CHAPTER 9

STEM CELL PROPERTIES OF ENDOMETRIUM

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What is the embryonic origin of the endometrium?

During the embryological development, the female genitalia develop from the resulting longitudinal invagination of the coelomic epithelium. Meanwhile, the primordial uterus develops from the Mullerian ducts. A septum that has formed during this development disappears to become the uterine cavity. The innermost layer of the primitive uterine endometrium is a simple cuboidal epithelium. This layer later develops into columnar and pseudostratified epithelia. Under this epithelial layer is a mesenchymal layer, which this also later develops into an endometrial stroma and myometrium. The glandular epithelial lumen buds and invaginates towards the stroma. The origins of the uterine endometrium allows for its extensive regenerative tissue with over 400 regeneration cycles during years of menstruation (1). Estrogen and progesterone hormones regulate these critical remodeling events on a monthly basis for the main purpose of preparing the endometrium for the implantation of the blastocyst (2).

What is the histiologic structure of the endometrium?

The endometrium is one of the three main constituents of the uterus, and this tissue has regenerative properties. With this regenerative characteristic, the endometrium resembles the intestinal villus. Two cells constitute the endometrium: 1-Epithelial cells and 2-Supporting mesenchymal cells (3). Furthermore, the endometrium divides into two functional layers. The outer layer is called the stratum functionalis, while the inner layer is the stratum basalis. The functionalis layer consists of a changing glandular tissue, while a constant stroma constitutes the inner basalis layer. The basalis layer lies sandwiched between the myometrium and the functionalis layer. The main components of the glands are columnar cells with leukocytes and vascular system. These two components originate from Müllerian ducts (4). During the menstrual cycle, the totality of the functionalis layer and a small portion of the basal layer sloughs off (5). Afterwards, rising levels of estrogen activates the regrowth of a new endometrial functionalis layer during the proliferative phase, resulting in a surface eipthelium, endometrial glands and a stroma (6). During the second secretory phase, progesterone inhibits epithelial growth and pro-

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