The Neuron

Communication Within a Neuron

(a) Cell body
(b) Myelin sheath
(c) Dendrites

Communication Between Neurons

Neurotransmitters

How Drugs Affect Communication Between Neurons

Table 3.1 Neurotransmitters and Their Functions

<table>
<thead>
<tr>
<th>Neurotransmitter</th>
<th>Function</th>
<th>Examples of Malfunctions</th>
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<td>Acetylcholine (ACh)</td>
<td>Enables muscle action; regulates attention, learning, memory, sleeping, and dreaming</td>
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<td>Undersupply linked to depression. Prozac and some other antidepressants raise serotonin levels.</td>
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<td>Endorphins</td>
<td>Acts within the pain pathways and emotion centers of the brain</td>
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The Neuron

- Cell body
- Dendrites
- Nucleus
- Axon
- Myelin sheath
- Neural impulse
- Terminal branches of axon
- Dendrites from another neuron
Communication Within a Neuron
Communication Between Neurons

- Dendrites
- Cell body
- Axon
- Terminal branches of axon
- Presynaptic terminal from another neuron
- Vesicles
- Synaptic gap
- Neurotransmitters
- Receptor site
- Sending neuron
- Receiving neuron
# Neurotransmitters

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How Drugs Affect Communication Between Neurons

Agonist actions
- Drugs increase the production of neurotransmitters: L-dopa
- Drugs increase the release of neurotransmitters: Amphetamine
- Drugs bind to autoreceptors and block their inhibitory effect: Clomidine (for high blood pressure)
- Drugs block the deactivation or reuptake of neurotransmitters: Prozac (SSRI) and cocaine
- Drugs bind to postsynaptic receptors and activate them or increase the neurotransmitter effect: Nicotine

Antagonist actions
- Drugs block the production of neurotransmitters: AMPT
- Drugs cause depletion of neurotransmitters in vesicles: Reserpine (antihypertensive)
- Drugs block the release of neurotransmitters: Botulinum toxin
- Drugs activate autoreceptors so that they inhibit release of neurotransmitters: Caffeine
- Drugs bind to postsynaptic receptors and block neurotransmitter binding: Propranolol (beta-blocker) Haldol (antipsychotic drug)