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## Role of Oocyte-Derived Paracrine Factors in Follicular Development in Mice

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Production of functional oocytes requires complex signal interactions of gonadotropins, steroid hormones, and growth factors produced by oocytes and follicular somatic cells. Mammalian oocytes produce members of the transforming growth factor beta superfamily, such as growth differentiation factor 9 (GDF9) and bone morphogenetic protein 15 (BMP15), and fibroblast growth factors (FGFs). Evidences suggest that interaction of these oocyte-derived paracrine factors (ODPFs) with other extra- and intra-follicular signals is critical for the normal development and function of both oocytes and follicular somatic cells. For example, the interaction of ODPFs and estrogen signals is required for maintaining the cumulus cell phenotype when assessed by the competence to undergo cumulus expansion process. ODPFs appear to have predominant effects on the estrogen signals in cumulus cells, since the presence of ODPFs significantly affected the biological processes regulated by estrogen in cumulus cells. Such ability of oocytes to coordinate other extra- and intra-follicular signals may explain the mechanism how oocytes determine the rate of follicular development.