Lecture #06 Neuromodulatory Systems

Question 1: Which correctly matches a neuromodulator with its principal nucleus of origin?

a) Serotonin, Hypothalamus

b) Dopamine, Hypothalamus

c) Acetylcholine, Hypothalamus

d) Serotonin, Raphe nuclei

e) Histamine, Locus Coeruleus

Lecture #06 Neuromodulatory Systems

Question 2: What is the most universal aspect of a neuromodulator's action?

a) It is G protein coupled

b) It has rapid onset

c) It has rapid termination

d) It originates from billions of widely dispersed cell bodies

e) It has precisely placed synapses

Lecture #06 Neuromodulatory Systems

Question 3: Where are the raphe nuclei located?

a) Midbrain (mesencephalon)

b) Brainstem midline

c) Dorsolateral pontine tegmentum

d) Basal forebrain

e) Hypothalamus

Lecture #06 Neuromodulatory Systems

Question 4: Which neuromodulator is released by stimuli that predict reward?

a) Histamine

b) Serotonin

c) Norepinephrine

d) Acetylcholine

e) Dopamine

Lecture #06 Neuromodulatory Systems

Question 5: What disease is believed to result from loss of cell bodies of cholinergic neuromodulatory neurons?

a) Alzheimer's

b) Parkinson's

c) Pick's

d) Hemiballismus

e) Huntington's

Lecture #06 Neuromodulatory Systems

Question 6: Where is the locus coeruleus located?

a) Ventral pons

b) Dorsal medulla

c) Ventral medulla

d) Dorsal midbrain

e) Dorsal pons

Lecture #06 Neuromodulatory Systems

Question 7: Where are the cell bodies of dopaminergic neurons?

a) Substantia nigra (SNc)

b) Basal forebrain

c) Raphe nuclei

d) Tuberomammillary nucleus

e) Locus coeruleus

Lecture #06 Neuromodulatory Systems

Question 8: 5-hydroxytryptamine (5HT) is which neuromodulator?

a) Serotonin

b) Dopamine

c) Norepinephrine

d) Acetylcholine

e) Histamine

Lecture #06 Neuromodulatory Systems

Question 9: Where are the cell bodies of noradrenergic (norepinephrinergic) neurons?

a) Tuberomammillary nucleus

b) Substantia nigra (SNc)

c) Locus coeruleus

d) Raphe nuclei

e) Basal forebrain

Lecture #06 Neuromodulatory Systems

Question 10: Where are the cell bodies of cholinergic neuromodulatory neurons?

a) Substantia nigra (SNc)

b) Locus coeruleus

c) Tuberomammillary nucleus

d) Raphe nuclei

e) Basal forebrain

Lecture #06 Neuromodulatory Systems

Question 11: Which neuromodulator is found in the pedunculopontine and laterodorsal tegmental nuclei of the pons?

a) Muscarine

b) Gamma Amino Butyric Acid (GABA)

c) Acetylcholine

d) Histamine

e) Galanin

Lecture #06 Neuromodulatory Systems

Question 12: What disease results from loss of substantia nigra (SNc) neurons?

a) Parkinson's

b) Pick's

c) Huntington's

d) Hemiballismus

e) Alzheimer's

Lecture #06 Neuromodulatory Systems

Question 13: Which is a prominent inhibitory peptide neuromodulator?

a) Histamine

b) Acetylcholine

c) Galanin

d) Gamma Amino Butyric Acid (GABA)

e) Muscarine

Lecture #06 Neuromodulatory Systems

Question 14: Which neuromodulator is most directly associated with reward prediction?

a) Substance P

b) Norepinephrine

c) Dopamine

d) Serotonin

e) Acetylcholine

Lecture #06 Neuromodulatory Systems

Question 15: What disorder results from loss of the subthalamic nucleus?

a) Hemiballismus

b) Huntington's

c) Parkinson's

d) Alzheimer's

e) Pick's

Lecture #06 Neuromodulatory Systems

Question 16: Which enzyme is required for production of norepinephrine but not dopamine?

a) Dopamine beta hydroxylase

b) Tyrosine hydroxylase

c) Dopa decarboxylase

d) 5-HTP decarboxylase

e) Tryptophan hydroxylase

Lecture #06 Neuromodulatory Systems

Question 17: Cocaine and amphetamines share which neuromodulatory action?

a) Increase of the duration and spatial extent of dopamine action

b) Reduction of symptoms of schizophrenia

c) Reduction of the duration and spatial extent of dopamine action

d) Increasing the activity of the serotonin transporter

e) Increasing the activity of the dopamine transporter

Lecture #06 Neuromodulatory Systems

Question 18: Which is a common feature of the initial synthetic step for Dopamine and Serotonin?

a) 5-HTP

b) Tryptophan amino acid

c) Tyrosine amino acid

d) Monoamine oxidase

e) Hydroxylase enzyme

Lecture #06 Neuromodulatory Systems

Question 19: What is the effect of blocking DAT or NET (SLC6A2)?

a) Increased acetylcholine levels

b) Decreased catecholamine levels

c) Decreased acetylcholine levels

d) Increased catecholamine levels

e) Decreased arousal

Lecture #06 Neuromodulatory Systems

Question 20: Which is a feature of direct ion channel neurotransmission that is not shared by neuromodulators?

a) Phosphorylation of membrane proteins

b) Amplification of effects by enzymes that convert multiple molecules

c) Wide variety of potential ultimate effects

d) Rapid and discrete action

e) Control of overall neuronal excitability

Lecture #06 Neuromodulatory Systems

Question 21: Which is a second location of the cell bodies of dopaminergic neurons?

a) Substantia nigra pars reticulata (SNr)

b) Striatum

c) Horizontal limb of the diagonal band of Broca (HDB)

d) Nucleus basalis of Meynert

e) Ventral tegmental area (VTA)

Lecture #06 Neuromodulatory Systems

Question 22: What disease progresses from loss of the D2 striatal neurons?

a) Pick's

b) Alzheimer's

c) Parkinson's

d) Hemiballismus

e) Huntington's