

## The hunt for peripheral chemoreceptors in an unusual species

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The carotid bodies (CBs) are small organs localized bilaterally at the bifurcation of the common carotid artery into the internal and external carotids. They work as peripheral chemoreceptors that sense changes in arterial blood O<sub>2</sub>, CO<sub>2</sub> and pH levels and activate sympathetic-mediated cardiorespiratory reflexes through their sensory nerve, the carotid sinus nerve (CSN) to restore the altered parameters<sup>1</sup>. Across all mammalian species, CBs are mainly formed by chemoreceptor cells (glomus cells) surrounded by glia-like sustentacular cells in small highly vascularized cell clusters called "glomoids". A variable quantity of connective tissue surrounds glomoids and defines the capsule of the CB, giving to the organ a discrete and compact aspect in some species whilst in others it is rather diffuse<sup>2,5</sup>. CBs have been recently addressed as peripheral metabolic sensors involved in glucose homeostasis and sympathetic drive control in metabolic diseases like type II diabetes<sup>3</sup>. Despite the pig represents one of the best pre-clinical model of type II diabetes available<sup>4</sup>, surprisingly a proper anatomical characterization of pig CBs is lacking in this species<sup>5</sup>. In the present work we provide a detailed and updated anatomical characterization of pig CBs as a fundamental step for further studies in this species. We firstly focused on the surgical identification of the CBs in pigs (n=7) followed by classic haematoxylin-eosin histological analysis of carotids bifurcation sections. We identified the CB bilaterally as a small compact corpuscle attached to internal carotid wall in the proximity of the carotid bifurcation. We observed a lobular structure where it was possible to recognize glomus and sustentacular cells in clusters resembling the glomoids as described in other species<sup>5</sup>. Neurofilament immunolabeling revealed a rich amount of neural fibers arising from the CBs that were dispersed in the surrounding adipose tissue without forming a well identifiable nerve structure. Further studies beyond routine histological preparations will be carried on for a deeper characterization of CBs. We aim at giving a proper anatomical basis for future functional studies of this intriguing organ in a key animal model of metabolic diseases like the pig.

### References

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### Key words

Carotid bodies, pig, type II diabetes.