

P4.15

Cough reflex regulation by brainstem mechanisms in the rabbit

Donatella Mutolo, L. Iovino, E. Cinelli, F. Bongianni

Dept of Experimental and Clinical Medicine, Section of Physiological Sciences, Univ. of Florence, Florence, Italy

Cough is a very important airway defensive act that functions to expel foreign or endogenously produced materials from the lower airways. Cough-related inputs are conveyed to the caudal nucleus tractus solitarii (cNTS) that projects to the brainstem respiratory network. The latter is reconfigured to generate the cough motor pattern. A high degree of modulation is operated on second-order neurons and the brainstem respiratory network by sensory inputs and higher brain areas. A schematic representation of relevant synaptic inputs to rapidly adapting receptor (RAR) neurons (RAR cells) as well as a block diagram summarizing the main central and peripheral neural mechanisms involved in the genesis and regulation of the cough reflex are presented. Drugs microinjected into the cNTS and the caudal ventral respiratory group (cVRG) caused either downregulation or upregulation of this reflex. The results suggest that both inhibition and disinhibition are important mechanisms subserving the control of cough reflex responses. Studies on the neural mechanisms underlying this defensive reflex may provide useful hints for the development of antitussive or protussive therapies.