

ESTROGEN AND PROGESTERONE RECEPTOR EXPRESSION IS SIGNIFICANTLY REDUCED IN CULTURED MYOMETRIAL AND FIBROID SMOOTH MUSCLE CELLS

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Fibroids are benign neoplasms of the smooth muscle cells of the uterus. Cultured myometrial and fibroid smooth muscle cells (MSMC & FSMC) have been widely used as a model for the study of fibroid growth. However, there is ongoing controversy regarding expression levels of estrogen and progesterone receptors (ER and PR) in cultured cells vs tissue. The aim of the present study was to measure levels of mRNA for ER α and PR in myometrium and fibroid, and in cultured MSMC & FSMC. Myometrium and fibroids were collected from hysterectomy specimens ($n = 8$). Part of the tissue was snap frozen and the rest was used to isolate SMC, which were cultured for 3 passages and collected for RNA at P0 (2 weeks in culture) and P3 (5 weeks in culture). ER α and PR levels were quantified using real-time PCR and normalized using 18S rRNA as an internal control. Both ER α and PR were detected in all samples. Large variability in receptor levels between different isolates was detected. Surprisingly, despite large differences between the means, none of comparisons of tissue v. P0 cells were significant by non-parametric tests. However, there was a statistically significant reduction in both ER α and PR expression between whole tissue and isolated cells at P3 (Table 1).

Table 1. Mean \pm s.e.m. ER α or PR v. 18S rRNA

	Myo	Fib	MSMC P0	FSMC P0	MSMC P3	FSMC P3
ER α ($\times 10^{-3}$)	4.82 \pm 0.97	7.18 \pm 1.57	0.88 \pm 0.68	0.21 \pm 0.03	0.15 \pm 0.03*	0.10 \pm 0.03**
PR ($\times 10^{-3}$)	93.36 \pm 24.28	67.77 \pm 17.86	10.36 \pm 2.19	18.62 \pm 6.79	3.99 \pm 1.04*	2.42 \pm 0.61*

* $P < 0.01$; ** $P < 0.001$, compared to matching tissue.

This is the first study to provide objective data to support a significant decline in ER α and PR expression in cultured MSMC and FSMC. Despite this decline, detectable levels of ER α and PR mRNA were present at both P0 and P3, potentially explaining why some published studies have been able to demonstrate *in vitro* response to steroids in these cells.