

Carotid and Aortic Bodies

An expanded area at the bifurcation of the carotid artery known as the carotid sinus contains numerous baroreceptors that function in the control of blood pressure by mediating changes in heart rate. Blood pressure is sensed by baroreceptors in specialized regions located in the carotid sinus and along the aortic arch. Baroreceptors (mechanoreceptors) respond to stretch and consist of myelinated sensory nerve fibers the bipolar neuronal cell bodies of which are located near the brain stem and project into the medulla of the brain. A decrease in blood pressure results in an increase in sympathetic stimulation and a release of norepinephrine. The action of norepinephrine is to stimulate cardiac activity and constrict blood vessels. Increase in blood pressure results in parasympathetic stimulation and release of acetylcholine. The action of acetylcholine is to slow cardiac activity and cause vasodilation.

A small group of cells and nerve endings adjacent to the carotid sinus known as the carotid body senses the partial pressure of respiratory gases and pH in the arterial blood and also contributes to respiratory and cardiovascular reflex regulation. Carotid bodies are encapsulated structures that consist of masses of large, polyhedral epithelioid (glomus) cells that are closely related to a rich network of sinusoidal vessels. The cells have large, pale nuclei and light, finely granular cytoplasm. In electron micrographs, the granules show dense cores and contain catecholamines and 5-hydroxytryptamine. A second cell type, the type II glomus cell, appears much the same as type I but lacks granules and are thought to be supporting glial cells. Aortic bodies are similar structures that lie close to the aorta between the angle of the subclavian and carotid arteries on the right and near the origin of the subclavian artery on the left. They are smaller than carotid bodies and consist of type I and type II glomus cells. They are thought to have functions similar to those of carotid bodies. The aortic bodies are supplied by fibers of the vagus nerve (X) whereas the carotid body receives fibers primarily from the glossopharyngeal nerve (IX). Both of carotid and aortic bodies are derived from the neural crest.

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