

AKB 70 Neurophysics

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Hauptvortrag

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Biophysics of Mechanosensory Localization: What, Where, and Why — •J. LEO VAN HEMMEN — Physik Department, TU München, 85747 Garching bei München

Auditory localization means locating a sound source, an auditory object, through sound waves emanating from a source and exciting hair cells. There is a huge family of sensory detectors that all work through the same mechanism, the mechanosensory one. Audition is best known: Sound waves excite hair cells that then send their action potentials or spikes to the auditory system. Defining a ‘map’ to be a neuronal representation of the outside sensory world, we implicitly ask: What is a map and how does it arise? In addition to sound waves there are other mechanical means to generate a neuronal response at the detectors. A surface wave allows a sand scorpion to locate prey near to it in a desert. Water waves stimulate hair cells in superficial neuromasts (i.e., detectors at the skin) of, e.g., the clawed frog *Xenopus* and in both superficial and canal neuromasts of fish. It is fair to call the ensuing process mechanosensory localization and ask whether the underlying neuronal mechanisms exhibit any *universality*. In so doing we will present a theory as to ‘what, where, and why’.