THE REGULATION OF *Cyp17a1* EXPRESSION IN MOUSE OVARIAN THECA CELLS *IN VIVO AND IN VITRO*

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Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in reproductive-aged women. Its most typical form is the association of hyperandrogenism with chronic anovulation. Theca cells (TC) of large antral and ovulatory follicles are the main source of ovarian androgens and express P450c17α, encoded by *Cyp17a1*, which converts progesterone to 17α-hydroxyprogesterone and androstenedione. *Cyp17a1* expression in TC from PCOS women is up-regulated by the hypersecretion of LH, however, the pathophysiology of PCOS still remains unclear.

To investigate the regulation of *Cyp17a1* by LH in TC, adult female C57BL/6J mice were treated with PMSG and hCG and the time course changes of genes involved in steroidogenesis were examined. TC isolated from prepubertal mice were cultured in the RPMI medium with or without LH (100 ng/ml) for 48h. To examine the effects of 17β-estradiol, TC were cultured in RPMI with or without LH plus ethanol or 17β-estradiol (10^{-7}M) and collected 48 and 96h later. Total RNA was isolated from ovaries or TC, and real-time RT-PCR was performed.

In vivo, the expression of *Cyp17a1, Hsd17b1,* and *Cyp19* mRNAs was reduced at 8h after hCG compared with that at 0h and it remained low through 48h. In contrast, the expression of *Cyp17a1* mRNA in TC was increased at 48h after the addition of LH and a dose-dependent response was not shown *in vitro*. These results suggest that *Cyp17a1* may be differently regulated between *in vivo* and *in vitro*, and the granulosa cells may contribute to the regulation of *Cyp17a1* *in vivo*. However, 17β-estradiol had no effect on regulation of *Cyp17a1* expression. To investigate the regulation of *Cyp17a1* in TC of PCOS, the PCOS model mice were established by the exposure to testosterone propionate, and the expression of *Cyp17a1* was examined.