

The “fight or flight” response of the sympathetic nervous system is a direct result of the multisystem action of catecholamines. Secretion from the adrenal medulla proceeding the activation of the sympathetic nervous system functions to regulate blood pressure by contracting the smooth muscle in the vasculature (via alpha-1 receptors). The adrenergic receptors linked to blood vessels have an especially high affinity for norepinephrine relative to the other amines. Further musculoskeletal actions of catecholamines include enhanced contractility of cardiac muscle (via beta-1 receptors), contraction of the pupillary dilator (via alpha-1 receptors), piloerection (via alpha-1 receptors), and relaxation of smooth muscle in the gastrointestinal tract, urinary tract, and bronchioles (via beta-2 receptors). Both epinephrine and norepinephrine modulate metabolism to increase blood glucose levels by stimulating glycogenolysis in the liver (via beta-2 receptors), increased glucagon secretion (via beta2 receptors) and decreased insulin secretion (via alpha-2 receptors) from the pancreas, and lipolysis in adipose tissue (via beta-3 receptors). Epinephrine also inhibits release of mediators from mast cells and basophils in type I hypersensitivity reactions.