Female reproductive system
Ovary

- **Capsule**
  - **Germinal Epithelium:** covered by a simple cuboidal epithelium.
  - **Tunica Albuginea:** layer of dense irregular CT that supports the epithelium.

- **Cortex:** outer region that is the site of oocyte development.
  - **Stroma:** highly cellular CT with fewer CT fibers
    - **Stromal Cells:** spindle-shaped cells.

- **Medulla:** inner region of fibroelastic CT with many large, tortuous blood vessels, lymph vessels and nerve fibers.
  - *Does not contain ovarian follicles.*
Capsule & cortex
Stroma of the cortex
Medulla
Primordial follicle

- **Primary Oocyte:** large (25 to 30 µm), round to oval cells with a vesicular nucleus.

- **Zona Pellucida:** layer of glycoproteins between the oocyte and follicular cells. It is visible a thin, *eosinophilic band* in many follicles.

- **Follicular Cells:** single layer of flattened cells that surround each oocyte.
Primary follicles
Ulilaminar vs multilaminar

- Primary oocytes surrounded by one or more layers of cuboidal-shaped granulosa cells (which develop from follicular cells).

✓ Unilaminar: primary oocytes surrounded by a single layer of follicular cells.

✓ Multilaminar: primary oocytes surrounded by multiple layers of granulosa cells.
Secondary (Antral ) follicle

- **Oocyte**: large (50 to 100 µm)

- **Zona Pellucida**: (eosinophilic).

- **Granulosa Cells**: continue to proliferate and form multiple structures:
  - **Corona Radiata**: several layers of cells immediately surrounding the oocyte.
  - **Cumulus Oophorus**: group of cells anchored to the follicle wall that contains the oocyte
  - **Stratum Granulosum**: multiple layers of cells that form the follicle wall that surrounds the antrum. *(It is avascular.)*
  - **Theca Folliculi**: stromal cells around the follicle develop into a sheath of highly vascularized connective tissue.
    - **Theca Interna**: inner cellular layer with *many blood vessels*
    - **Theca Externa**: outer more fibrous layer.

characterized by the formation an antrum (a fluid-filled space) containing an oocyte.
➢ A very large, mature follicle (25 mm or more in diameter).

➢ **Oocyte**: not visible in most sections because of the large size of mature follicles.

➢ **Stratum Granulosum**: becomes thinner as the follicle continues to grow in size. (It is avascular.)

➢ **Theca Folliculi**: becomes more organized and contains many blood vessels.

➢ **Stigma**: raised area of the ovarian surface where a mature follicle will burst through to release the ovum during ovulation.
Corpus albicans

Degradation of *corpus luteum* into a fibrous *scar* when it *ceases* to function
Fallopian tube

- **Mucosa**: thin longitudinal folds that project into the lumen.

- **Muscularis**: consists of an inner circular or spiral layer and an outer longitudinal layer.

- **Serosa**: composed of a simple cuboidal epithelium (or mesothelium) supported by a thin layer of connective tissue.
Mucusa: Simple Columnar Epithelium + Lamina Propria
consists of two types of cells
- Ciliated Cells
- Peg Cells
Fallopian tube

- **Muscularis**: consists of an inner circular or spiral layer and an outer longitudinal layer.
Fallopian tube

- **Serosa**: composed of a simple cuboidal epithelium (or mesothelium) supported by a thin layer of CT
Uterus
Uterus

- **Endometrium**
  - **Functional Layer**: upper two thirds of the mucosa
  - **Basal Layer**: lower third of the mucosa
Uterus

Mucosa

✓ Simple Columnar Epithelium:
  ✓ ciliated columnar
  ✓ non-ciliated secretory cells.

✓ Endometrial Stroma:
  underlying lamina propria is highly cellular
✓ **Uterine Glands:**
epithelium invaginates into the stroma to form simple tubular glands lined with mostly **non-ciliated secretory cells.**
Myometrium
- Inner and Outer Layers:
  mostly longitudinal bundles of smooth muscle.

- Middle Layer (or Stratum Vasculare)
  - thickest layer
  - mostly circular or spiral bundles of smooth muscle
  - with numerous blood vessels.
Perimetrium
CT covered by an outer **serous layer** or **visceral peritoneum** that is continuous with the broad ligament
Uterus - Menstrual Cycle
**Uterine Glands:**

- Surface epithelium invaginates into the stroma to form new glands.
- Simple tubular glands lined with mostly non-ciliated secretory cells.
- The glands are straight (or slightly wavy).
- Glands have narrow lumens.
- Very little secretion.
Early secretory

**Uterine Glands**
- begin secreting

✓ The glands become coiled

✓ slightly dilated lumens.
Late secretory

Uterine Glands
✓ secretory cells that begin secreting
✓ The glands become maximally coiled
✓ large, dilated lumens.
Menstrual phase

Functional layer is lost during menstruation.
Cervix

➢ **Endocervix**
  (forms the wall of the cervical canal)
  ✓ Simple Columnar Epithelium
  ✓ Numerous **Cervical Glands**

➢ **Ectocervix**
  (part of the cervix that protrudes in the vagina)
  ✓ Stratified Squamous Non-Keratinized Epithelium
  ✓ **Cervical Glands** relatively few

**Cervical Wall** composed of dense CT rich in both collagen and elastic fibers.

*Unlike the rest of the uterus, it contains **little** smooth muscle.*
Cervix

- **Endocervix**
  - Simple Columnar Epithelium

- **Ectocervix**
  - Stratified Squamous Non-Keratinized Epithelium

**Transformation Zone**
- **Mucosa**: transverse folds (or rugae)
- Stratified Squamous Non-Keratinized Epithelium and **lamina propria** (no glands)
  - **Muscularis**: An inner circular layer and a much thicker, outer longitudinal layer
  - **Adventitia**