

Table 8-1 Opposing effects on target tissues of the sympathetic and parasympathetic divisions of the autonomic nervous system

| Target tissue | Sympathetic division | Parasympathetic division |
|---|---|--|
| Glands | | |
| Lacrimal (tear) glands | No effect | Stimulates production of tears |
| Salivary glands | Stimulates production of a small amount of viscous saliva ("dry mouth") | Stimulates production of a large amount of dilute saliva |
| Adrenal medulla | Stimulates secretion | No effect |
| Eye | | |
| Radial muscles of iris | Pupillary dilation | No effect |
| Iris sphincter muscles | No effect | Pupillary constriction |
| Ciliary muscle (controls thickness of lens) | Relaxation (focuses on distant objects) | Contraction (focuses on close objects) |
| Heart | | |
| Pacemaker cells | Increases rate of heartbeat | Decreases rate of heartbeat |
| Ventricular contractile fibers | Increases force of contraction | Little or no effect |

Table 8-1 Opposing effects on target tissues of the sympathetic and parasympathetic divisions of the autonomic nervous system

| Target tissue | Sympathetic division | Parasympathetic division |
|--|--|-------------------------------|
| Lungs | | |
| Smooth muscles in walls of bronchioles | Dilates bronchioles | Constricts bronchioles |
| Mucous glands | No effect | Stimulates secretion of mucus |
| Gastrointestinal tract | | |
| Sphincter muscles | Contraction | Relaxation |
| Smooth muscles in walls of tract | Reduces tone and motility | Increases tone and motility |
| Exocrine glands | Inhibits secretion | Stimulates secretion |
| Gallbladder | Inhibits contraction | Stimulates contraction |
| Liver | Increases glycogenolysis and therefore blood sugar | No effect |
| Other tissues | | |
| Urinary bladder | No effect | Stimulates muscle contraction |
| Arterioles | Vasoconstriction in vessels supplying skin and gut; vasodilation in some vessels supplying skeletal muscle | No effect |

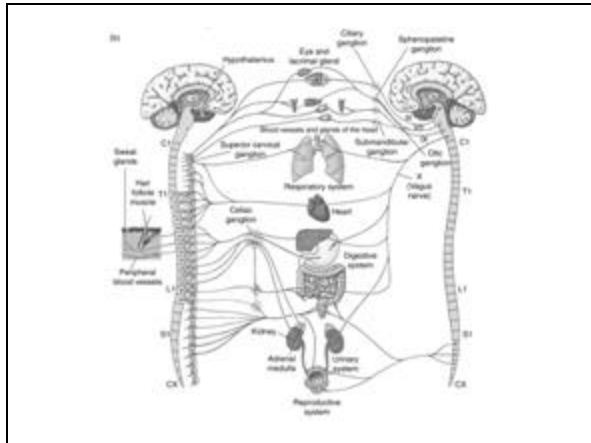


Table 8-2 Pharmacology of neurotransmission in the autonomic nervous system

| | Transmitter of preganglionic neuron | Receptors on postganglionic neuron | Transmitter of postganglionic neuron | Receptors on target tissue |
|--------------------------|-------------------------------------|------------------------------------|--------------------------------------|---|
| Sympathetic division | Acetylcholine (ACh) | Nicotinic ACh receptors | Norepinephrine | α - or β -adrenergic receptors |
| Parasympathetic division | Acetylcholine | Nicotinic ACh receptors | Acetylcholine | Muscarinic ACh receptors |