

Gamma oscillations in the somatosensory cortex of newborn rats

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Abstract

Here we addressed a question of whether gamma oscillations previously described in the whisker-related barrel cortex are a universal pattern of activity in the somatosensory cortex of newborn rats. Intracortical recording of local field potentials and action potentials in neurons using multisite silicon electrodes in 2-7-day-old rats showed that mechanical stimulation of single fingers or specific areas on the plantar or back side of the foot evoked early gamma oscillations followed by spindle-burst oscillations in the corresponding regions of the somatosensory cortex. Early gamma oscillations had maximum amplitude in layer IV of the somatosensory cortex and effectively synchronized action potentials in layer IV neurons. It was concluded that early gamma oscillations evoked by activation of the topographic sensory input are a universal activity pattern of the entire somatosensory cortex of newborn rats. © 2014 Springer Science+Business Media New York.

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Keywords

electroencephalogram, gamma oscillations, newborn, sensory responses, somatosensory cortex