

Accepted Manuscript

Research Article

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PII: S0306-4522(18)30623-7

DOI: <https://doi.org/10.1016/j.neuroscience.2018.09.025>

Reference: NSC 18653

To appear in: *Neuroscience*

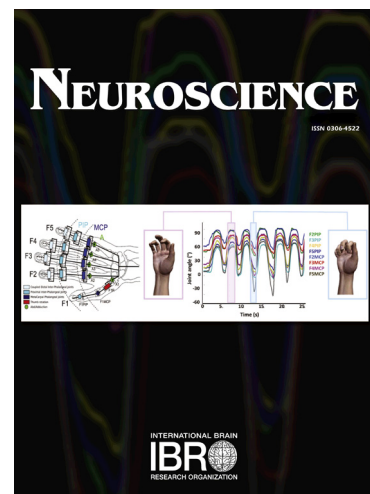
Received Date: 13 March 2018

Revised Date: 21 August 2018

Accepted Date: 18 September 2018

Please cite this article as: F. Paliaryn, R.M. Incrocci, M.J. Nobre, Behavioural and auditory electrophysiological rebound as a compensatory response to the reinforcing effects of morphine, *Neuroscience* (2018), doi: <https://doi.org/10.1016/j.neuroscience.2018.09.025>

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Behavioural and auditory electrophysiological rebound as a compensatory response to the reinforcing effects of morphine

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Abstract

Auditory-evoked potentials (AEPs) can be modified by associative learning, where the appearance of learned compensatory responses (CCRs) may result in the emergence of drug withdrawal symptoms and relapse. Although CCRs' influence on later attentive and cognitive domains has been extensively examined, contextual conditioned tolerance occurring in preattentive mechanisms operating at earlier stages of information processing have remained largely unexplored. To extend our knowledge on this subject, compensatory changes on the motor and emotional aspects of behaviour evoked by contextual cues were investigated with an electronic open field in morphine-pretreated rats challenged with two morphine overdoses (40 and 80 mg/kg). CCRs influence on the AEPs recorded in the central nucleus of the inferior colliculus (CIC) was analyzed with the help of a field potential recording device and a two-chamber shuttle box placed inside a Faraday cage system. The emergence of electrophysiological CCRs was analysed by recording AEP latency and amplitude elicited in the central nucleus of the IC (CIC) with the aid of a field potential recording device and a two-chamber shuttle box placed inside a Faraday cage system. Behavioural analysis indicated that CCRs ensue in non-familiar contexts. Electrophysiological data revealed increases in the amplitude of AEPs evoked in a non-familiar context. Our results indicate that behavioural learning responses emerge following Pavlovian conditioning even with the use of low and regular doses of morphine over a short-term treatment. Changes in the CIC electrophysiology may indicate that the development of drug dependence occurs covertly in the early stages of sensory information processing

Keywords: Morphine, Compensatory Response, Inferior Colliculus, Electrophysiology, Auditory Evoked Potentials

INTRODUCTION

In drug-dependent subjects, the drug-related context has the ability to evoke drug craving, greatly contributing to relapse following a withdrawal period (Breese et al., 2005). Regarding opiates, just a few drug-paired trials can potentially become signals for impending drug use. For drugs with this characteristic, the probability for an association between drug effects and the context or contextual cues where drug intake

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