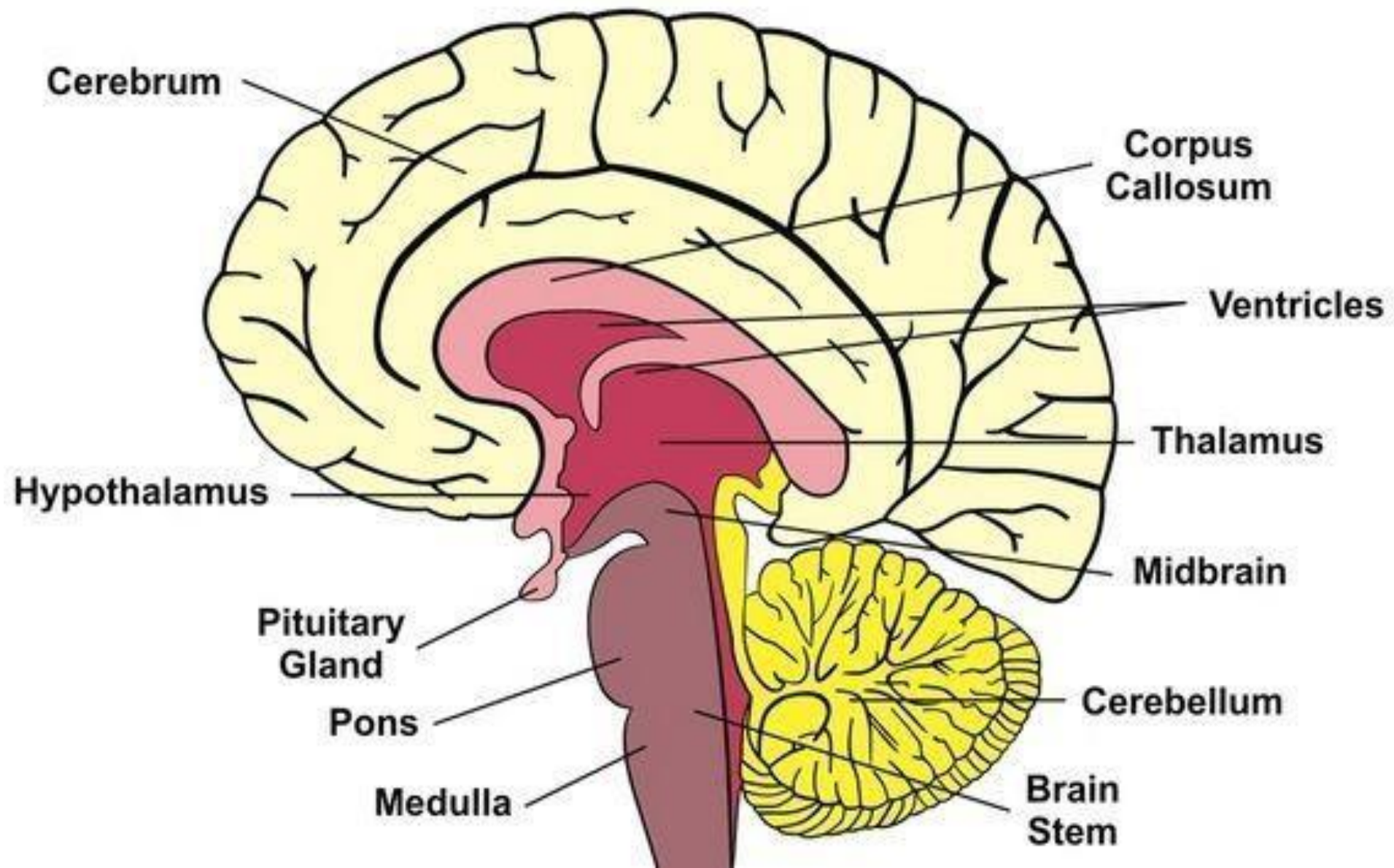
# Layers of Protection for the Brain

- the brain is incased in bone skull and covered with the **meninges** (membranes located between bone and soft tissue). These together with the **cerebrospinal fluid** protect the brain from injury.



**THE  
LAYERS  
OF THE  
BRAIN**





Corpus callosum - the bundle of neurons that the two halves of your brain.

