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Topic Cognitive Neuroscience

Field of Research

The neuronal and psychological basis of learning and memory at the level of the central nervous system, of peripheral physiological processes and at the level of cognitive and motor processes are investigated. Results of the basic psychobiological research are applied to specific clinical problems. A main focus of attention is the elucidation of the extent of cortical and behavioral plasticity. The experimental definition of the biological and physiological boundaries of learning is used for the development of behavioral treatment strategies for disorders which have been difficult to treat. Behavioral treatment methods have been developed and experimentally tested in controlled studies with the collaborating clinical institutions for the following disorders: Epilepsy, chronic pain, high blood pressure, aphasia, parkinsons disease, scoliosis and kyphosis, anxiety disorders, local brain lesions and severe motor paralysis (ALS, stroke), and attentional disorders.

Methods

Magnetoencephalography (MEG), fetal magnetoencephalography (fMEG) electroencephalography (EEG), functional magnetic resonance imaging (fMRI), transcranial magnetic stimulation (TMS), behavioural techniques.

Publications

- # Anders, S., Birbaumer, N., Sadowski, B., Erb, M., Mader, I., Grodd, W., & Lotze, M. (2004). Parietal somatosensory association cortex mediates affective blindsight. *Nature Neuroscience.*, 7(4), 339-340
- # Huse E, Preissl H, Larbig W, Birbaumer N. Phantom limb pain. *The Lancet* 358:1015 (2001)
- # Birbaumer N, Ghanayim N, Hinterberger T, Iversen I, Kotchoubey B, Kübler A, Perelmouter J, Taub E, Flor H. A spelling device for the paralysed. *Nature* 398:297-98 (1999)
- # Birbaumer N. Rain man's revelations. *Nature* 399:211-212 (1999)

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