

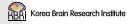
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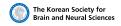
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Program Book

















P37.09 Involvement of area 3a in nociception processing investigated by fMRI of anesthetized rhesus monkey

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P37.10 Distinct spatiotemporal responses of Dentate granule and mossy cells to local change in a onedimensional landscape

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P37.11 Cell-type specific role of the ventral pallidum and subthalamic nucleus circuitry in locomotion and behavior

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P37.12 Slow spindles are associated with cortical high frequency activity

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P37.13 Analysis of structural connectivity network of basal ganglia in mouse brain: MR diffusiontractography at 9.4 T

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P37.14 Brain-wide neural dynamics during flexible task switching in mice

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P37.15 Structural correlates of modular organization of activity propagation in the primate somatosensory cortex

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P37.16 Predicting transgenic markers of a neuron by electrophysiological properties using machine learning

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P37.17 Characterization of receptive fields of mouse retinal ganglion cells through comparative analysis of spike-triggered average and spike-triggered covariance

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P37.18 Persistent gamma spiking in SI non-sensory fast-spiking cells predicts perceptual success

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P37.19 Acute amyloid β (25-35 and 1-40) effects on oscillatory activity and synaptic plasticity in the CA3-CA1 circuit of the hippocampus

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P37.20 Information processing in the primary olfactory cortex directly induces hippocampal synaptic

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P37.21 Effect of interpopulation spike-timing-dependent plasticity on neuronal synchronized rhythms in clustered small-world networks with inhibitory and excitatory populations

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Effect of interpopulation spike-timing-dependent plasticity on neuronal synchronized rhythms in clustered small-world networks with inhibitory and excitatory populations

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We consider clustered small-world networks with two inhibitory (I) and excitatory (E) populations. This I-E neuronal network has adaptive dynamic I to E and E to I interpopulation synaptic strengths, governed by interpopulation spike-timing-dependent plasticity (STDP). In previous works without STDPs, fast sparsely synchronized rhythms, related to diverse cognitive functions, were found to appear in a range of noise intensity D for static synaptic strengths. Here, by varying D, we investigate the effect of interpopulation STDPs on synchronized rhythms that emerge in the I- and the E-populations. Depending on values of D, long-term potentiation and long-term depression for population-averaged values of saturated interpopulation synaptic strengths are found to occur, and they make effects on the degree of population synchronization. In a broad region of intermediate D, the degree of good synchronization (with higher spiking measure) becomes decreased, while in a region of large D, the degree of bad synchronization (with lower spiking measure) gets increased. Consequently, in each I- or E-population, the synchronization degree becomes nearly the same in a wide range of D. We note that this kind of equalization effect in interpopulation synaptic plasticity is in contrast to the Matthew (bipolarization) effect in intrapopulation (I to I and E to E) synaptic plasticity where good (bad) synchronization gets better (worse).

Keywords: Equalization effect, Interpopulation spike-timing-dependent plasticity, Fast sparsely synchronized rhythm, Inhibitory and excitatory populations