

The scientific goal of the project is to understand the expression and role of vaspin (VASP) in the regulation of porcine ovarian cell physiology. VASP belong to the group of hormones, which are produced by fat cells. The secretory fat in the production and secretion into the bloodstream of a number of bioactive substances that regulate physiological processes of the body, known as adipokines. Adipokines secreted can influence both locally within the adipose tissue or where they exert autocrine or paracrine activity and by regulating the function of other endocrine tissues. Adipokines are involved in the regulation of appetite influence, energy balance, development of obesity and inflammatory processes are necessary to preserve physiological homeostasis. They also play an important role in the regulation of reproductive function by affecting puberty, regulation of the menstrual cycle, fertility, implantation of the embryo, oocyte maturation, fetal development and even pregnancy. Many studies have shown the relationship between changes in adipokines secreted observed in obesity, a pathology such as ovarian function, such polycystic ovary syndrome (PCOS). It is now known that there is a close link between nutritional status and reproductive success of animals, including pigs. The pig is an excellent experimental model to study various physiological and pathological processes because of the great similarity to human anatomy and function of many organs. In the serum of obese women reported elevated levels of VASP, but its role in regulation of female reproduction is unknown. Model in the proposal study will be ovarian follicle, which is periodically varying in both their morphology and function unit of the ovary. The main role of the ovarian follicle is to create a suitable environment for the growth and maturation of the oocyte, capable of fertilization and subsequent development, thus providing an extension of the species. The maturity of the oocyte is a prerequisite for its ability to fertilize and proper embryonic development and fetal. Basic research conducted in the project will include: *i*). determination of gene and protein expression of VASP, immunolocalization and concentration in plasma and follicular fluid; *ii*) identify the factors which regulated VASP expression and understanding molecular mechanism of the observed changes; *iii*). determination of VASP influence the expression of gonadotropin receptors, steroids and IGF-1; and determining the primary and induced gonadotropin and IGF-1 secretion of steroids produced by the follicle cells; *iv*). VASP to investigate the effect on the process of *in vitro* maturation of oocytes; *v*). explanation VASP effect on the ovarian cell proliferation and apoptosis and to clarify the molecular mechanisms of the observed changes. The results of the project will clarify the role of VASP in the ovarian cells regulation. The results bring new knowledge about the enormity of endocrinology of the ovary and the factors regulating the oocytes maturation, which will expand our knowledge of local ovarian hormones and their molecular mechanisms. The proposed research in the future may allow for an explanation of the problems associated with the females fertility.