The aim of the project is to determine the role of nesfatin-1 in the control of the pig reproductive system. Nesfatin-1 is a peptide controlling food intake and energy homeostasis. Based on fragmentary literature data and our preliminary studies, it can be hypothesized that nesfatin-1 also affects the functioning of the female reproductive system. In the presented project, it is planned to study the expression of nesfatin-1 in the specialized structures of the porcine hypothalamus (the part of the brain which produces GnRH - a hormone controlling the pituitary gland and, indirectly, ovaries), in the pituitary gland, whose hormones directly affect the functions of the reproductive system, and in the ovaries (granulosa, theca interna, and luteal cells) during the oestrous cycle. The aim of the proposed research is also the investigation of nesfatin-1 effect on the secretory functions of the pituitary and ovary at various phases of the cycle, including FSH, LH and PRL secretion by anterior pituitary cells and steroid hormones by ovarian follicular and luteal cells, as well as the determination of the mechanism of nesfatin-1 action in the examined cells, the verification of the hormone influence on the formation of new blood vessels, apoptosis and proliferation, and the examination of nesfatin-1 effect on transcriptome, proteome and metabolome of pituitary and ovarian cells. The domestic pig, used in the project as an experimental model, is an animal of great economic importance, therefore a better understanding of its physiology may be important in breeding these animals. Moreover, due to the great similarity of physiological processes in this species and humans (hence the use of pigs in biomedical research and as a source of xenotransplants), the obtained results may be important for a better understanding of human physiology and be helpful in the prevention or treatment of reproductive system disorders.