

## **Abstract**

Cumulus cells in the ovarian follicles emerge by differentiation from somatic granulosa cells. They are located around the oocytes in stratified clusters and their innermost layer is called the corona radiata. Cytoplasmic microvilli of cumulus cells pass through zona pellucida to the proximity of the oolema, where formation of gap junctions enables signalling and metabolic codependency. Oocytes produce factors affecting processes in cumulus cells, including their metabolism and viability. By modulating the abundance of cyclic nucleotides in oocytes, cumulus cells allow the maintenance of meiotic arrest, providing time for oocytes to finish their growth and gain competence for maturation. Because oocytes have a very limited ability to process glucose, metabolic cooperation with cumulus cells enables them to gain the energy needed for processes associated with growth and maturation. Several metabolic pathways of glucose processing create energy substrates for the formation of ATP, which they then transport to the oocytes. They also regulate the amount of lipid droplets in oocytes and protect them from cellular toxicity. An increase in the concentration of luteinizing hormone in the follicle just before ovulation induces the transmission of the signal for cumulus expansion. Interruption of the connections between corona radiata and oocytes leads to resumption of meiosis.

## **Key words**

cumulus cells, oocyte, maturation, metabolism, cumulus cell expansion