



A Local Angiotensin-generating System in the Carotid Body for the Adaptation to Hypoxia

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Chemoreceptors of the carotid body are responsive to changes in blood gases, pH and hormones circulating in the arterial blood, and are responsible for the reflexive regulation of cardiopulmonary activities. In addition to the circulating chemicals, a growing amount of evidence supports that vasoactive substances locally produced in the carotid body regulate the activity of the carotid chemoreceptors. Recent studies have shown the expression of key components of the renin-angiotensin system (RAS) in the carotid body. This intrinsic angiotensin-generating system could modulate the chemoreceptor activity via AT₁ receptors in the chemosensitive cells. Intriguingly, the expression levels of the local RAS and a number of autocrines/paracrines, such as endothelin-1 and nitric oxide, were notably up-regulated in the carotid body during chronic hypoxemia. The up-regulation was associated with increases in the level of receptors for the ligand binding, thus enhancing the chemoreceptor response to the vasoactive substances. These local regulatory mechanisms mediated by the local RAS might play significant roles in the modulation of chemoreceptor activity and the adaptive changes in the carotid body during hypoxia. (Supported by research grants from RGC and HKU)