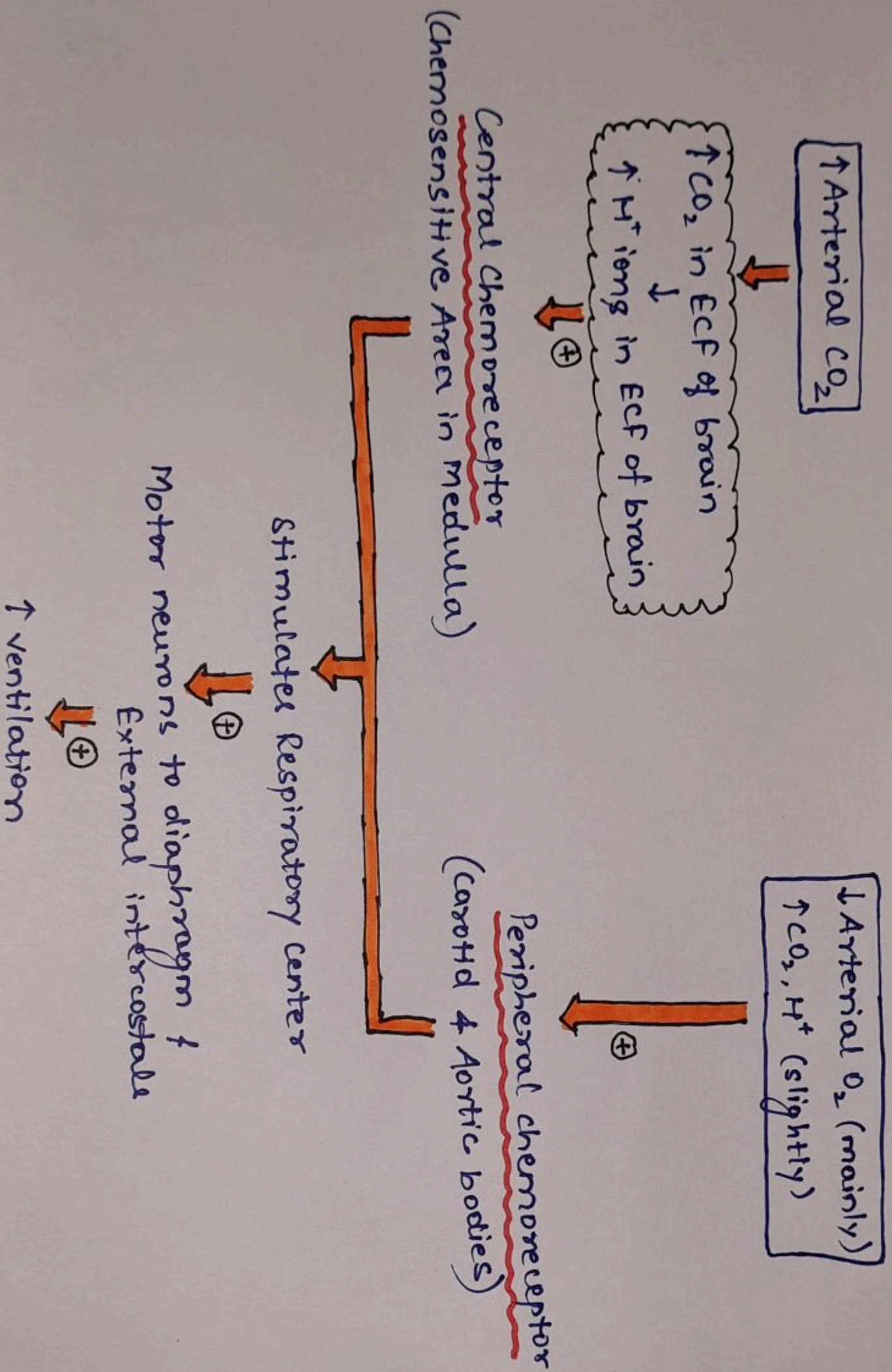
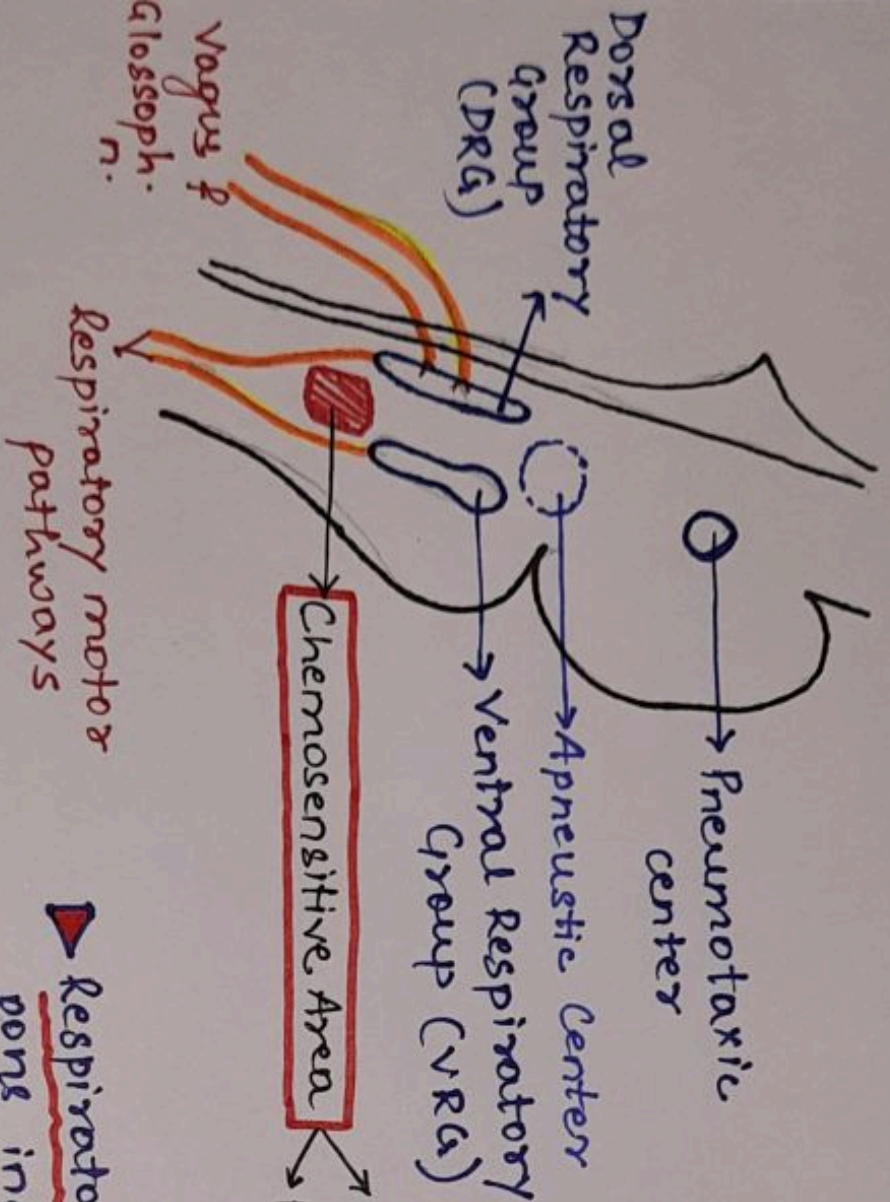


CHEMICAL REGULATION OF RESPIRATION



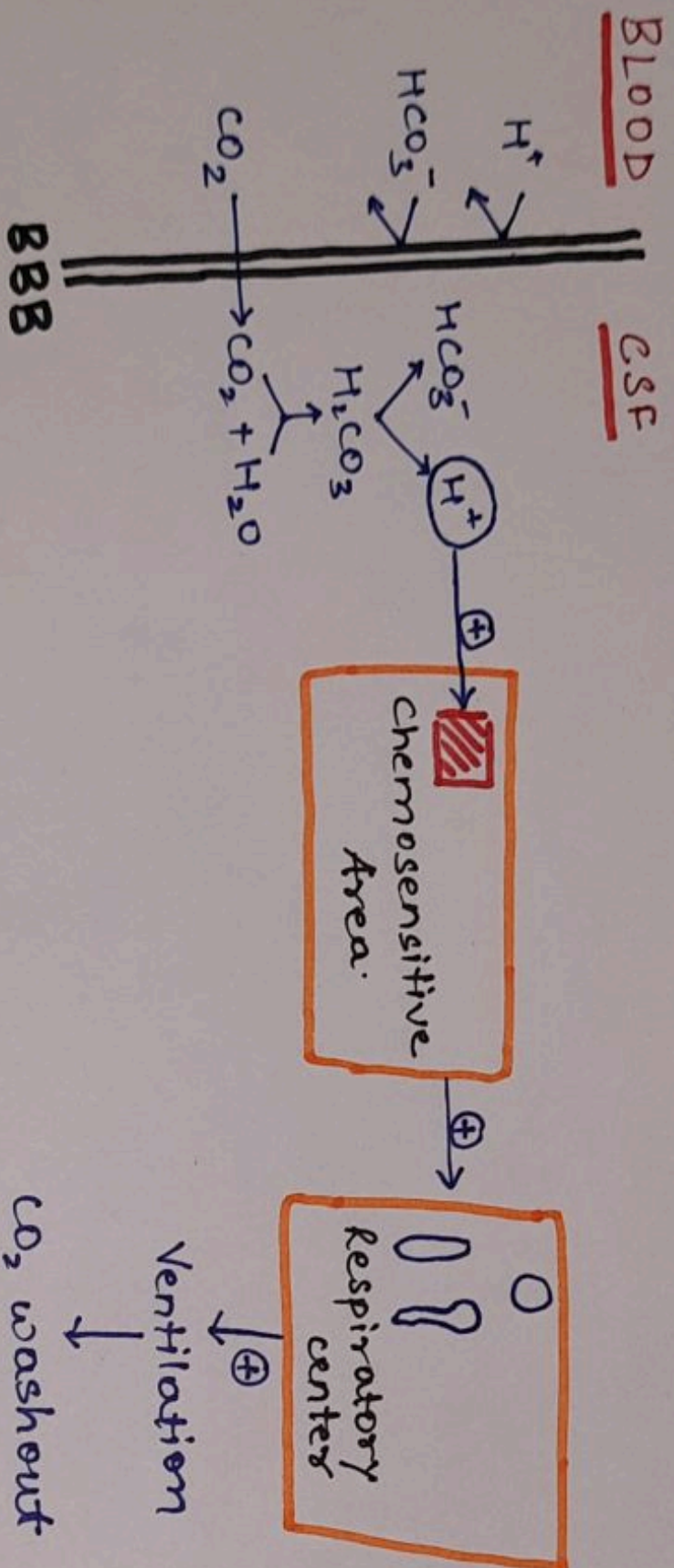


is a central chemoreceptor located bilaterally beneath ventral surface of medulla.

► Respiratory center located in medulla & pons include

- Pneumotaxic center
- DRG
- VRG

Mechanism of Action of Central Chemoreceptor



Peripheral Chemoreceptor System

→ Detects

Mainly :- O_2 in blood

Less extent :- CO_2 , H^+

→ Peripheral chemoreceptors

- Carotid bodies (mostly)

↳ located bilaterally in bifurcation of common carotid artery

- Aortic bodies (few)

↳ located along Arch of Aorta.

→ pO_2 below normal in blood

↓
powerful stimulation of chemoreceptor

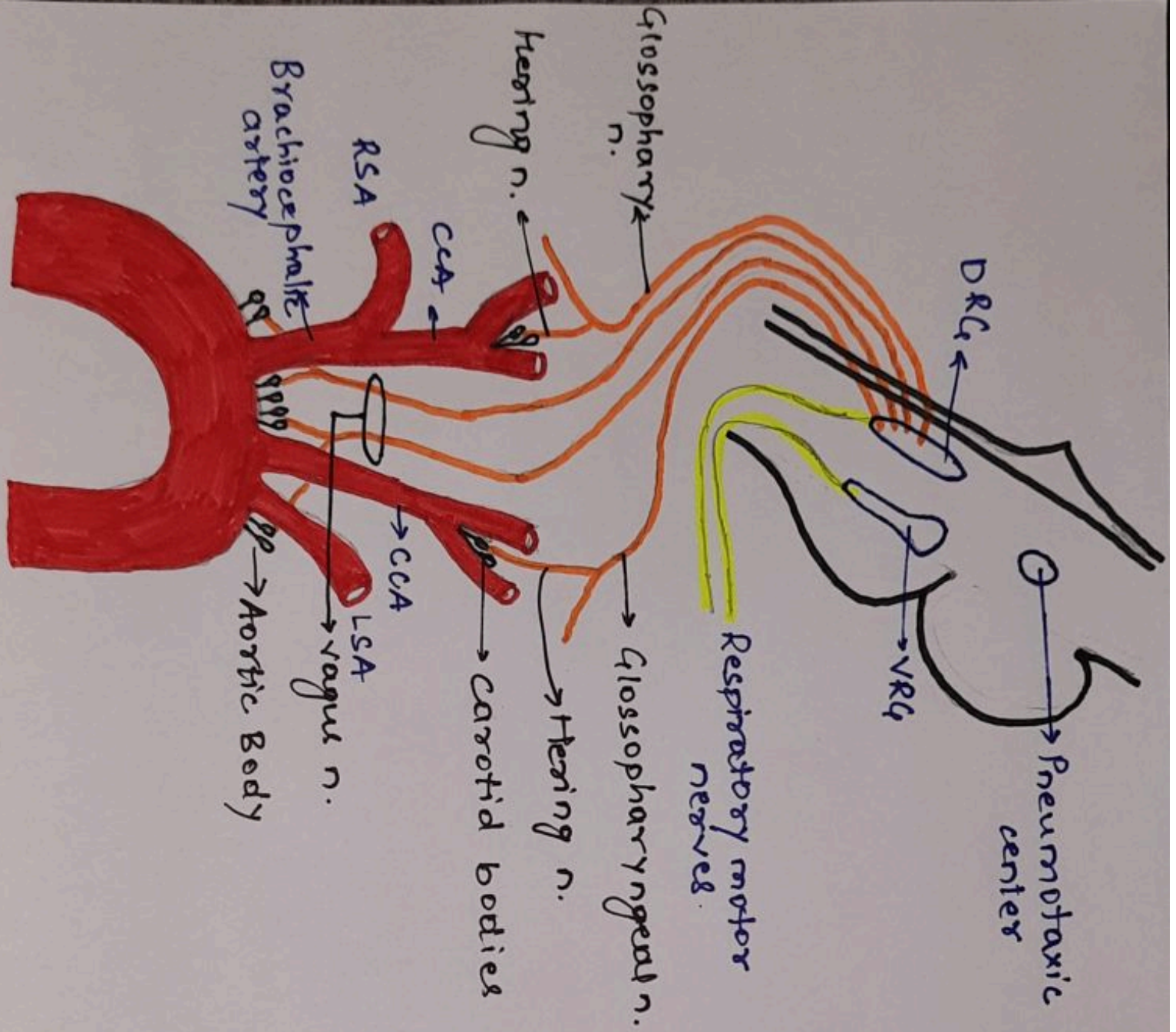
↓
Nerve signals through

vague & glossopharyngeal n.

↓
DRG of medulla

PCO_2 & pH

↓
slight stimulation of p. chemoreceptor



Peripheral chemoreceptors (Carotid & Aortic bodies)

→ Glomus cells → synapse with n. endings

↓ have

O_2 sensitive K^+ channels

↓ Inhibited by ↓ pO_2

↓ cells depolarise

↓ Ca^{++} VCC open →

Intracellular $[Ca^{++}] \uparrow \uparrow$

↓ NT Release

↓ Nerve signals sent to CNS (DRG)

↓ Stimulate ventilation

Artery

↓ pO_2

↓ K^+ channel

↓ Depolarise

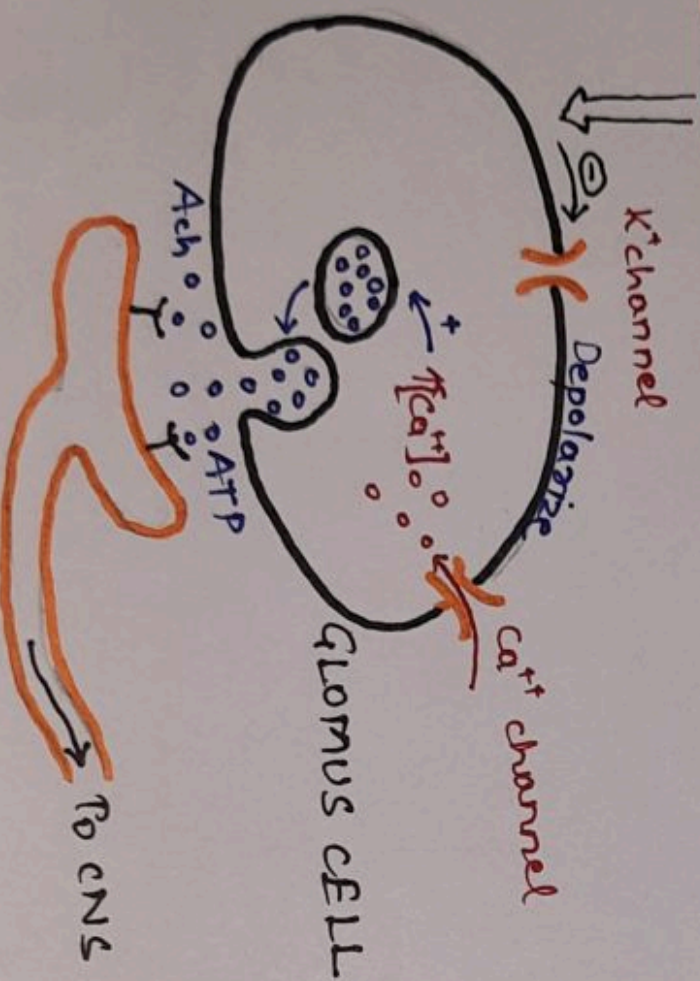
↓ Ca^{++} channel

↑ $[Ca^{++}]$

GLOMUS CELL

ACh ATP

→ To CNS



Central chemoreceptor

Location → Chemosensitive Area in Medulla

Stimuli → ↑ Arterial CO_2

Innervation → N-fibre directly project to Respiratory center

Rapidity in Response → Slower response as compared to peripheral receptors

Peripheral chemoreceptor

Carotid & Aortic Bodies.

↓ Arterial O_2 (mainly)
↑ CO_2 & H^+ (slightly)

Aortic bodies by vagus n.
Carotid bodies by glossoph. n.

Five times as rapid as central stimulation.