The scientific goal of the project is to determine the role of the hormone – OMENTIN1 in the regulation of female reproductive function. The reproductive success of both humans and farm animals strictly depends on many factors, including from the nutritional status of the body. We have long known about the existence of mutual interaction between the endocrine system regulating the body's metabolism and reproductive functions. In recent years, there have been more and more reports about the discoveries of peptides involved in the regulation of the body's energy homeostasis at the level of both the central nervous system and in numerous peripheral tissues. One of them is OMENTIN1 discovered in 2006. In the light of the growing number of infertility cases and complications associated with this disease, understanding homeostatic mechanisms regulating food intake, energy balance, and body weight is an important element of interest for scientists from around the world. From the point of view of biomedical sciences, the correlation between the body weight of a reproductive success body appears as an extremely complex process consisting of interactions between the central nervous system and gonads (ovary / testis). OMENTIN1 is a hormone involved in the regulation of the body's energy balance, as well as sugar and lipid metabolism. Due to limited literature data, little is known about its reproductive function. Therefore, the purpose of this project is to examine the expression of OMENTIN1 in the tissues of the pituitary - ovary and determine the effect of this hormone on the functioning of pituitary and ovary cells in two prolific breeds of pigs: fat Meishan and lean Large White. The basic research carried out in the project will include: ***(i)*** determination of the expression of the OMENTIN1 gene and protein, immunolocalisation in the cells of the pituitary and ovarian follicles as well as blood and follicular fluid concentration; ***(ii)*** determination of factors regulating expression of OMENTIN1 in the pituitary and ovary; ***(iii)*** analyzing the effect of OMENTIN1 on transcripts and proteomes in pituitary and ovary cells; ***(iv)*** understanding the direct effect of OMENTIN1 on secretory function, adipokines expression, proliferation and activation of pituitary and ovary cell protein kinases, ***(v)*** examining the effect of OMENTIN1 on the *in vitro* maturation process of oocytes, and explaining the molecular mechanisms of observed changes. All this tasks will be realize on different metabolic status of animals, so that’s in our proposal we will be collected samples from two prolific breeds of pigs: fat Meishan and lean Large White. Project results will clarify the role of OMENTIN1 in regulating porcine pituitary and ovarian cell function at different metabolic status. The pig is an excellent experimental model for studying various physiological and pathological processes due to its high similarity to humans in the anatomy and function of many internal organs. The obtained results will bring a lot of new knowledge about the pituitary and ovarian endocrinology/transcriptome/proteome as well as factors regulating oocyte maturation which will expand our knowledge about local hormones and their molecular mechanisms. In the future, proposed research may clarify problems related to female fertility. This proposal will be realize in international cooperation with French National Institute for Agricultural Research.