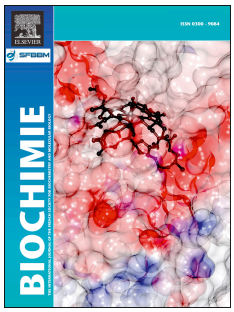
Accepted Manuscript



The hypothalamic neuropeptide orexin A– a possible regulator in glucose homeostasis and germ cell kinetics in adult mice testes

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PII: S0300-9084(18)30180-9

DOI: 10.1016/j.biochi.2018.06.021

Reference: BIOCHI 5456

To appear in: *Biochimie*

Received Date: 10 March 2018

Accepted Date: 26 June 2018

Please cite this article as: D. Joshi, D. Sarkar, S.K. Singh, The hypothalamic neuropeptide orexin A– a possible regulator in glucose homeostasis and germ cell kinetics in adult mice testes, *Biochimie* (2018), doi: 10.1016/j.biochi.2018.06.021.

Abstract

Orexin A (OXA), a hypothalamic neuropeptide, regulates food intake, sleep-wake cycle and energy balance by binding to its receptor (OX1R). Apart from brain, OXA and OX1R are also present in peripheral organs including reproductive tissues. Mammalian reproduction depends on uptake and proper utilization of glucose in the testes. This study, therefore, examined role of OXA/OX1R system in regulation of glucose homeostasis in adult mouse testis under *in vivo* and *ex vivo* conditions. Binding of OXA to OX1R was blocked using an OX1R antagonist, SB-334867. Mice were given a single bilateral intratesticular injection of the antagonist at doses of 4 and 12µg/mouse and sacrificed 24 h post-injection. In order to understand the direct role of OXA in testes of adult mice, an *ex vivo* experiment was performed where binding of OXA to OX1R in the testis was blocked by using the same OX1R antagonist. The antagonist treatment affected testicular glucose and lactate concentration with concomitant down-regulation in the expression of glucose transporters 3 and 8. A decreased activity in lactate dehydrogenase enzyme and imbalance between germ cell survival and proliferation were also noted in testes in treated mice. The results of *ex vivo* study supported the results obtained from *in vivo* study. The findings thus suggest involvement of OXA/OX1R system in regulation of testicular glucose homeostasis and germ cell kinetics in adult mice.

Keywords: Apoptosis; Glucose homeostasis; Orexin A; PCNA; Germ cells