

O-6(기초) The Expression of ETS Family of Transcription Factors during Follicular Growth and Ovulation in Mice

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Background & Objectives: Mice with targeted disruption of ERM, a member of ETS family transcription factors, lose the ability to maintain spermatogonial stem cell niche. However, potential roles for ERM in female reproduction in mice are unknown. The aim of this study is to assess the spatiotemporal expression profiles of PEA3 subfamily of ETS transcription factors, ERM, ER81, and PEA3, in the mouse ovary.

Method: To obtain ovarian samples at each stage of follicular growth and ovulation, we stimulated mice with pregnant mare's serum gonadotropin (PMSG) and human chorionic gonadotropin (hCG). Experimental groups are: 0 hr (PMSG only), 3 hr (3 hr post-hCG), 6 hr, 9 hr, and 15 hr. We extracted total RNA from each ovary and performed RT-PCR and quantitative RT-PCR. We also performed immunofluorescence staining on frozen tissue sections.

Results: Three members of PEA3 subfamily exhibit specific expression patterns during follicular growth and ovulation. Expression of PEA3 is increased at 3 hr-post hCG and decreased at 6 hr. PEA3 expression is upregulated again at ovulation (15 hr). Expression of ERM is increased during early stages of follicular growth (at 3 hr) and this level is sustained until ovulation. Its expression is decreased after ovulation. Expression of ER81 is not notable during follicular growth and ovulation. We then examined cell type-specific localization of ERM and PEA3 proteins by immunofluorescence staining. Nuclear localization of PEA3 was noted in granulosa cell (GC) layers in early and late follicles. Immunoreactive ERM was localized in a scattered pattern in GC layers and also in oocytes.

Conclusions: PEA3 subfamily of ETS transcription factors exhibit differential expression and localization during stages of follicular growth. Specific spatiotemporal expression patterns of ERM and PEA3 in the mouse ovary suggest that these transcription factors may play important roles in regulating genes involved in events of follicular growth and ovulation.