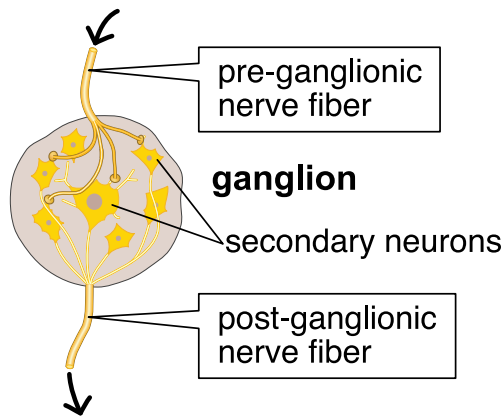


Excitable cardiac cells are regulated by the Autonomic Nervous System



Regardless of origin, autonomic impulses are passed on to secondary neurons in a (parasympathetic) cardiac ganglion or a (sympathetic) chain ganglion.



Secondary neurons send impulses through a postganglionic fiber to activate special receptors of the heart's excitable cells.

Autonomic regulation of excitable cells

Sympathetic
(excitatory)

to cell receptors

• automaticity cells



• contractile cells



• cells of the AV node



Parasympathetic
(inhibitory)

to cell receptors

Before reaching the heart, all autonomic impulses pass into the cardiac (parasympathetic) ganglia or the chain (sympathetic) ganglia via preganglionic nerves. Each preganglionic fiber synapses with at least one secondary neuron within a ganglion. There are also synaptic communications between ganglia. After “analysis” (author’s opinion) within the ganglia, impulses are distributed directly to heart cells through postganglionic nerve fibers. The cardiac physiology is directly controlled by postganglionic nerve fibers that emerge from the ganglia. These postganglionic fibers activate special *cell membrane receptors*⁵⁶ of the three types of excitable cardiac cells: automaticity cells, contractile cells, and cells of the AV node. However not all excitable cells have all types of receptors. The activated receptor initiates a specific biochemical process, depending on excitable cell type and the receptor type (e.g., parasympathetic versus sympathetic) that is activated. Generally, sympathetic impulses stimulate excitable cardiac cells, while parasympathetic impulses inhibit the functions of excitable cardiac cells.