Periostin's Effect on Myometrial to Uterine Fibroid Transition

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Introduction: Uterine fibroids are common tumors that develop in the myometrium of the uterus and are characterized by excess extra cellular matrix. Uterine fibroids affect between 25% and 89% of women and, when clinically significant, can cause symptoms such as excessive uterine bleeding, pelvic pain and discomfort, as well as anemia. Currently, the only definitive treatment is hysterectomy. In an effort to identify potential targets for treatment, RNA-Seq was performed on normal myometrial and fibroid tissues. POSTN (Periostin), an extracellular matrix protein, was found to be overexpressed in the majority of fibroids. Periostin has been investigated as a target for potential drugs in fibrous tissues such as lung, skin, and kidney. We hypothesize that Periostin plays a role in the transition from myometrial to fibroid cells.

Methods: Human myometrial cell line was transduced with periostin over-expression lenti-virus particles or control virus and two cell lines of each were generated (CTRL 1 & 2 and POSTN 1 & 2, respectively). qPCR was used to analyze expression of known fibroid markers (*TGIF, TGFβ1, CCND1, COL3A1, PGR, CTTNB1,* and *ESR2*) and periostin expression in POSTN-overexpressing cells lines compared to CTRLs. Experiments were ran in triplicate.

Results: For the majority of markers analyzed, CTRL1 showed higher expression than CTRL2. CTRL1 also showed higher levels of periostin expression. Because of this it was deemed an invalid control and excluded from analysis. A significant difference ($p = 0.05$) was found in *TGFβ1* expression between CTRL2 and POSTN1. A significant difference was also found in *COL3A1* expression between CTRL2 and POSTN1 ($p = 0.014$) but not POSTN2 ($p = 0.99$). Finally, a significant difference ($p = 0.0004$) was found in PGR expression between all 3 cell lines (CTRL2, POSTN1, and POSTN2).

Conclusion: Some fibroid biomarkers showed differences in expression between POSTN and CTRL cell lines, indicating that periostin may be involved in the transition from myometrial to fibroid-like cells. Currently, Western Blot analysis is being used to validate the qPCR results. Ongoing research is being conducted to further determine the effects of Periostin on uterine fibroid development and its potential as a druggable target to treat the disease.