

## THE ROLE OF VENTRAL RESPIRATORY COLUMN IN REGULATION OF COUGH

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Ventral respiratory column VRC in the ventrolateral medulla contains respiratory neurons employed in generation shaping and transmission of respiratory motor pattern. Several series of experiments in anesthetized spontaneously breathing cats revealed significant contribution of VRC respiratory and non-respiratory units in control of tracheobronchial cough response. The electromyograms of inspiratory parasternal and expiratory abdominal muscles and esophageal pressure were analysed for cough before and after microinjections of neuroactive drugs. Massive neuronal excitation by non-specific glutamate receptor agonist D,L-homocysteic acid (DLH) within the caudal VRC containing mostly expiratory pre-motoneurons as well as within the most rostral VRC containing mostly expiratory units inhibitory to other neuronal populations resulted in great inhibition of coughing with little effect on cough temporal features. DLH microinjections in the rostral VRC where various neuronal populations form the core of respiratory cough central pattern generator induced some suppression and shortening of cough abdominal discharge. Non-specific glutamate receptor antagonist kynurenic acid microinjected in rostral VRC markedly decreased inspiratory and expiratory cough efforts, inspiratory phase and total cough cycle time. GABA<sub>A</sub> receptor antagonist gabazine in the rostral VRC greatly reduced the number and expiratory efforts, prolonged inspiratory phase, expiratory phase and total cycle time for cough. These results are consistent with significant and specific contribution of excitation and inhibition within the respiratory neuronal network to the generation of cough motor pattern and the existence of cough-specific neuronal assemblies in the VRC involved in the cough control.

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