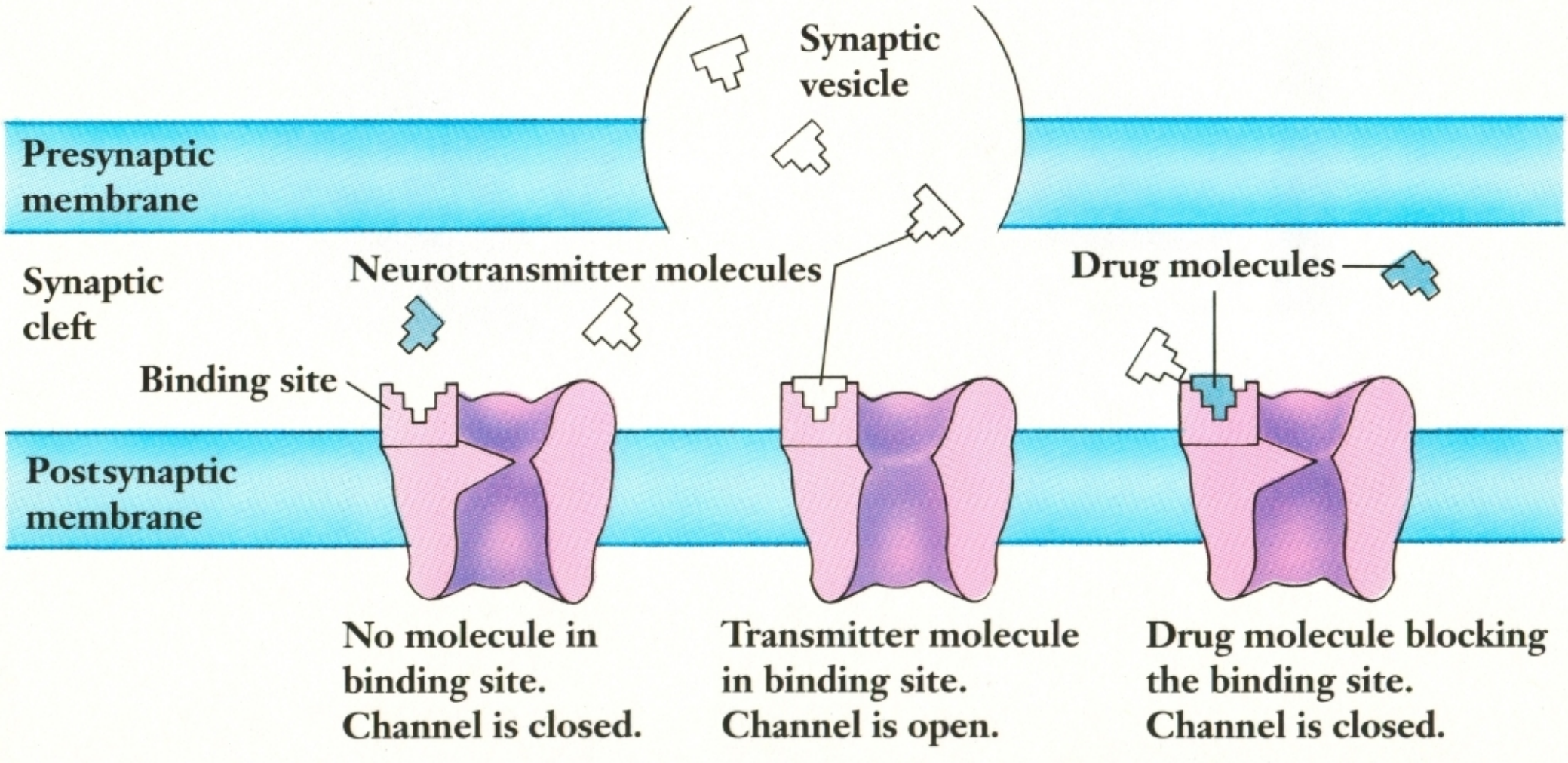
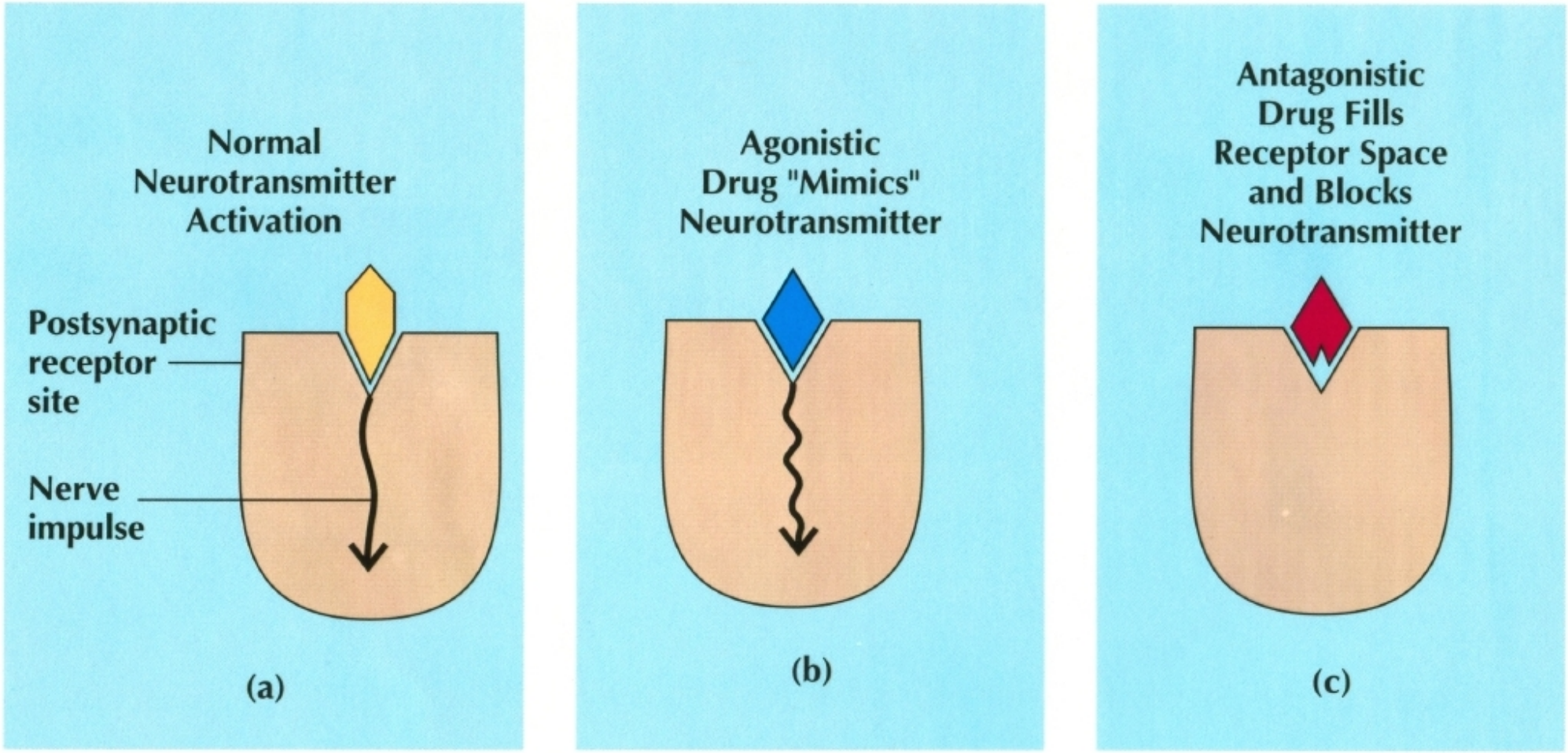
Neurotransmitter	Known or Suspected Effects
Serotonin	Affects mood, sleep, appetite, sensory perception, temperature regulation, pain suppression, impulsivity, and aggression; may play a role in some psychological disorders, such as depression
Acetylcholine (ACh)	Affects muscle action, cognitive functioning, memory, REM (rapid-eye-movement) sleep, emotion. Suspected role in Alzheimer's disease
Dopamine (DA)	Affects movement, attention, memory, learning, and emotion. Plays a role in both schizophrenia and Parkinson's disease.
Norepinephrine (NE) (or noradrenaline)	Affects learning, memory, dreaming, emotion, waking from sleep, eating, alertness, wakefulness, reactions to stress
Epinephrine (or adrenaline)	Affects emotional arousal, memory storage, and metabolism of glucose necessary for energy release
GABA (gamma aminobutyric acid)	Neural inhibition in the central nervous system; Tranquilizing drugs act on GABA to decrease anxiety

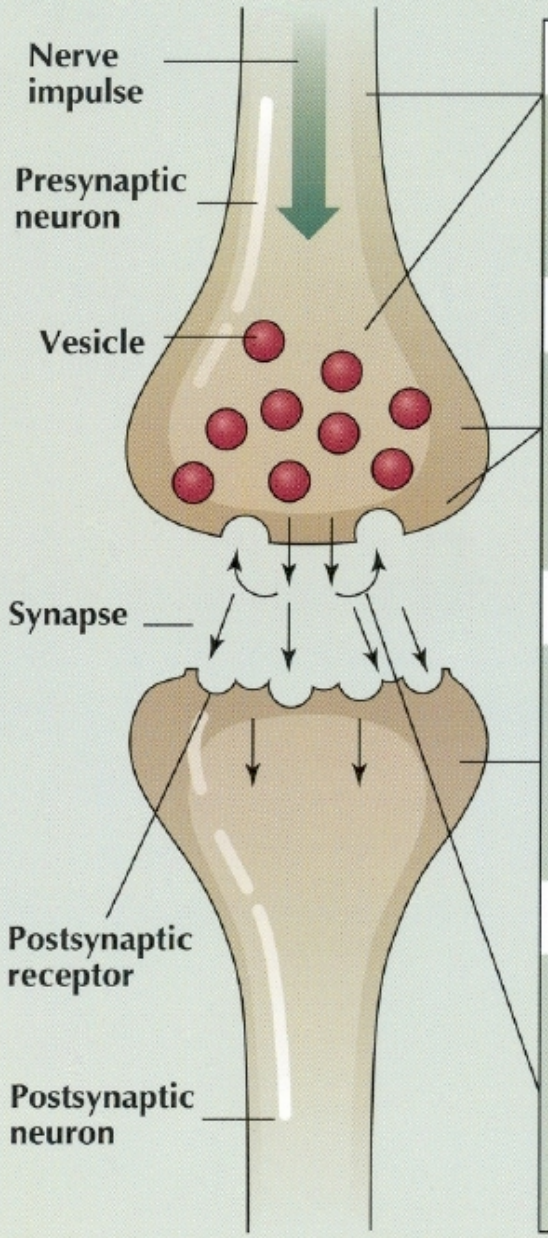
Receptor Binding Sites - Lock and Key Setup



Drug Action


Normal
Neurotransmitter
Activation
Postsynaptic
receptor
site
Nerve
impulse
(a)
Agonistic
Drug "Mimics"
Neurotransmitter
(b)
Antagonistic
Drug Fills
Receptor Space
and Blocks
Neurotransmitter
(c)

Neurotransmitters and Drug Action



How neurotransmitters work	Agonist drugs (mimics neurotransmitter effects)	Antagonist drugs (blocks neurotransmitter effects)
(Step 1) Production		
(1) Neurotransmitter is produced.	Drug serves as a precursor for neurotransmitter synthesis (e.g., L-DOPA is used to make dopamine).	Drug blocks production.
(Step 2) Storage and release		
(2) Neurotransmitter is stored in vesicle. When impulse arrives, neurotransmitter is released.	Drug increases the release of neurotransmitter (e.g., black widow spider venom increases acetylcholine release).	Drug blocks neurotransmitter storage and/or release.
(Step 3) Reception		
(3) Neurotransmitter binds to postsynaptic receptors and activates them.	Drug attaches to receptors and activates them (e.g., Nicotine activates acetylcholine receptors and morphine activates endorphin receptors).	Drug blocks neurotransmitter by filling receptor space but doesn't activate the neuron (e.g., drugs for schizophrenia block dopamine).
(Step 4) Inactivation		
(4) Excess neurotransmitter is deactivated by reuptake or enzymatic breakdown.	Drug blocks inactivation of neurotransmitter leaving more in the synapse to stimulate receptors (e.g., cocaine and nicotine block reuptake of dopamine and norepinephrine).	