

Follicular fluid provides the optimal environment for oocyte growth, meiotic maturation and the acquisition of oocyte competence for embryonic development. Many studies revealed that somatic follicular cells provide a special dialouge to support their function. The discovery of extracellular vesicles (EV) as a mediator of cell-to-cell communication opens a new era of research. EVs mediate cell-to-cell dialog by transferring molecules to target cells and may affect multiple biological processes. The cargo of follicular fluid (FF) EVs, such as proteins and miRNAs, are involved in many pathways: regulation of ovarian functions, folliculogenesis, luteogenesis and steroidogenesis as well as oocyte-cumulus expansion. At the time of ovulation the oocyte together with small amount of FF are entered in to the oviduct. Follicular fluid is a complex and dynamic biological fluid derived from plasma components that have crossed the blood-follicle barrier and metabolites secreted by granulosa (GC) and theca interna (TC) cells. The cellular origin of FF EVs and their cargo remain unknown Hence, the aim of this project is to evaluate whether EVs derived from the porcine ovarian GC, TC and or cumulus oocyte complex (COC) are capable to affect porcine morphological and functional sperm characteristic. In this project it is assumed to perform the following research tasks: Task.1. Characterization of EVs derived from FF (from small, medium and large follicles), granulosa cells, theca interna cells and COCs. Task.2. Influence of EVs on morphological and functional characteristic of porcine spermatozoa. Task.3. Functional properties of spermatozoa after its incubations with EVs . The proposed studies are basic, however important to understand the proper feritlization proces and some events which are in close connection with it.