

生命科学

电刺激大鼠mPFC对听皮层神经元听反应的影响

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摘要 实验在40只成年SD大鼠上进行, 使用常规电生理学方法, 观察了电刺激大鼠内侧额叶前皮质(medial prefrontal cortex, mPFC)对听皮层神经元听反应的影响. 在122个神经元上观察了电刺激mPFC对听反应的影响. 对其中93个神经元作了详细分析发现, 有73个神经元的听反应受到易化(39个, 41.9%)或抑制(34个, 36.6%). 刺激mPFC对听反应的影响存在最佳刺激间隔, 大多数神经元(51个, 69%)在10~15 ms之间. 结果提示, 大鼠mPFC可对听皮层神经元的听反应调制, 这种调制可能是通过多级神经元环路实现的.

关键词 [大鼠](#) [内侧额叶前皮质](#) [听皮层](#) [听反应](#)

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Electrical stimulation of rat medial prefrontal cortex influences responses of auditory cortical neurons to acoustic stimuli(Chinese)

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Abstract

Conventional electrophysiological technique was used to investigate the influences of electrical stimulation to medial prefrontal cortex (mPFC) on the acoustically evoked responses of auditory cortical (AC) neurons in 40 rats. Among 122 AC neurons isolated, the influences of mPFC on the acoustically evoked responses of 93 AC neurons were investigated systematically. 20 (21.5%) neurons were not affected, but the acoustically evoked responses of the remaining (73 neurons, 78.5%) were either facilitated (39 neurons, 41.9%) or inhibited (34 neurons, 36.6%). The degree of facilitation and inhibition in the acoustically evoked responses was dependent upon the time intervals between acoustic and electrical stimuli. The best intervals of facilitation or inhibition were between 5 and 30 ms (mostly 10 and 15 ms). Our findings suggest that the mPFC may affect the activity of AC neurons through different multi-synaptic pathways.

Key words [rat](#) [medial prefrontal cortex](#) [auditory cortex](#) [auditory response](#)

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