

OLFACTORY AND CAROTID BODY CHEMOSENSING: A PECULIAR LINK

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The carotid body (CB) is a peripheral chemosensing organ whose main role is to detect arterial oxygen levels. The CB is considered a sensor of hypoxia and thus plays an essential regulatory role in the hypoxic respiratory response. The main function of the olfactory brain system is to sense odorants, a type of chemosensing, owing to the peripheral olfactory epithelium equipped with sensory receptors in the nose. Recently, olfactory receptors have been identified in CB suggesting a link between the two chemoreceptive systems. This study investigated the presence of the olfactory marker protein (OMP), a key olfactory transduction effector, in CB tissue excised postmortem from human cadavers. Immunohistochemistry was performed using specific antibodies. The sustentacular cells, another non-receptor type of CB cells, were used as a control for comparison. Abundant expression of OMP in CB chemoreceptor but not sustentacular cells was found. The presence of OMP in chemoreceptor cells indicates that the olfactory system plays a role in generating the hypoxic respiratory chemoreflex. Yet no distinct function can be ascribed to the olfactory system in CB at present. The finding supports the notion that the chemoreceptive mammalian systems have evolutionally conserved molecular homology, irrespective of the anatomical localization and function they fulfill.