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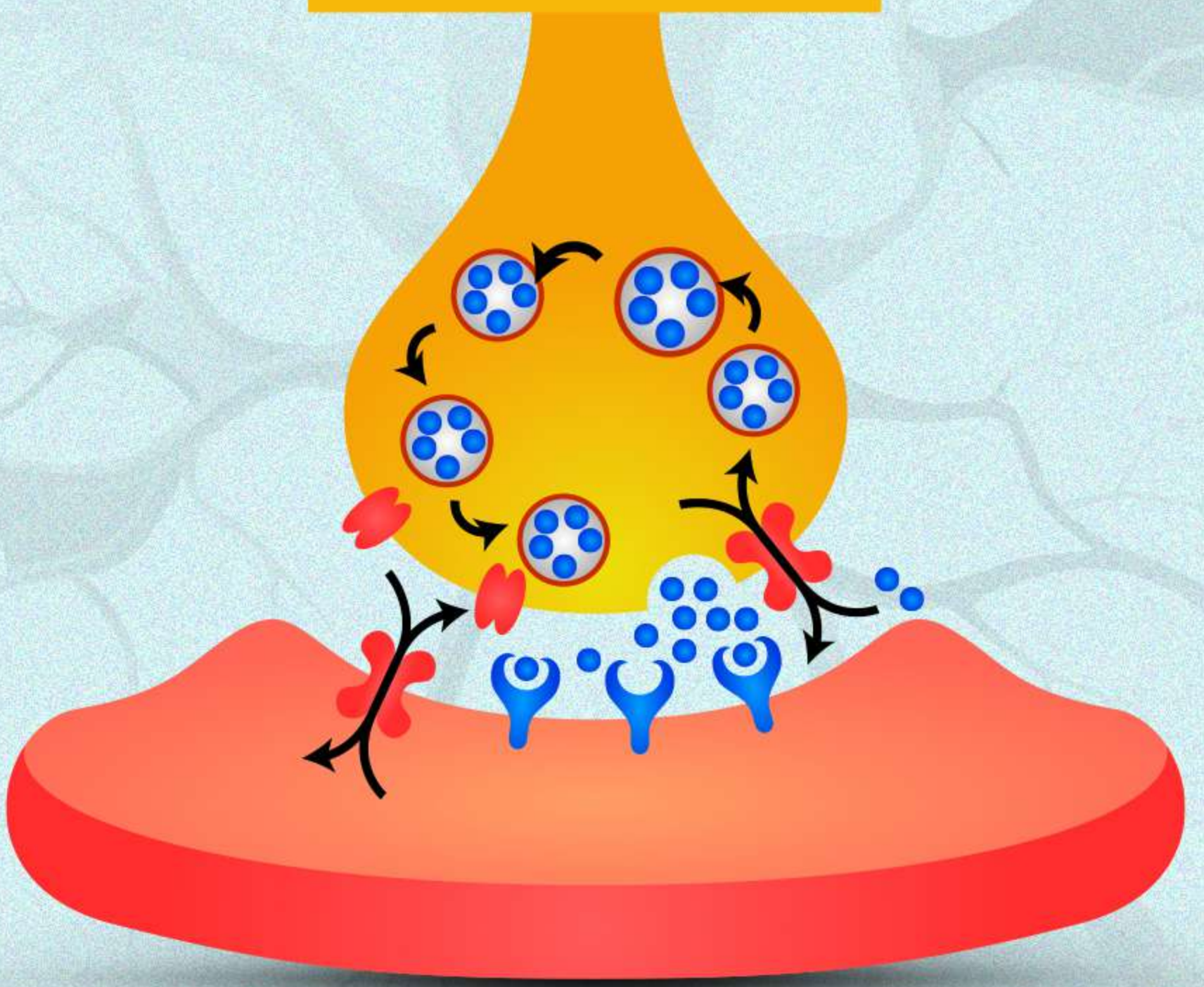
Neurotransmitters

and Their Role



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Sample MCQs For Psychology Entrance

Let's explore the kind of questions examiners love to ask about this topic!

Q1. Which neurotransmitter imbalance is most closely linked with the symptoms of Huntington's disease?

a
Dopamine deficiency

b
Acetylcholine deficiency

c
Excess Serotonin

d
GABA deficiency

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Q2. The drug Fluoxetine (Prozac) primarily acts by:

a

Blocking dopamine receptors

b

Inhibiting the reuptake of serotonin

c

Enhancing GABA activity

d

Stimulating norepinephrine release

Read carefully, challenge yourself to guess first.
If you can't, answers are revealed in the last slide.

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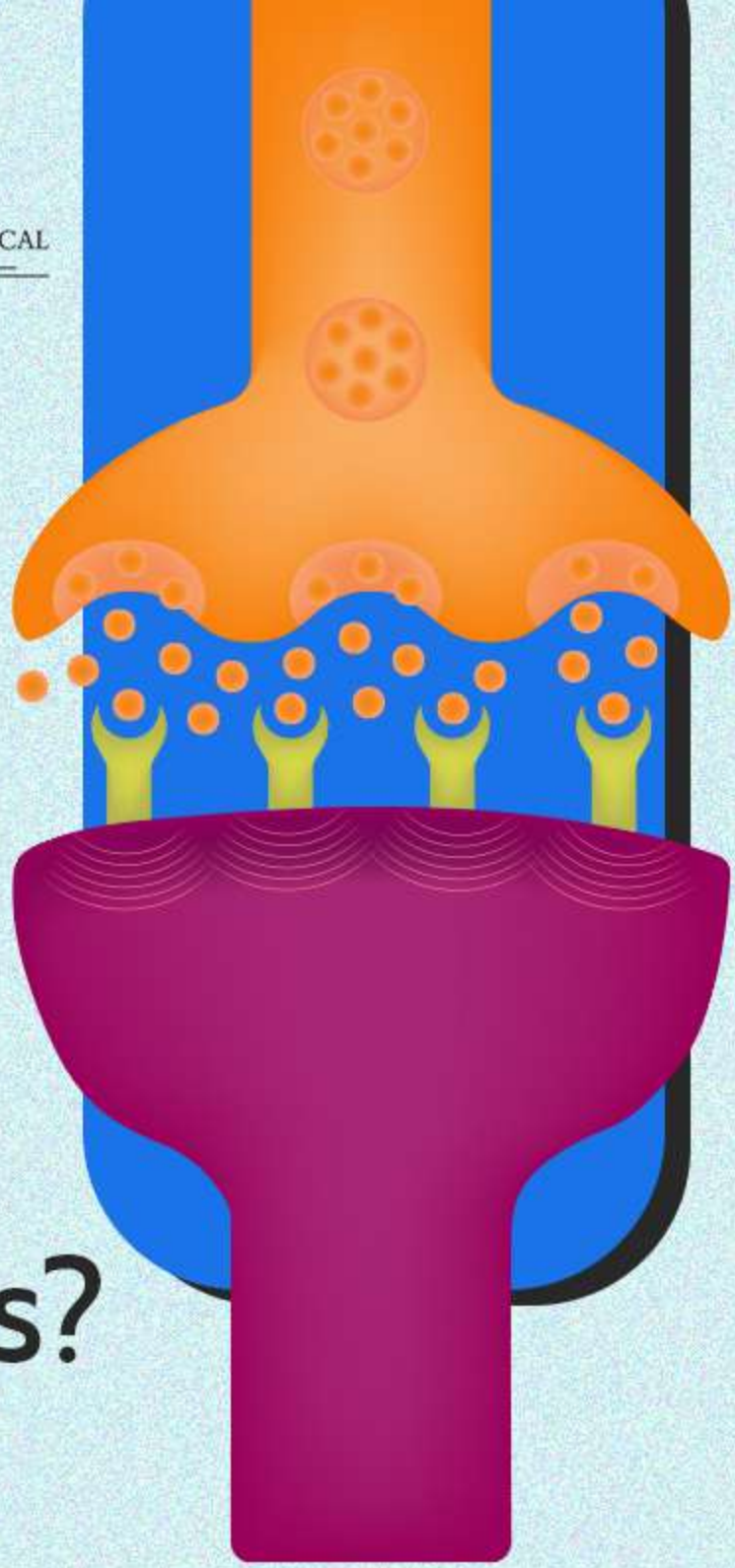

What Are Neurotransmitters?

Neurotransmitters are **chemical messengers** that transmit signals across synapses — the gaps between neurons.

When an electrical impulse reaches the axon terminal, neurotransmitters are released into the **synaptic cleft** and bind to receptors on the next neuron, influencing whether it fires or not.

This process, known as synaptic transmission, forms the basis of all neural communication.

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Types of Neurotransmitters

Neurotransmitters can be classified as:

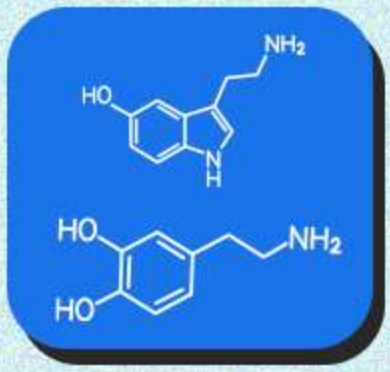
- **Excitatory**
  increase the likelihood of neuron firing (e.g., Glutamate).



- **Inhibitory**
  decrease neuron firing (e.g., GABA).



- **Modulatory**
  regulate groups of neurons and influence other neurotransmitters (e.g., Dopamine, Serotonin).



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Major Neurotransmitters and Their Functions

1.



Acetylcholine (ACh):

- Involved in muscle action, memory, and learning.
- Deficiency linked with Alzheimer's disease.

2.



Dopamine:

- Regulates movement, motivation, and reward.
- Excess activity linked with Schizophrenia, deficiency linked with Parkinson's disease.

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3.



Serotonin:

- Influences mood, appetite, and sleep.
- Low levels associated with depression and anxiety disorders.

4.



Norepinephrine:

- Associated with alertness and arousal.
- Plays a role in the body's fight-or-flight response.
- Imbalance linked with mood disorders.

5.



GABA (Gamma-Aminobutyric Acid):

- Main inhibitory neuro-transmitter in the CNS.
- Helps calm neural activity; deficiency can lead to anxiety or seizures.

6.



Glutamate:

- Main excitatory neuro-transmitter; crucial for learning and memory.
- Excess glutamate may cause neuronal damage (excitotoxicity).

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Historical and Research Insights



- The first neurotransmitter discovered was Acetylcholine by Otto Loewi (1921) during his famous frog heart experiment.
- Dale's Principle: A neuron releases the same neurotransmitter at all its terminals.
- Modern imaging and psychopharmacological research link neurotransmitters to specific mental disorders and drug mechanisms — a core area in clinical and biological psychology.

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The correct answers are:

Q.1 D) GABA deficiency

Q.2 B) Inhibiting the reuptake of serotonin