Adrenergic Neurotransmitters

Presented By;-

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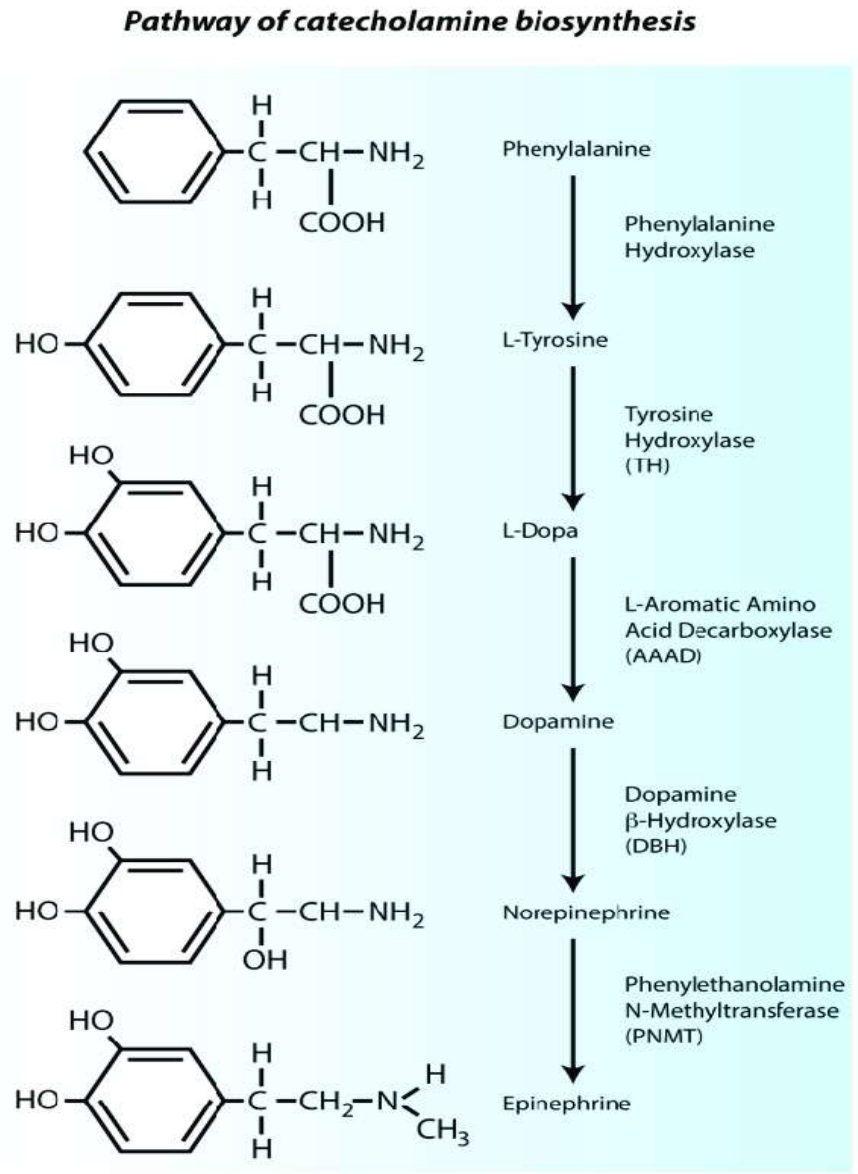
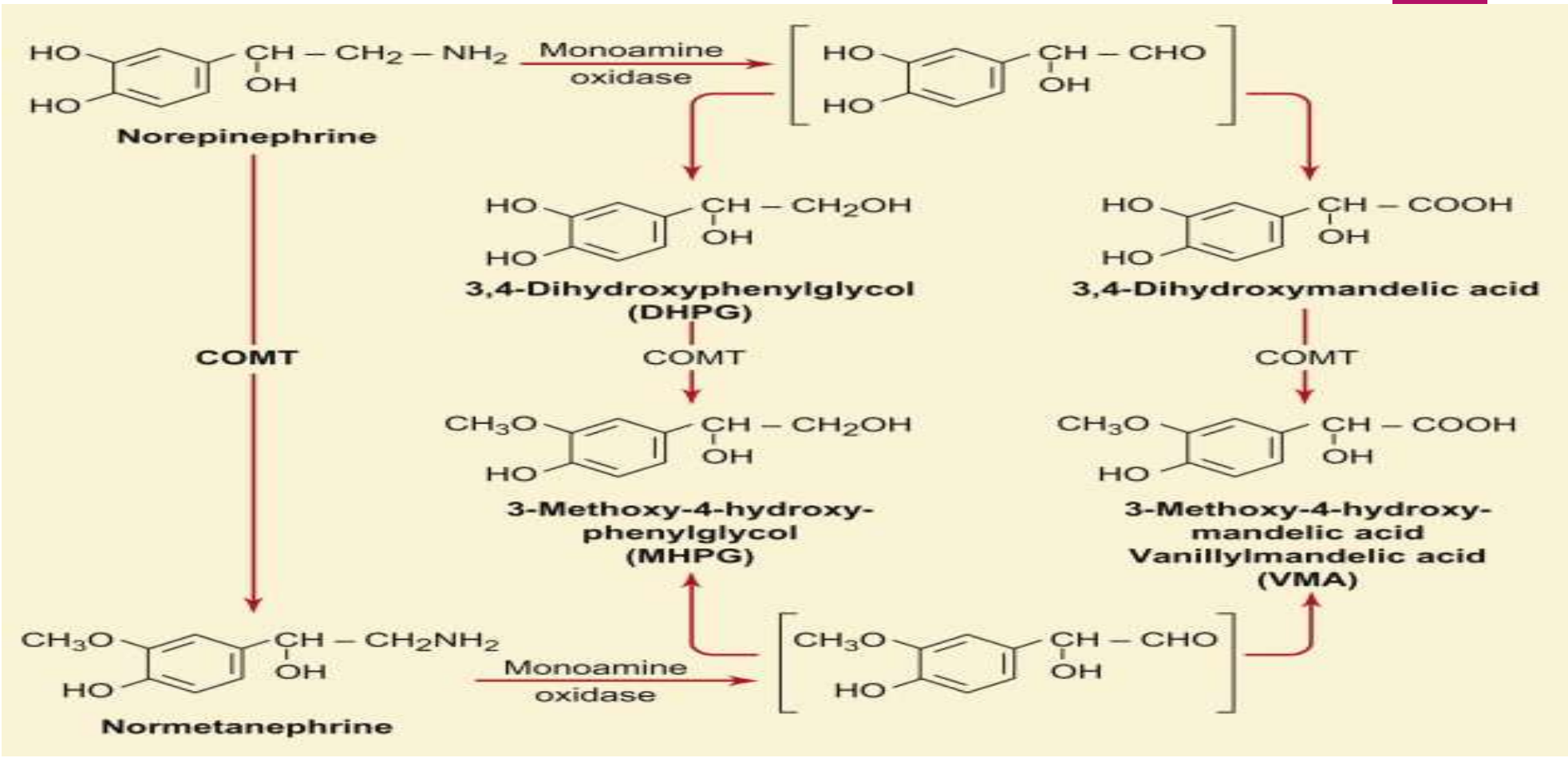
Adrenergic Neurotransmitters

- **Adrenergic neurotransmitters**—also called **catecholamines**—are chemical messengers released by the ***sympathetic nervous system (SNS)*** *and the* ***adrenal medulla*** that mediate **"fight-or-flight"** responses.
- The main adrenergic neurotransmitters are **norepinephrine, epinephrine, and dopamine**.
- They are **synthesized** from the amino acid **tyrosine** and act on **adrenergic receptors (α and β receptors)** to **regulate** vital physiological functions such as heart rate, blood pressure, respiration, and metabolism.

Biosynthesis of catecholamine



Catabolism of Catecholamine



Adrenergic receptors (Alpha & Beta) and their distribution.

Adrenergic receptors are classified into alpha (α) and beta (β) subtypes, each with distinct functions and locations.

Receptor Type	Primary Location	Main Functions
Alpha-1 (α1)	Smooth muscle (blood vessels, bladder), eye	Vasoconstriction, pupil dilation, bladder sphincter contraction
Alpha-2 (α2)	Brain, spleen, pancreas	Inhibition of norepinephrine release, modulation of insulin secretion
Beta-1 (β1)	Heart, kidney	Cardiac stimulation (increased heart rate and contractility), renin release
Beta-2 (β2)	Lungs (bronchioles), liver, skeletal muscle	Bronchodilation, glycogenolysis, vasodilation
Beta-3 (β3)	Adipose tissue	Lipolysis (fat breakdown)

Thank you

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