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Cholinergic neurotransmitters

Presented By;-

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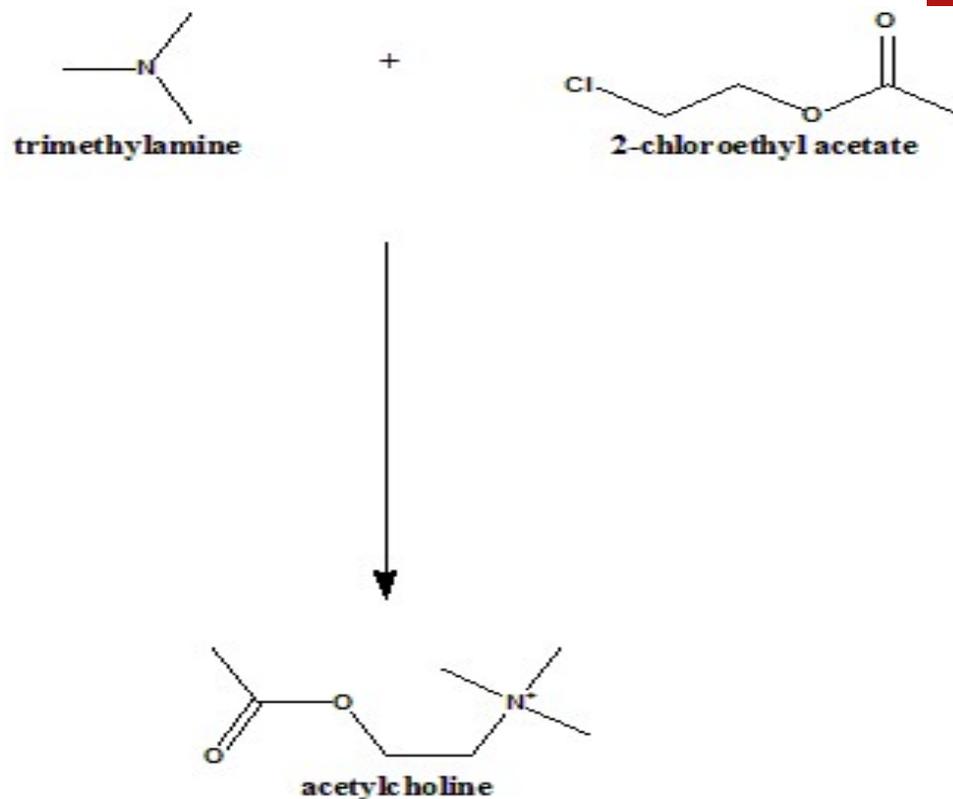
Cholinergic neurotransmitters

- ❑ Cholinergic neurotransmitters are chemical messengers that use **Acetylcholine (ACh)** to transmit signals in the **central and peripheral nervous system**.
- ❑ They act on **cholinergic receptors**, which include:
 - ✓ **Muscarinic receptors (M1–M5)**
 - ✓ **Nicotinic receptors (Nn, Nm)**
- ❑ This system is crucial for functions like muscle control, cognitive processes, and regulating many physiological actions in both the central and peripheral nervous systems.

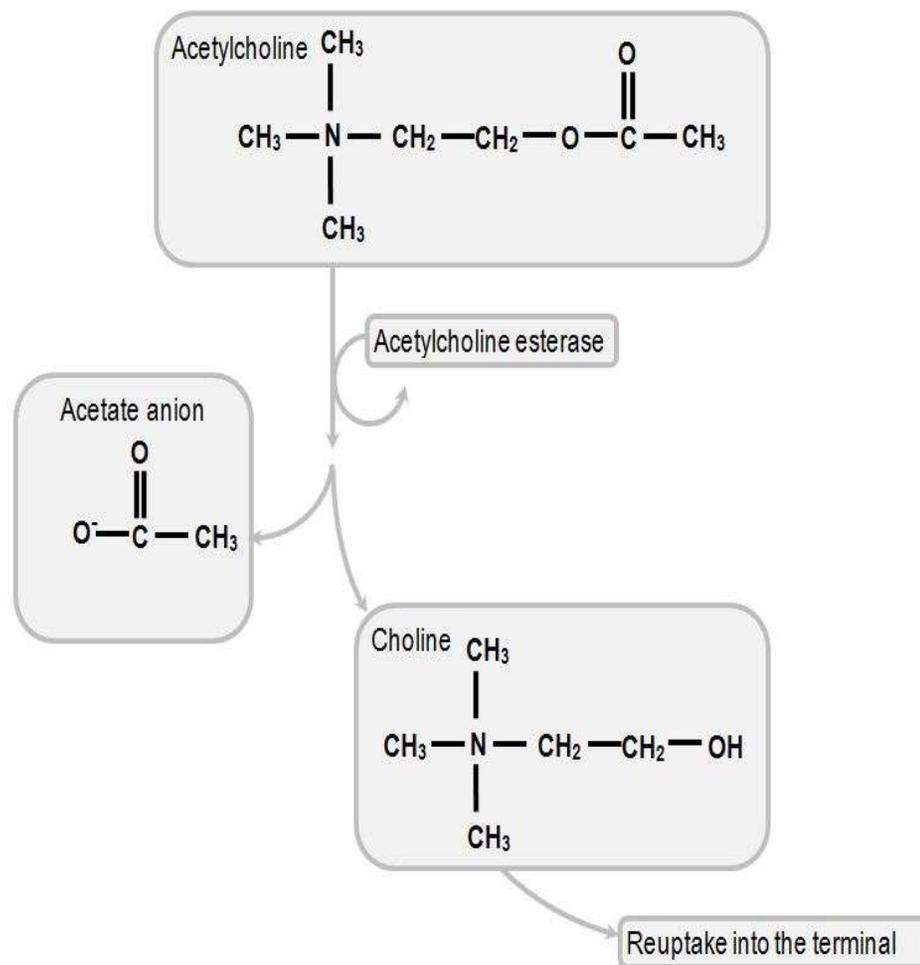
Biosynthesis of Acetylcholine

Method of synthesis

Trimethylamine and 2-chloroethyl acetate
reacts together to give
acetylcholine.



Catabolism (breaking down complex molecules) of Acetylcholine



Cholinergic receptors (Muscarinic & Nicotinic) and their distribution

Receptor Type	Subtype	Location	Primary Effect
Nicotinic	N₁ (Nm, Muscle)	Neuromuscular junction of skeletal muscle	Stimulation leading to skeletal muscle contraction
	N₂ (Nn, Neuronal)	Autonomic ganglia (sympathetic & parasympathetic), adrenal medulla, CNS	Stimulation of postganglionic neurons, release of hormones (e.g., adrenaline)
Muscarinic	M₁	CNS (cortex, hippocampus), gastric glands, salivary glands	Activation of cognitive functions, memory, and increased glandular secretions
	M₂	Heart (sinoatrial and atrioventricular nodes)	Decreased heart rate and force of contraction (inhibitory effect)
	M₃	Smooth muscles (gastrointestinal, bronchi, bladder), exocrine glands (salivary, sweat, gastric)	Smooth muscle contraction (e.g., bronchoconstriction, increased GI motility), increased glandular secretions
	M₄	CNS (hippocampus, neostriatum)	Modulatory roles, less well characterized than M ₁ -M ₃
	M₅	CNS (substantia nigra), brain vasculature	Less well characterized; thought to be involved in dopamine pathways



Thank you
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