

Dissecting neural plasticity in emotional learning: The function of AMPA-receptor subtypes

Initiative: Dynamik und Adaptivität neuronaler Systeme (beendet)

Bewilligung: 23.03.2005

Laufzeit: 3 Jahre

Pavlovian fear conditioning is one of the most powerful paradigms to study emotional learning. Activity-dependent changes of neuronal connections in the form of long-term potentiation (LTP) in the amygdala might underlie fear conditioning as suggested by numerous behavioural and in vivo electrophysiological experiments. However, molecular mechanisms modulating synaptic transmission in the amygdala are not understood. By using mouse mutants with gene-targeted deletions of AMPA receptor subtypes - the principal glutamate-gated ion channels for fast synaptic transmission in the brain - previous studies of the participating groups showed that some receptor subtypes are essential for LTP and for proper fear learning to occur. Neuronal underpinnings of LTP at synaptic connections with distinct AMPA receptor subtypes remain to be identified using a combination of molecular biological, electrophysiological, imaging and behavioural techniques. The goal of this project is to reveal tasks played by AMPA receptor subtypes at specific synaptic connections in the amygdala during fear-learning.

Projektbeteiligte

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