DRUGS

- Every drug that affects motor behavior works at the synapse.

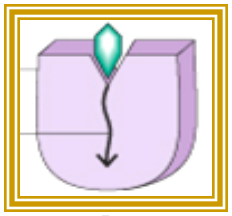
- Works at the post-synaptic neuron:
  - **Agonist:** helps NT do its job by *increasing release of the neurotransmitter*
  - **Antagonist:** blocks NT from doing its job by *blocking the receptors* of a neurotransmitter

- Works at the pre-synaptic neuron:
  - **Reuptake inhibitor:** A SSRI is a drug that blocks the reuptake of NT on the pre-synaptic neuron

Caffeine as an antagonist

Neural Bases of Psychology: Receptor Sites

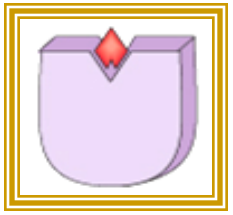
- **normal** message

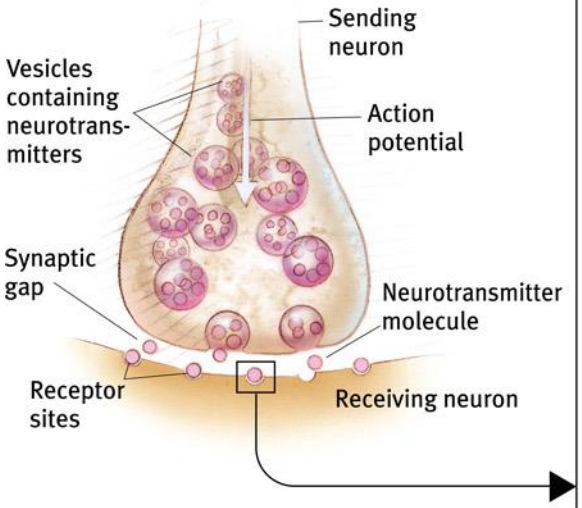


- **blocked** message (wrong shape)

- **agonistic drugs** mimic shape and enhance neurotransmitter

- **antagonistic drugs** fill the site and block neurotransmitter



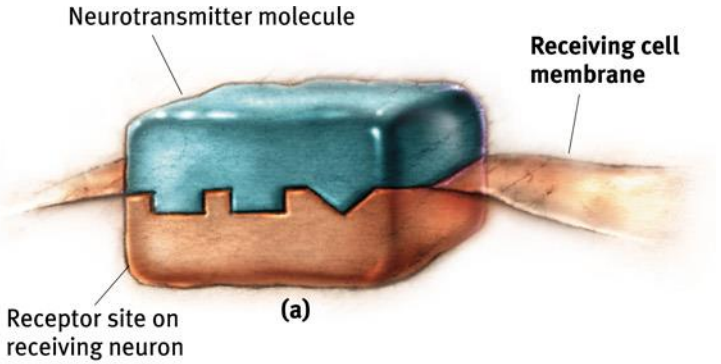


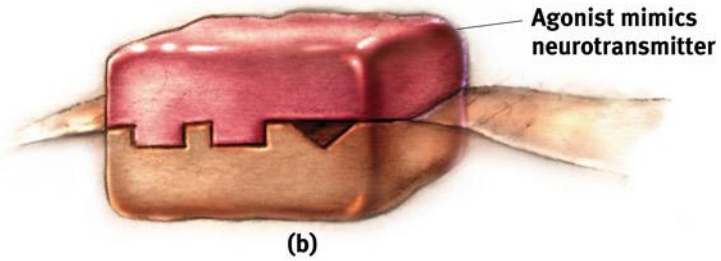
Neurotransmitters carry a message from a sending neuron across a synapse to receptor sites on a receiving neuron.

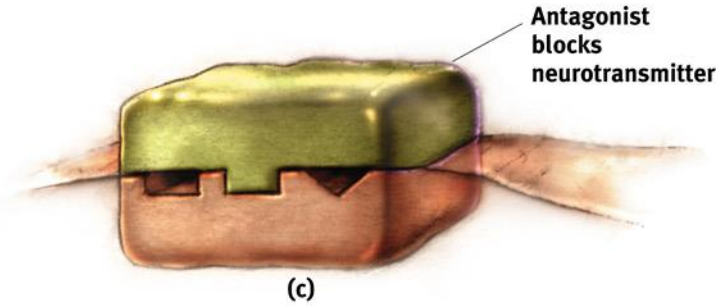
This neurotransmitter molecule fits the receptor site on the receiving neuron, much as a key fits a lock.

This agonist molecule excites. It is similar enough in structure to the neurotransmitter molecule to mimic its effects on the receiving neuron. Morphine, for instance, mimics the action of endorphins.

This antagonist molecule inhibits. It has a structure similar enough to the neurotransmitter to occupy its receptor site and block its action, but not similar enough to stimulate the receptor. Curare poisoning paralyzes its victims by blocking ACh receptors involved in muscle movement.







Examples

- **Curare (used by natives on poison darts):**
  - Stops ACh from fitting into receptor sites
- **Black Widow venom:**
  - Is similar to Ach and accelerates movement
    (can produce seizures and convulsions)

Which is an agonist?

Which is an antagonist?

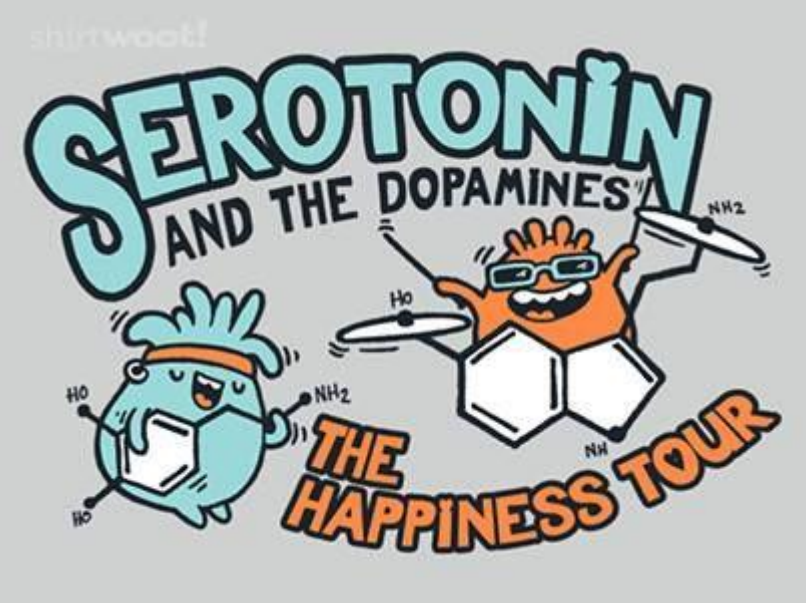
Neurotransmitters and Drug Treatment

- Dopamine (NT): excessive levels in the brain associated with schizophrenia and low levels associated with Parkinson's disease
  - Thorazine used for schizophrenia patients b/c it blocks dopamine (antagonist)
  - L-Dopa used for Parkinsons (agonist)
    - Patients develop tolerance

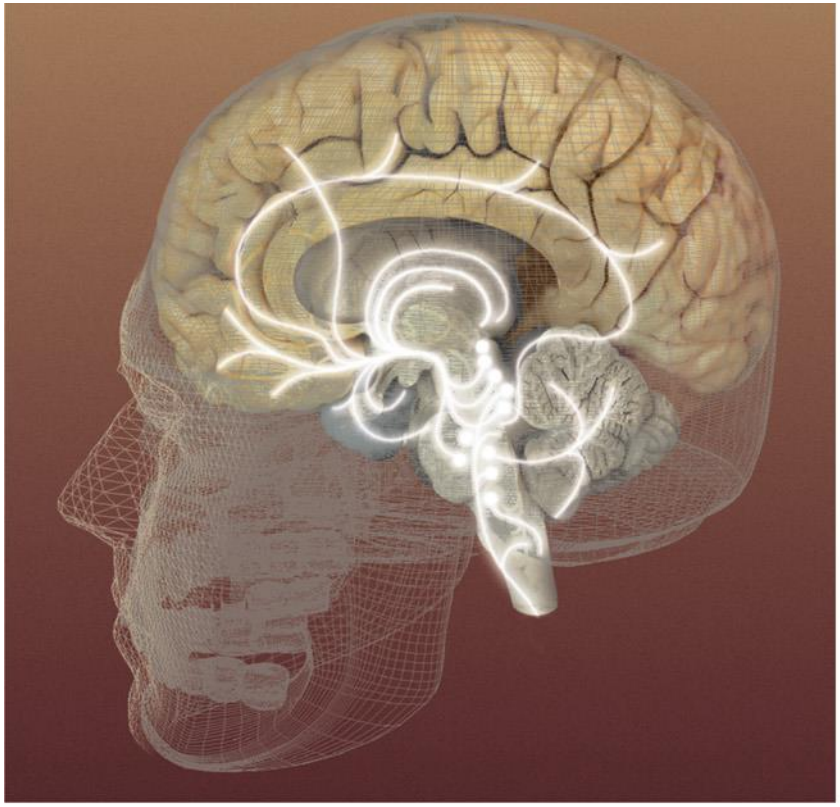
Neurotransmitters and Drug Treatment

- Serotonin (NT):
  - Low levels associated with depression
  - Administer Prozac – S.S.R.I. (selective seratonin reuptake inhibator)
  - M.A.O.'s breakdown serotonin, dopamine,
    - M.A.O. **inhibitors** help seratonin (agonist)

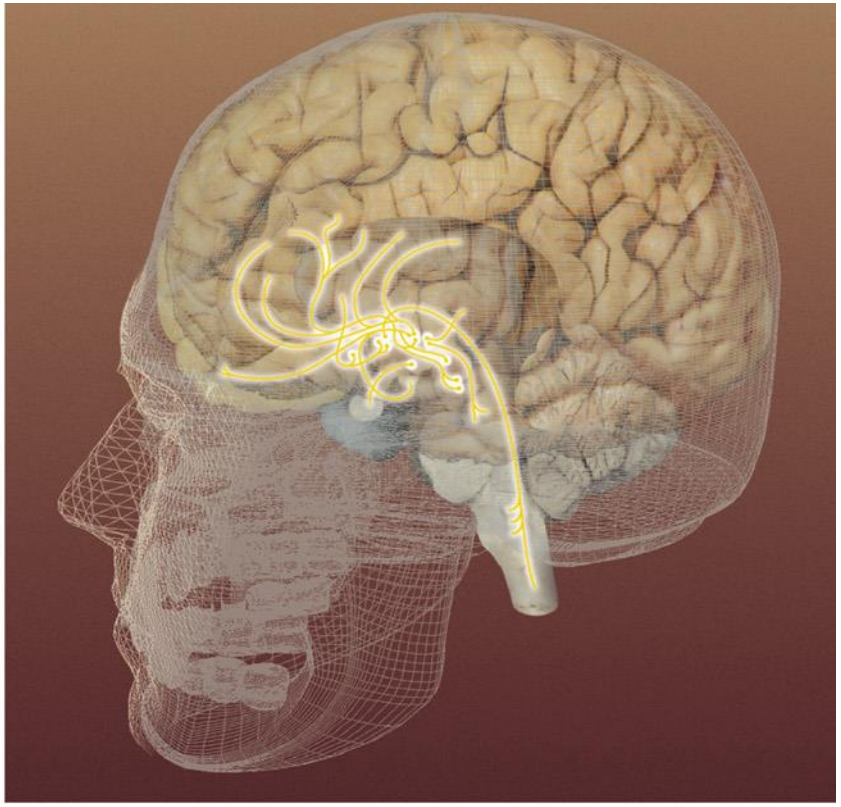

"For once we're going to have a happy family get-together. I'm, stuffing the turkey with Prozac."


SEROTONIN AND THE DOPAMINES
THE HAPPINESS TOUR


Technically the only two things you enjoy:
Serotonin and Dopamine



Serotonin pathways



Dopamine pathways

Neurotransmitters and Drug Treatment

- Endorphins: natural pain killing NT
  - Toughens the membrane of neurotransmitter sacs preventing them from breaking
    - Pain signal is stopped
  - Morphine: mimics endorphins (agonist)