D119 A Possible Role of Oxytocin in the Regulation of GnRH Release and Gene Expression in GT1-1 Neuronal Cells

Junehee Park *, Sehyung Cho, and Kyungjin Kim
Department of Molecular Biology and Research Center for Cell Differentiation, College of National Sciences, Seoul National University, Seoul 151-742, Korea

The neurohypophyseal nonapeptide oxytocin is the main hormone responsible for the initiation of labor by inducing uterine contractions and milk ejection during lactation. Oxytocin exerts its effects via cognate oxytocin receptors, which belong to the G-protein coupled seven transmembrane receptor superfamily. Recent studies demonstrated that oxytocin receptors are present in the discrete brain regions including the hypothalamus, and oxytocin stimulates gonadotropin-releasing hormone (GnRH) release from the hypothalamic explants incubated *in vitro*. Thus, we attempted to examine whether oxytocin can directly affect the GnRH release and/or GnRH gene expression in the GnRH-producing neuronal GT1-1 cell line. Using a reverse transcription-coupled polymerase chain reaction (RT-PCR) analysis, we identified oxytocin receptor mRNA in GT1-1 cells. Treatment of GT1-1 cells with oxytocin elicited increase in GnRH release and GnRH content in a dose-related manner. Oxytocin ($1x10^{-8}$ M) increased GnRH release by 5-folds over basal level. In contrast, GnRH mRNA levels were decreased in a time-dependent manner. Significant decreases in GnRH mRNA levels were observed within 3h after oxytoxin ($1x10^{-7}$ M) treatment and sustained up to 12h. A transient transfection experiment with 3kb of the rat GnRH promoter fused to a luciferase reporter vector revealed that there was no change in the GnRH promoter activity. In summary, oxytocin may exert its direct action on GnRH neurons.

D120 Suppression of Follicle Apoptosis by Pituitary Adenylate Cyclase Activating Peptide in the Rat Ovary

Jin Lee*, Heun-Jung Park, Hueng-Sik Choi, Hyuk-Bang Kwon and Sang-Young Chun
Hormone Research Center, Chonnam National University, Kwangju 500-757

Pituitary adenylate cyclase activating polypeptide (PACAP) is a novel neuropeptide with considerable homology to vasoactive intestinal peptide. PACAP has been shown to be present in the rat ovary and stimulates steroidogenesis. To further investigate the regulation and physiological role of this peptide in the ovary, the present studies assessed gonadotropin regulation of PACAP mRNA and its effect on follicle apoptosis. Northern blot analysis revealed that PACAP mRNA was transiently induced by hCG treatment reaching the highest level at 6 hr whereas PMSG had no effect. Similarly, preovulatory follicles cultured in vitro exhibited the induction of PACAP mRNA in response to LH and FSH. Treatment with PACAP-38 suppressed follicle apoptosis in a dose-dependent manner. Furthermore, cotreatment with PACAP antagonist and LH partially reversed the suppressive effect of LH on apoptosis, implying a mediatory role of endogenously produced PACAP. These data suggest that LH causes transient induction of PACAP mRNA and part of the suppressive action of LH on follicle apoptosis is mediated by this peptide.
[Supported by KOSEF Grant HRC-97-0102]