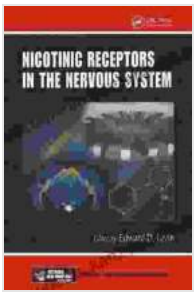
Nicotinic Receptors in the Nervous System: Frontiers in Neuroscience

Nicotinic receptors are a class of ligand-gated ion channels that are activated by nicotine and other agonists. They are found in the central and peripheral nervous systems, where they play a role in a variety of physiological processes, including synaptic transmission, addiction, and pain perception.



Nicotinic Receptors in the Nervous System (Frontiers in Neuroscience) by Alchemist Jedi

★★★★★ 5 out of 5

Language	: English
File size	: 7051 KB
Screen Reader	: Supported
Print length	: 312 pages

Nicotinic receptors are pentameric proteins composed of five subunits. The most common subunit combinations are α4β2, α3β4, and α7. Each subunit has four transmembrane domains, with the second transmembrane domain forming the ion-conducting pore.

Nicotinic receptors are activated by the binding of two molecules of acetylcholine to the extracellular domain of the receptor. This binding causes a conformational change in the receptor, which opens the ion-conducting pore and allows sodium and potassium ions to flow across the membrane.

The activation of nicotinic receptors can have a variety of effects on the nervous system, depending on the location of the receptors and the subunit composition of the receptor. For example, the activation of nicotinic receptors in the central nervous system can lead to increased neurotransmitter release, which can result in兴奋 or inhibition of neuronal activity. The activation of nicotinic receptors in the peripheral nervous system can lead to muscle contraction, salivation, and other autonomic effects.

Nicotinic Receptors and Synaptic Transmission

Nicotinic receptors are found at many synapses in the central and peripheral nervous systems. At these synapses, nicotinic receptors mediate the fast excitatory synaptic transmission.

The activation of nicotinic receptors at the presynaptic terminal leads to the release of neurotransmitters such as acetylcholine, glutamate, and GABA. The release of these neurotransmitters then activates nicotinic receptors on the postsynaptic neuron, leading to the rapid depolarization of the neuron and the generation of an action potential.

The fast excitatory synaptic transmission mediated by nicotinic receptors is essential for the proper function of the nervous system. This type of synaptic transmission is involved in a variety of cognitive processes, including learning and memory.

Nicotinic Receptors and Addiction

Nicotine is the main addictive component of tobacco smoke. Nicotine binds to and activates nicotinic receptors in the brain, leading to the release of dopamine, a neurotransmitter that is involved in reward and pleasure. The

activation of nicotinic receptors in the brain also leads to the inhibition of GABA, a neurotransmitter that is involved in inhibition. This combination of effects leads to the pleasurable effects of nicotine and the reinforcing effects of nicotine addiction.

The development of nicotine addiction is a complex process that involves both genetic and environmental factors. However, the activation of nicotinic receptors in the brain is a key step in the development of nicotine addiction.

Nicotinic Receptors and Pain Perception

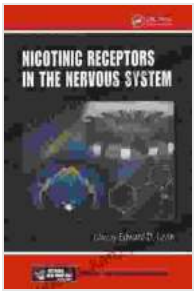
Nicotinic receptors are also involved in pain perception. The activation of nicotinic receptors in the spinal cord can lead to the release of endorphins, which are endogenous opioids that have analgesic effects. The activation of nicotinic receptors in the brain can also lead to the inhibition of pain signals.

The analgesic effects of nicotinic receptors are thought to be mediated by the inhibition of pain-transmitting neurons in the spinal cord and brain. This inhibitory effect is thought to be due to the activation of GABAergic neurons by nicotinic receptors.

The analgesic effects of nicotinic receptors have been demonstrated in a variety of animal models of pain. These findings suggest that nicotinic receptors may be potential targets for the development of new pain medications.

Nicotinic receptors are a class of ligand-gated ion channels that play a variety of roles in the nervous system. These receptors are involved in synaptic transmission, addiction, and pain perception. The development of

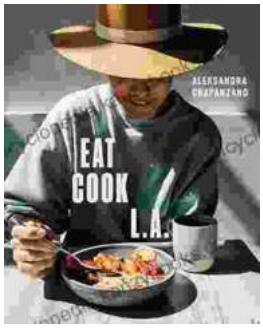
new drugs that target nicotinic receptors may lead to new treatments for a variety of neurological disFree Downloads.



Nicotinic Receptors in the Nervous System (Frontiers in Neuroscience) by Alchemist Jedi

★★★★★ 5 out of 5

Language : English
File size : 7051 KB
Screen Reader : Supported
Print length : 312 pages



Journey into the Culinary Delights of "Eat Cook": An Immersive Exploration of Fast, Easy, and Flavorful Cooking

: Unlocking the Secrets of Streamlined Cooking Are you tired of spending hours in the kitchen, only to be left with mediocre results? Do you long for the convenience of...

Embark on a Culinary Journey: Traditional Soviet Union Jewish Recipes from Odessa Snacks

Nestled on the shores of the Black Sea, Odessa, Ukraine, is a vibrant city steeped in a rich culinary history. As a melting pot of cultures,...