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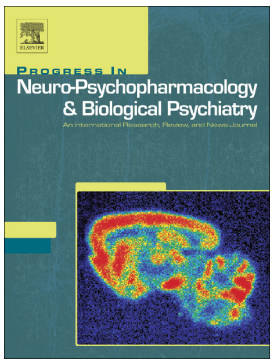

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Sara Karimi, GholamaliHamidi, Zahra Fatahi, Abbas Haghparast

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Orexin 1 receptors in the anterior cingulate and orbitofrontal cortex regulate cost and benefit decision-making

Sara Karimi [1], GholamaliHamidi [1,*] Hamiidi@yahoo.com**, Zahra Fatahi [2], Abbas Haghparast [2,*]** Haghparast@yahoo.com

1Physiology Research Center, Kashan University of Medical Sciences, Kashan, Iran

2Neuroscience Research Center, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

***Corresponding authors.**

Abstract

Orexin neurons are discretely localized within the lateral hypothalamus and have widespread projections into all areas of the brain. In addition, several lines of evidence specify that orexins may also participate in the regulation of a variety of affective and cognitive processes. The Orexin-1 receptor (OX1r) is distributed extensively throughout the prefrontal cortex (PFC). Delay-based decision- making is mediated largely by the orbitofrontal cortex (OFC) while effort- based decision-making is controlled by the anterior cingulated cortex (ACC). Hence, in the present study, a series of experiments were conducted to clarify the role of OX1r in the mPFC (ACC and/or OFC) in cost and benefit decision-making. The rats were trained in a delay and/or effort- based form of cost-benefit T-maze decision-making task. Two goal arms were different in the amount of accessible reward and cost. Before surgery, all animals were selecting the high