

CHAPTER 10

PARACRINE MEDIATORS OF ENDOMETRIAL GROWTH AND DIFFERENTIATION

Erdem SAHIN, Yusuf MADENDAG, I. Ipek MUDERRIS

Which hormones regulate endometrial growth and differentiation?

Hormones regulate changes in the endometrium, which often involve changes in tissue morphology and functional differentiation (1). The ovaries produce two major groups of hormones—estrogens and progesterone. Estrogen remains the predominant hormone after menstruation and provides for the proliferation of epithelial and underlying stromal cells to ensure the full thickness of the mature endometrium. During the ovarian luteal phase, progesterone becomes the dominant hormone and prompts the phenotype of the epithelial cells to become secretory and develop a glandular structure.

Which mechanisms provide this hormonal regulation?

The uterine spiral arteries expand under the influence of progesterone and estrogen, which signal lymphoid cells to infiltrate the endometrial stroma, especially the sub-epithelial area. All of these patterns of growth, differentiation, and tissue development are done in preparation for the arrival and implantation of the developing embryo. The nutrients and stimuli necessary for embryo maturation provide for the secretory epithelial cells. Proteins formed by the uterine epithelium activate the embryo to initiate adhesion and implantation. The decidualized stromal cells that secrete proteins regulate the implantation reaction of the invading trophoblasts and participate in the formation of the maternal placenta (2).

What is the importance of embryo–endometrium synchrony in early pregnancy?

The importance of embryo–uterine synchrony in early pregnancy is well documented (2). One study has reported that, after ovulation, the risk of miscarriage increases if the embryo implants after the 10th day and increases further (52–82%) after 11–12 d (2). Synchronization between the existing embryo and the uterus is a process that serves to eliminate a degraded embryo. Endometrial

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