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Titel: Neurale Grundlagen sprachlicher Funktion

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Abstract: The ability to perceive and produce speech allows human beings a complex form of communication, which makes us special amongst other creatures. For more than one century neuropsychology has been attempting to systematically identify, describe, and map the neural mechanisms of speech perception and production.

Besides the well documented knowledge about a privileged role of the left hemisphere for speech functions it has recently been demonstrated that the right hemisphere also plays an important role in speech and nonspeech processing.

Recent neuroscience models and empirical evidence (also from my group) suggest that the processing of rapidly changing acoustic information in the speech signal, and not the linguistic stimuli per se, may account for the functional and structural lateralisation of speech in the human brain. Accordingly, the right auditory cortex is preferentially driven by slowly changing suprasegmental auditory cues constituting melodic and rhythmic modulation in both speech and music. In the recent past we have published a series of brain imaging studies (EEG, fMRI) that elucidated the nature of functional lateralization in spoken language and vocal utterances (human laughter, acoustic aspects of voicing).

Besides the continuation of our studies on brain function, my group presently aims at identifying structural asymmetries and the specifically designed macroscopic architecture in the human auditory cortex that complement the evidence of functional asymmetries during auditory processing and speech perception provided so far.