

# *What Does Your Brain Look Like?*



## *Brain Anatomy*

周韻家

Yun-Chia Chou

Institute of Neuroscience

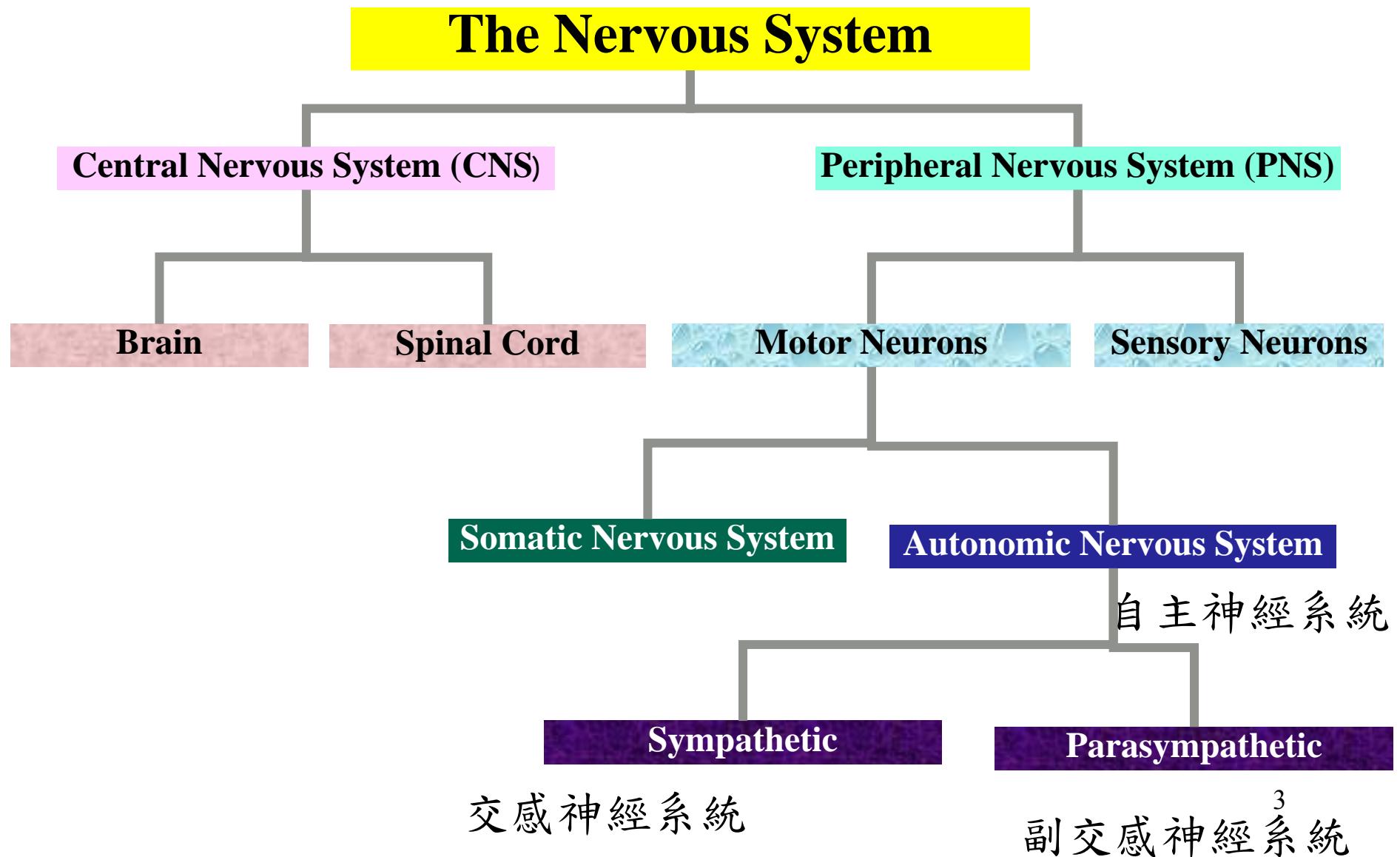
National Yang-Ming University

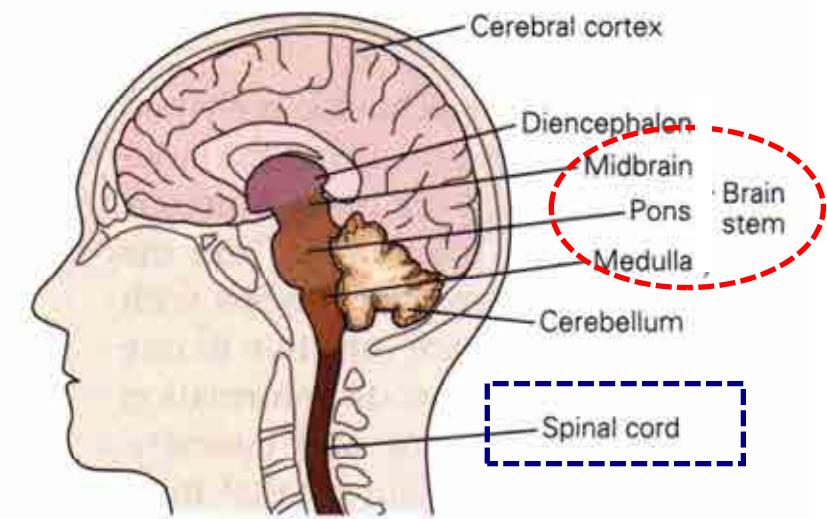
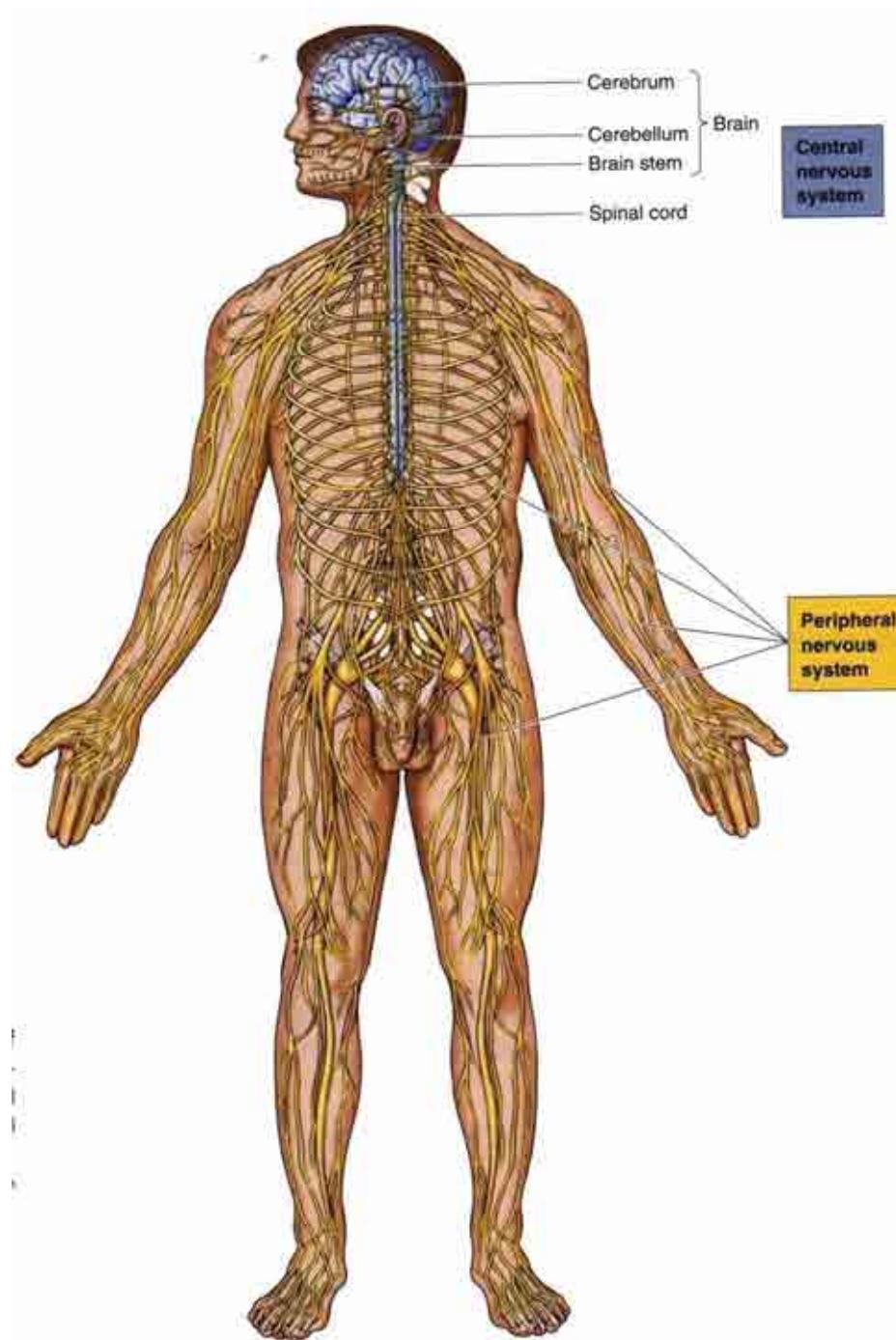


# Functional Organization of Nervous System

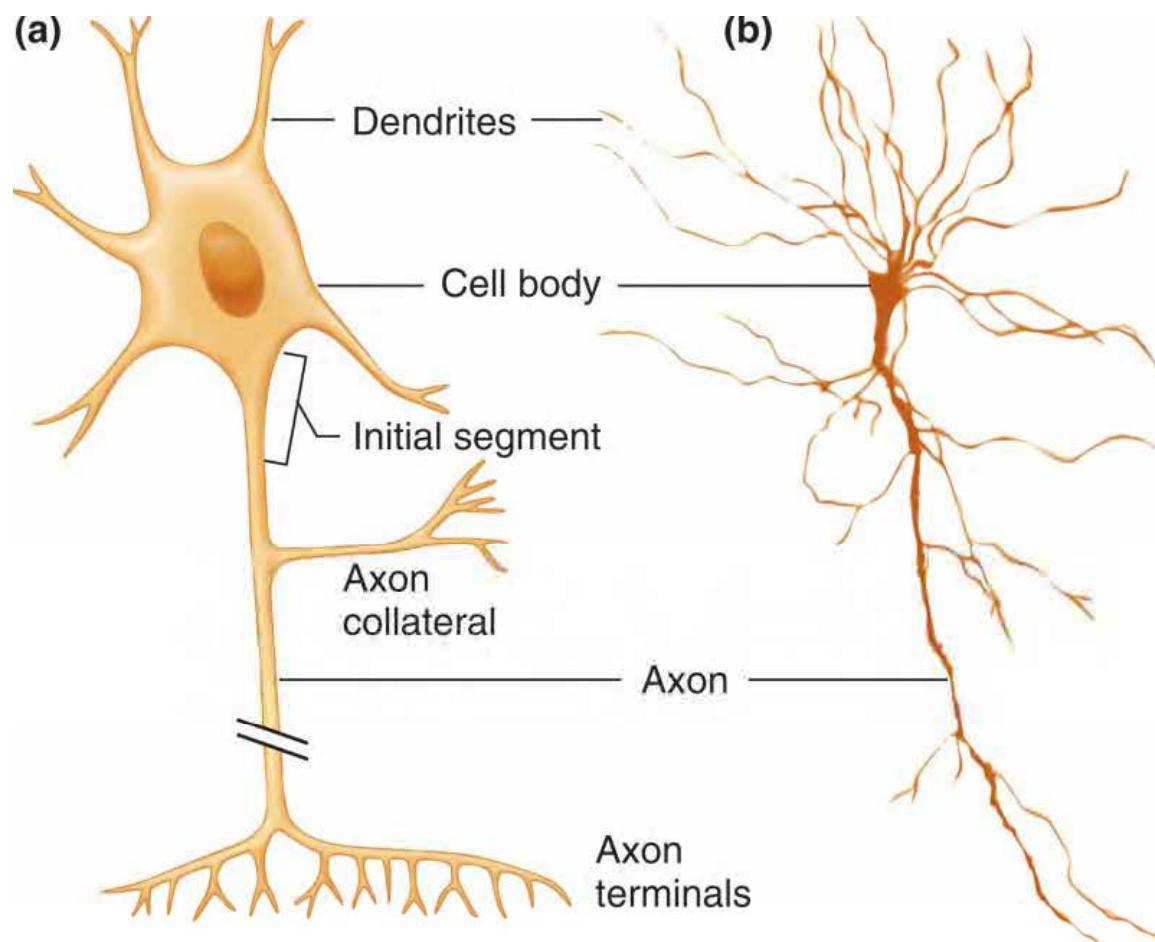
- ✿ Sensory system
- ✿ Motor system
- ✿ Association areas of cerebral cortex

# Organization of the Nervous System





# Structure of Neurons



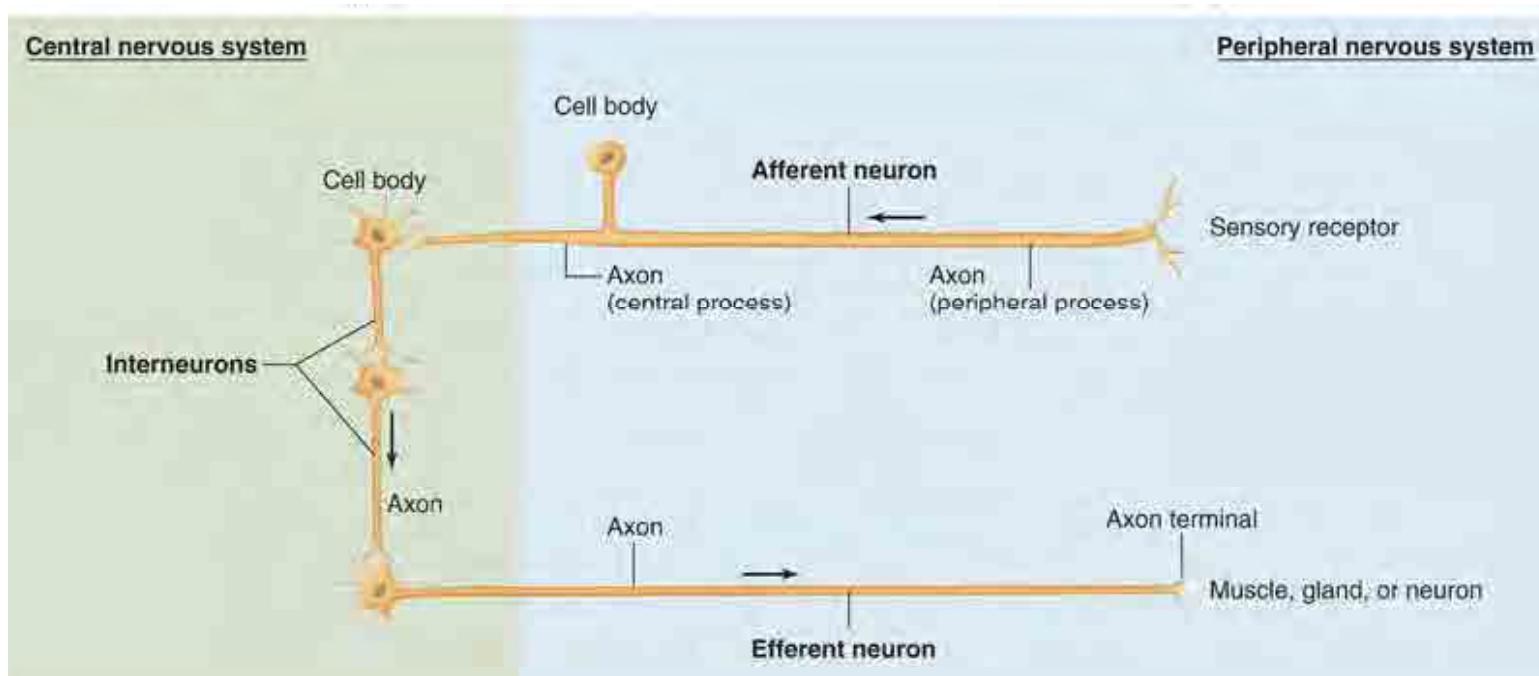
**Neurites (processes, fibers):**

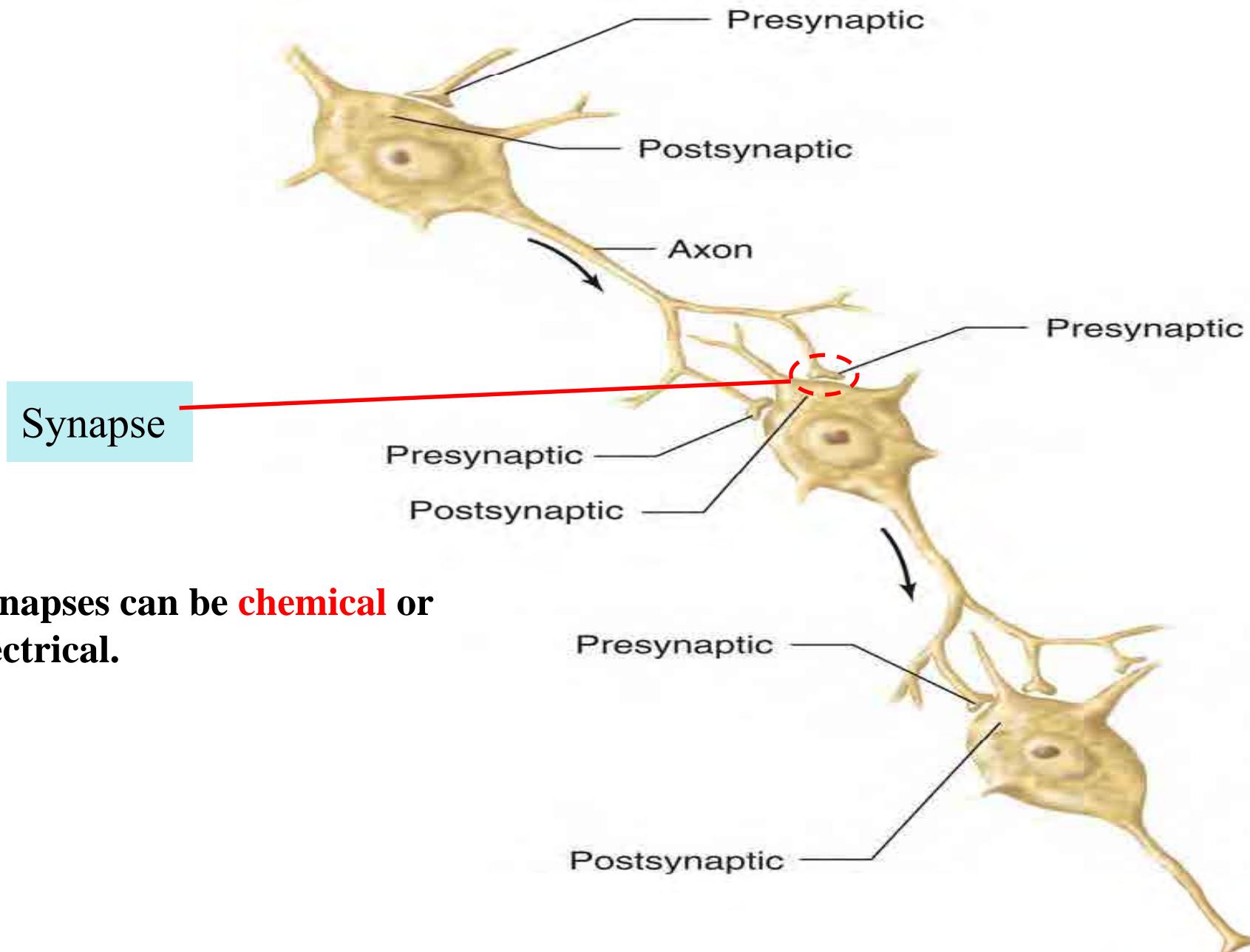
**Axons (軸突): to deliver information**

**Dendrites (樹突): to receive information**

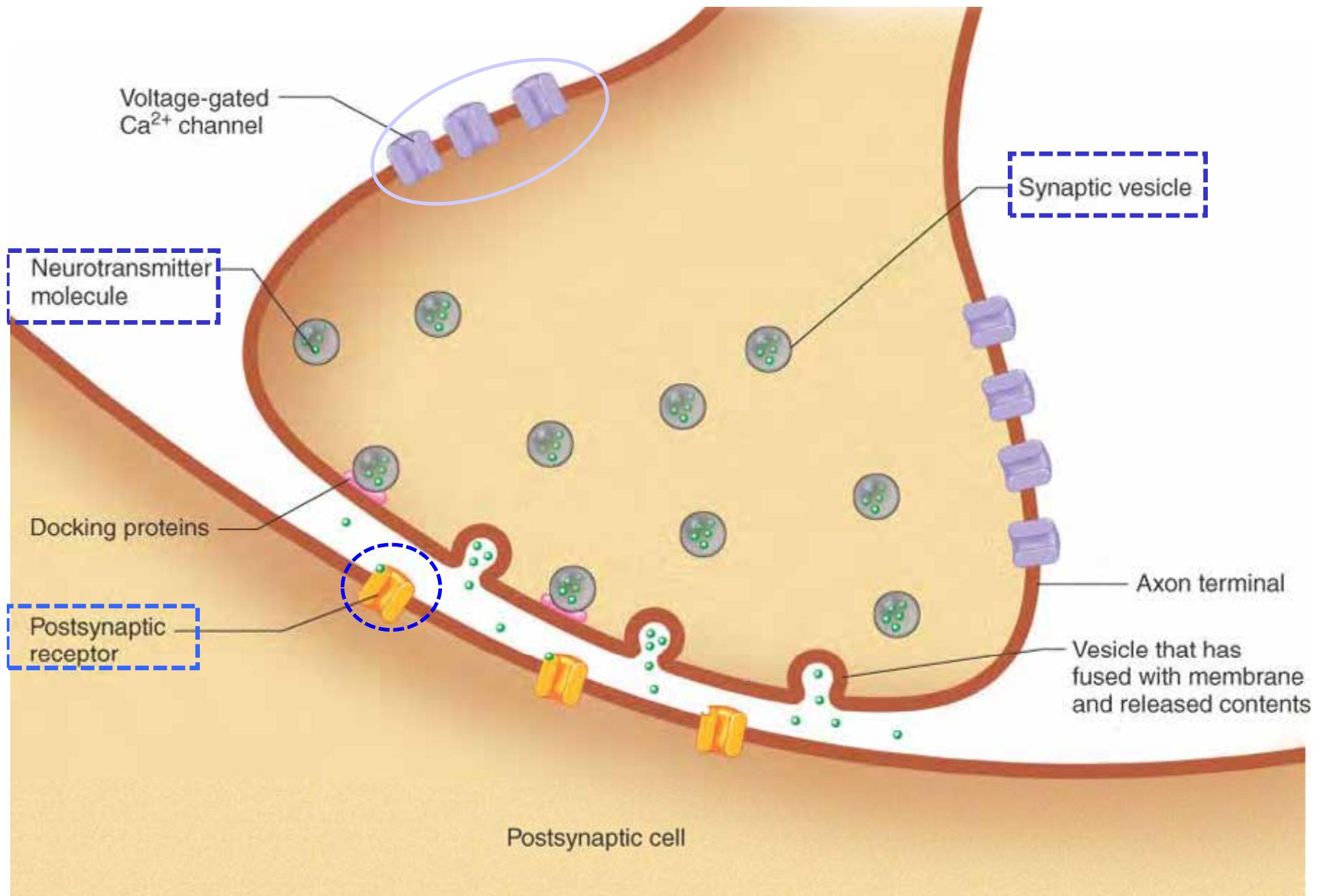
# CNS

# PNS

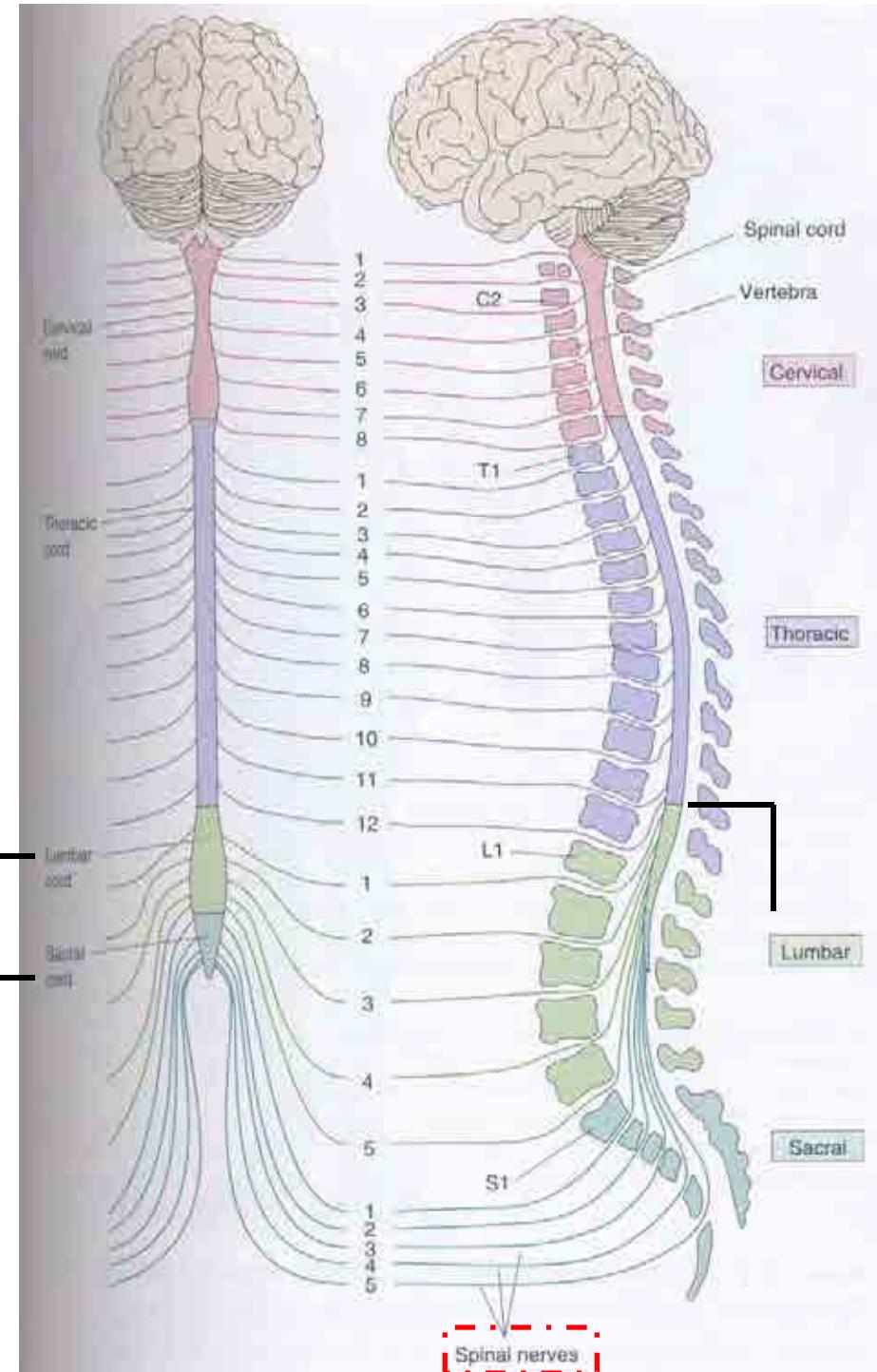
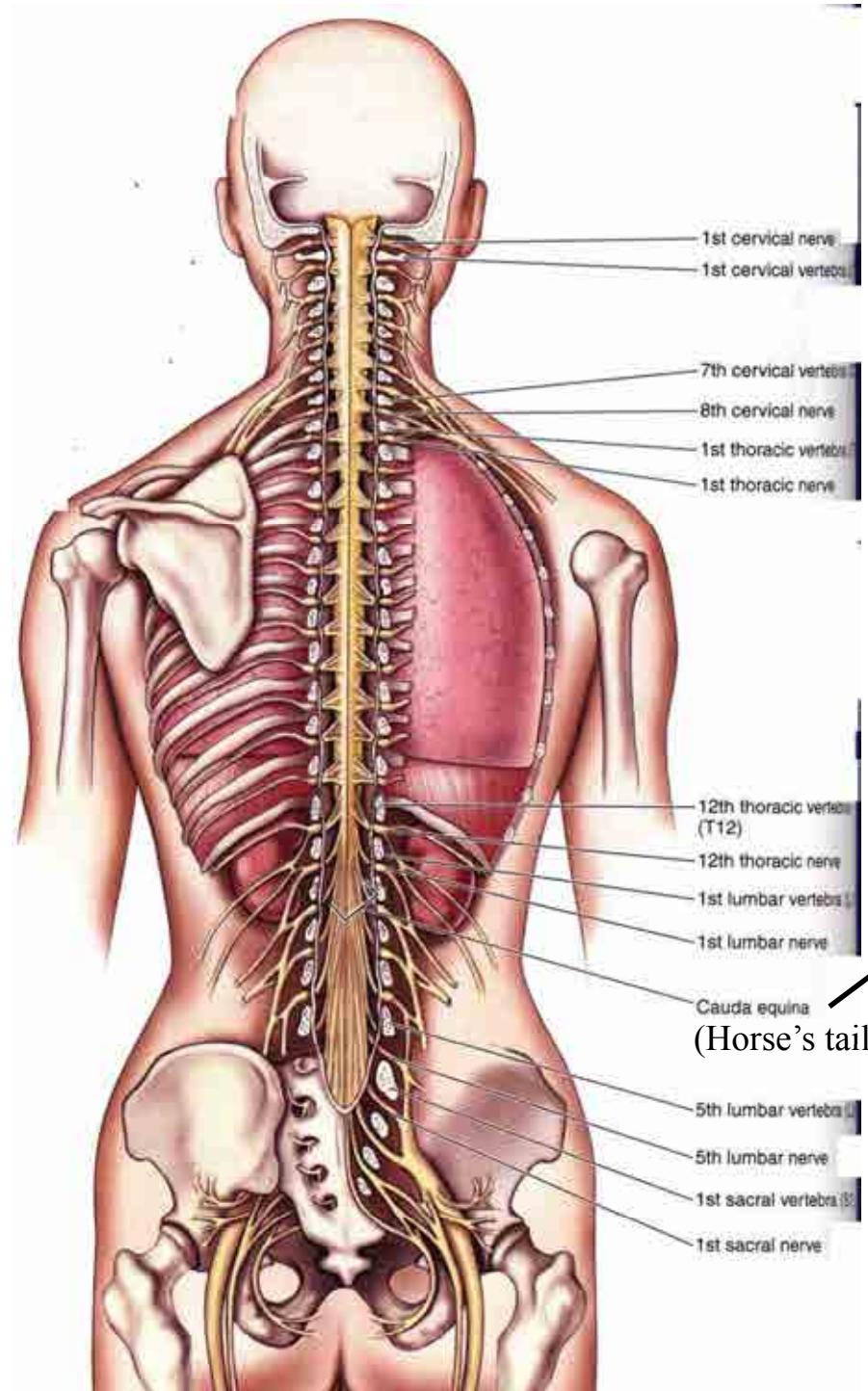


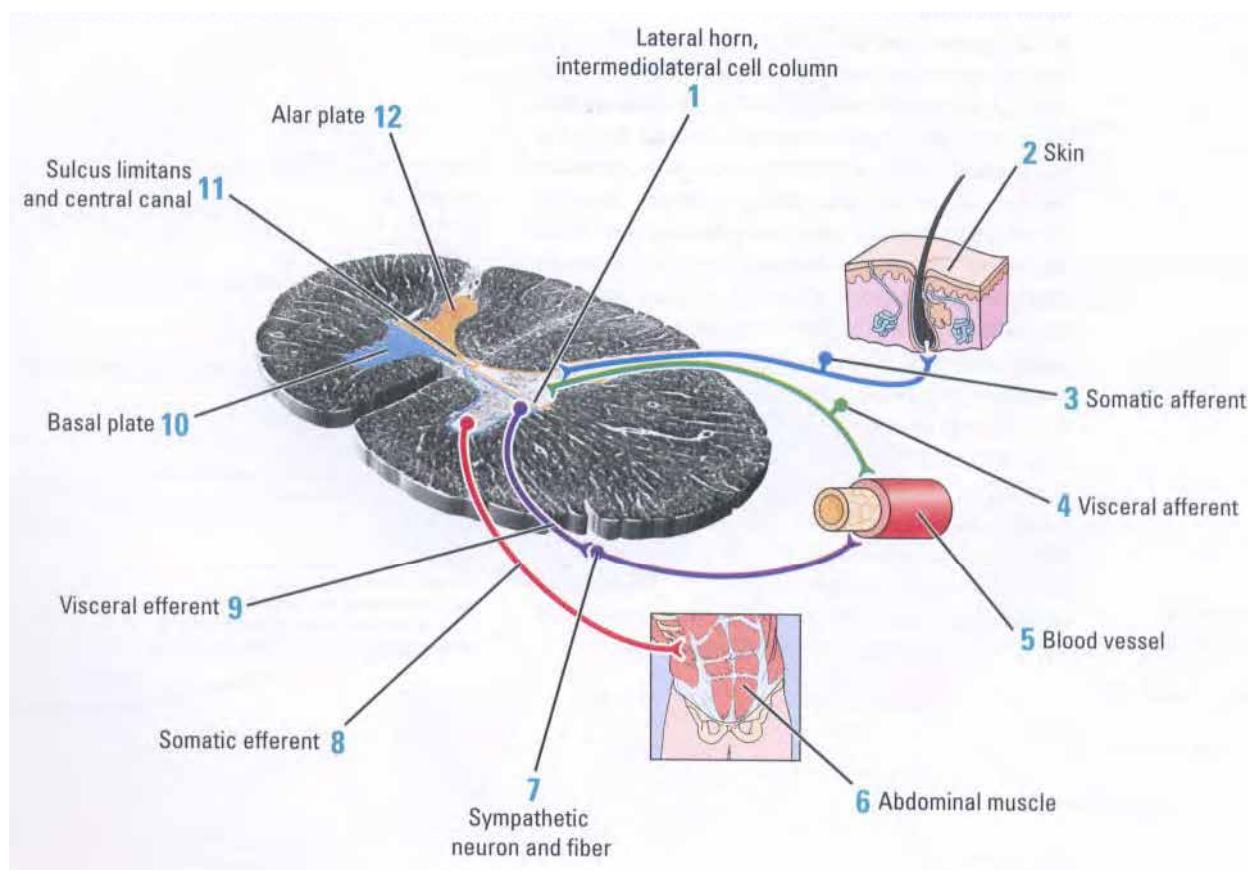
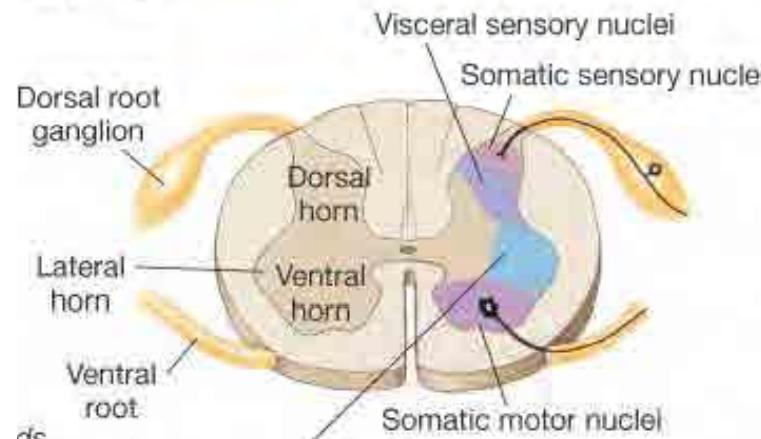


**Synapses can be **chemical** or electrical.**

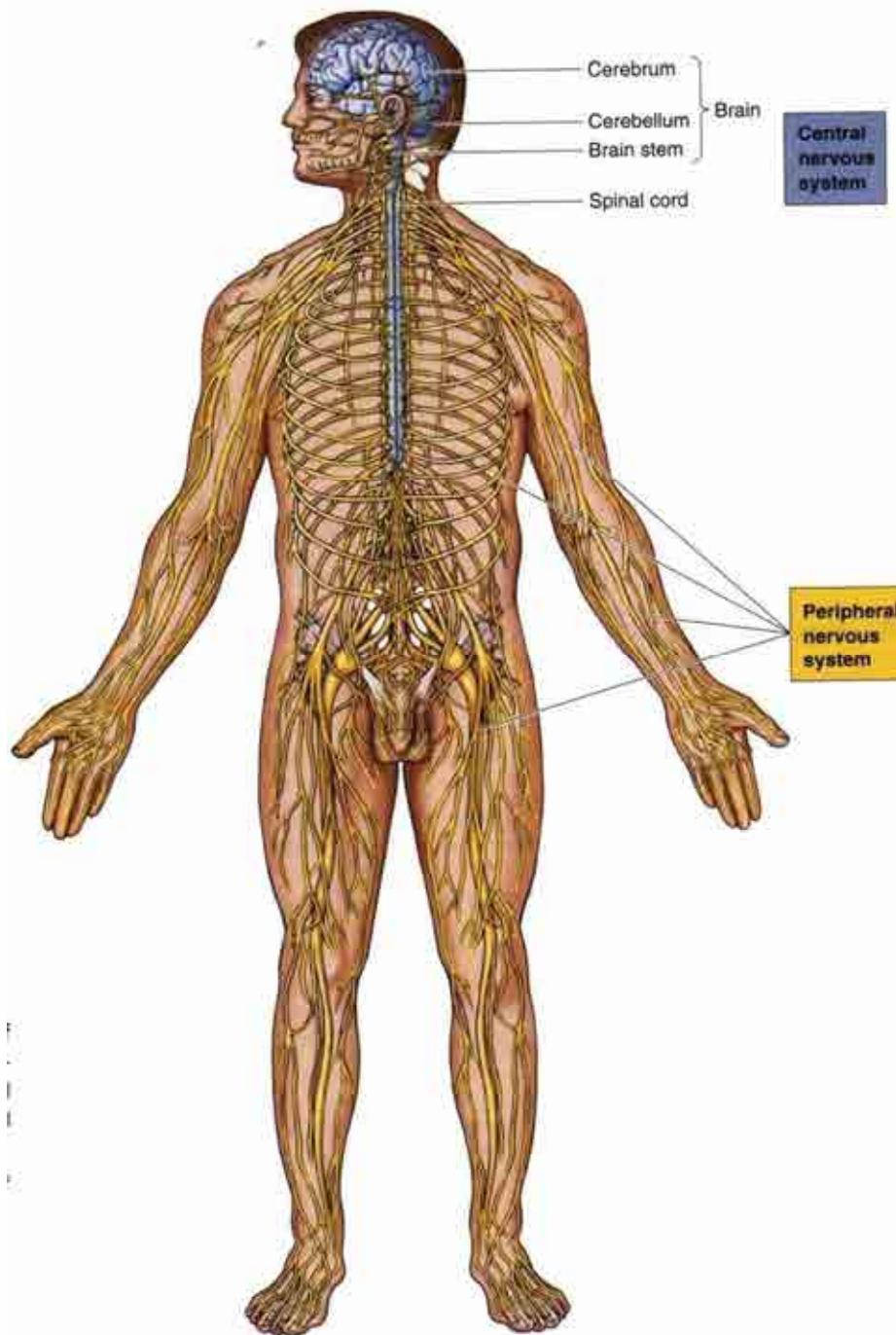


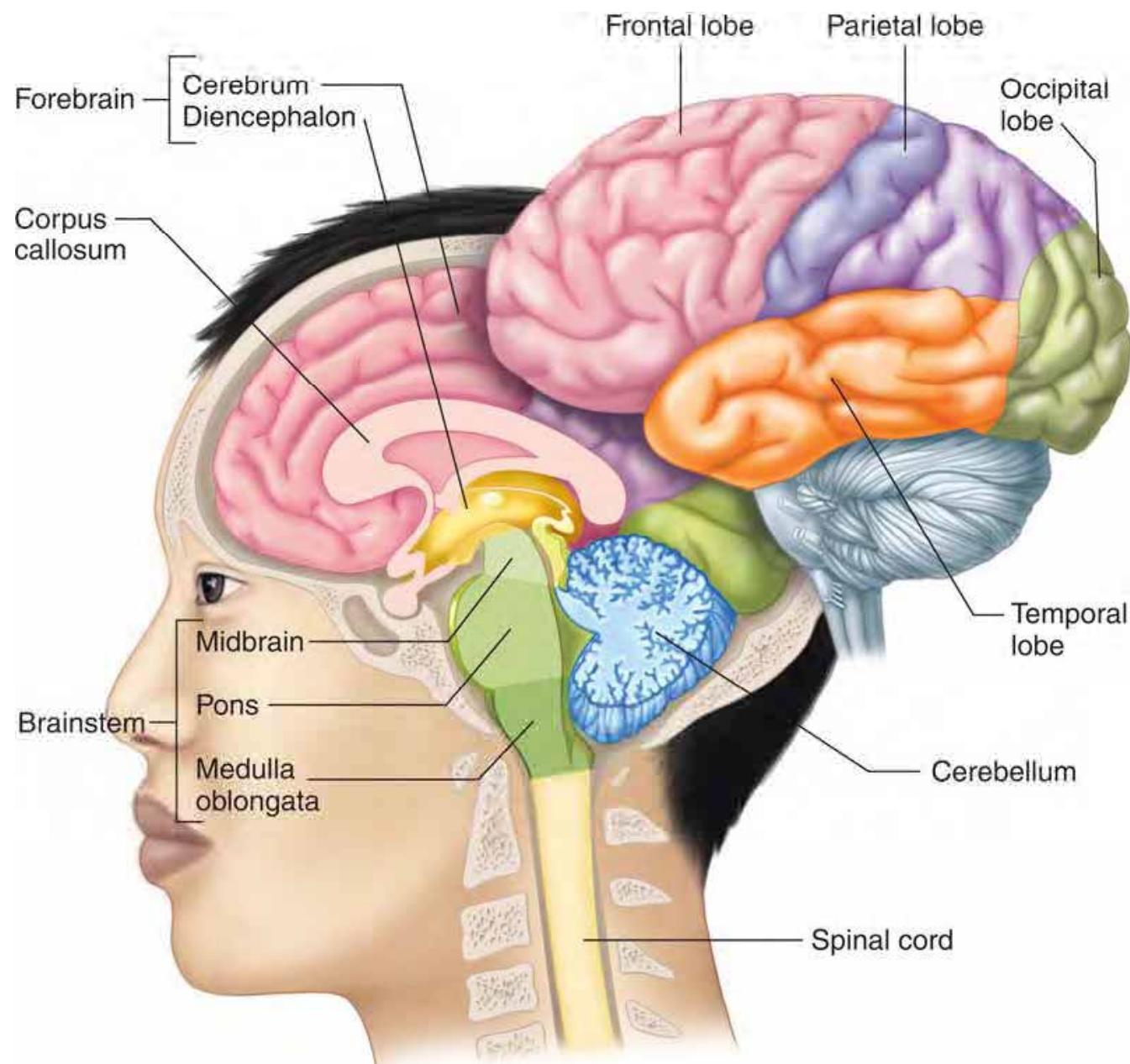
# Spinal Cord

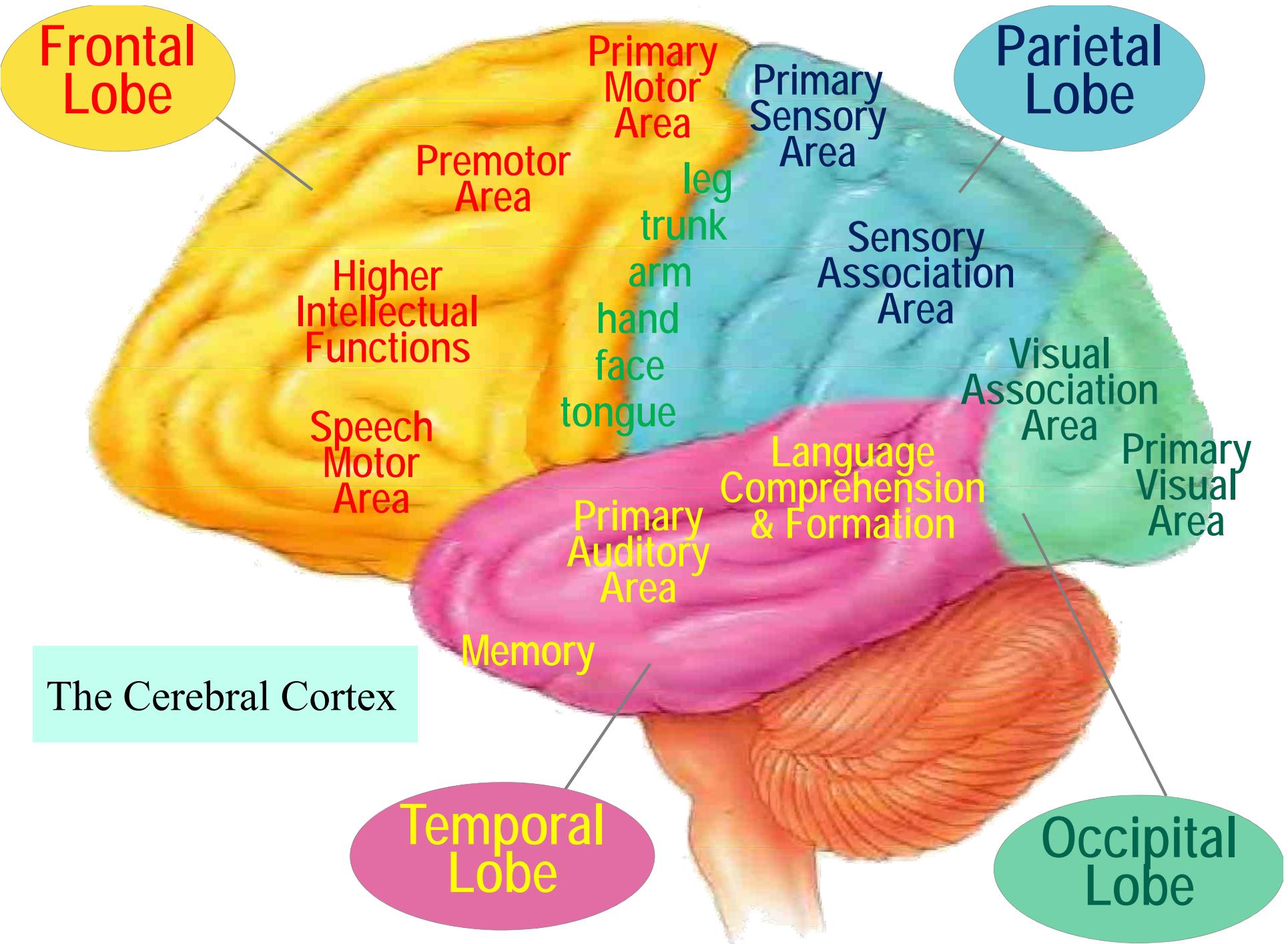




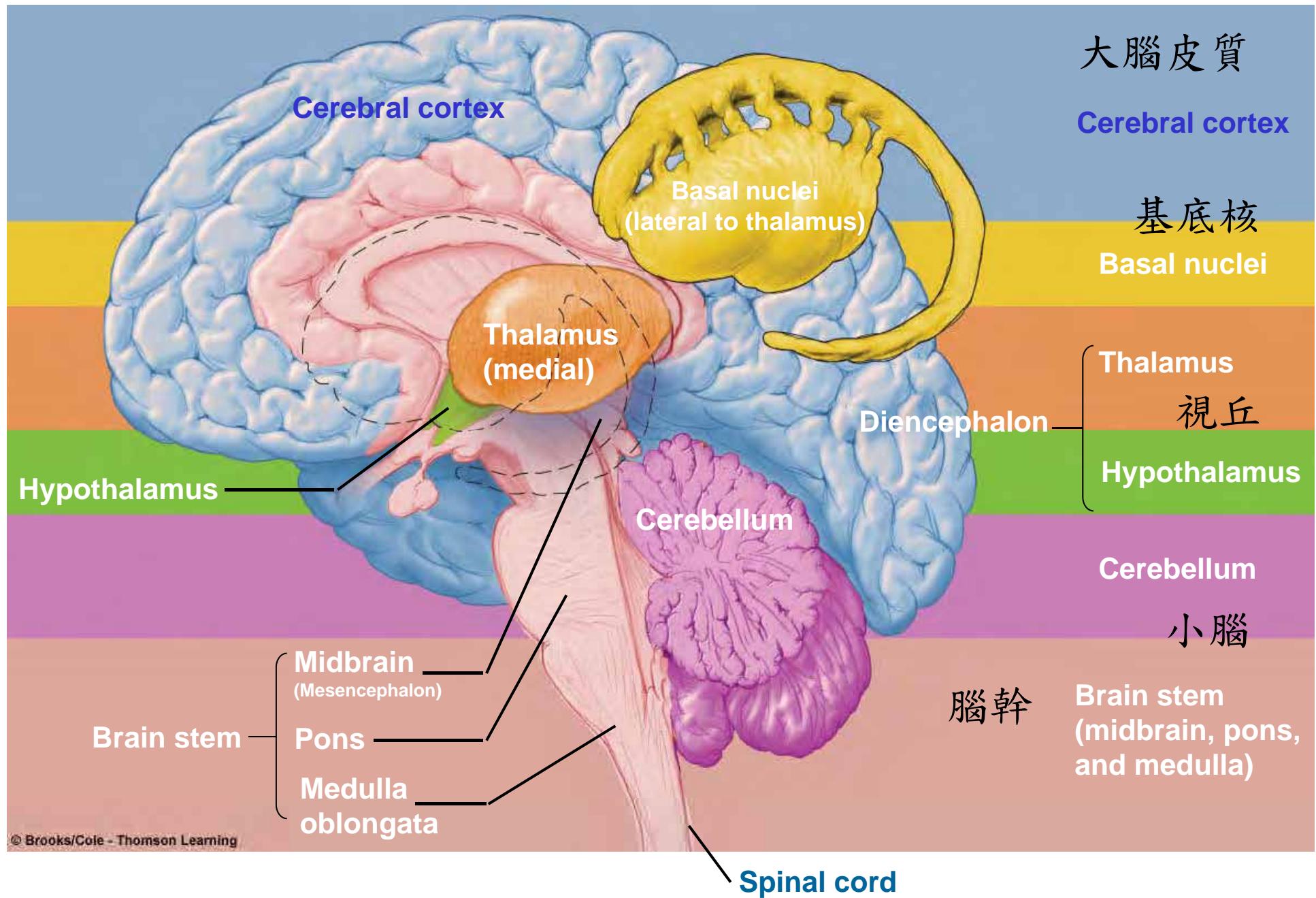
# Brain





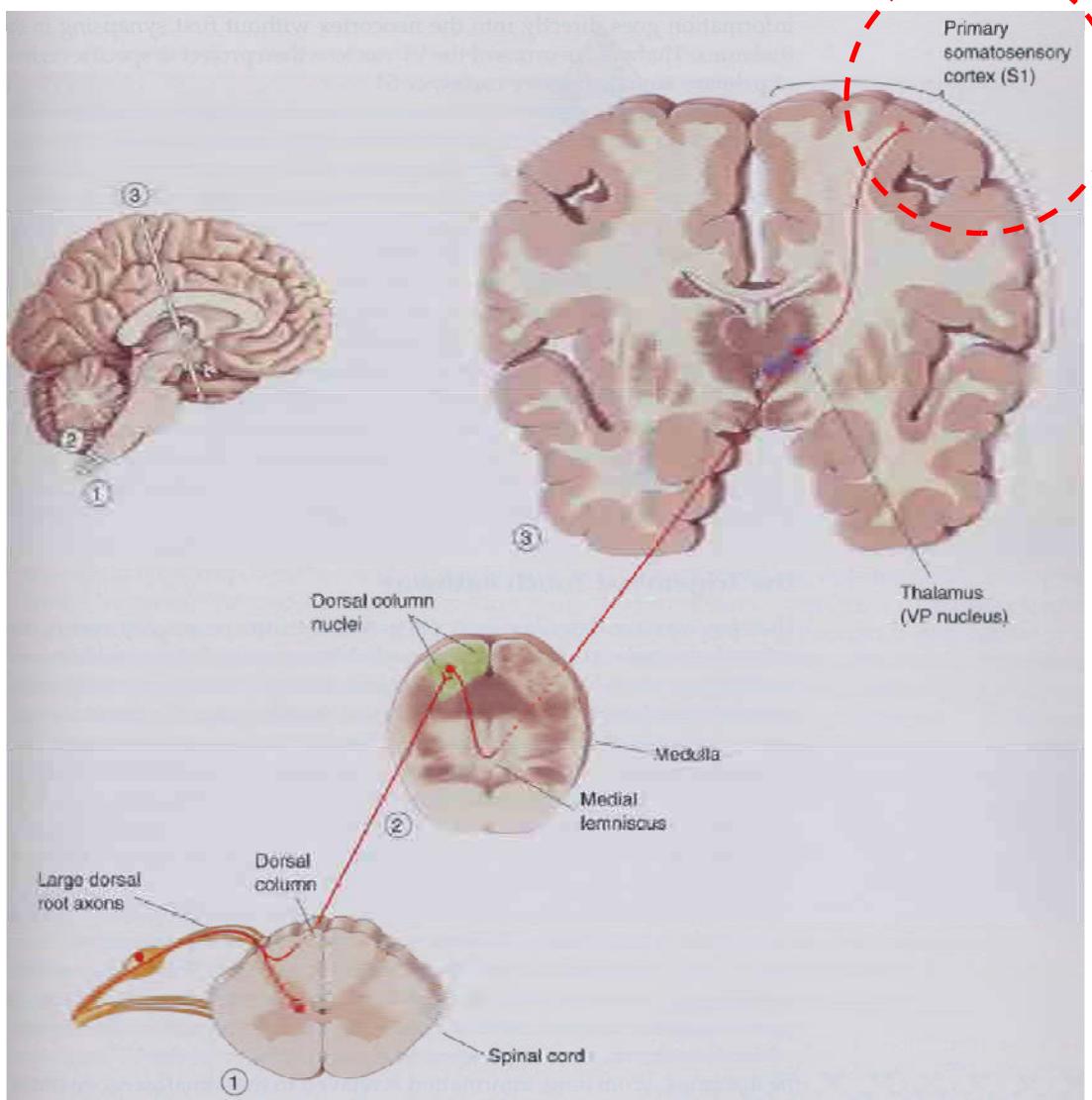


# Brain components

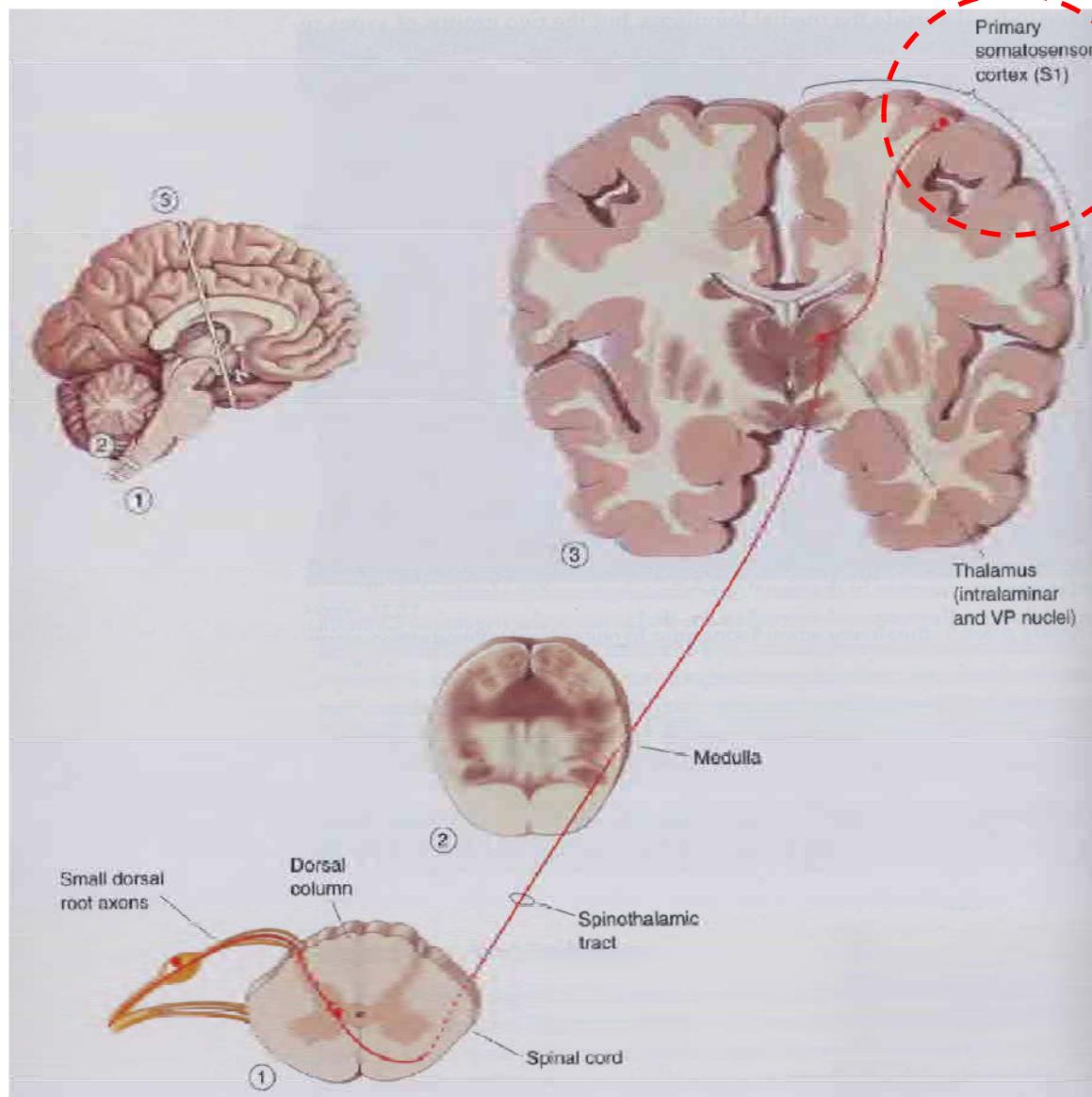


## Dorsal column-medial lemniscal pathway

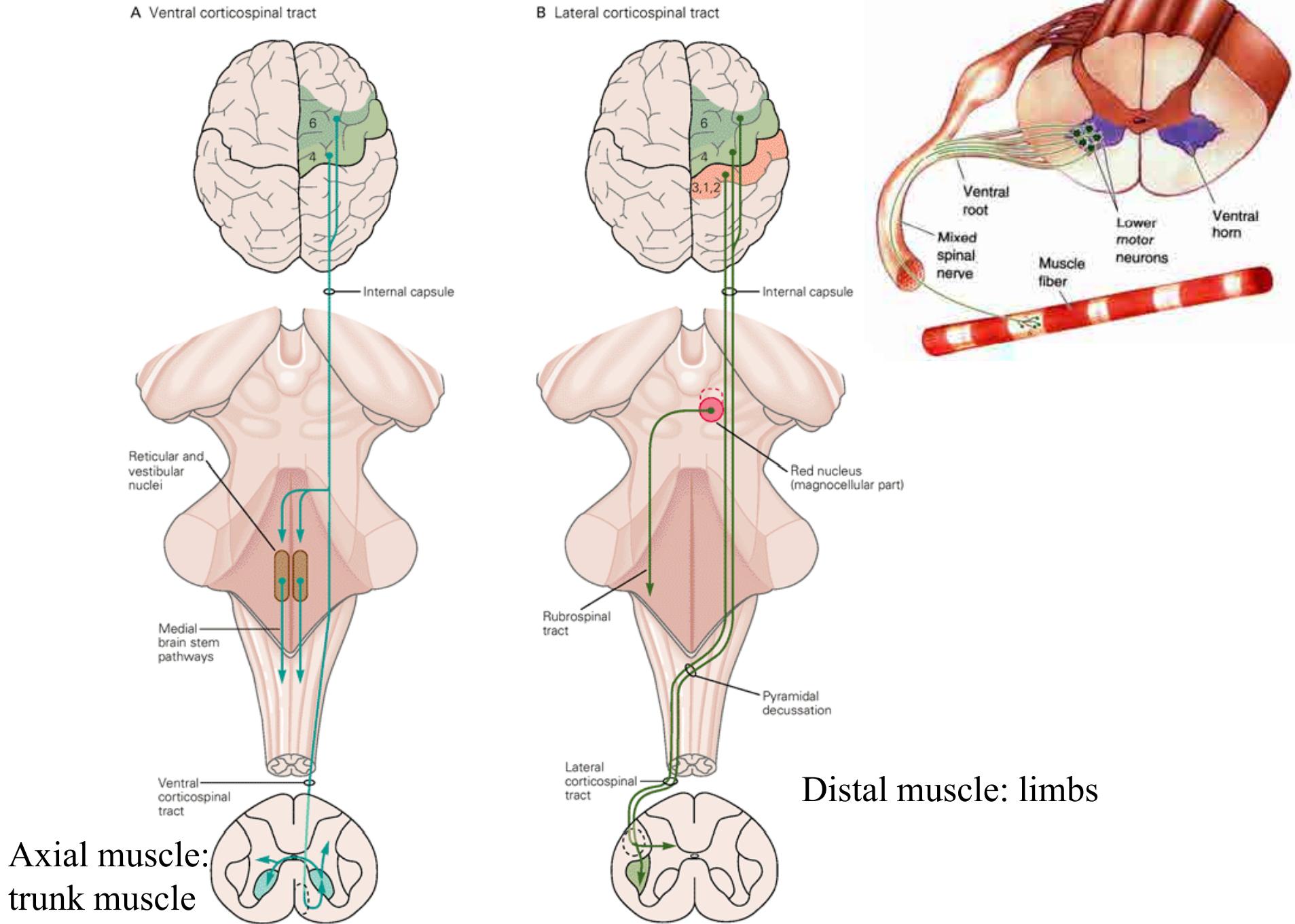
1. Touch sensation
2. Position sensation (proprioception)

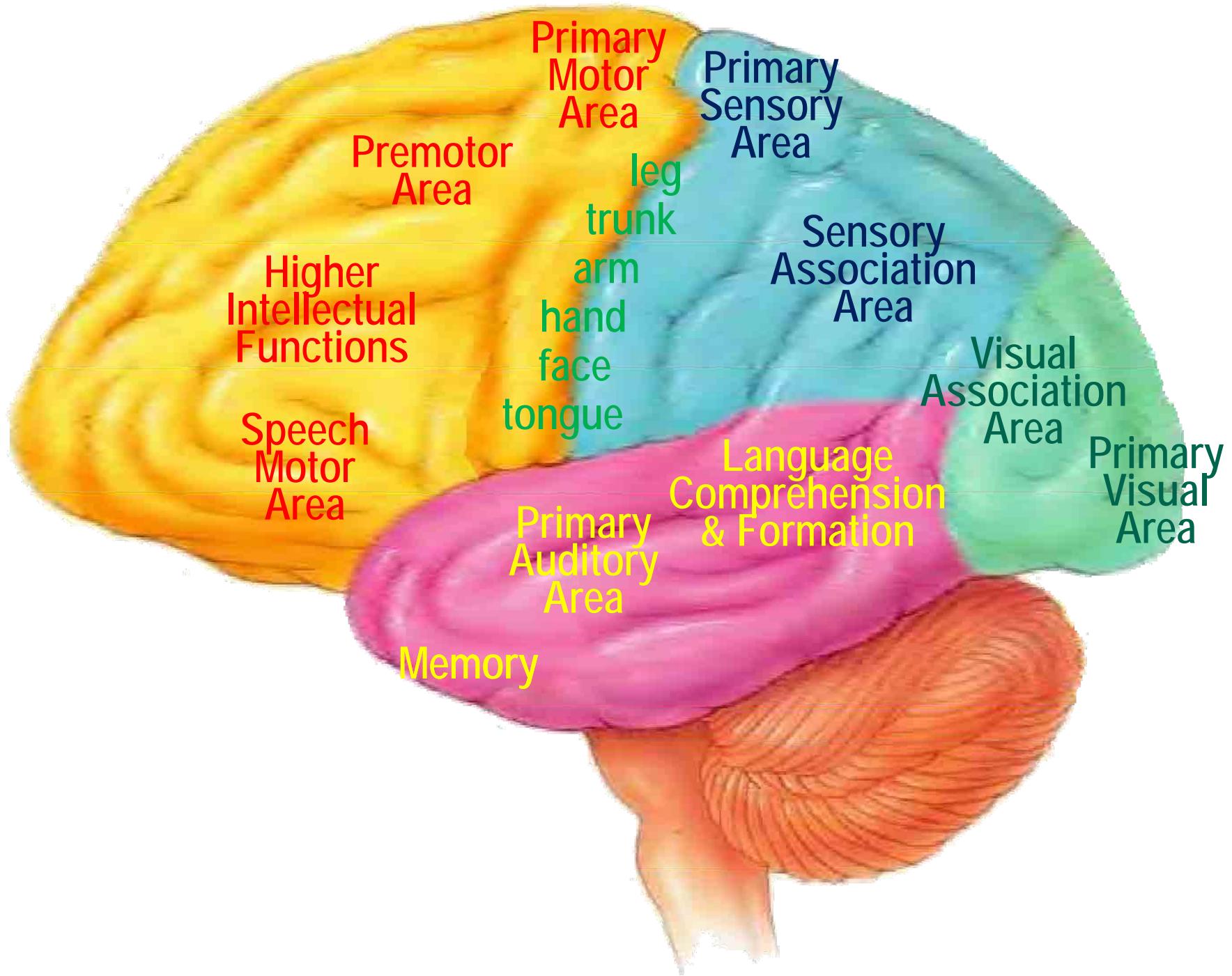


## Spinothalamic pathway

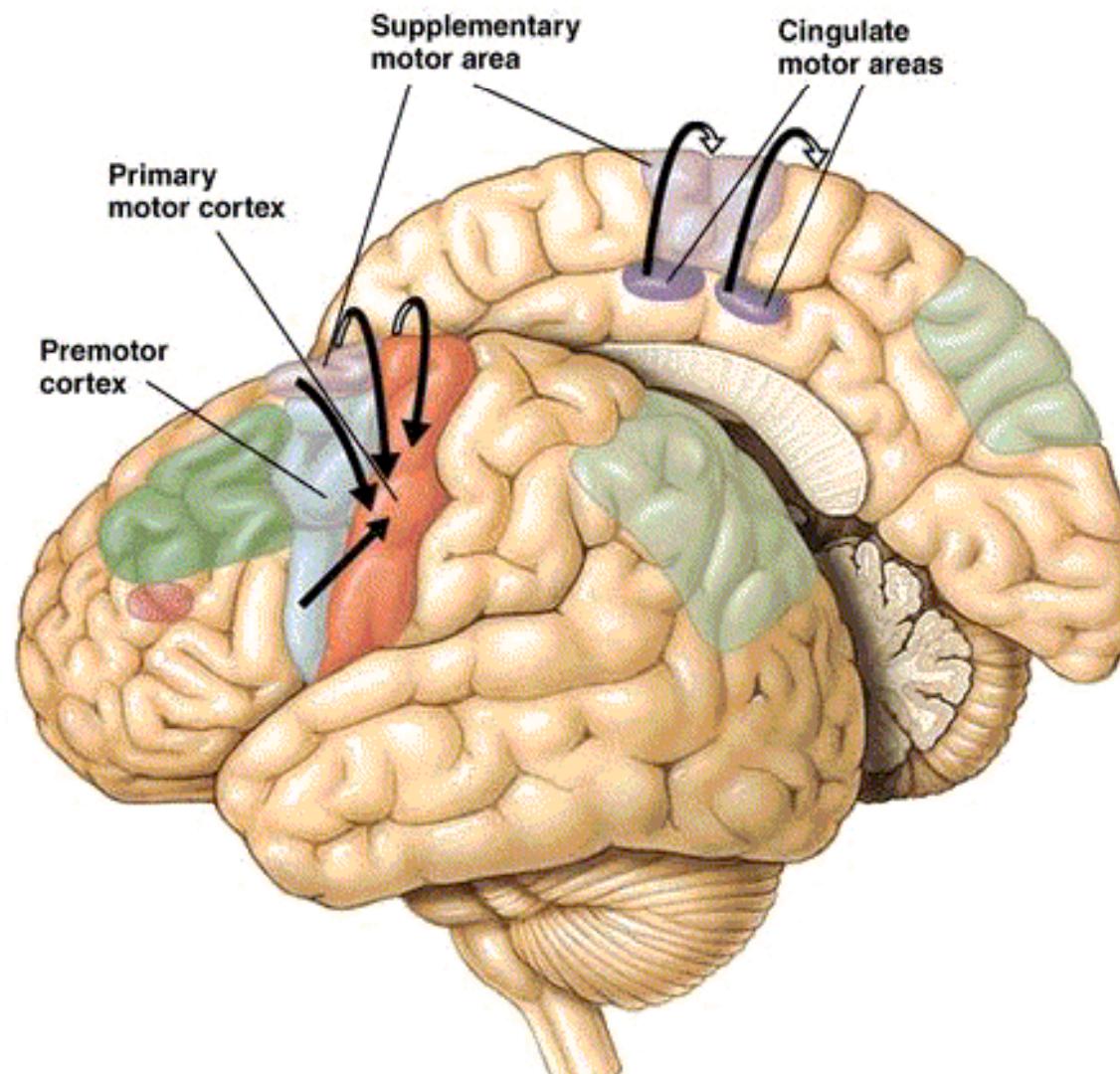


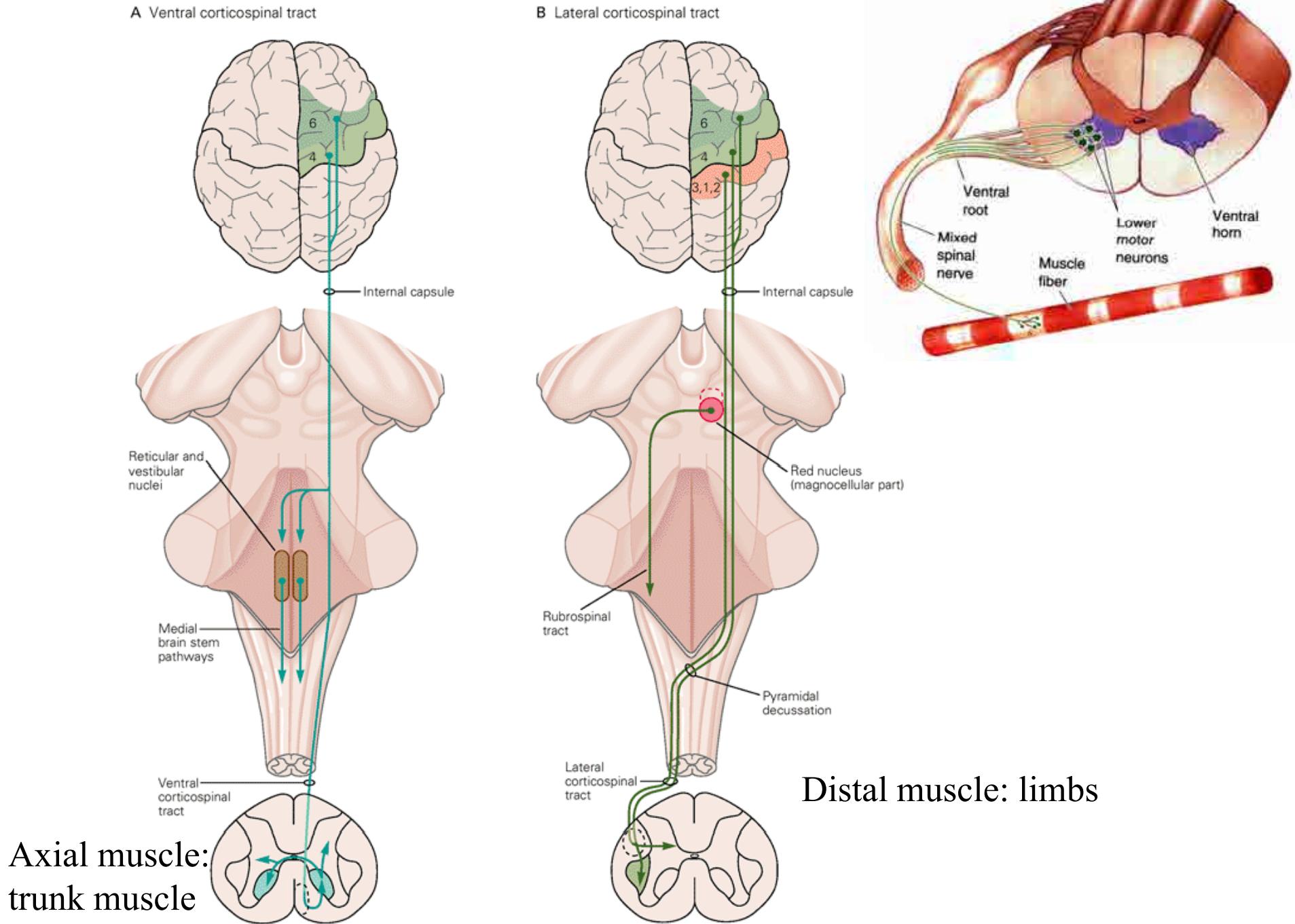
1. Pain sensation
2. Temperature sensation



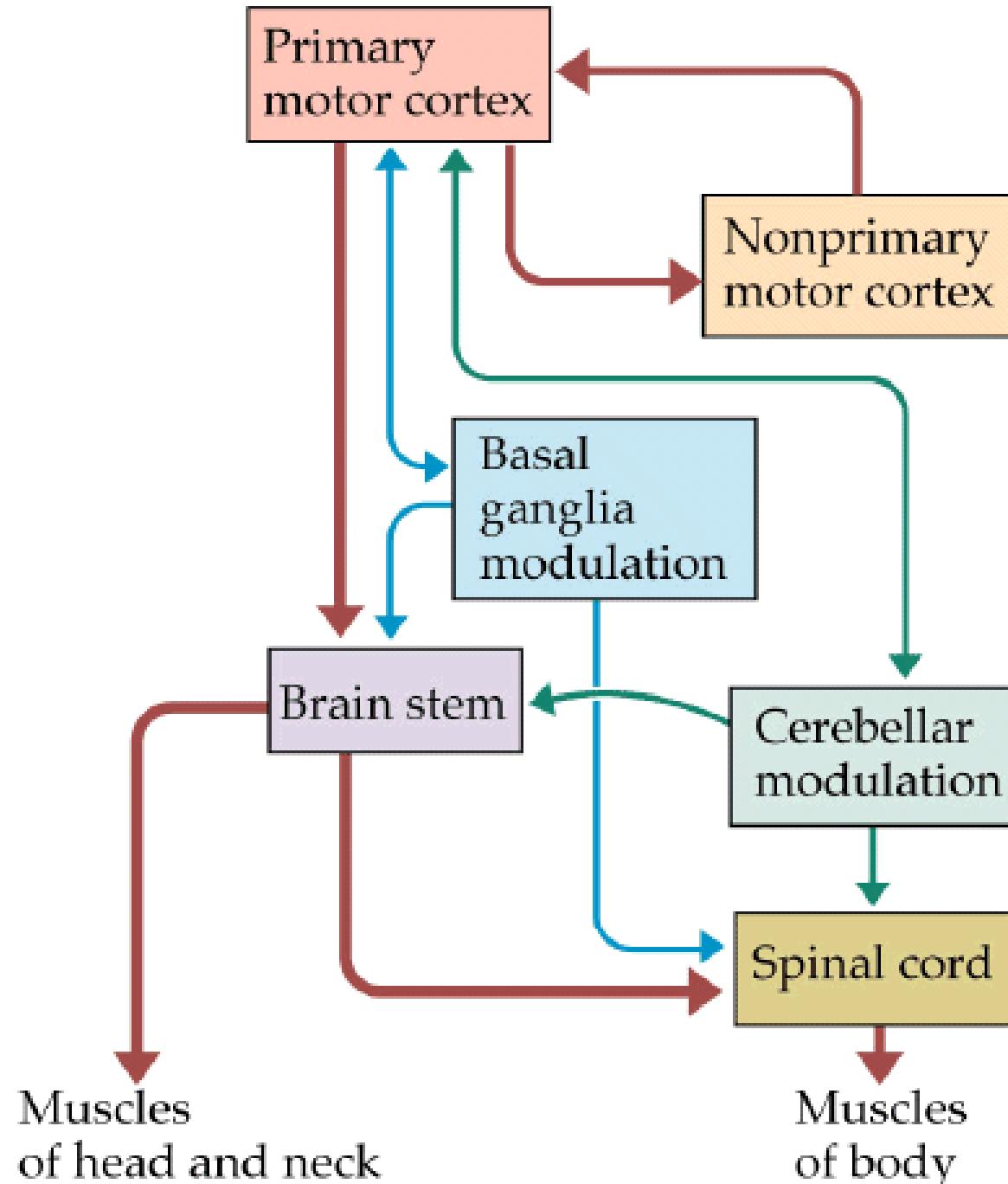


# Secondary Motor Cortex





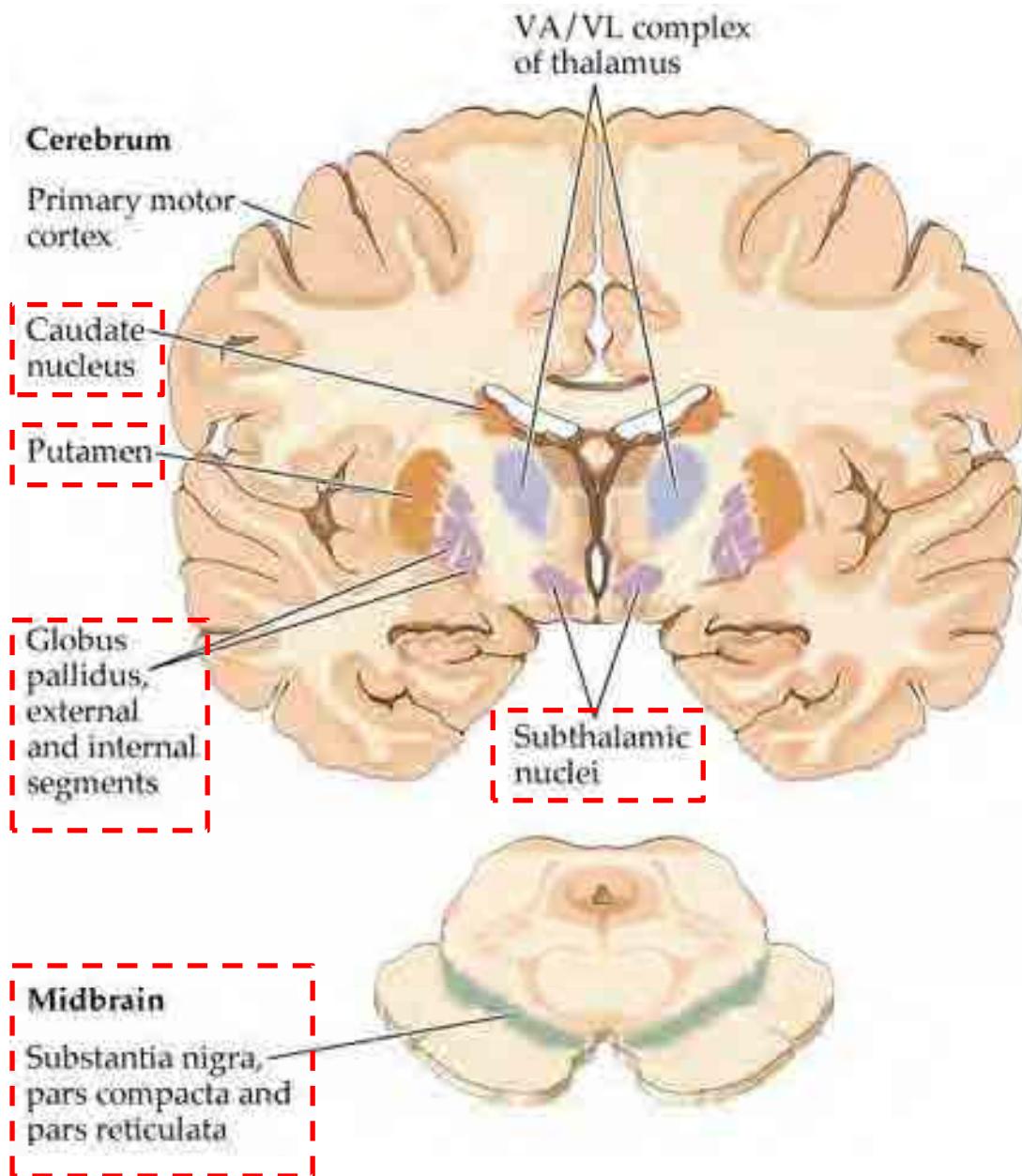
## Interaction of CNS areas involved in movement



# Basal Ganglia

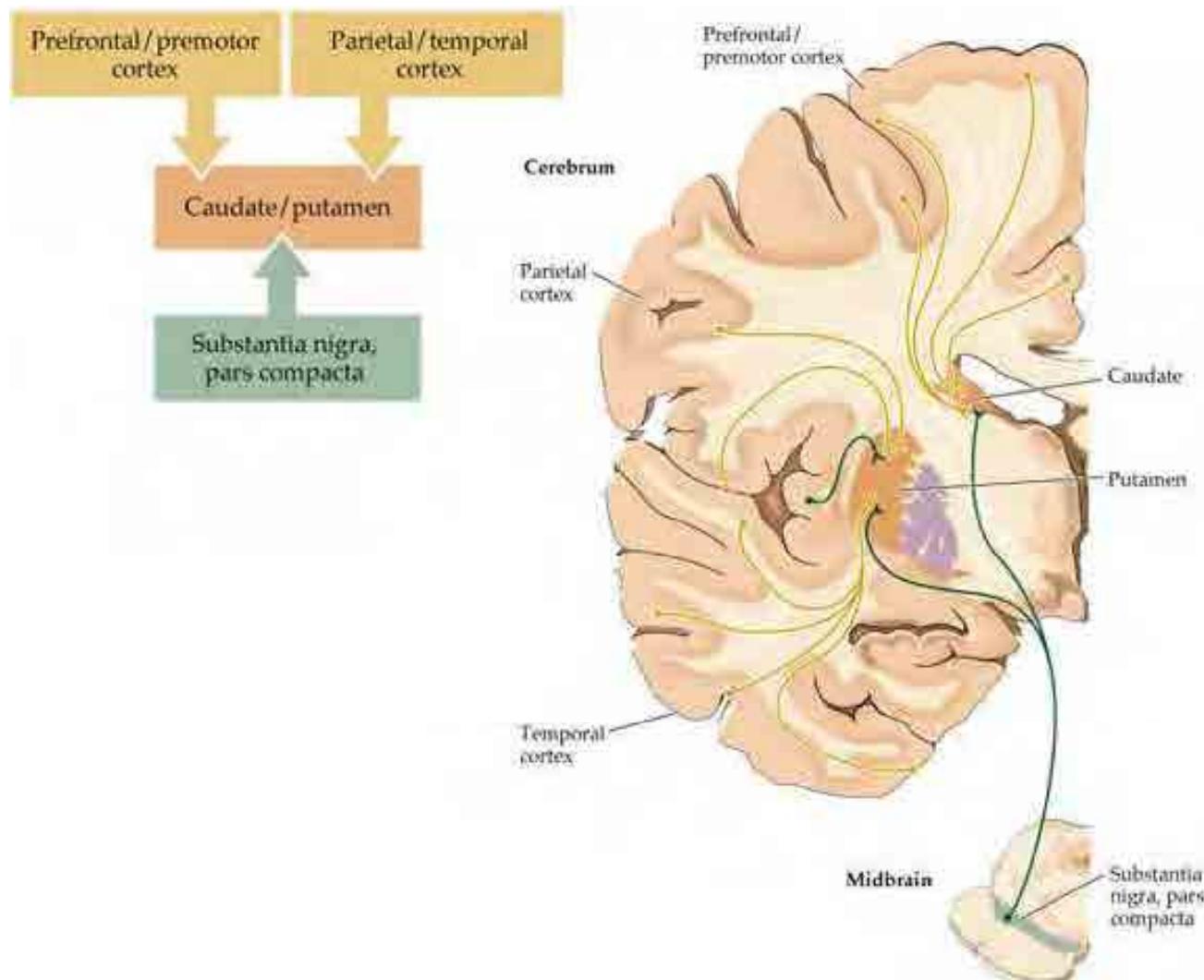
## The basal ganglia include

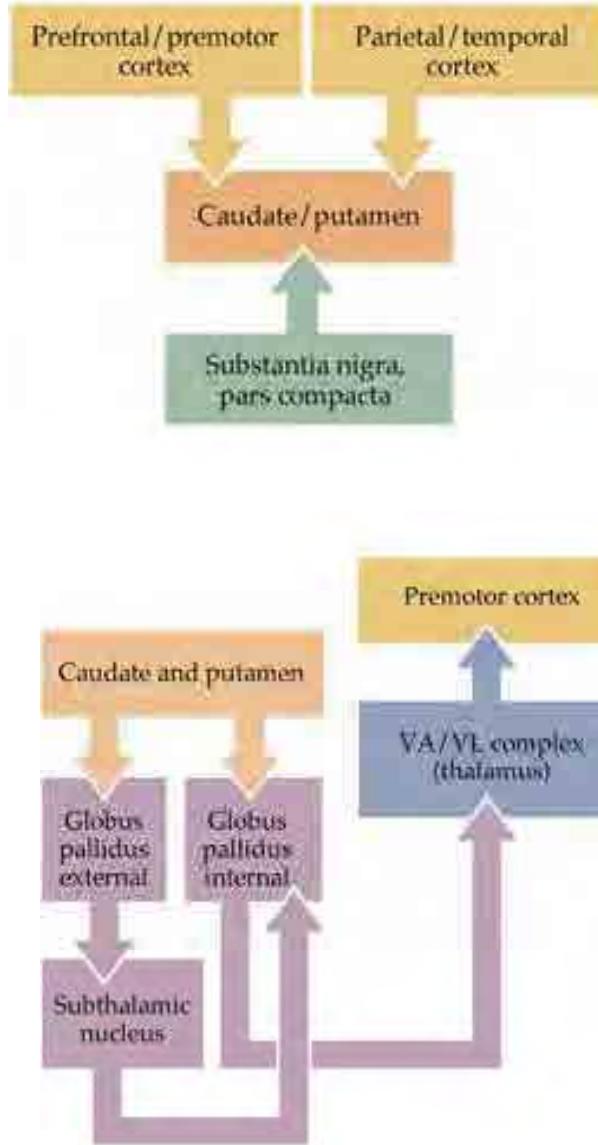
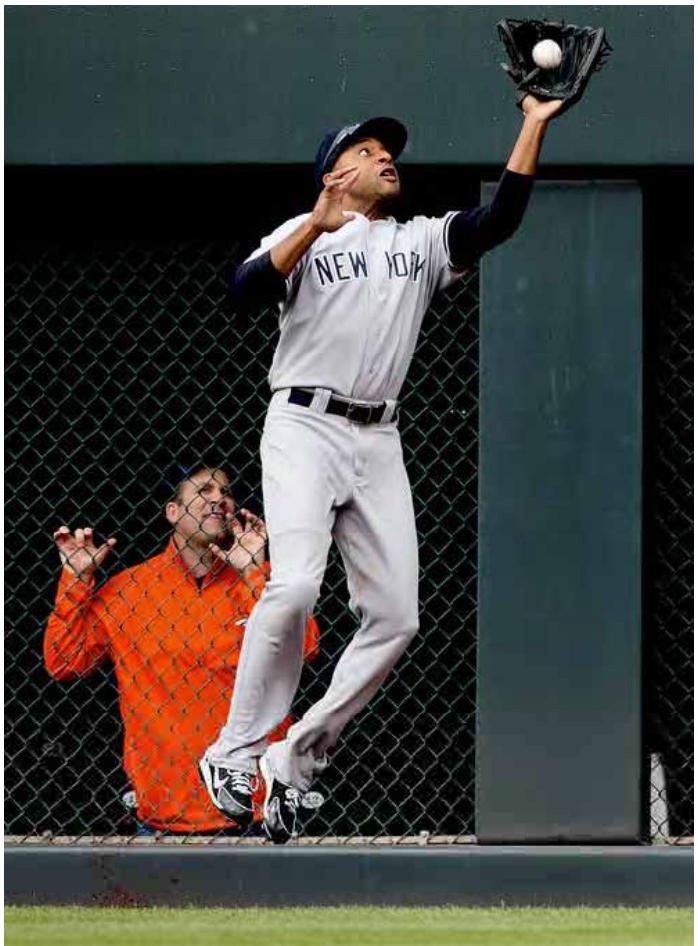
- ✿ Caudate nucleus
- ✿ Putamen
- ✿ Globus pallidus (internal segment, external segment)
- ✿ Subthalamic nucleus
- ✿ Substantia nigra (pars compacta, pars reticulata)



Striatum:  
caudate nucleus + putamen

# Organization of Inputs to Basal Ganglia

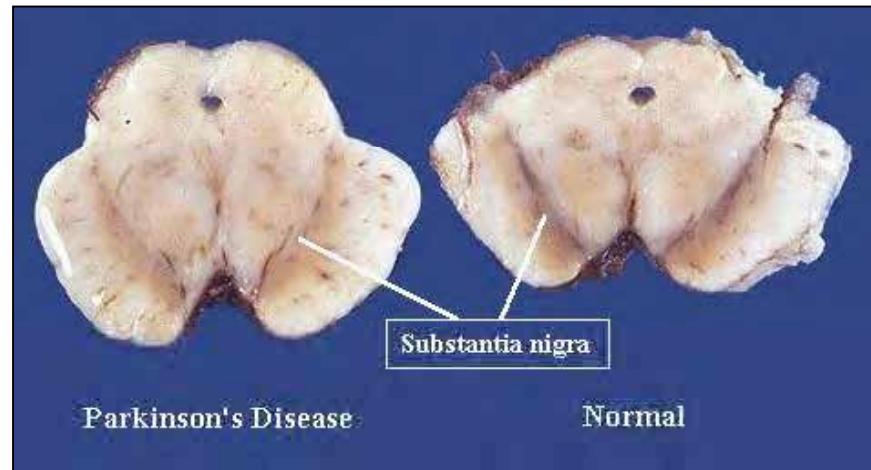




# Parkinson's Disease

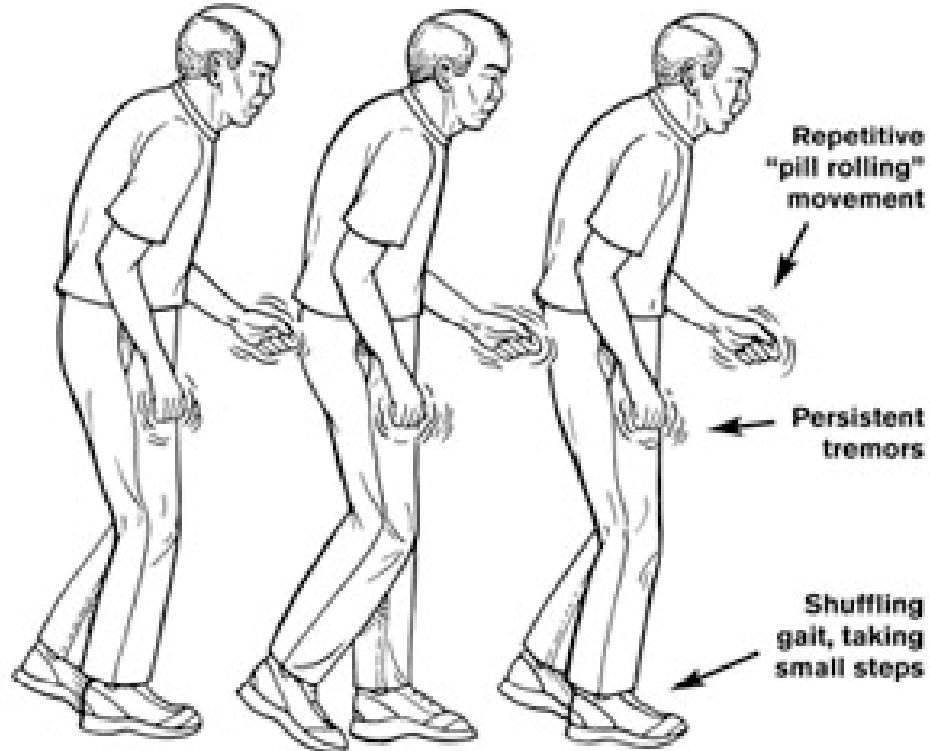
Pathology hallmarks

- ④ Nigostriatal degeneration
- ④ Degeneration of **dopaminergic** neurons in **substantia nigra**



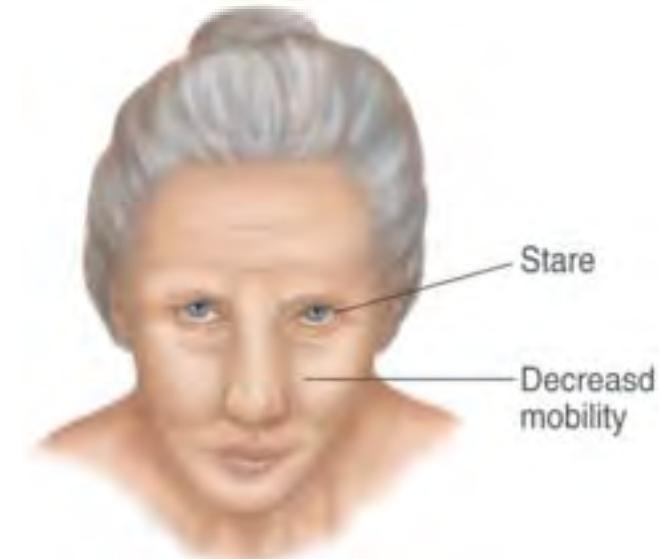
# Parkinson's Disease

## Clinical symptoms



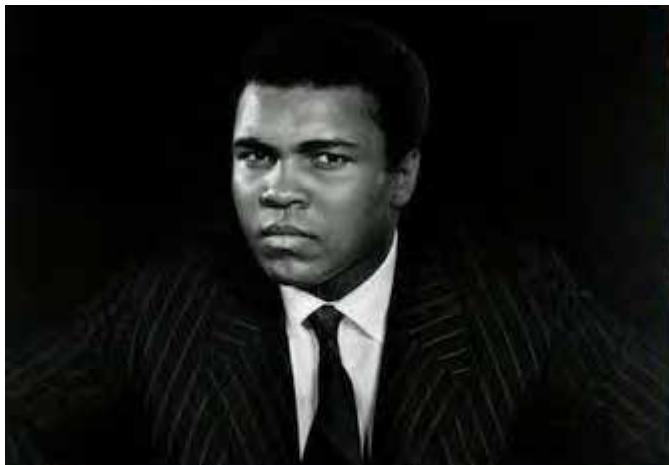
# Parkinson's Disease

## Clinical symptoms



- ✿ mask-like faces
- ✿ decrease facial mobility=blunted expression
- ✿ decreased blinking
- ✿ characteristic stare

Muhammed Ali



Michael J Fox



former pope John Paul II



Yasser Arafat

