Histology Lab

Female Reproductive System

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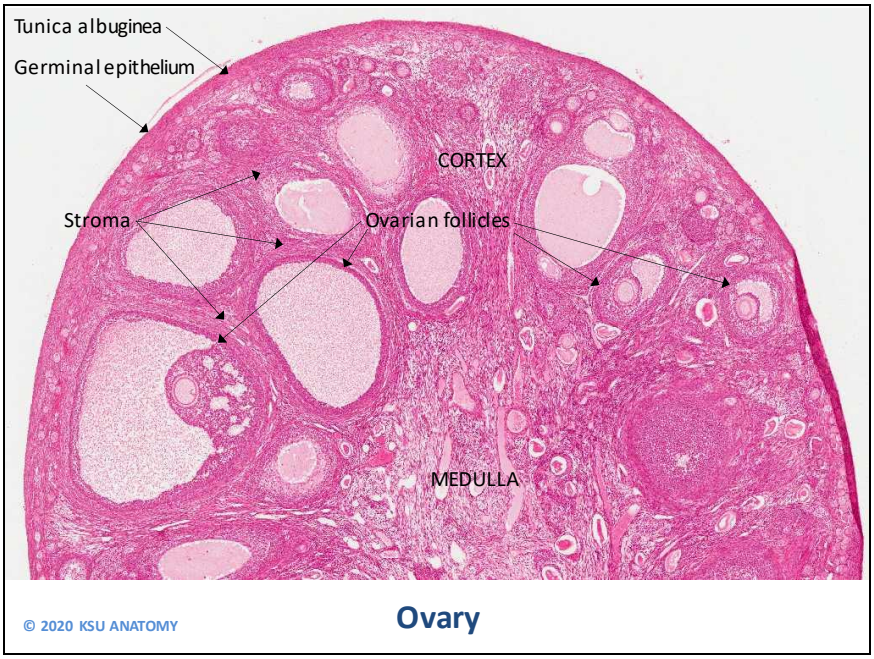
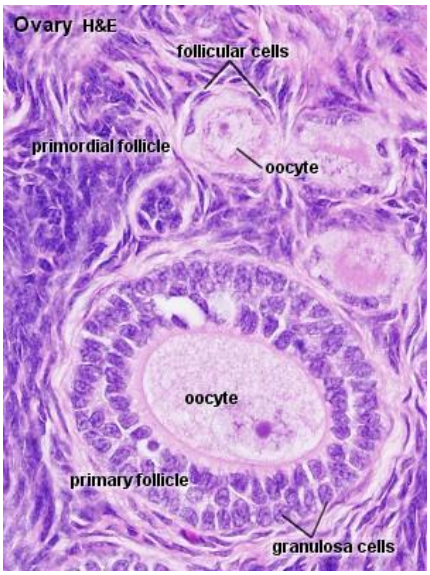
This is the Histology Practical Lab of the Female Reproductive System.



This is a section in the ovary.
The ovary is covered by a single layer of simple squamous epithelium, called germinal epithelium.
Underneath the germinal epithelium lies a dense collagenous CT capsule called tunica albuginea.
The ovary consists of an outer cortex and an inner medulla.
The medulla consists of highly vascular loose CT.
The cortex contains ovarian follicles in various stages of development in a CT stroma composed of fibroblast-like stromal (or interstitial) cells.
We can see in this section the different stages or types of ovarian follicles:
Primordial follicles are small and found near the tunica albuginea. They grow and increase in size to become primary, then secondary, and finally mature Graafian follicles.



Ovary – Primordial & Primary Follicles

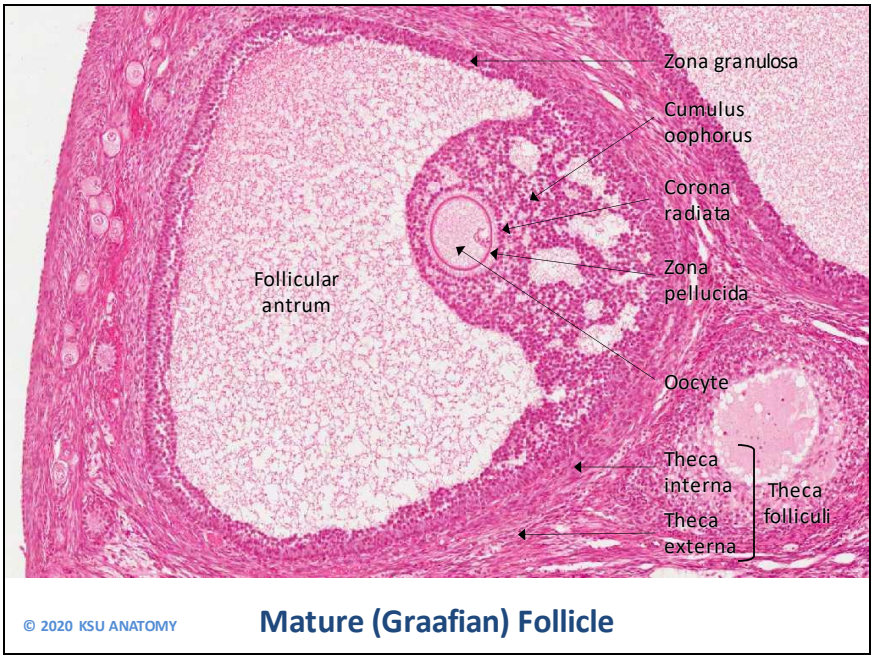
Adapted from Blue Histology (https://www.lab.anhb.uwa.edu.au/mb140/)

Each primordial follicle is formed of one large cell (which is the primary oocyte) surrounded by a single layer of flat cells called follicular cells, which become cuboidal in primary follicles.

There are two types of primary follicles, unilaminar and multilaminar, depending on the number of layers of follicular cells that surround the primary oocyte. So this is a multilaminar primary follicle because it has more than one layer of cuboidal follicular cells, which are now called granulosa cells.

The primary oocyte has a pale cytoplasm and a large vesicular nucleus (fine chromatin and prominent nucleolus).

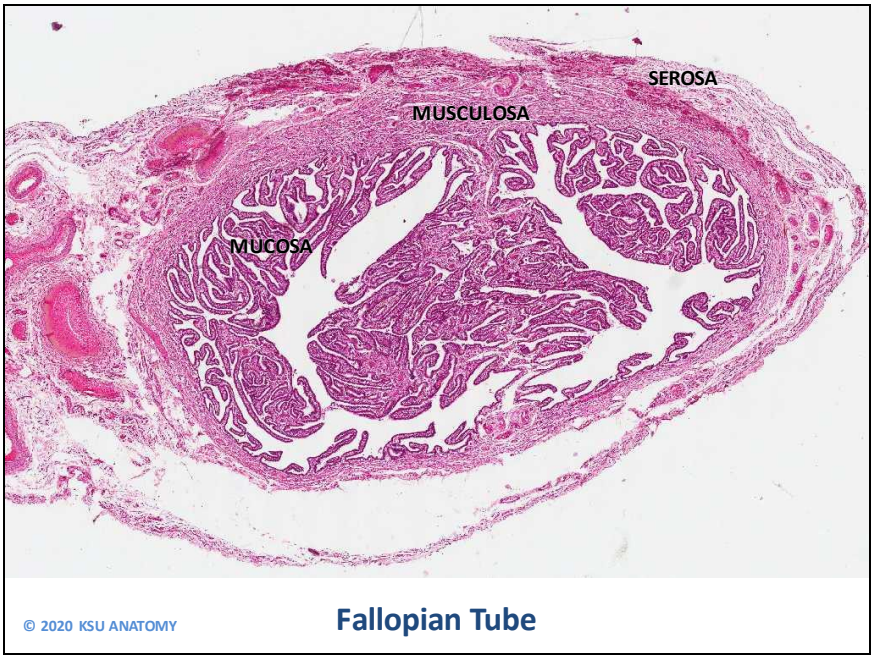
Notice the stroma with its fibroblast-like stromal cells.



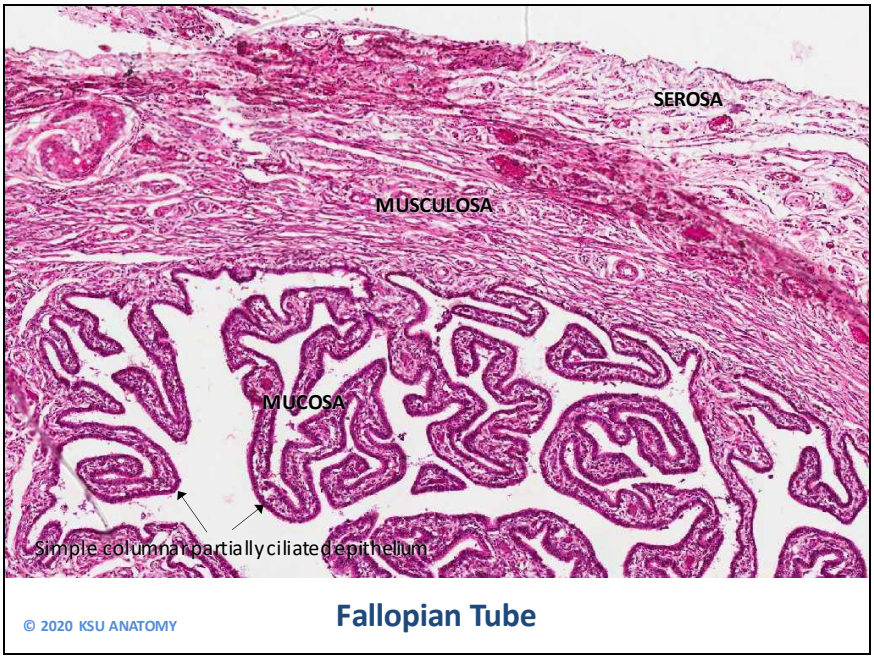
Mature (Graafian) Follicle

Mature (or Graafian follicle) is an extremely large follicle whose diameter may reach as much as 2.5 cm by the time of ovulation. Graafian follicle has a very large cavity and a thin wall. The cavity is called follicular antrum and is filled with follicular fluid (or liquor folliculi). The wall is formed of few layers of granulosa cells called zona granulosa resting on a basement membrane surrounded by theca folliculi. The granulosa cells also form a group of cells called cumulus oophorus surrounding the oocyte and hanging it from one side of the cavity. The first layer of these cells that immediately surrounds the primary oocyte are columnar and are called the corona radiata. The oocyte is surrounded by a thick deeply acidophilic membrane called the zona pellucida, which protects and nourishes the oocyte. You can notice also in the picture the germinal epithelium, the tunica albuginea, many primordial and primary follicles, and the stroma with its fibroblast-like stromal cells.

When asked about identifying features of a section in the ovary, you can answer: germinal epithelium, tunica albuginea, cortex, medulla, ovarian follicles (primordial, primary, secondary, and Graafian), stromal cells, also the fate of the ovarian follicles (corpus luteum, atretic follicles, corpus albicans).



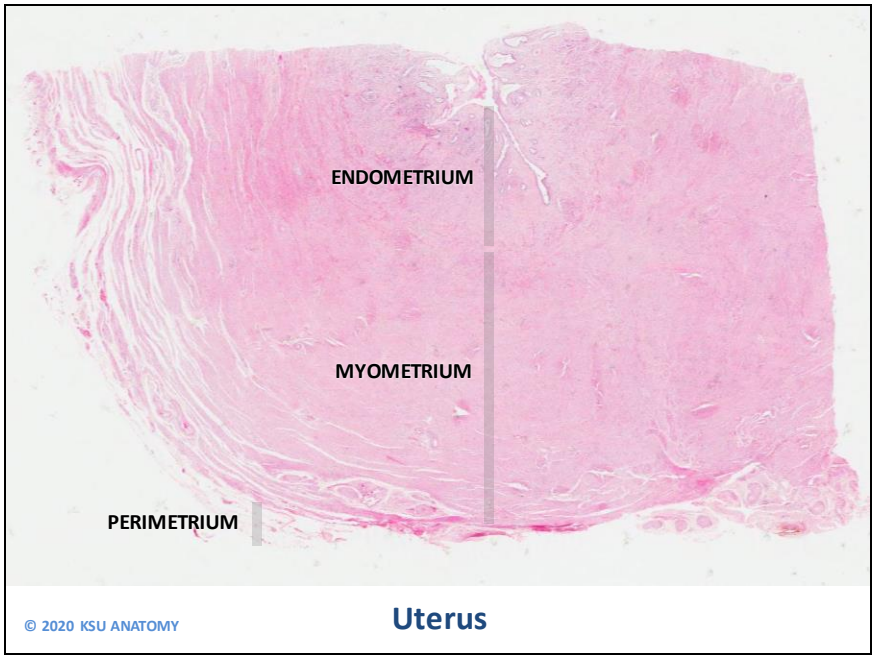
This is a section in the Fallopian tube (also called the oviduct). It's formed of three layers; Mucosa, Musculosa, and Serosa. The lumen is not seen as a regular central cavity, instead many irregular folds of the mucosa divided the lumen into irregular thin narrow cleft-like spaces.



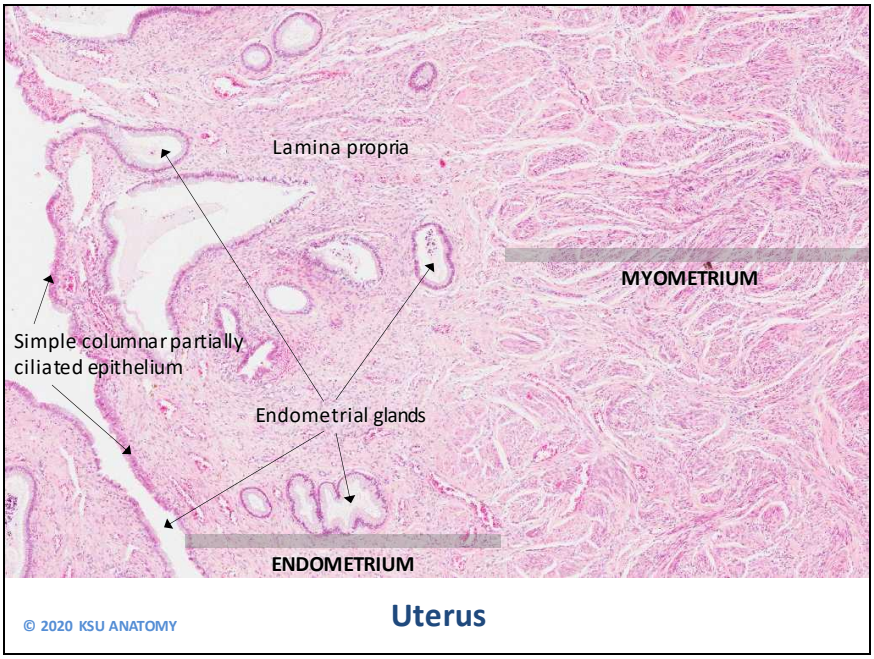
Fallopian Tube

Mucosa is highly folded and is formed of simple columnar partially ciliated epithelium (some cells are ciliated and some are non-ciliated) on a lamina propria or corium of loose CT. Musculosa is formed of inner circular and outer longitudinal layers of smooth muscle fibers, but these layers are not sharply demarcated from each other. Serosa is formed of loose CT covered by simple squamous mesothelium of the peritoneum.

When asked about identifying features of a section in the Fallopian tube, you can answer: highly folded mucosa, muscularis, serosa, simple columnar partially ciliated epithelium.

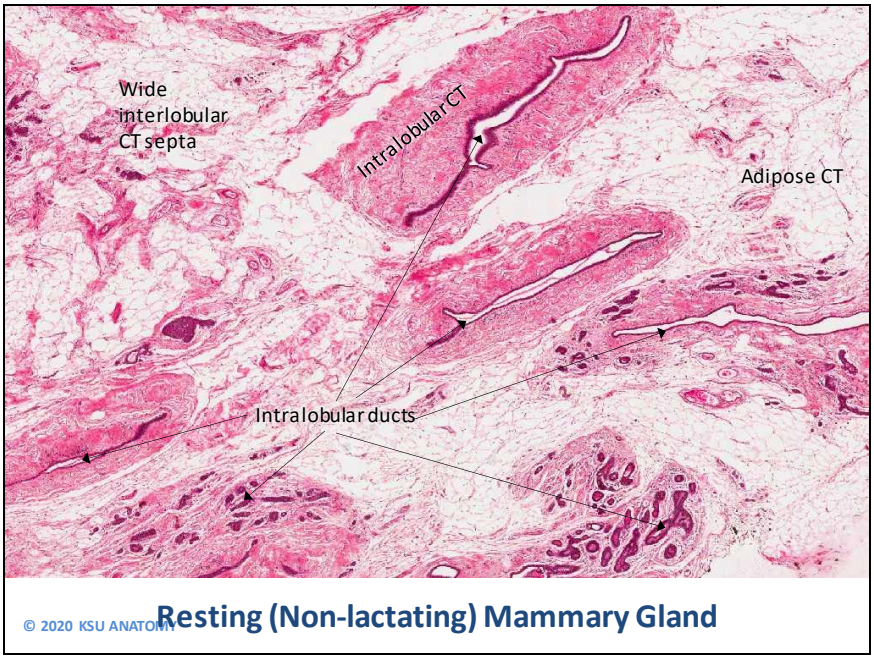


This is a section in the uterus. The uterus has a narrow flat lumen and a thick muscular wall. The wall consists of three layers: mucosa (or endometrium), musculosa (or myometrium), and an adventitia or serosa (or perimetrium).



The endometrium is lined by simple columnar partially ciliated epithelium on a lamina propria of CT containing simple branched tubular glands called uterine or endometrial glands. The myometrium forms the main thickness of the wall and is formed of three ill-defined layers of smooth muscle fibers (inner longitudinal, middle circular, and outer longitudinal; LCL but these layers are not well demarcated from each other, the middle circular is richly vascularized). The perimetrium is formed of loose CT covered by simple squamous mesothelium in parts of the uterus covered by peritoneum.

When asked about identifying features of a section in the uterus, you can answer: endometrium, myometrium, perimetrium, endometrial glands, simple columnar partially ciliated epithelium.



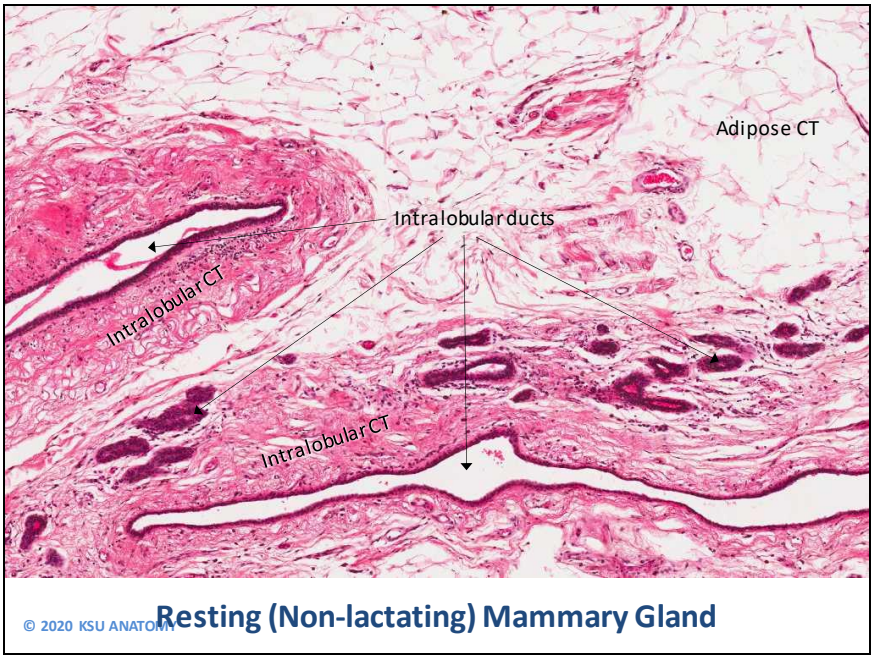
This is a section in a resting (non-lactating) mammary gland. This is the state of the mammary gland before the appearance of secretory units (or alveoli) which appear only during pregnancy and start functioning only during lactation. So the parenchyma of the resting mammary gland consists of duct system only with no secretory units. All what we can see are ducts and CT.

– The gland is divided into lobes and lobules.

– The interlobular CT septa are wide and contain numerous fat cells (we call this adipose CT).

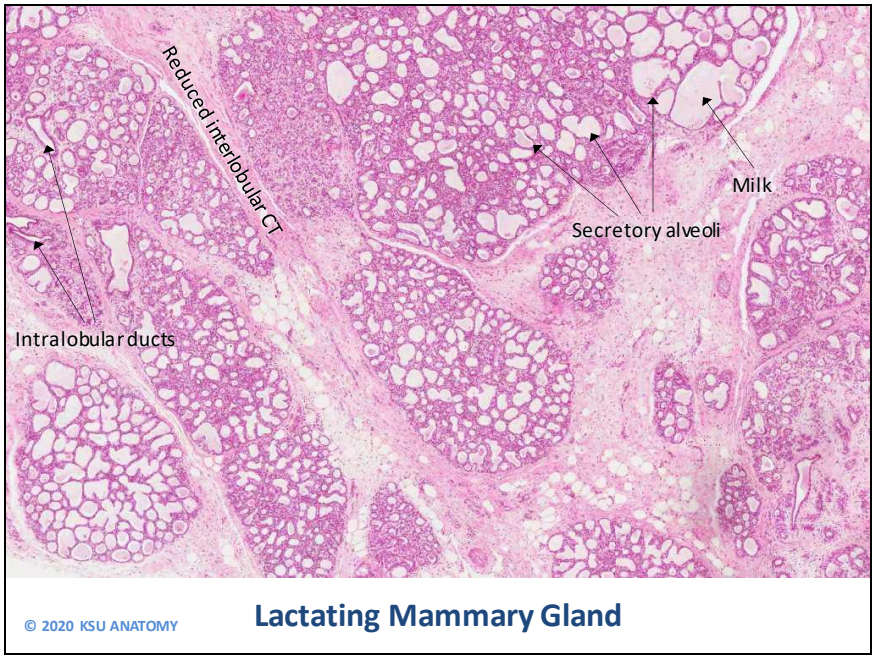
– The intralobular CT is loose, cellular, but contains no fat cells.

– Intralobular ducts are present singly or in groups, and their walls are darkly stained. Small ducts are lined by a single layer of cuboidal epithelium, while larger ducts have a double layer of cuboidal cells. They are cut in all possible planes; transverse, oblique, and longitudinal.

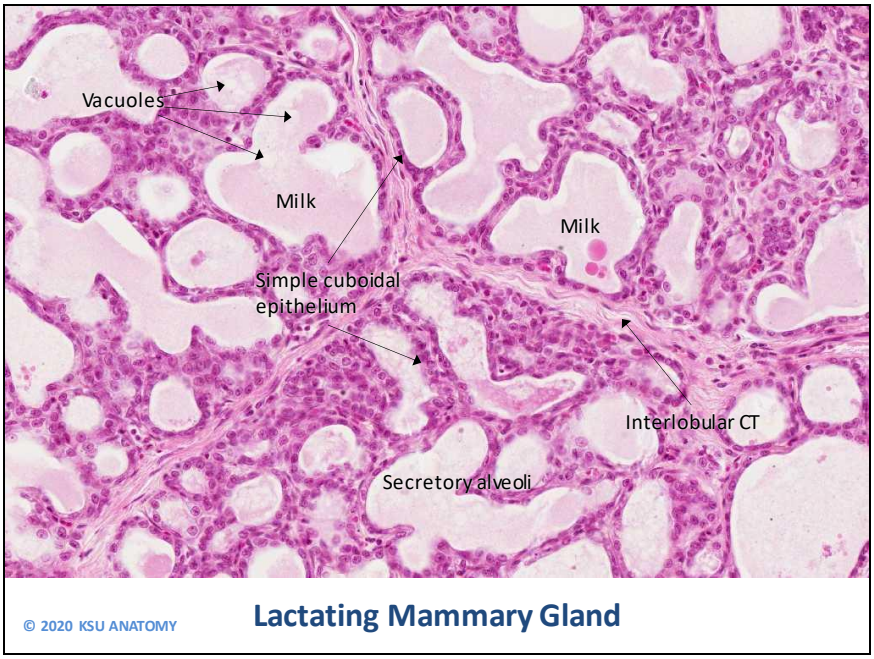


Resting (Non-lactating) Mammary Gland

Higher magnification. You can see here that the interlobular tissue is largely adipose CT and the lobules contain only ducts in loose and cellular CT.
When asked about identifying features of a section in the resting mammary gland, you can answer:
wide interlobular CT septa, adipose CT, intralobular ducts lined by a single or a double layer of cuboidal epithelium, no secretory units (no alveoli, no milk secretion).



This is a section in lactating mammary gland. The lobules are full of secretory alveoli and contain also intralobular ducts. The alveoli are mostly irregular in shape and distended with milk. The intralobular and interlobular CT are reduced.



Most of the alveoli are lined with simple cuboidal epithelium that may become flattened or even squamous when they are full of milk. The milk inside the alveoli stains red and appears vacuolated due to dissolved fat content.

When asked about identifying features of a section in lactating mammary gland, you can answer:

reduced interlobular and intralobular CT, secretory alveoli, intralobular ducts, simple cuboidal epithelium, acidophilic milk secretion with vacuoles.

Thank You

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