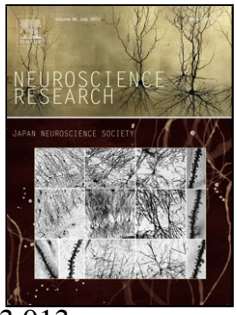

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Hypothalamic regulation of the sleep/wake cycle

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Highlights

・Orexin neurons are involved in maintenance of arousal state.

・Input and output pathways to orexin neurons.

・Manipulation and recording of neural activity of orexin neurons in vivo.

・MCH neurons play an important role in sleep/wakefulness regulation.

・Central circadian clock, suprachiasmatic nucleus, and sleep/wakefulness regulation.

Abstract

Sleep is one of the most important physiological functions in mammals. It is regulated by not only homeostatic regulation but also circadian clock. Several neuropeptide-producing neurons located in the hypothalamus are implicated in the regulation of sleep/wakefulness. Among them, orexin/hypocretin-producing neurons (orexin neurons) are a crucial component for maintenance of wakefulness, because lack of orexin function results in narcolepsy, which is a sleep disorder. Recent findings have identified substances that excite or inhibit neural activity of orexin neurons. Furthermore neural projections of the neurons