

South Kazakhstan State Pharmaceutical Academy

Foreign Languages Department

The theme: The Physiology of the
nervous System

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Group: 202 «A» PH.

Checked by: Senior teacher Ybyray F.T.

Plan

I. Introduction

II. Main part

1. Organization of Peripheral Nervous System (PNS)

2. Organization of Central Nervous System(CNS)

III. Conclusion

IV. Literature

Central nervous system (CNS)

Peripheral nervous system (PNS)

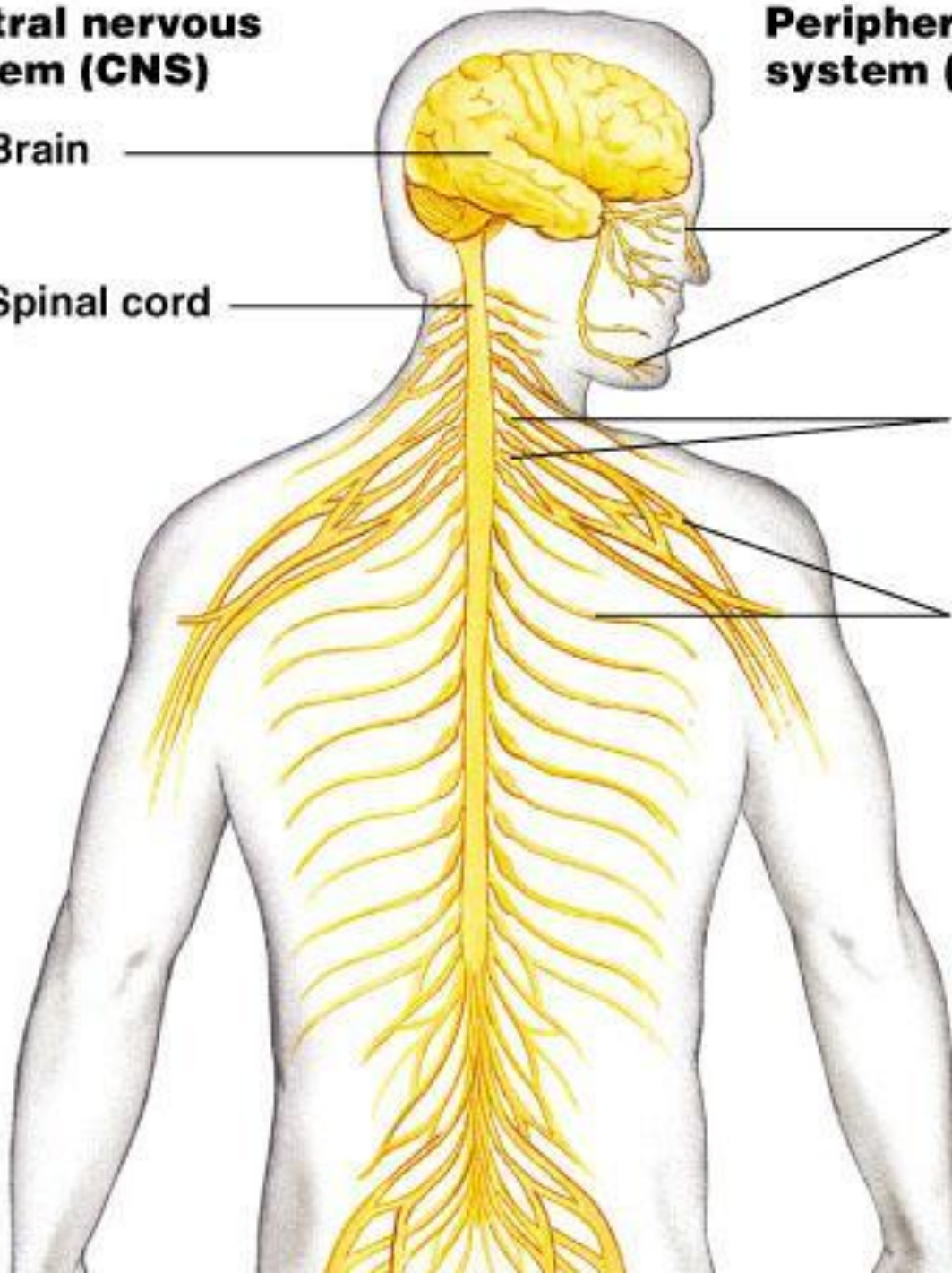
Brain


Spinal cord

Cranial
nerves

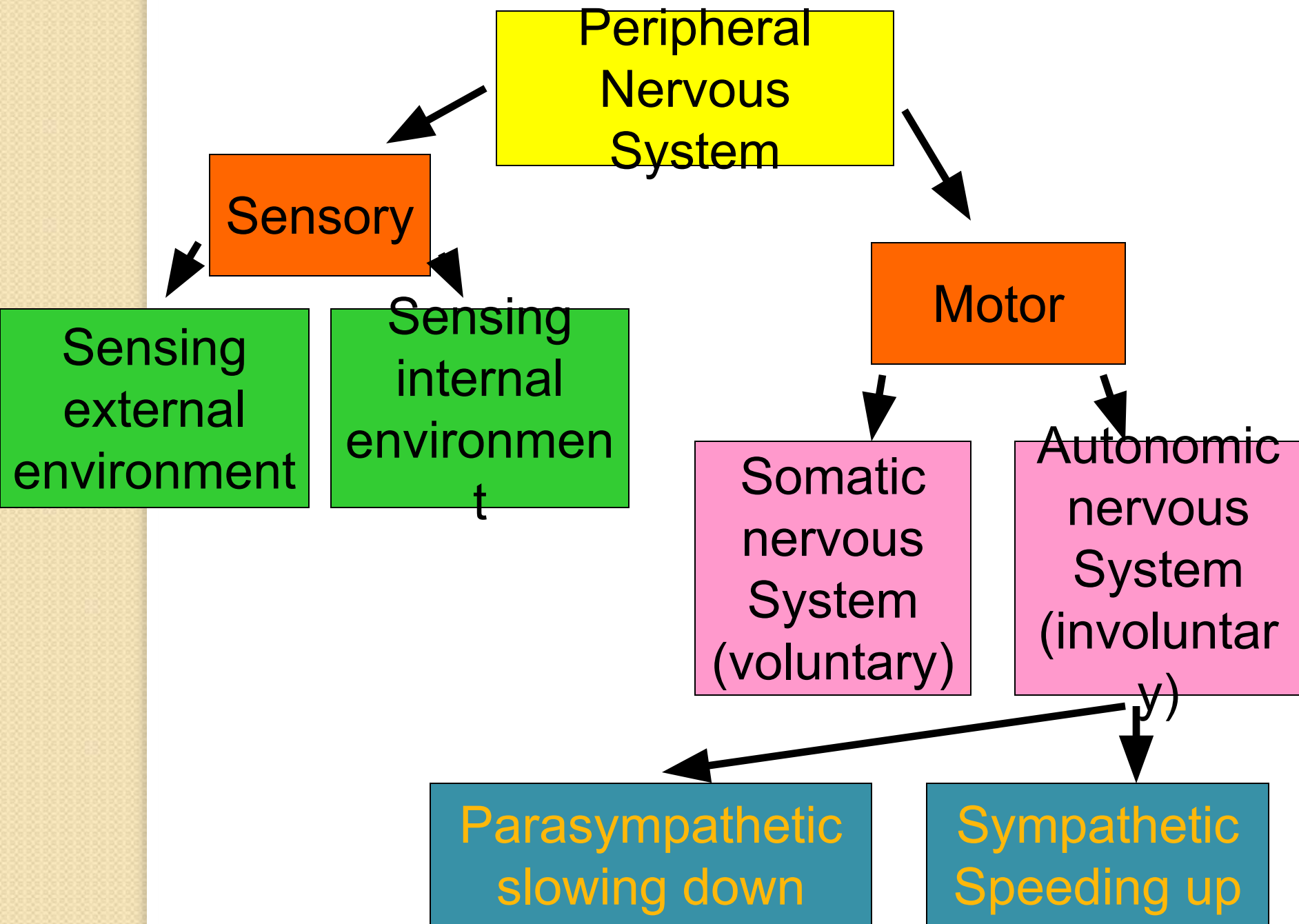
Ganglia
outside
CNS

Spinal
nerves





Organization of Peripheral Nervous System (PNS)



Autonomic
nervous
System
(involuntary)



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graph TD; A[Autonomic nervous System (involuntary)] --> B[Parasympathetic Slowing down]; A --> C[Sympathetic Speeding up]; B --> D[Rest and Digest]; C --> E[Fight or Flight];
```

This diagram is a flowchart illustrating the two branches of the autonomic nervous system. At the top is a pink box labeled 'Autonomic nervous System (involuntary)'. Two arrows point downwards from this box to two blue boxes: 'Parasympathetic Slowing down' on the left and 'Sympathetic Speeding up' on the right. From the 'Parasympathetic' box, an arrow points down to a green box labeled 'Rest and Digest'. From the 'Sympathetic' box, an arrow points down to a green box labeled 'Fight or Flight'. A text note in the top right corner states 'This is a continuation of the previous flow chart'.

This is a continuation
of the previous flow
chart

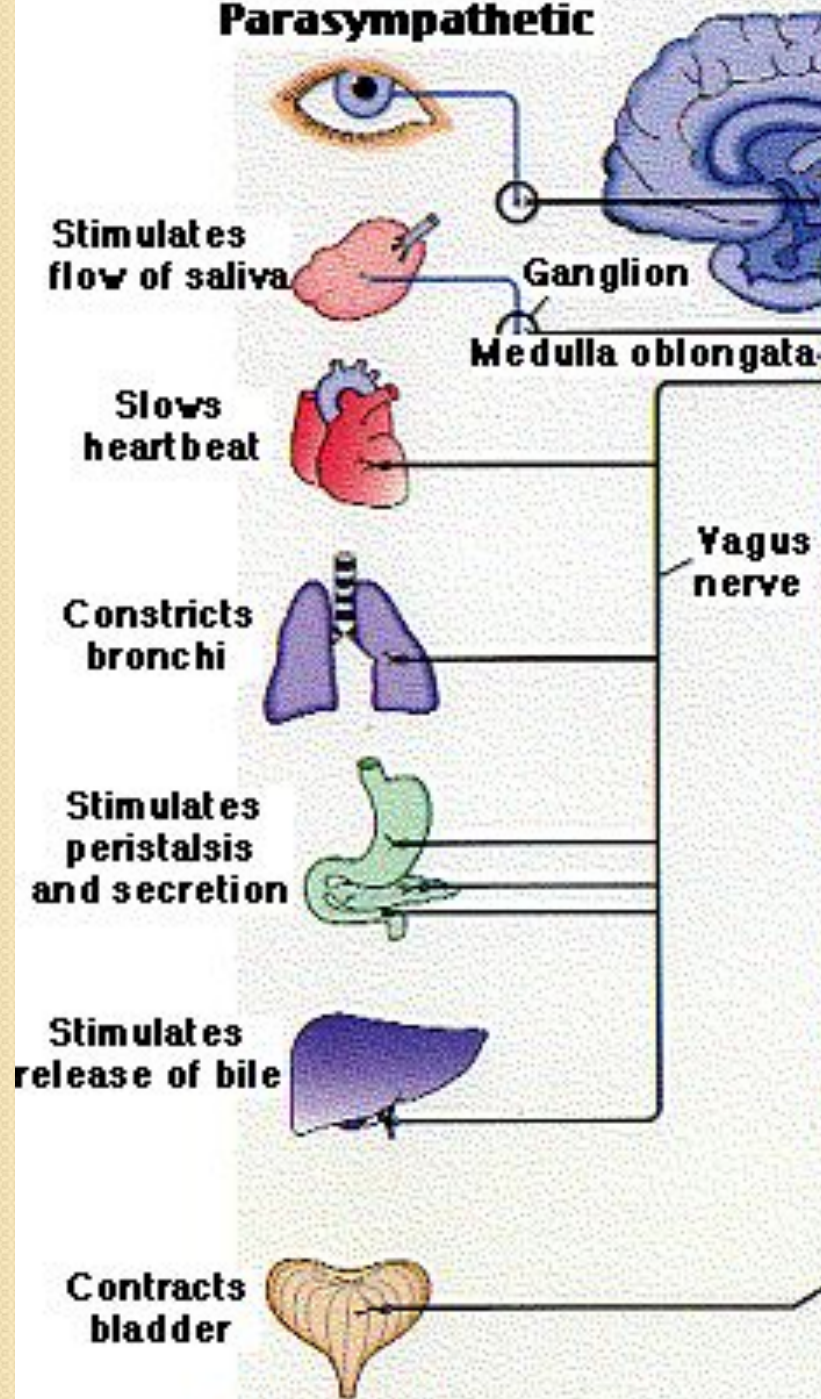
Parasympathetic
Slowing down

Rest and
Digest

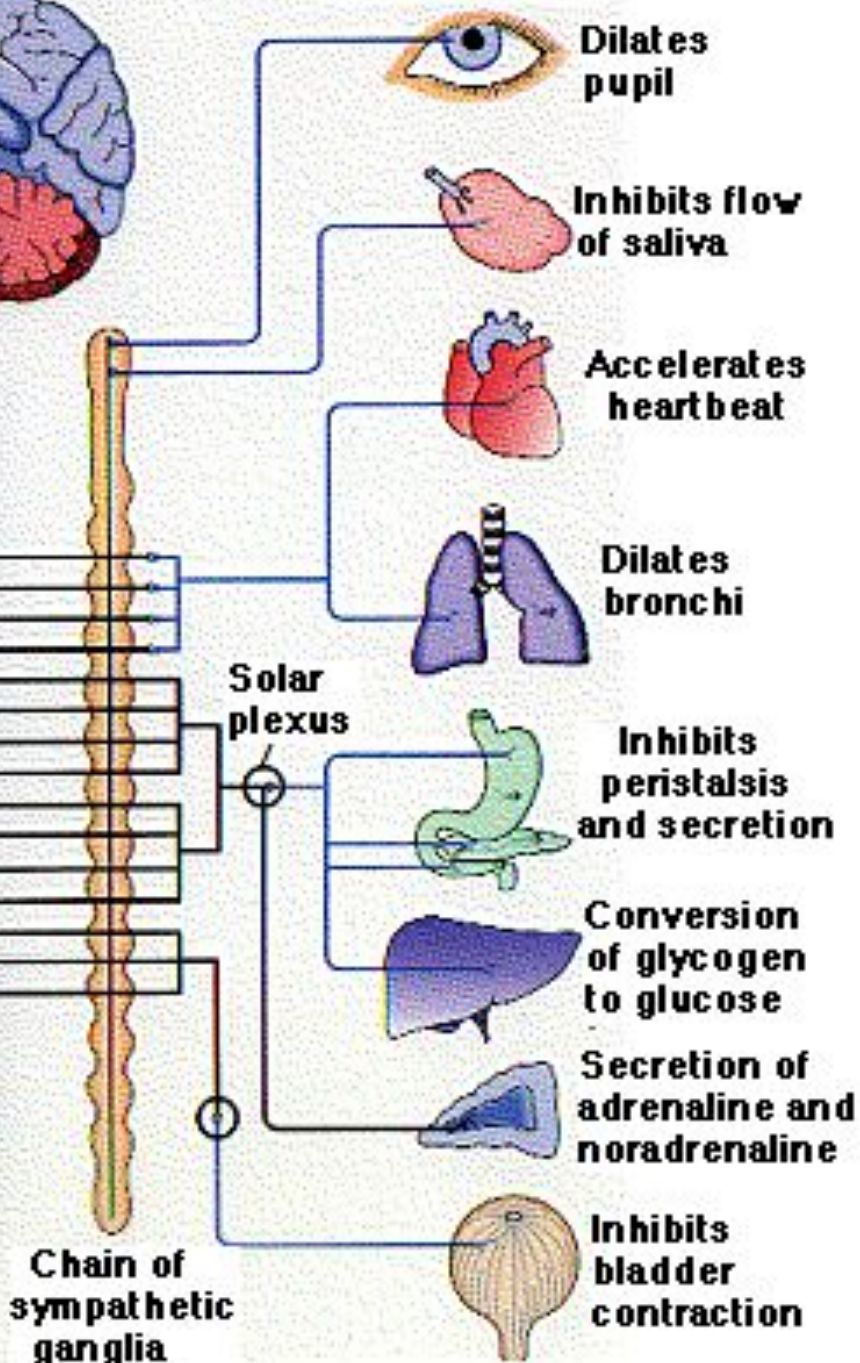
Sympathetic
Speeding up


Fight or
Flight

Parasympathetic

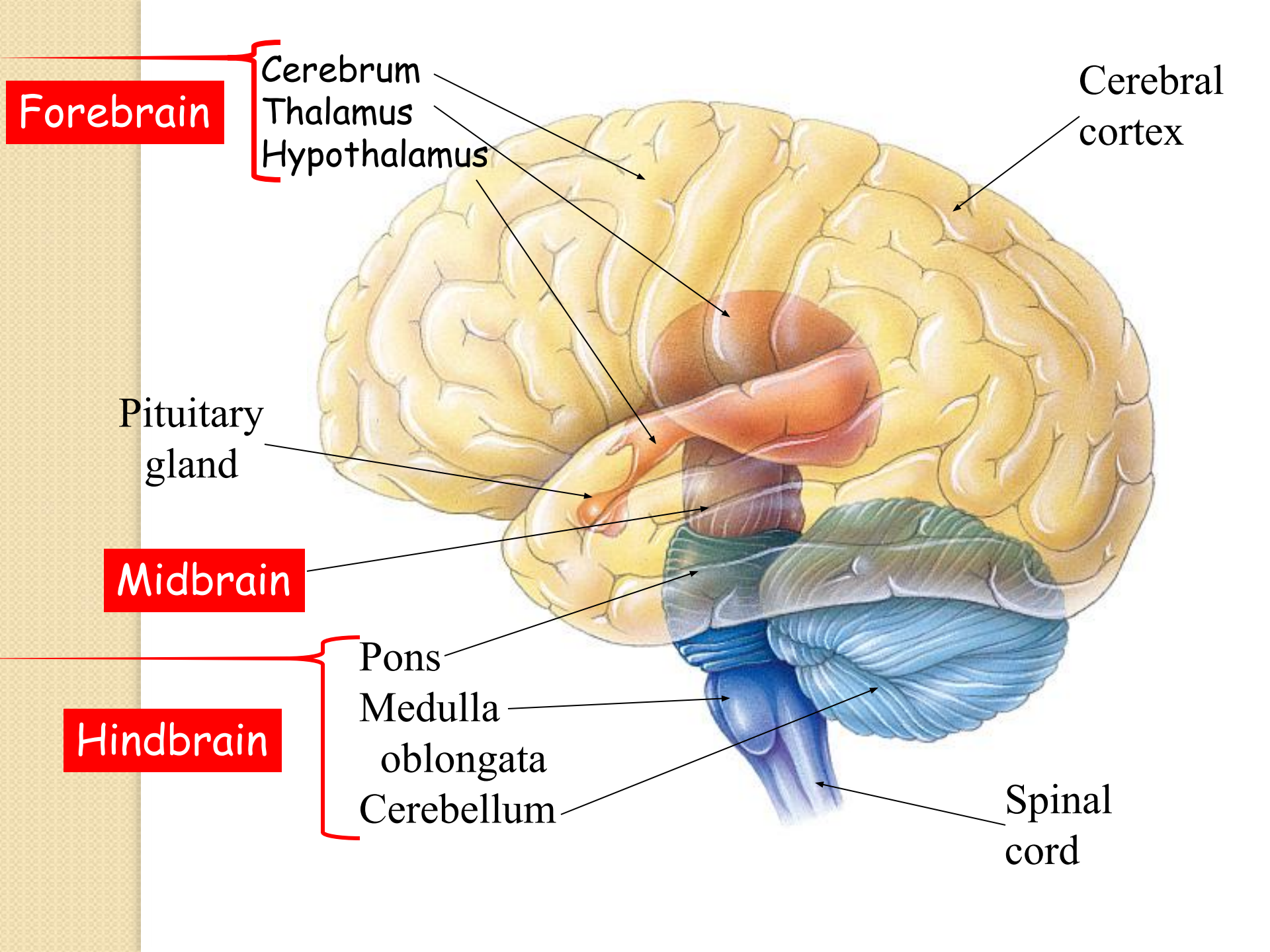


Sympathetic





Organization of Central Nervous System (CNS)



Forebrain

- Cerebrum
- Thalamus
- Hypothalamus

Cerebral cortex

Pituitary gland

Midbrain

Hindbrain

- Pons
- Medulla oblongata
- Cerebellum

Spinal cord

Frontal Lobe

Parietal Lobe

- Frontal Association
- Speech
- Motor Cortex

- Taste
- Speech
- Reading

- Smell
- Auditory Association
- Hearing

- Vision
- Visual Association

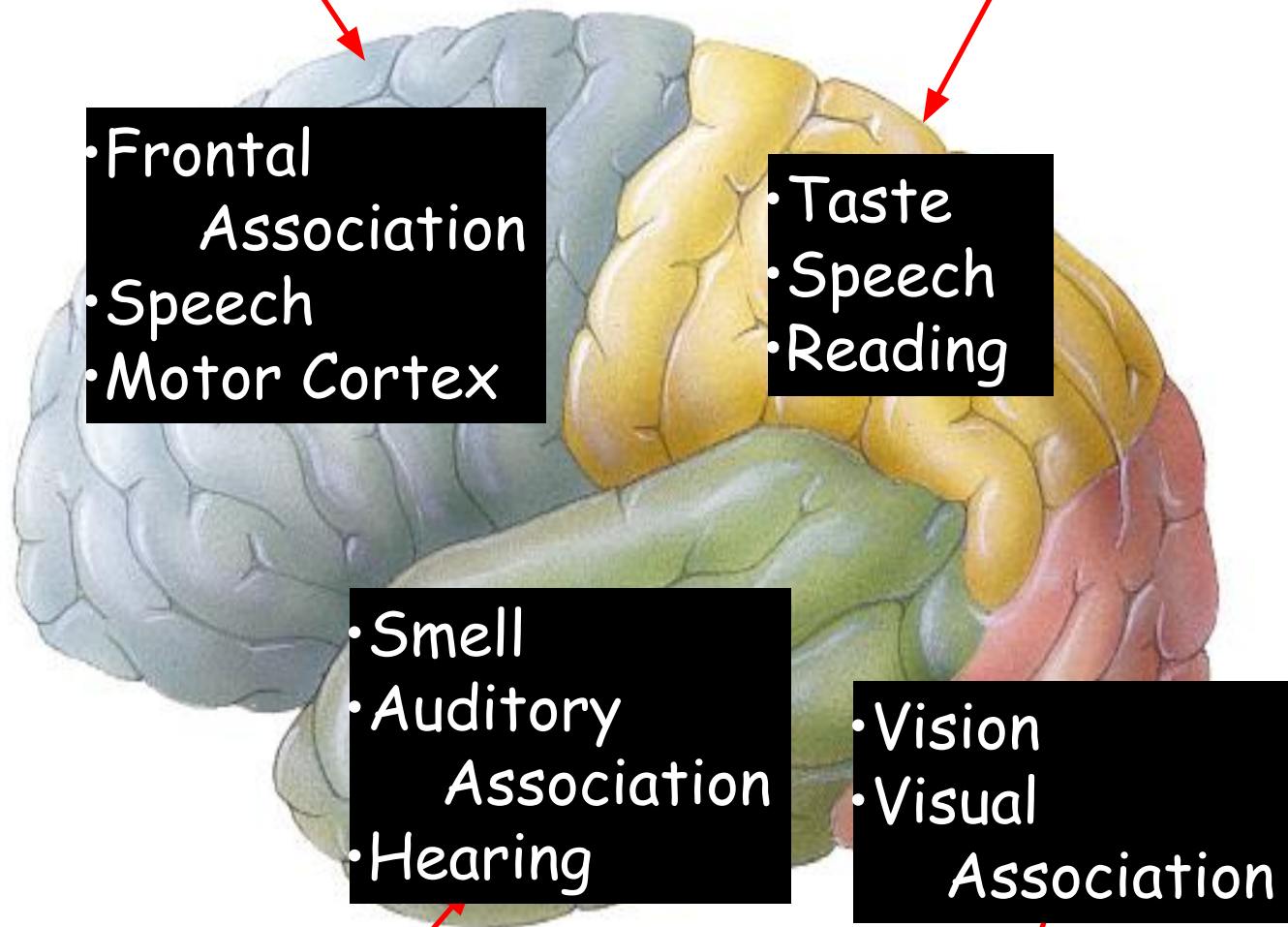
Temporal Lobe

Occipital Lobe

Left Hem. | Right Hem.

Corpus Callosum

On your notes you need to have the left picture and labels



Nervous Tissue

● Glial Cells

- 90% of CNS
- Structural framework
- Fatty Myelin sheath
- Phagocytosis
- Cerebrospinal fluid circulation

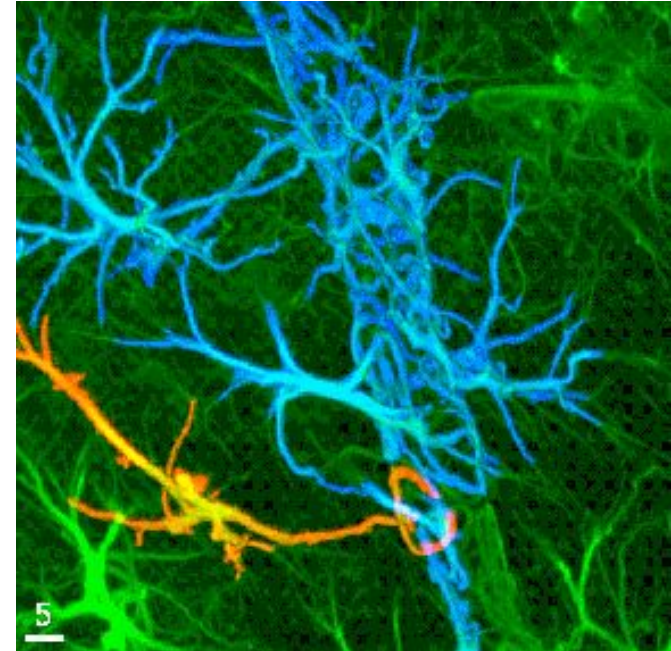


Table 9-1 SUPPORTING CELLS OF NERVE TISSUE: THE NEUROGLIA

Type of Cell	Location	Function
Astrocytes	Brain and spinal cord	Anchor neurons to blood capillaries; control the flow of ions around neurons; may aid neurons in impulse conduction
Ependymal cells	Line cavities in brain and spinal cord	Help form and circulate cerebrospinal fluid
Microglia	Brain and spinal cord	Phagocytize invading microorganisms and dead nerve tissue
Oligodendrocytes	Brain and spinal cord	Provide insulating coverings around CNS axons, forming a myelin sheath
Schwann cells	Large nerves of the peripheral nervous system	Provide insulating coverings around large PNS axons



Structure of Single Neuron




3 types of Neurons

Sensory Neurons – neurons that carry **incoming** information from the sense to the CNS

Interneurons – CNS neurons that internally communicate and intervene **between** the sensory inputs and motor outputs

Motor Neurons – Carry **outgoing** information from the CNS to muscle and glands



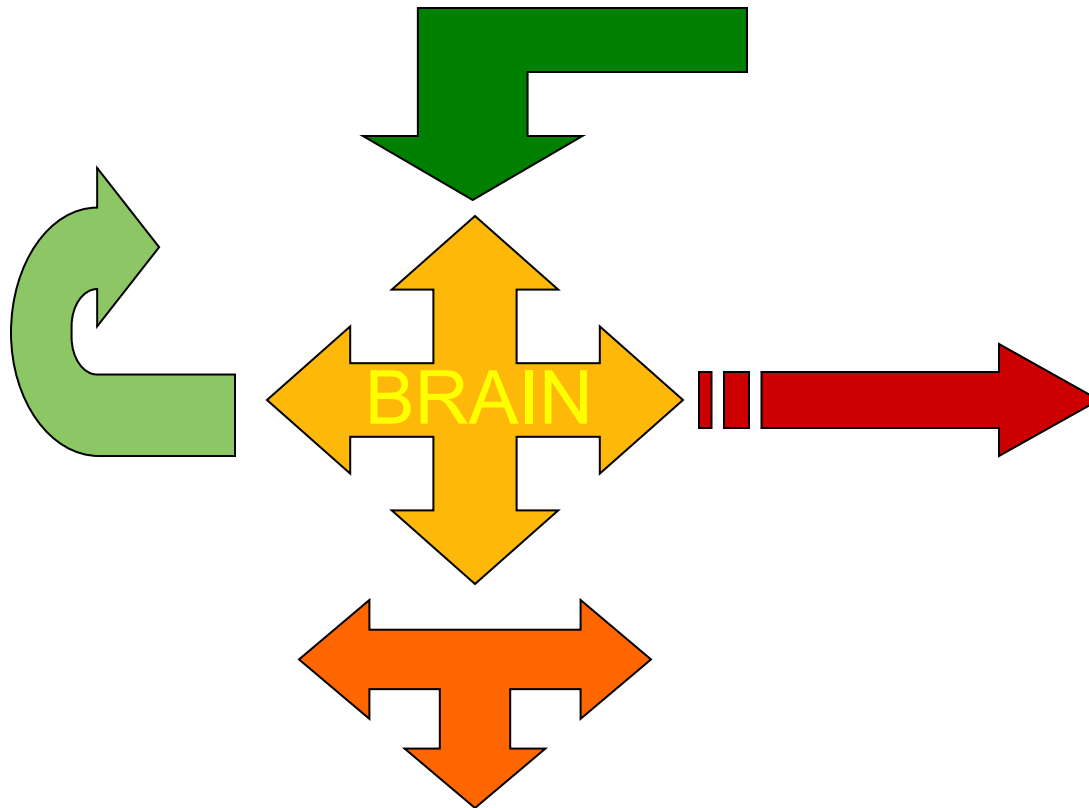
How do cells detect and respond to changes in their internal and external environment to successfully survive and maintain homeostasis?

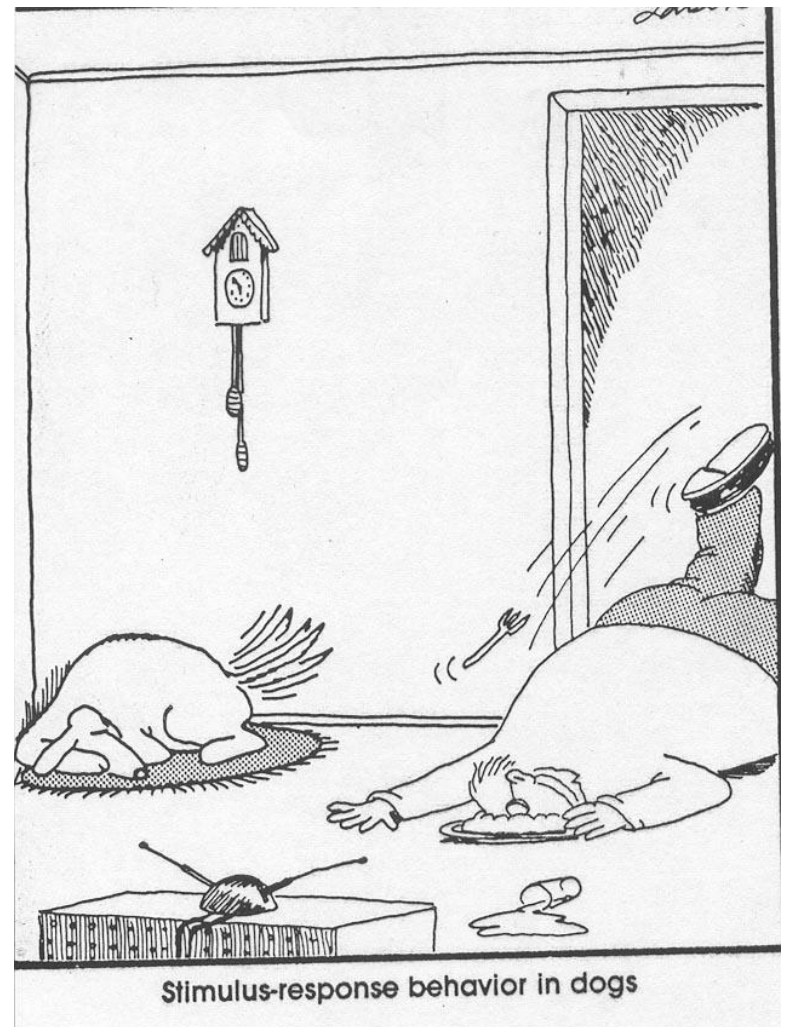
1)

Detection of signals from the outside environment or detection of deviation (change) from homeostasis from the internal environment.



2) Integration of multiple signals from outside and inside to produce appropriate response.





3) Response to counteract stimulus being detected.

Draw your own picture to represent RESPONSE

- 1) Detection of signals from outside environment or detection of deviation (change) from homeostasis from internal environment.
- 2) Integration of multiple signals from outside and inside to produce appropriate response.
- 3) Response to counteract stimulus being detected

System builds a Reflex Arc

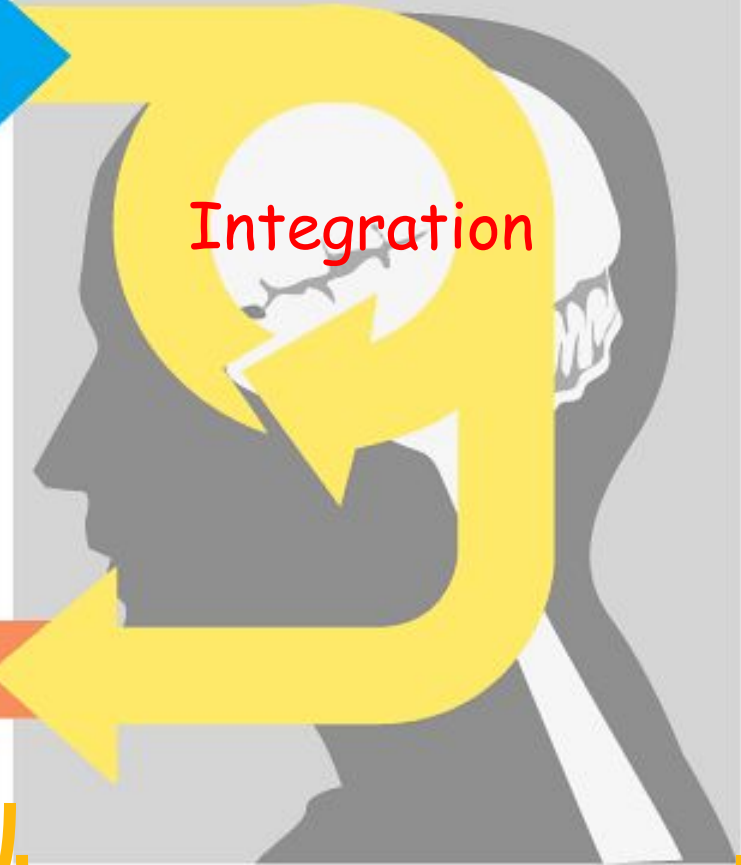
Sensor Receptor (Detection)



Sensory Input



Integration



Motor Output

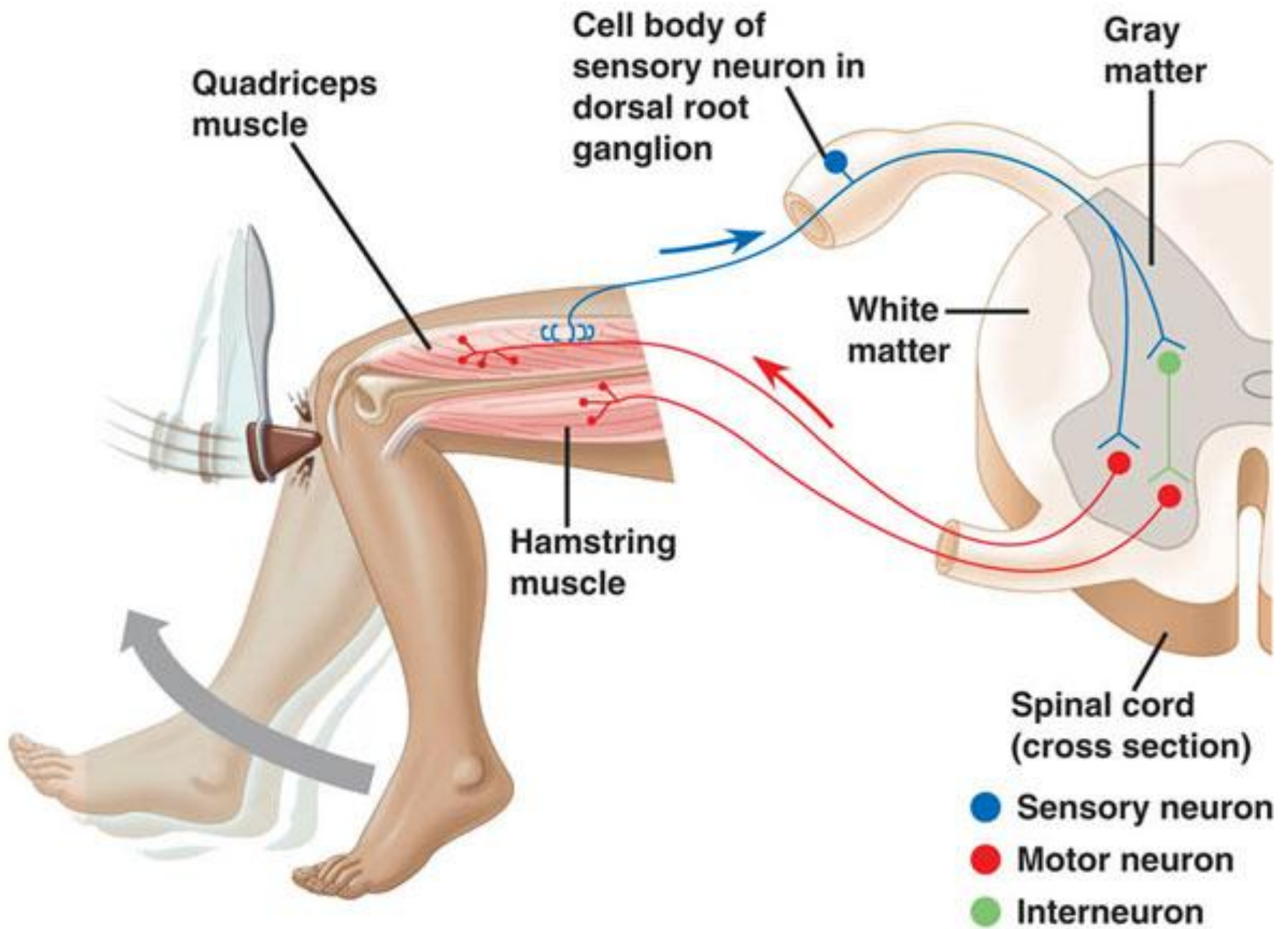


Effector (Response)



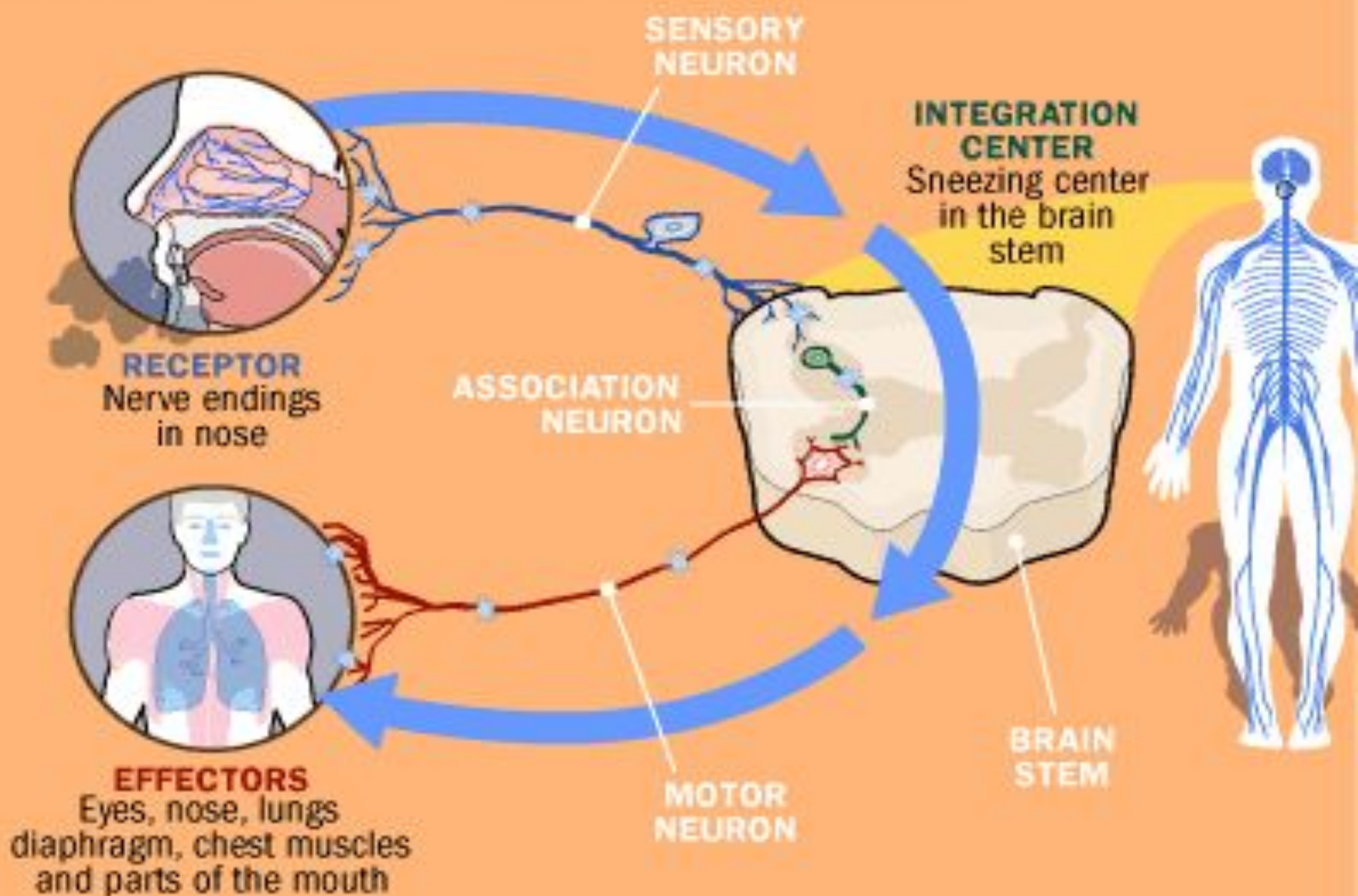
Peripheral Nervous
System (PNS)

Central Nervous
System (CNS)



The Sneeze Reflex Arc

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- **DEPOLARIZED** = Inside the membrane becomes more positive than outside.
- This causes a **THRESHOLD** to be **REACHED** and an impulse (**ACTION POTENTIAL**) begins in the second cell.
- After the neurotransmitter relays its message it is rapidly **REMOVED** or **DESTROYED**, thus halting its effect.
- The molecules of the neurotransmitter may be broken down by **ENZYMES**, taken up again by the axon terminal and recycled, or they may simply diffuse away.
- **NERVE GAS** prevents enzymes from breaking down neurotransmitters, as a result muscles in the respiratory and nervous system become paralyzed.

Chemical Influences

- How might stimulants work?
(Amphetamines, caffeine, nicotine)
 - Increase synaptic transmission □ increased energy/mood, decreased appetite.
 - Increased irritability and anxiety
- How might depressants work? (Alcohol, anti-anxiety drugs, heroin)
 - Inhibition of impulses (blocking receptors of NT)
 - Can result in depression

[Animations](#)

CONCLUSION

NEUROTRANSMITTER is a chemical substance that is used by one neuron to signal another. The impulse is changed from an Electrical Impulse to a Chemical Impulse (Electrochemical Impulses).

Literature

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