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THE LOW MOLECULAR WEIGHT LIGANDS OF THE LUTEINIZING AND FOLLICLE-STIMULATING HORMONE RECEPTORS, AS A NEW GENERATION OF THE REGULATORS OF REPRODUCTIVE FUNCTIONS

A. O. Shpakov[a], *, D. V. Dar'in[b], A. A. Bakhtyukov[a], and K. V. Derkach[a]

[a] *Sechenov Institute of Evolutionary Physiology and Biochemistry, Russian Academy of Sciences, St. Petersburg, 194223 Russia*

[b] *St. Petersburg State University, St. Petersburg, 199034 Russia*

**E-mail: alex_shpakov@list.ru*

The development of the new regulators of the receptors of the luteinizing (LH) and follicle-stimulating (FSH) hormones is one of the intensively developed areas of molecular endocrinology and reproduction, which is caused by significant problems with the use of gonadotropins, both their natural and recombinant forms. The greatest prospects are associated with the low molecular weight ligands of the LH and FSH receptors, which by their activity can be allosteric agonists or antagonists, positive or negative allosteric modulators or combine their functions. The main

advantages of the low molecular weight ligands are: 1) the selectivity of action in relation to a specific intracellular signaling cascade, which is especially important in the case of simultaneous activation of several cascades by gonadotropins; 2) the lack of competition between the gonadotropins and the low-molecular agonists for receptor binding, due to differences in the localization of the orthosteric and allosteric sites with which they bind; 3) the possibility of enhancing the effect of gonadotropin when it is used together with low molecular allosteric agonists or modulators, which may be due to their chaperone-like activity; and 4) the effectiveness in both parenteral and oral administration. The review summarizes and analyzes literature data on the design and mechanisms of action of the low-molecular allosteric ligands of the LH and FSH receptors, and also presents the recent achievements of the authors in the field of creation and study of the thienopyrimidine derivatives with the activity of selective LH receptor agonists that affect LH-dependent processes *in vitro* and *in vivo*.

Keywords: low molecular weight ligLand, allosteric regulator, luteinizing hormone receptor, luteinizing hormone, follicle-stimulating hormone, thienopyrimidine, steroidogenesis