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THE MOLECULAR MECHANISMS OF LEPTIN ACTION ON THE HYPOTHALAMO-PITUITARY-GONAD AXIS

A. A. Bakhtyukov, A. O. Shpakov*

I. M. Sechenov Institute of Evolutionary Physiology and Biochemistry RAS, St. Petersburg, 194223;

* e-mail: bahtyukov@gmail.com

Adipokin leptin is the most important regulator of food behavior and energy metabolism. Along with this, leptin controls the endocrine system including the hypothalamic-pituitary-gonad axis. The targets of leptin are the hypothalamic neurons involved in the regulation of gonadoliberein synthesis, the gonadotrophs of the anterior pituitary producing gonadotropins, and testicular and ovarian cells responsible for steroidogenesis, folliculogenesis and spermatogenesis. In all these cells, the leptin targets, the leptin receptors and other components of the leptin signaling system are localized. The activity of hypothalamic neurons is regulated by leptin circulating in the blood, which is transported to the brain through the blood-brain barrier by receptor-mediated endocytosis. The regulation of the leptin system in gonadotrophs, Leydig cells of the testes and follicular cells of the ovaries is carried out by both the circulating leptin and leptin, which is synthesized in the pituitary and gonads. The abnormalities of leptin regulation of the gonadal axis lead to reproductive dysfunctions. The most important factors that lead to the impaired leptin signaling are obesity and metabolic syndrome, and this is the basis of the close relationship between metabolic disorders and diseases of the reproductive system. The review is devoted to the current state of the problem of leptin regulation of the hypothalamic-pituitary-gonad axis.

Key words: leptin, leptin receptor, hypothalamic-pituitary-gonad axis, gonadotropins, testosterone, reproduction