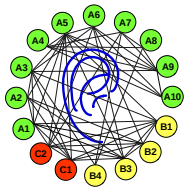

E I N L A D U N G

zum Vortrag im Rahmen des Seminars des SFB/TRR 31

Freitag, 7. August 2009, 14 Uhr c.t.

im Raum W2 1-143, Universität Oldenburg

und im Raum G26.1 – 010, Rechenzentrum
der Universität Magdeburg (per Videoübertragung)

"An evolutionary perspective on middle ears"

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The traditional view that a tympanic middle ear developed only once, when vertebrates made the transition from fish in water to land-living animals, has been shown to be wrong. Middle ears with a tympanum connected by one or more ossicles to the inner ear developed very much later in evolutionary history. This happened over long periods of time and independently in many vertebrate lineages - most now extinct. The mammalian middle ear is different and is not an “improved” single-ossicle middle ear. It is a radical and fortuitous new development that owes its origin more to changes in feeding patterns than it does to hearing. It happened to transmit higher-frequency sounds better than single-ossicle middle ears and paved the way for the origin of the high upper-frequency hearing limits of most mammals. Parallel to the development of a tympanic middle ear in therian mammals and a large increase in brain size, the ancestral pressure-gradient middle ear was replaced by a purely pressure system. Sound localization then became almost completely dependent on neural computation. This paper presents one view of the evolutionary changes in middle-ear systems of vertebrates and an historical perspective on these remarkably simple and yet highly effective structures.