pharmacology

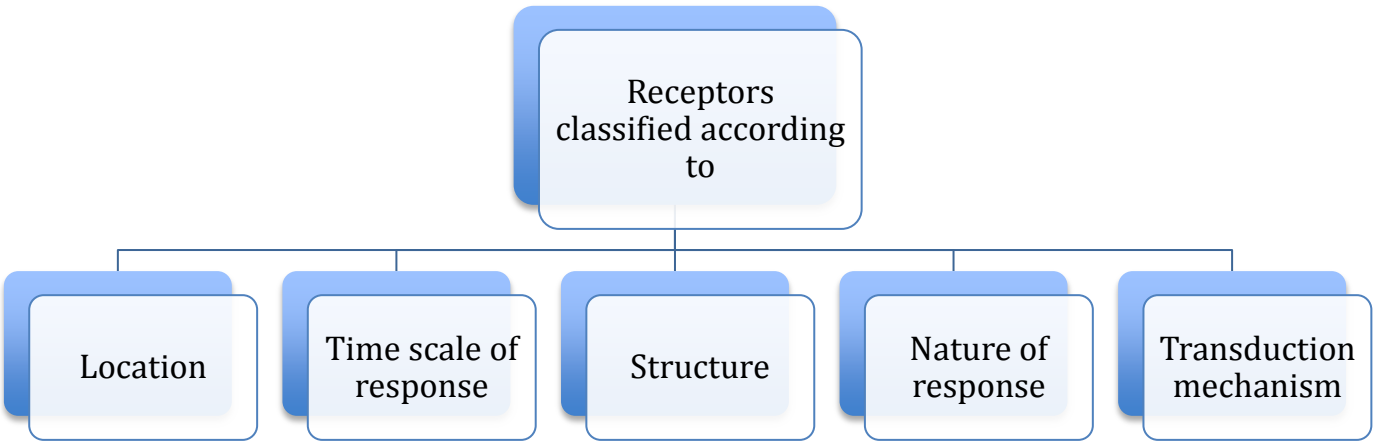
By:.

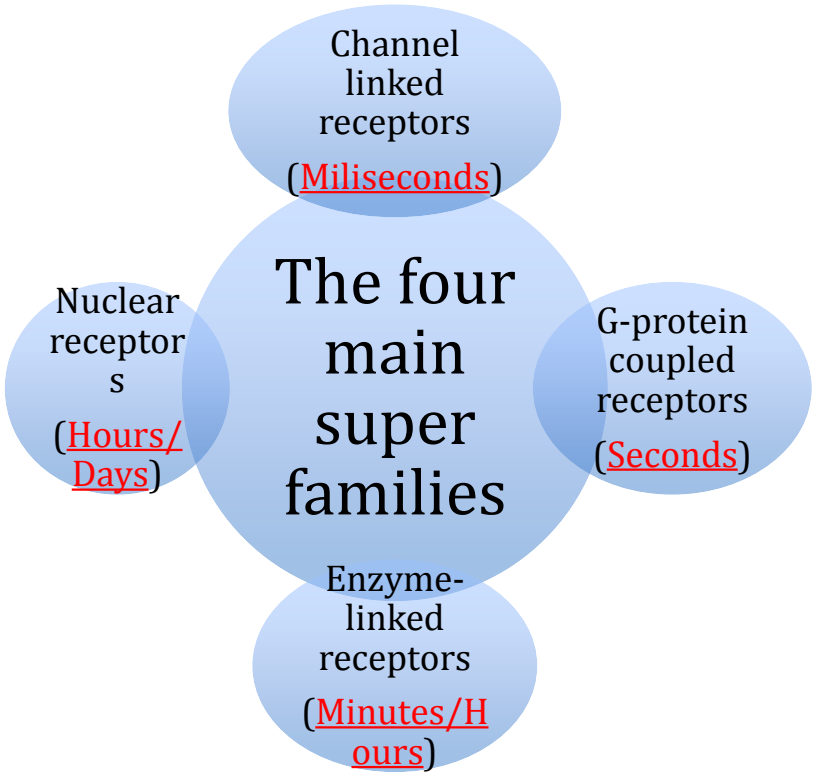
Team of pharmacology

3rd Pharmacology Lecture "Receptors Families"

Lecture objectives :

1- Know the receptor functions.
2- Know the receptor classification and the main super families.





Notes:

1) Channel-linked receptors (Ionotropic receptors / Ligand-gated ion channels)

Involved in → *fast synaptic neurotransmission*

Example : Nicotinic Ach receptor activated by Ach

♦**Difference between Voltage-Gated Ion Channel & Channel-Linked Receptor is in the way of activation:**

*Voltage-Gated Ion Channel is activated by: a change in action potential (an action potential is a short-lasting event in which the electrical membrane potential of a cell rapidly rises and falls, following a consistent path [مسار ثابت/محدد]

These channels are shut when the membrane potential is near the resting potential of the cell, but they rapidly begin to open if the membrane potential increases to a precisely defined threshold value)

*Channel-Linked Receptor is activated by: occupancy of a ligand (as mentioned before)

2) G-protein receptors (Metabotropic Receptor) Are the Most Abundant Type.

Involved in → *less rapid transmission of :*

Transmitters:	*Hormones:*	*Others:*
Adrenaline	*Glucagon*	*Peptides*

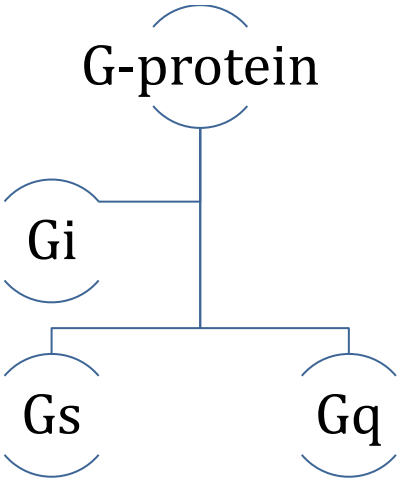
G-protein take the signal from the receptor & give it to the effector protein

G-protein → α + Guanyle Di-phosphate (GDP)

β

γ

Types of G-protein according to their α subunits :



Examples : Adrenoceptors

α1 Adrenoceptors coupled to Gq → Stimulates PLC
α2 Adrenoceptors coupled to Gi → Inhibits AC

β1&2 Adrenoceptors couled to Gs → Stimulates AC

Cholinergic receptors

M1 & M3 Ach receptors coupled to Gq → stimulates PLC

M2 & M4 Ach receptors couples to Gi → inhibits Ac

3) Enzyme-linked receptors

They control many cellular functions as; motility, growth, differentiation, division & morphogenesis(التشكل).

Involved in slow action of hormones

Examples:

Guanyle cyclase-linked receptors(Atrial Natriuretic Peptide **[ANP]** Receptor**).**

Tyrosine kinase-linked receptors (Insulin Receptor**).**

4) Nuclear receptors

Involved in regulation of Protein Synthesis, (the slowest in action)

Examples:

(in the cytosol) Glucocorticoid receptor (GR)

(in the nucleus) Thyroid hormone receptor