

## Microinjection of Orexin-A into the Locus Coeruleus Area Induces Morphine Withdrawal Behaviors in Morphine Independent Rats

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### Abstract

**Introduction:** Orexin neuropeptide has a role in opioid withdrawal behaviors. Orexin-expressing neurons that are present in the hypothalamic nuclei send dense projections to the Locus Coeruleus (LC). Withdrawal syndrome is temporally associated with hyperactivity of LC neurons. LC neurons do not show withdrawal-induced hyperactivity in brain slices from morphine-dependent rats. Thus, it has been suggested that the increase in LC neuronal activity seen *in vivo* is mediated by extrinsic factors. Therefore, this study was carried out to find whether LC microinjection of orexin-A can induce withdrawal behaviors. **Method:** Adult male Wistar rats were used in this study. Intra-LC microinjection of orexin-A or orexin-A vehicle was performed one week after LC cannulation. Thereafter, somatic signs of withdrawal were evaluated during a period of 25 min. **Findings:** Orexin-A induced several signs of morphine withdrawal. **Conclusion:** It may be concluded that orexin at LC acts as an extrinsic factor in the expression of morphine withdrawal syndrome.

**Keywords:** Orexin-A, Morphine Withdrawal Syndrome, Locus Coeruleus

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