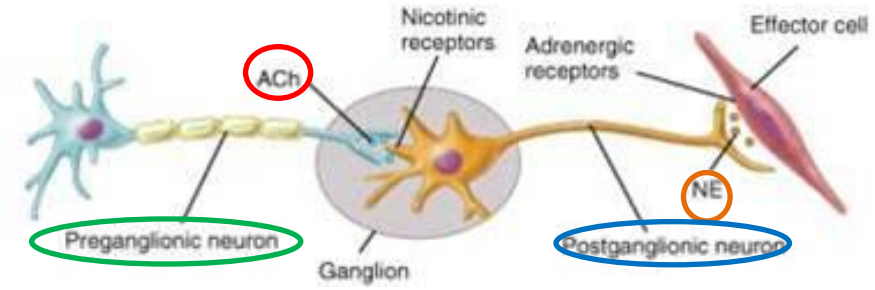
MECHANISM OF ACTIONS

THE NEUROTRANSMITTERS & RECEPTORS OF ANS

- **ANS Neurotransmitters: Classified as either cholinergic or adrenergic neurons based upon the neurotransmitter released :**

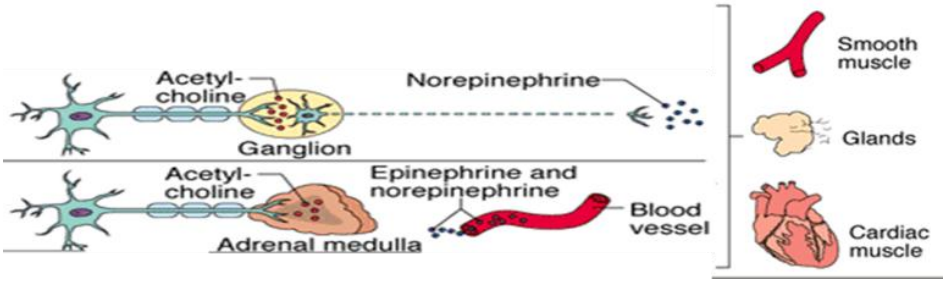
1.ADRENERGIC (Sympathetic):



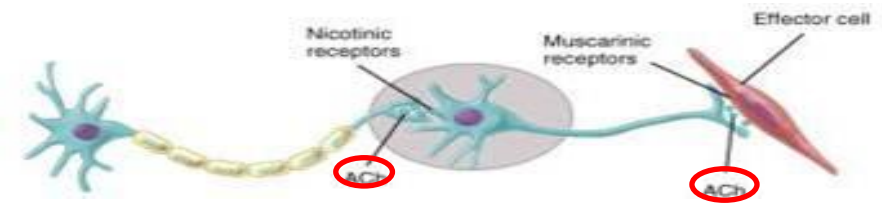
-Neurotransmitter is Norepinephrine, they called it like that because when they discover it in the beginning it is noradrenalin.

- Sympathetic is Adrenergic because the neurotransmitter is Norepinephrine.
-At the (preganglionic neuron) or (autonomic ganglia) the neurotransmitter is ACH .
- At the postganglionic neuron the neurotransmitter is Norepinephrine at the target organ, Except for sweat glands & blood vessels to skeletal muscles, their transmitter is ACH.

عارفين من المحاضرة السابقة ان sympathetic دايم يقلل من الافراز في الجسم بسبب وجود norepinephrine ولكن في الغدد العرقية بما انه ال neurotransmitter تبعه هوACH فراح يسوي stimulate ويزيد الافراز فيها + في sympathetic راح يكون فيه construction في جميع blood vessels بسبب وجود norepinephrine الا blood vessels اللي توصل الدم للعضلات فراح تكون متوسعة بسبب ACH



2.CHOLINERGIC(parasympathetic):

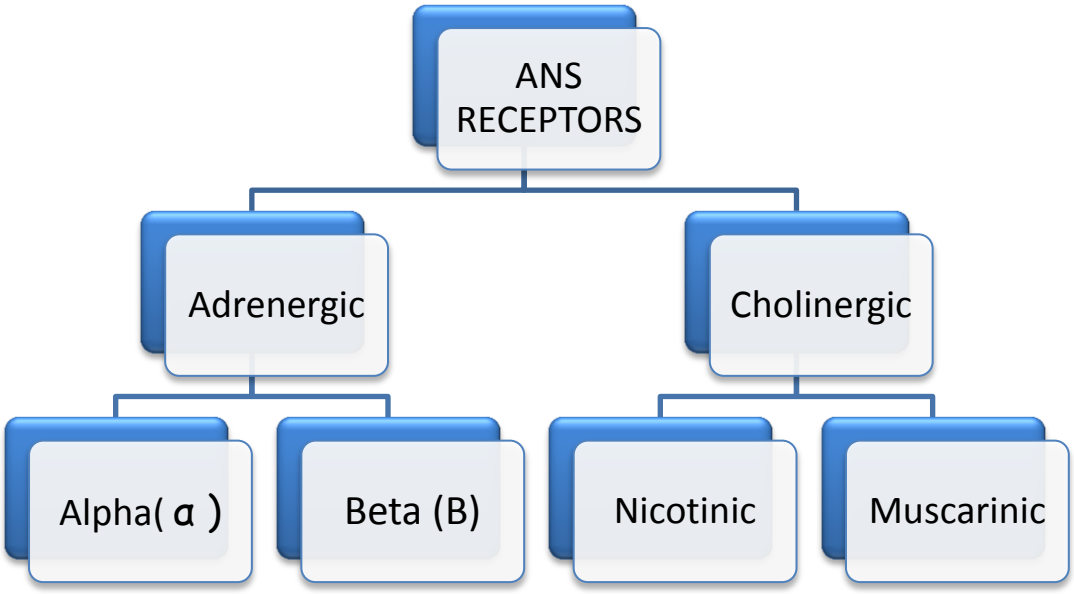


-the both preganglionic & postganglionic neurotransmitter is ACH.

NOTEICE THAT: when we said the ADRENERGIC & CHOLINERGIC the ANS classified according to neurotransmitter at the POSTGANGLIONIC neuron.

يعني لما نتكلم بشكل عام وما حدد لي الموقع اذا كان في ال post واو الـ pre، فهو يقصد الـ postganglionic neuron , فراح يكون في sympathetic الـ norepinephrine وفي parasympathetic الـ ACH .

- **ANS RECEPTORS:**



Adrenergic Receptors:

- **Alpha (α) adrenergic receptors are found in :**

  -Iris

  -Blood vessels

  -GIT

- **Beta (β) adrenergic receptors can be beta one (β1) or beta 2 (β1) → found in :**

  -Heart (β1)Bronchioles (β2)

  -Skeletal muscle (β2)

  -GIT (β2)

- **Norepinephrine mainly excite α (and β to a lesser extent).**
- **Epinephrine excites both α & β equally .**

Adrenergic Receptors Blockers:

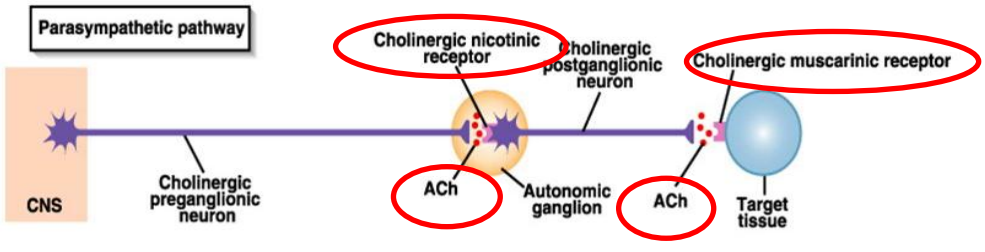
-α blockers:

Prazosin (α 1) - Yohimbine (α 2)

- β blockers:

Propranolol (β1 & β2) - Atenolol (β 1)

Cholinergic Receptors:



Are divided into:

- (1) Nicotinic → found in all ganglia (i.e., the synapses between pre- & postganglionic of both sympathetic & parasympathetic divisions of the ANS
- (2) Muscarinic → found on all effector cells innervated (& stimulated) by :

- postganglionic parasympathetic fibres , &

- postganglionic cholinergic sympathetic nerves (blood vessels of skeletal muscles & sweet glands)

Drugs block cholinergic receptors:

- Hexamethonium (block both types).
- Atropine (block muscarinic receptors).

summary

According to	Adrenergic(sympathetic)		Cholinergic(parasympathetic)	
	preganglionic	postganglionic	preganglionic	postganglionic
neurotransmitter	ACH	Norepinephrine	ACH	
Receptors	nicotinic	Alpha (α) or Beta (β1), (β2) Except: sweat gland & bl vessels >> muscarinic	nicotinic	muscarinic