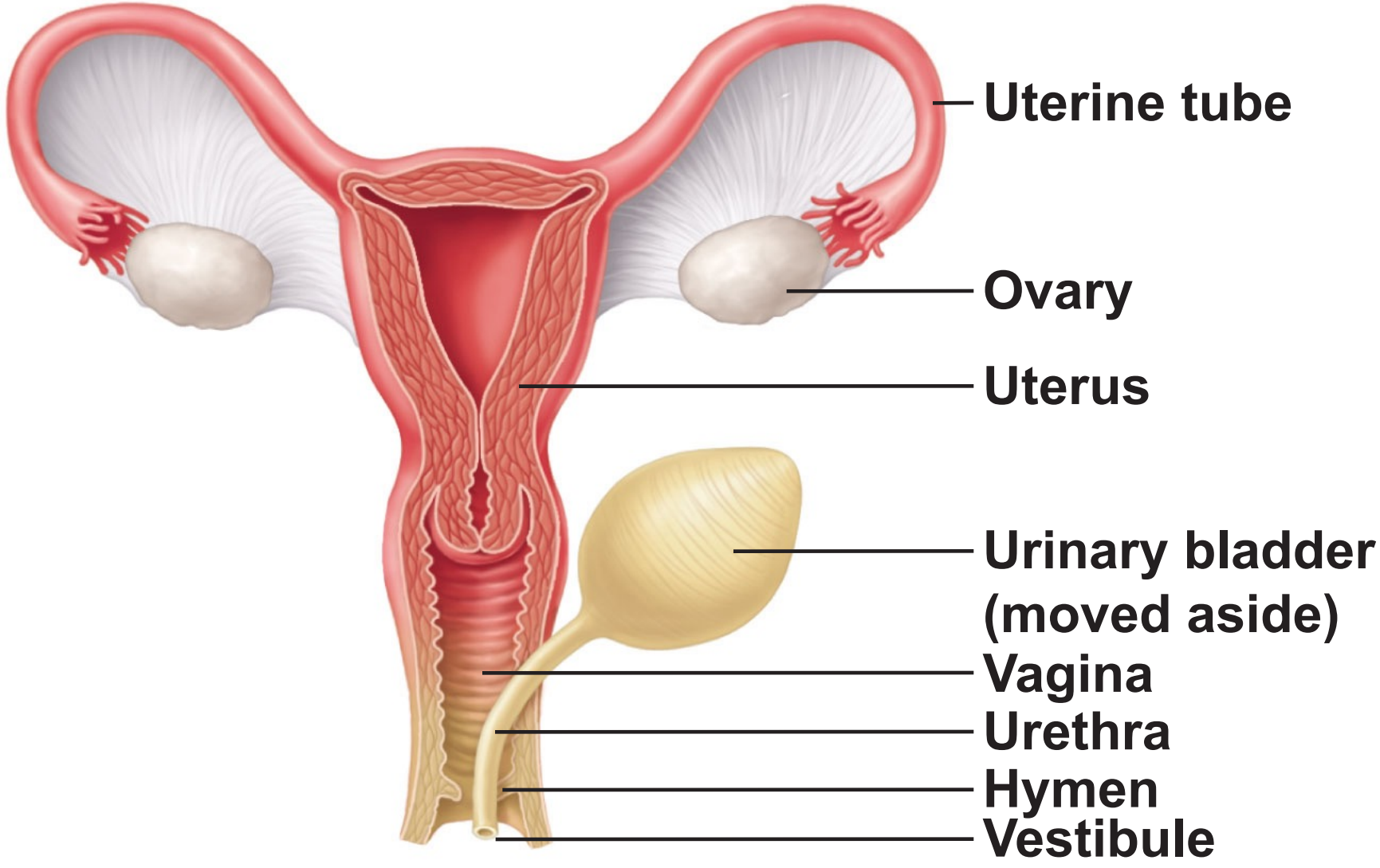
Female Reproductive Anatomy



Female Reproductive Anatomy

- **Ovaries**: **female gonads**
  - Produce female gametes (ova)
  - Secrete female sex hormones, **estrogen** (estradiol, estrone, estriol), and **progesterone**
- **Internal genitalia**: located in pelvic cavity; include **ovaries** and **duct system** (uterine tubes, uterine horns/uterus, and vagina)
- **External genitalia**: external sex organs

The structure of the uterine tubes and uterus are especially variable.

Reproductive Functions

- Production of female gametes
- Gametes transporting
- Fecundation site
- Conceptus side to nourish the fetus until parturition
- Control the reproductive cycle
- Coordinate the ovarian and uterine cycles

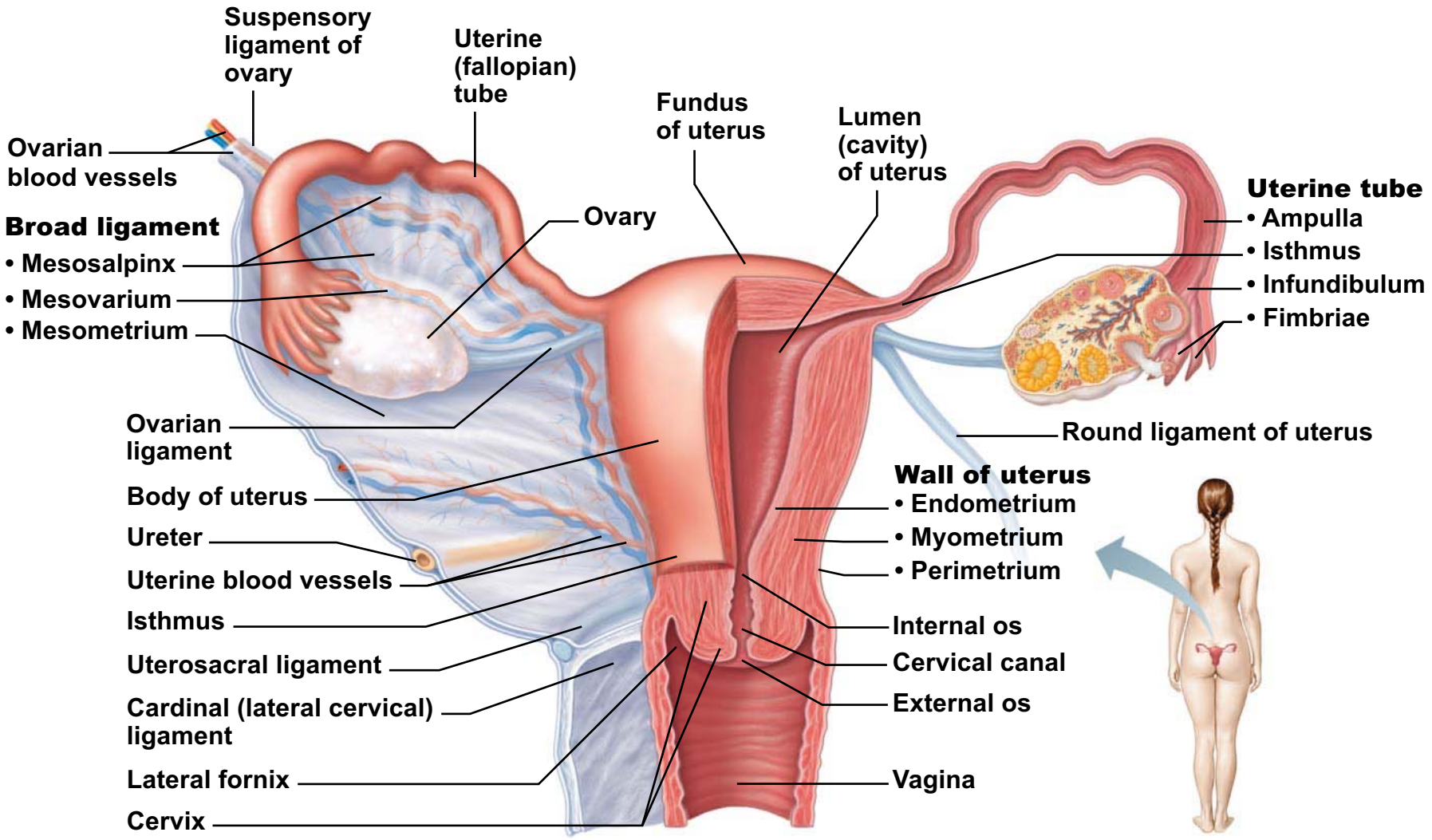
The Ovary: female gonad

Functions

- an exocrine gland, producing oocytes (gametogena function)

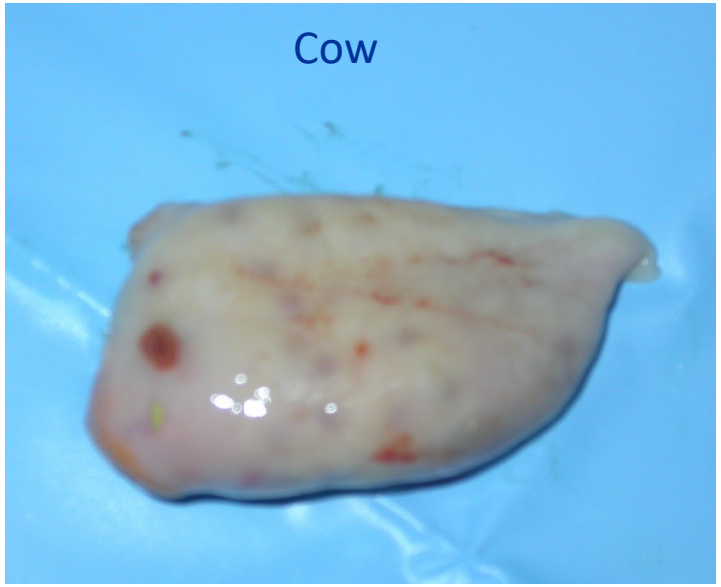
- an endocrine gland, secreting the female hormones: estrogen and progesterone (endocrine function)

Ovaries



(a) Posterior view

Ovaries



Blood supply for ovaries

Arterial Supply

•The **ovarian artery** (a branch of the Aorta) and

•ovarian branches of the uterine artery form anastomoses in the mesovarium and the broad ligament.

•From ovarian artery forms an arterial plexus ~10 coiled arteries enter the hilus of the ovary.

•Smaller branches radiate into the cortex.

•In the cortex they branch and anastomose to give rise to a rich capillary network around follicles.

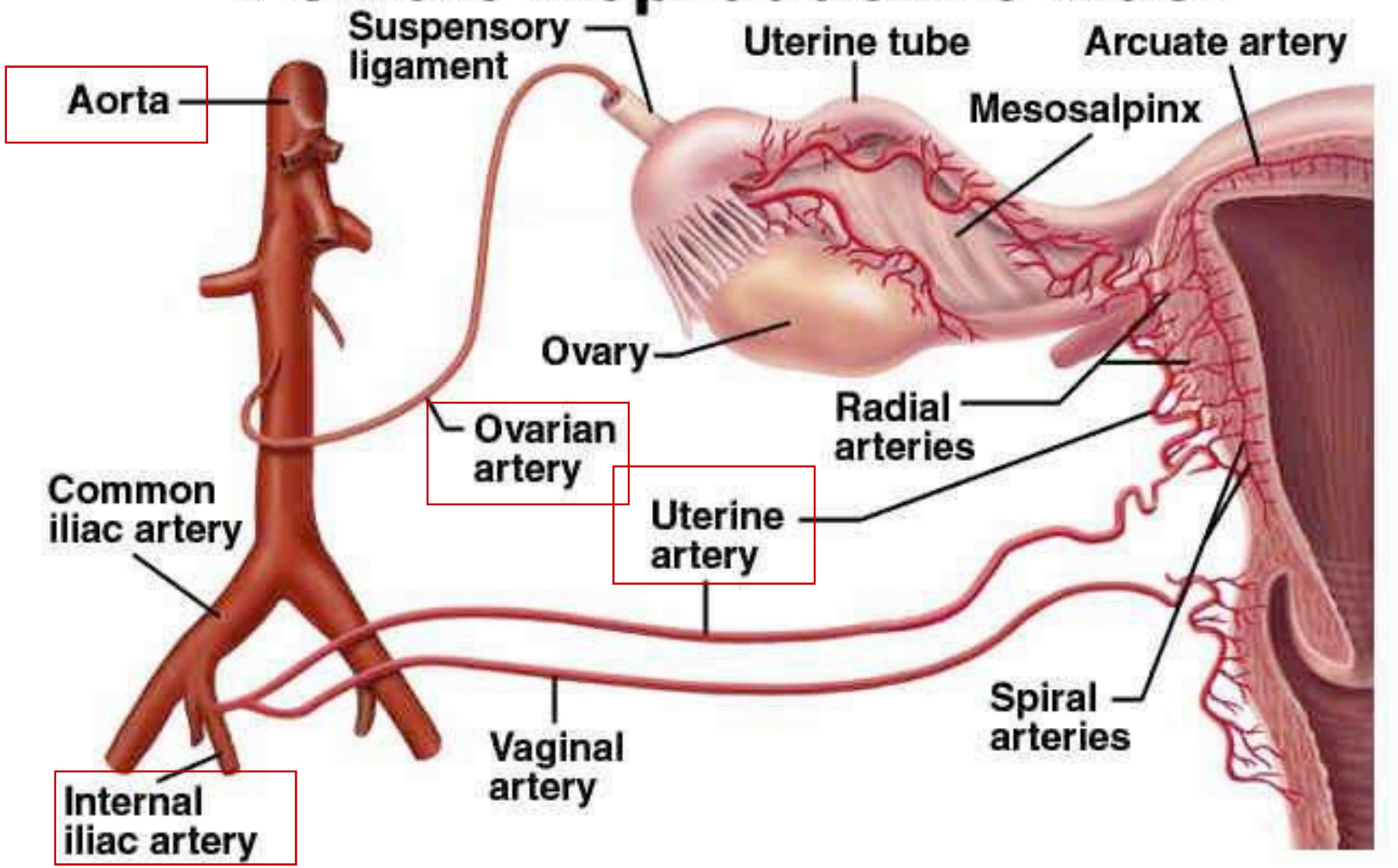
Venous Drainage

•Venous drainage follows the course of the arterial system.

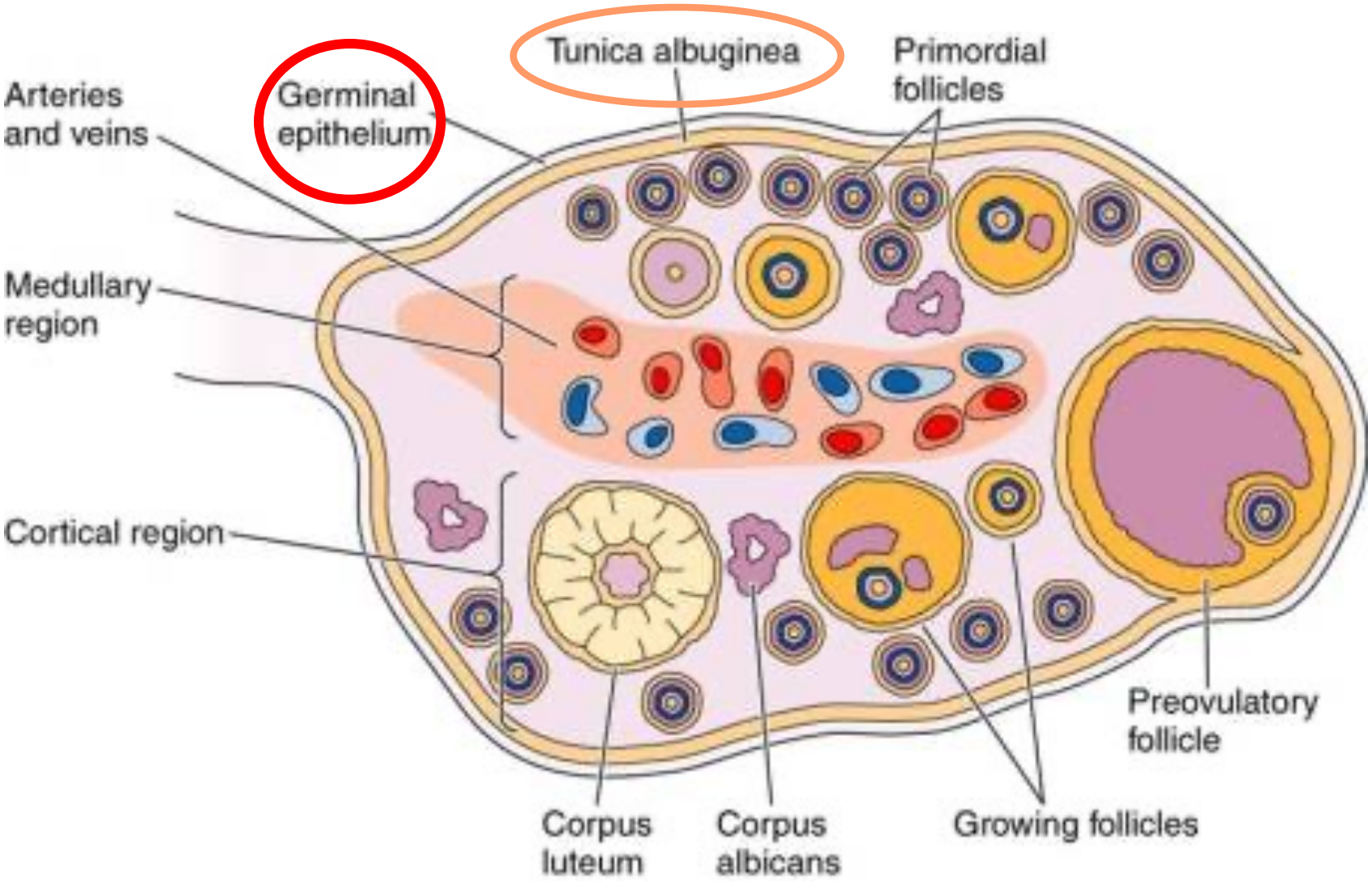
•Medullary veins are large and tortuous.

•The Ovarian Artery is closely associated with the Uterine Vein. This is important for the transfer of luteolytic PGF2α from the Uterus to the Ovary.

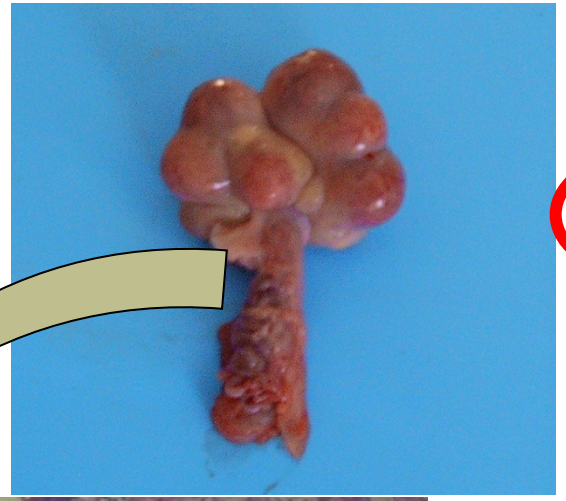
Blood Supply to Female Reproductive Tract

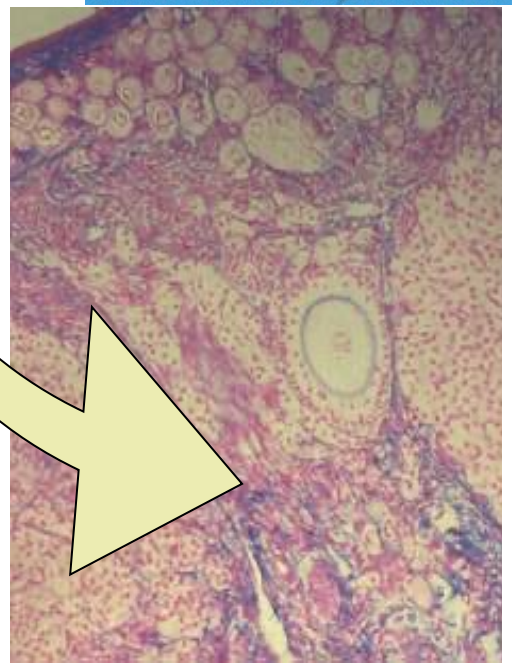


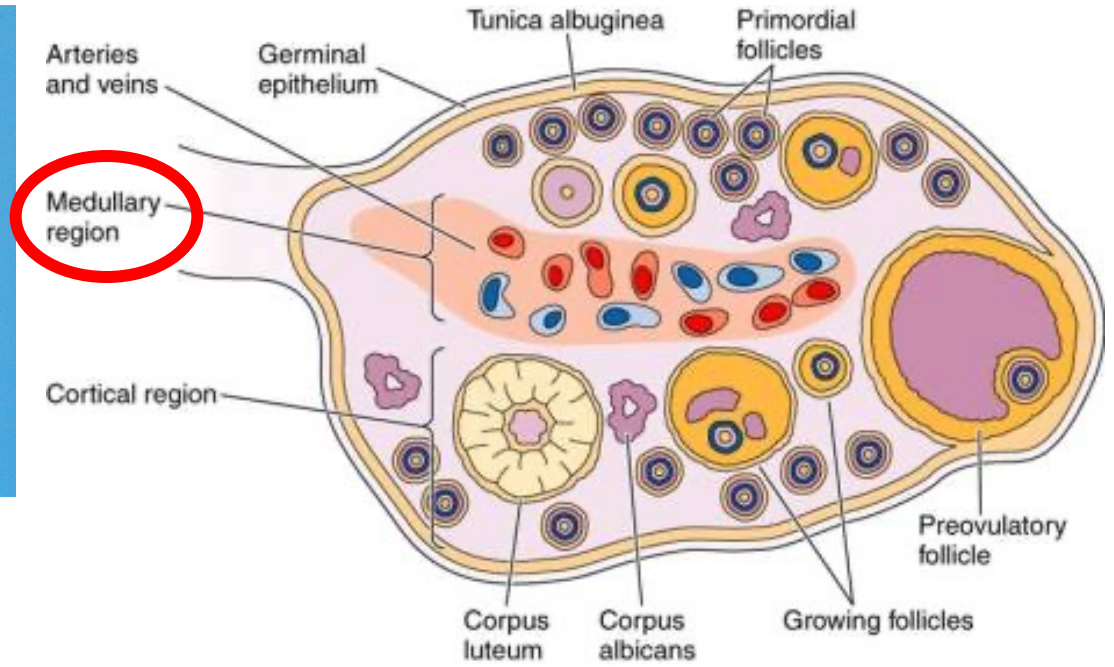
OVARY


Tunica albuginea
Primordial follicles
Arteries and veins
Germinal epithelium
Medullary region
Cortical region
Preovulatory follicle
Corpus luteum
Corpus albicans
Growing follicles

OVARY: HILUS



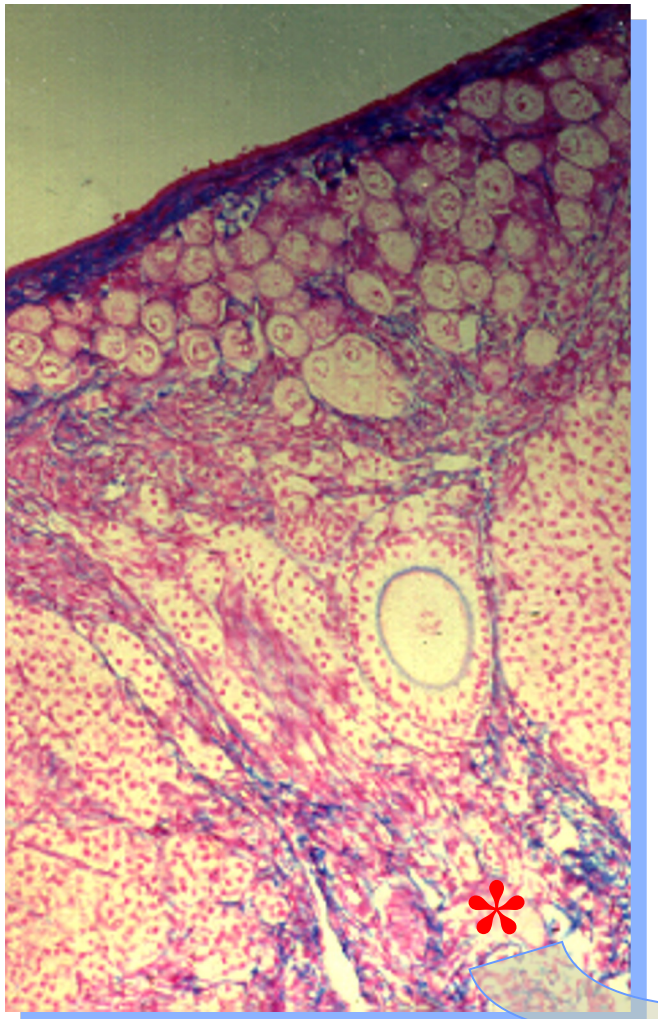




The **hilus** is the region through which blood vessels, lymphatics and nerves enter and leave the ovary. It is contiguous with and histologically similar to the medulla.

OVARY:

*MEDULLA



The **medulla** is composed of loose areolar connective tissue containing numerous elastic and reticular fibers, large blood vessels, nerves and lymphatics.

The Uterine tubes= fallopian tubes = oviducts

Function

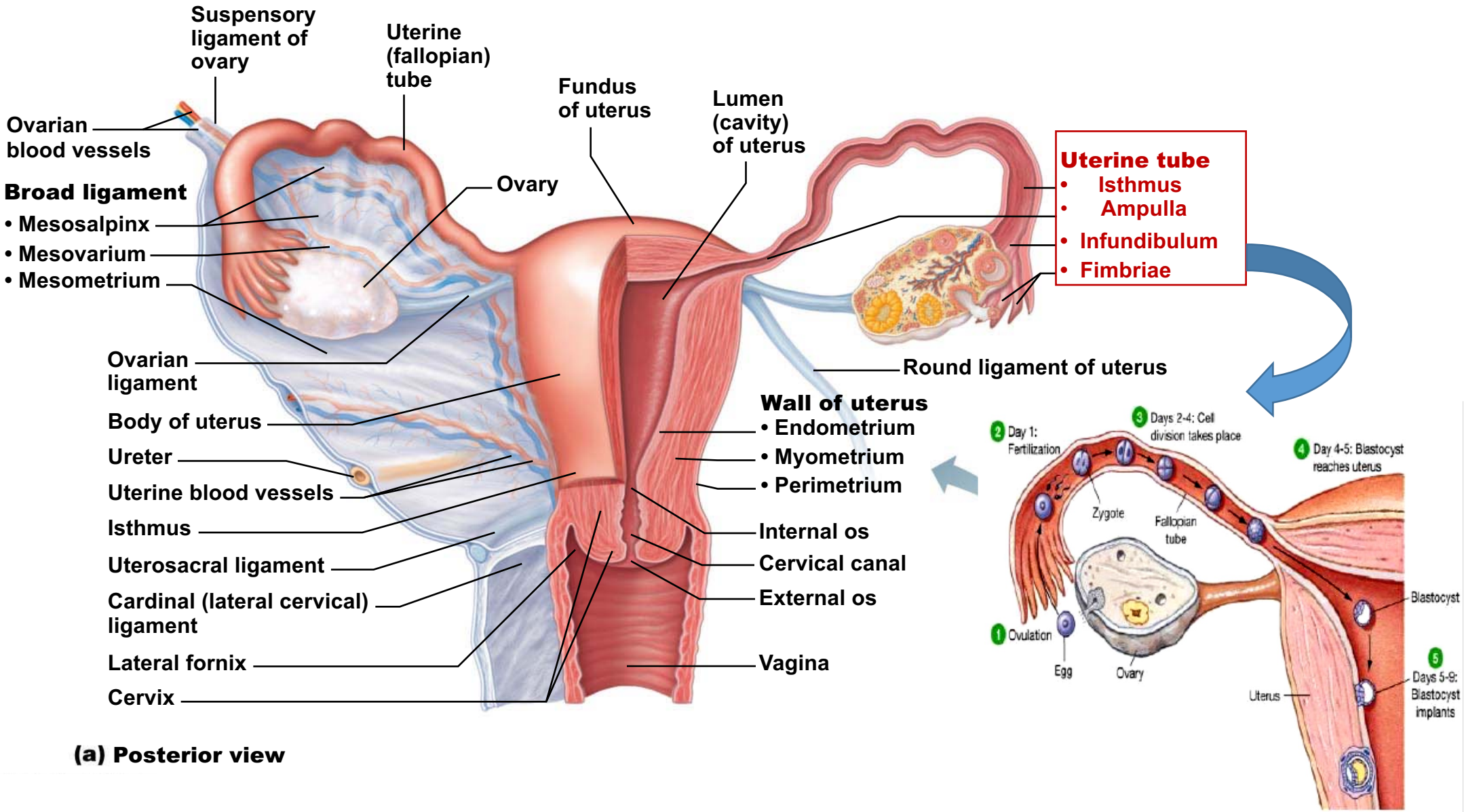
The uterine tubes (also called Fallopian tubes or oviducts):

1. transport the ovum from the ovary to the site of fertilization

2. help transport spermatozoa, the haploid male gametes, from the site of deposition to the site of fertilization

3. provide an appropriate environment for fertilization

4. transport the fertilized ovum (embryo) to the uterine horns/uterus where implantation and further development may occur.


Suspensory ligament of ovary
Uterine (fallopian) tube
Fundus of uterus
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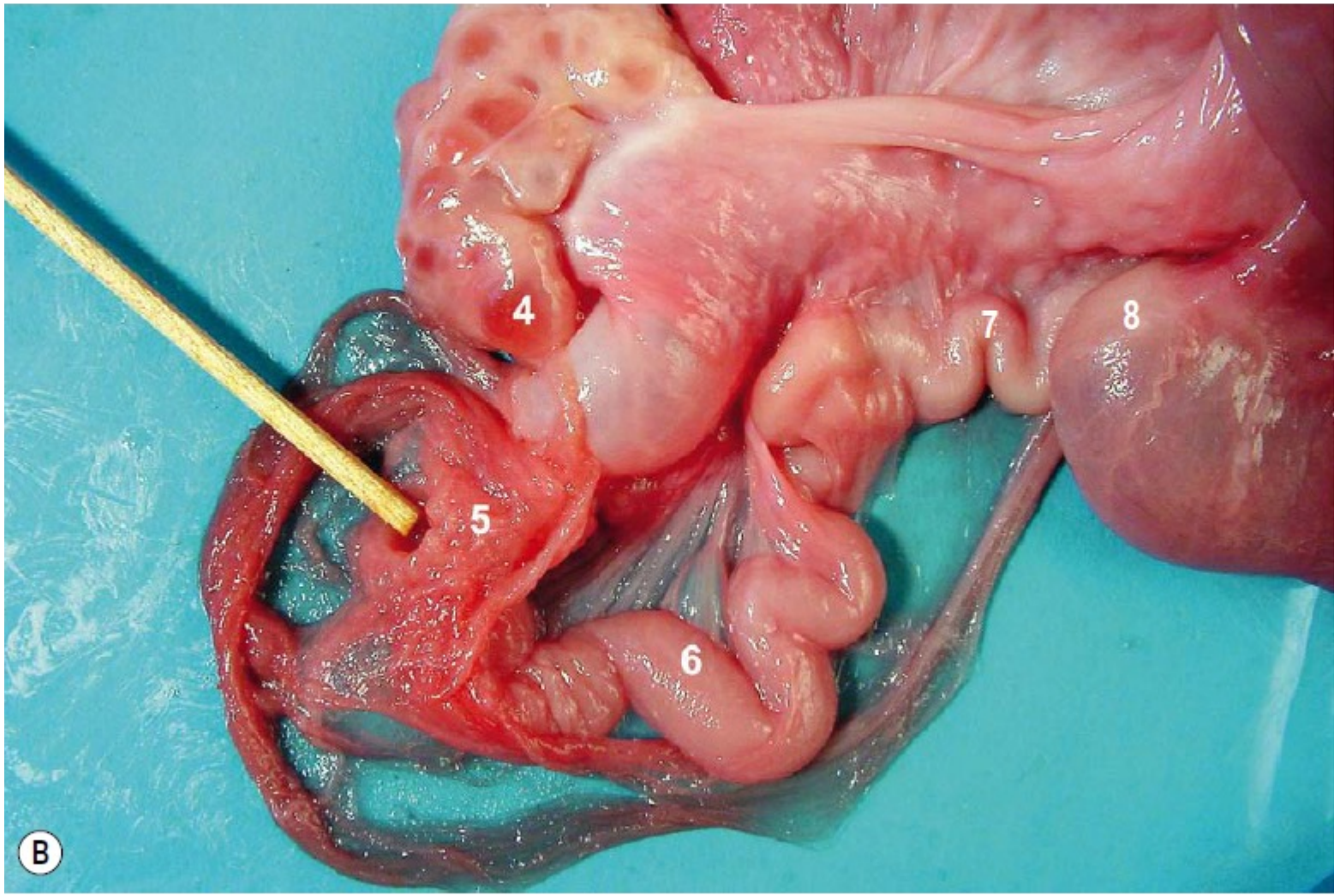
Cardinal (lateral cervical) ligament
Lateral fornix
Cervix
Wall of uterus
• Endometrium
• Myometrium
• Perimetrium
Internal os
Cervical canal
External os
Vagina
(a) Posterior view
1 Ovulation
2 Day 1: Fertilization
3 Days 2-4: Cell division takes place
4 Day 4-5: Blastocyst reaches uterus
5 Days 5-9: Blastocyst implants
Egg
Ovary
Zygote
Fallopian tube
Blastocyst
Uterus



5: Infundibulum;
6: Ampulla;
7: Isthmus;
8: Tip of uterine horn.

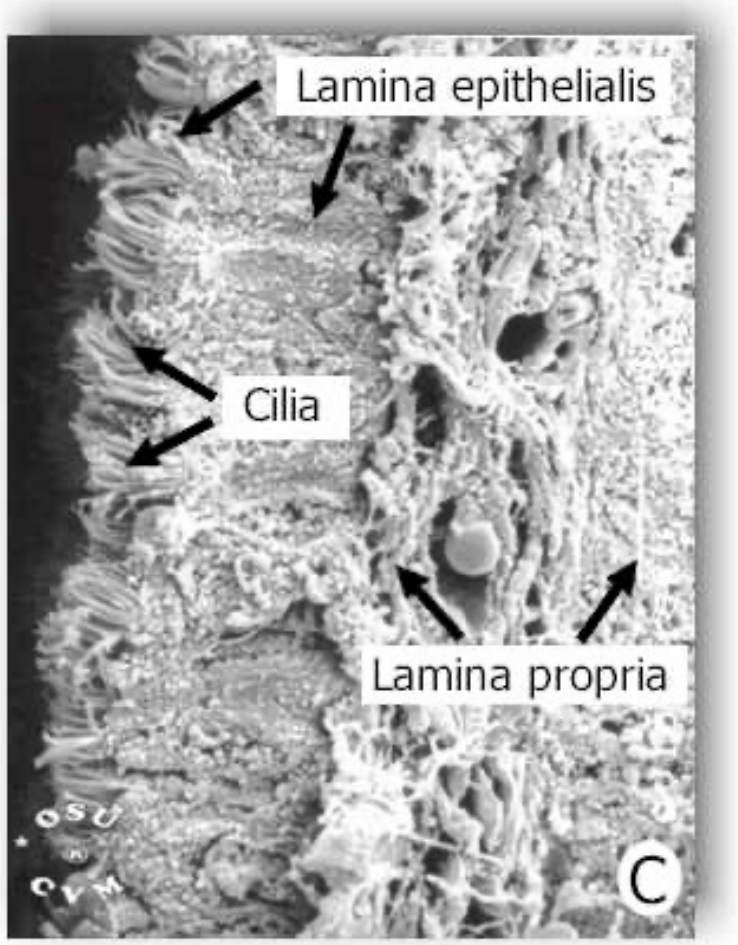
The wooden stick points to the abdominal opening of the oviduct.

TUNICA MUCOSA

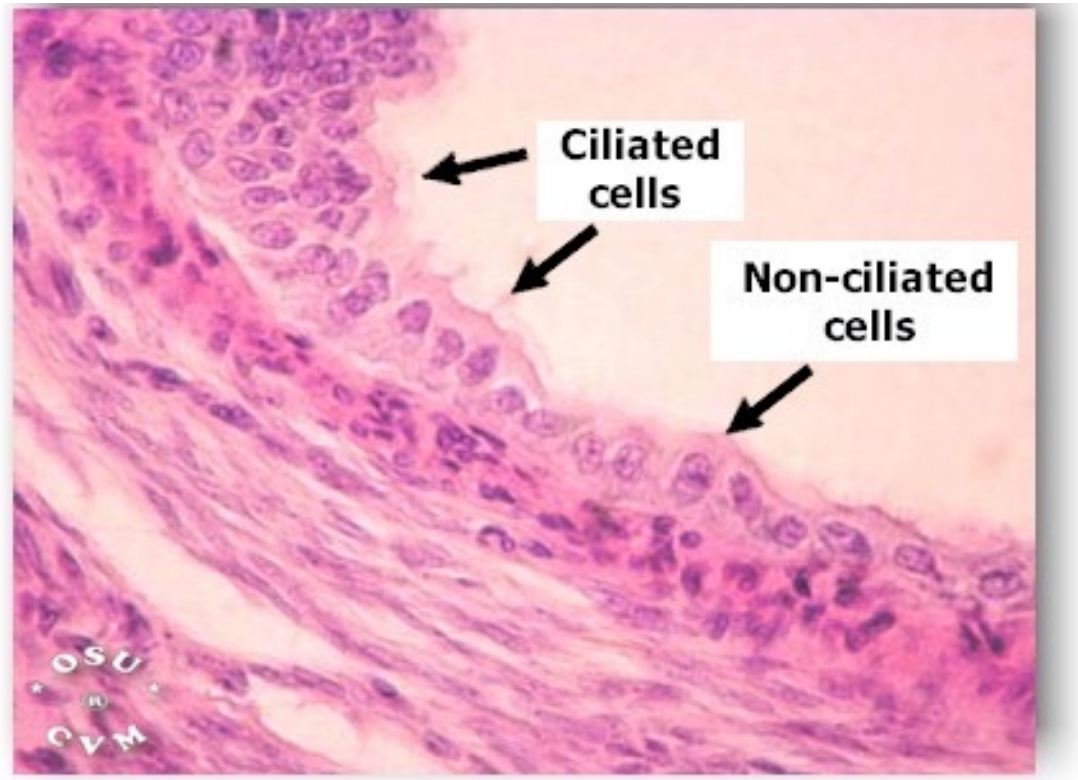
The epithelium of the tunica mucosa is **simple columnar** and contains two types of cells:

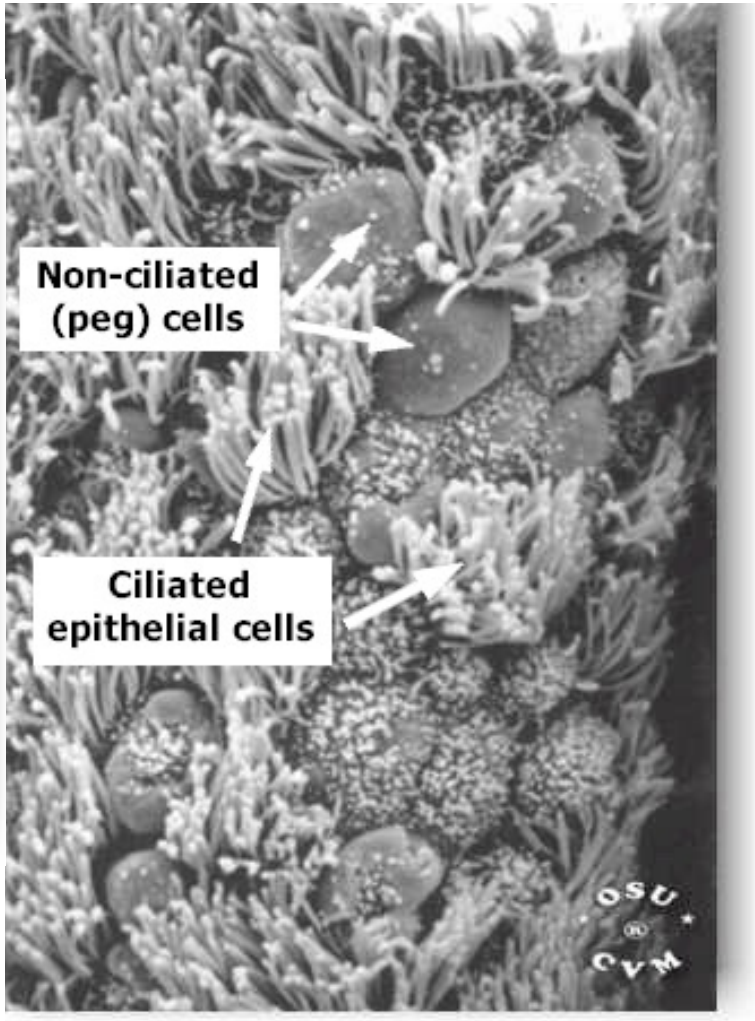
(1) ciliated; ciliary beating causes caudal fluid flow, to move the oocyte toward the uterus;

(2) non-ciliated secretory cells

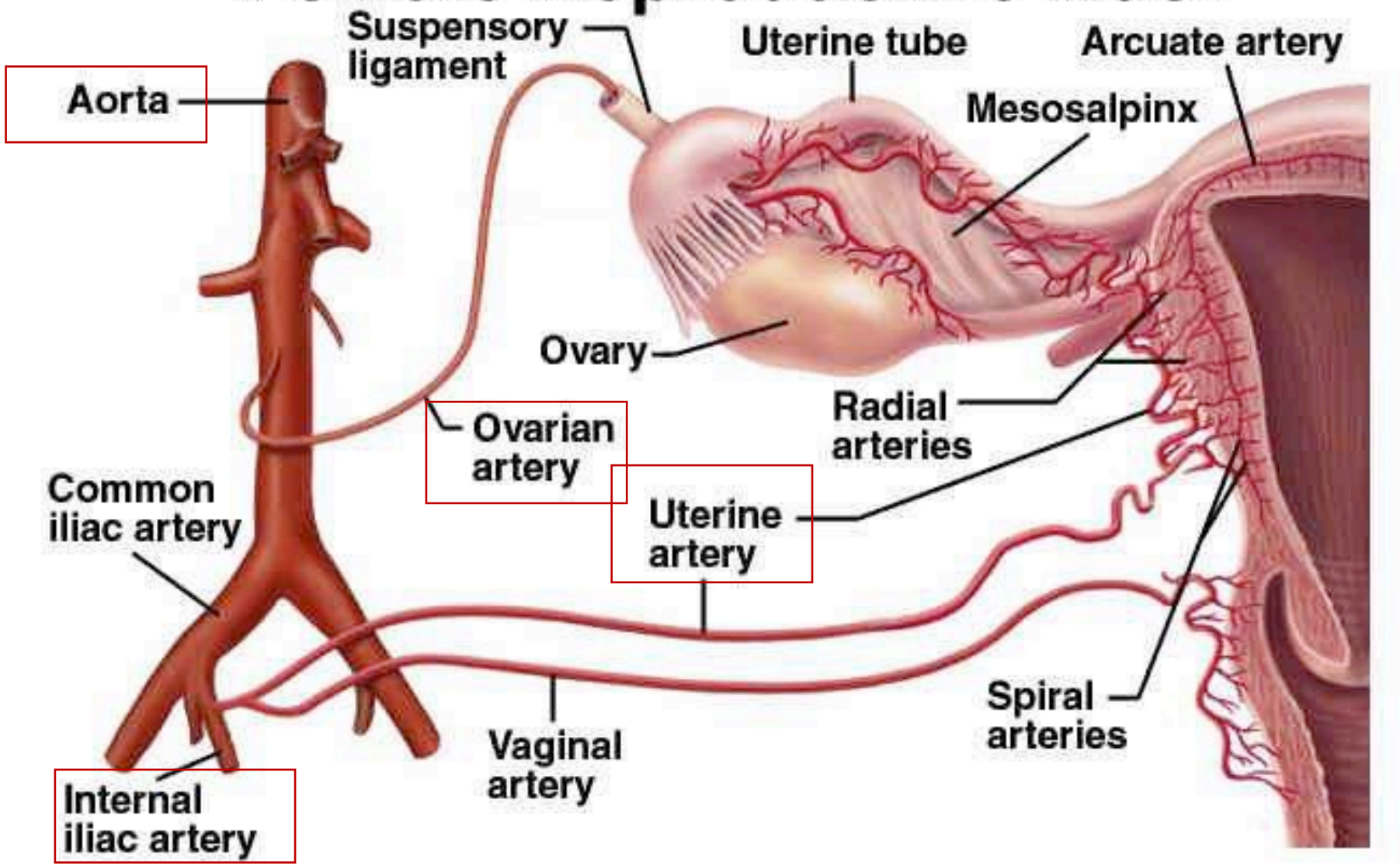


TUNICA MUCOSA





Blood Supply to Female Reproductive Tract



The uterus (womb)

https://www.youtube.com/watch?v=LUtjft-8s5k

Functions

1. serves to receive the sperm

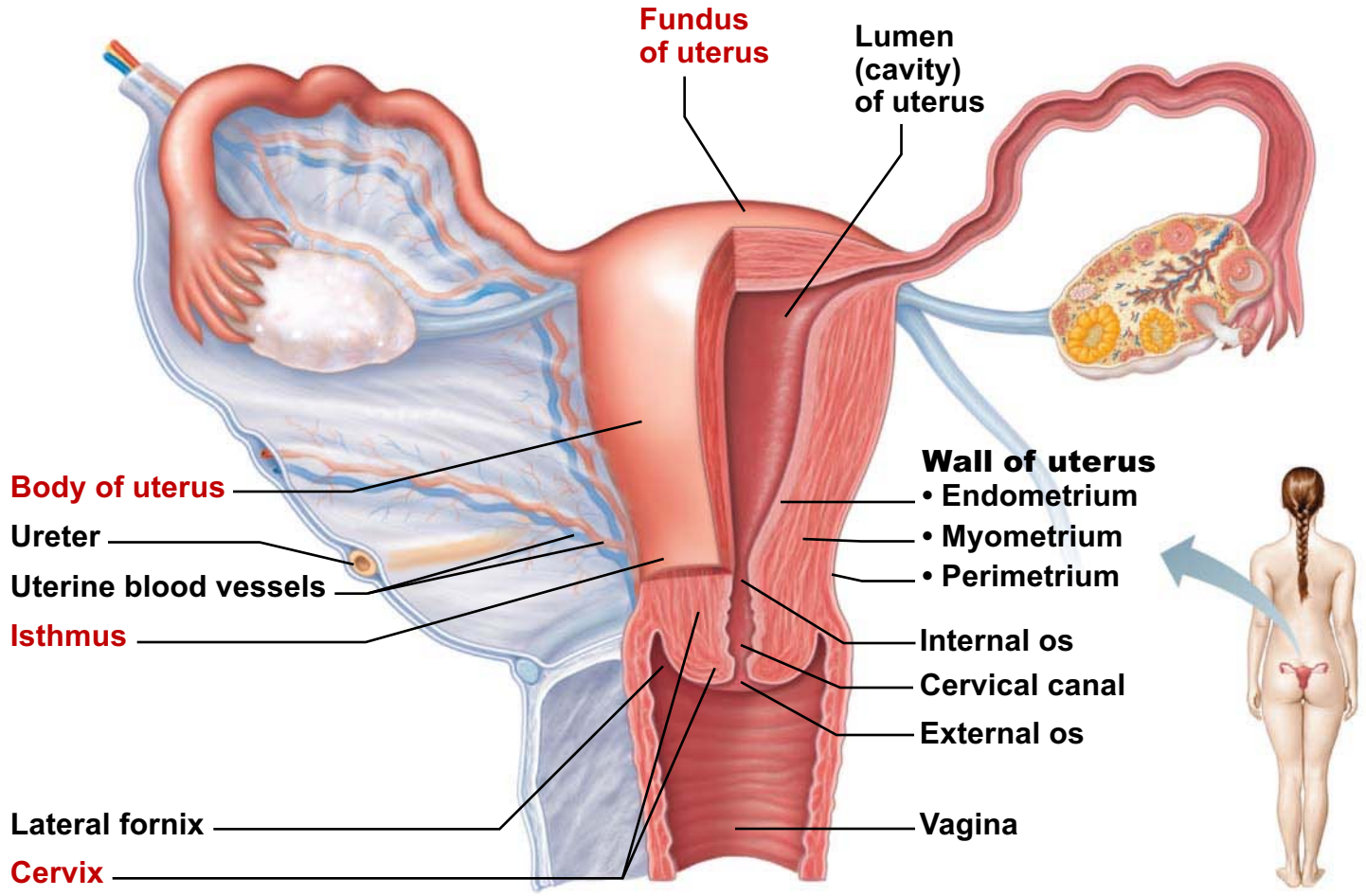
2. transports sperm from site of deposition to uterine tubes for fertilization

3. provides suitable environment for:
a. implantation of the embryo
b. nourishment of the embryo & fetus during pregnancy

4. provides mechanical protection of the fetus

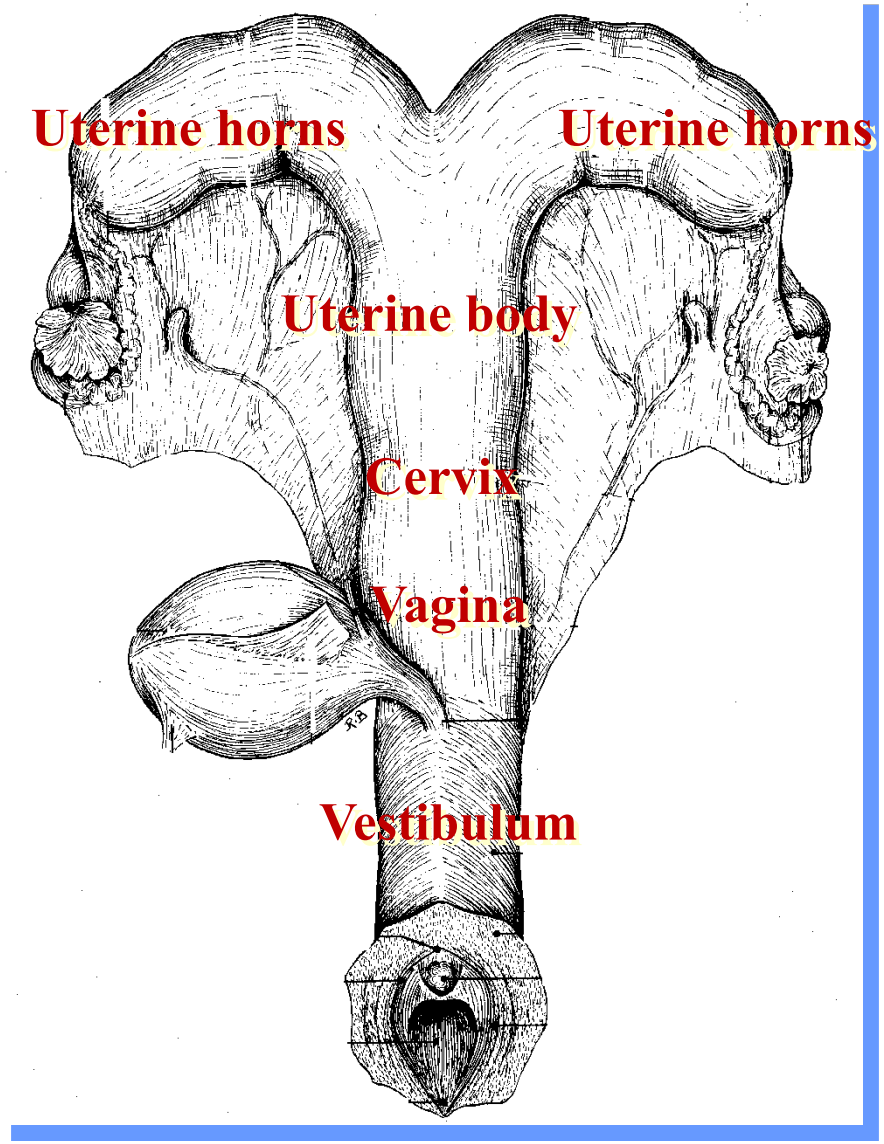
5. expels the mature fetus at the end of pregnancy

The uterus: woman



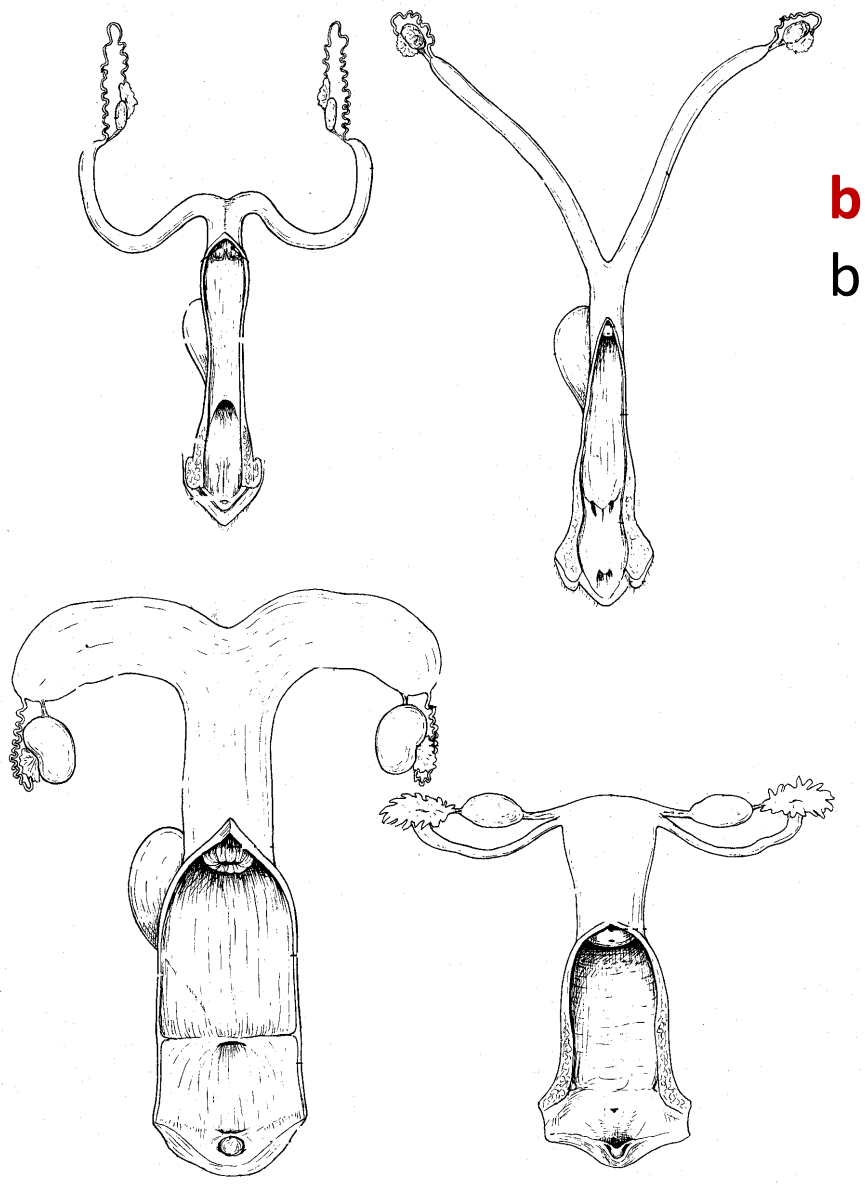
(a) Posterior view

The uterus: domestic animals



Uterus configuration

duplex:
rat, rabbit, guinea pig



bicornuate:
bitch, sow, cow, ewe

bipartite:
mare

simplex:
primate, human

Cervix

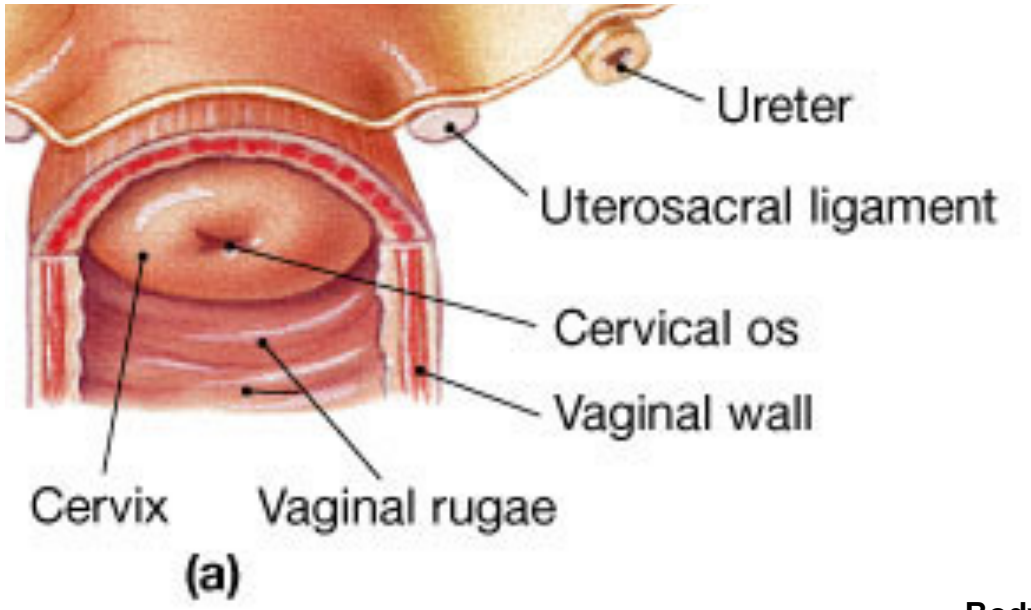
Cervix: narrow neck, or outlet; projects into vagina

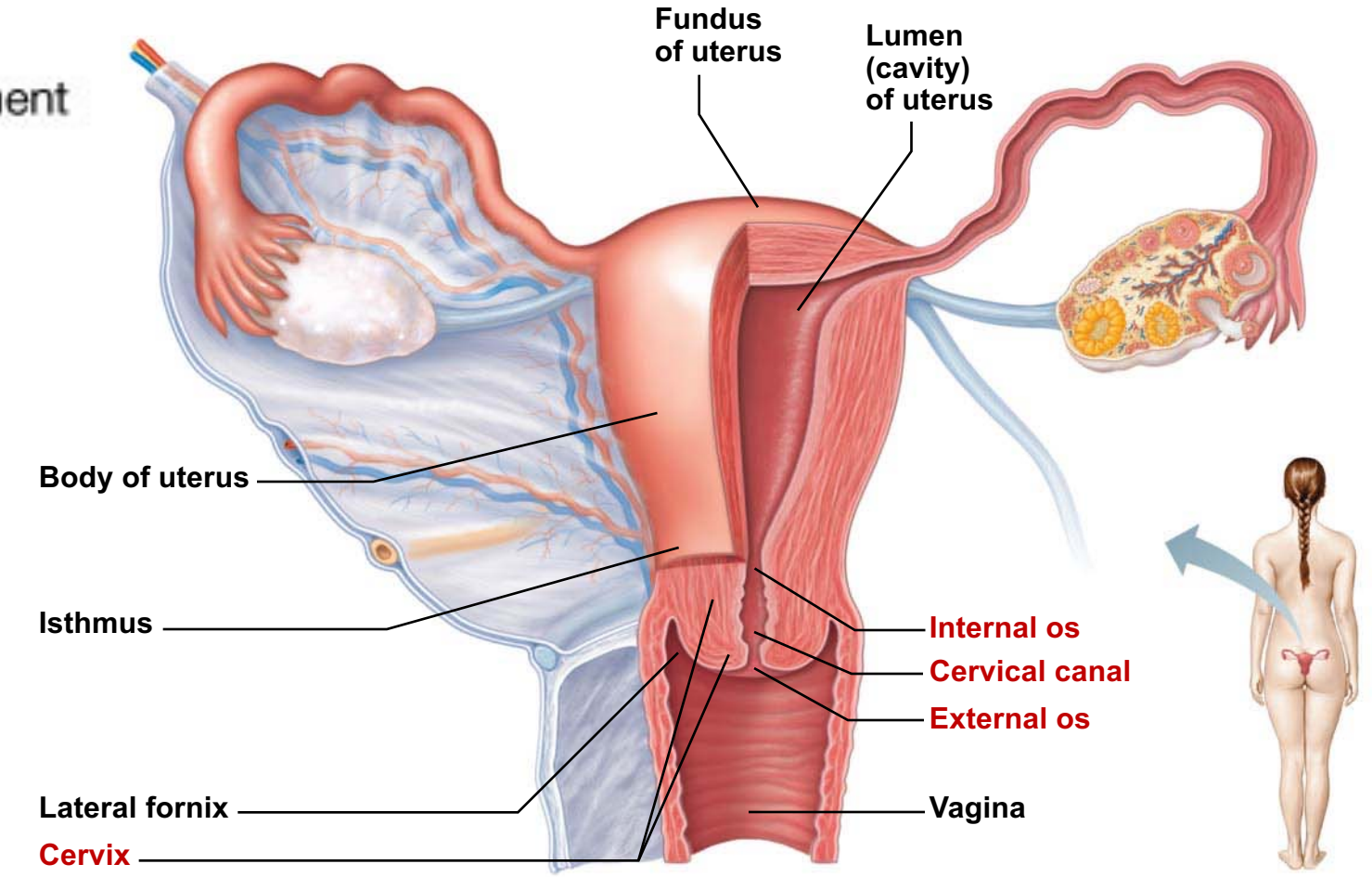
Cervical canal communicates with:

- Vagina via *external os*
- Uterine body via *internal os*

Cervical glands secrete mucus that blocks sperm entry except during estrus

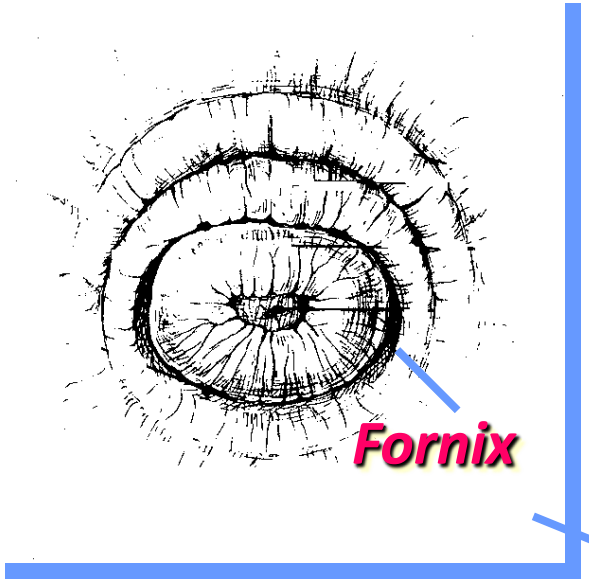
Cervix

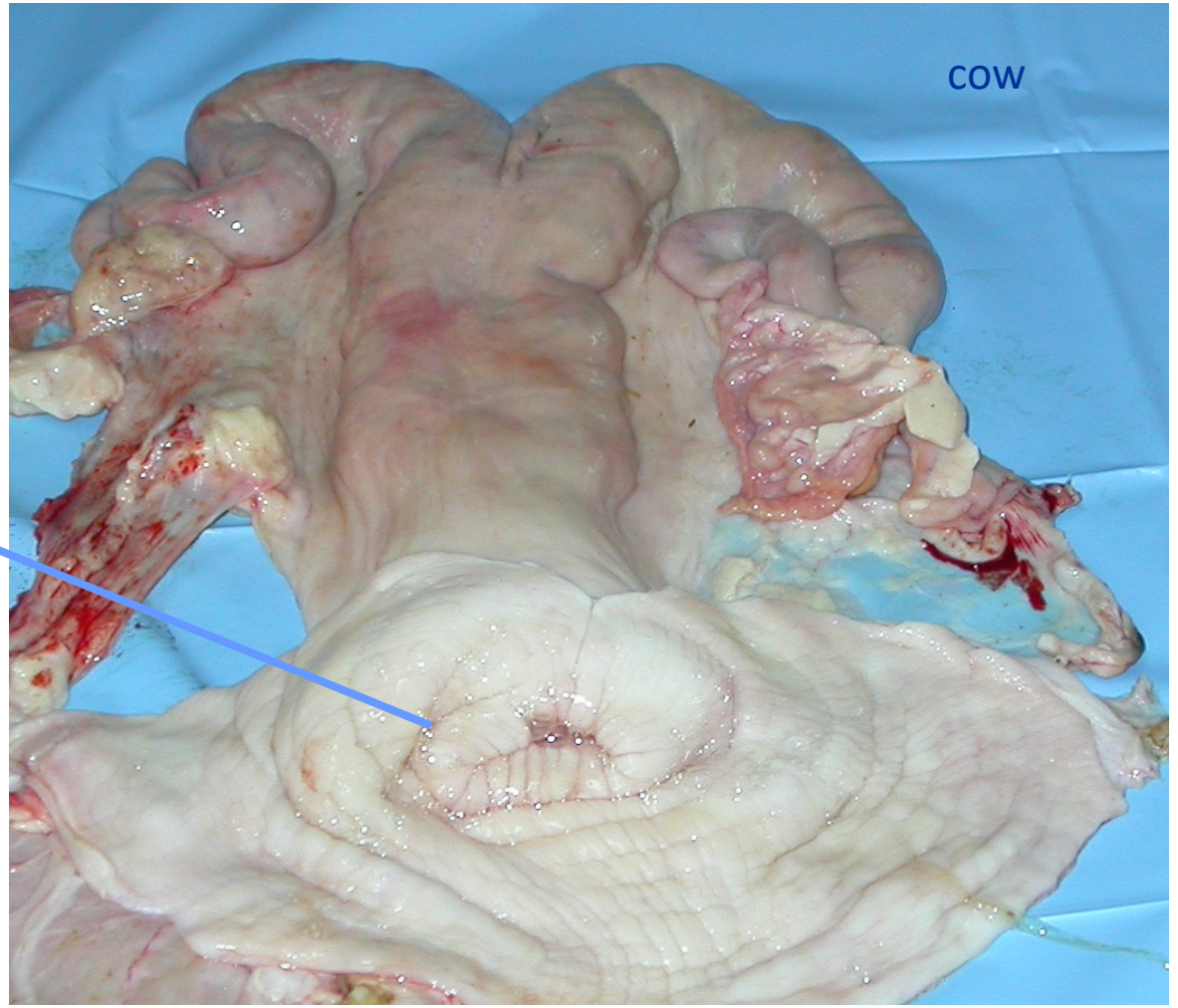




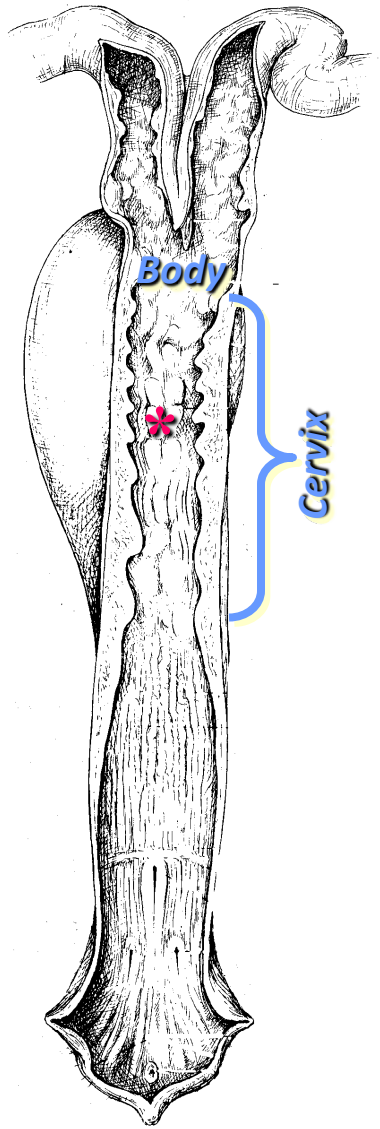
(a) Posterior view

Cervix: cow





Cervix: sow

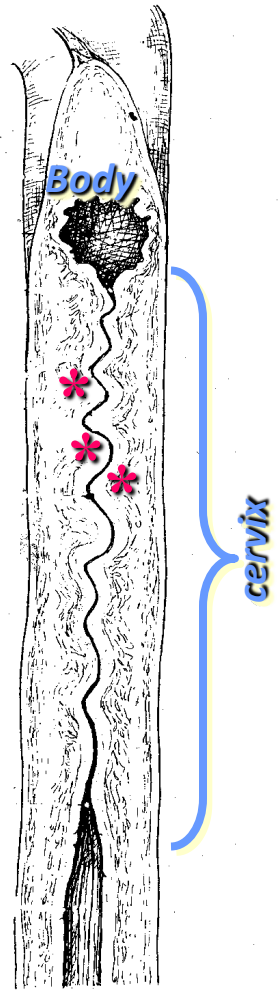


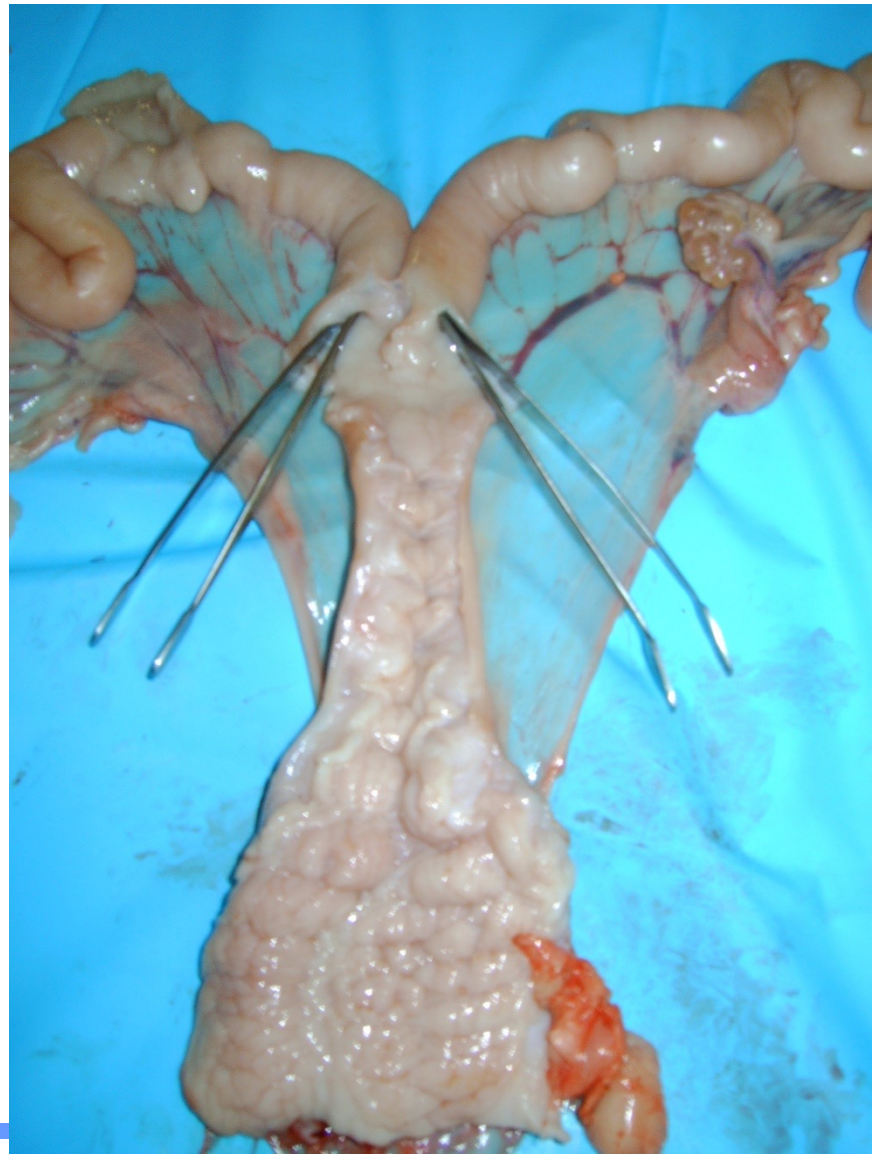
The body is very small (few cm).

The cervix is very long (10 cm)
And directly continous into
the vagina without forming
the fornix.
Cervical folds form rings

cervical rings*

that interdigitate with each other
to close the cervical canal.

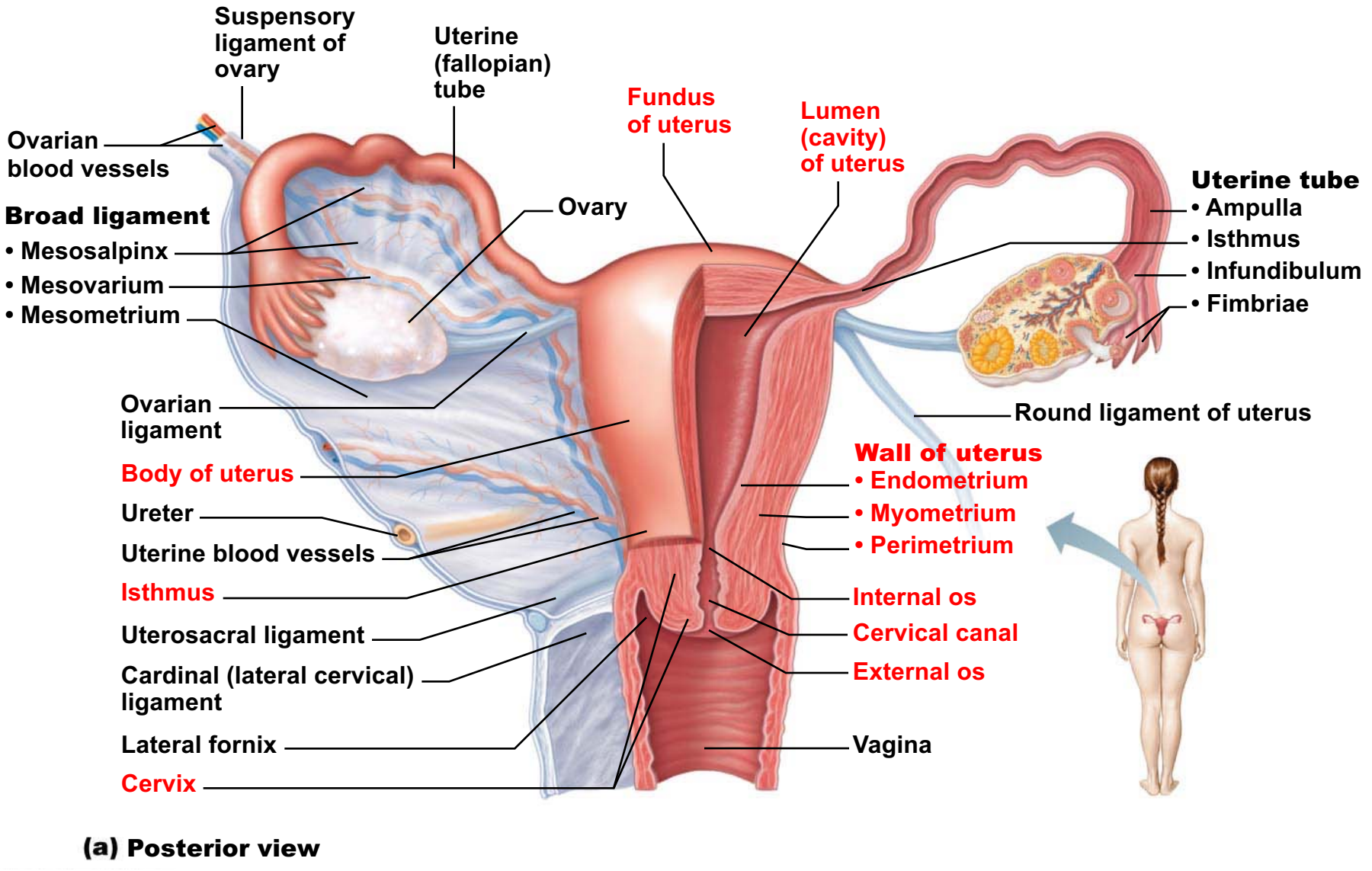




In the fundus and body of the uterus, the wall is divided into the:

- Three layers of **Uterine wall**
  - **Perimetrium**: tunica serosa
  - **Myometrium**: tunica muscularis
  - **Endometrium**: tunica mucosa and tunica submucosa

The Uterus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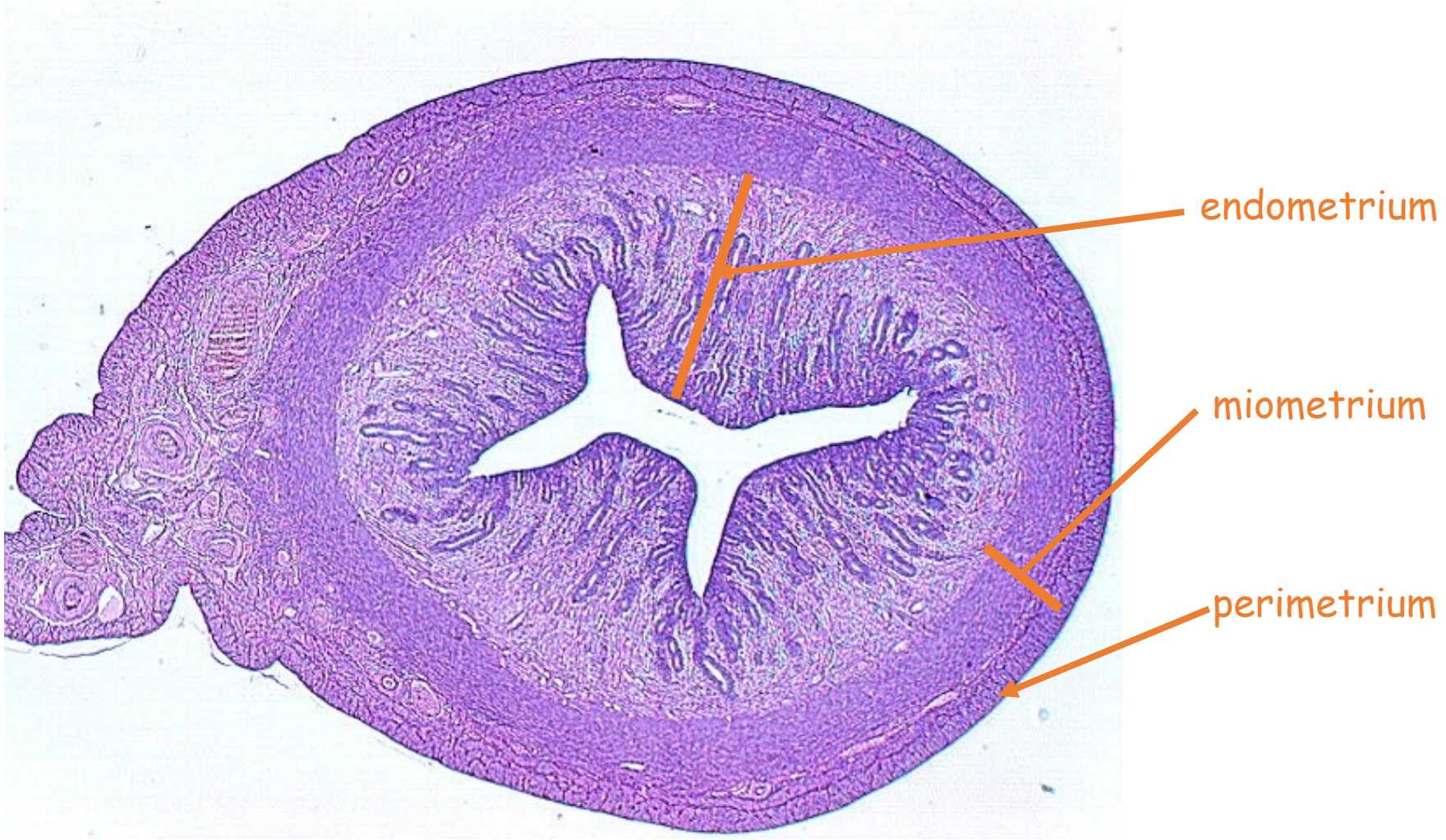
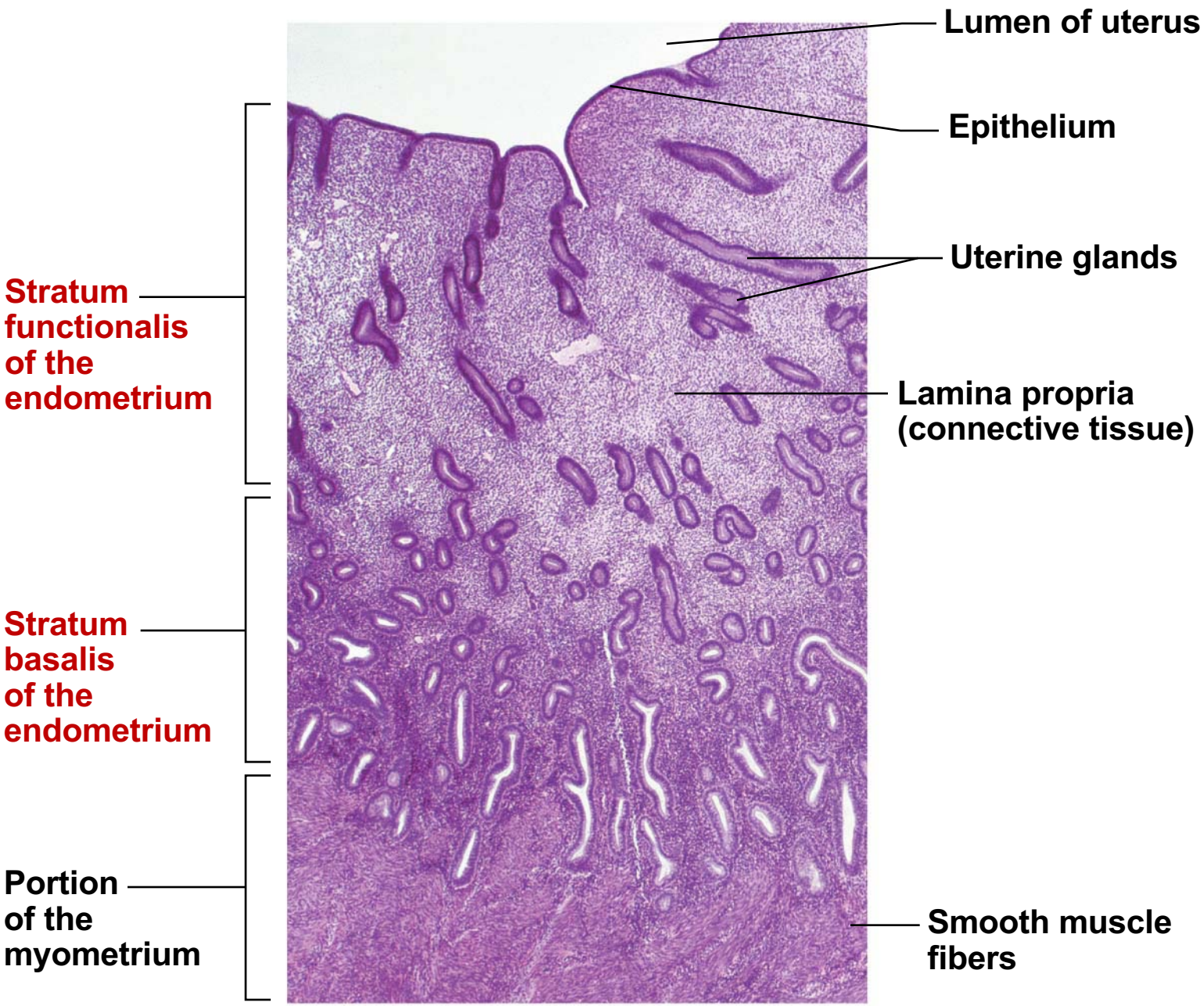
Vagina
Cervix
(a) Posterior view

UTERUS: STRUCTURE

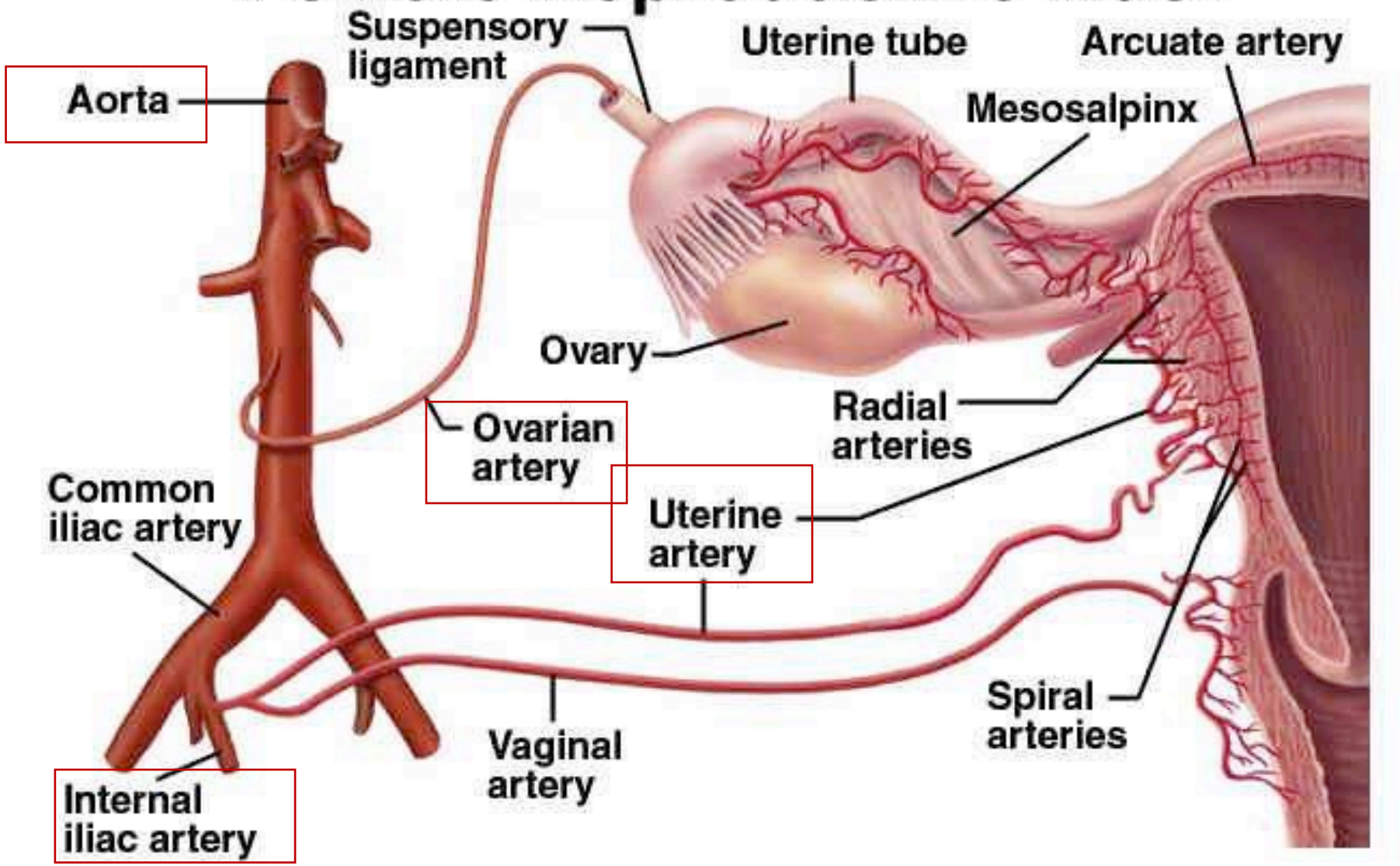


The Endometrium

- Endometrium has two chief layers (*strata*)
  - **Stratum functionalis** (**functional layer**)
    - Changes in response to ovarian hormone cycles
    - Shed during menstruation
  - **Stratum basalis** (**basal layer**)
    - Forms new stratum functionalis after menstruation
    - Unresponsive to ovarian hormones


Lumen of uterus
Epithelium
Uterine glands
Lamina propria (connective tissue)
Smooth muscle fibers
Stratum functionalis of the endometrium
Stratum basalis of the endometrium
Portion of the myometrium
(a)

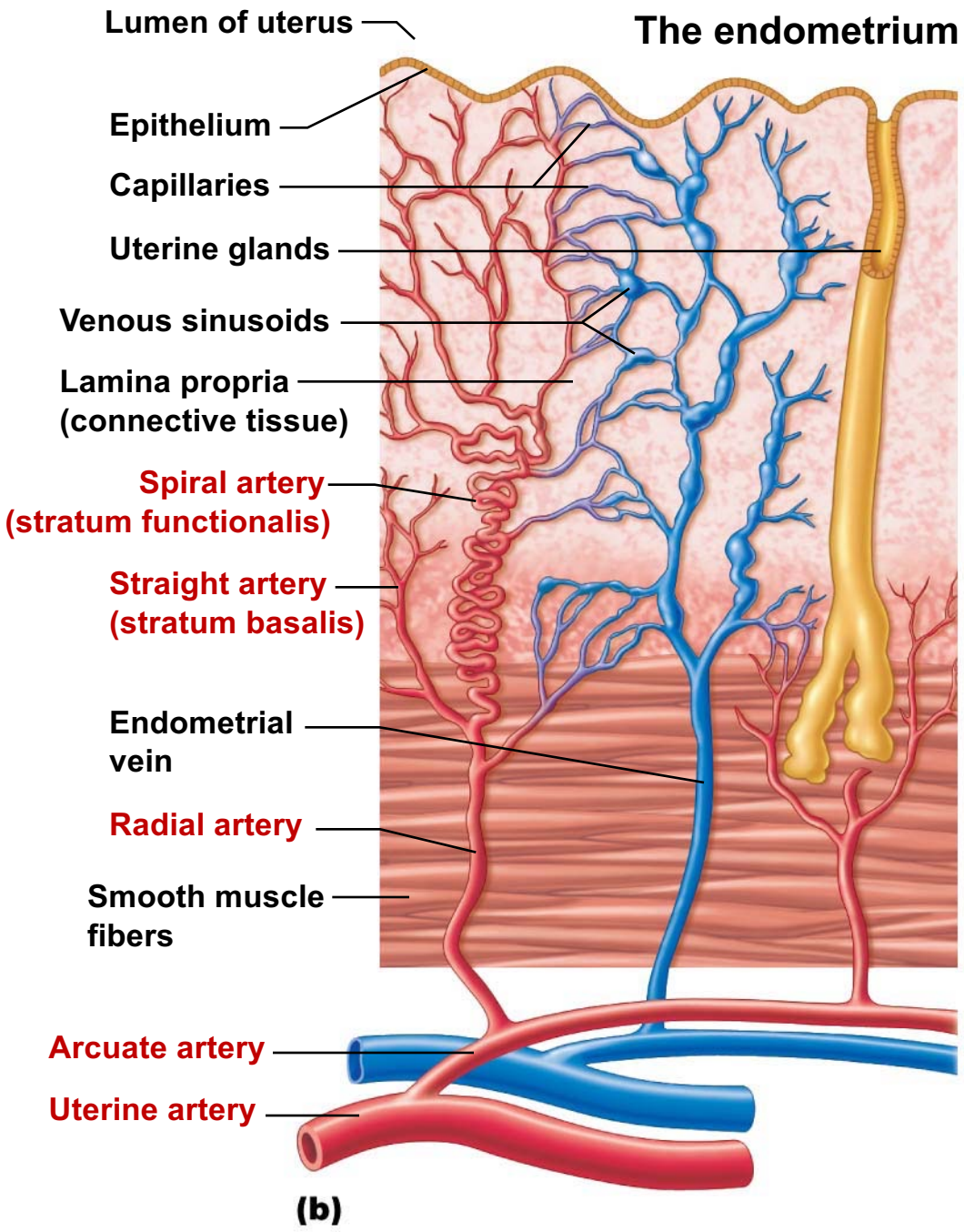
Blood Supply to Female Reproductive Tract



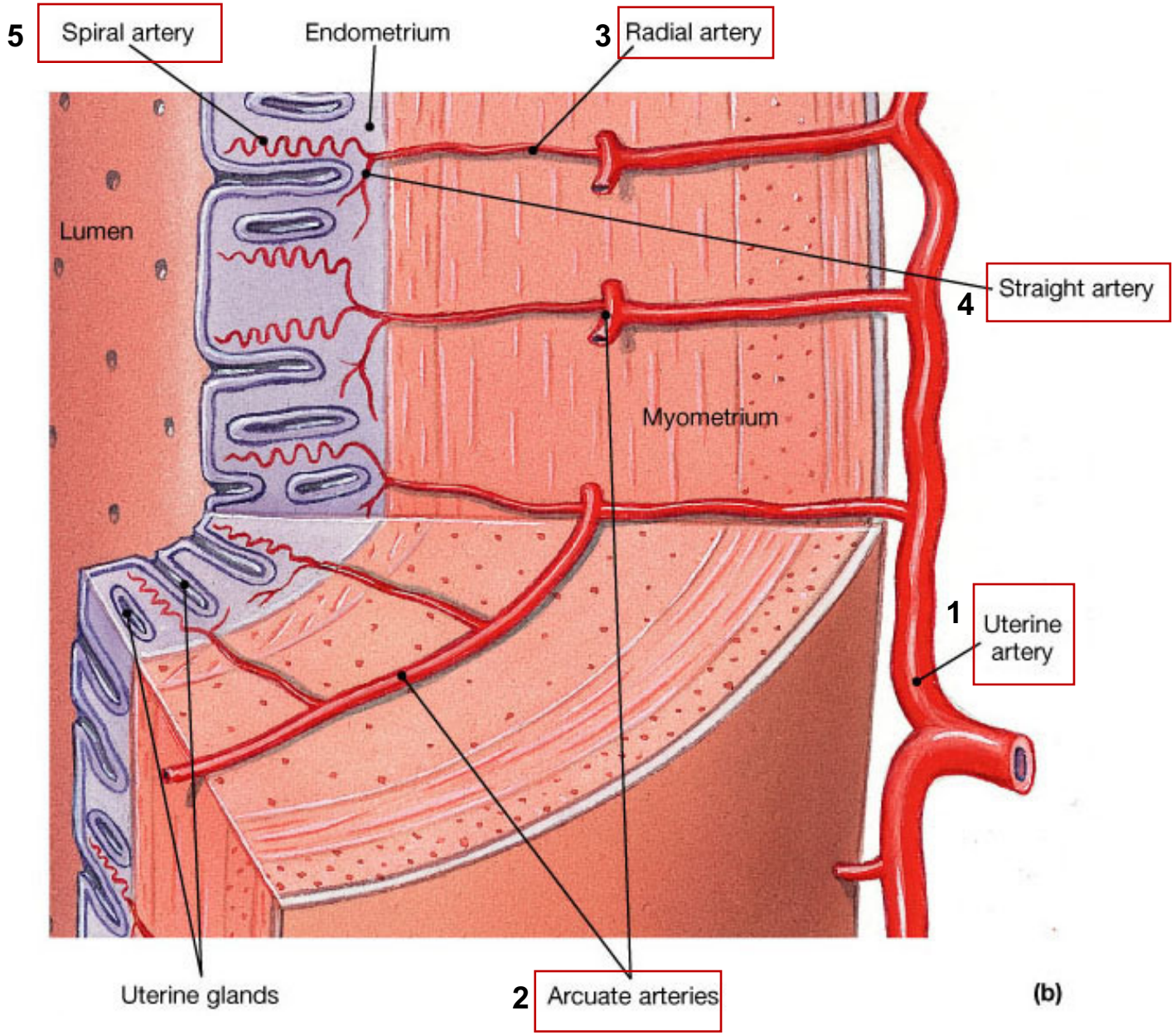
The Uterus

- Vascular supply plays key role in cyclic changes
  - **Uterine arteries** arise from *internal iliacs* and branch into:
  - **Arcuate arteries** in myometrium; branch into:
  - **Radial arteries** in endometrium; branch into:
    - **Straight arteries** in stratum basalis and
    - **Spiral arteries** in stratum functionalis
      - Degenerate and regenerate
      - Spasms cause shedding of functionalis layer during menstruation

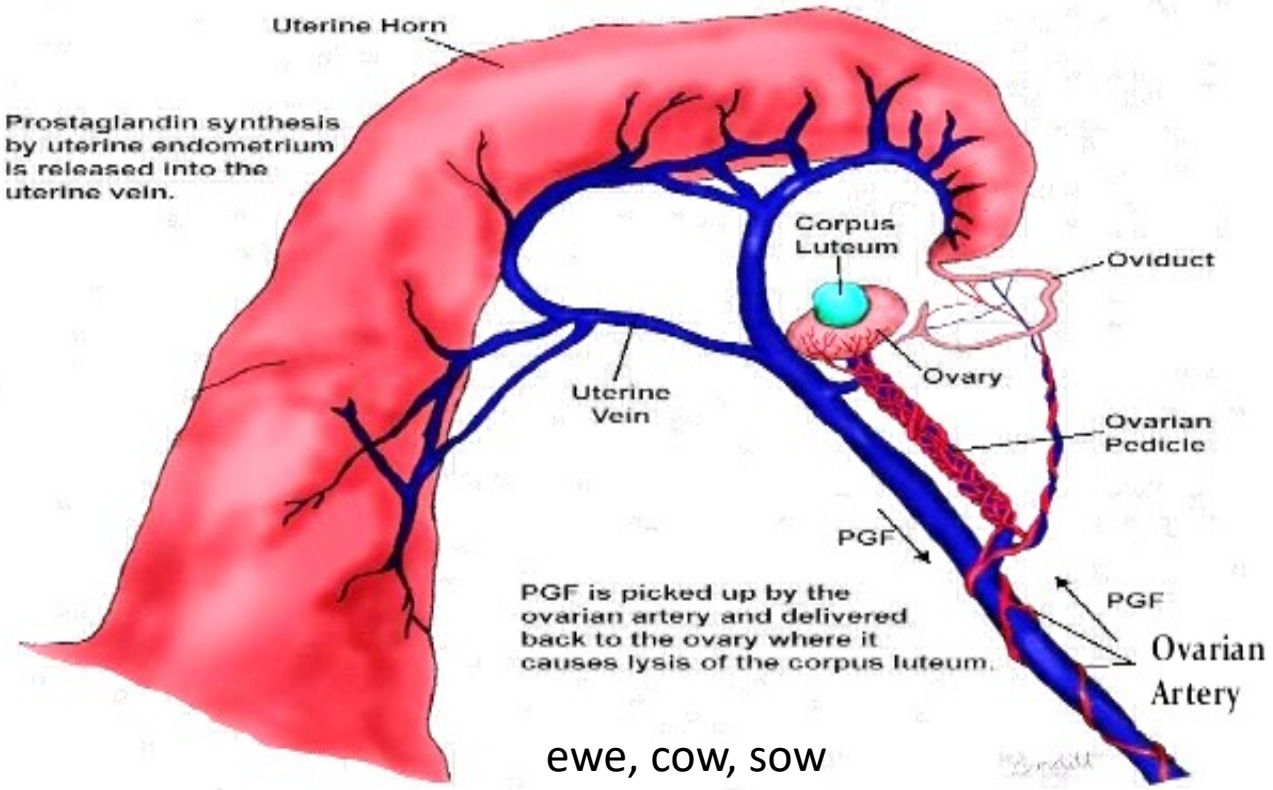
The endometrium and its blood supply.



The Uterine Wall



Counter-current transfer system



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