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Veterinarni Medicina

The role of TGF superfamily gene expression in the regulation of folliculogenesis and oogenesis in mammals: a review

Piotrowska H, Kempisty B, Sosinska P, Ciesiolka S, Bukowska D, Antosik P, Rybska M, Brussow KP, Nowicki M, Zabel M:

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The normal differentiation of follicles from the preantral to the antral stage is regulated by the synthesis and secretion of several important growth factors. Moreover, the proper growth and development of the oocyte and its surrounding somatic granulosa-cumulus cells is accomplished through the activation of paracrine pathways that form a specific cross-talk between the gamete and somatic cells. It has been shown that several growth factors produced by the ovary are responsible for the proper growth and development of follicles. The developmental competence of mammalian oocytes (also termed

ability of female gametes to reach maturation (the MII stage) and achieve successful monospermic fertilisation. Proper oocyte development during folliculo- and oogenesis also plays a critical role in normal zygote and blastocyst formation, as well as implantation and the birth of healthy offspring. Several molecular markers have been used to determine the developmental potency both of oocytes and follicles. The most important markers include transforming growth factor beta superfamily genes (TGFB), and the genes in this family have been found to play a crucial role in oocyte differentiation during oogenesis and folliculogenesis. In the present review, we summarise several molecular aspects concerning the assessment of mammalian oocyte developmental competence. In addition, we present the molecular mechanisms which activate important growth factors within the TGFB superfamily that have been shown to regulate not only follicle development but also oocyte maturation.

Keywords:

...omics, epigenetics, molecular genetics,
regulation of gene expression

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