

**DIFFERENT FORMS OF LONG TERM POTENTIATION:  
SPECIFICITY OR REDUNDANCY**

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Sensory experience may affect neuronal communication by altering synaptic signalling. Depending on the type of the synaptic activity during experience, synaptic signalling may grow stronger (potentiation) or weaker (depression) and these changes may last from minutes to weeks. Long term potentiation (LTP) is one of the most studied forms of synaptic plasticity and has been proposed to be an important substrate of learning and memory processes. Using *in vitro* recordings in brain slices we take advantage of pharmacological and genetic manipulations to study mechanisms of LTP in different neural systems. We have observed high divergence of LTP mechanisms in different brain circuits, which may be illustrated by opposing effects of ERK1 mutation on LTP in hippocampus and striatum. Moreover, on evidence of our studies in hippocampus and amygdala, different electrical stimulation paradigms, induce mechanistically different forms of LTP. Thus, at least three different forms of LTP may be recorded in the stratum radiatum following different types of stimulations of Schaffer collaterals in CA1 region of hippocampus. The question we want to ask with our future research is about the functional specificity and relevance of these different forms of LTP.