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## **NEUROTROPHINS, TRK-RECEPTORS AND CALCIUM BINDING PROTEIN LOCALIZATION IN MECHANOSENSORY SYSTEMS AND RETINA OF NOTHOBRANCHIUS GUENTHERI**

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### **Abstract**

*Neurotrophins are growth factors playing a crucial role in the survival, differentiation, development, and plasticity of neurons. They exert their effects by binding to specific receptors (Trks) in the central and peripheral nervous systems, including sensory organs. Calcium-binding proteins (CaBPs) are also present in these systems. They are involved in essential physiological functions related to calcium ions, such as nerve impulse transmission, neurogenesis, synaptic plasticity, and transmission. Further, CaBPs are supposed to be involved in neuron protection. Neurotrophins and CaBPs perform their roles in various vertebrates, including fish. Nonetheless, based on existing knowledge, there is no record of the presence of neurotrophins in the sensory organs of *Nothobranchius guentheri*. Due to its relatively short lifespan, *N. guentheri* has emerged as a valuable model for aging studies, holding significant relevance in the field of translational medicine. As a teleost, its sensory systems share several morphological and functional similarities with mammals, including humans. However, unlike mammals, fish sensory organs keep the regeneration capability. In light of this, the present research sought to identify the neurotrophin-receptor systems and calcium-binding proteins (CaBPs) in the mechanosensory organs and retina*

*of N. guentheri. Utilizing immunoperoxidase, single, and double immunofluorescence methods, the investigation unveiled the localization of neurotrophins and CaBPs in the inner ear, neuromasts of the lateral line system, and retinal cells of N. guentheri. This newfound information indicates the influence of these proteins on the biology of N. guentheri, reinforcing its suitability as a model for aging studies. The implications of these findings could significantly contribute to research on age-related neurodegeneration within the realm of translational medicine.*

**Keywords**

Neurotrophins, Trk Receptors, Sensory Organs, *Nothobranchius Guentheri*, Translational Medicine