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Commentary

Note on Two Different Post Synaptic Receptor

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DESCRIPTION

A metabotropic receptor, also described as a G-protein-coupled receptor, is a type of membrane receptor that regulates cell activity by commencing a series of metabolic events. Metabotropic and ionotropic receptors are the two types of receptors used by the neurological system. Metabotropic receptors are indirectly linked to ion channels by signal transduction processes such as G proteins, whereas ionotropic receptors generate an ion channel pore. Particular chemical ligands activate both receptor forms. When an ionotropic receptor is active, it opens a channel through which ions like Na^+, K^+, and Cl can pass. When a metabotropic receptor is activated, a cascade of intracellular events occurs, which include ion channels opening, but also include opening of number of second messenger molecules. Chemical messengers attach to metabotropic receptors, triggering a variety of biochemical signaling cascade consequences. Metabotropic receptors are all G protein-coupled receptors. When a ligand binds to a G protein-coupled receptor, a signaling pathways cascade is activated, which can change gene transcription, regulate other proteins in the cell, release intracellular Ca^{2+}, or directly affect ion channels on the membrane. The ligands for metabotropic receptors include small molecule transmitters, monoamines, peptides, hormones, and even gases, among others. These receptors can stay open for seconds to minutes and are linked to long term effects such synaptic strength modification and short- and long-term synaptic plasticity modulation. They can also enter the circulatory system to spread a signal over the globe. The alpha helix-shaped Trans membrane spanning domains with an external amino terminus are frequently stated, and the polypeptide chain is said to be made up of 450-550 amino acids. There are seven hydrophobic Tran's membrane domains in G protein coupled receptors. Although GABAB receptors require heterodimerization to function effectively, the majority of them are monomeric proteins. The N terminus of the protein molecule is on the membrane's extracellular side, whereas the C terminus is on the intracellular side. These ligands are not immediately taken up or destroyed in compared to fast-acting neurotransmitters. The word refers to the creation of intracellular metabolites as a result of transmitter binding. Metabotropic receptors that bind to G-proteins are a three-protein complex. Other G-protein subunits may enhance or decrease the activity of enzymes that create intracellular messengers that affect the activity of kinases, while one subunit may modulate ion channels. Glutamate, acetylcholine, and serotonin are small molecule neurotransmitters that engage both metabotropic and ionotropic receptors; mammalian peptides, on the other hand, mostly activate metabotropic receptors. Metabotropic receptors are a type of membrane receptor that does not have an ion channel pore and instead uses signal transduction mechanisms, such as G proteins, to a cascade of intracellular actions involving second messenger molecules. Glutamate receptors, muscarinic acetylcholine receptors, GABAB receptors, most serotonin receptors, and receptors for norepinephrine, adrenaline, histamine, dopamine, neuropeptides, and endo cannabinoids are all examples of metabotropic receptors. Seven hydrophobic trans membrane motifs are found in metabotropic G protein-coupled receptors. When a neuron transmitter connects to a receptor, the G-protein is activated, which then stimulates the secondary messengers. The presynaptic membrane's metabolotropic receptors could either block or facilitate neurotransmitter release from the presynaptic neuron. Metabotropic receptors take more time to open than inotropic receptors because they require the activation of a lot of molecules in the electrochemical process. They will last much longer than ionotropic receptors, than which lasts for few milliseconds.

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