

Dopamine Theory of Schizophrenia

Schizophrenia is caused by too much dopamine (DA)

- DA antagonists are effective neuroleptics (antischizophrenic drugs)
 - Chlorpromazine
 - Reserpine
- Evidence
 - Neuroleptics take 2-3 weeks to work
 - Parkinson's disease (PD) side effects
 - PD = reduced DA in striatum
 - Schizophrenia = too much DA
 - Cocaine/amphetamine increase DA levels and induce schizophrenia type symptoms (stereotype behavior)

Problems with DA Theory

Different drug mechanisms

- Reserpine depletes DA
 - By breaking down synaptic vesicles
- Chlorpromazine does not deplete DA
 - DA levels are normal
 - Increased levels of DA metabolites
 - Is a receptor blocker

► Mechanisms of Drug Effects

Some Mechanisms of Drug Action

Agonistic Drug Effects

Drug increases the synthesis of neurotransmitter molecules (e.g., by increasing the amount of precursor).

Drug increases the number of neurotransmitter molecules by destroying degrading enzymes.

Drug increases the release of neurotransmitter molecules from terminal buttons.

Drug binds to autoreceptors and blocks their inhibitory effect on neurotransmitter release.

Drug binds to postsynaptic receptors and either activates them or increases the effect on them of neurotransmitter molecules.

Drug blocks the deactivation of neurotransmitter molecules by blocking degradation or reuptake.

Antagonistic Drug Effects

Drug blocks the synthesis of neurotransmitter molecules (e.g., by destroying synthesizing enzymes).

Drug causes the neurotransmitter molecules to leak from the vesicles and be destroyed by degrading enzymes.

Drug blocks the release of the neurotransmitter molecules from terminal buttons.

Drug activates autoreceptors and inhibits neurotransmitter release.

Drug is a receptor blocker; it binds to the postsynaptic receptors and blocks the effect of the neurotransmitter.

