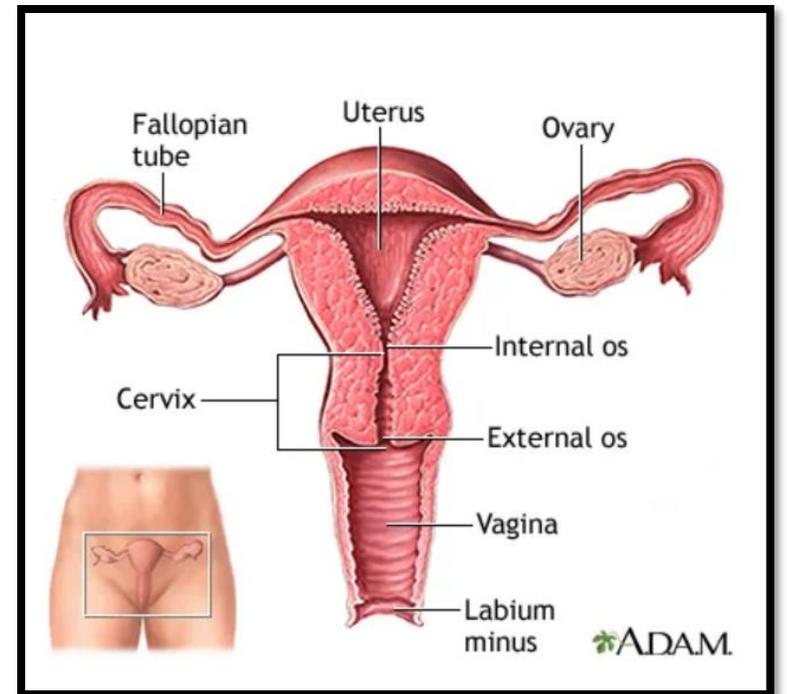


سورة التوبة

Female genital system

DR. Ola Abd El Latef



THE FEMALE GENITAL SYSTEM

This system includes:

A-Primary sex organ:

-Ovaries

B-Secondary sex organs:

-Fallopian tubes.

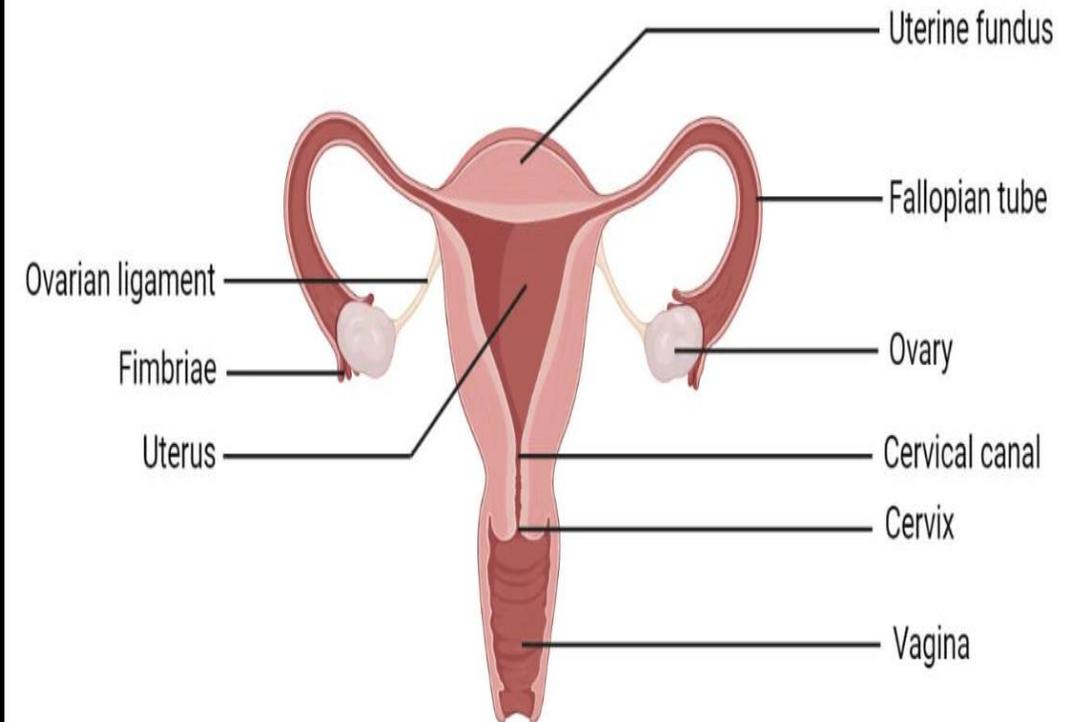
-Uterus.

-Vagina.

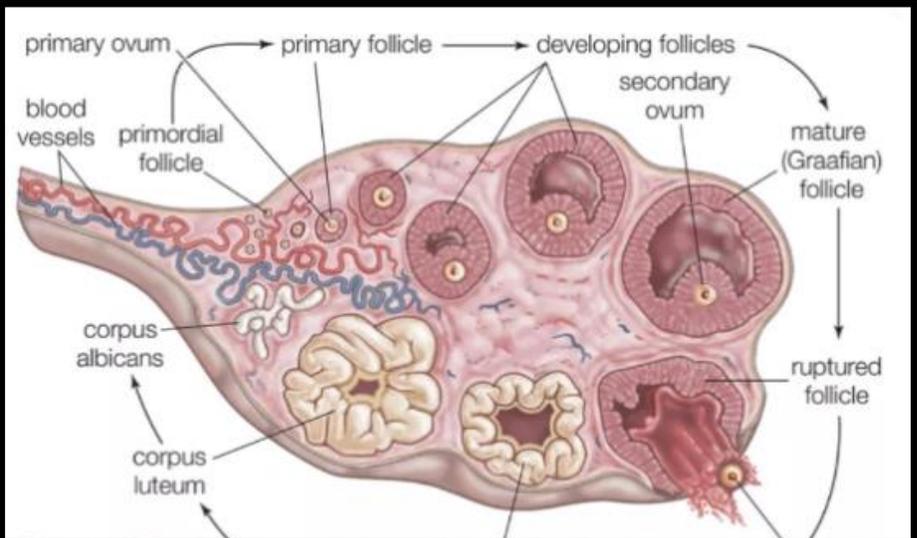
-External genitalia.

-Mammary glands.

Female Reproductive System



THE OVARY



A-Stroma:

1-Tunica albuginea.

A whitish capsule.

Formed of dense collagenous C.T.

2-Stroma cells.

These are fusiform cells with oval nuclei.

3-Reticular connective tissue.

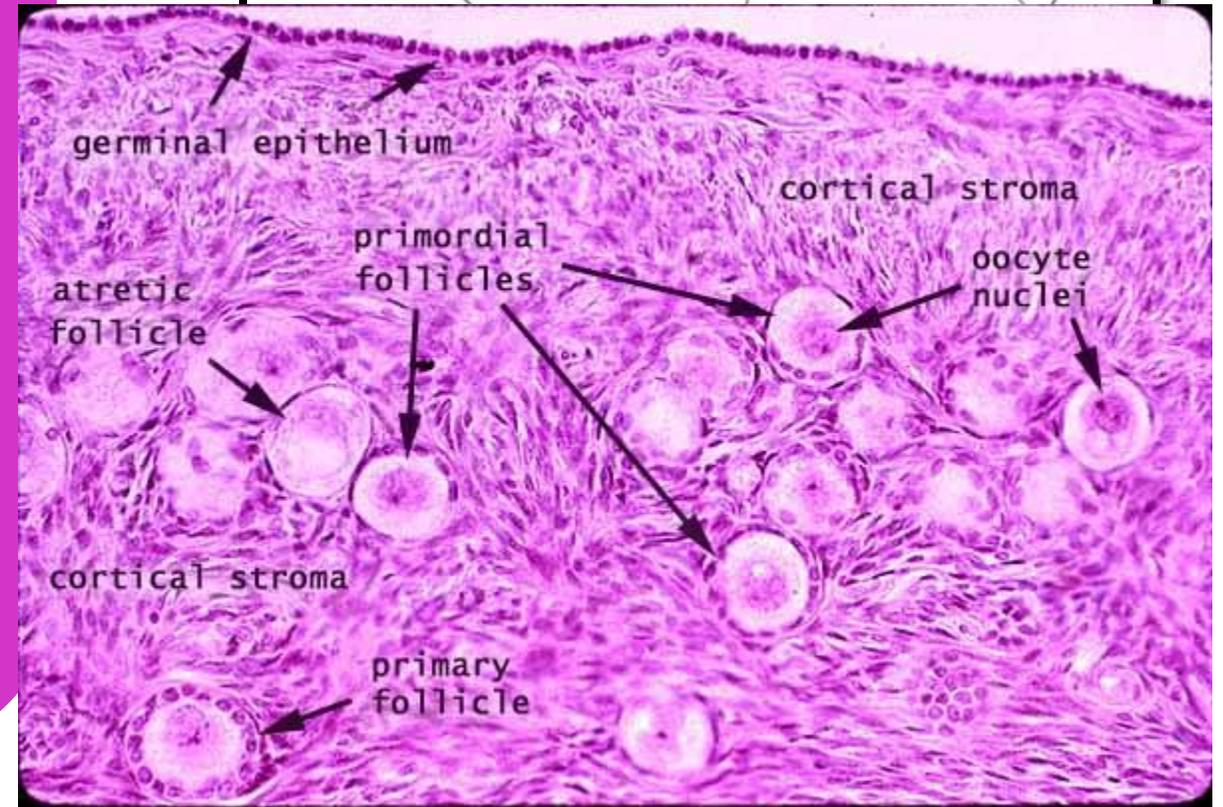
In between the follicles.

B-Parenchyma:

1-Covering epithelium

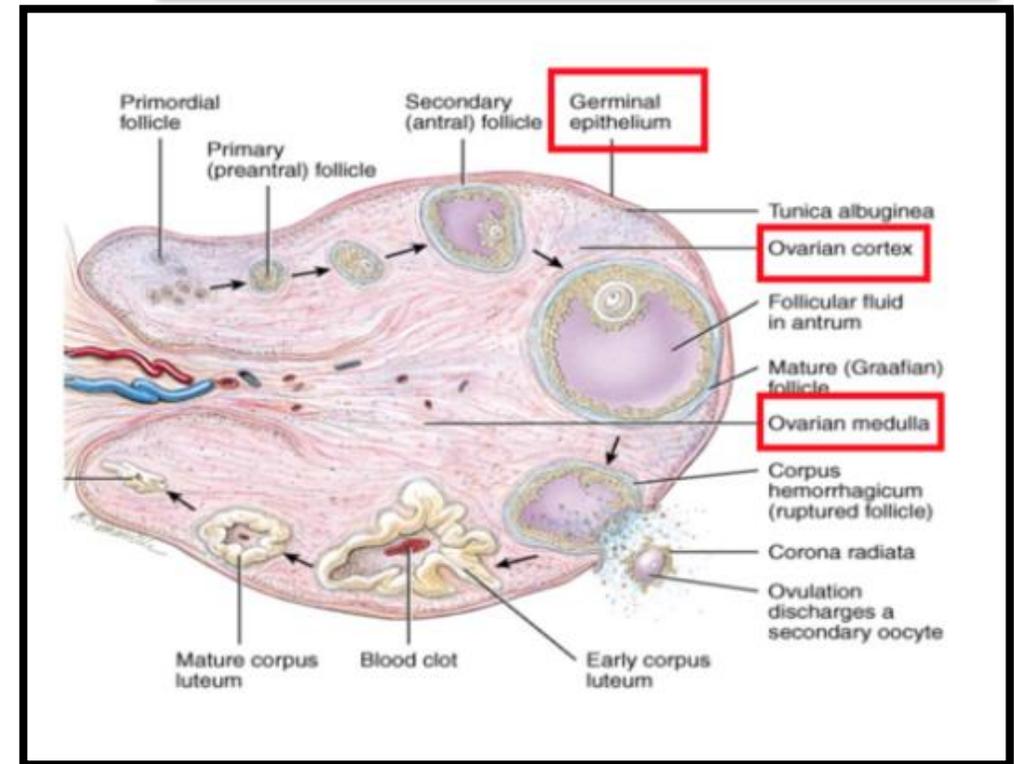
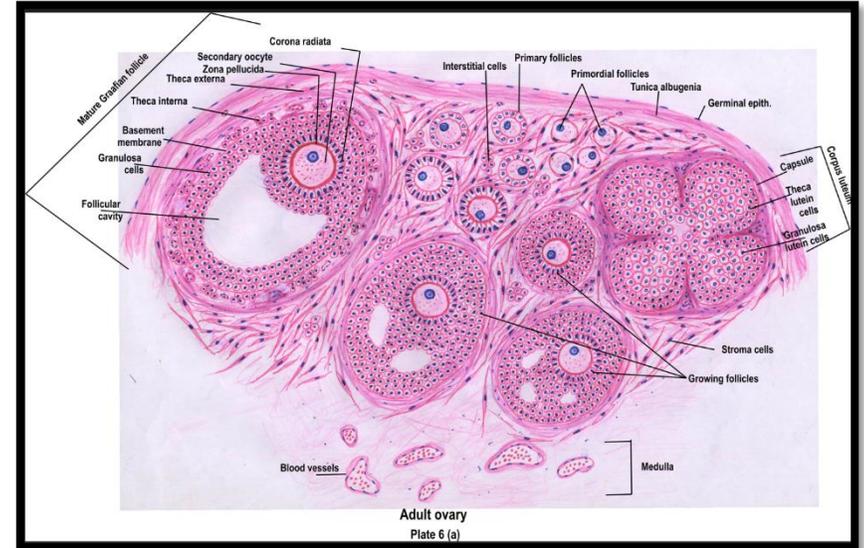
2-Cortex

3-Medulla



Covering Epithelium

- The ovary is not covered with peritoneum.
- It is covered by a single layer of epithelial cells.
- In adult, it is **simple squamous epithelium**.
- In young girls, it is **simple cubical epithelium**.



The Cortex

The cortex of the ovary consists of:

A- Ovarian follicles.

1- Primordial follicles.

2-primary follicles.

3-Growing (Secondary) follicles.

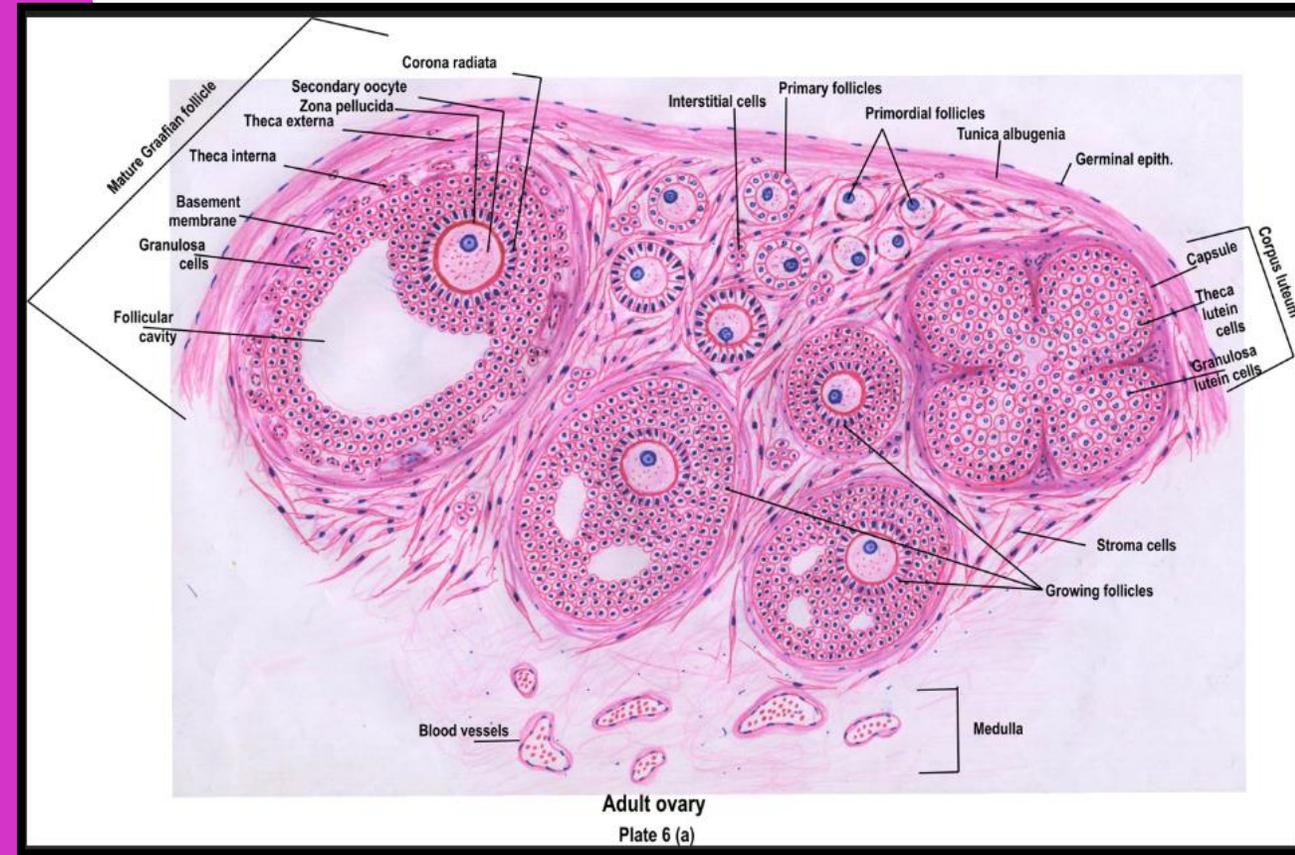
4-Mature graffian follicles.

5-Corpus Luteum

B- Interstitial gland.

- These are some cells of the theca interna of the atretic follicle.
- They are present in groups in the stroma.
- These are polygonal cells with central rounded nuclei and contain lipid droplets.

They secrete estrogen.



1-Primordial Follicles

Number: numerous and in groups.

Site: under the tunica albuginea.

Size: small.

Structure:

1- Primary oocyte:

Origin:

From **primordial germ cells** of the yolk sac.

These cells migrate to the ovaries and form the **oogonia** which enlarge in size to form primary oocytes.

Nucleus:

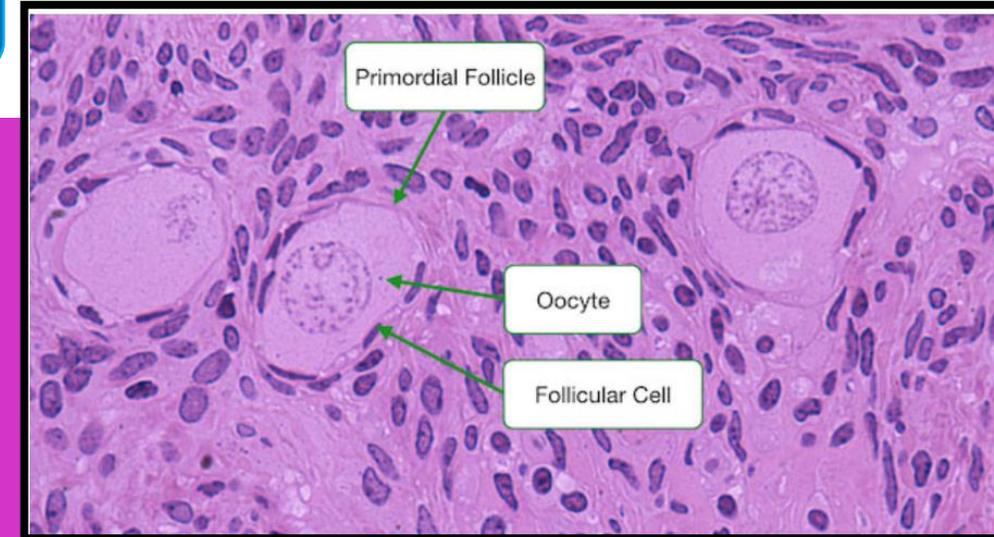
Large vesicular, rounded and eccentric.

Contains **46 d-chromosomes**.

Cytoplasm: *Pale acidophilic ,contains few yolk sac granules.*

2- Follicular cells:

These are flat cells, which form a single layer around the primary oocyte.

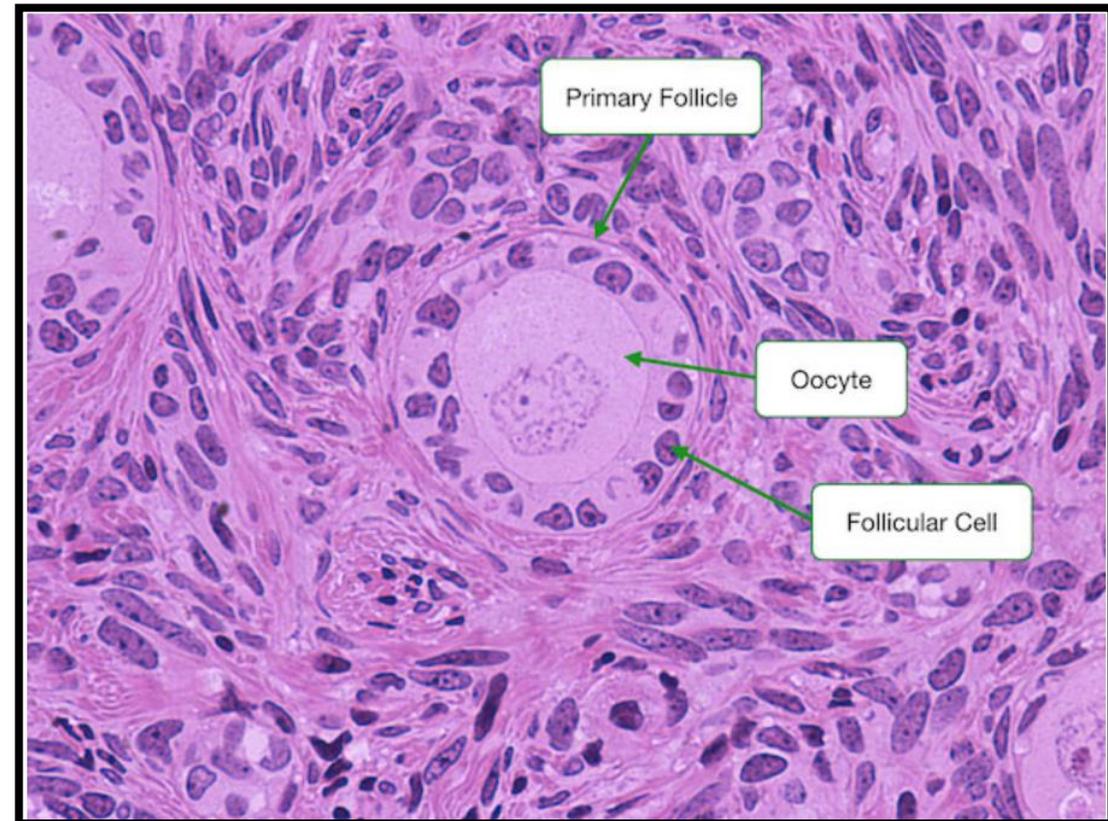




2-Primary Follicles

They are similar to the primordial follicles but:

- Primary oocytes are **larger in size**.
- Follicular cells become **cubical, then columnar**.



3-Growing (Secondary) Follicles

Site: deep in the cortex.

Size: double its size.

Structure:

1- Primary oocyte:

As described above but:

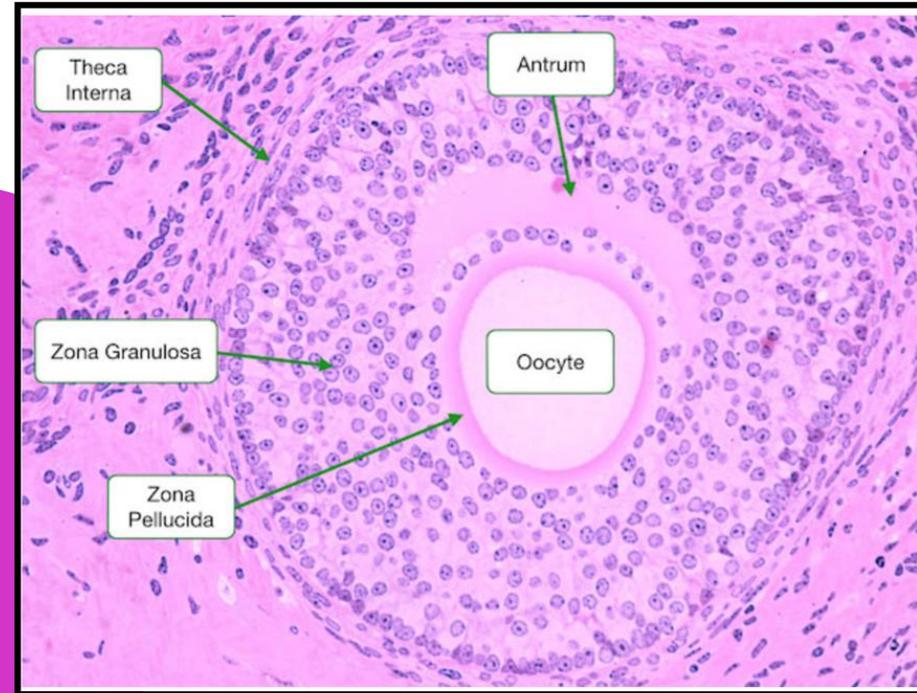
It doubles its size .

Its cytoplasm contains **more** yolk granules.

It becomes surrounded by acidophilic membrane called

(Zona pellucida)

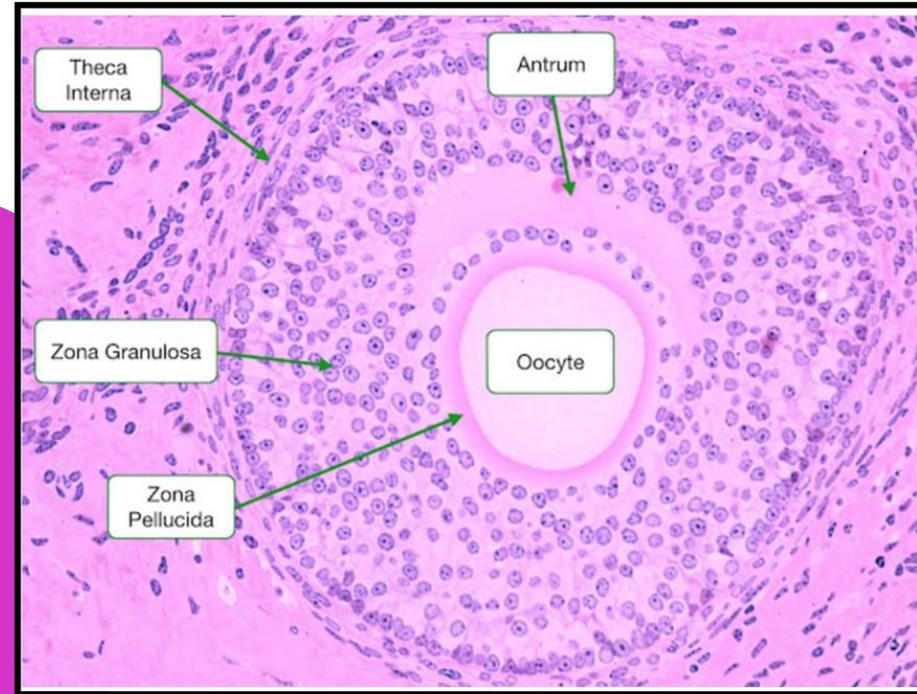
By EM its cell membrane produces microvilli into the zona pellucida.



3-Growing (Secondary) Follicles

2- Zona pellucida:

- It is an acidophilic membrane around the oocyte.
- It is glycoprotein in nature (stained with PAS).
- Produced by both the oocyte and follicular cells.
- The oocyte sends microvilli into it.
- Also, the follicular cells send processes through it to provide the oocytes with nourishment.



3-Growing (Secondary) Follicles

3- Follicular cells:

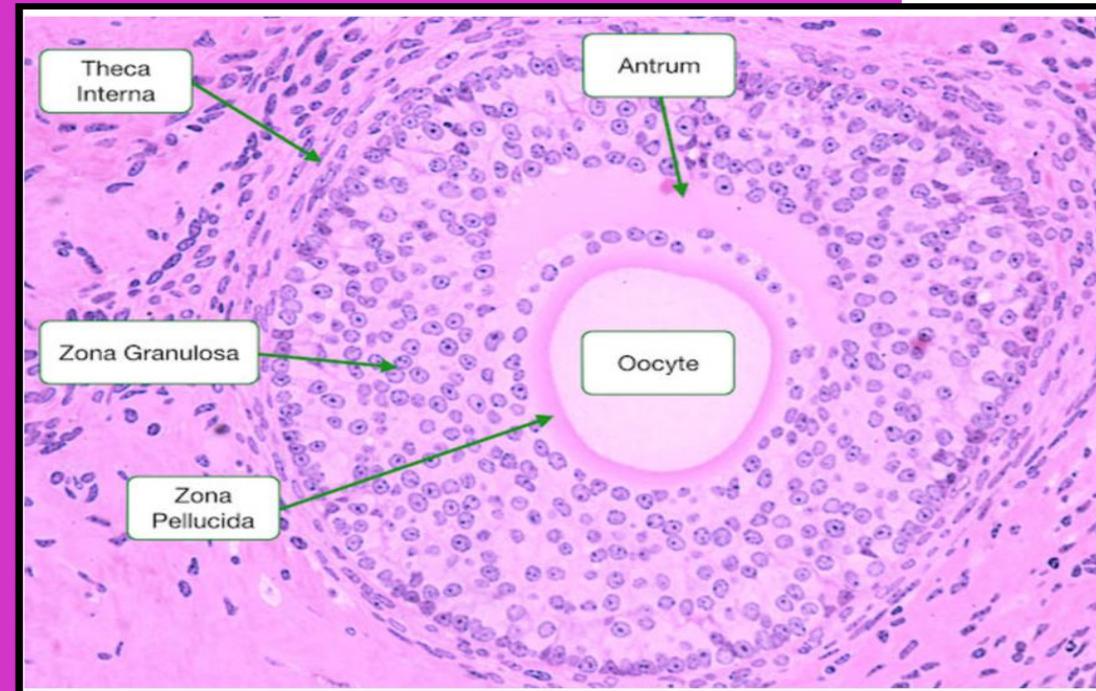
- In response to **FSH**, the follicular cells **proliferate** to form many layers.
- In response to **LH**, they begin to **secrete follicular fluid**, which accumulate in multiple spaces \longrightarrow single large cavity that pushes the oocyte to one side and divides the follicular cells into 2 groups:

a- Cumulus oophorus:

These groups of cells surround the oocyte.
They connect oocyte to one side of the follicle.

b- Granulosa cells:

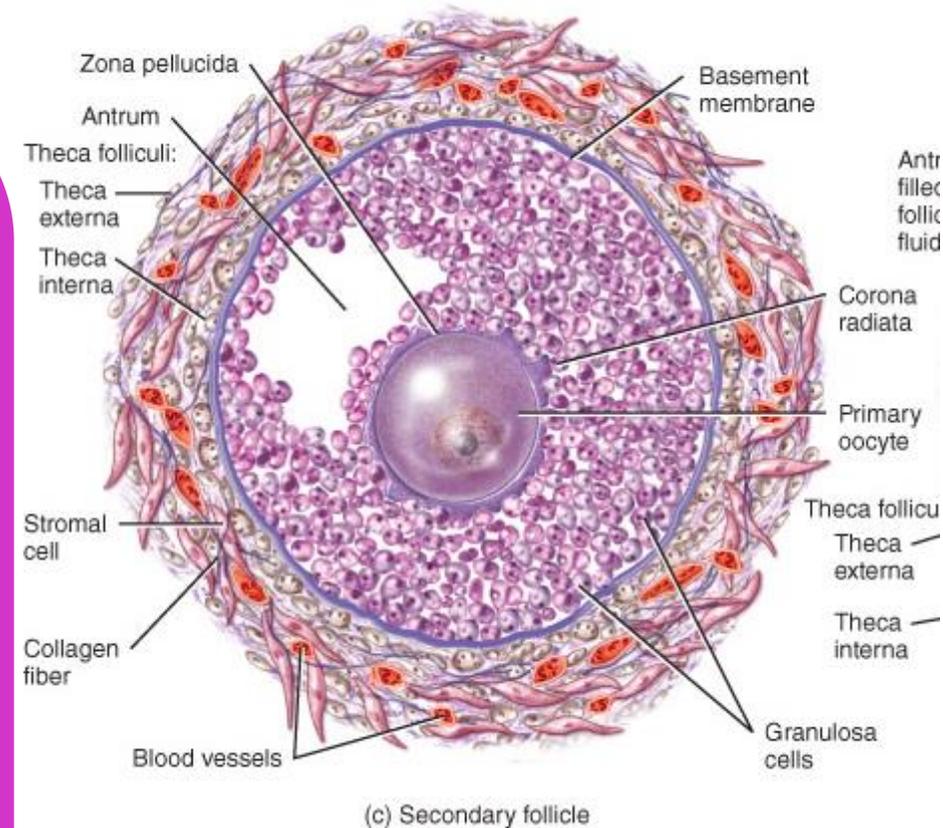
These groups of cells line the cavity.
They are polygonal in shape.
They have pale acidophilic cytoplasm.
They have central rounded nuclei.
They secrete **estrogen** hormone.



3-Growing (Secondary) Follicles

4- Theca folliculi:

- As a result of growth of the follicles, the stroma cells become condensed around them to form a capsule called theca folliculi.
- The theca later differentiate into theca **externa** and theca **interna** (see mature graafian follicle).



4-Mature Graafian Follicles

Site: bulging on the surface of the ovary.

Size: 1 cm.

Number: one every 28 days.

Structure:

1- Secondary oocyte:

Origin: first meiosis of primary oocyte.

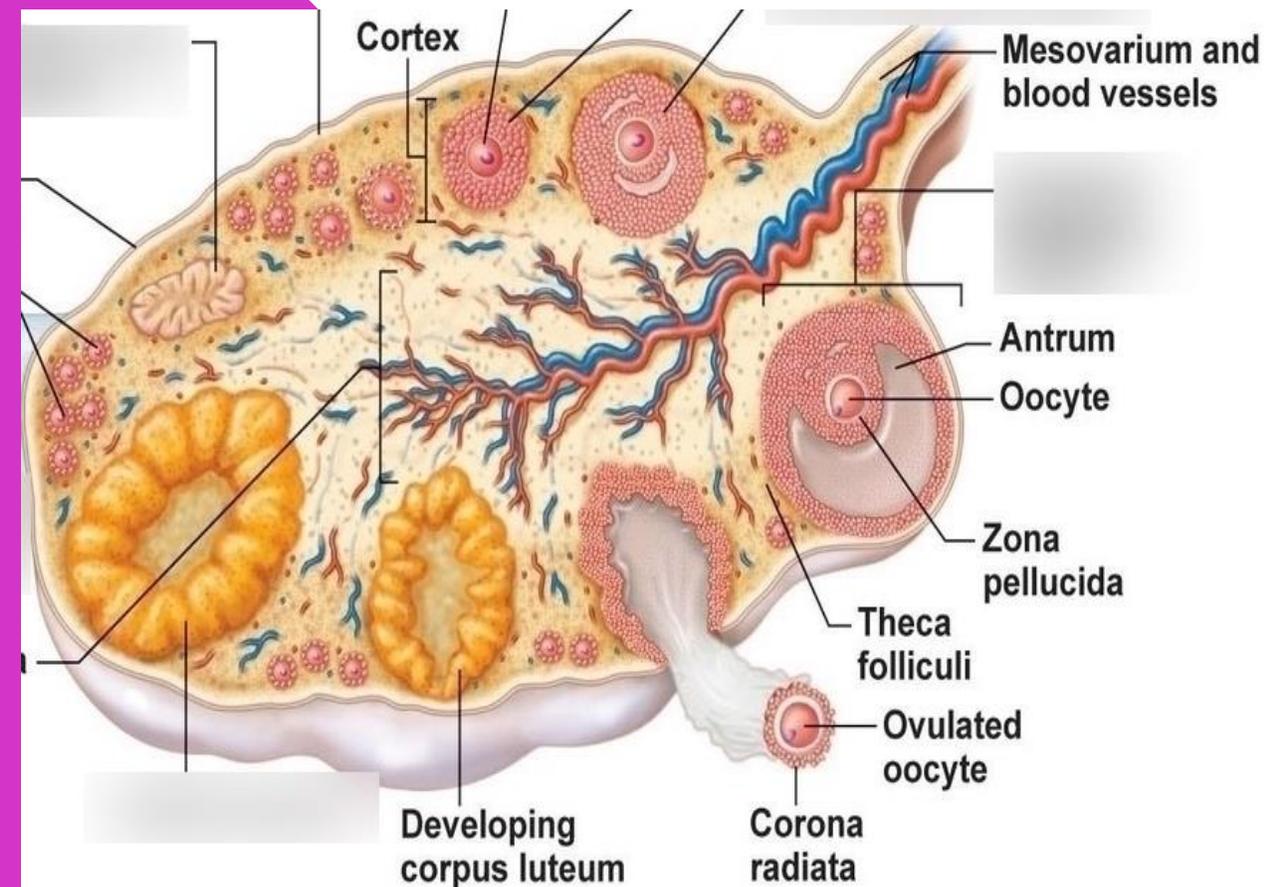
Similar to primary oocyte but:

Size: larger

Nucleus: contains 23 d-chromosomes.

Cytoplasm: full of yolk granules.

2- Zona pellucida: as before.



4-Mature Graafian Follicles

3- Follicular cells:

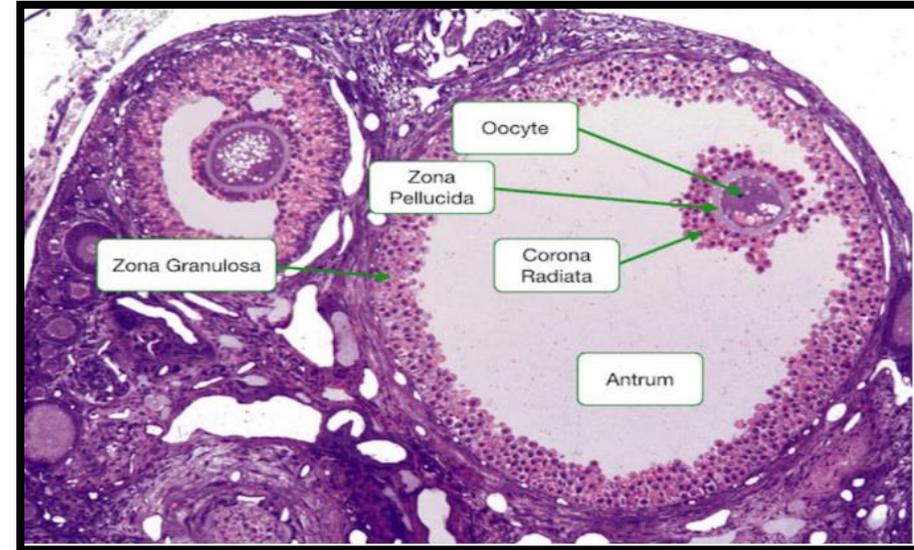
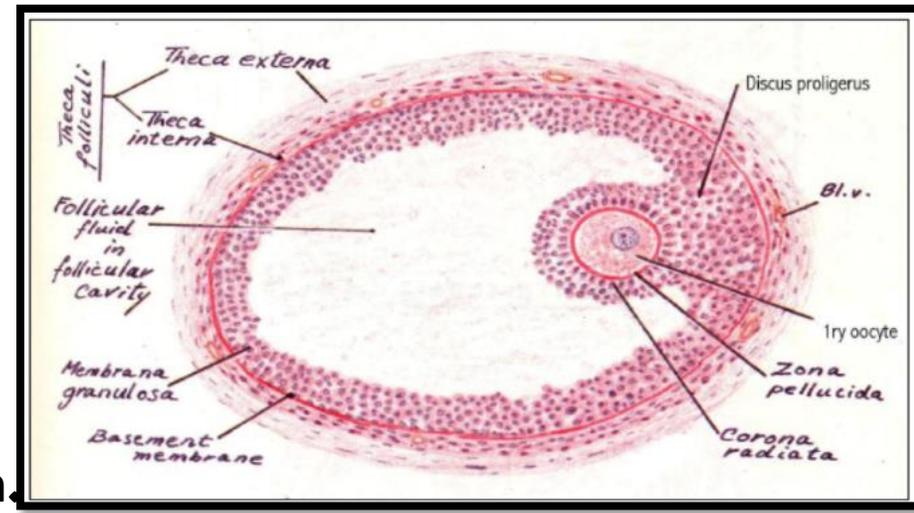
- **Granulosa cells:** see before.
- **Cumulus oophorus:** see before.
- **Corona radiata:**
 - It is a layer of columnar cells surrounding the zona pellucida.
 - They send processes into the zona pellucida to give nutrition to the oocyte.

4- Theca folliculi:

- See before.
- It is differentiated into:
 - Theca interna (vasculosa):**
It is cellular, vascular and secretes estrogen.
 - Theca externa (fibrosa):**
It is fibrous and less vascular.

Fate of mature graafian follicle:

When the follicular fluid is markedly increased, the follicle ruptures and releases its secondary oocyte on the surface of the ovary (ovulation).



Ovulation

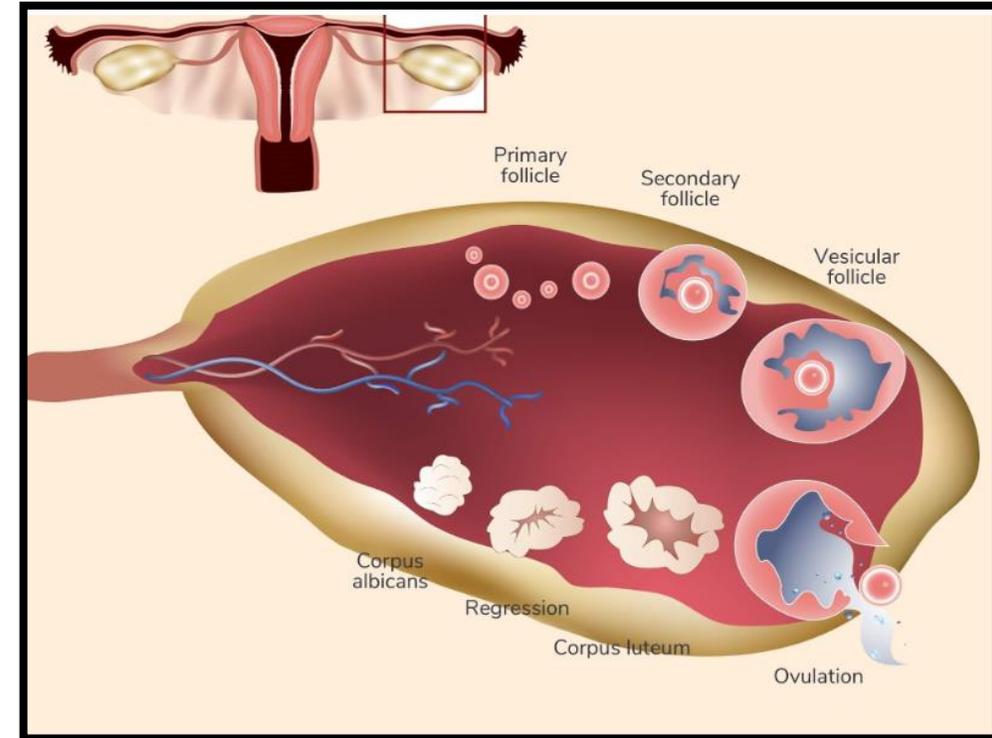
Definition: It is the rupture of a mature graafian follicle and discharge of the secondary oocyte into the peritoneal cavity.

It occurs once every 28 days.

Mechanism:

At the middle of menstrual cycle, the LH reaches its peak and stimulates the follicular cells to increase the intrafollicular fluid causing rupture of the follicle.

The oocyte is released and the remaining part of the follicle forms the corpus luteum.



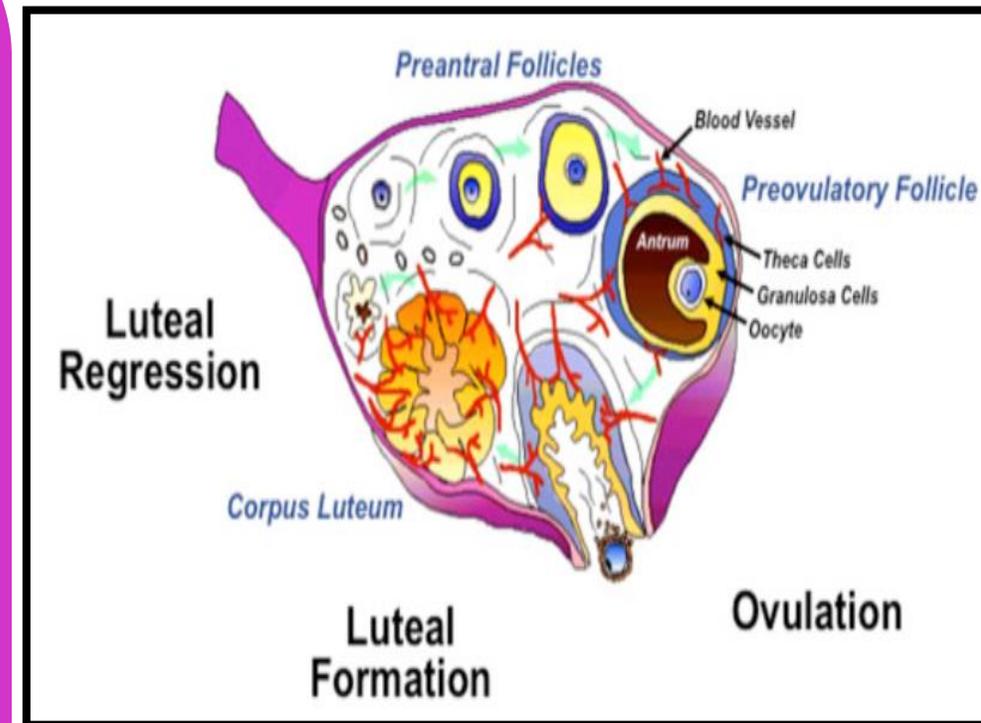
Corpus Luteum

Definition:

It is a temporary endocrine structure secreting progesterone and some estrogen.

Formation:

- Rupture of the mature follicle and release of the oocyte (ovulation) causes a sudden drop of the intra-follicular pressure.
- The wall of the follicle becomes folded and the aperture on its surface closes to form the corpus luteum.



Corpus Luteum

Structure:

1- Granulosa lutein cells:

These are the zona granulosa of follicular cells.

Shape: large polyhedral cells.

Nucleus: central, rounded and vesicular.

Cytoplasm: pale acidophilic.

Function: secrete **progesterone** hormone.

2- Theca Lutein cells:

These are the theca interna cells.

They are similar to granulosa lutein cells but:

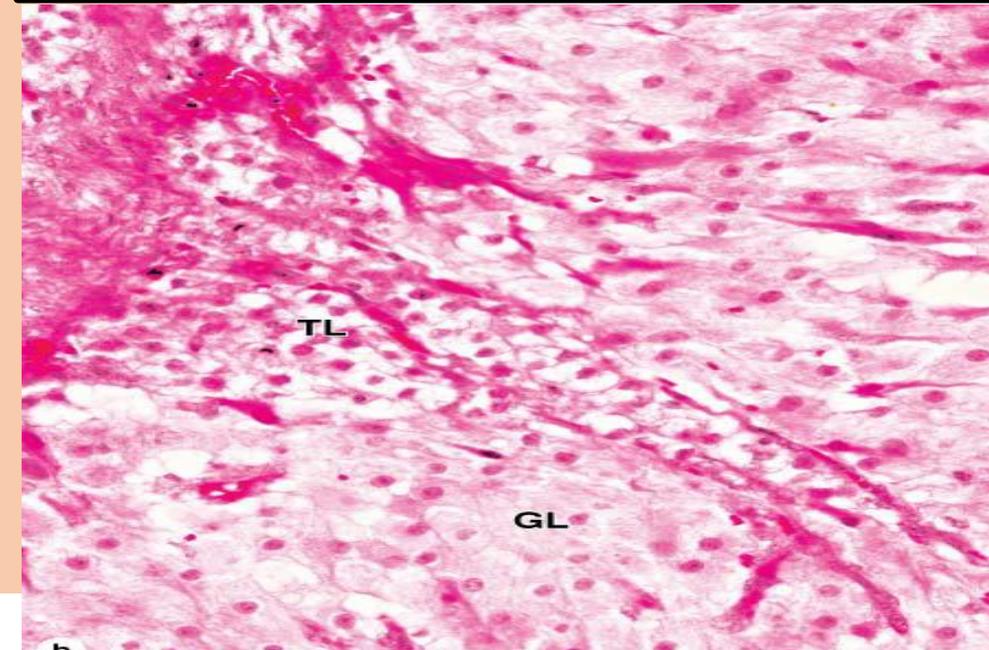
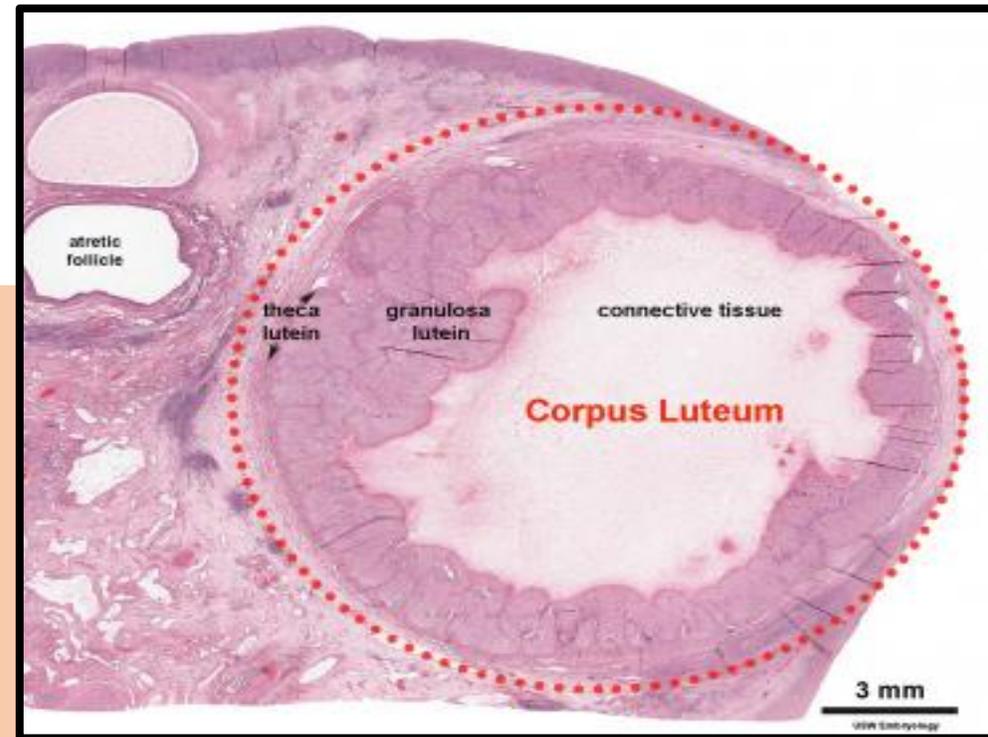
Smaller in size.

Have darkly stained nuclei.

Secrete **estrogen**.

3- Fibrous capsule:

It is the remaining part of the theca externa surrounding the corpus luteum.





Types of corpus luteum:

1-Corpus luteum of menstruation:

If fertilization does not occur, the corpus luteum is maintained for 10-12 days under effect of LH.

After this period, it starts to involute, its cells degenerate and stop secreting progesterone.

Sudden drop of progesterone causes menstruation

The corpus luteum then, changes into a white scar called “corpus albicans”.

2-Corpus luteum of pregnancy:

If fertilization occurs, the corpus luteum continues to enlarge to about 5 cm under effect of HCG.

Its secretion of progesterone maintains pregnancy till the 3rd month when its function is taken by the placenta.

After labour it involutes into “corpus albicans”.

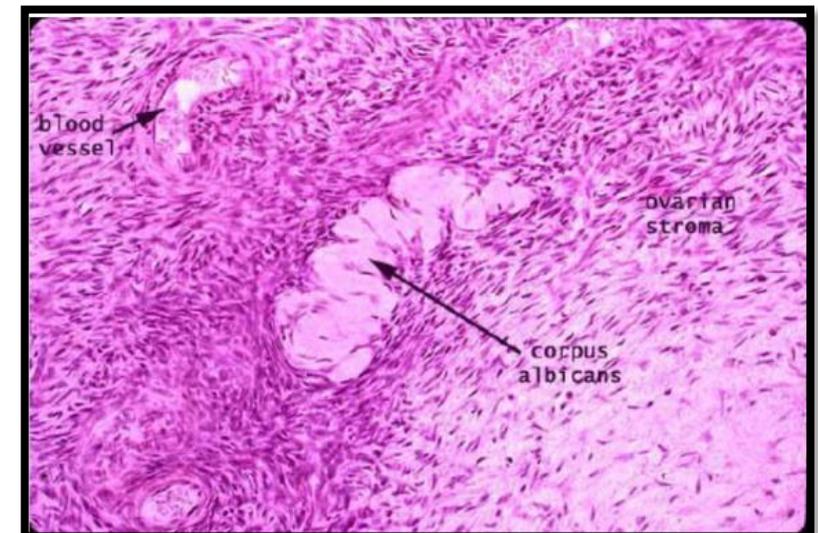
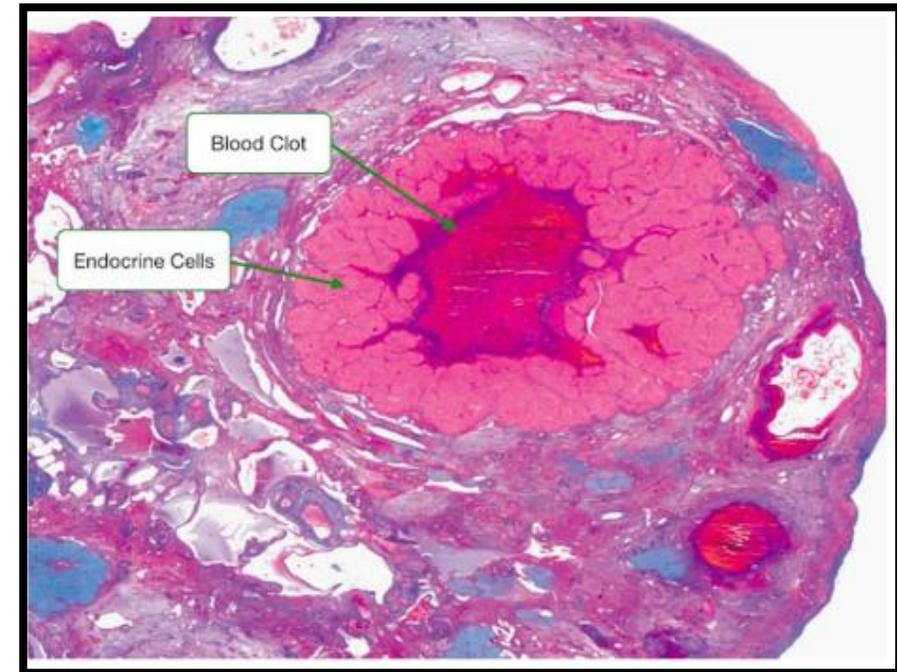
Types of corpus luteum:

3- Corpus haemorrhagicum:

- Temporary structure formed immediately after ovulation from the ovarian follicle as it collapses and is filled with blood that quickly clots
- It appears as a red spot on the surface of the ovary.

4- Corpus albicans:

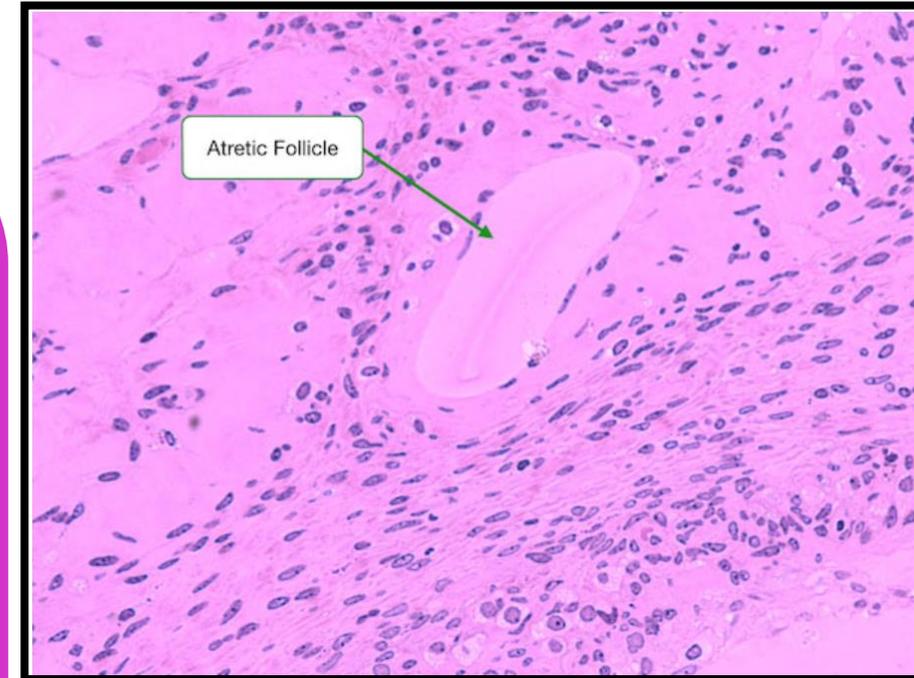
It is the involuted corpus luteum. It appears as a scar of dense collagenous tissue.



Types of corpus luteum:

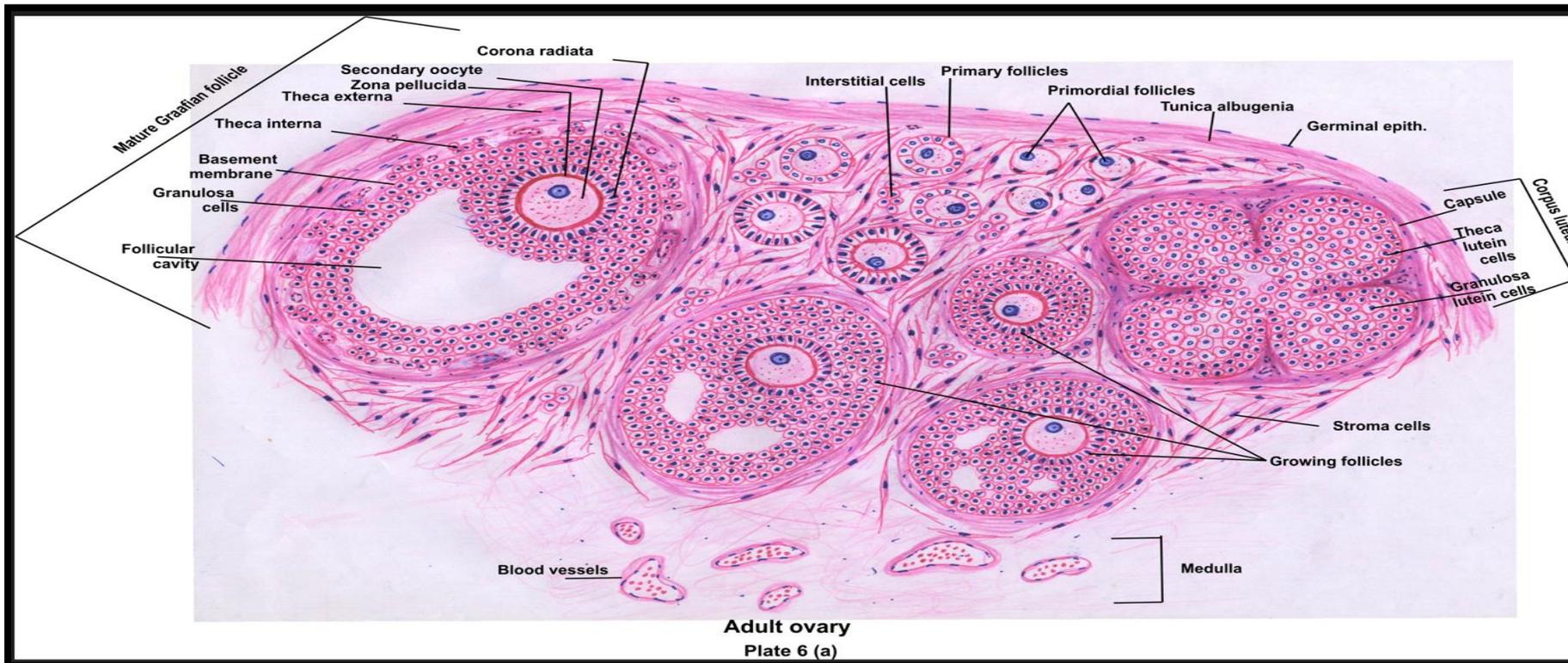
5- Corpus atreticum (atretic follicle):

- Only one of the growing follicles reaches maturity and ruptures every 28 days.
- The remaining follicles degenerate and are replaced by a fibrous C.T (atretic follicles).



The Medulla

- It consists of highly vascular loose connective tissue.
- It contains blood vessels, nerves and lymphatics.
- It also contains elastic fibers and few sm. m. fibres



References

- **Junqueira LC, Carneiro J: Junqueira's Basic Histology. Text and Atlas, fourteenth edition, Copyright © 2016 by McGraw-Hill Education.**
- **Student medical histology book, Mansoura university.**

