

Primordial to primary transition in folliculogenesis:

Role of weel kinase in the mouse ovary

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INTRODUCTION: Despite of the importance of the primordial follicle recruitment, factors and mechanisms for process is poorly understood. The objective of the present study was to find out the differentially expressed factors between primordial and primary follicles, and to evaluate expression and role of the one of them, weel kinase, in the follicular transition from primordial (PMF) to primary (PRI).

METHOD(S): To find out differentially expressed genes in primordial vs. primary follicles, suppression subtractive hybridization (SSH) was accomplished. We used whole ovaries from day1 and day 5 mice since these are mainly consist of PMF and PMF/primary follicles, respectively. In the day1 subtractive library, weel was one of the most abundantly expressed genes. To confirm the differential weel mRNA expression, each stage follicles were collected by using laser capture microdissection (LCM) and analyzed by RT-PCR. Immunohistochemistry was used to localize the weel protein expression. To evaluate the role of weel in early follicle growth, neonatal ovaries were cultured with increasing doses of weel antibody (0, 1, 10, and 100ng/ml). Follicular development was assessed by histological analysis at 4 day and 8 day of culture.

RESULT(S): We confirmed that the weel mRNA and protein highly present in the primordial follicles and gradually decreased with follicular development. Weel protein was expressed in oocytes. We found more growing follicles in the ovaries cultured with weel antibody than in control ovaries. Treatment of weel antibody stimulates follicular growth in a dose dependent manner. We observed simultaneous FSH receptor expression with follicular growth.

CONCLUSION(S): Results from the present study strongly suggest that the presence of weel, a universal mitotic inhibitor, in oocytes of the early stage follicles may play a role in the meiotic cell cycle arrest of the primary oocytes at the primordial follicle stage as well as the follicular growth.

*Supported by Korean Health 21 RND Project, Ministry of Health and Welfare, Korea
(01-PJ10-PG6-01GN13-0002).*