## 73. CROSSTALK BETWEEN PROGESTERONE AND INTERLEUKIN 11 SIGNAL TRANSDUCTION PATHWAYS IN HUMAN ENDOMETRIAL STROMAL CELLS DURING DECIDUALIZATION

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Decidualization of endometrial stromal cells is critical for embryo implantation and establishment of pregnancy. IL-11 is one of the few molecules known to be obligatory for decidualization and implantation in the mouse and enhances progesterone (P)-induced human endometrial stromal cell (HESC) decidualization[1,2]. IL-11 signals via a heterodimeric complex composed of an IL-11 receptor alpha (IL-11Rα) chain and gp130 and signal transduction occurs via the Janus kinase/signal transducer and activator of transcription (STAT) pathway. This study examined the regulation of STAT3 in HESC during P-induced decidualization and the effect of IL-11 on activation of STAT3 in HESC. The decidualization of HESC was assessed using an *in vitro* model in which P was administered for 10 days to cells cultured in serum-free conditions with added estrogen (E). Medium was changed every 48 h for measurement of prolactin (PRL) as a decidual marker, and cellular protein was extracted at each medium change for Western analysis. HESC were also cultured in serum free conditions for 30 min with added IL-11 and cellular protein extracted at 5 min intervals for Western analysis. Treatment of HESC with P increased the abundance of STAT3 protein from day 6 of culture coinciding with an increase in PRL secretion. Co-treatment of HESC with antiprogestin (onapristone) after decidualization was in process reduced the abundance of STAT3, but had no influence on STAT3 phosphorylation. Addition of IL-11 to HESC resulted in the phosphorylation of STAT3 from 5 min. Phosphorylation was abolished following co-treatment with IL-11 neutralising antibody while STAT3 levels remained stable. Our observations demonstrate that P regulates STAT3 protein expression in HESC possibly via P receptor and IL-11 phosphorylates STAT3 in HESC. The data provides evidence of synergy between the P and IL-11 signal transduction pathways during decidualization of HESC. This knowledge is important in understanding the formation of decidua and a functional placenta, and regulation of fertility.

(1) Robb L, Li R, Hartley L, Nandurkar HH, Koentgen F, Begley CG (1998) *Nat. Med.* **3**: 303–308. (2) Dimitriadis E, Robb L, Salamonsen LA (2002) *Mol. Hum. Reprod.* **8**: 636–643.

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