

Synaptic Plasticity I

Lecture #4

- Experimental approaches to determine the strength of synaptic connections
- Potentiation of synaptic transmission (PTP, STP, LTP, L-LTP)
- Induction of LTD
- Spike timing dependent plasticity (Bi and Poo, 1998)
- Properties of LTP
 - Cooperativity
 - Associativity
 - Input Specificity

Mechanisms of LTP induction

- The role of NMDA receptor activation
- NMDA receptor act as molecular coincident detector
- The role of Ca⁺⁺ influx
- The correlation between the conditions for NMDA receptor activation and the properties of LTP

Possible Locus of Synaptic Plasticity

- Number of Synapses
- Strength of Synaptic Transmission at Individual Synapse
- Efficacy of Charge Transfer from Synaptic Sites to Soma

Background Reading:

(Bear, 1996; Bi and Poo, 2001; Bliss and Collingridge, 1993; Liao et al., 1995; Malenka and Nicoll, 1999; Sanes and Lichtman, 1999; Zucker, 1999)