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Mini-Symposium:
Molecular Mechanisms of Follicular Development and Ovulation

Preface

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Mammalian oocytes start meiosis but are immediately arrested at the diplotene stage of the first meiotic prophase in prenatal life. The oocytes are closely surrounded by somatic cells, and the communication with these somatic cells is an important for oocyte growth with the competence to resume meiosis and progress to the metaphase II stage. During early follicular development, oocyte-secreted factors regulate somatic cell proliferation and differentiation, which forms granulosa cell layers and follicle membrane. During follicular development stage from secondly follicles to preovulatory follicles, follicle stimulating hormone (FSH) secreted from pituitary gland acts on granulosa cells to induce cell proliferation and differentiation to increase responsiveness to ovulation stimuli (LH surge). LH receptor (LHCGR) is not expressed on oocytes, but on granulosa cells where LH induces the expression of several kinds of secreted factors. The secreted factors act on oocytes or cumulus cells initiating oocyte meiotic resumption and maturation.

This mini-symposium “Molecular Mechanisms of Follicular Development and Ovulation” consists of 4 mini-reviews. It will interest not only scientific researchers but also medical doctors and staff in both human and animal reproduction field because the contributors are young scientists who active in the field of ovarian molecular endocrinology. Recent techniques for gene profiling have revealed that numerous kinds of genes are expressed in each type of cell in the follicle at selective time points. Additionally, the functions of genes involved in follicular development and ovulation have been clarified by genetic approaches using mutant, knockout or knockin mice models. In this mini-symposium, the mini-reviews introduce the recent progress of our understanding of follicular development and ovulation at the molecular level.

I hope that the basic information about ovarian functions is beneficial to our understanding of how to develop ovarian stimulation programs, *in vitro* culture techniques for human infertility care and reproductive technology for animals.