

There is a close relationship between nutritional status and reproductive success in animals, including pigs. Metabolic processes and reproductive system functions are controlled by a number of hormones. It can be assumed that in addition to hormones affecting only selected metabolic processes or reproductive organs or structures, there are also other hormones creating a link controlling both the metabolic status and reproductive system functions. Based on sparse literature data and findings from our preliminary studies, a hypothesis can be put forward that chemerin is one such hormone. It is planned in the project to investigate the expression of the chemerin gene and its receptors, as well as the presence of the hormone protein and receptor proteins in the specialized hypothalamic structures (part of the brain secreting GnRH - the hormone controlling the pituitary gland and, indirectly, ovaries), in the pituitary gland, whose hormones directly affect the reproductive system functions, and in the ovaries of gilts during the oestrous cycle and early pregnancy, associated with the implantation of embryos. Another objective of the proposed research is to determine the effect of chemerin on the secretory functions of the pituitary gland and ovaries at different phases of the cycle: to investigate the secretion of FSH and LH by the anterior pituitary cells and to determine the mechanism of action of chemerin in these cells, to investigate the effects of chemerin on the secretion of steroid hormones by luteal cells, granulosa cells and theca interna cells, and to analyse the effect of chemerin on the transcriptome in the pituitary and ovarian cells of pigs. Findings from this research may help to better understand the mechanisms of hormonal control of metabolism and reproduction in pigs, an economically important species, and in future may facilitate the modification of these processes in animals. Moreover, the domestic pig is a very good experimental model, and is much more similar to human beings than the more frequently used laboratory rodents, so the results will be important for the understanding of human physiology.