

Anadolu University. Sterilized and dried cotton pellets were implanted under the skin of the scapular region of animals under the propofol anesthesia. Three different doses of (+)-terpinen-4-ol (10, 50 and 100 mg/kg, i.p.) diluted in dimethylsulfoxide was applied once a day for a week. Indomethacine as used a standard antiinflammatory agent. Data obtained by weighing the dried the cotton pellets at the end of experiments were evaluated using one way variance analysis and post hoc Tukey HSD test for multiple comparison and results were considered as significant where p value was <0.05.

**Results:** (+)-Terpinen-4-ol was observed to exert antiinflammatory activity in a dose-depnt manner.

**Conclusion:** In the present study, (+)-terpinen-4-ol was shown to act as an antiinflammatory compound on the *in vivo* chronic inflammation. To the best of our knowledge *in vivo* antiinflammatory actions of (+)-terpinen-4-ol was shown for the first time. Due to its lipophilic nature and ethnopharmacological use of extracts containing this compound, (+)-terpinen-4-ol is suggested as a new antiinflammatory drug acting on tissues including nervous system which requires further investigations.

**Keywords:** montoterpene, terpinen-4-ol, inflammation

#### P-26

##### Inhibition of long-term potentiation by low frequency stimulation in the perforant pathway – dentate gyrus synapses

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**Objective:** Long-term potentiation (LTP) and depression can be considered in terms of the relationship of stimulation frequency and resultant change in synaptic plasticity. Low-frequency stimulation (LFS) given before induction of LTP inhibits LTP without affecting either basal synaptic strength or the early phase of LTP. This anterograde inhibitory effect of LFS is persistent and is blocked by inhibitors of phosphatases. Herein, we investigated the effect of LFS on subsequent LTP magnitude using four different stimulus frequencies.

**Methods:** The study used four groups of adult Wistar rats. The effect of different stimulation patterns (0.5-Hz, 1-Hz, 2-Hz and 5-Hz, n=8/ group) designed to induce long-lasting depression of the perforant pathway inputs to the dentate gyrus on subsequently induced LTP was investigated. All paradigms consisted of 900 pulses. LTP was induced by a strong tetanisation protocol and measured as 5-min average of excitatory-postsynaptic potential (EPSP) and population spike (PS) 5 min and 60 min after its induction. LTP magnitude was compared using one-way ANOVA test.

**Results:** The input-output curves of the groups were comparable to each other, as shown by the non-significant interaction observed between stimulus intensity and frequency. We found

that 0.5-Hz, but not 5-Hz, stimulation inhibited for 60 min the subsequent induction of fEPSP-LTP by a normally efficient LTP-inducing protocol. There was significant difference in PS-LTP between two groups at two measurement intervals (p<0.001) and positive correlations between LTP magnitudes and frequencies.

**Conclusion:** These data indicate that certain patterns of LFS can activate different intracellular molecular cascades, and that long-lasting activation of phosphatases by prior LFS can suppress the subsequent expression of LTP. We suggest that this form of metaplasticity may influence information storage by modulating the capacity of synapses to express LTP after repeated bouts of activity.

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**Keywords:** hippocampus, priming stimulation, long-term potentiation, metaplasticity, rats

#### P-27

##### The metaplastic properties of the dentate granule cells alter in adult onset hypothyroidism by decreasing Akt phosphorylation

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**Objective:** In the present study, we examined whether stimulation known to induce LTD has modulating effects on LTP induction at the dentate gyrus synapses, where first relay of the hippocampus is, and whether thyroid hormones (THs) play a role in LTD and subsequent LTP modulation. We also investigated the differences in activation of two main MAPKs and Akt between control and hypothyroid rats in the hippocampus which was dissected out from the brain at least 95 min after priming onset.

**Methods:** To this end, *in vivo* electrophysiological recordings were performed from the dentate gyrus of control and 6-n-propyl-2-thiouracil (PTU)-treated animals, during which we employed two different types of low-frequency stimulation (1 Hz and 5 Hz) of the perforant pathway prior to tetanic stimulation to induce LTP. Activation of extracellular signal-regulated protein kinases 1/2, c-Jun N-terminal kinase, and Akt was measured in the hippocampus which was dissected out from the brain at least 95 min after priming onset.

**Results:** The LTD elicited by 5 Hz stimulation negatively impacts the LTP induced by subsequent tetanic stimulation in hypothyroid animals; manifest by a more rapid diminution in the fEPSP slope and population spike amplitude. This phenomenon was accompanied by lower phosphorylated levels of Akt in surgically resected hippocampi of hypothyroid rats compared to those of euthyroid rats. Metaplastic response and the expression of mentioned proteins were not different in 1 Hz primed hippocampus between two groups.