

POPULAR SCIENCE PROJECT SUMMARY

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 of such hormones.

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 porcine endometrium and myometrium during the oestrous cycle and early pregnancy, associated with the implantation of embryos, as well as in the trophoblasts and conceptuses. Another objective of the proposed research is to determine the effect of chemerin on the secretion of steroid hormones, prostaglandins and cytokines, and the expression of integrins and metalloproteinases in the endometrial explants on days 10 to 12 of the oestrous cycle and during early pregnancy, as well as to analyse the effect of chemerin on the transcriptome and proteome of the endometrial cells. We also would like to clarify the potential influence of chemerin on the processes of angiogenesis and apoptosis in the porcine endometrium. It is also planned to determine the effect of steroid hormones and prostaglandins on the expression of chemerin system in the endometrium.

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.