

Female Reproductive System

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What we'll talk about...

- Hormones that regulate structural changes in the menstrual cycle
- Follicular development in the ovary
- Changes in the endometrium during the menstrual cycle

The menstrual cycle comprises functional and structural changes in the ovary and endometrium.

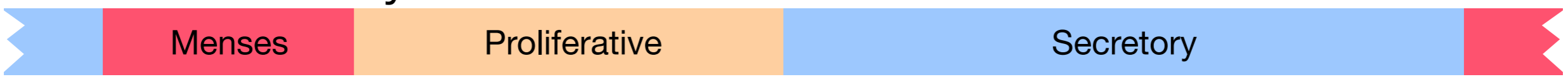
Ovulation



Ovarian Cycle



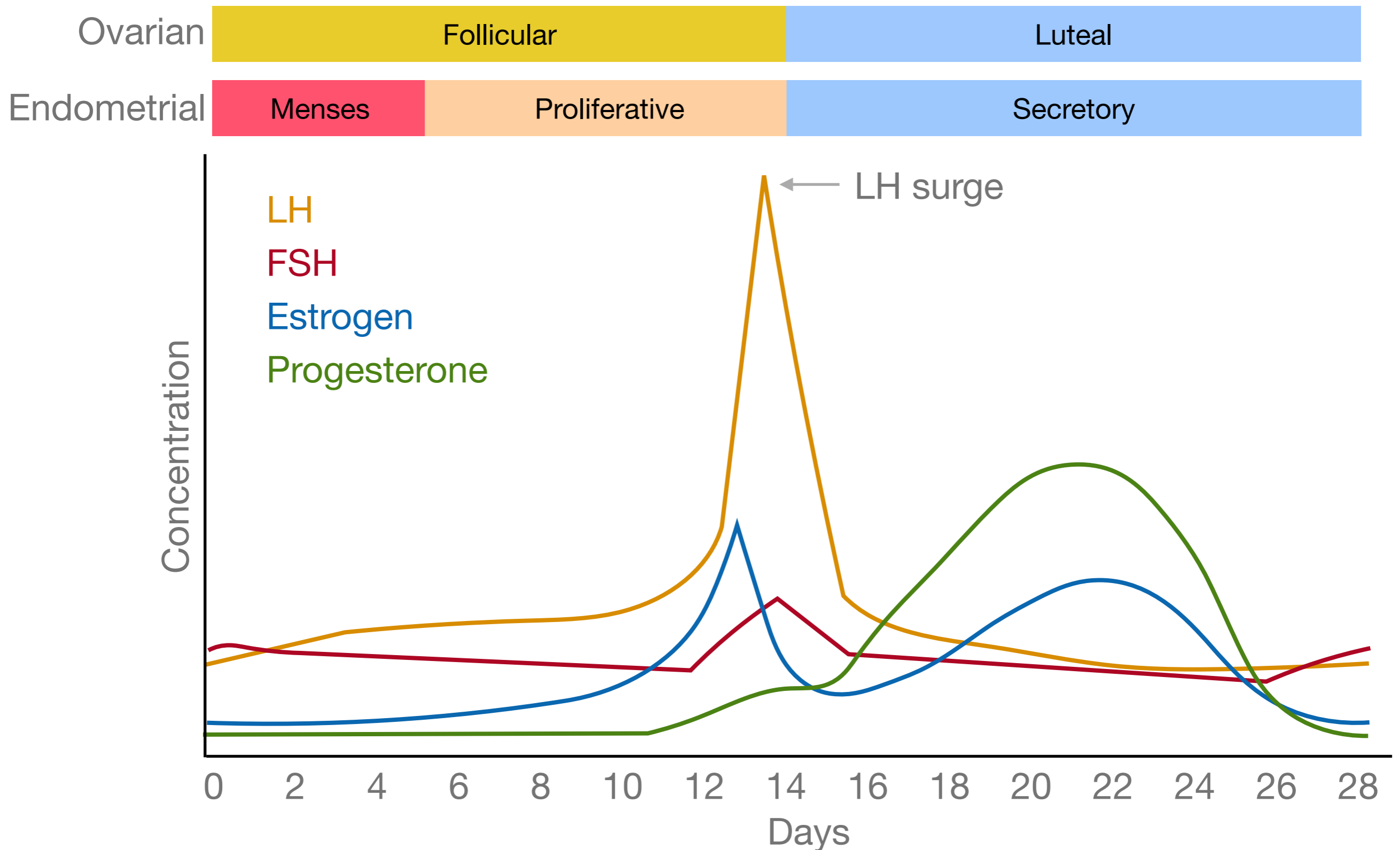
Endometrial Cycle



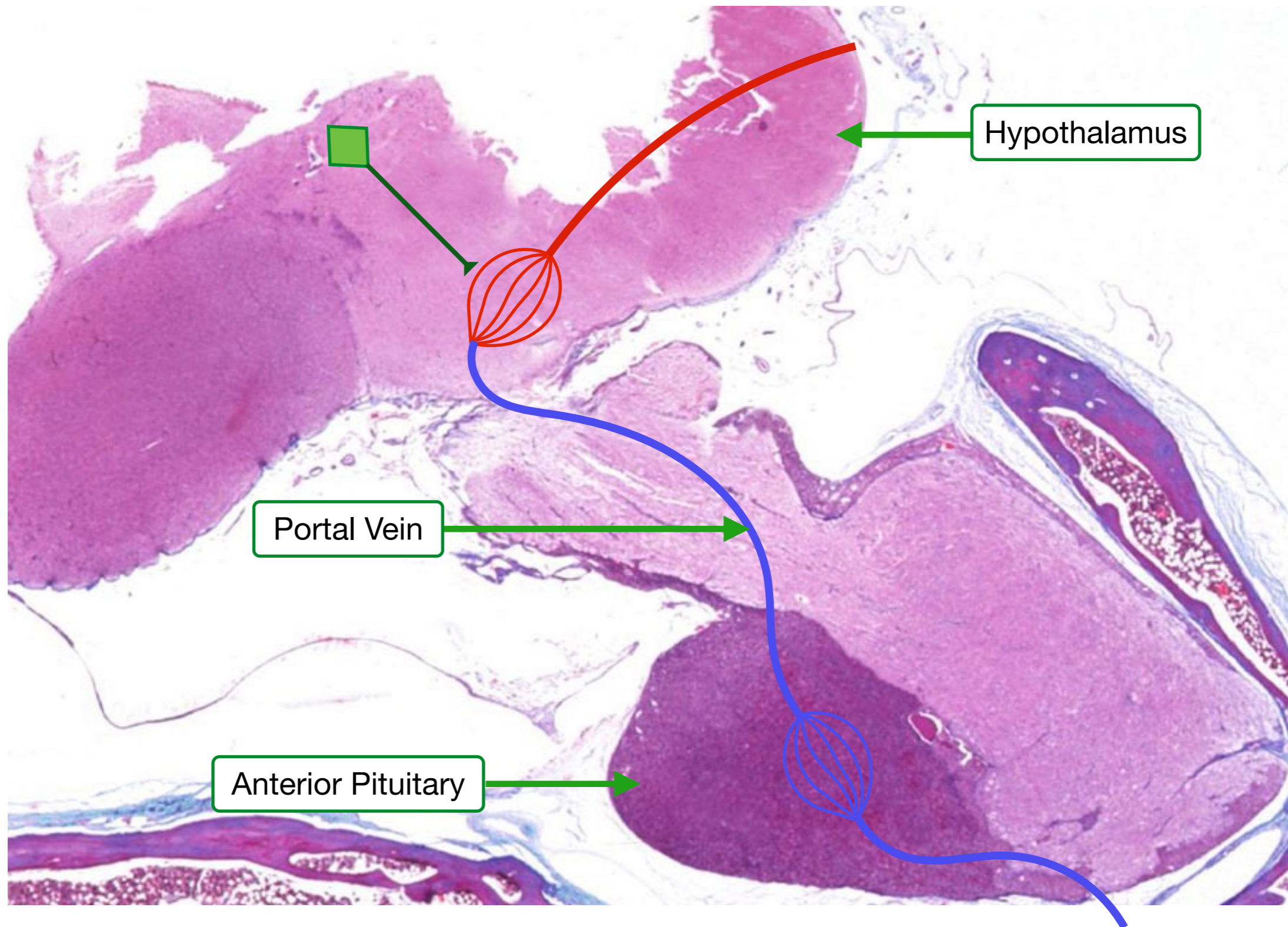
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

Days

Hormones produced in the anterior pituitary and ovary drive cyclical changes.

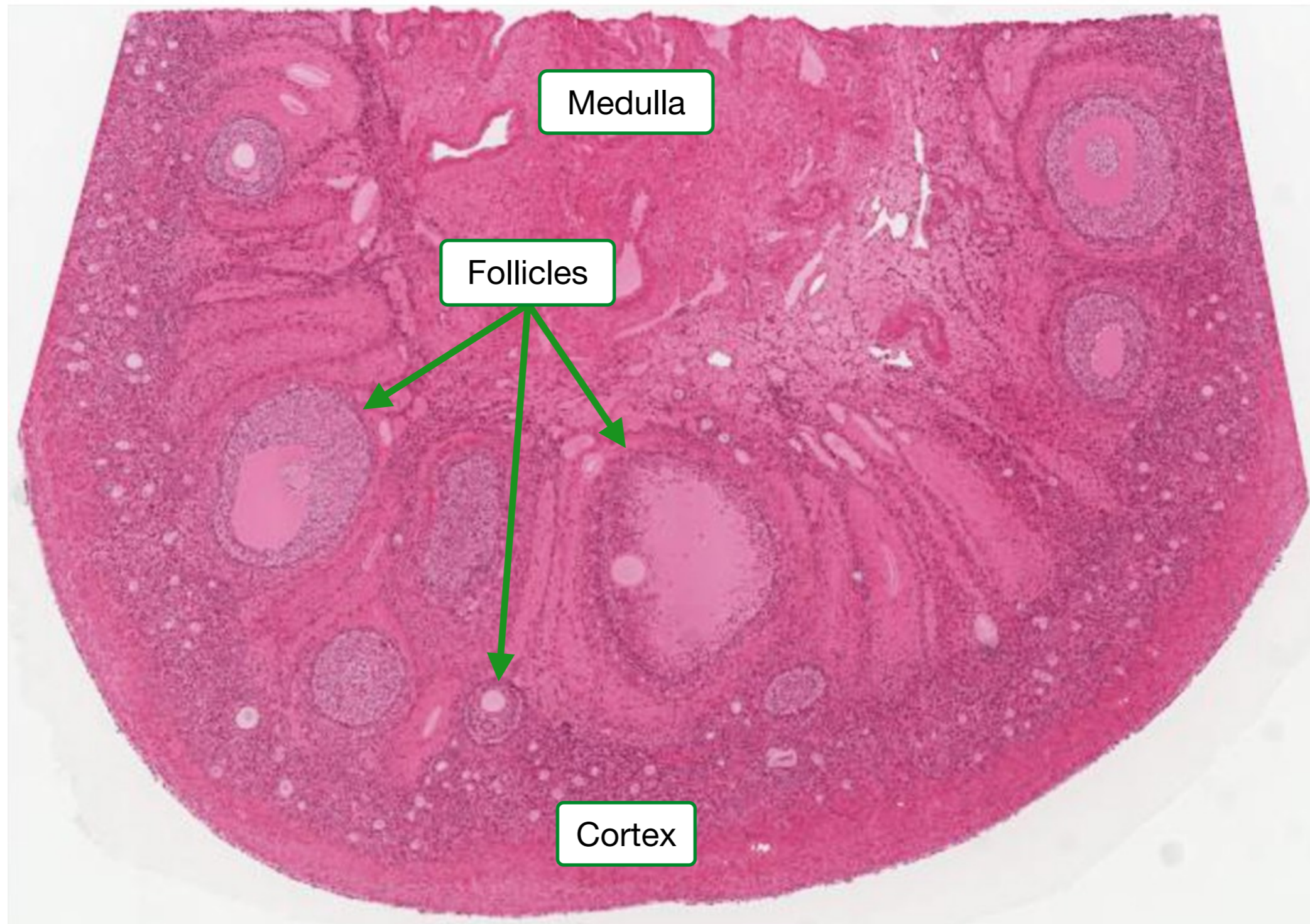


A portal system delivers releasing hormones from the hypothalamus to the anterior pituitary.



Ovary

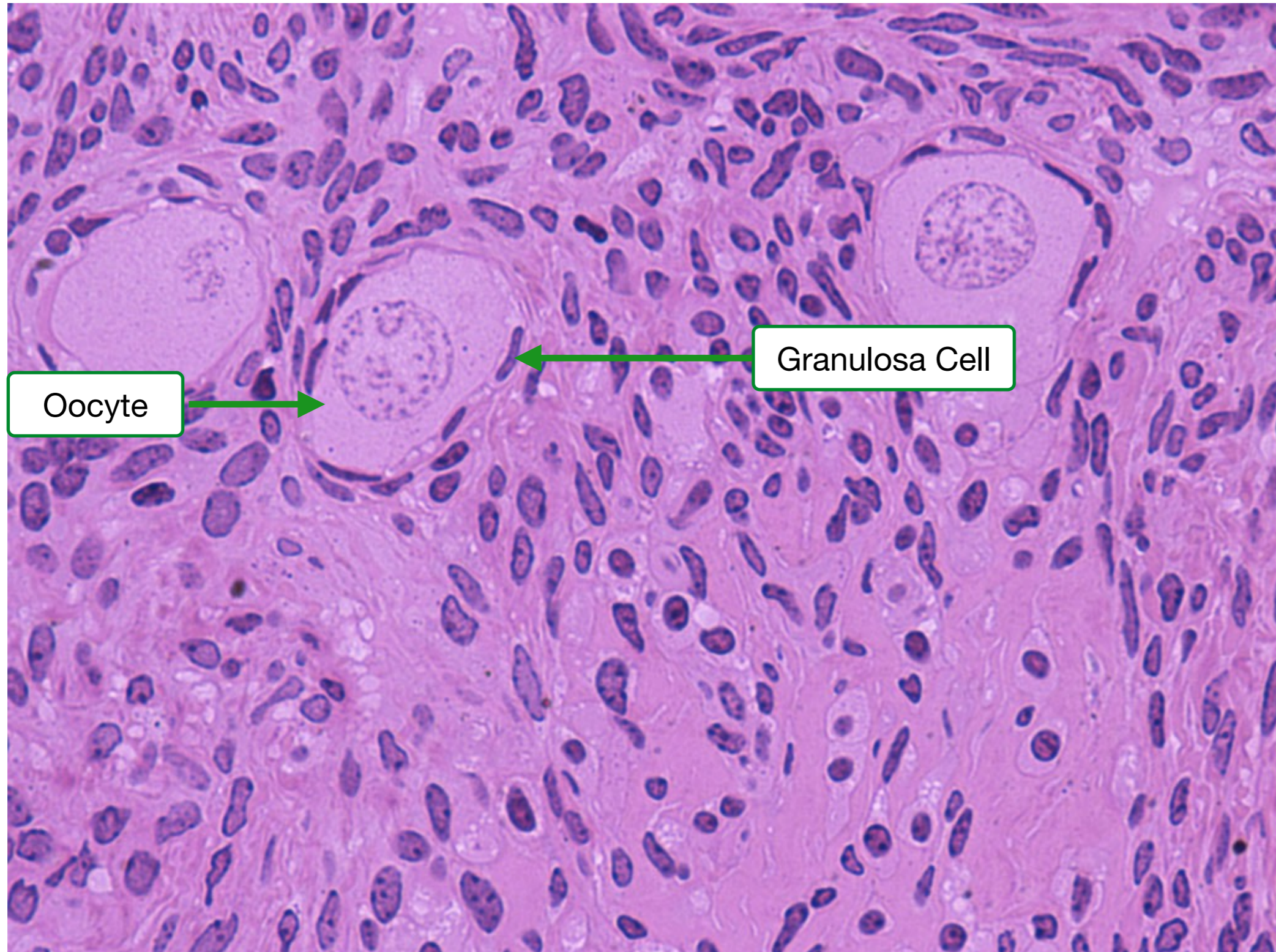
The cortex of the ovary contains follicles in different stages of development.



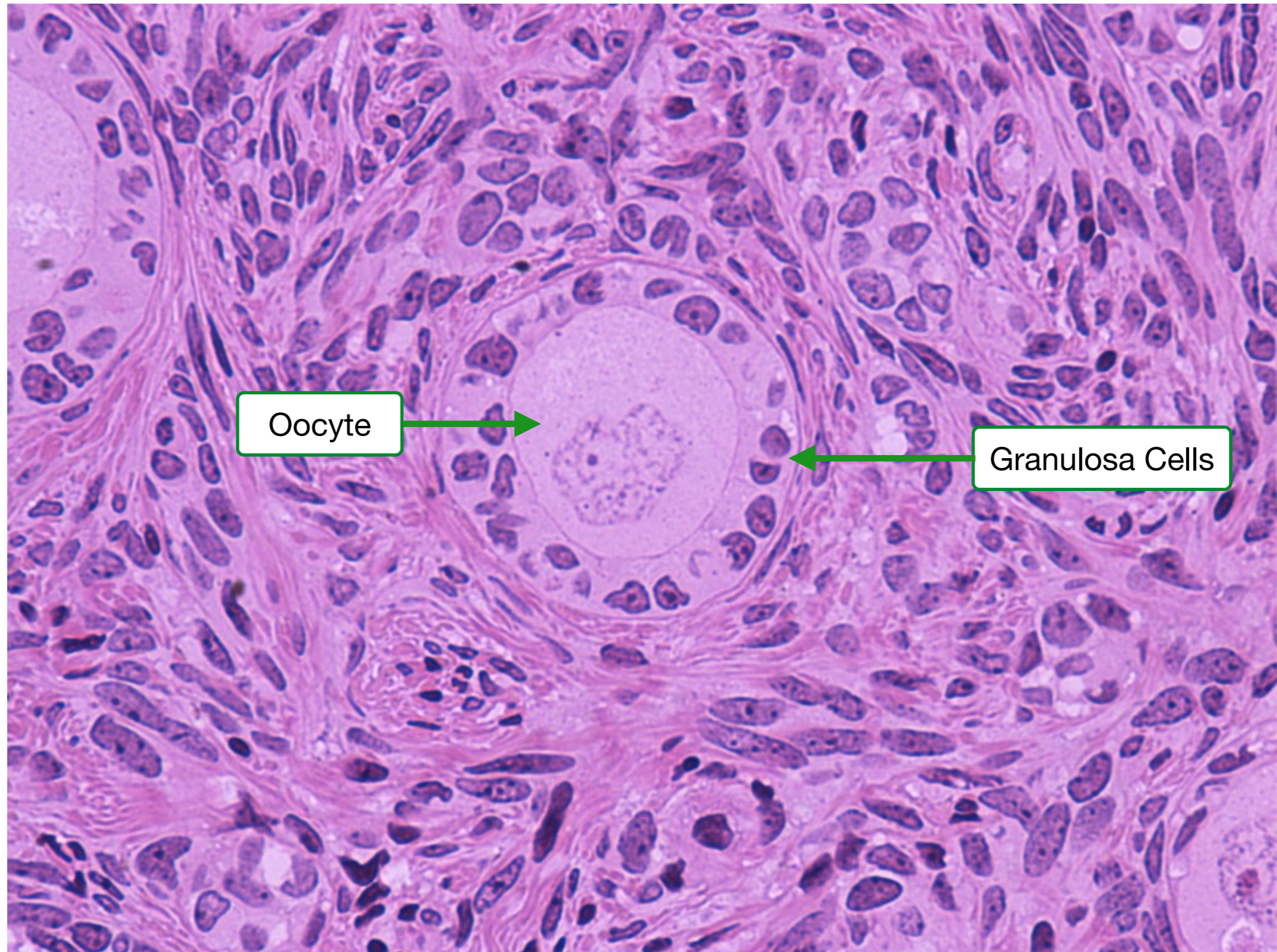
Stages of follicle development in the ovary

- Primordial
- Primary
- Secondary
- Graffian

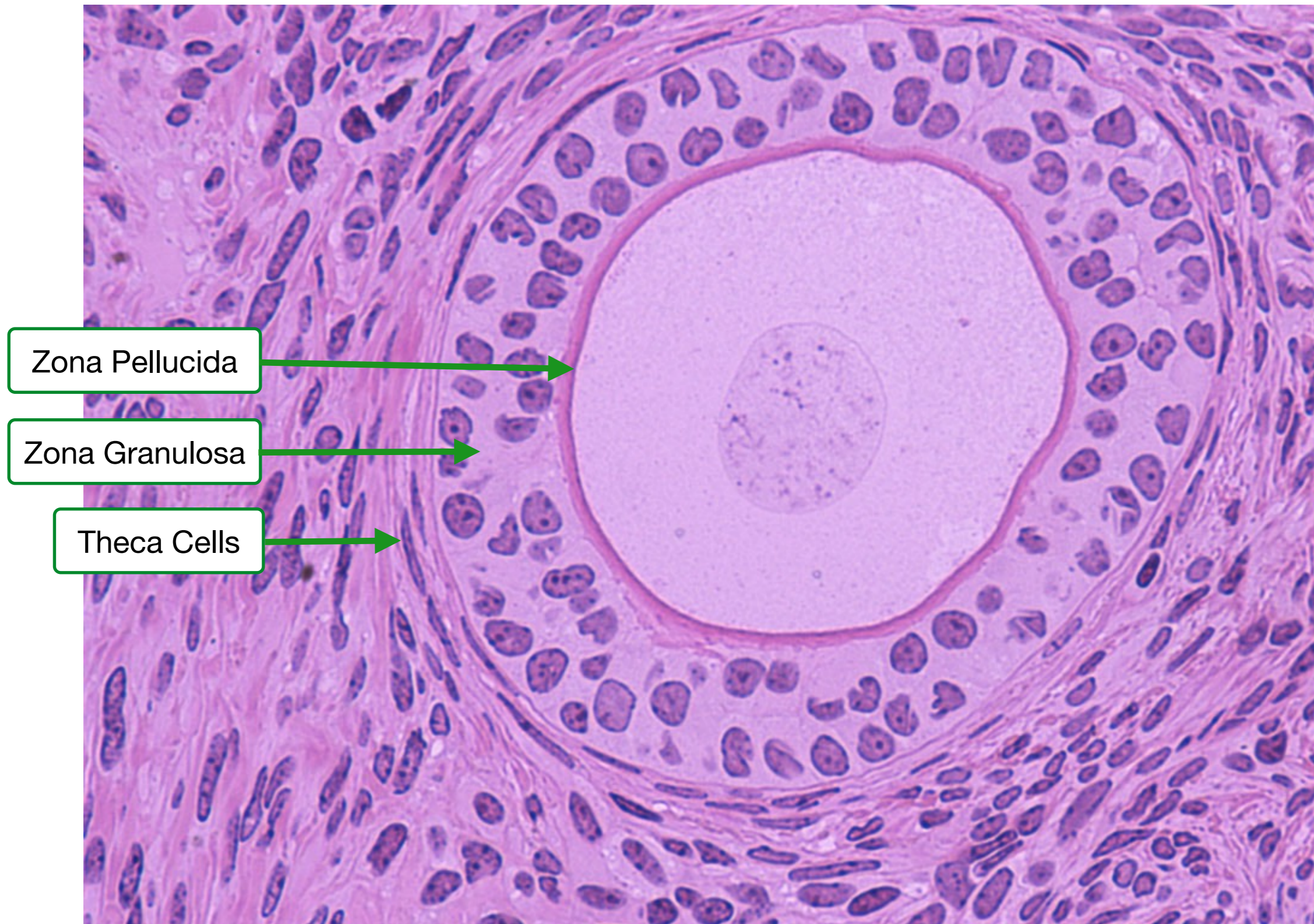
Primordial follicles contain an oocyte and a layer of squamous granulosa cells.



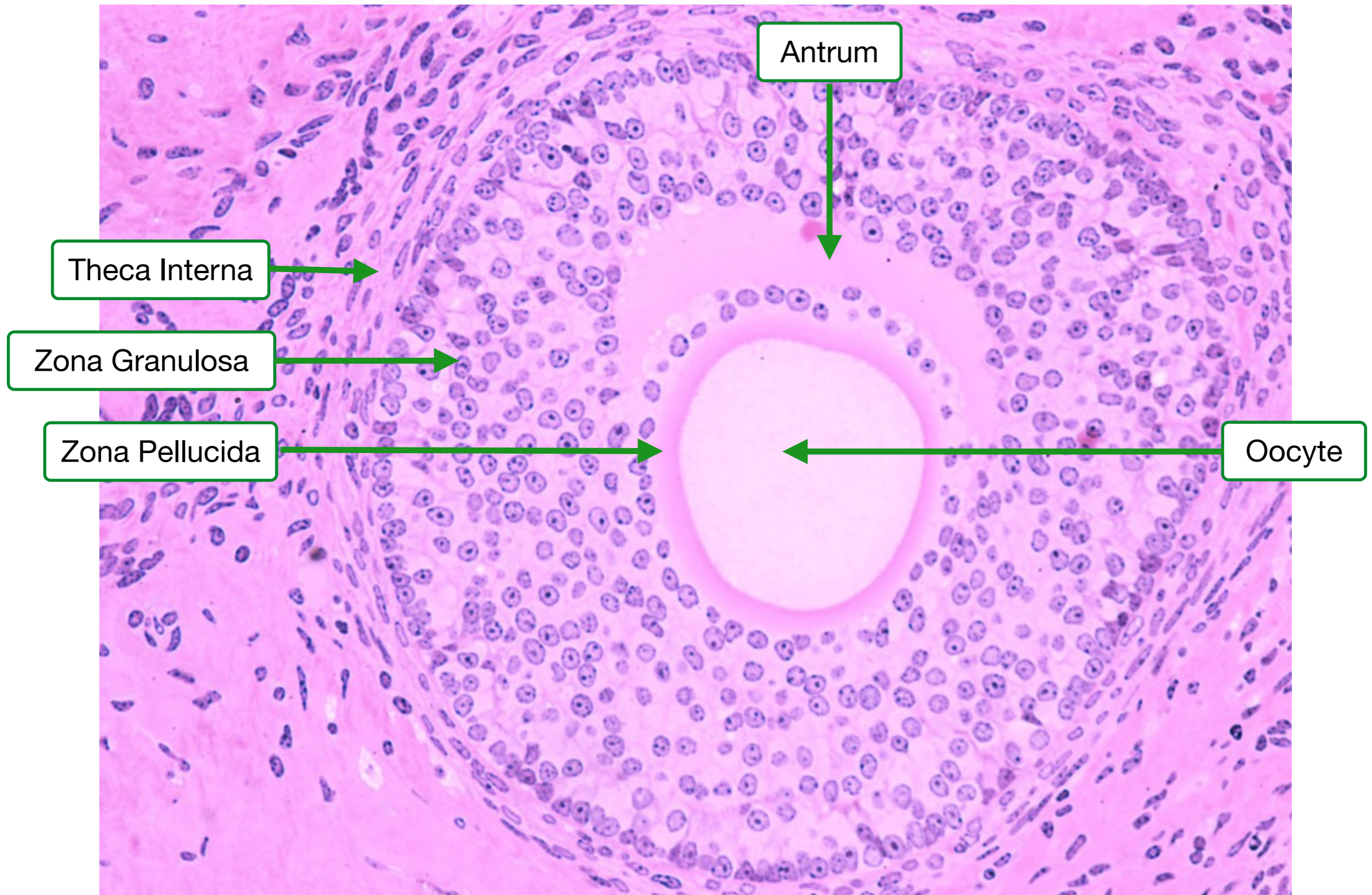
Primary follicles contain a larger oocyte and cuboidal granulosa cells.



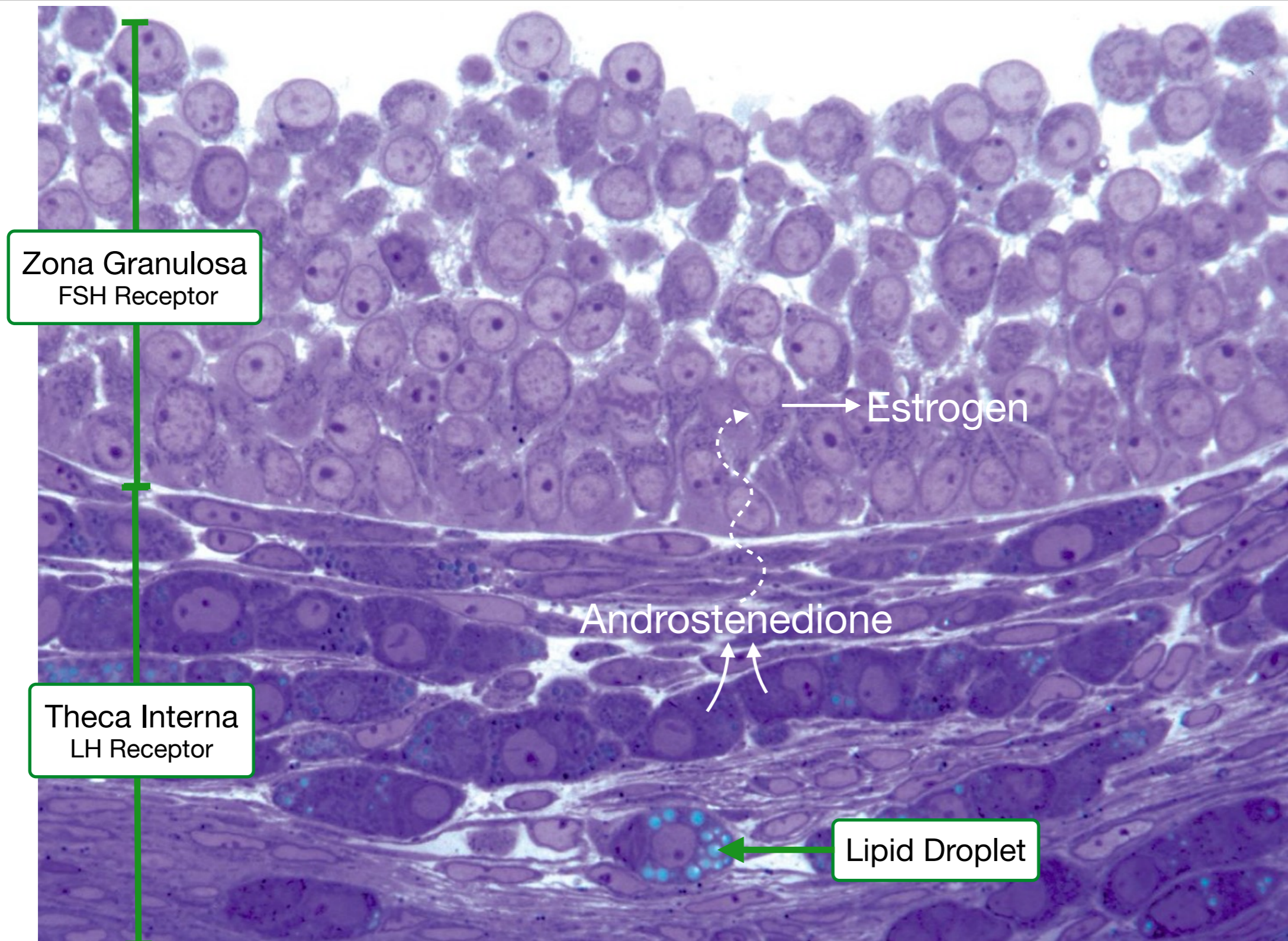
Late-stage primary oocytes contain theca cells, layers of granulosa cells and a zona pellucida.



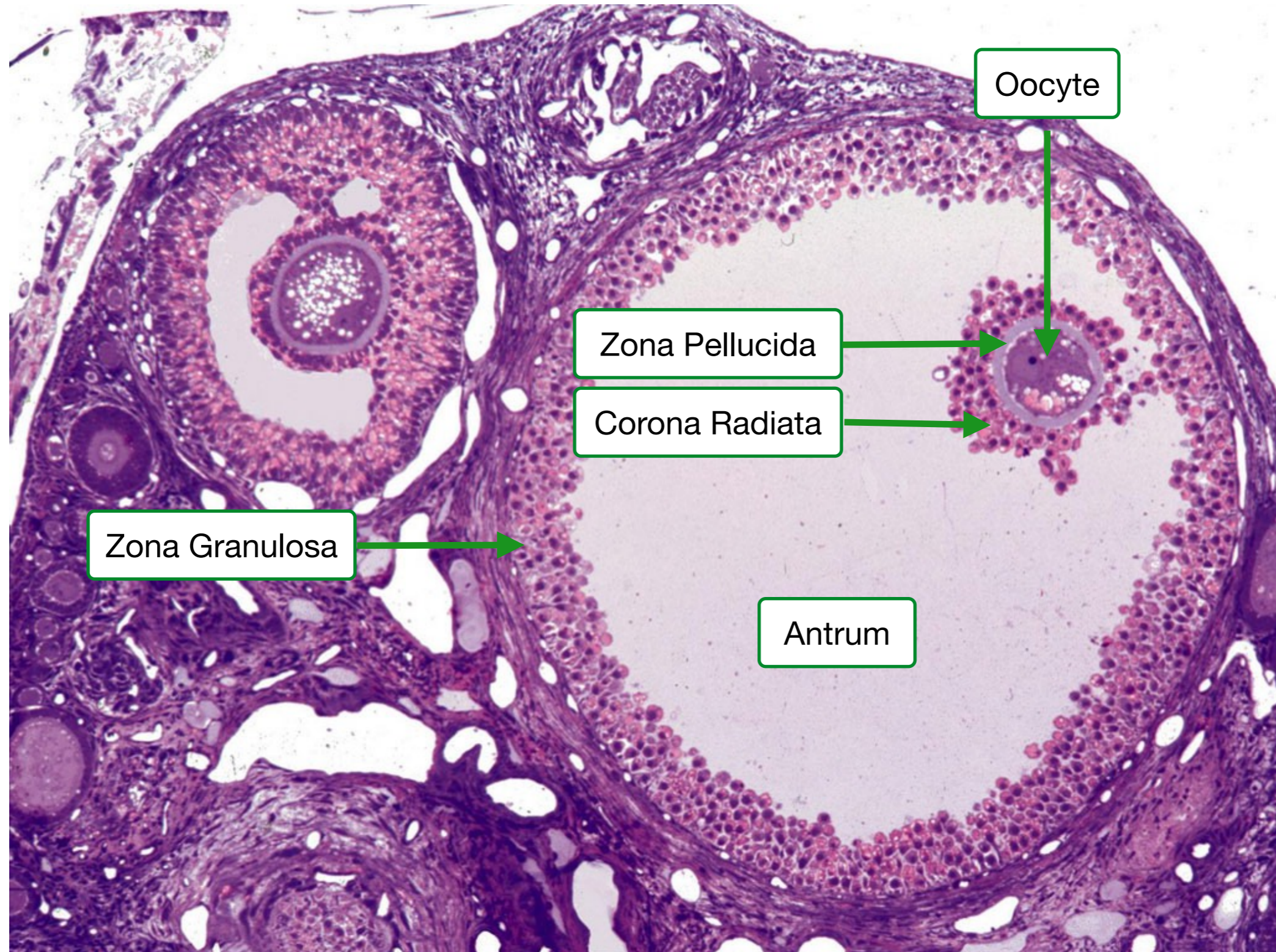
In secondary follicles, a fluid-filled antrum appears in the zona granulosa.



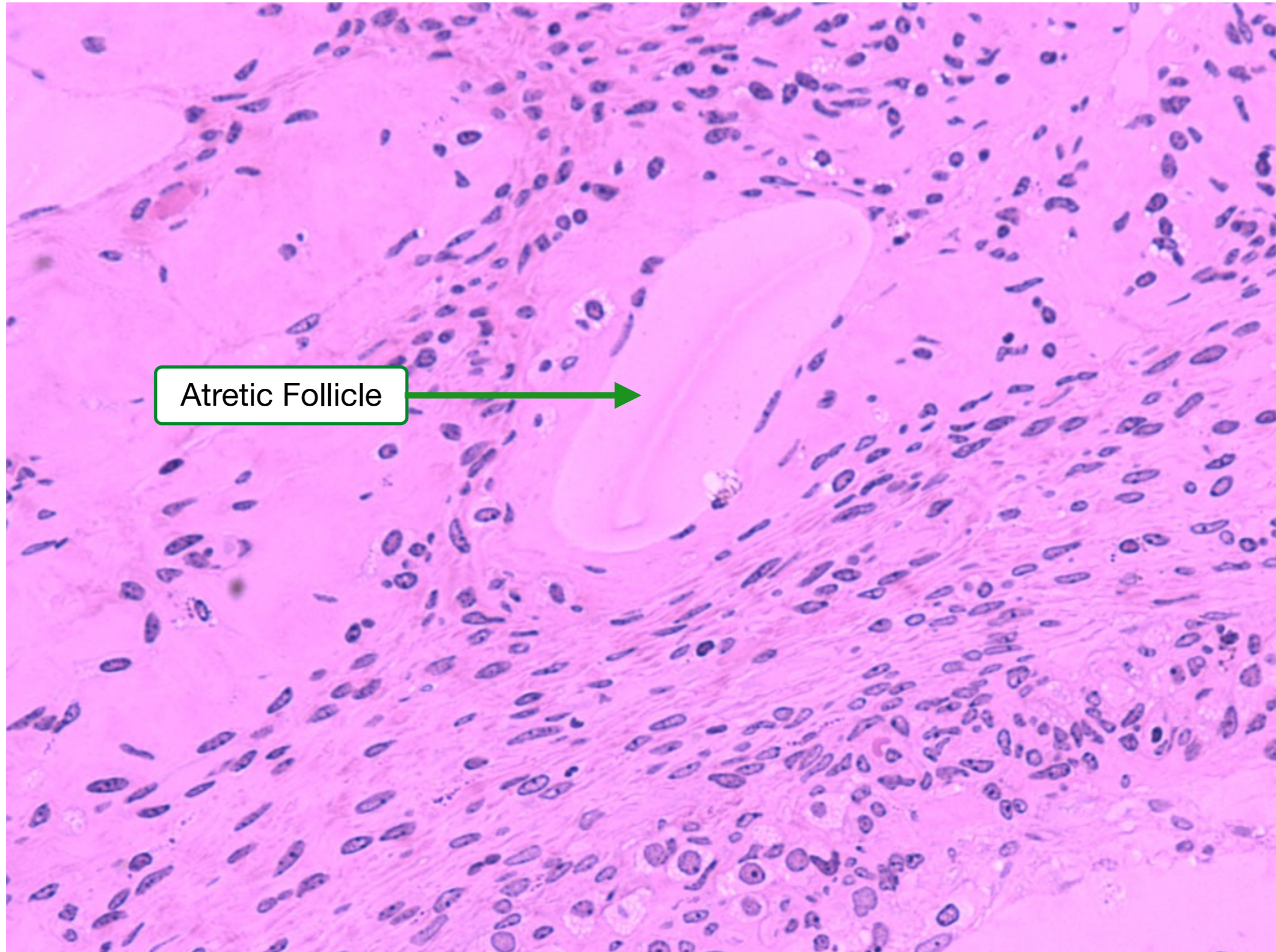
Cells in the theca interna produce androgens which cell in the granulosa convert to estrogen.



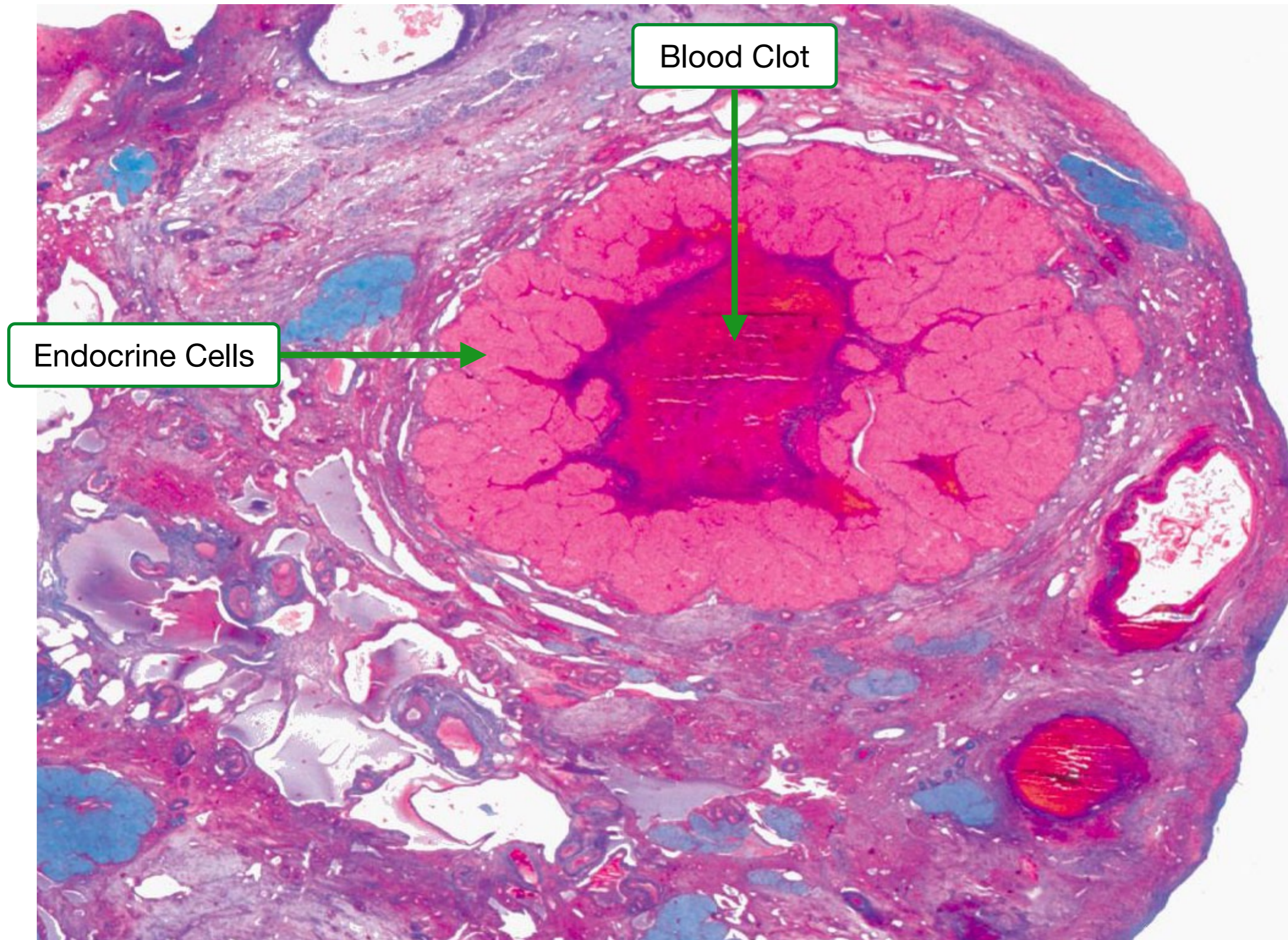
Graafian follicles contain an eccentrically localized oocyte and large antrum.



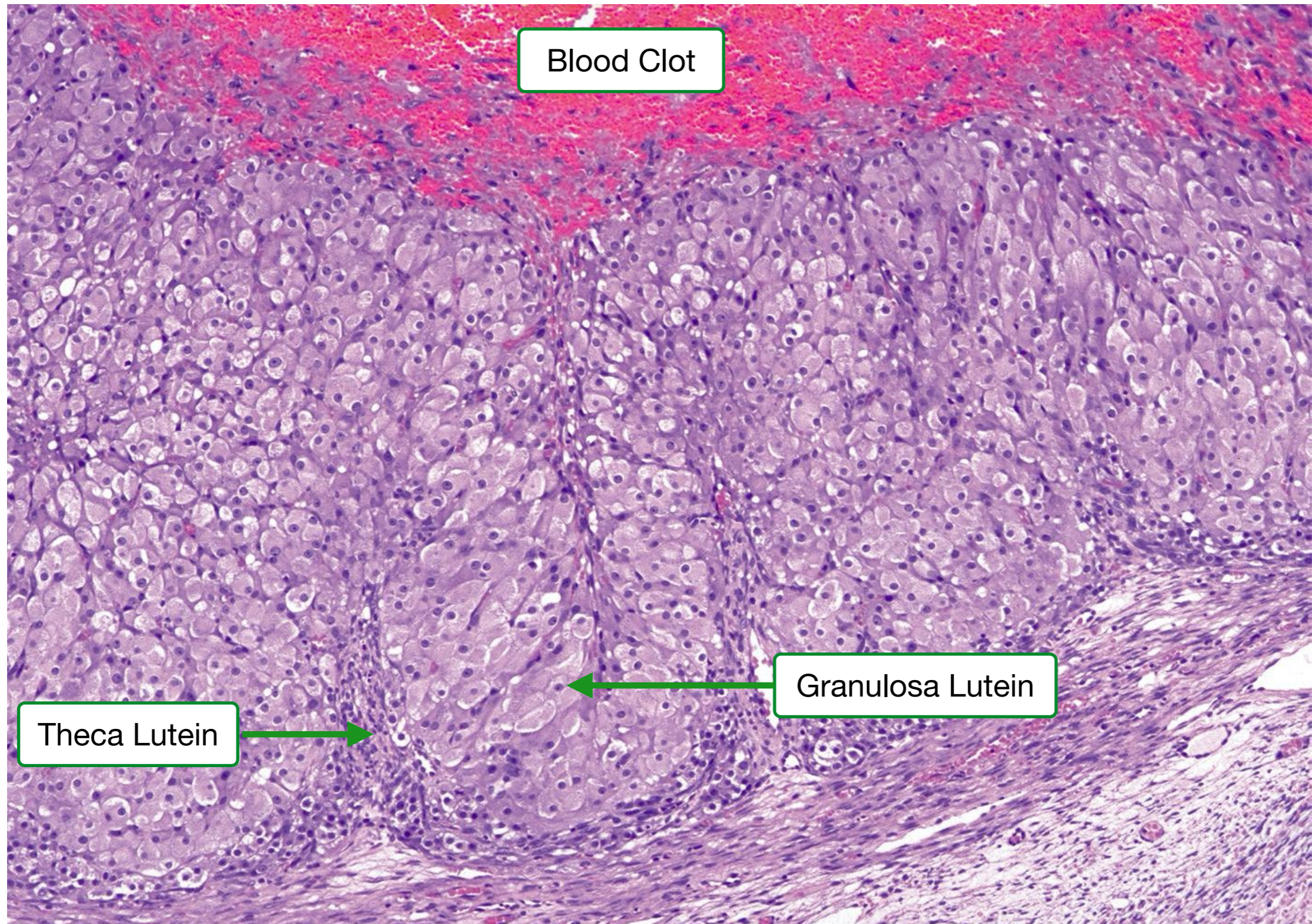
Most Graafian follicles undergo atresia which leads to their degeneration.



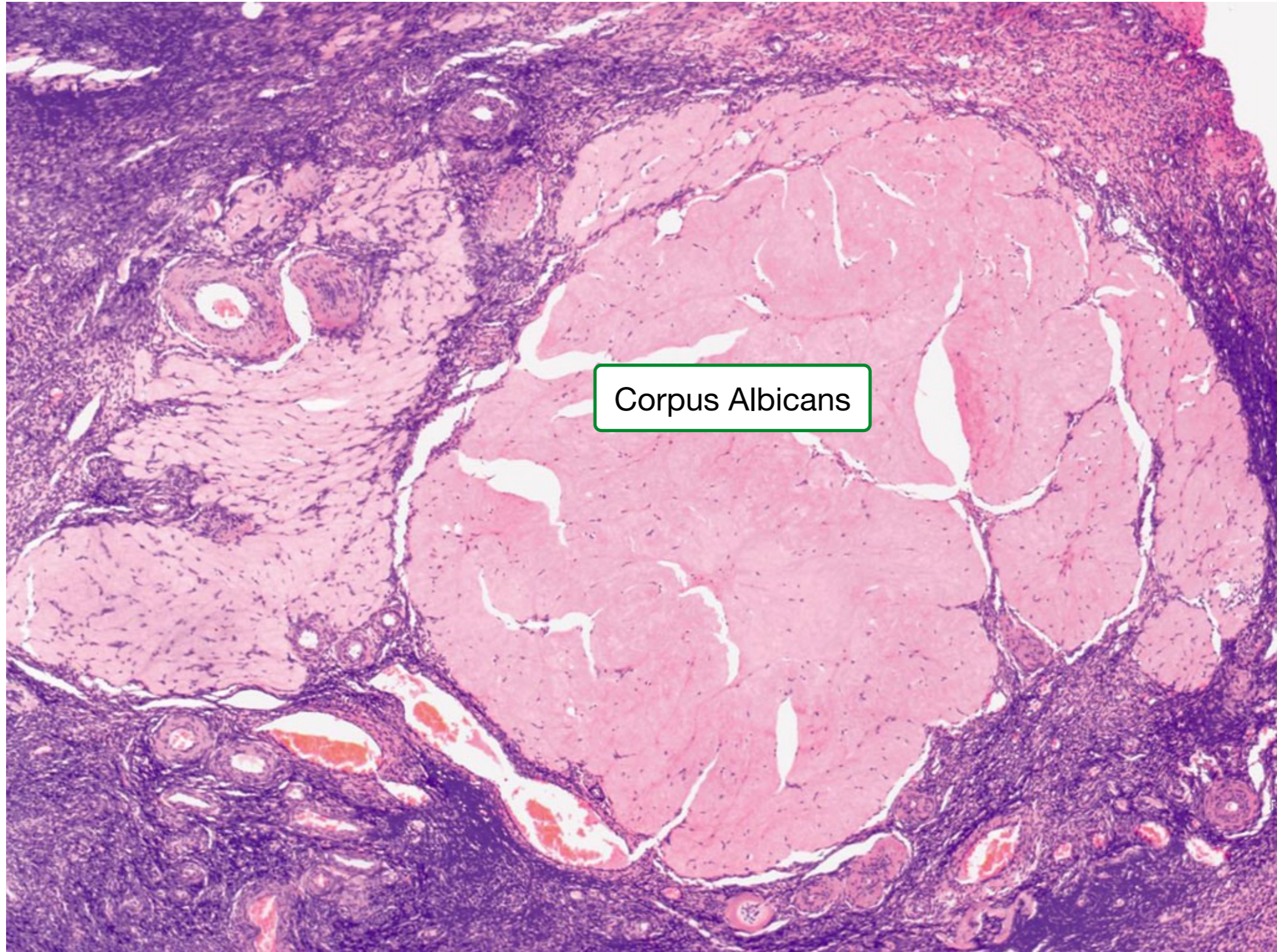
After releasing its ovum, the Graafian follicle becomes a corpus luteum.



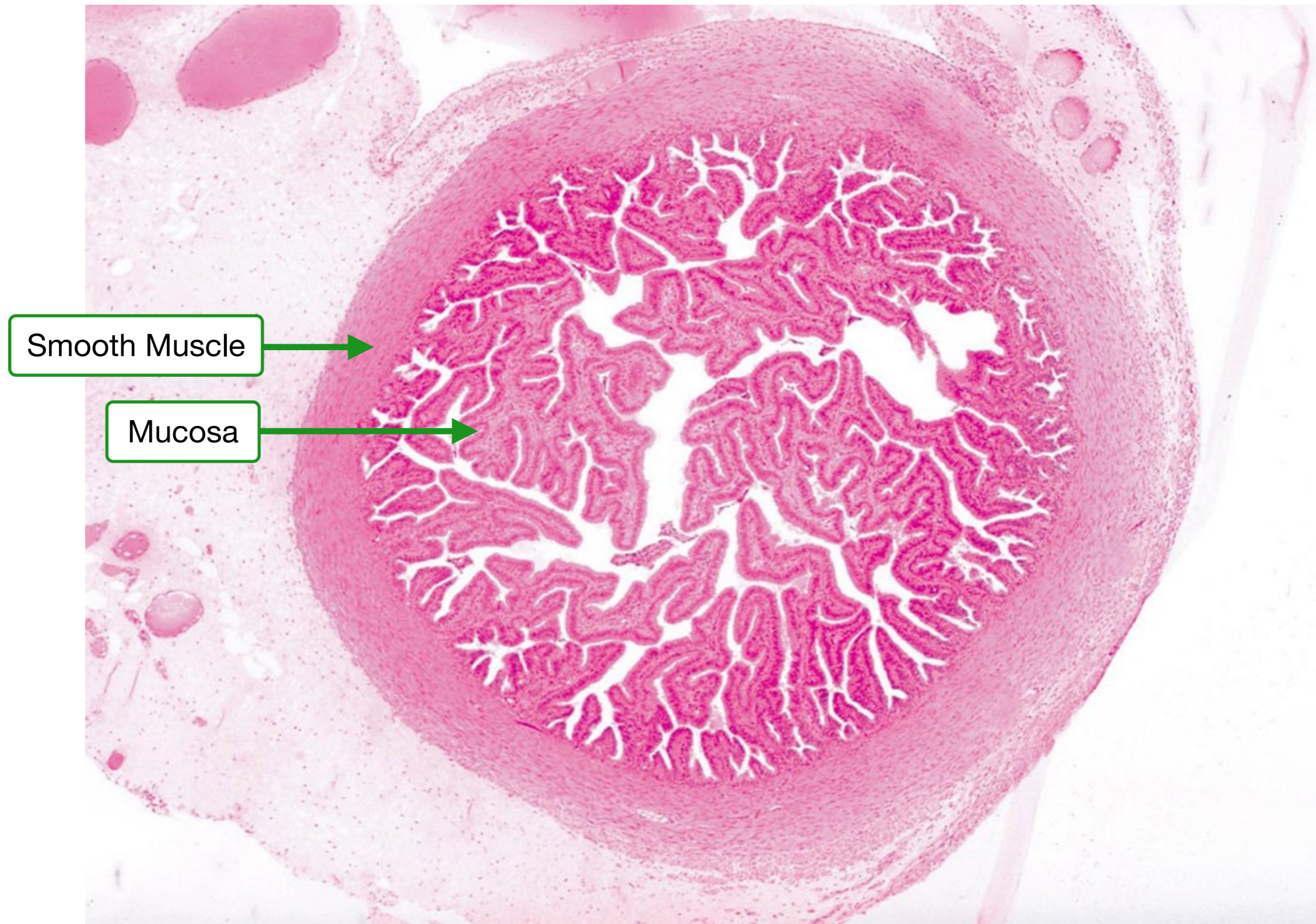
The theca lutein and granulosa lutein cells produce progesterone and estrogen.



Without implantation of an embryo, the corpus luteum degenerates into a corpus albicans.



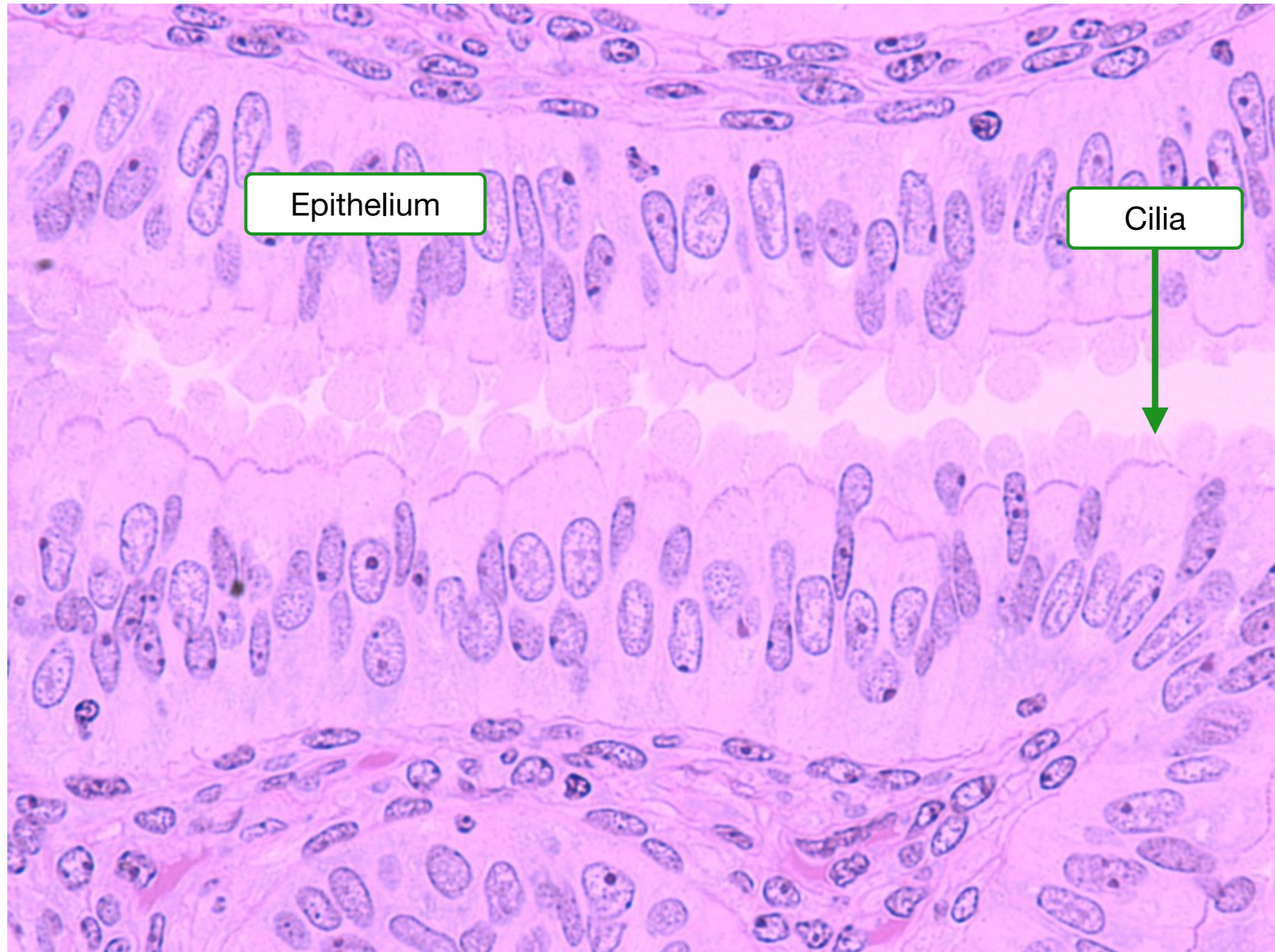
The oviduct consists of an inner mucosa and outer layer of smooth muscle.



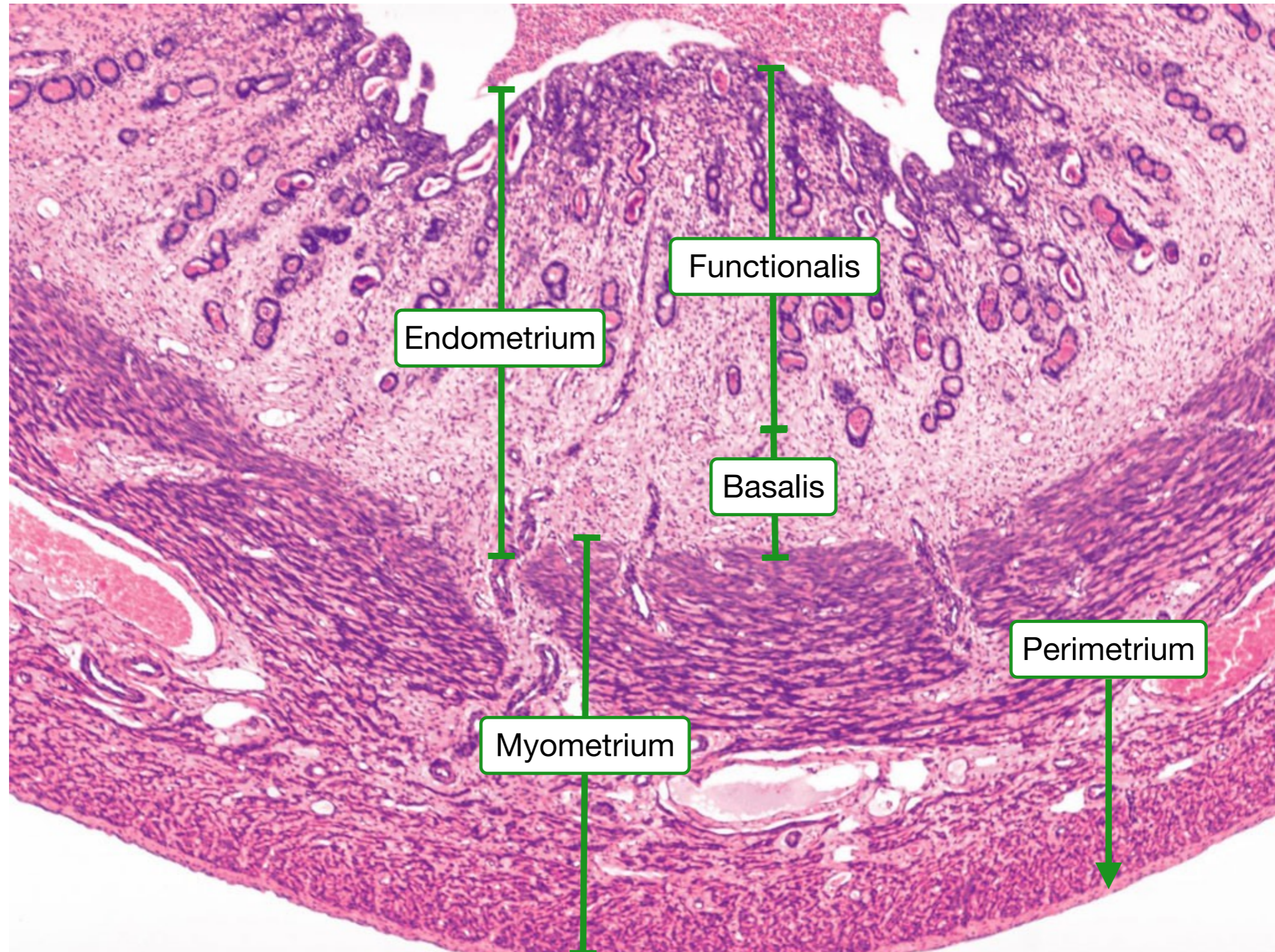
Components of the female reproductive tract

- Oviduct
- Uterus
- Cervix
- Vagina

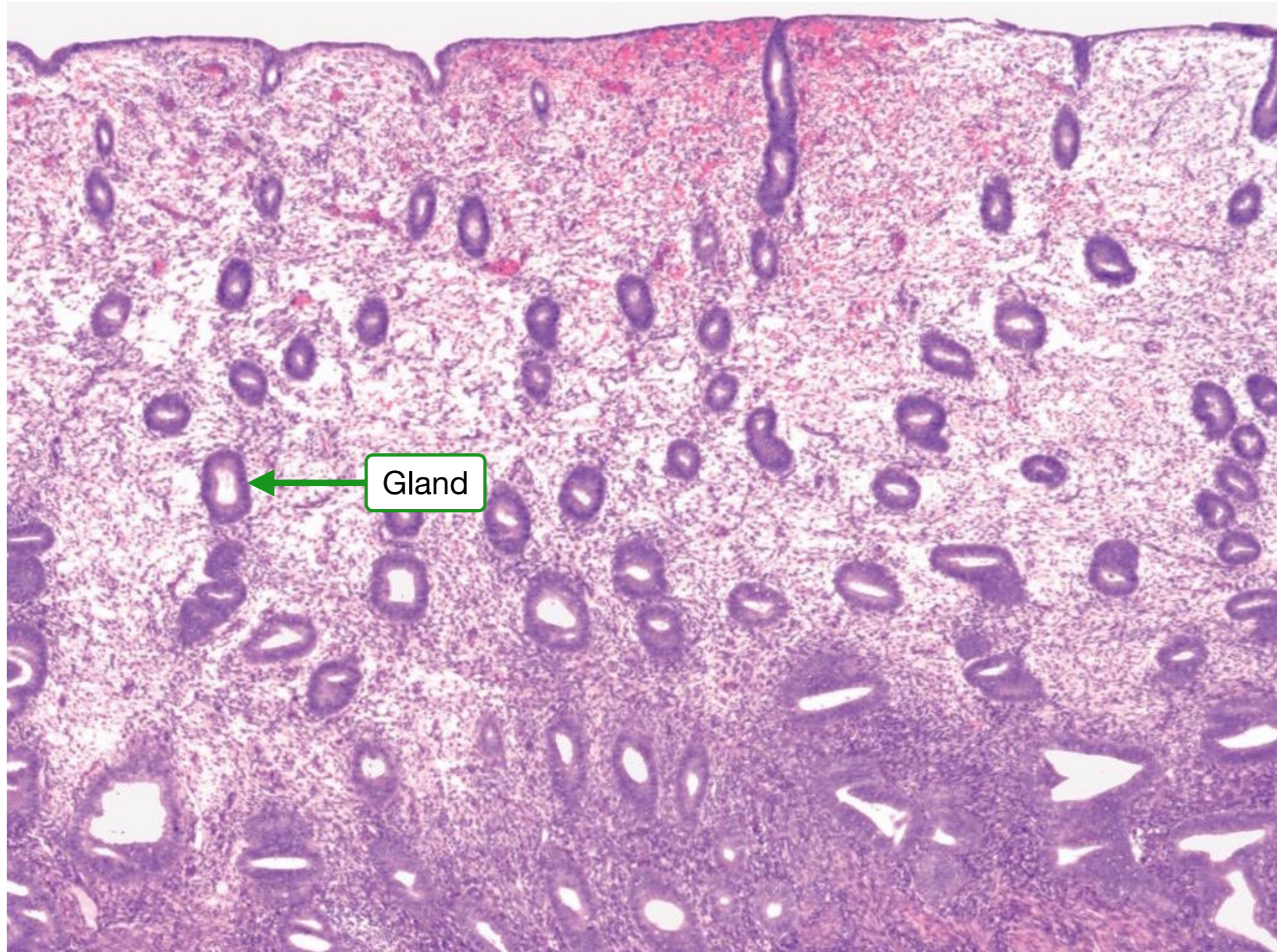
The oviduct is lined by simple columnar epithelium with cilia.



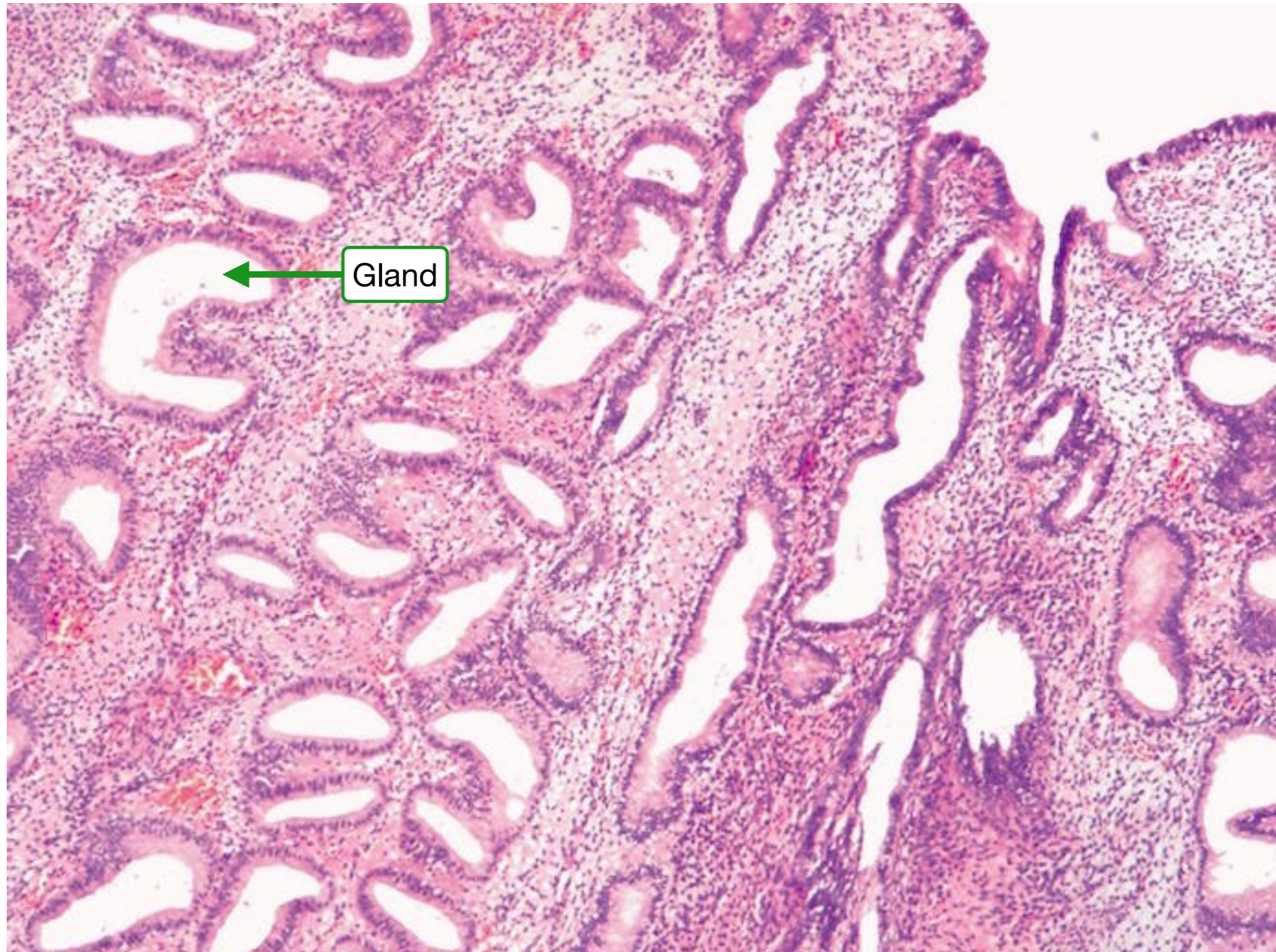
The uterus contains a glandular endometrium and myometrium of smooth muscle



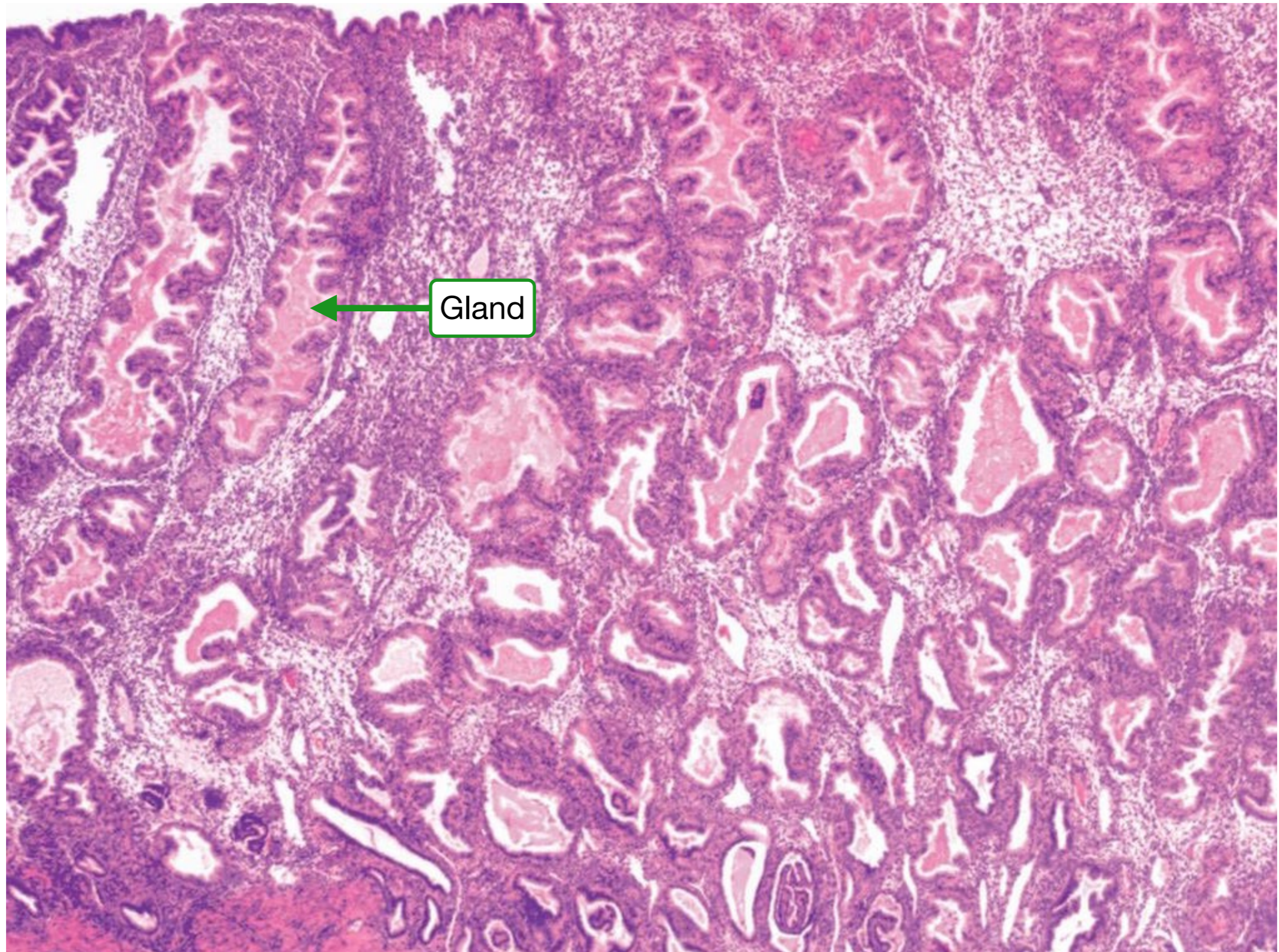
The endometrial glands expand during the proliferative phase to increase its thickness.



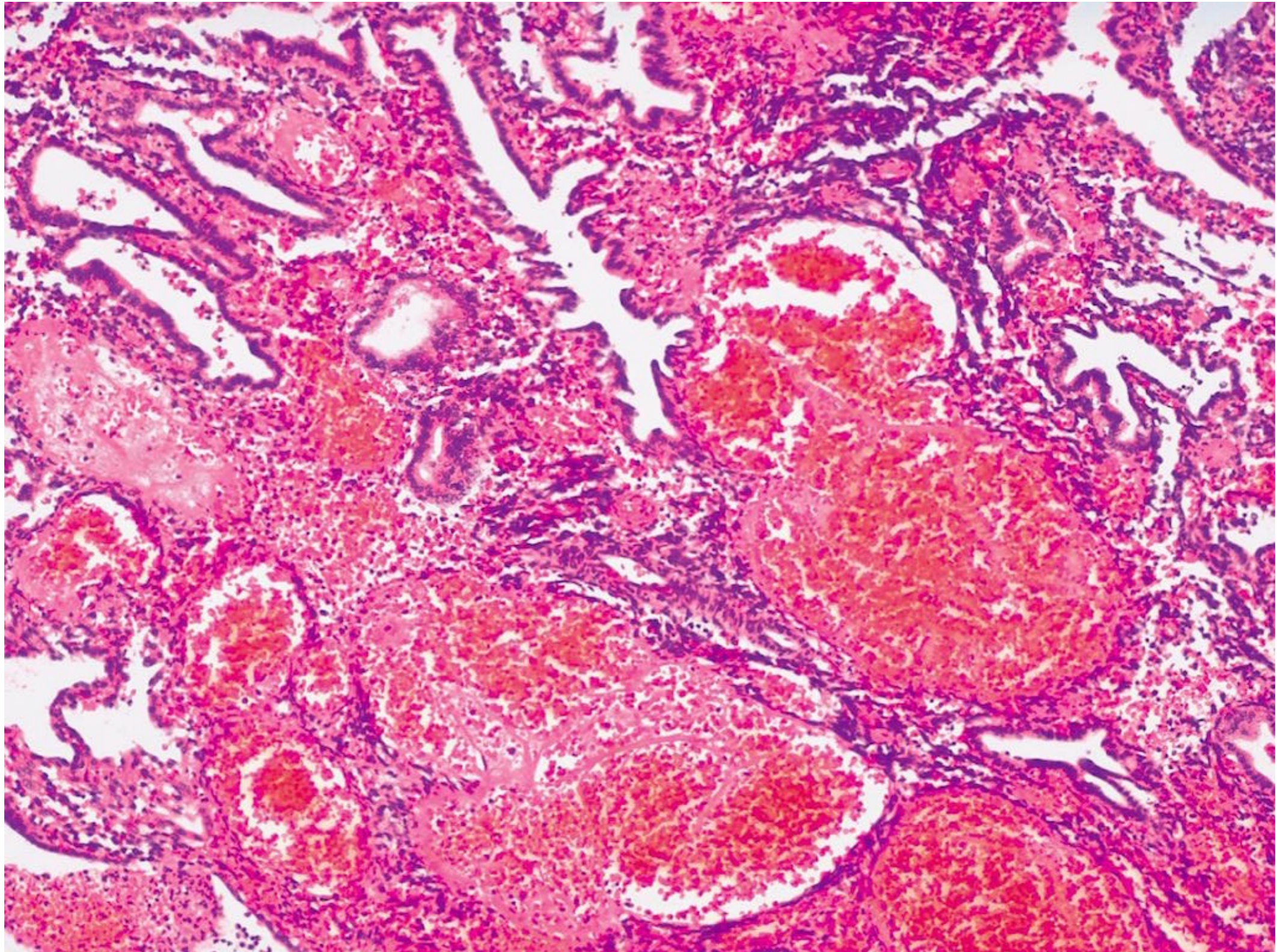
The late proliferative phase see larger and more numerous glands.



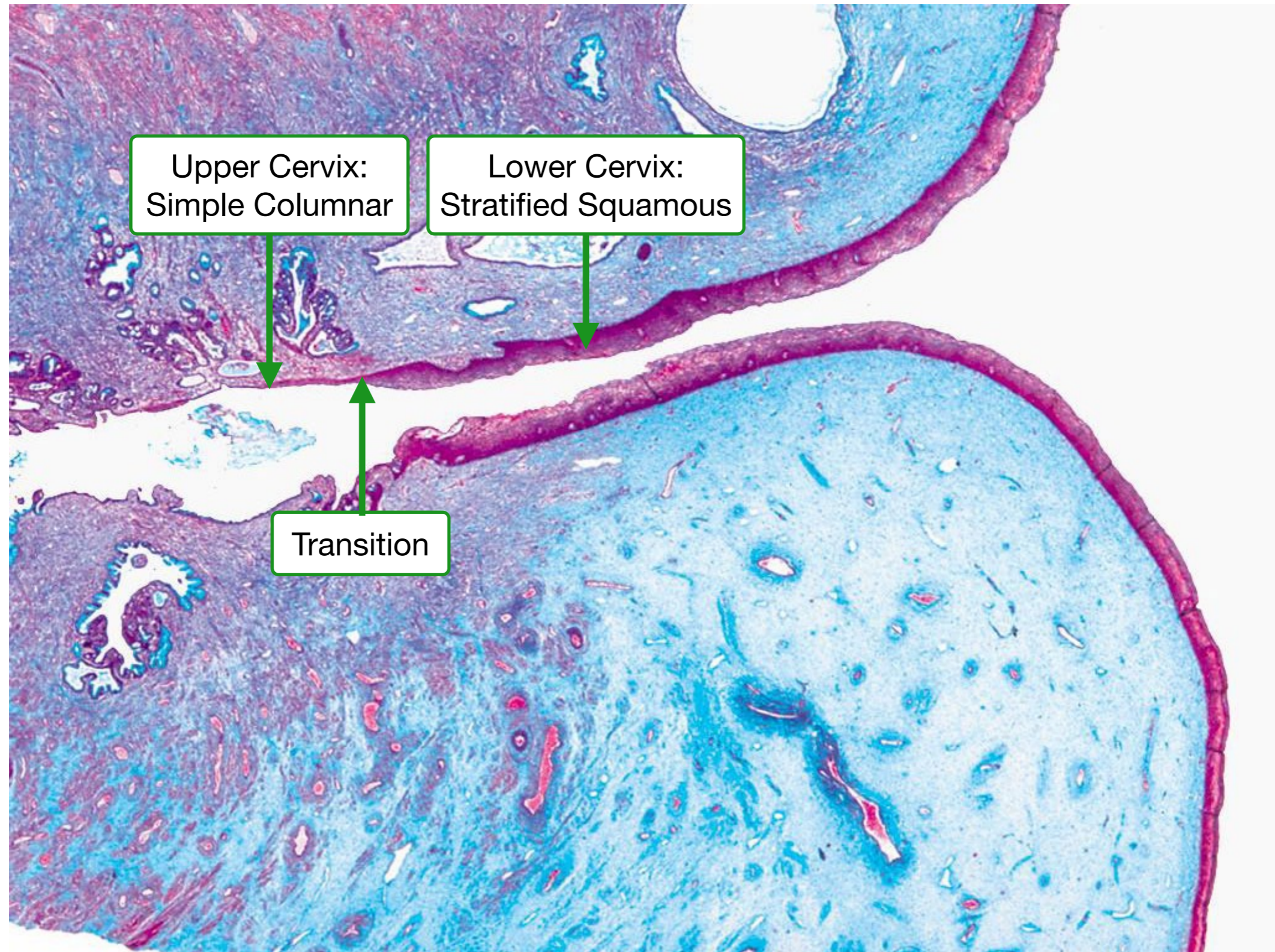
In the secretory phase, the epithelial cells secrete glycogen and glycoproteins.



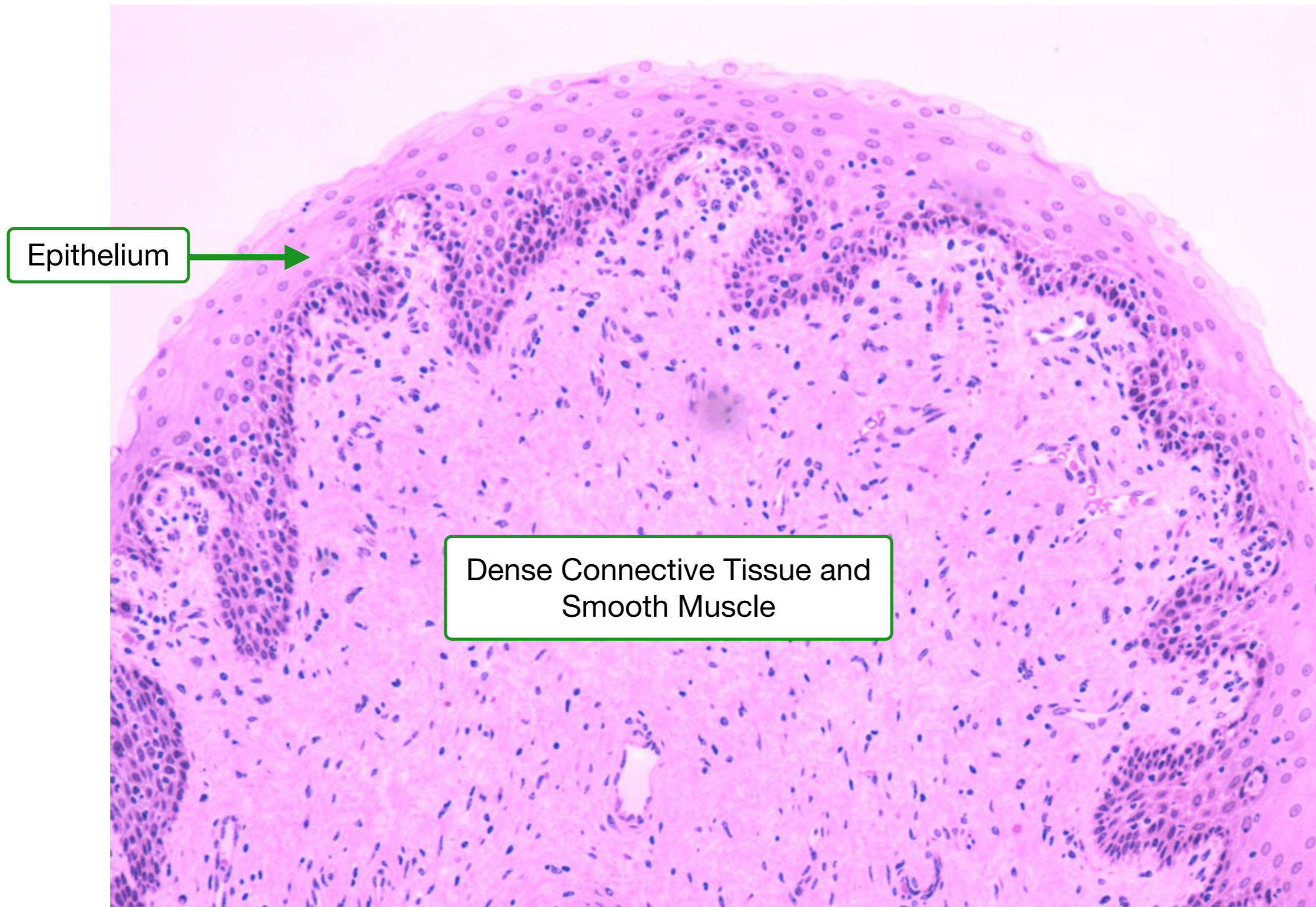
Without implantation of an embryo, the endometrium degenerates during menstruation.



The epithelium of the cervix transitions from simple columnar to stratified squamous.



The vagina has a stratified squamous epithelium over dense connective tissue.



Take home messages...

- Gonadotrophs in the anterior pituitary secrete FSH and LH in response to GnRH.
- FSH stimulates granulosa cells and LH stimulates theca interna cells and granulosa lutein cells.
- Follicles develop through well defined stages
- The endometrium cycles through proliferative, secretory and menstrual phases.