

Recitation 5 Worksheet

Second Messenger Pathways and Diffuse Modulatory Brain Systems

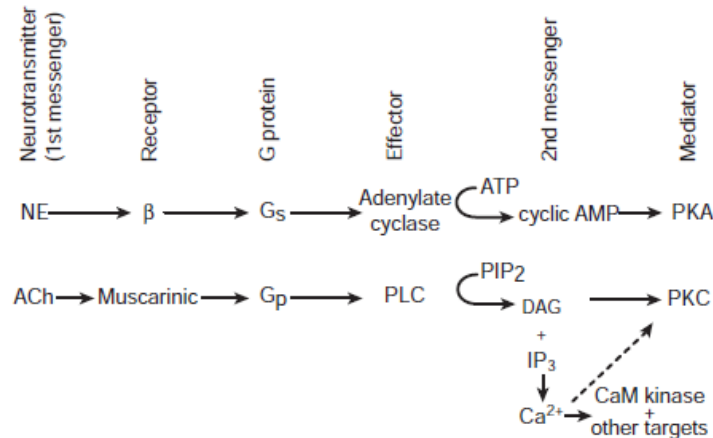


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Alberts, B., A. Johnson, et al. *Molecular Biology of the Cell*. 4th ed. Garland Science, 2002. Figure 15-36 The two branches of the inositol phospholipid pathway.

See Figure 15-36 The two branches of the inositol phospholipid pathway: <http://www.ncbi.nlm.nih.gov/books/NBK26912/>

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Alberts, B., D. Bray, et al. *Molecular Biology of the Cell*. 3rd ed. Garland Science; 1994. Figure 15-35 The activation of CaM-kinase II.

See Figure 15-35 The activation of CaM-kinase II: <http://www.ncbi.nlm.nih.gov/books/NBK28400/>

System	Location of cell bodies	Projections	Functions	Comments
Norepinephrine	Locus coeruleus	Widespread regions of brain and spinal cord	Attention, arousal, sleep-wake cycles	The axons varicosities along processes
Serotonin (5-HT)	Caudal raphe nuclei	Widespread regions of brain and spinal cord	Arousal, wakefulness	Antidepressants (SSRIs) are serotonin reuptake inhibitors
Dopamine	Substantia nigra (SN) and ventral tegmental area (VTA)	Frontal lobe, limbic system, striatum	Reinforcement, euphoria, motor control	<ul style="list-style-type: none"> - Degeneration of SN cells leads to Parkinson's disease - Stimulation of VTA substitutes for feeding, pleasure, reinforcement - Amphetamines and cocaine potentiate dopamine release - antipsychotics are dopamine blockers
Acetylcholine	Septal nuclei Nucleus basalis	Hippocampus, cortex	Arousal, sleep-wake cycles	- Cholinergic cells degenerate in Alzheimer's disease

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