

# Time structure, temporal correlation and coherence of chemosensory impulses propagated through both carotid nerves in cats

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In spontaneously breathing, pentobarbitone anesthetized cats, we recorded simultaneously the impulses in the chemosensory fibers of both carotid (sinus) nerves, to analyze the correlations between the frequencies of chemosensory discharges ( $f(?)$ ) and their activation ( $\{df(?)\}/dt\}(a)$ ) and deactivation ( $\{df(?)\}/dt\}(d)$ ) rates. We studied the chemosensory responses to brief exposures to hypoxia (100% N<sub>2</sub>; 5-s and 10-s) and hyperoxia (100% O<sub>2</sub>; 30-s), and intravenous injections of excitatory (NaCN 0.2-100  $\mu$ g/kg) and inhibitory (dopamine hydrochloride 0.02-20  $\mu$ g/kg) chemoreceptor agents. Hypoxia increased  $f(?)$  with a high temporal correlation between frequency levels in both nerves. Prolonging hypoxic stimulation increased  $\{df(?)\}/dt\}(d)$ , with preservation of  $\{df(?)\}/dt\}(a)$ . Hyperoxic exposure produced highly correlated decreases in  $f?$  in both nerves, but reduced correlation if  $df(?)\}/dt$ . Increasing doses of NaCN produced analogous increments in  $f(?)$ ,  $df(?)\}/dt$  and their correlations, the  $\{df(?)\}/dt\}$