

# Neuroanatomie du Système nerveux

## De la Structure à la Fonction

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D2

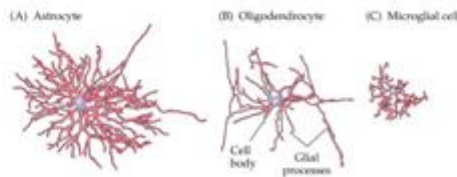
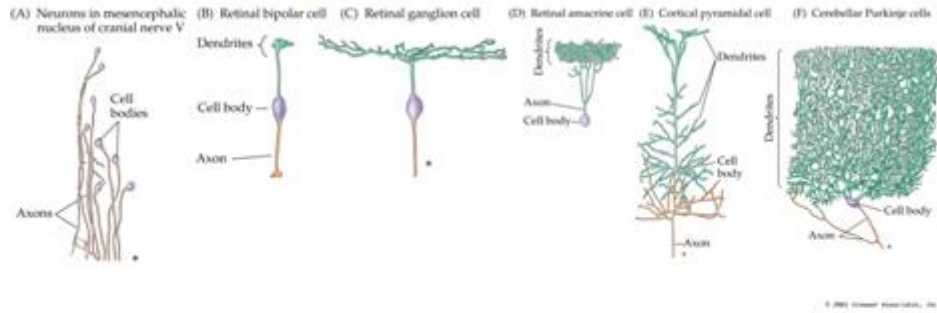
### The Organization of the Nervous system

- Cellular Component
  - **Nerve Cells:** Neurone : specialised for the intercellular communication
  - **Neuroglial Cells:** Astrocyte, oligodendrocyte, Schwann Cells, microglia cells lack of axon and dendrite
  - **Neural Circuits:** defined by synaptic connections
  - **Neural Systems:** concern circuits that serve similar functions; two major neural system
    - Sensory system
    - Motor system

D3

The Organization of the Nervous system

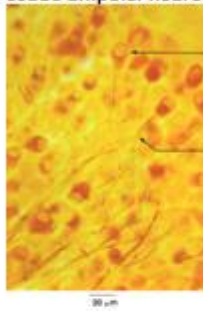
• Cellular Component



All these cells can be labelled by different techniques

D4

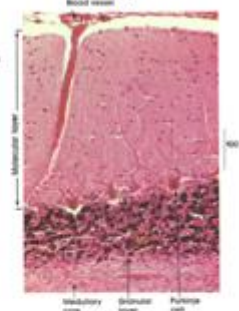
SENSORY GANGLION (GASSERIAN)  
Pseudo unipolar neurons



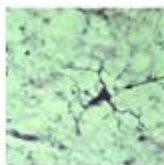
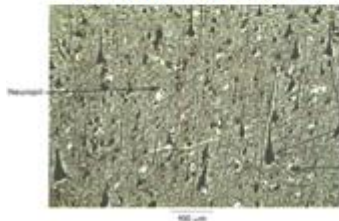
Lower Motoneurone



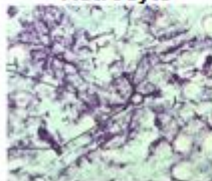
Purkinje Cells



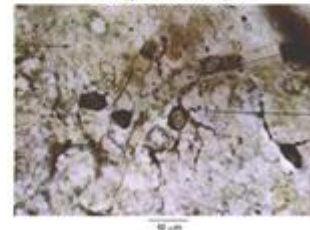
Bertz cells of Motor Cortex



Astrocyte



Oligodendrocyte

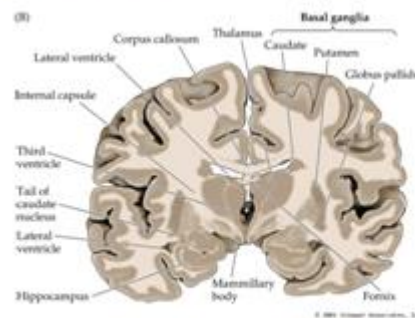
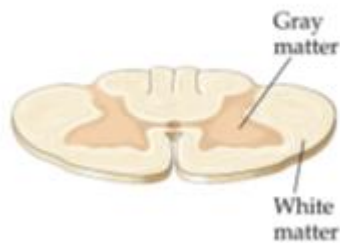


D5

## The Organization of the Nervous system

- Tissue Component

- Gray matter
- White Matter



D6

## The Organization of the Nervous system

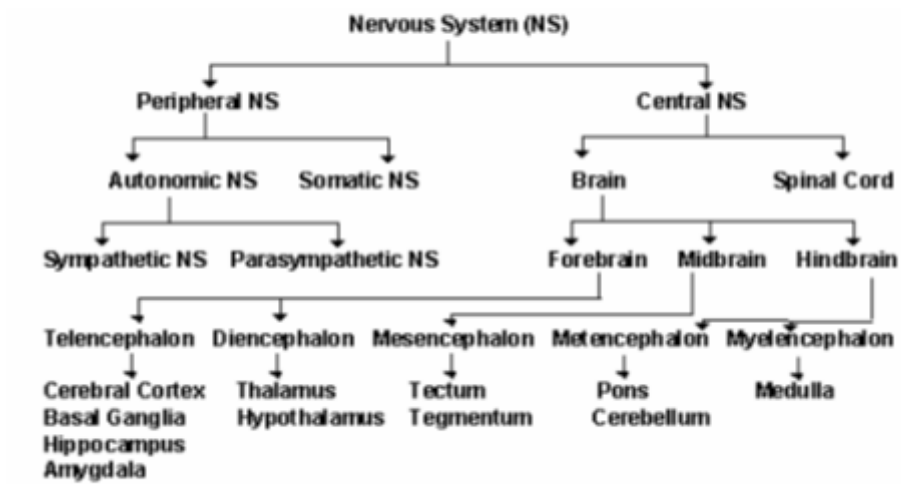
- Structural Components

- Central nervous system
  - Brain
  - Spinal cord
- Peripheral nervous system
  - Sensory System: sensory neurons which link sensory receptors (body surface/specialised receptors)
    - » Dorsal root ganglia lie adjacent to the spinal cord
    - » Cranial nerve ganglia lie adjacent to the brainstem
  - Motor System
    - » Somatic motor division
    - » Autonomic motor division

D7

## The Organization of the Nervous system

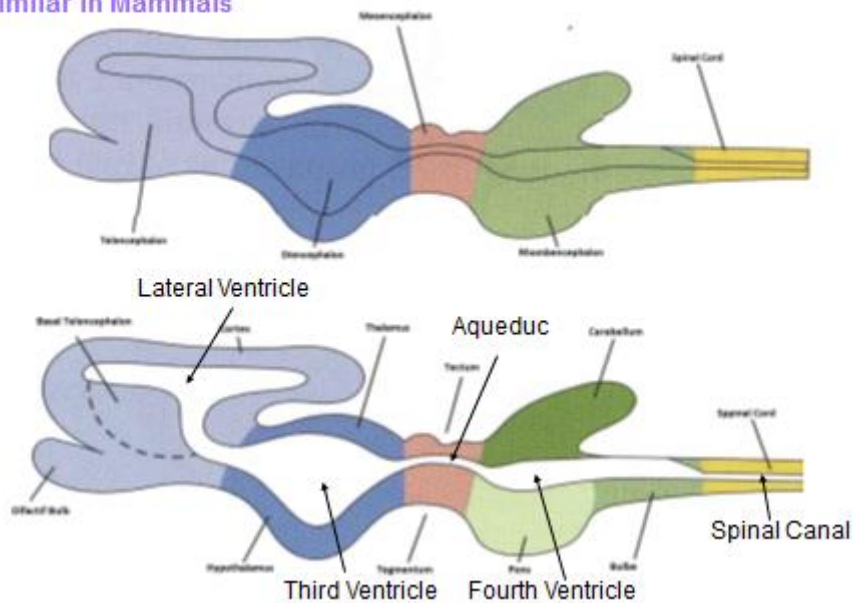
### Structural Components



D8

## The Organization of the Nervous system

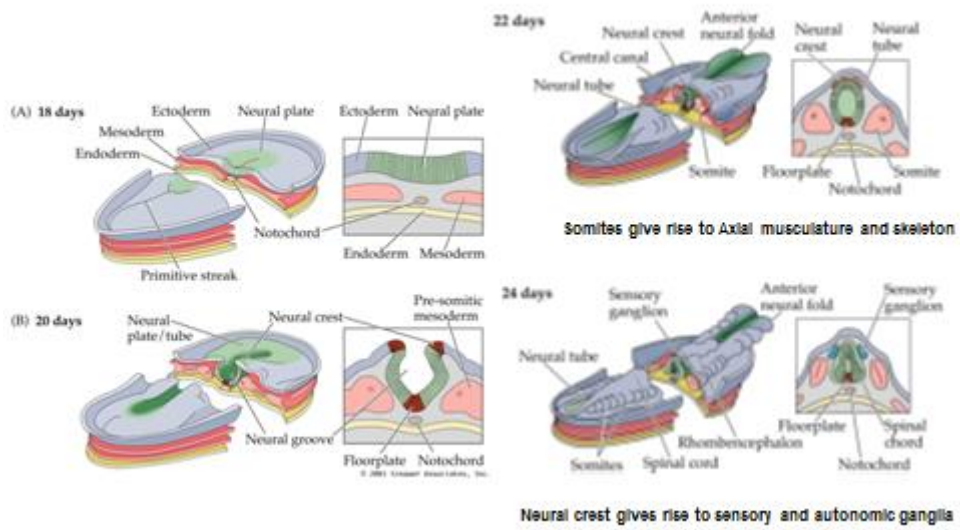
- From early stage of development, the organisation of the brain is similar in Mammals



D9

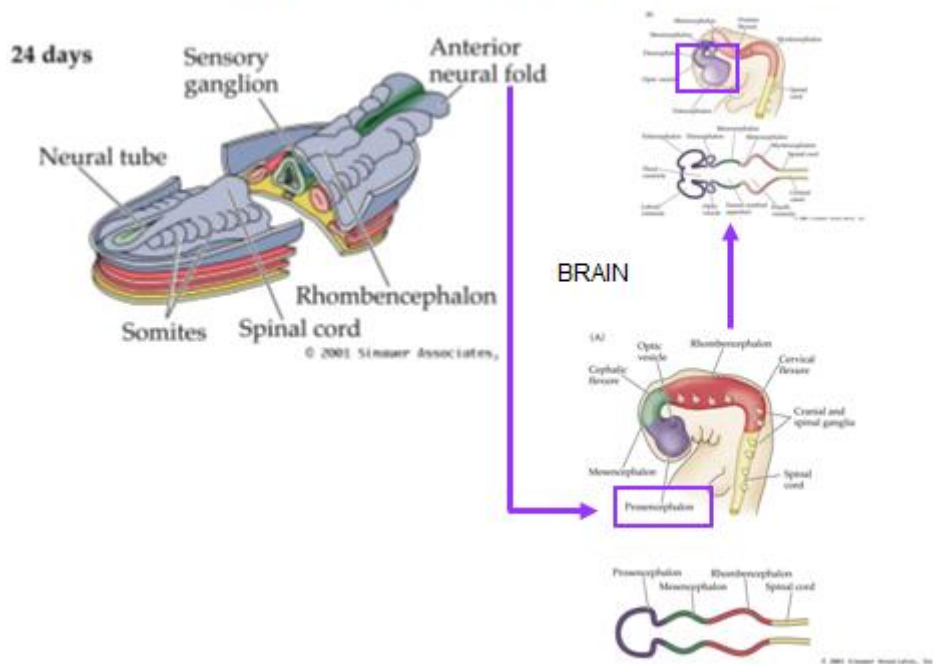
## The Organization of the Nervous system

- **Functions are related to the brain development**  
The skin and the nervous system emerge from ectoderm



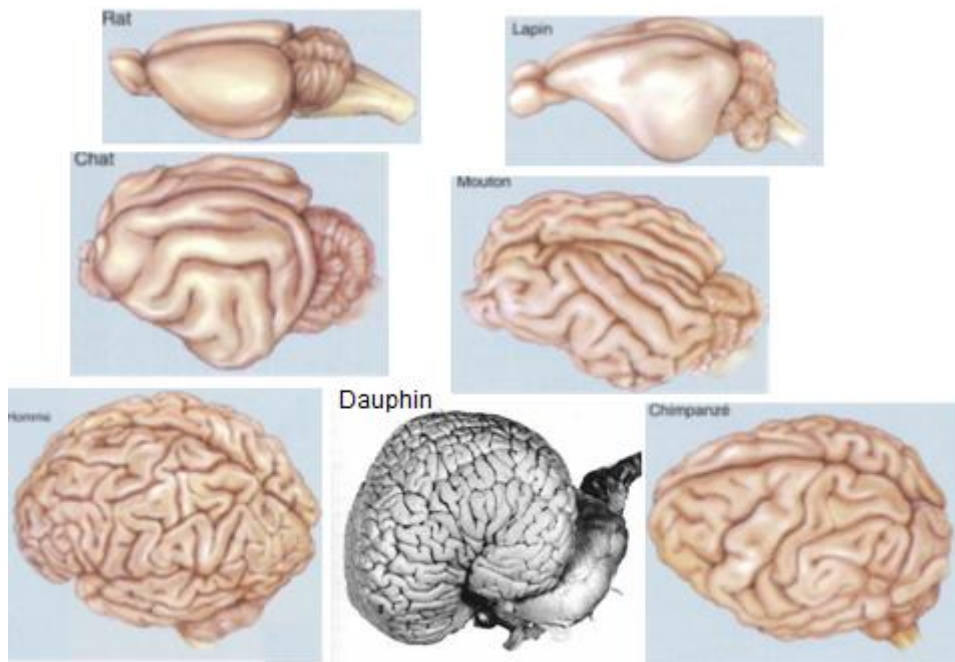
D10

## The Organization of the Nervous system



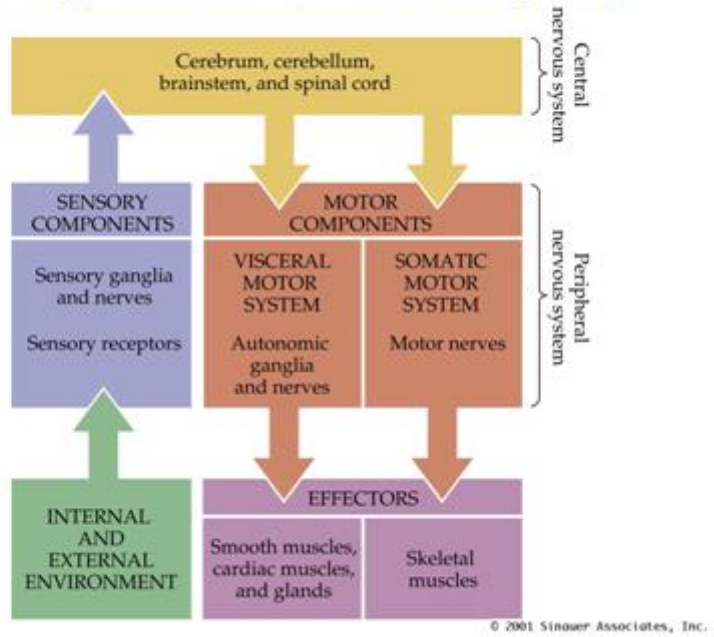
**D11**

The Organization of the Nervous system



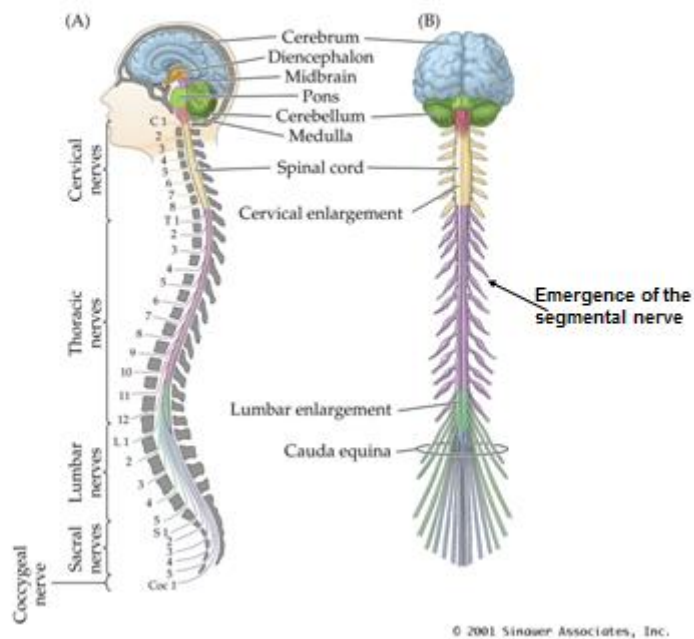
**D12**

# The Organization of the Nervous system



D13

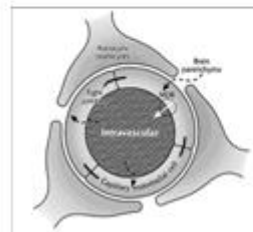
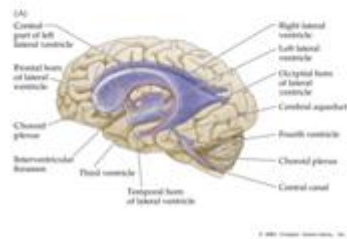
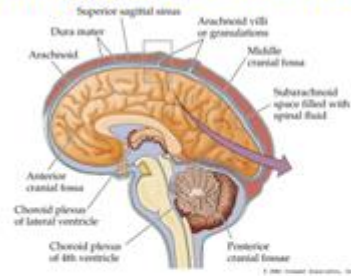
# The Organization of the Nervous system



D14

## The Organization of the Nervous system

- All brains have protection and blood vascularisation

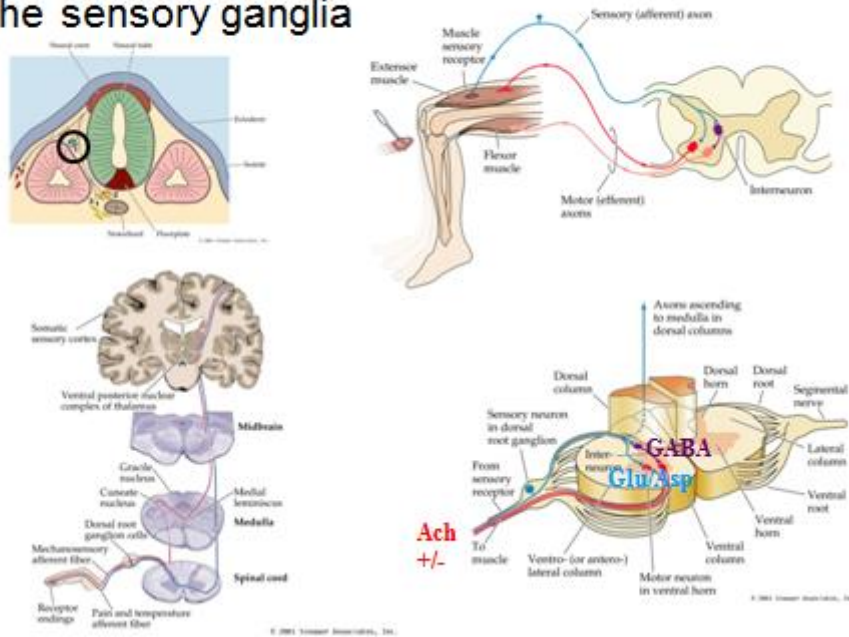


D15



# The Organization of the Nervous system

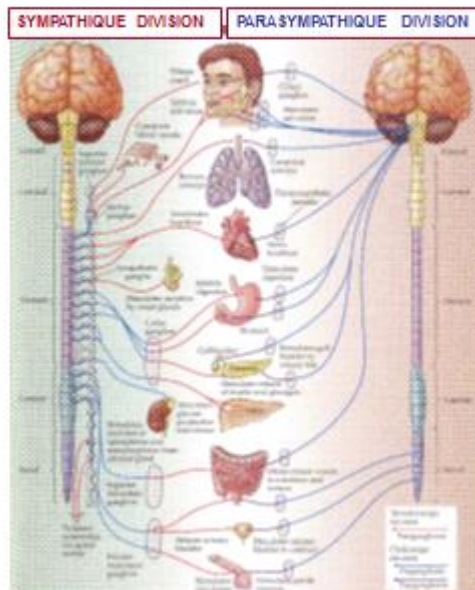
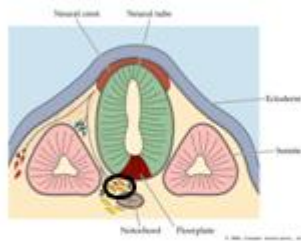
- The sensory ganglia



D16

# The Organization of the Nervous system

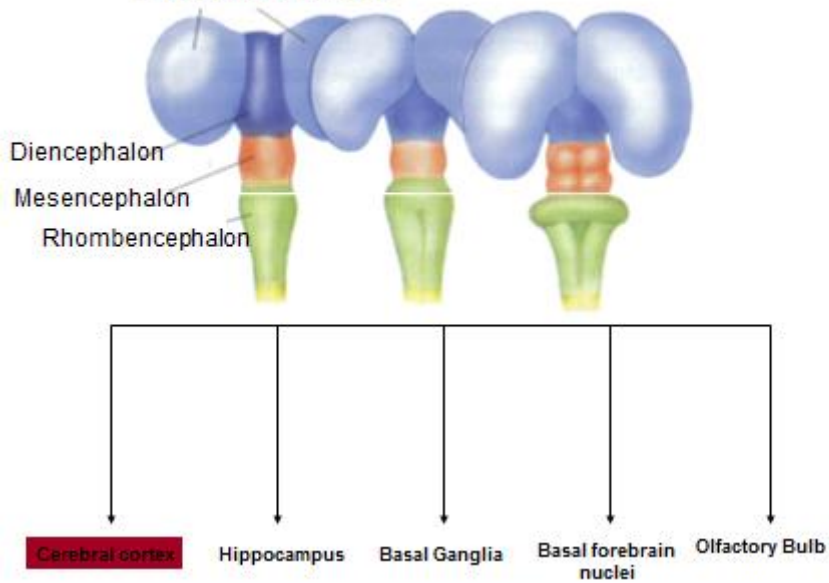
- Autonomic ganglia



D17

### The Organization of the Nervous system

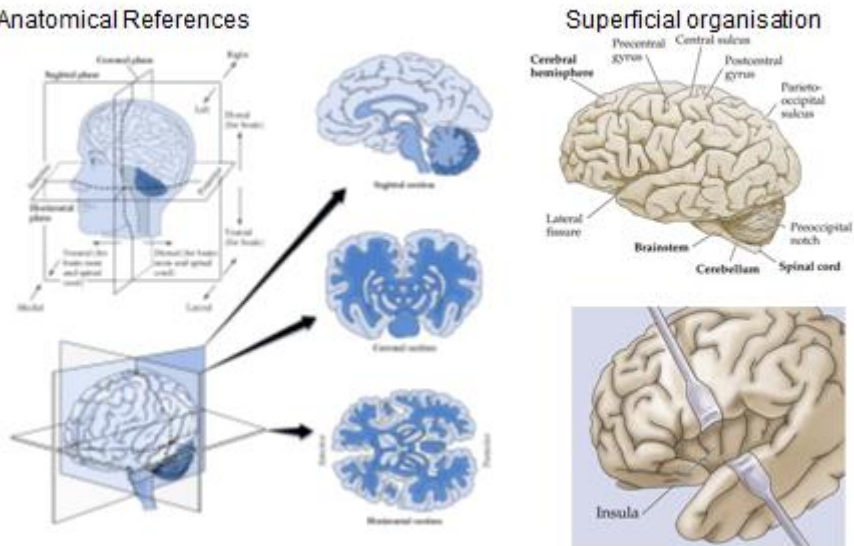
- The birth of the telencephalon  
2 cerebral hemisphere



D18

### The Organization of the Nervous system

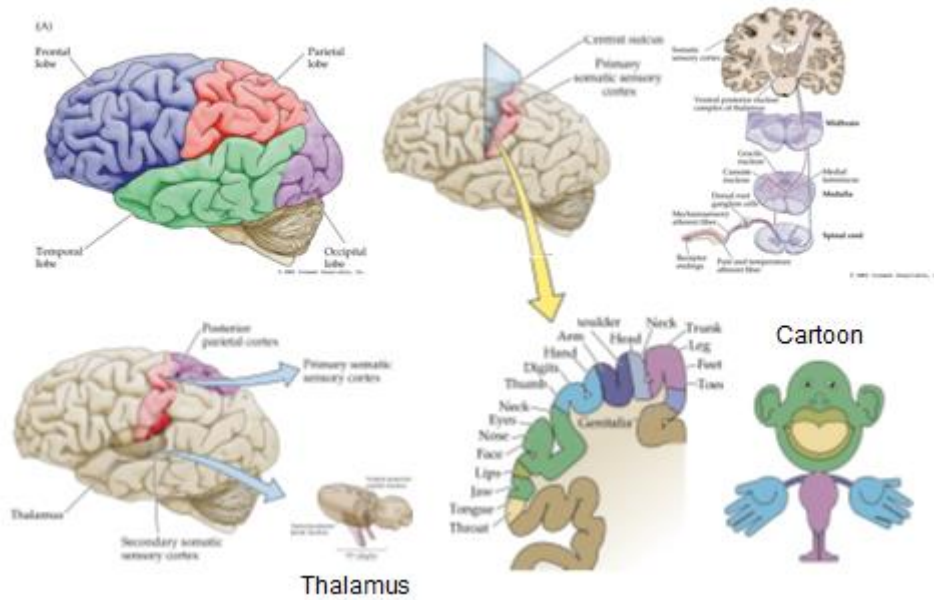
- The Cerebral Cortex
- Anatomical References



D19

## The Organization of the Nervous system

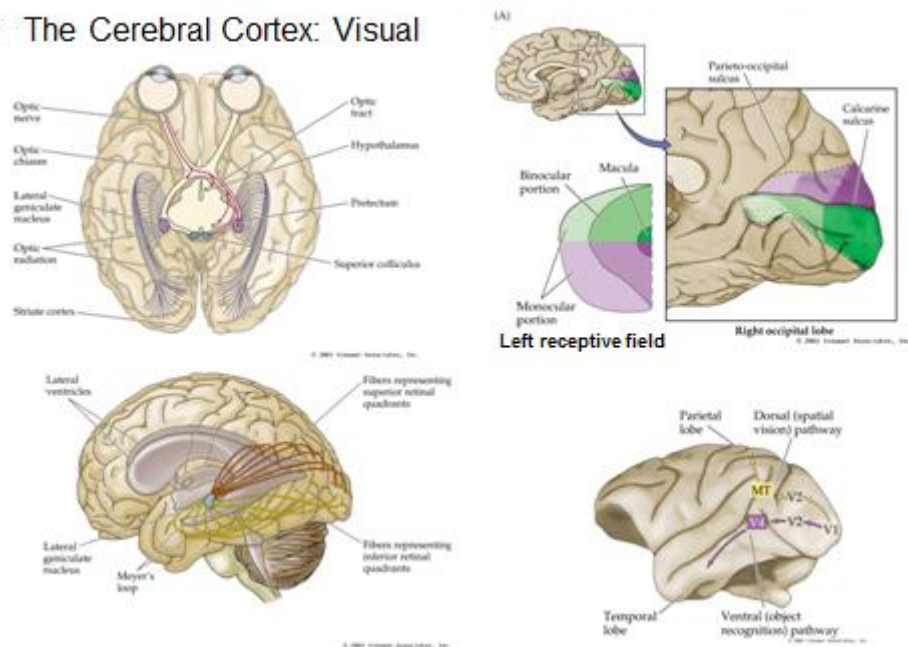
- The Cerebral Cortex: Somatic



D20

## The Organization of the Nervous system

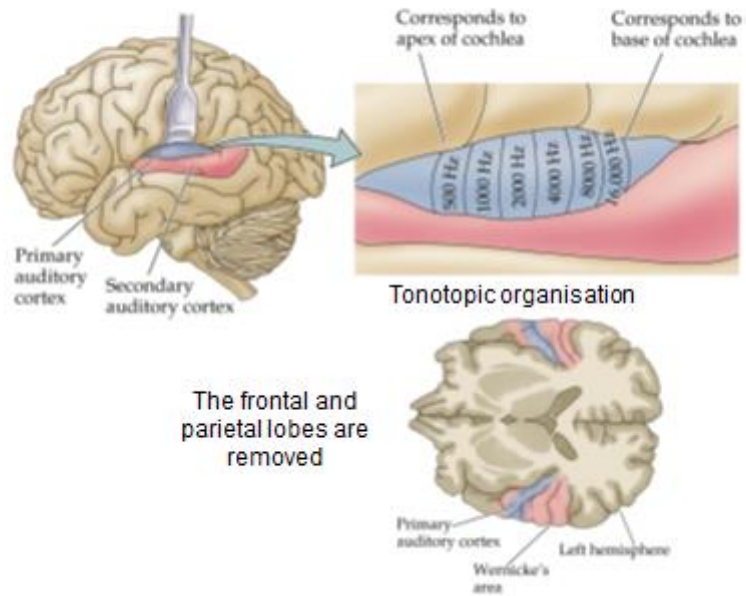
- The Cerebral Cortex: Visual



D21

### The Organization of the Nervous system

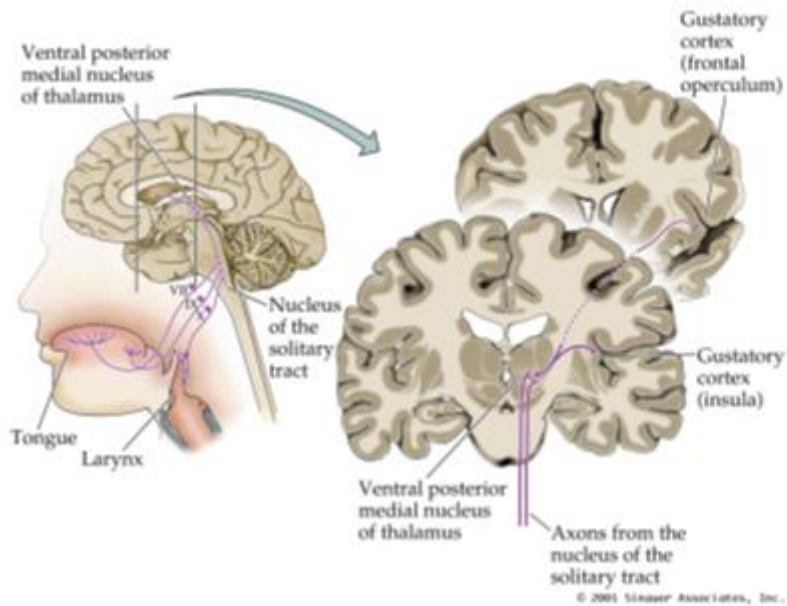
- The Cerebral Cortex: Auditory



D22

### The Organization of the Nervous system

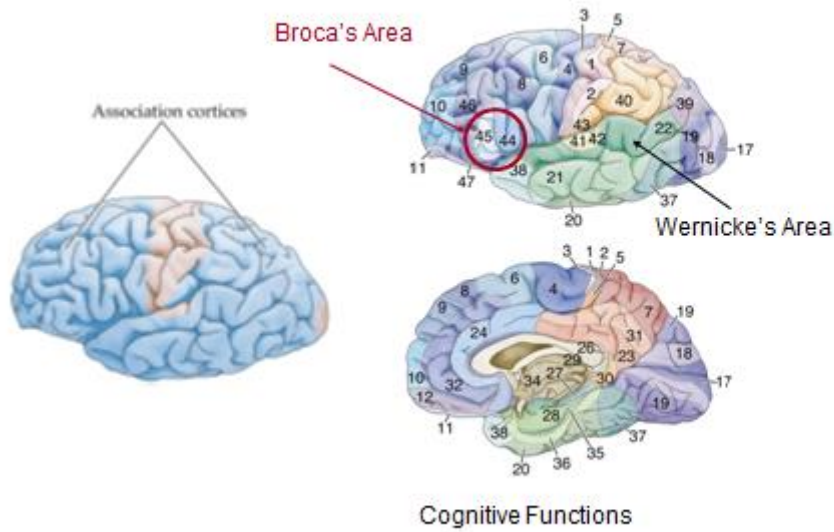
- The Cerebral Cortex: Gustative



D23

### The Organization of the Nervous system

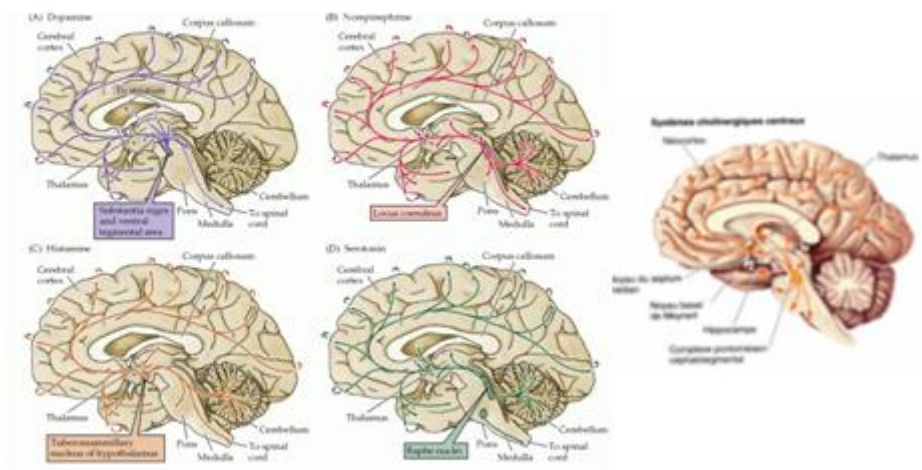
- The Cerebral Cortex: The Association Cortices



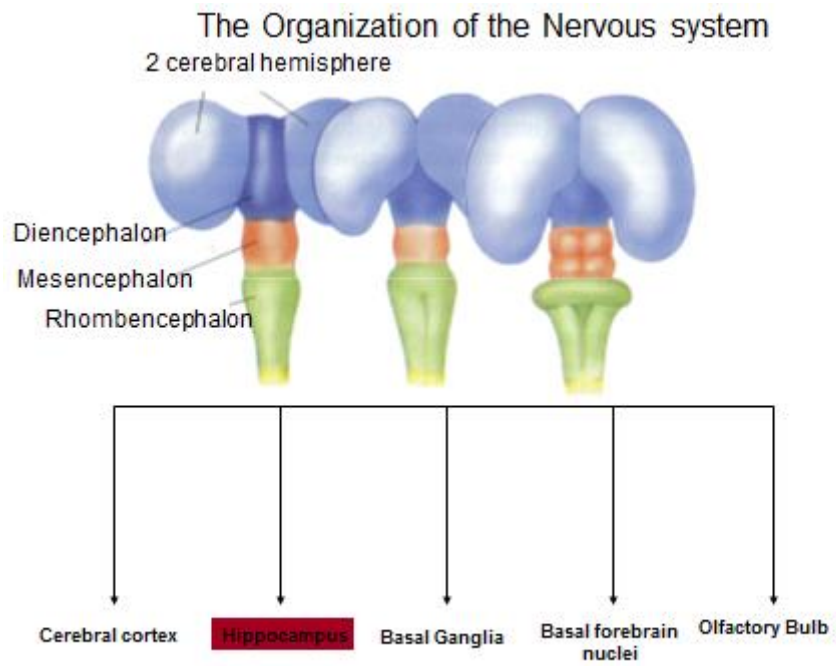
D24

### The Organization of the Nervous system

- The Cerebral Cortex



D25



D26

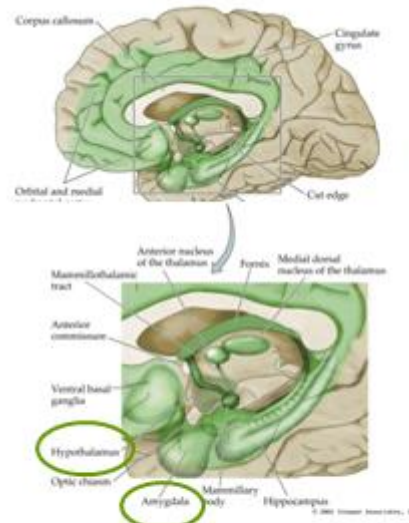
## The Organization of the Nervous system

### • The Hippocampus



It includes the hippocampus proper, the dentate gyrus, the subiculum, and is a key part of the limbic system.

- Indispensable in the process of anterograde memory processing
- Encode and recall information
- Highly connected to the orbital-medial prefrontal cortex and amygdalla

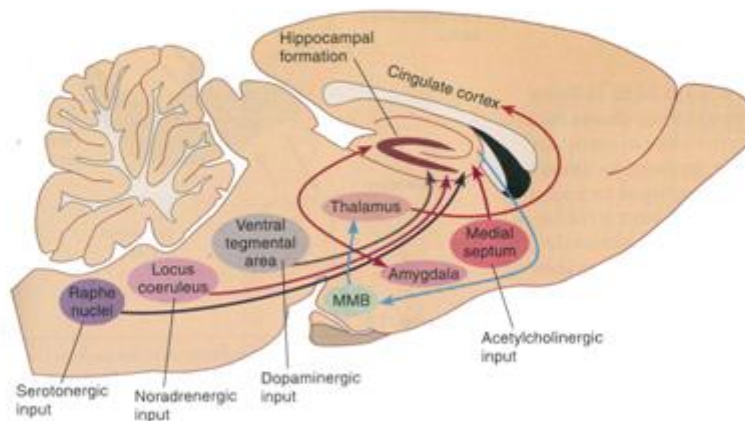


Amygdalla and the hypothalamus are involved in emotional behaviour and aggressive behaviour.

D27

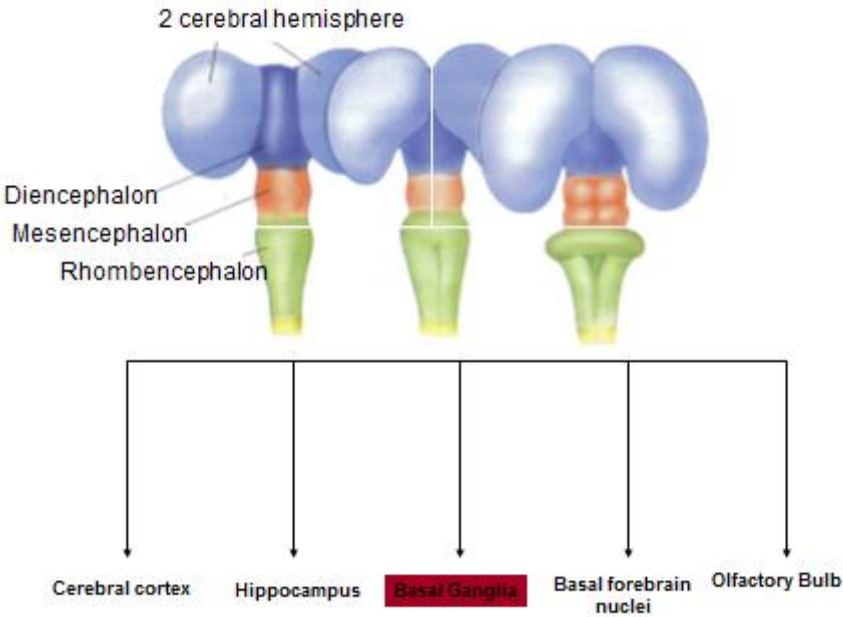
## The Organization of the Nervous system

### • The Hippocampus: Innervation



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# The Organization of the Nervous system



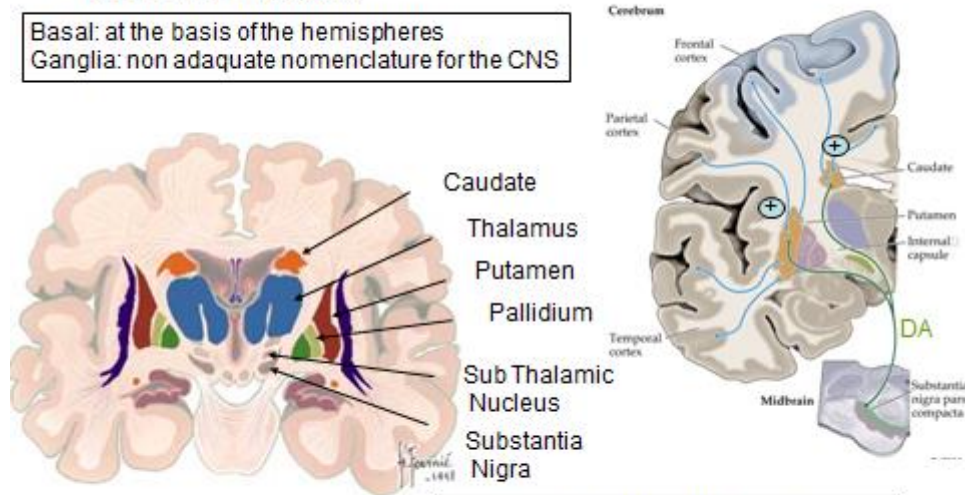
D29



# The Organization of the Nervous system

## • The Basal Ganglia

Basal: at the basis of the hemispheres  
Ganglia: non adequate nomenclature for the CNS

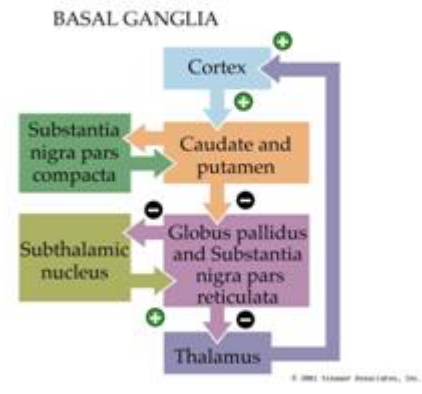
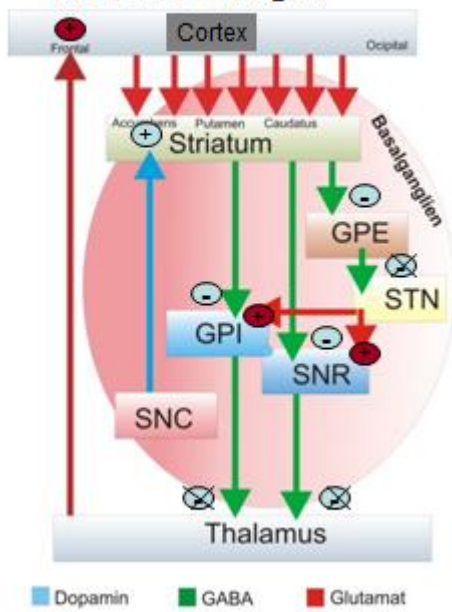


Dynamic system of subcortical structures that interact each other with a proper rhythmicity and with a parts of thalamus and cortex

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# The Organization of the Nervous system

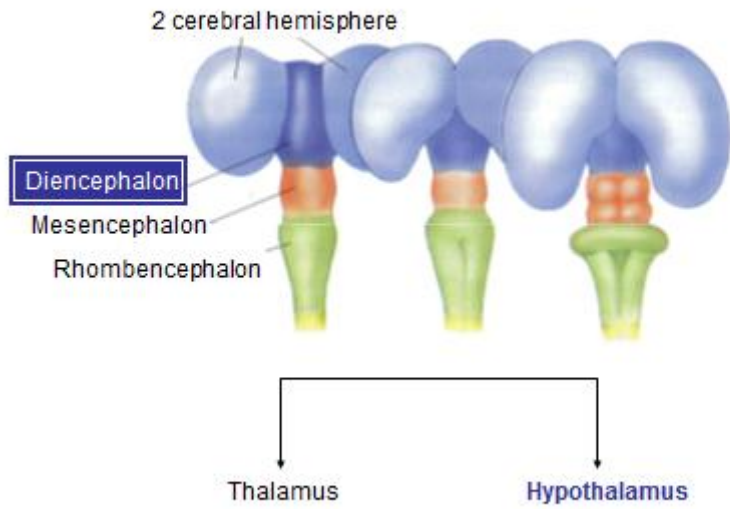
## • The Basal Ganglia



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The Organization of the Nervous system

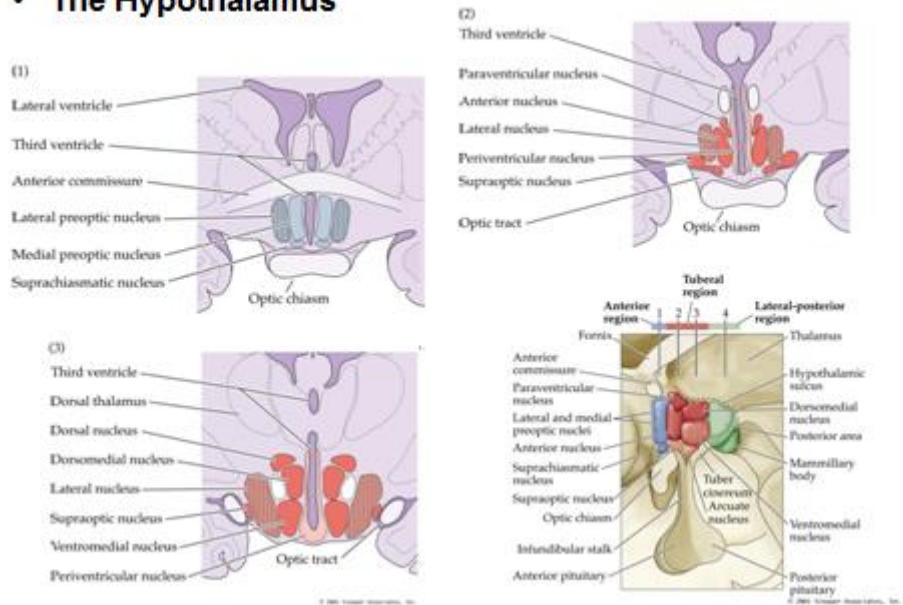
• The Diencephalon:



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The Organization of the Nervous system

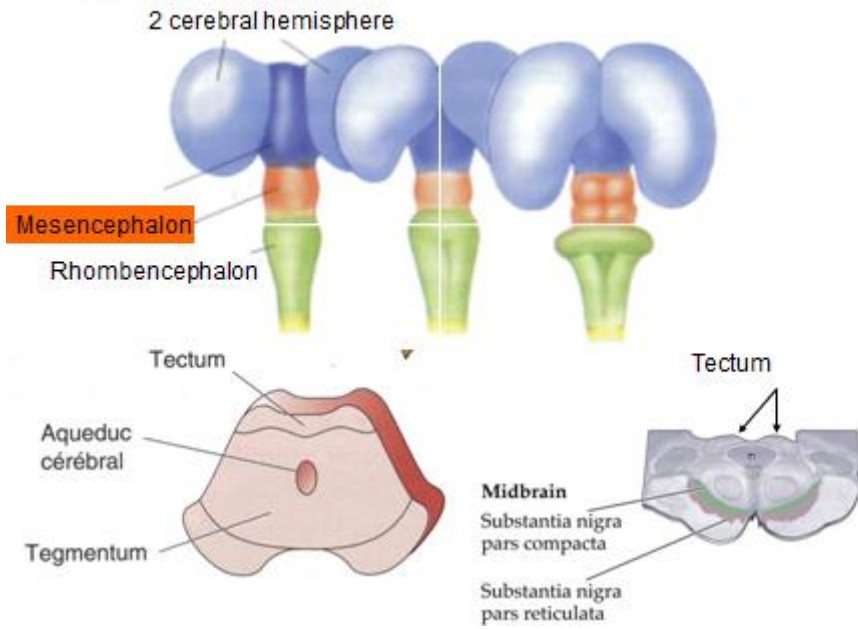
• The Hypothalamus



D33

The Organization of the Nervous system

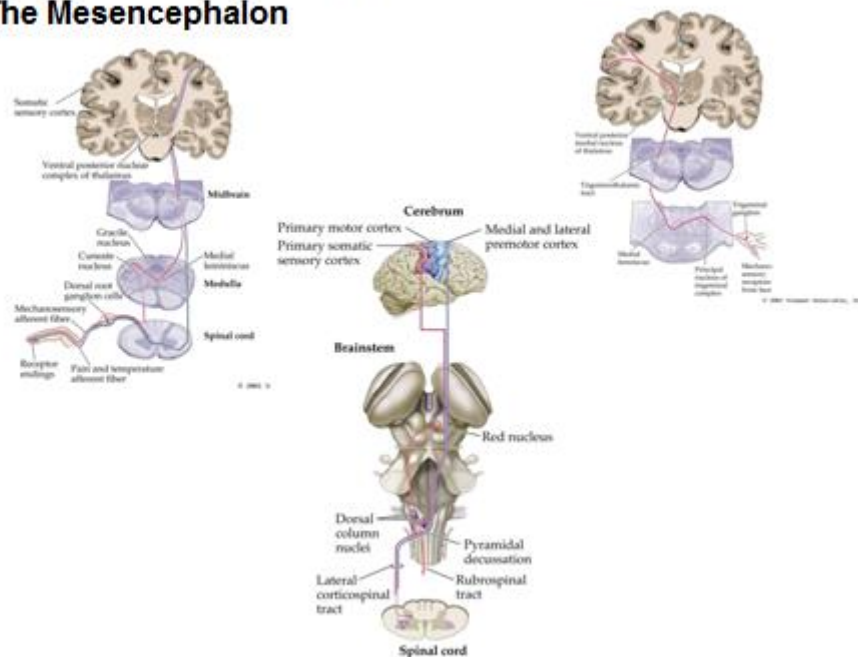
• The Mesencephalon



D34

The Organization of the Nervous system

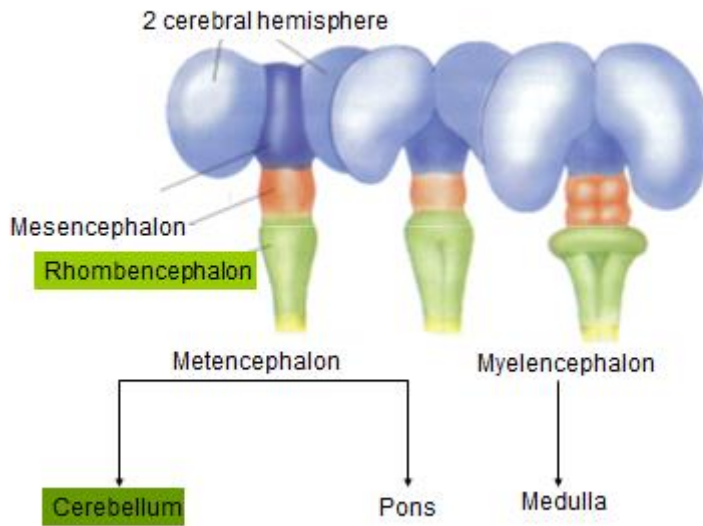
• The Mesencephalon



D35

### The Organization of the Nervous system

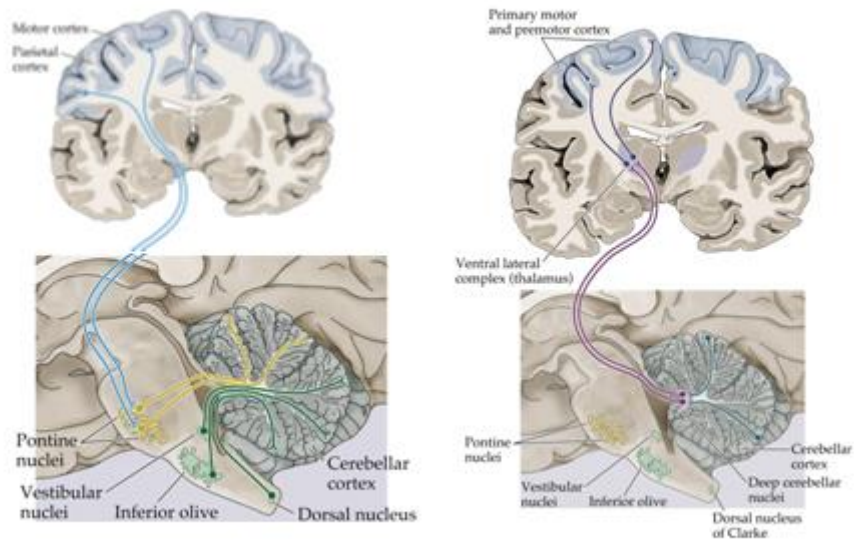
- **The Caudal Brain**



D36

### The Organization of the Nervous system

- **The Cerebellum**



D37

## The Organization of the Nervous system

- **The Caudal Brain**

