

Neurotransmitter Transporters Structure , Function and Regulation

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* Introduction:-

The monoamines include Dopamine Nor-epinephrine and serotonin., act as a **neurotransmitters** in central and Peripheral nervous system for many cognitive functions as memory, emotion and autonomic functions.

Synaptic neurotransmission in the central nervous system requires the precise control of the duration and magnitude of neurotransmitter action at specific molecular targets. At the molecular level, neurotransmitter signaling is regulated by ion – channels , secretory proteins, pre and postsynaptic receptors and transporters.

* Mechanisms of Biogenic *Amine Transporters:-

The transport of biogenic amines through the membrane may occur through ligand gated ion channels as Na , K and CL ions which act as cofactors for transport. These ions can help in the transport of amines either through ion gradient – derive, biogenic amines across the membrane, Kinetic technique, or thermodynamic difference.

* Gene Organization and Polymorphism:

The cloning of monoamine transmission has provided structure in formation which can be used to understand transporter expression and function. There is yet knowledge about the role of 5' & 3' Promotor regions and gene expression. Constructing the hypotheses of disease etiology & distinguishing candidate gene study but provides the association of complex diseases influenced by many genes contribute to the illnesses. The rapid evolution of technology will aid in assaying number of markers that can be identified and used for more complex analysis .

* MonoamineTransporters:-

Sodium–Coupled Transporters for:

GABA , Glycine and Tourine.

GABA is the major inhibitory neurotransmitter in

the CNS. GABA binds to GABA receptors with conformational changes that allow CL ions to influ with inhibition of membrane polarization. The transportation of glycine and tourine is a mirror image for GABA.

*Vesicular Neurotransmission.

Vesicular transport has observed in many neurotransmitters as acetyl choline, glutamate and GABA. All transporters are driven by proton electrochemical gradient generated by this. enzyme utilize the energy of cytoplasmic ATP to translocate HT ions into the vesicle and generates an acid positive inside the vesicular neurotransmission utilize the energy by exchanging one or more protons with a neurotransmitter molecule .

*Neurotransmitter- Transporter.

The neurotransmitter – transport or reuptake carrier is the most important component of the synaptic activity, the cloned transporters include sequences of multiple N-Linked glycosyl to new sites in the large extracellular loop. It is widely accepted that protein undergo post-translocational changes such as glycosylation with affection of transporter function and stability.

Dopamine Transporter Blockers.

The dopamine transporters, are proteins located in the presynaptic nerve terminals that plays a major role in reuptake of released dopamine uptake of Nit and time – dependant and is inhibited by variety of compounds such as cocaine usually binds to specific sites in the brain that called cocaine receptors. Changes in dopamine density neurons, dopamine transporter sites are responsible for several neurological disorders as well as drug abuse.