

Histochemical Localisation of Carbonic Anhydrase in the Inner Ear of developing Cichlid Fish, *Oreochromis mossambicus*

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Inner ear otolith growth in terms of mineralisation mainly depends on the enzyme carbonic anhydrase (CA). CA is located in specialised, mitochondria-rich macular cells (ionocytes), which are involved in the endolymphatic ion exchange, and the enzyme is responsible for the provision of the pH-value necessary for otolithic calcium carbonate deposition. In the present study, for the first time the localisation of histochemically demonstrated CA was analysed during the early larval development of a teleost, the cichlid fish *Oreochromis mossambicus*. CA-reactivity was observed already in stage 7 animals (onset of otocyst development; staging follows Anken et al., *Zool. Anz.* 231: 1-10, 1993). Neuroblasts (from which sensory and supporting cells as well as ionocytes are derived) proved to be CA positive. Already at stage 12 (hatch), CA-positive regions could be attributed to ionocyte containing regions both in the so-called mesh-work and patches area of the macula (i.e., clearly before ionocytes can be identified on ultrastructural level or by employing immunocytochemistry). In contrast to the circumstances observed in mammalian species, sensory hair cells stained negative for CA in the cichlid. With the onset of stage 16 (finray primordia in dorsal fin, yolk-sac being increasingly absorbed), CA-reactivity was observed in the vestibular nerve. This indicates the onset of myelination and thus commencement of operation. The localisation of CA in the inner ear of fish (especially the differences in comparison to mammals) is discussed on the basis of its role in otolith calcification. Acknowledgement: This work was financially supported by the German Aerospace Center (DLR) (FKZ: 50 WB 9997/50 WB 0527).