

Foundations of Addiction Science

Addiction Science · Answer Key · 12 Questions

1. Which neurotransmitter is primarily associated with the brain's reward system and the reinforcing effects of addictive substances?

- A) Acetylcholine
- B) Dopamine**
- C) Serotonin
- D) GABA

2. Which brain region, often referred to as the 'executive control center', is responsible for decision-making and impulse regulation, and is frequently impaired in addiction?

- A) Prefrontal cortex**
- B) Cerebellum
- C) Hippocampus
- D) Occipital lobe

3. What is the term for the physiological state where the body adapts to a substance, requiring larger doses to achieve the same initial effect?

- A) Withdrawal
- B) Sensitization
- C) Tolerance**
- D) Craving

4. Which protein-based mechanism describes the process by which neurons communicate, a process often hijacked by chronic drug use?

- A) Synaptic plasticity**
- B) Neural pruning
- C) Axonal atrophy
- D) Glial scarring

5. According to the Incentive Salience Theory, what is the primary role of dopamine in addiction?

- A) Producing the feeling of pleasure
- B) Encoding the value of cues that predict rewards**
- C) Reducing the physical symptoms of withdrawal
- D) Increasing the rate of drug metabolism

6. Which pharmacological class of drugs works by binding to mu-opioid receptors, effectively blocking the brain's pain-processing pathways?

A) Stimulants

B) Opioids

C) Benzodiazepines

D) Hallucinogens

7. What term describes the psychological and physical symptoms that occur when an individual ceases or reduces the use of a substance after prolonged use?

A) Relapse

B) Tolerance

C) Withdrawal

D) Habituation

8. In the context of addiction, what does the term 'cross-tolerance' mean?

A) Tolerance to one drug resulting in tolerance to another of the same class

B) The inability to develop tolerance to any substance

C) Developing tolerance to a drug while abstaining from others

D) The interaction between psychological stress and drug tolerance

9. Which brain structure is primarily involved in the formation of conditioned associations between drug-related environmental cues and the rewarding effects of the drug?

A) Amygdala

B) Thalamus

C) Pons

D) Medulla

10. Chronic exposure to substances of abuse can lead to long-lasting changes in gene expression without altering the DNA sequence; what is this field of study called?

A) Genomics

B) Epigenetics

C) Proteomics

D) Metabolomics

11. Which neurotransmitter system is the primary target for benzodiazepines, which are often used to manage alcohol withdrawal symptoms?

A) Dopamine

B) Serotonin

C) GABA

D) Glutamate

12. What is the effect of chronic cocaine exposure on the dopamine transporter (DAT) levels in the brain?

A) An increase in DAT density

B) A decrease in DAT density

C) No change in DAT expression

D) The total destruction of DAT proteins