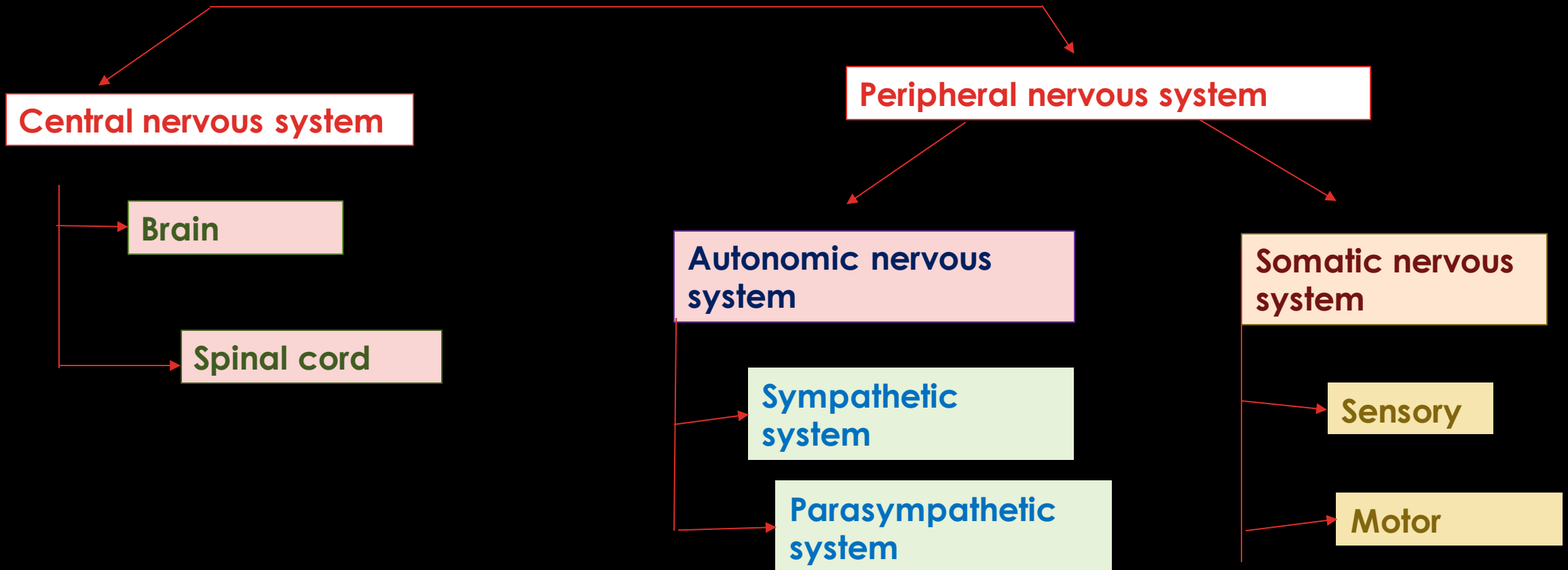



NERVOUS SYSTEM

NERVOUS SYSTEM

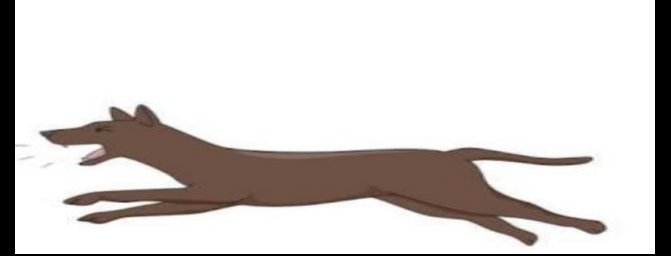


- 
- **Central nervous system:** CNS which is composed of the **Brain & Spinal cord**.
 - **Peripheral nervous system:** Which includes neurons located Outside the **brain & spinal cord** i.e any nerve that enter or leaves the CNS.

AUTONOMIC NERVOUS SYSTEM

- The autonomic nervous system is the part of the nervous system that supplies the internal organs, including the blood vessels, stomach, intestine, liver, kidneys, bladder, genitals, lungs, pupils, heart, and sweat, salivary, and digestive glands.
- The autonomic nervous system, along with the endocrine system coordinates the regulation & integration of bodily function.
- The autonomic nervous system has two main divisions:
 - 1) Sympathetic system
 - 2) Parasympathetic system

Sympathetic system:
“Fight & flight”



Parasympathetic system:
“Rest & Digest”



EFFECTORS OF THE ANS

- Neurons of the ANS innervate effectors that are Not under voluntary control.
- Think of effectors you Do not voluntarily control (involuntary).

Example of effectors innervated by the ANS are:

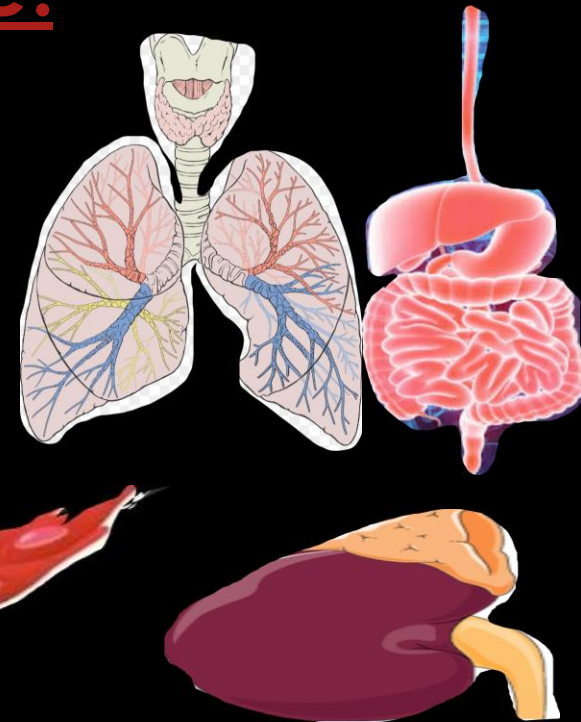
- Heart



- Smooth muscle of bronchial tubes & GI tract

- Smooth muscle lining blood vessels

- Glands





CNS

2- neurons

Effectors innervated by ANS

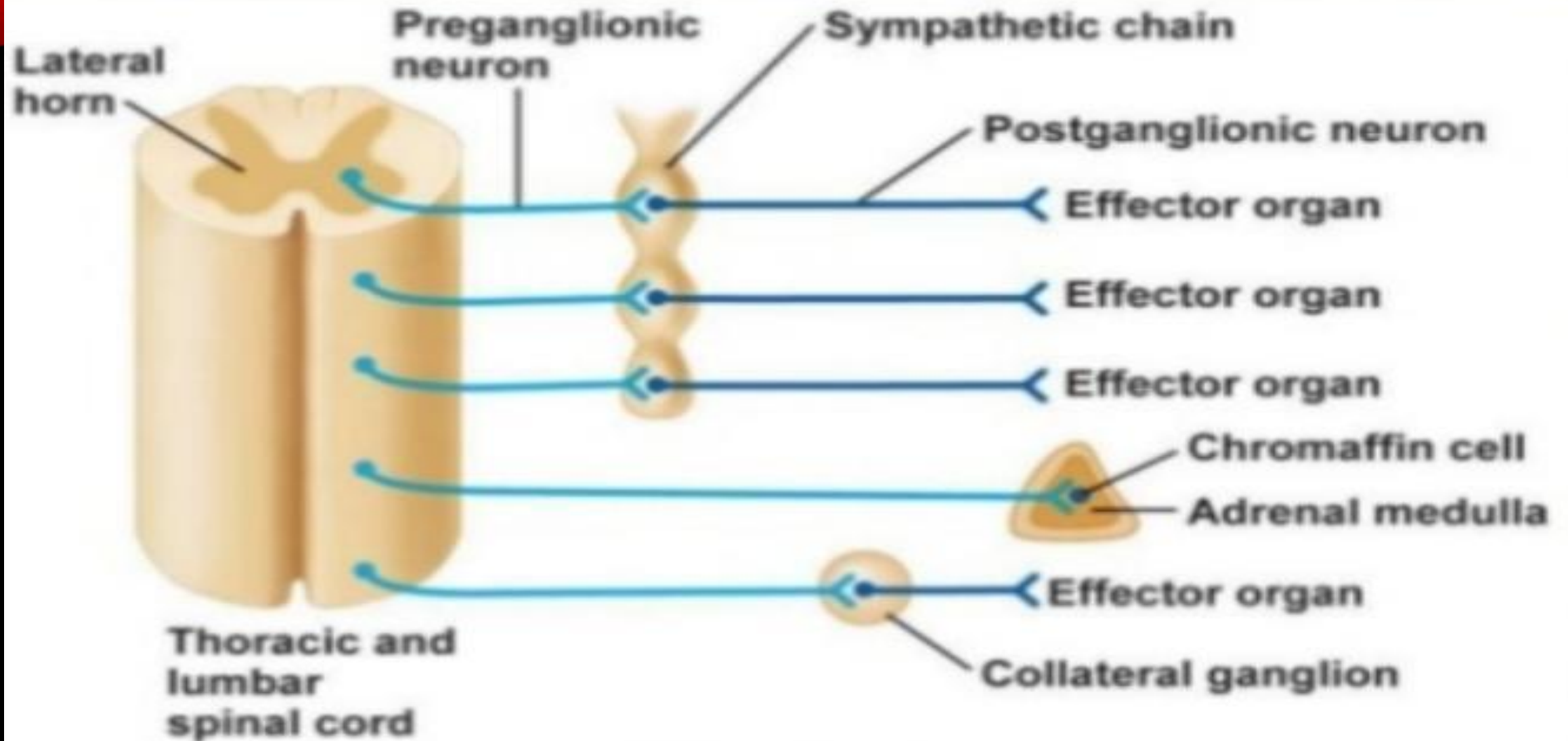
First neuron = preganglionic neuron

Ach= Acetylcholine= Cholinergic

Second neuron= Postganglionic neuron

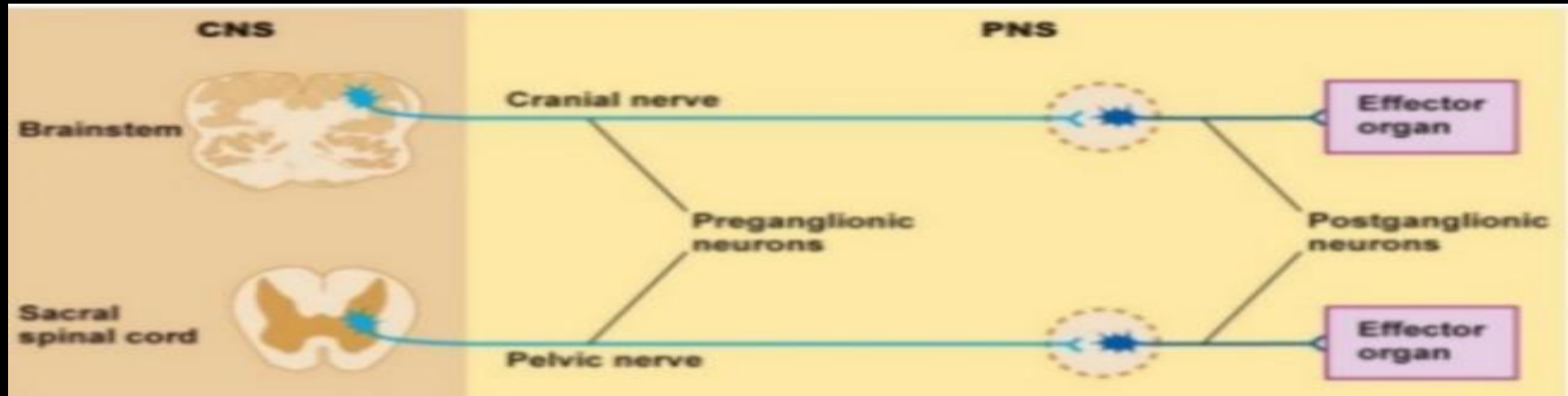
NE=Norephindrine= Adrenergic neuron

SYMPATHATHIC SYSTEM



- Anatomically, the sympathetic & parasympathetic neurons originate in the CNS & emerge from two different spinal cord regions.
- The preganglionic neurons of the sympathetic system come from thoracic & lumbar regions (T1-L2) of the spinal cord, & they synapse into two cord like chains of ganglia that run close to & parallel on each side of the spinal cord.
- Axons of the post ganglionic neuron extend from these ganglia to the tissues that they innervate & regulate.
- The sympathetic nervous system is also called thoracolumbar division because of its origin.
- In most cases, the preganglionic endings of sympathetic nervous system are highly branched enabling one preganglionic neuron to interact with many postganglionic neurons.
- This arrangement enables them to activate numerous effector organs.

PARASYMPATHETIC SYSTEM



- The parasympathetic preganglionic fibers arise from cranial nerve 3 (Oculomotor), 7 (Facial), 9 (glossopharyngeal) & vagus as well as from the sacral regions (S2 & S4), of the spinal cord & synapse in ganglia near or on the effector organ.
- They are also called as craniosacral division.

TWO SYSTEMS IN OPPOSITION OF ONE ANOTHER

Parasympathetic system

Slow heart rate



Sympathetic system

increase heart rate

Dual autonomic innervation

~ One receptor subtype from each System tends to dominate in a tissue.

Example:- Cardiac Myocytes= B-1, smooth Muscle of airways= B-2,

Smooth muscle lining in blood vessels= alpha-1

EXCITATION & INHIBITION

Oddly humbered= Usually Excitory

Beta-1 = oddly humbered= Excitory

Activating beta-1

on cardiac Myocytes = heart rate

Activating alpha-1

on blood vessels = decrease blood vessels

(Vesoconstriction)

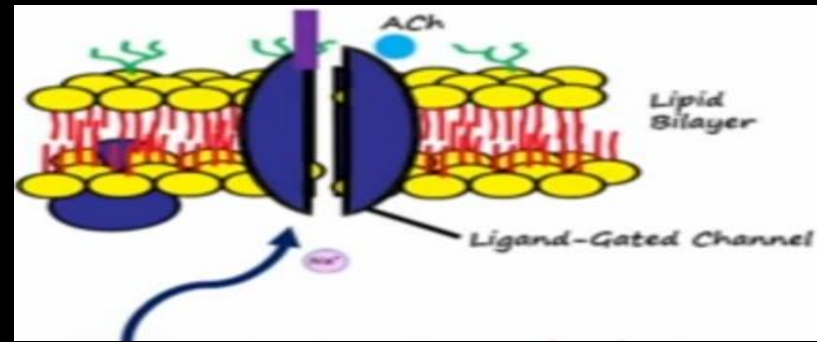
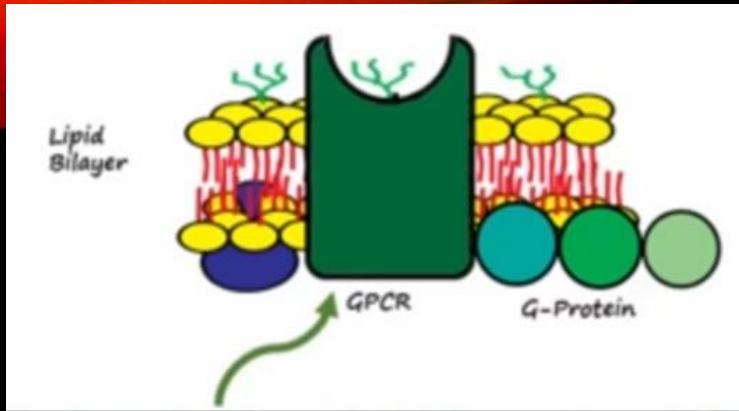
Evenly numbered= usually inhibitory

Beta-2 = evenly numbered= Inhibitory

Activating beta-2

In Airways= increase ventilation

(bronchodialation)



G- protein coupled receptors (GPCR)

- ~ All Adrenergic receptors (alpha & Beta)
- ~ All muscarinic receptors (M)
- ~ Excitatory or Inhibitory

Not G- Protein coupled receptors (Ligand- gated channel)

- ~ All Nicotinic receptors (N1 or N2)
- ~ Increase permeability of Na^+ & Ca^{2+}
- ~ Always excitatory

Please remember

- ~With Adrenergic & muscarinic receptors, evenly numbered subtypes tend to be inhibitory while oddly numbered tend to be Excitatory.
- ~Nicotinic receptors are always Excitatory.

SOMATIC NERVOUS SYSTEM

- The **somatic nervous system (SNS or voluntary nervous system)** is the part of the peripheral nervous system associated with the voluntary control of body movements via skeletal muscles.
- The somatic nervous system consists of afferent nerves or sensory nerves, and efferent nerves or motor nerves.
- **Afferent nerves:-** Afferent nerves are responsible for relaying sensation from the body to the central nervous system.
- **Efferent nerves:-** efferent nerves are responsible for sending out commands from the CNS to the body, stimulating muscle contraction; they include all the non-sensory neurons connected with skeletal muscles and skin.

FUNCTION OF ANS:

- Largely co-ordinates visceral and reflexive actions
- Mostly not under conscious control (there are exceptions)
- Senses the internal environment of the body and acts accordingly
 - Consists of both visceral sensory and motor neurons
- Also called “involuntary nervous system”
- Pretty complex
- Has a number of specializations that help co-ordinate a variety of responses with small set of fibers
- Important for homeostasis – maintenance of constant internal environment of the body



Thanks for watching.....



ORGANISATION AND FUNCTION OF ANS



Hello guys.....

Welcome to key pharmacy.....

I am going to discuss about remaining part of organisation And function of ANS.

Previous video part 1 dekhne k liye description or suggestion mai link given h ..
Ap yaha se dekh skte h...

Aiye shuru krte hn, Aj ka topic..