

ACTIVITY 3.4

Mouse Party: Drugs and Neurotransmitters

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Instructions

Instruct students to use the Mouse Party interactive website (<http://learn.genetics.utah.edu/content/addiction/mouse/>) from the University of Utah Genetic Science Learning Center to explore effects of each of the drugs listed in the chart provided. Then, have the students complete the table with this information:

- Identify which neurotransmitter is affected by the drug.
- Explain how the drug alters activity at the synapse.
- Identify the drug as an agonist/antagonist for that particular neurotransmitter.



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MOUSE PARTY: DRUGS AND NEUROTRANSMITTERS

Use the [Mouse Party interactive](#) from the University of Utah Genetic Science Learning Center to explore effects of each of the drugs listed below.

Then, complete the table with this information:

- Identify which neurotransmitter is affected by the drug.
- Explain how the drug alters activity at the synapse.
- Identify the drug as an agonist/antagonist for that particular neurotransmitter.

DRUG	NEUROTRANSMITTER(S)	HOW DOES THE DRUG ALTER ACTIVITY AT THE SYNAPSE?	AGONIST OR ANTAGONIST
Alcohol			
Cocaine			
Methamphetamine			
LSD			
Marijuana			
Ecstasy			
Heroin			

MOUSE PARTY: DRUGS AND NEUROTRANSMITTERS— ANSWER KEY

DRUG	NEUROTRANSMITTER(S)	HOW DOES THE DRUG ALTER ACTIVITY AT THE SYNAPSE?	AGONIST OR ANTAGONIST
Alcohol	GABA	It makes GABA receptors even more inhibitory.	Agonist (for GABA)
	Glutamate	It binds to Glutamate receptors, preventing it from binding to the cell.	Antagonist (for Glutamate)
Cocaine	Dopamine	It blocks reuptake of dopamine.	Agonist
Methamphetamine	Dopamine	Methamphetamine is taken into axon by reuptake pumps (“transporters”). It invades vesicles and pushes dopamine molecules out into the synapse.	Agonist
LSD	Serotonin	It chemically resembles serotonin and binds to receptor sites.	Agonist (sometimes antagonist)
Marijuana	Dopamine	It blocks activity of inhibitory neurotransmitter, resulting in a flood of dopamine.	Agonist (for dopamine)
Ecstasy	Serotonin	Ecstasy mimics serotonin and is taken up by reuptake pumps. Transporters push excess serotonin into the synapse.	Agonist
Heroin	Dopamine	Heroin blocks inhibitory neurotransmitters, triggering release of dopamine.	Agonist

