

Wnt7a Expression Is Limited to the Endometrial Luminal Epithelium: Potential Role in Postmenstrual Endometrial Repair

*Krieg, S.A., *Fan, X., Dahl, S., Westphal, L.W., Druzin, M., and Nayak, N.R.

*equal contribution

Objective

The Wnt family of secreted growth factors is crucial for the appropriate prenatal development of the female reproductive tract. Mice lacking one of these proteins, WNT7a, have many of the reproductive tract abnormalities similar to that seen with prenatal exposure to diethylstilbestrol. Dysregulation of WNT7a leads to epithelial abnormalities in the colon and carcinogenesis in other systems. WNT7a is expressed in the endometrium, but its function in the human postnatal endometrium is not fully understood. In this study, we examine WNT7a expression pattern and cellular localization during postmenstrual regeneration of human endometrium.

Materials and Methods

This protocol was approved by the Stanford IRB. Endometrial specimens were obtained during hysterectomy or endometrial biopsies (n=4) and embedded in OCT. Frozen tissue sections were then used for *in situ* hybridization (ISH) with ³⁵S-labelled riboprobes. RNaseA-resistant hybrids were detected by autoradiography.

Results

There was profound upregulation of Wnt7a expression in the endometrial luminal epithelial cells during the early proliferative phase (postmenstrual cycle day 5-10). Wnt7a was also expressed in some of the upper gland cells just below the luminal epithelium, but the signal was not detectable in the lower endometrial gland cells or stromal cells.

Conclusions

The WNT family of secreted glycoproteins are becoming increasingly appreciated for their role in embryogenesis, the epithelial-mesenchymal transition and cancer. These intracellular signaling proteins are also essential for normal adult physiological processes. One organ system for which this has been shown is that of the colon, where inhibition of WNT signaling results in the absence or disorganization of the luminal epithelial surfaces. Similar to the colon, normal female adult endometrium also requires cyclical endometrial repair of the uterine luminal epithelium. Thus, our observation of Wnt7a expression exclusively in the newly formed luminal epithelium and upper glands during the early proliferative phase suggests a role for WNT7a in postmenstrual endometrial regeneration.