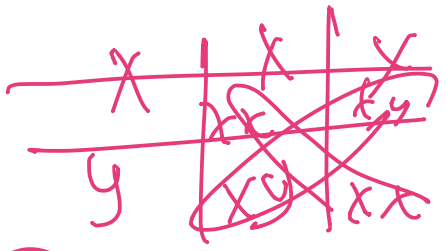
#Anatomy

REPRODUCTION

*Who is Responsible for Bringing males + females?

↳ For Sure male (XY) → that's why the male doked the Sex. Whereas Females Have (XX) genes so they will only give X.

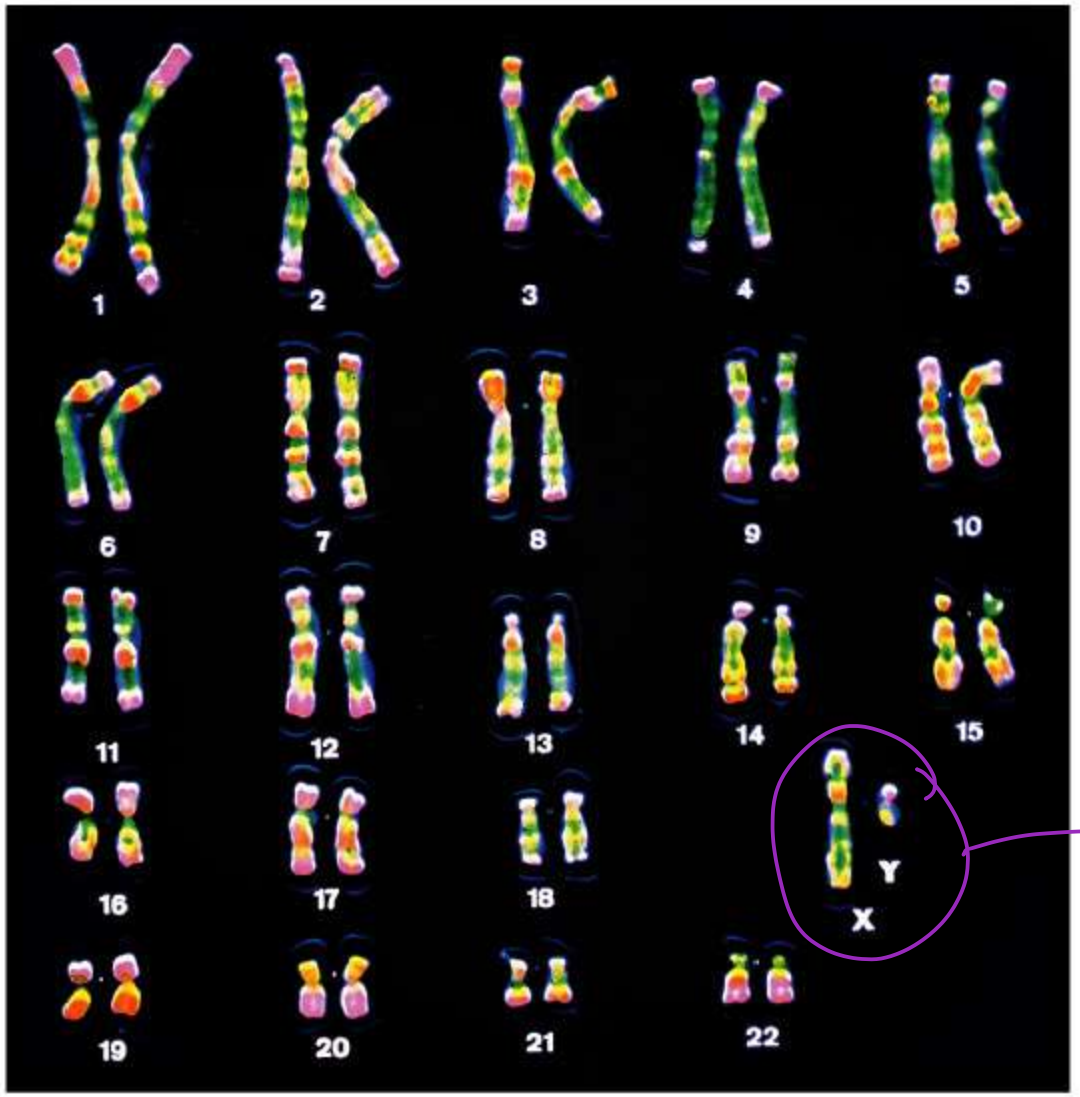


X

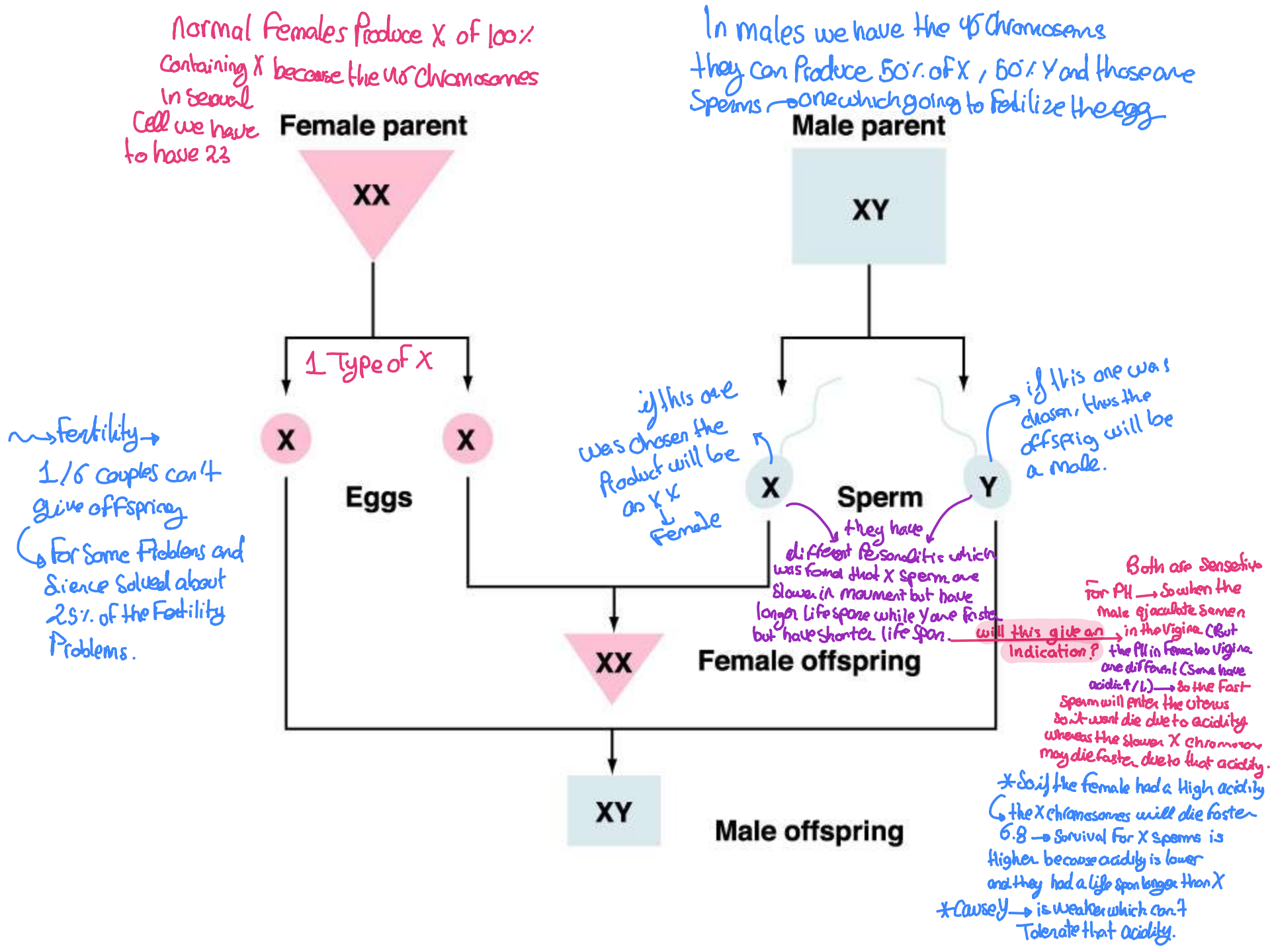
Y → Faster

We have 46 chromosomes → they are 23 Pairs which means that each 2 chromosomes are identical so 2 copys but there is one pair that is expected → only Homologus in Females (XX) but not in males (XY)
}
SEX Chromosome

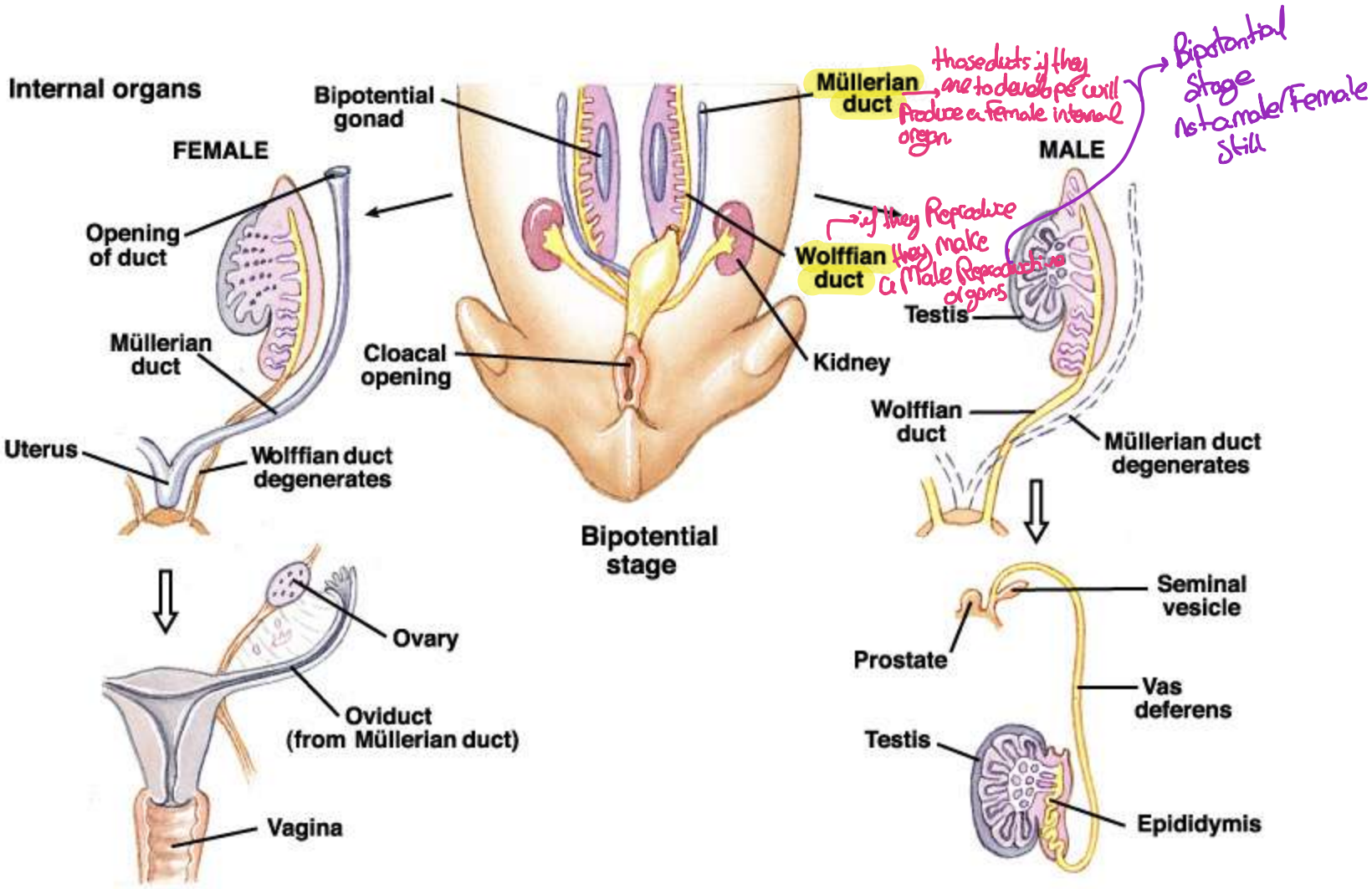
*Human has 22 Identical Pairs of chromosomes
↓
Autosomes
and one Pair of Sex Chromosomes
XX / XY



→ only can be seen in male.

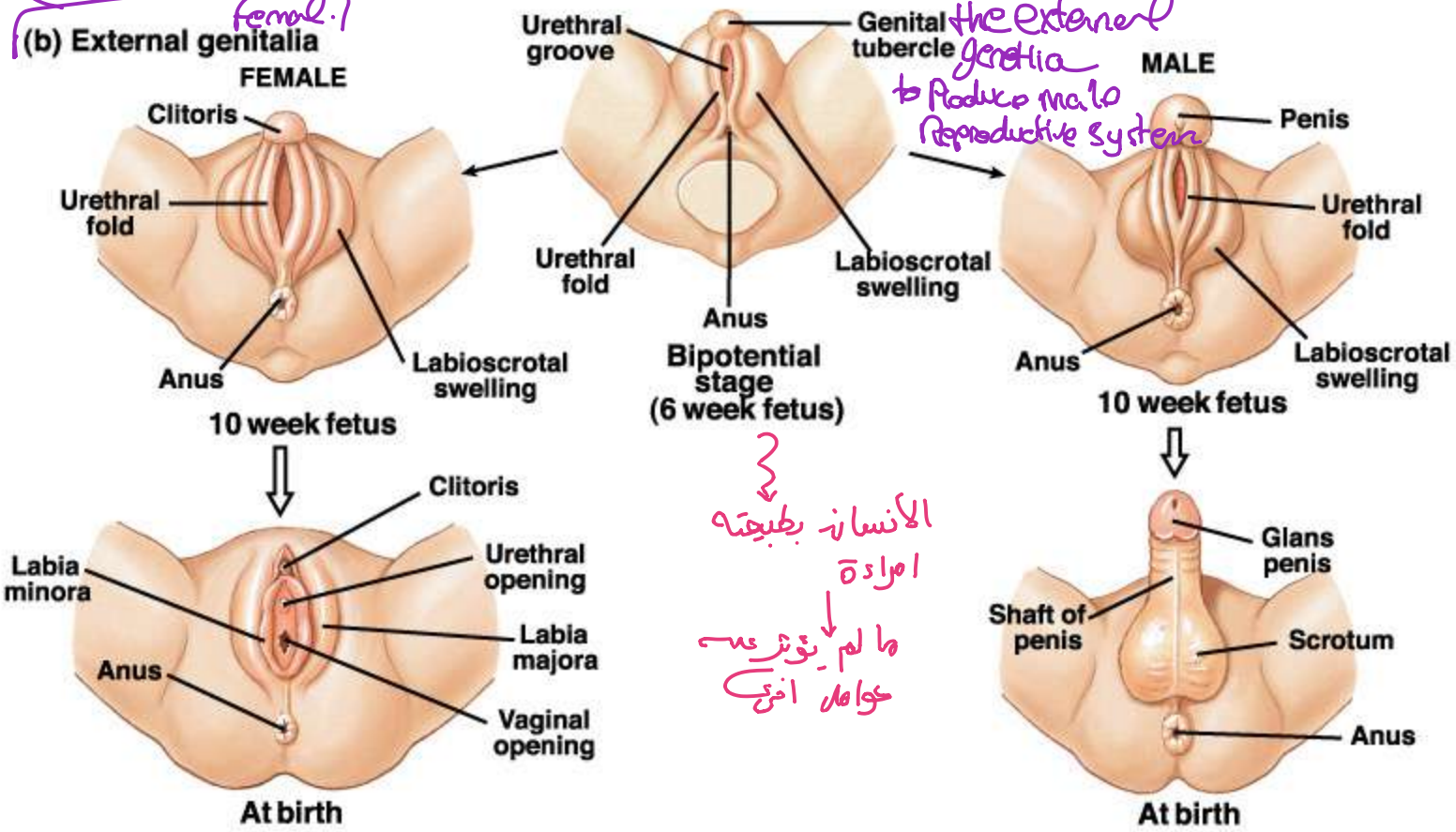

Normal Females Produce X of 100% Containing X because the 46 Chromosomes In Sexual Cell we have to have 23
In males we have the 46 Chromosoms they can Produce 50% of X , 50% Y and those are Sperms one which going to Fedilize the egg
Female parent
XX
Male parent
XY
1 Type of X
X
X
Eggs
X
Sperm
Y
if this one was chosen the Product will be an X X ↓ Female
if this one was chosen, thus the offspring will be a male.
they have different Personalities which was found that X sperm are slower in movment but have longer Life spane while Y are faster but have shorter life span.
XX
Female offspring
XY
Male offspring
~> fertility ->
1/6 couples can't give offspring
For some Problems and Sience Solved about 25% of the Fertility Problems.
will this give an Indication?
Both are Sensetive For PH → So when the male ejaculate Semen in the Vigina (But the PH in Female Vigina are different (Some have acidict / L) → So the Fast Sperm will enter the uterus and wont die due to acidity whereas the slower X chromosom may die faster due to that acidity.
*So if the female had a High acidity
the X chromosomes will die faster
6.8 → Survival For X sperms is Higher because acidity is lower and they had a life span longer than X
*Causey → is weaker which can't Tolerate that acidity.

Until week 6 → the embryo has the Potential to be male or Female → Has Potential For Both Systems



*until week 6 → we have the Bipotential Stage → this Can Potential become a male or female than according to the development of Y chromosome starts to produce the external genitalia to produce male reproductive system

no Y chromosome directly become of female. due to Presence of Y chromosome

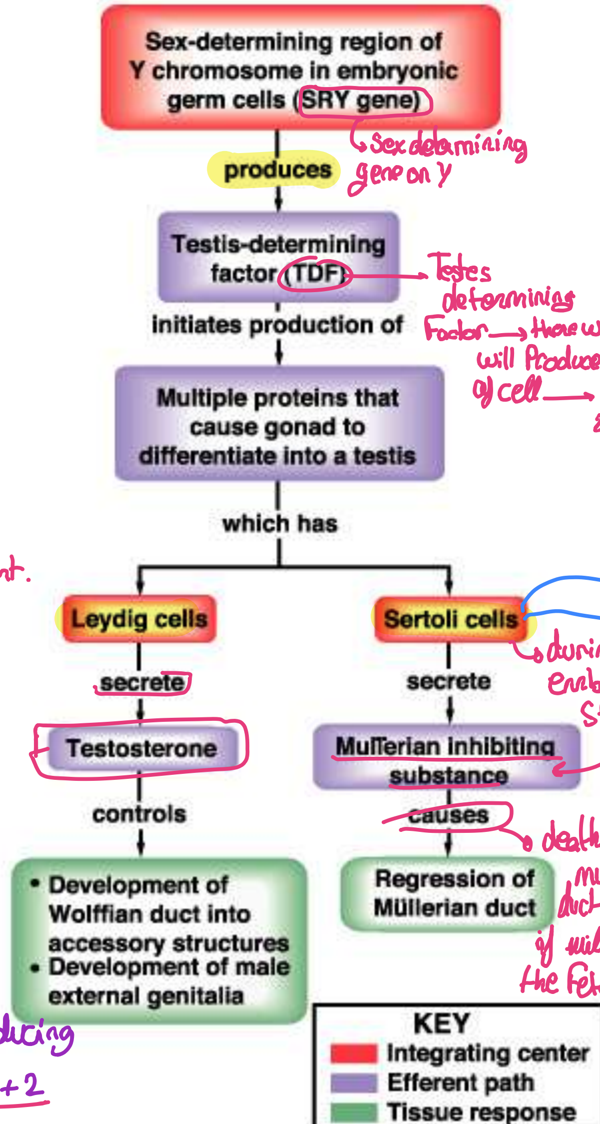


الأنسان بطبيعته ارادة ↓ ما لم يؤثر عليه عوامل اخرى

* XX chromosomes don't do anything → Continus normaly

انا ما ار تغير

xy كبتص



↳ Sex determining gene on Y

Testes determining Factor → there will be Certain Proteins that will Produce and differentiate into 2 types of cell → 1) Sertoli cell 2) Interstitial cells

↳ during embryonic Stages.

Blood Testes Barrier ↓ تمنع antibodies عن sperms

→ Secretion Fluid

→ death of mulerian duct that if will develope the Fetus will be a female ⇒ male

How is the number of Huminity is determined?

↳ women From Birth have specifed no. of egg thus a female undergose miosis 1 while being an infant.

6×10^6 eggs Before Birth

2×10^6 at Birth

degregation

↓

at pupalty = 500 active eggs

For men

1) mitosis go first → cell goes in place

second → makes the sperms

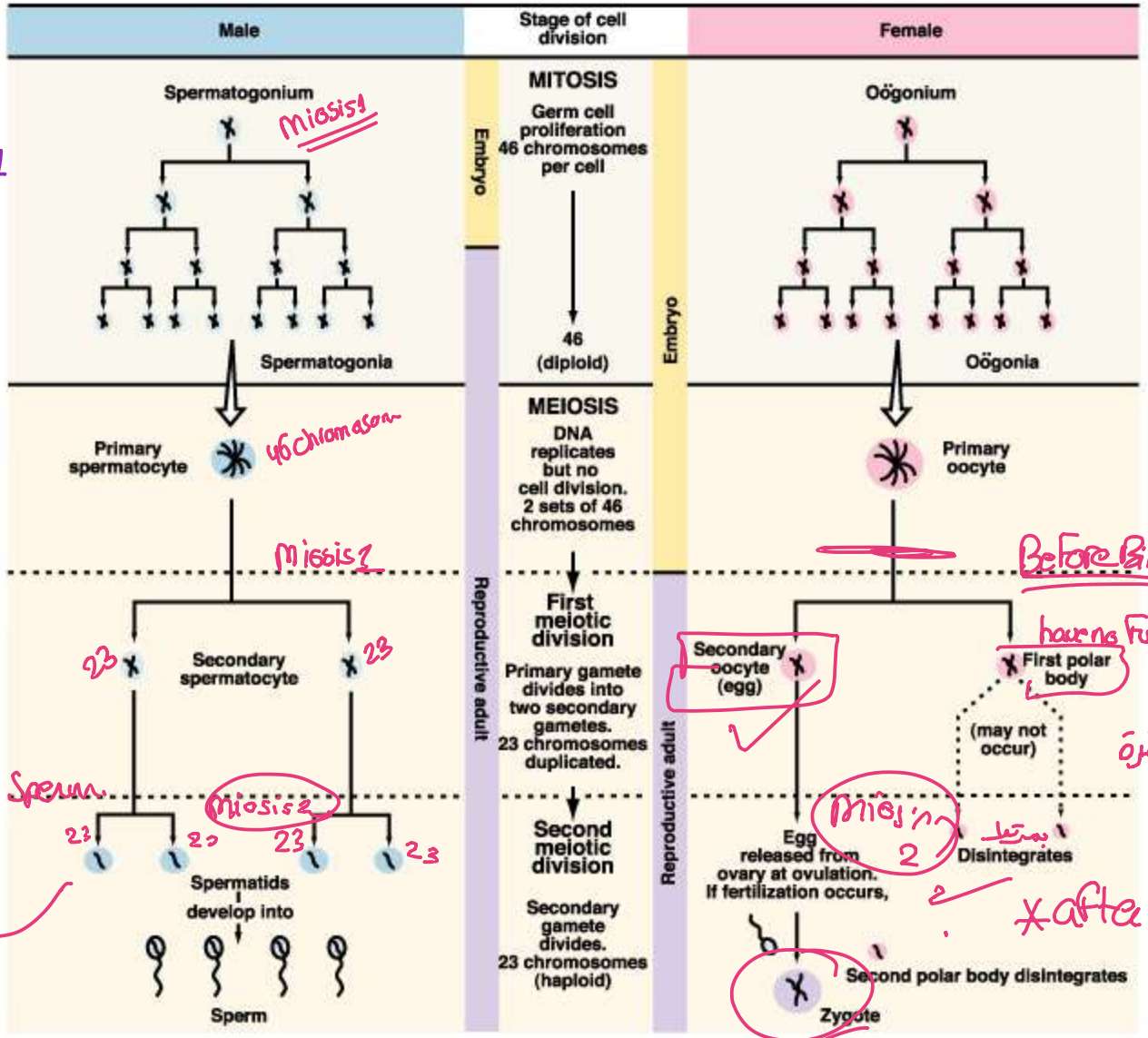
during miosis 1

So at pupaity → cells Responsible for Producing sperms Undergoes miosis 1+2

whereas women after filtrization goes with the miosis 2

* a male can Produce 1000 sperm/min → so → Storage for million
But only 1 is needed for filtrization

* Up to 10%
↓
abnormal
more → infelterity



2 cells
Mitosis
↓
identical cell 46

miosis
↓ 4 cells 23 Chromo
4 cells

Before Birth → miosis 1
having Function.
خلية كبيرة / خلية صغيرة

Spermatogonia
Converted to Sperm.

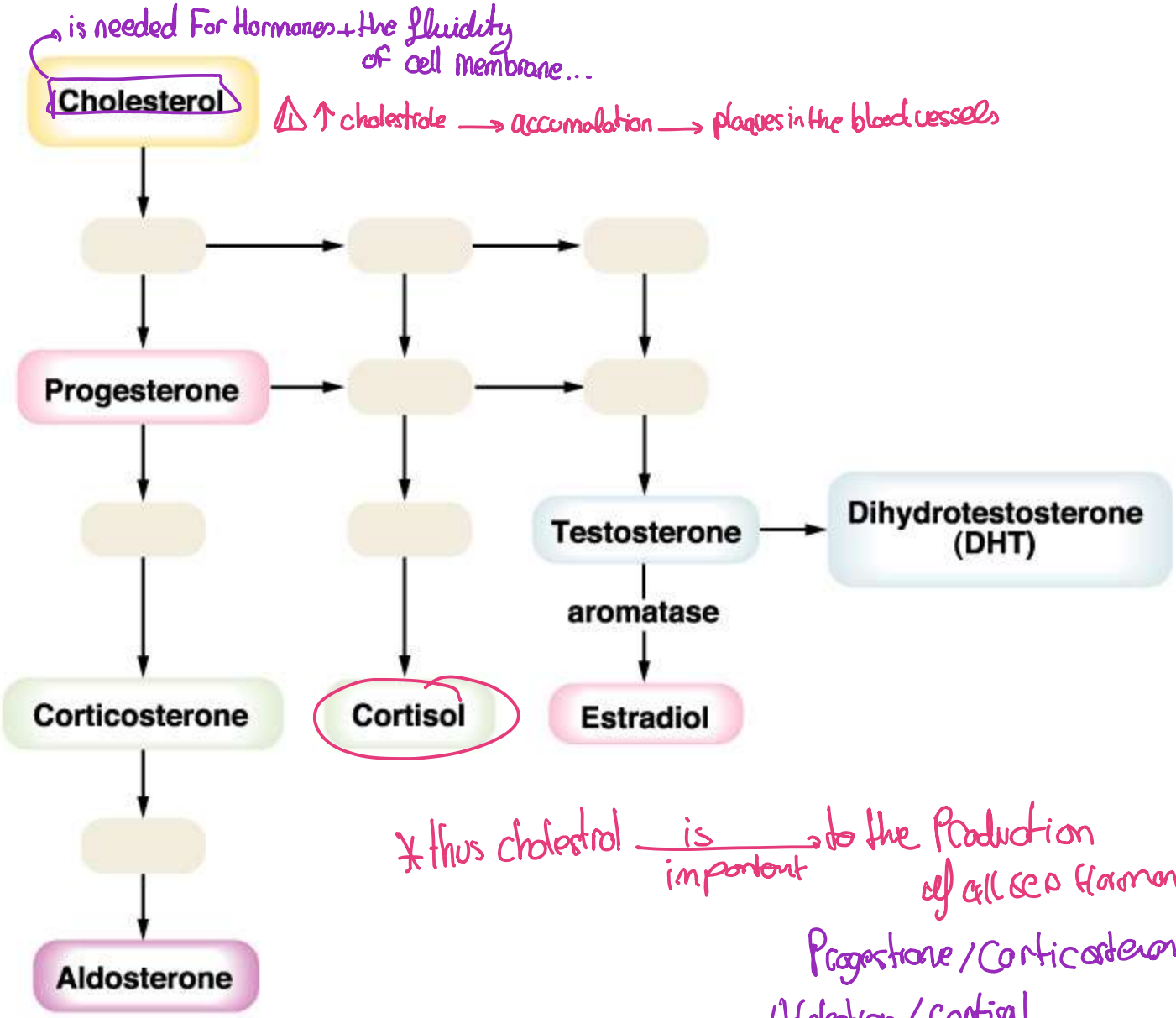
وقت البلوغ miosis يبدأ

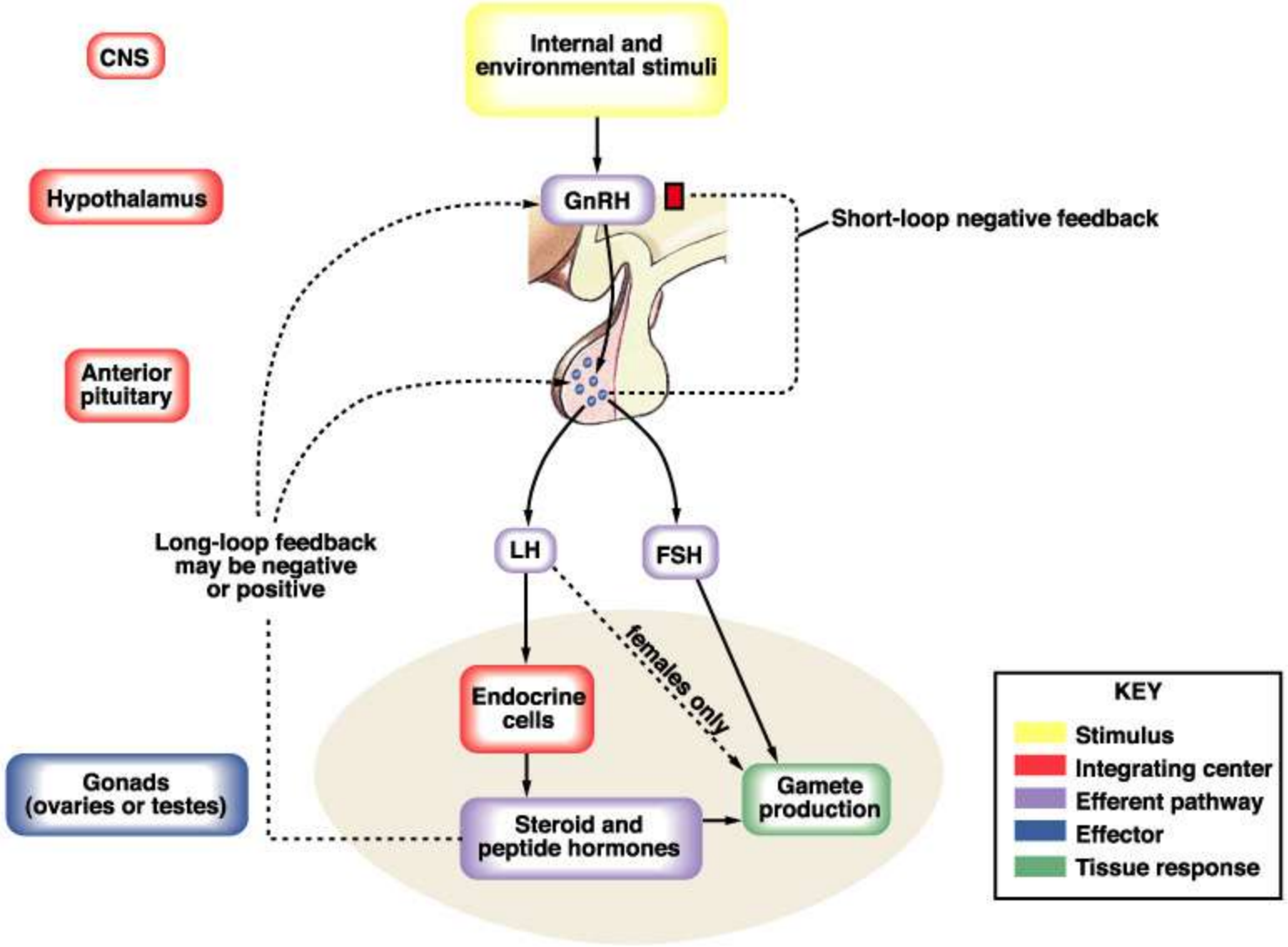
Miosis 2 يبدأ

Disintegrates

* after filtrization
↓
miosis 2

each miosis For male 64 days


is needed For Hormones + the fluidity of cell membrane...
Cholesterol
⚠ ↑ cholestrole → accomulation → plaques in the blood vessels
Progesterone
Testosterone
Dihydrotestosterone (DHT)
aromatase
Corticosterone
Cortisol
Estradiol
Aldosterone
* thus cholestrol is important to the Production of all these Hormones
Progestrone / Corticosterone
Aldestron / cortisol
Test → DHT + estradial.


CNS
Internal and environmental stimuli
Hypothalamus
GnRH
Short-loop negative feedback
Anterior pituitary
Long-loop feedback may be negative or positive
LH
FSH
females only
Endocrine cells
Gonads (ovaries or testes)
Steroid and peptide hormones
Gamete production
KEY
Stimulus
Integrating center
Efferent pathway
Effector
Tissue response

→ the start of sex Hormones begin at → Hypothalamuth

↓ Release

GNRH → Has a direct effect on anterior Pituitary gland

↓ effect the Release of

LH + FSH ← 2 Hormones in Both Sex

FSH → Responsiable for the maturation of the Oocytes (eggs) in females
+ developent of Both Gametes (Sperm + eggs)

LH → Has a Responsiblty for the Production of sex Hormones in Males + females Including the ovulation in female ✗ LH has Receptors in the endocrine in both males + females.

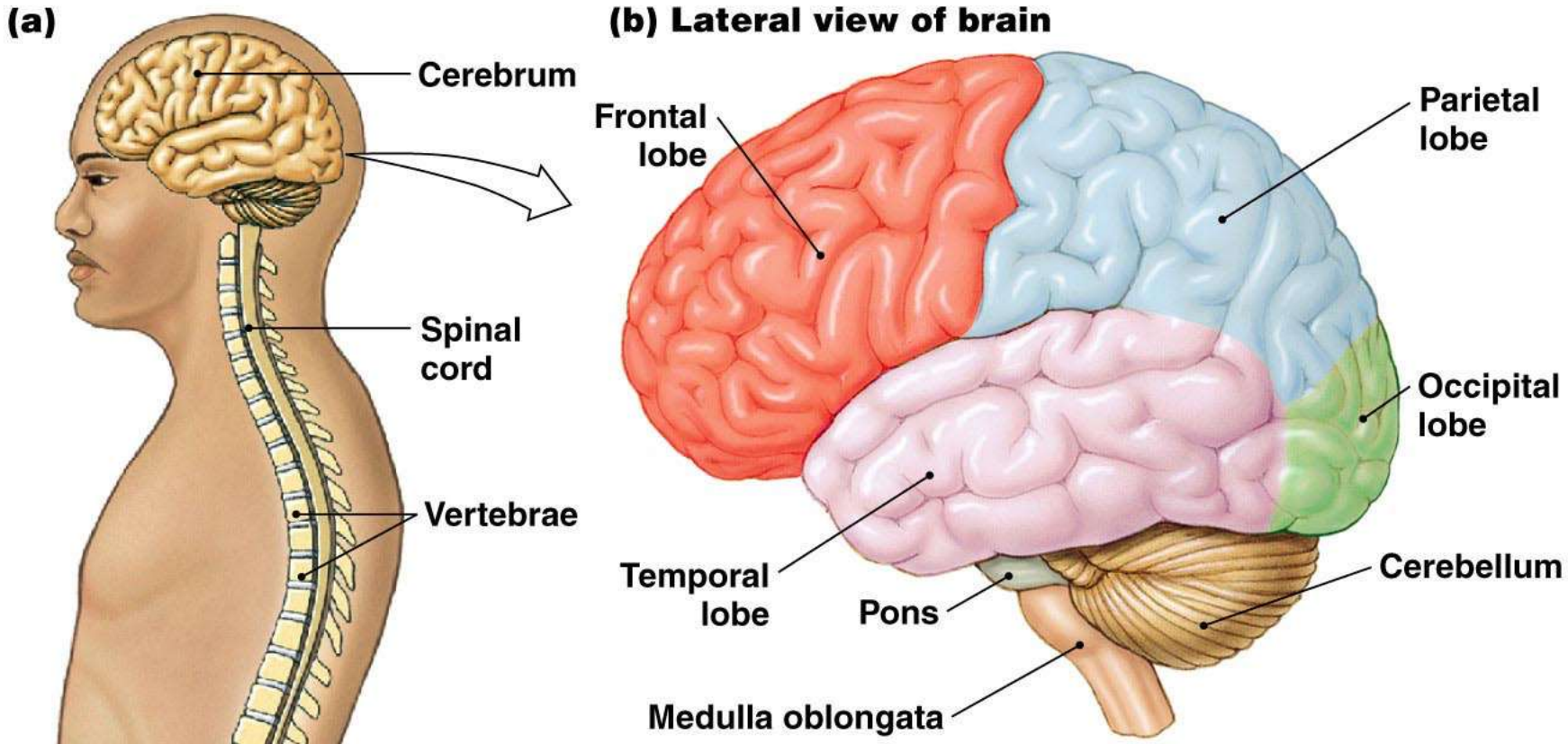


Figure 9-9a–b (1 of 5)

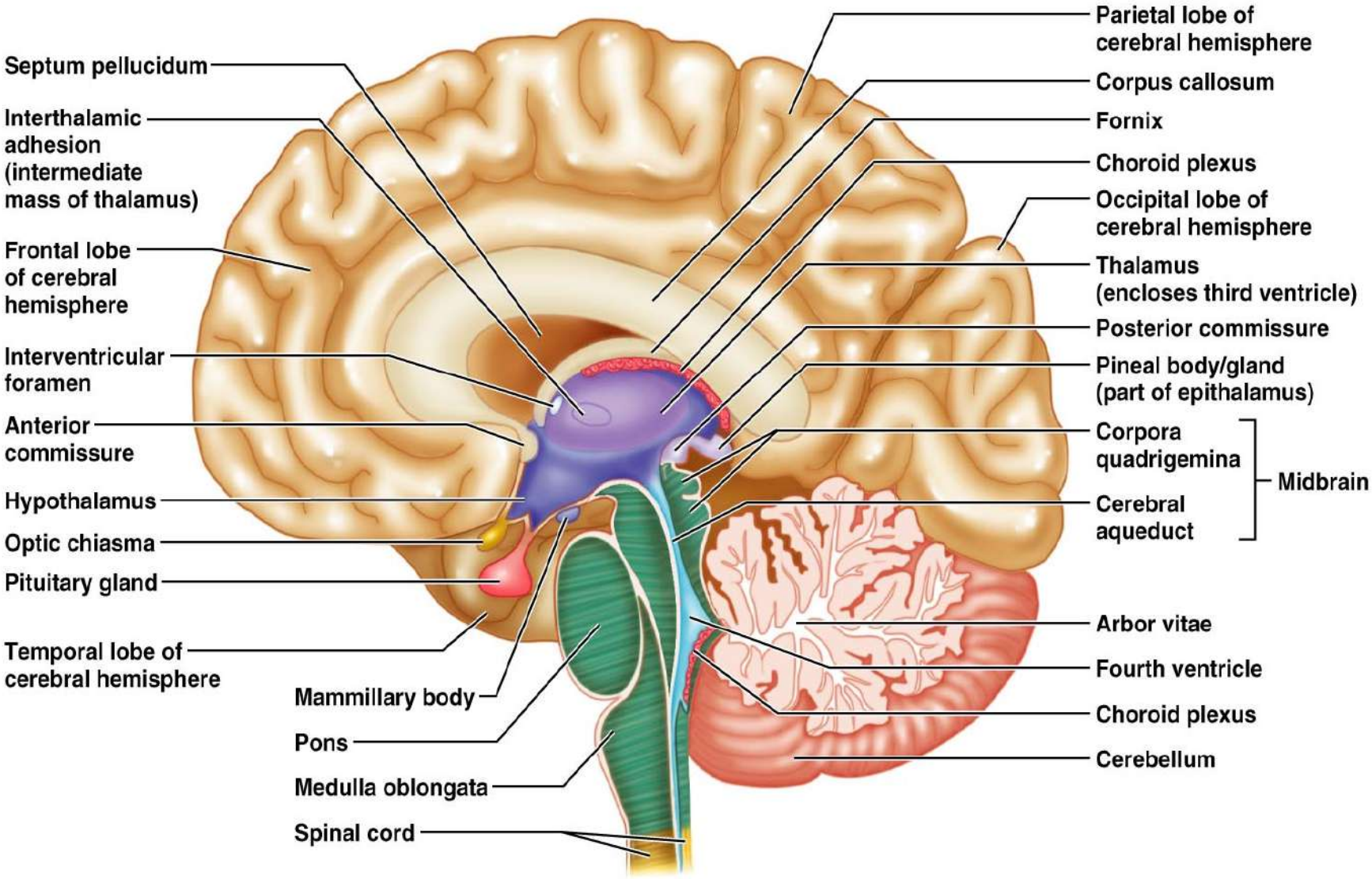
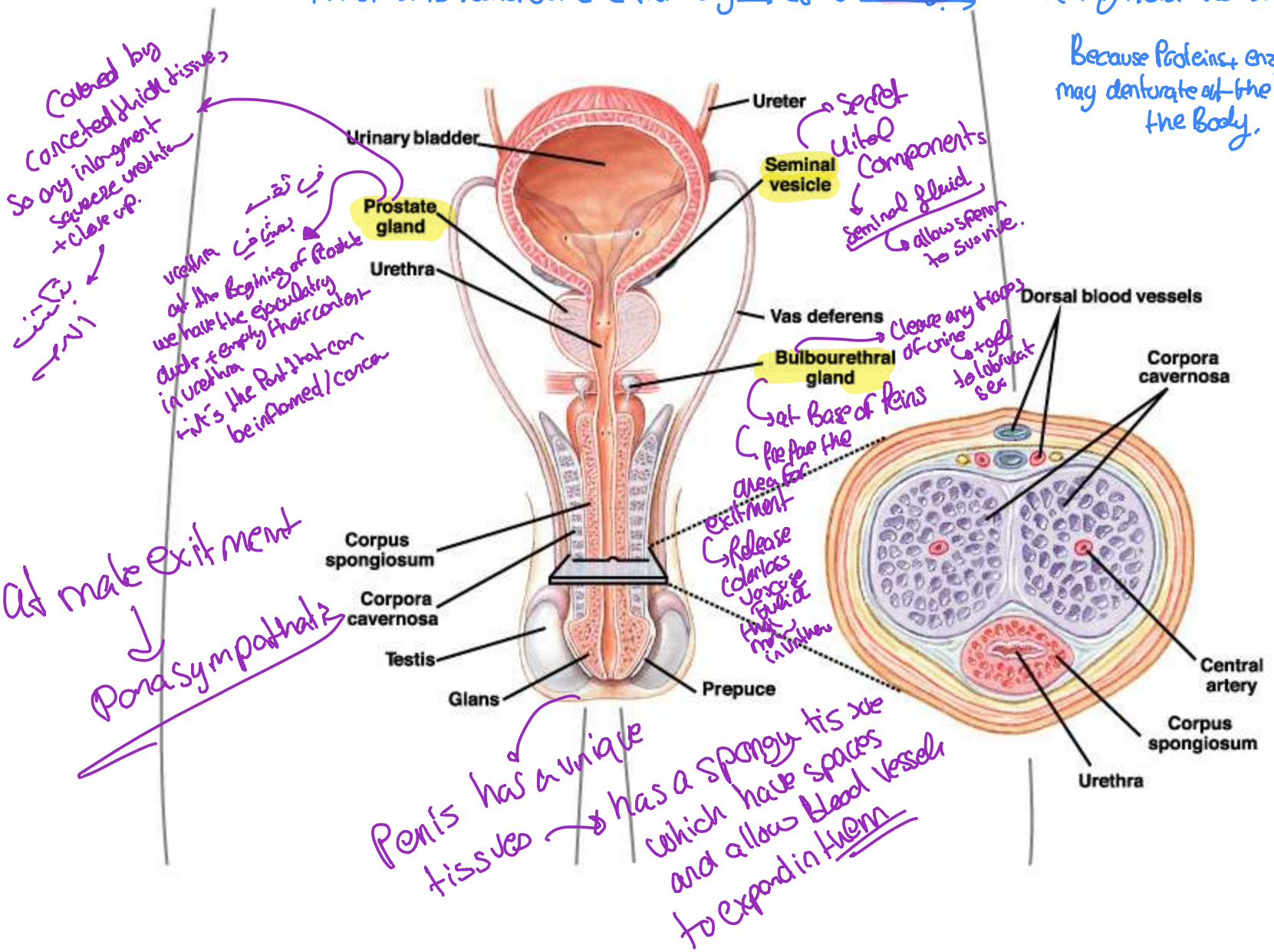

Septum pellucidum
Interthalamic adhesion (intermediate mass of thalamus)
Frontal lobe of cerebral hemisphere
Interventricular foramen
Anterior commissure
Hypothalamus
Optic chiasma
Pituitary gland
Temporal lobe of cerebral hemisphere
Mammillary body
Pons
Medulla oblongata
Spinal cord
Parietal lobe of cerebral hemisphere
Corpus callosum
Fornix
Choroid plexus
Occipital lobe of cerebral hemisphere
Thalamus (encloses third ventricle)
Posterior commissure
Pineal body/gland (part of epithalamus)
Corpora quadrigemina
Cerebral aqueduct
Midbrain
Arbor vitae
Fourth ventricle
Choroid plexus
Cerebellum

Figure 12.12

*Male Reproductive System:

Part of it is found out side the body → testes → why? → Because they need a lower temperature

Because Proteins + enzymes may denaturate at the temperature of the body.



Covered by Conceted fluid tissues So any inlargment squeeze urethra + close up.

Urethra at the begining of Prostate we have the ejaculatory ducts + empty their content in urethra + it's the Part that can be inflamed/cancer

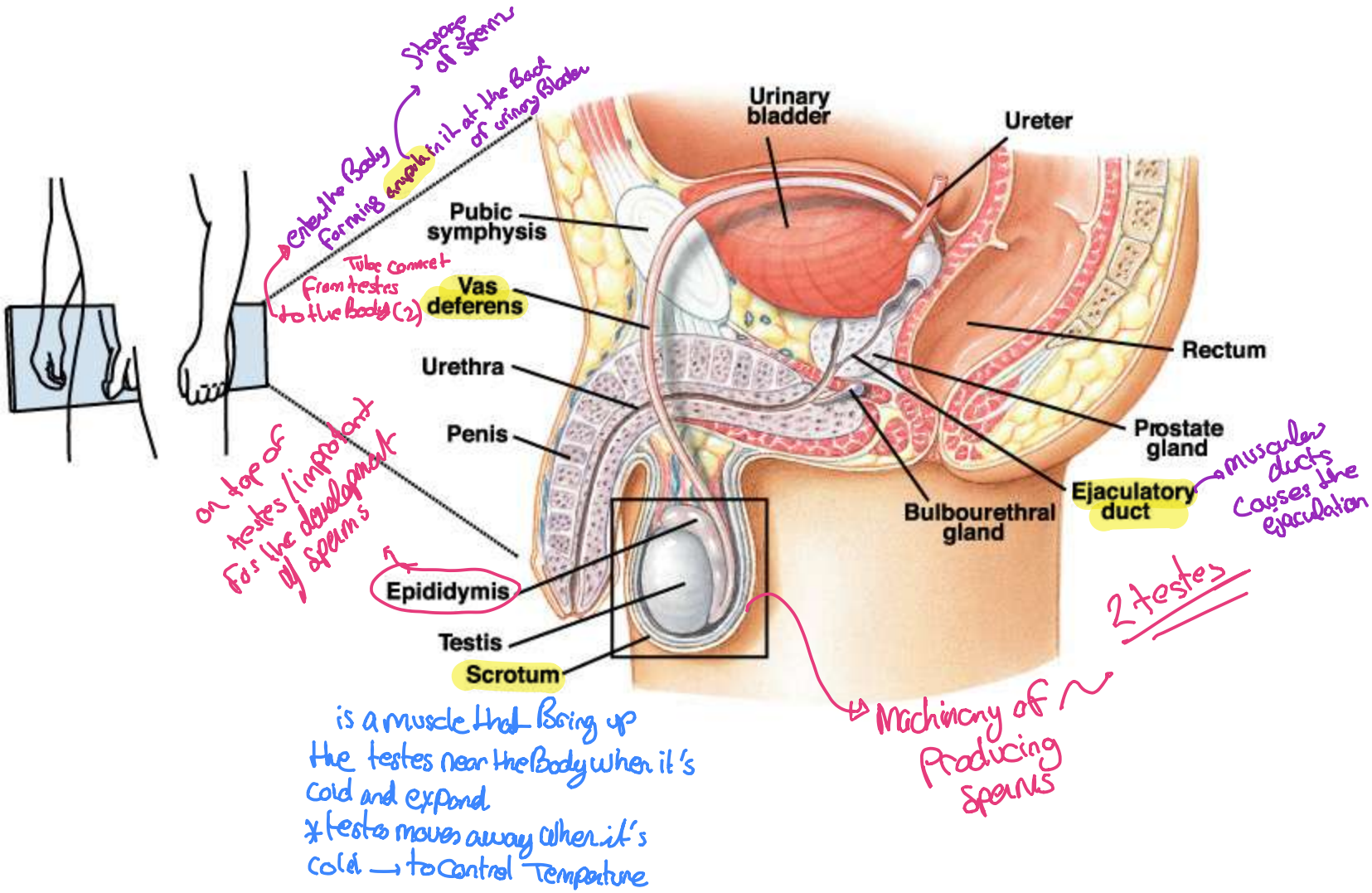
Seminal vesicle → Sperm United Components → seminal fluid → allow sperm to survive.

Cleave any traces of urine → to lubricat sex

Set Base of Penis → Prepare the area for excitment → Release colorless viscous fluid that mix in Urethra

At male excitment → Parasympathatic

Penis has a unique tissues → has a spongy tissue which have spaces and allow Blood vessels to expand in them


Urinary bladder
Ureter
Pubic symphysis
Vas deferens
Urethra
Penis
Rectum
Prostate gland
Ejaculatory duct
Bulbourethral gland
Epididymis
Testis
Scrotum
Storage of sperms
Enter the Body Forming
Tube connect From testes to the body (2)
on top of testes (important for the development of sperms
is a muscle that bring up the testes near the body when it's cold and expand
* testes moves away when it's cold → to control Temperature
Machinery of Producing sperms
2 testes
muscular ducts causes the ejaculation

*Sperms have capcity to move But unable to move.

*Capacitization

Main organ to Produce Sperm + Hormones

Testes → 90 chamber

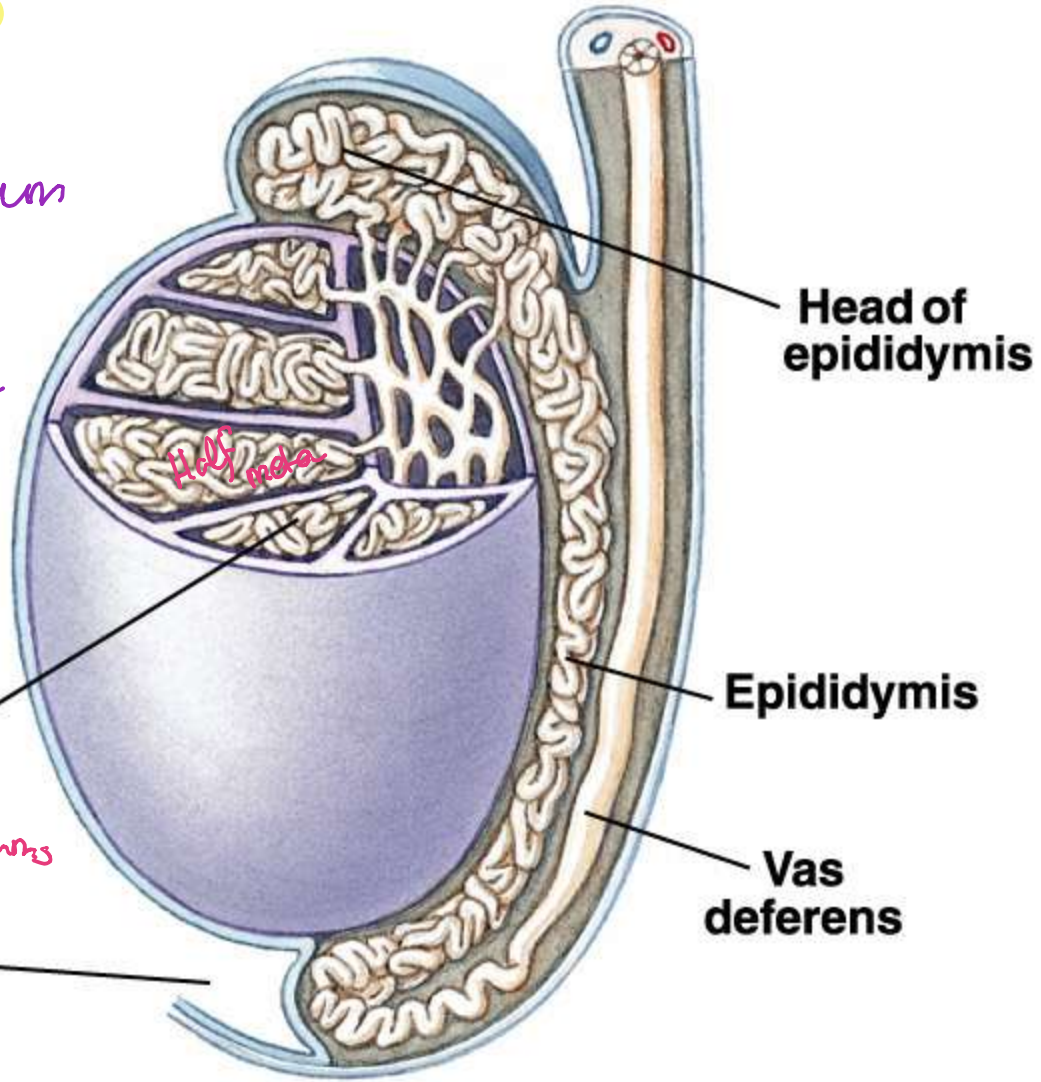
* each chamber has Seminiferous Tuble

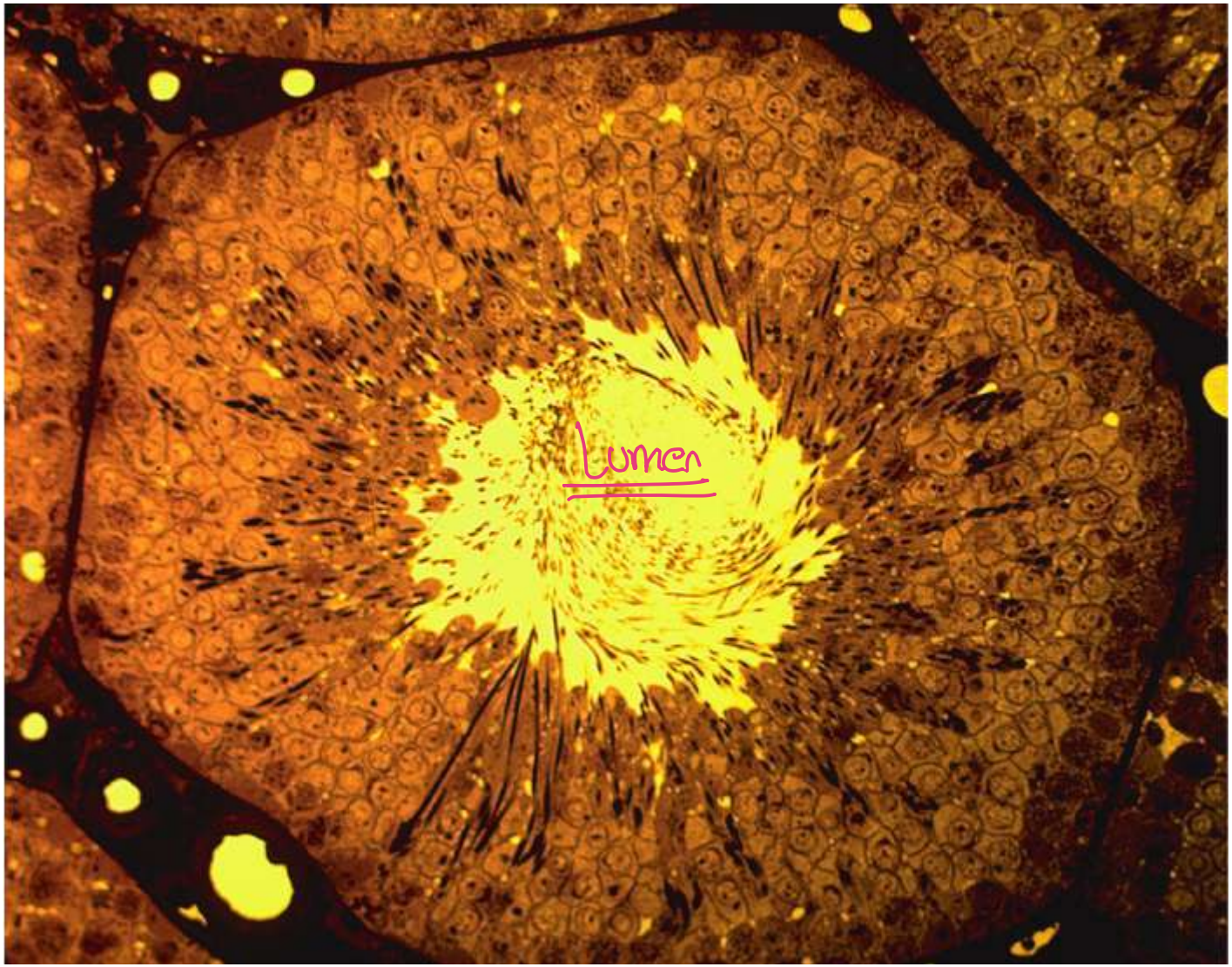
Total length → 45m
Both 90

Seminiferous tubule

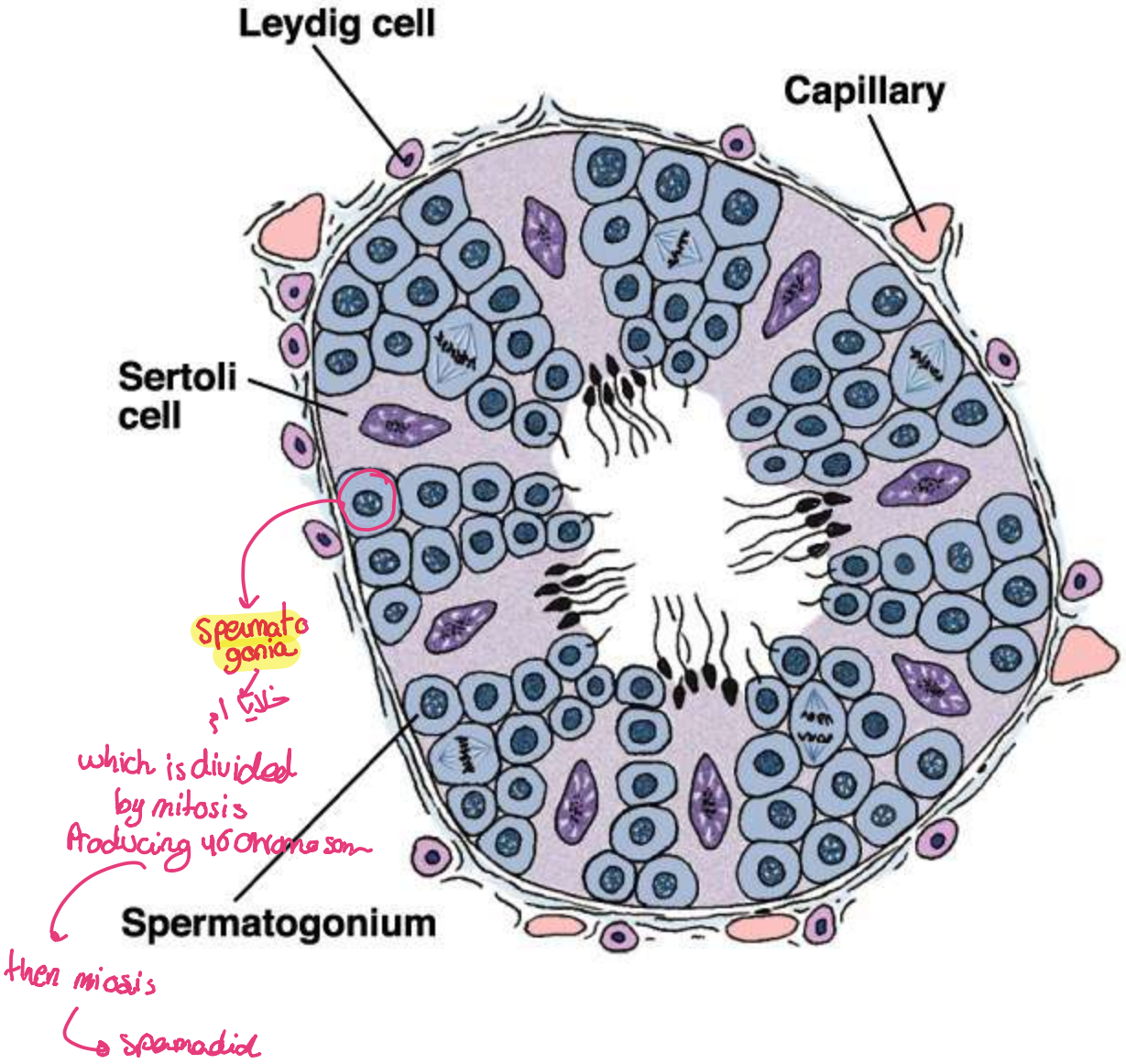
Small Tubles Containing the cell Producing sperms

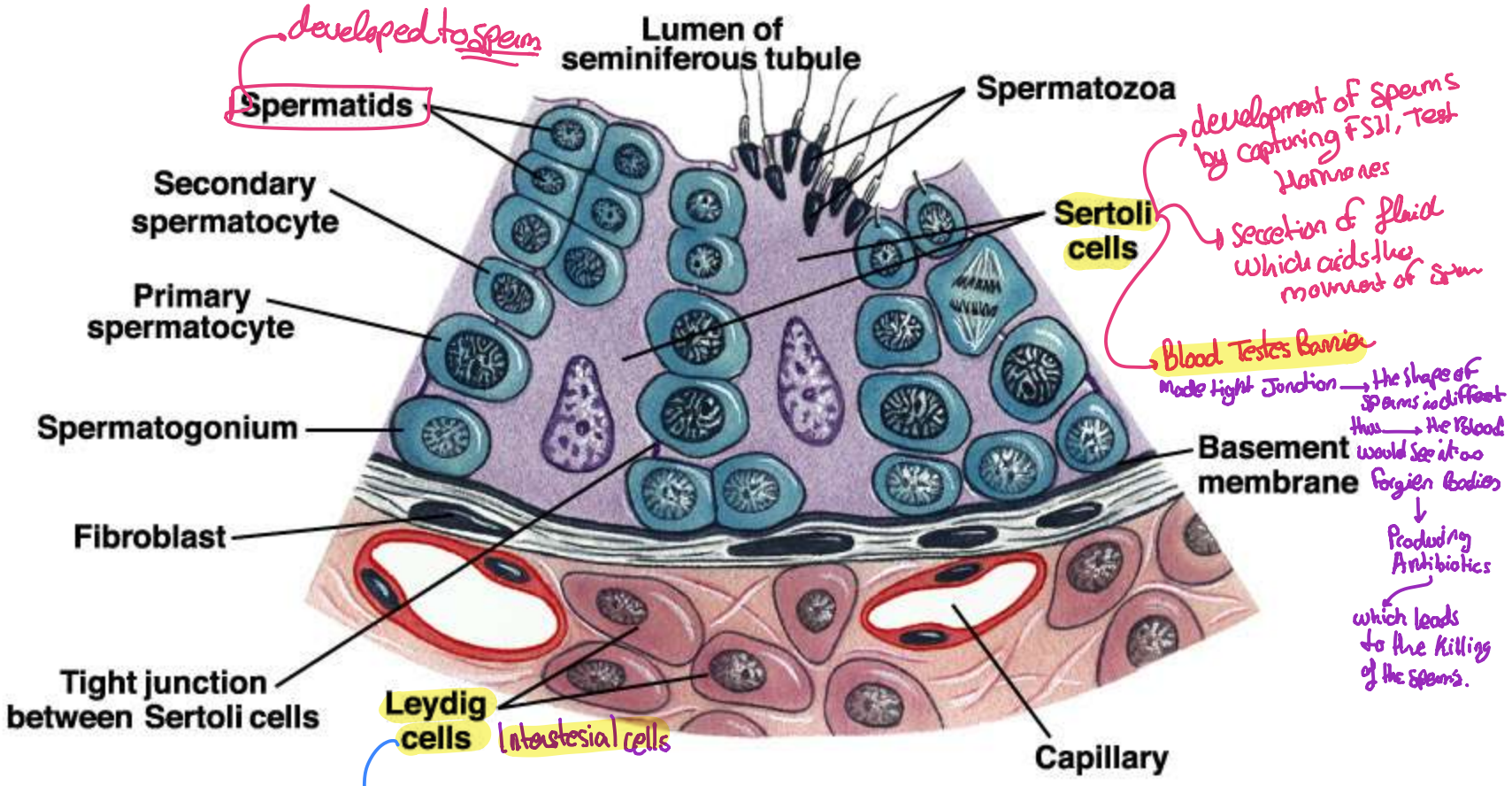
Spermato gonia





* Lumen that Sperm can Pass through * membrane → have spermatogonia


Leydig cell
Capillary
Sertoli cell
Spermatogonia
خلايا ام
which is divided by mitosis producing 46 chromosom
then miosis
spermatid
Spermatogonium


developed to sperm
Spermatids
Lumen of seminiferous tubule
Spermatozoa
Secondary spermatocyte
Primary spermatocyte
Spermatogonium
Fibroblast
Tight junction between Sertoli cells
Sertoli cells
development of sperms by capturing FSH, Test Hormones
Secretion of fluid which aids the movment of sperm
Blood Testes Barrier
made tight Junction → the shape of sperms is different thus → the blood would see it as foreign Bodies
Producing Antibiotics
which leads to the killing of the sperms.
Basement membrane
Leydig cells
Interstesial cells
Capillary
Out side the Seminfreous Tubule
1) Target of the LH
LH → Sertoli cell → Producing Testosterone
Sperm.

3 Areas:

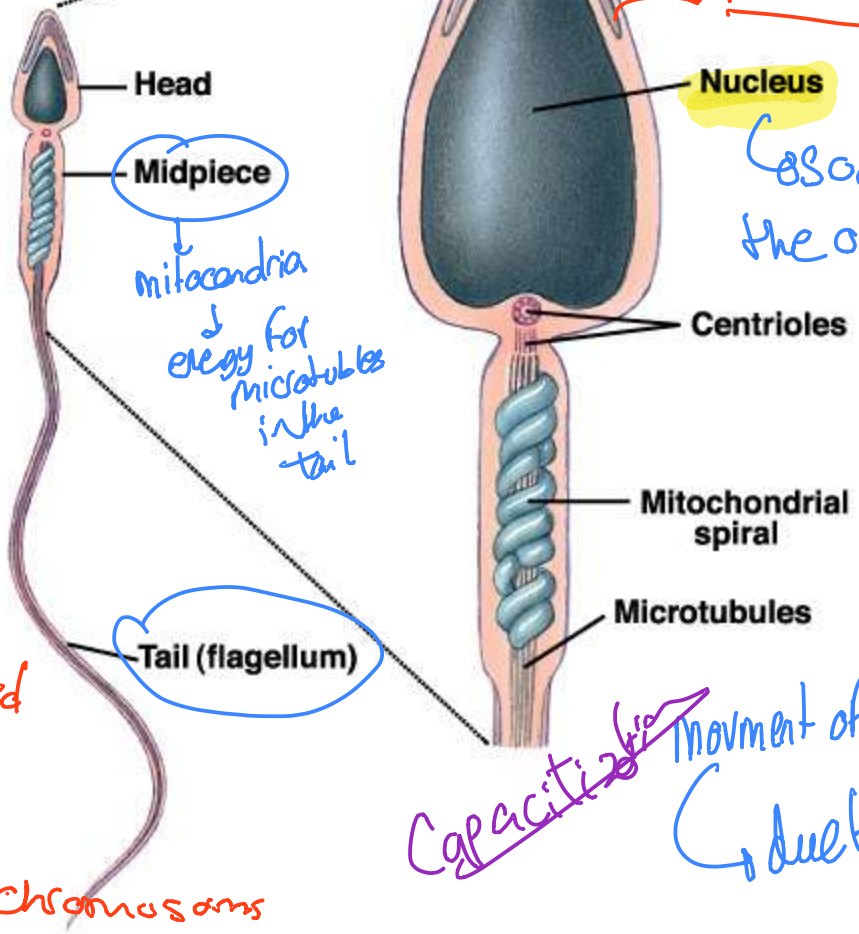
Sperm Head

Neck

Tail

↓

Flagilla.



Powerful enzymes يحتوي القراب على بفتت

Powerful enzyme

to support Sperm to Pass Between Cells

يخرقوا البويضة بفتت التصاقات Hyaluronic acid يحتوي القراب

mitocandria

Nucleus

is smaller than the one of the oocyte

mitocandria

↓

energy for microtubles in the tail

The Head is compacted

Every tiny + small

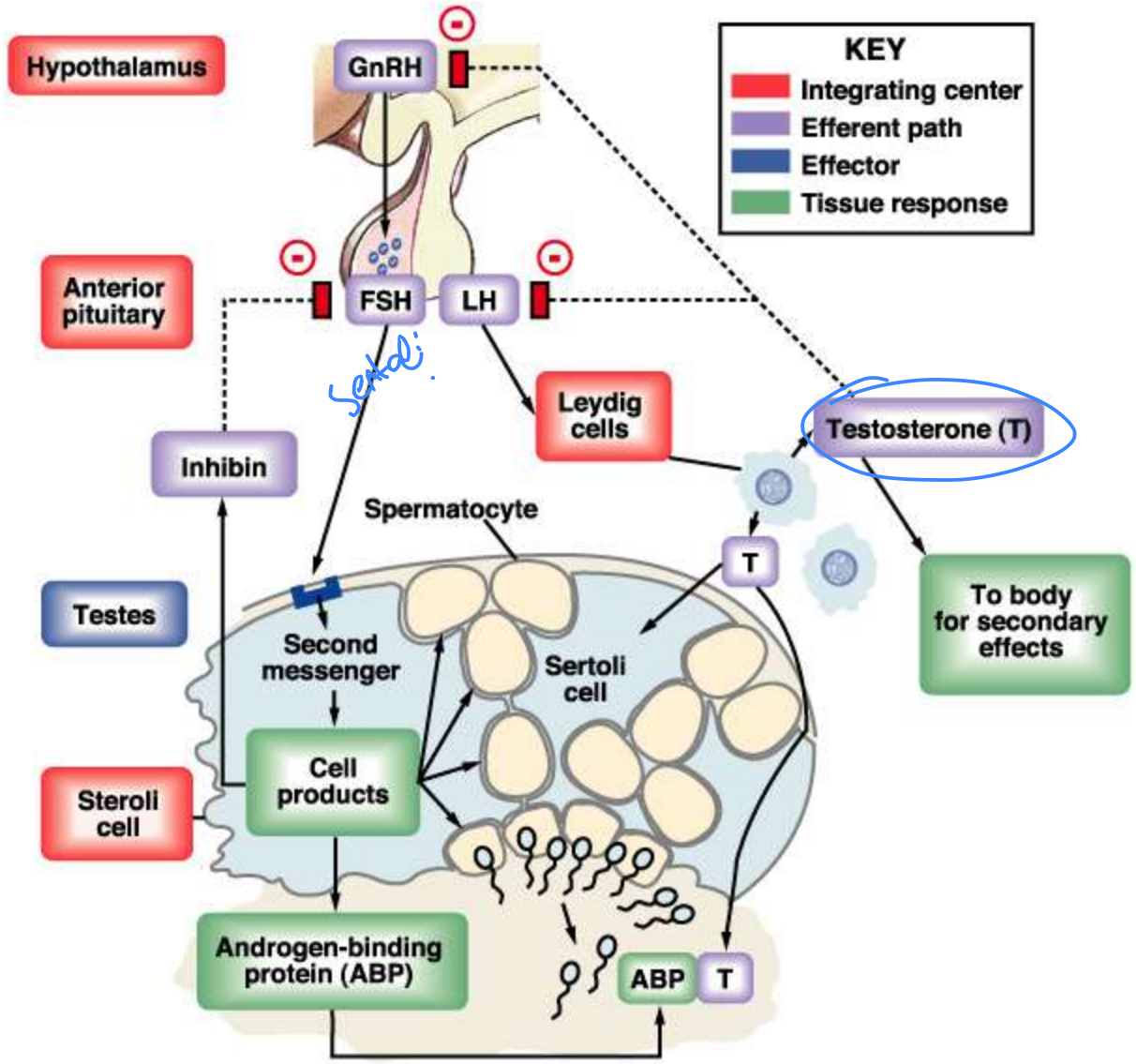
the Head → Nucleus → 23 Chromosoms

Capacitation

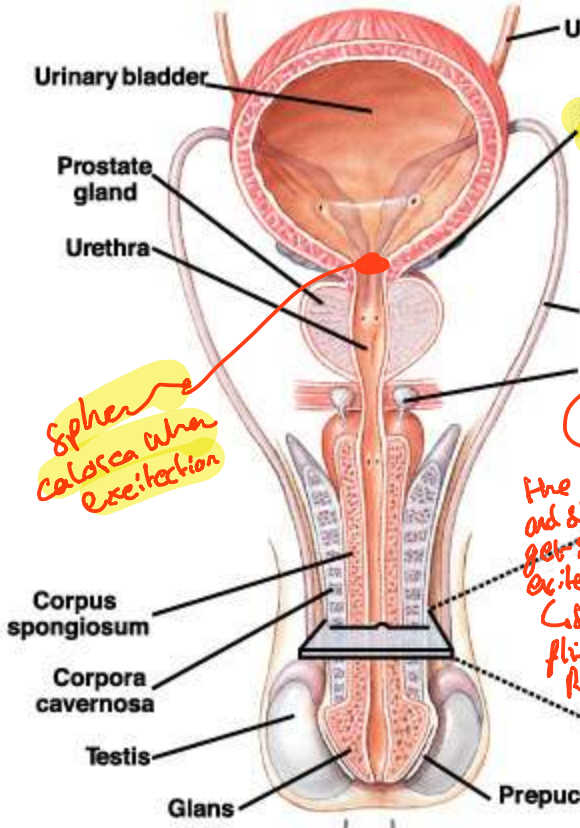
Movment of Sperm is inhibited

↳ due to the loss of energy

life span → 3 day في بيئة انثوية


KEY
Integrating center
Efferent path
Effector
Tissue response
Hypothalamus
GnRH
Anterior pituitary
FSH
LH
Sertoli
Leydig cells
Testosterone (T)
Inhibin
Spermatocyte
T
To body for secondary effects
Testes
Second messenger
Sertoli cell
Cell products
Steroli cell
Androgen-binding protein (ABP)
ABP
T

*Penis:



Seminal vesicle → Glands (exo) Release essential fluid for the life of sperms → Releasing 60% → Come out from these glands (Semen).

Fructose + menial fluid + ... + enzymes cause Coagulation of Semen.

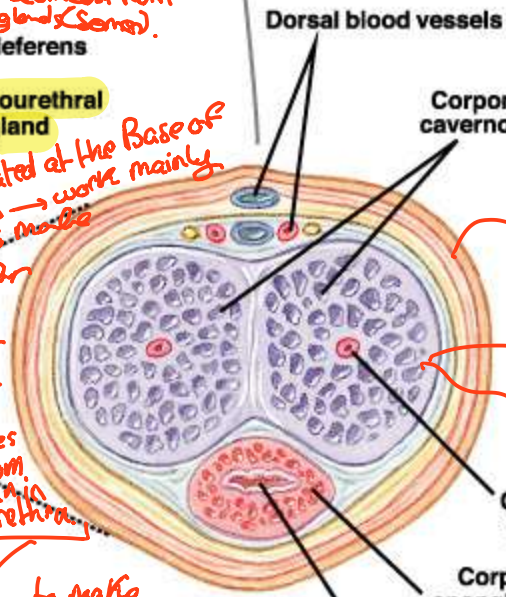
why does that happen? to stick higher in the vagina

↳ 30% of fluid is produced by Prostate

what is left 10%? ↳ from the Testes.

Spher... ↳ Corpora when excitation

Bulbourethral gland ↳ located at the Base of the penes → work mainly ... get sexually excited ↳ secret fluid to Remove traces from urine in urethra.



Unique Structure.

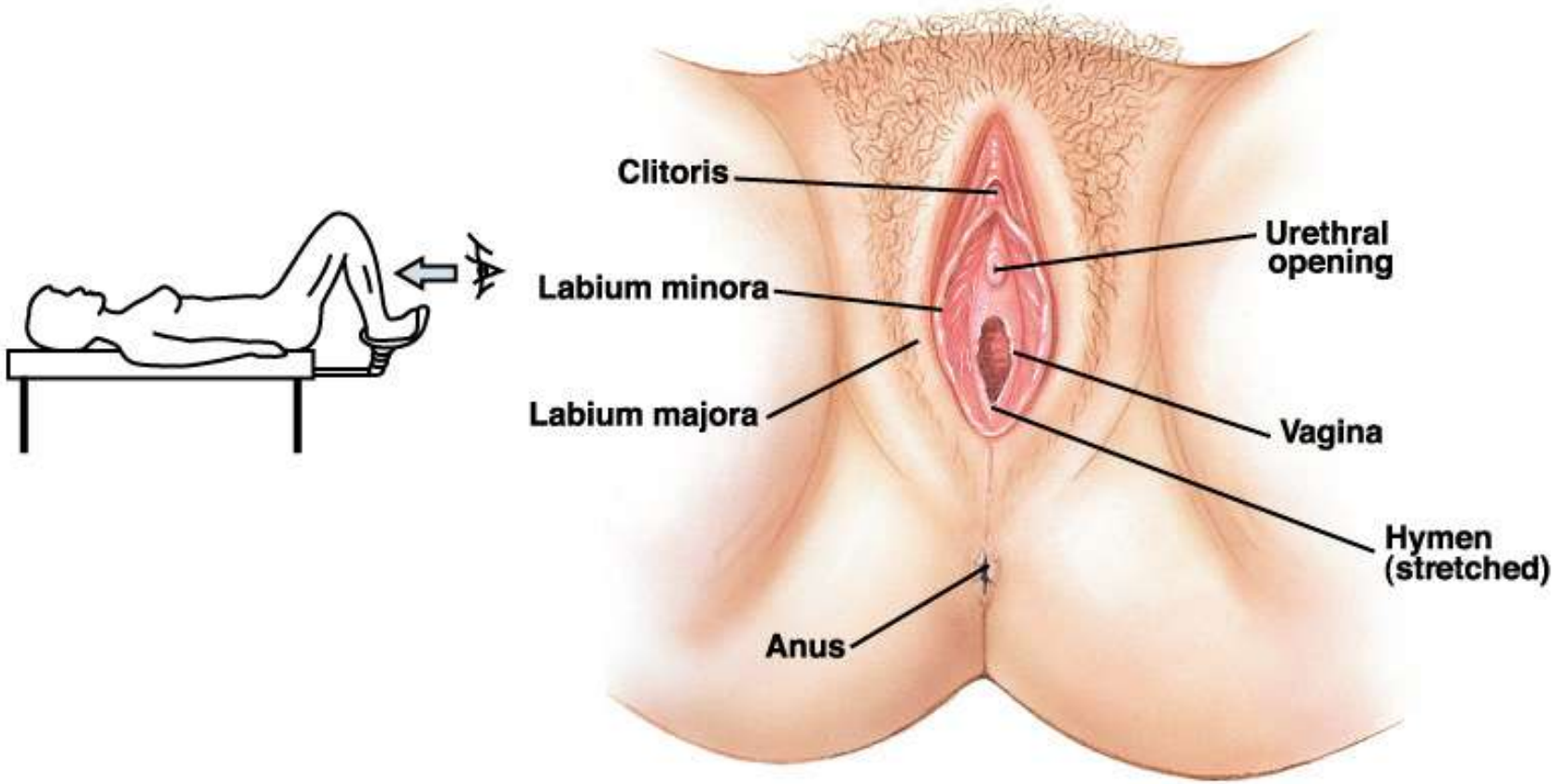
Erectile Tissues

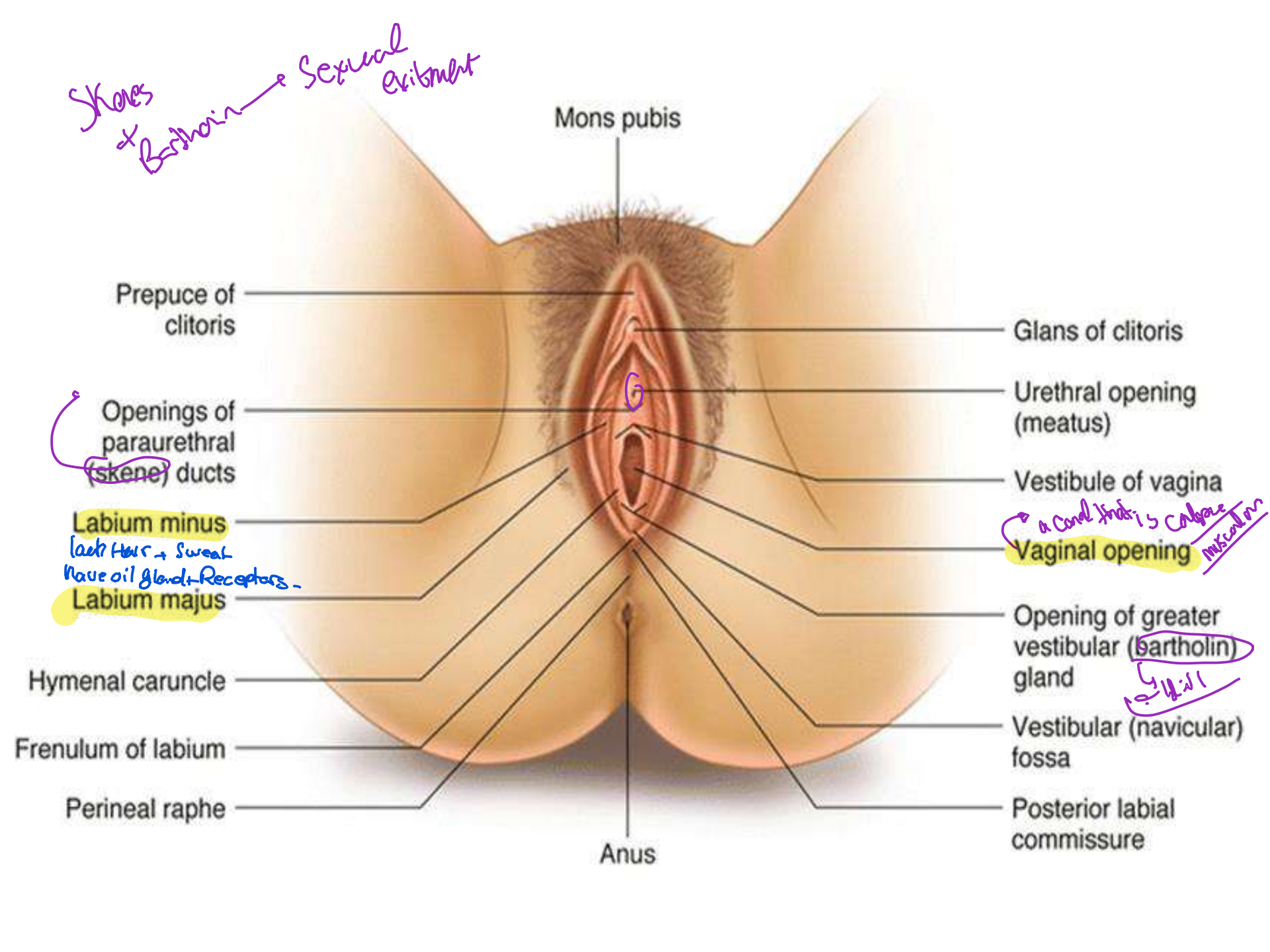
Sponge

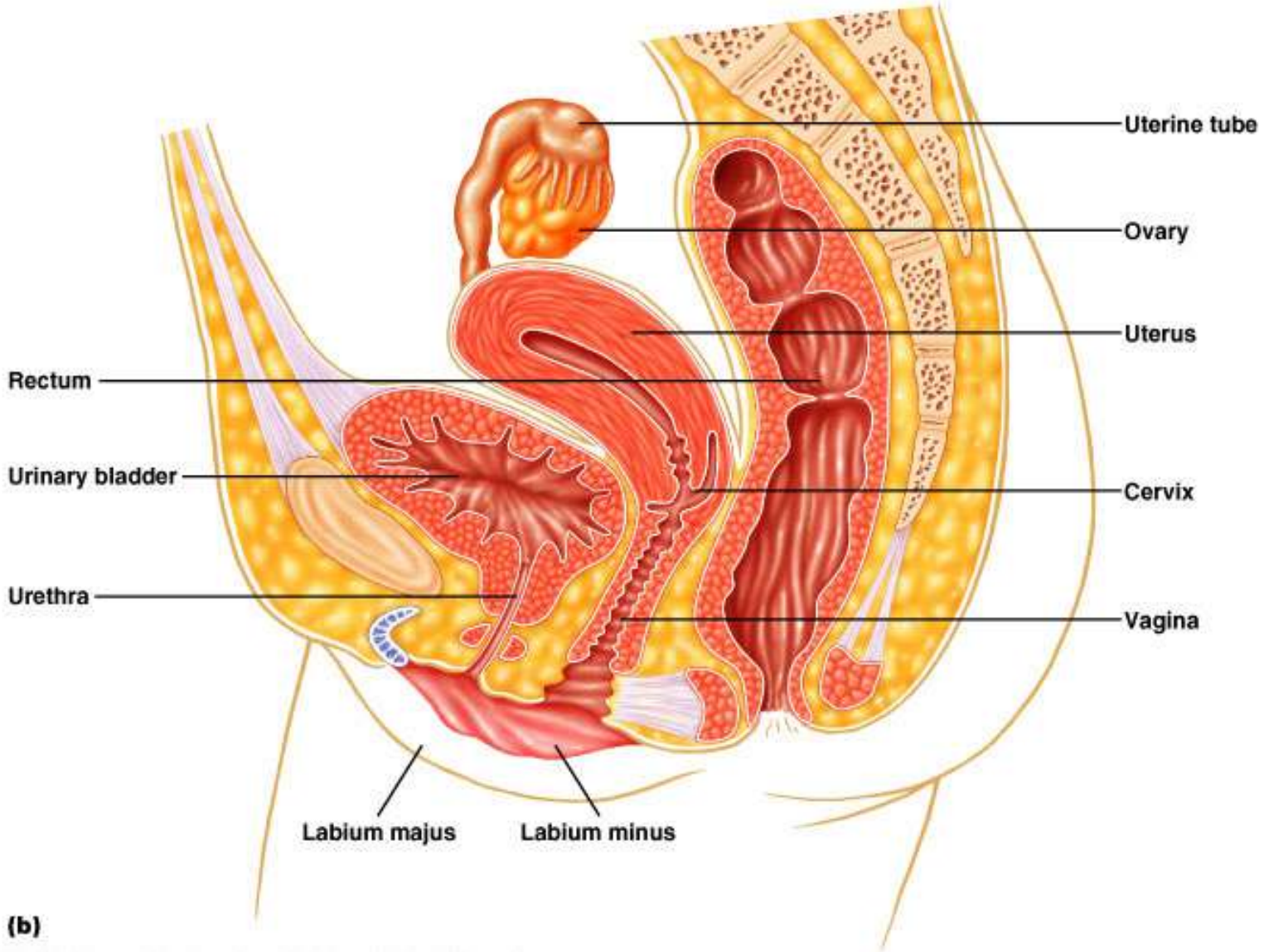
Blood vessels ↳ Parasympathetic innervation.

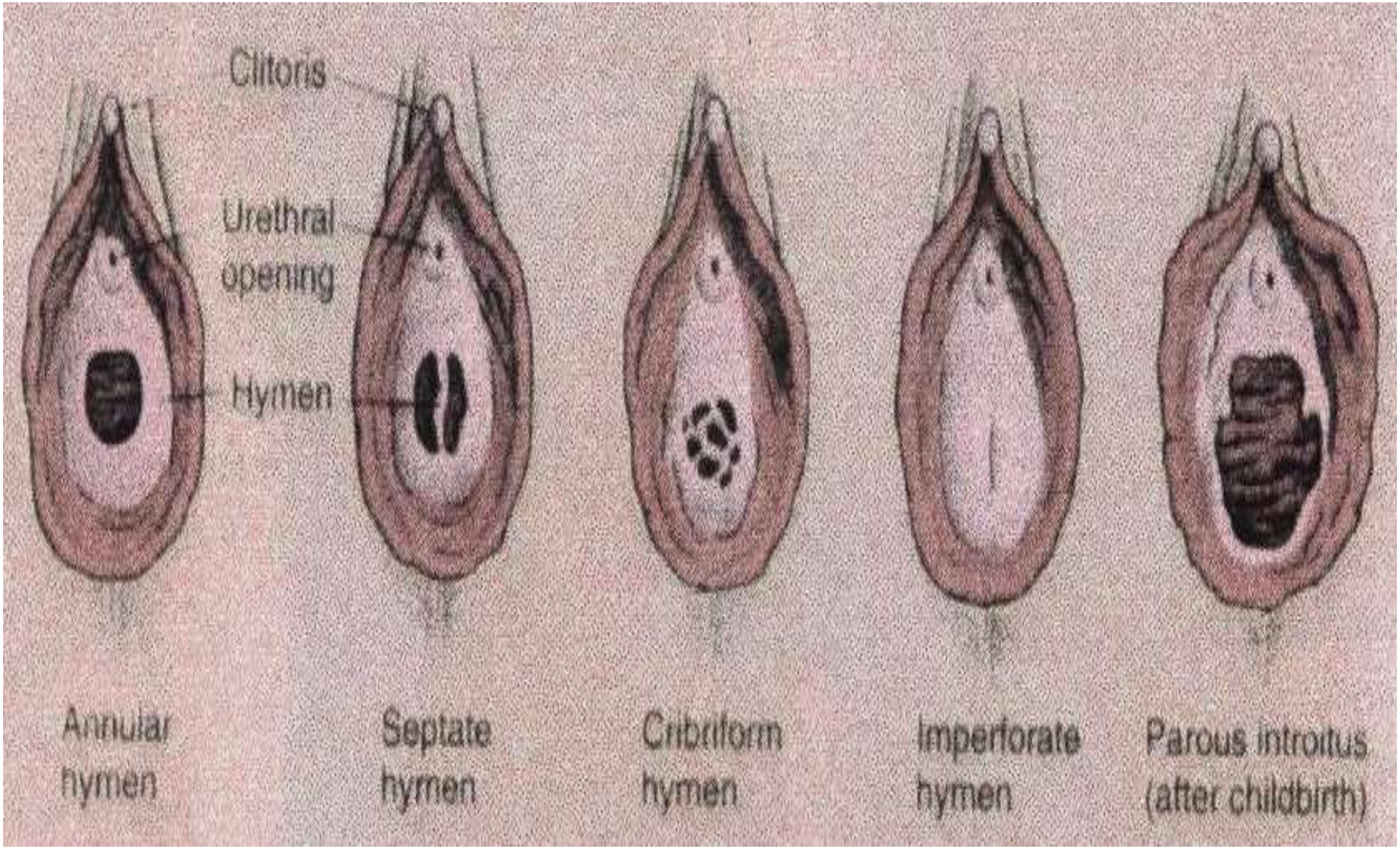
Because to make sure there is no toxic material that affect Semen.

Bigger ↳ more blood flow.

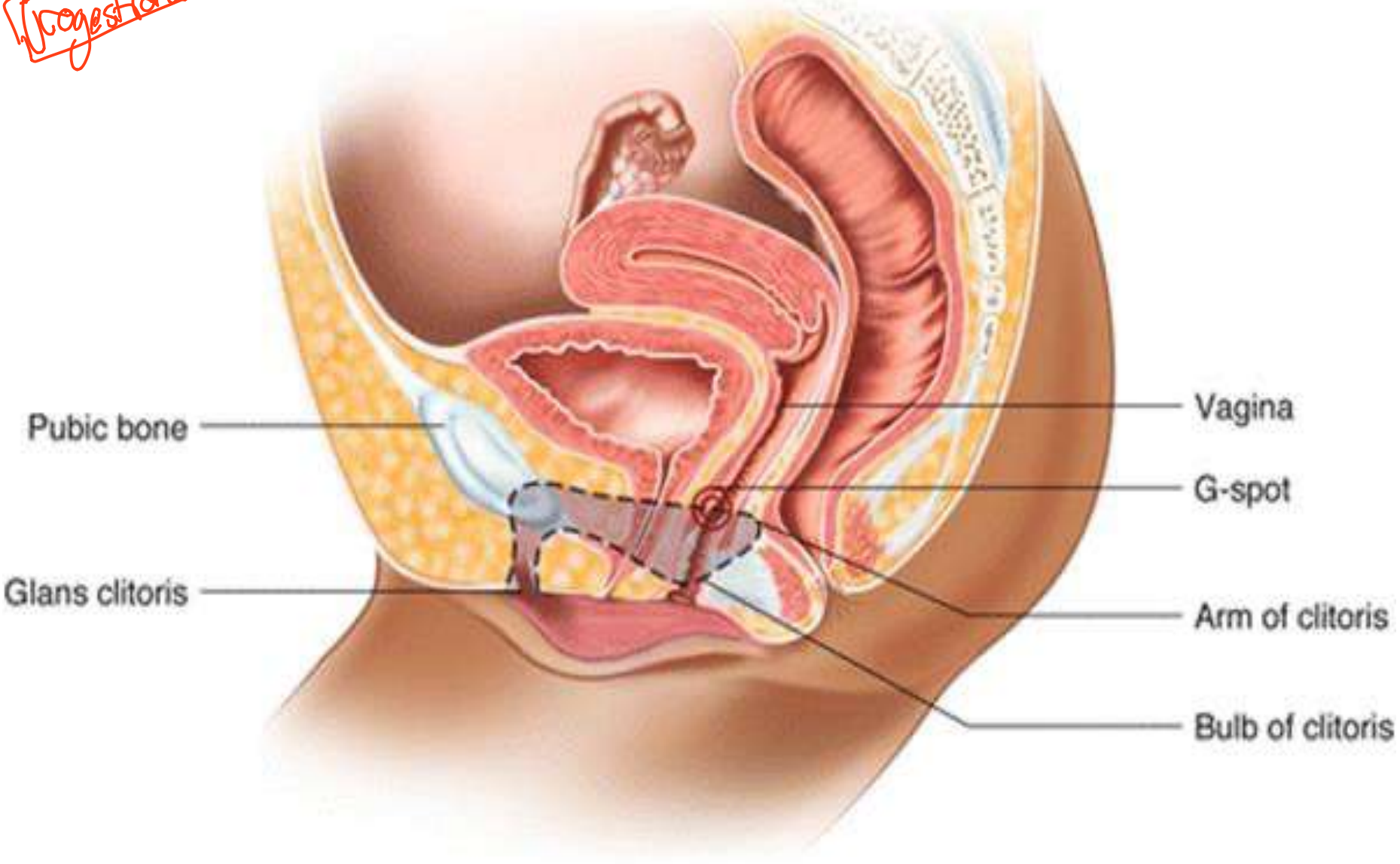

Clitoris
Urethral opening
Labium minora
Labium majora
Vagina
Hymen (stretched)
Anus


Mons pubis
Prepuce of clitoris
Glans of clitoris
Openings of paraurethral (skene) ducts
Urethral opening (meatus)
Vestibule of vagina
Labium minus
Vaginal opening
Labium majus
Opening of greater vestibular (bartholin) gland
Hymenal caruncle
Vestibular (navicular) fossa
Frenulum of labium
Perineal raphe
Posterior labial commissure
Anus

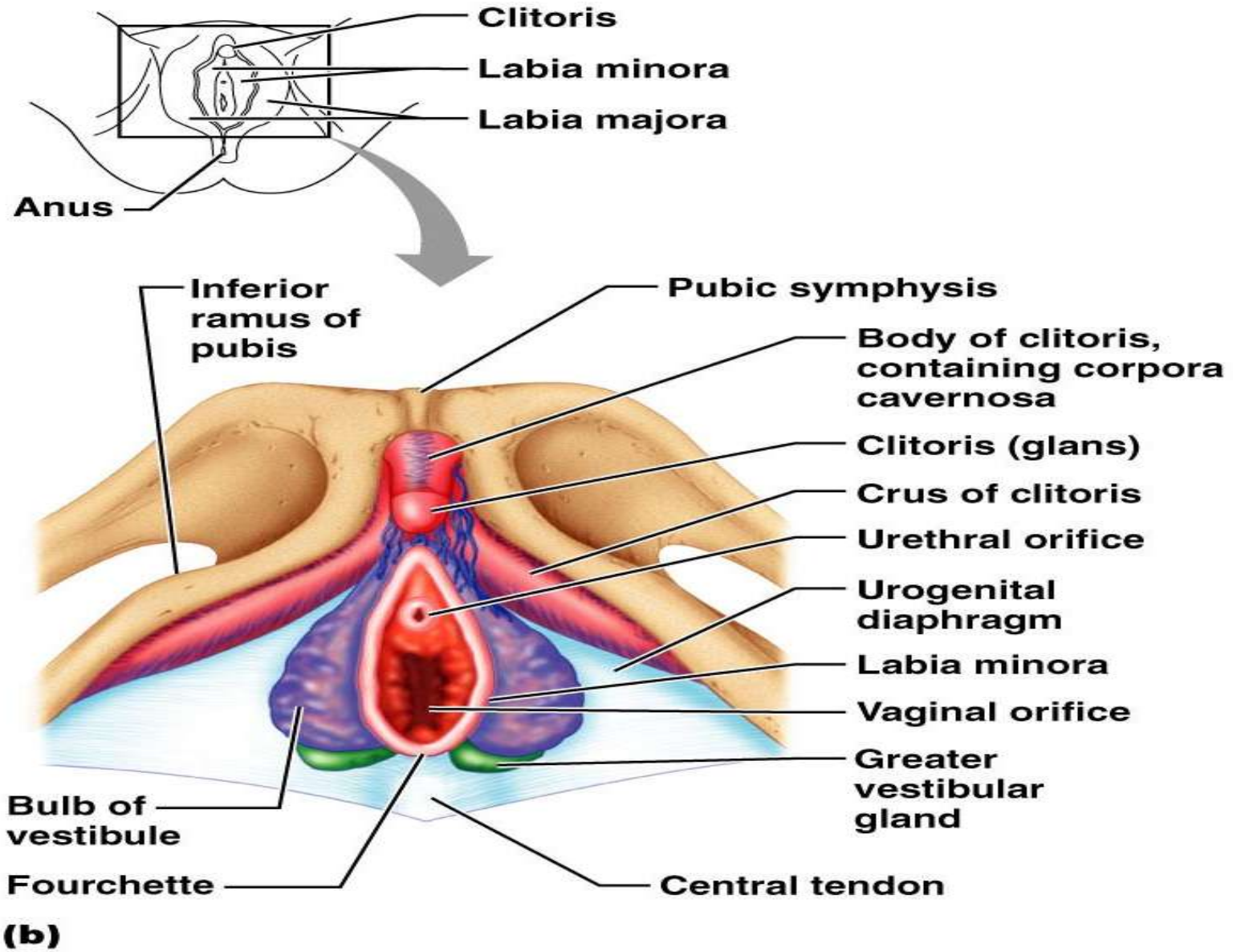

Uterine tube
Ovary
Uterus
Rectum
Urinary bladder
Cervix
Urethra
Vagina
Labium majus
Labium minus
(b)

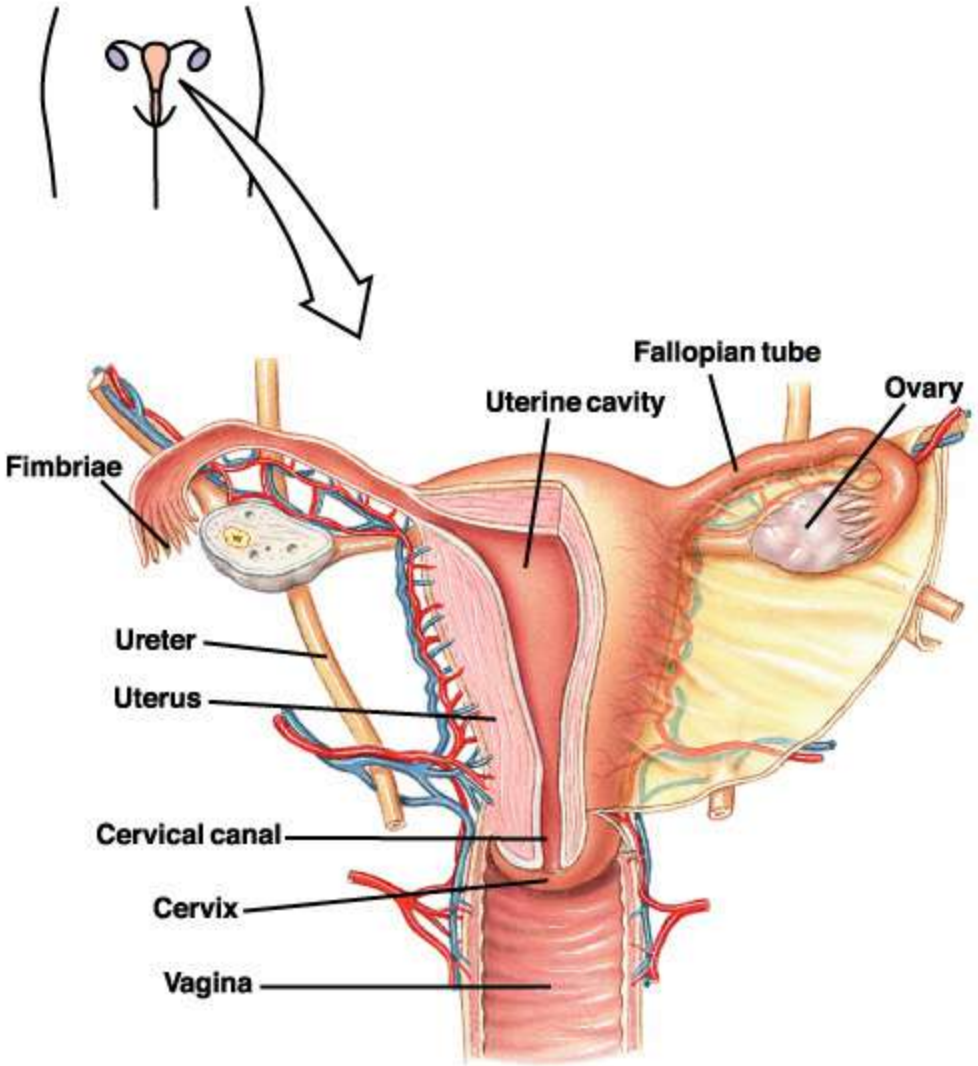

Clitoris
Urethral opening
Hymen
Annular hymen
Septate hymen
Cribriform hymen
Imperforate hymen
Parous introitus (after childbirth)

Progesterone

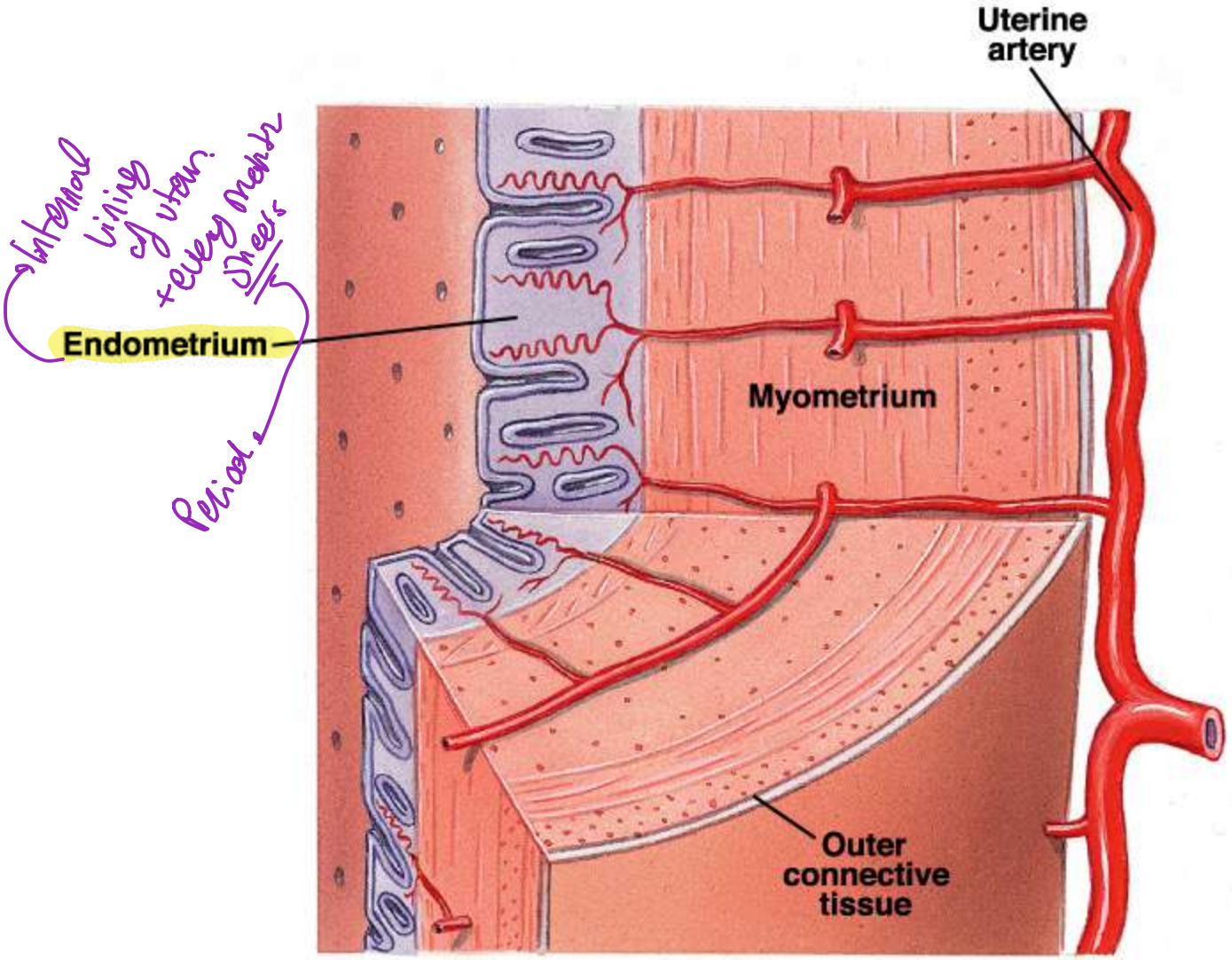


Female External Genitalia: Deep




Fallopian tube
Uterine cavity
Ovary
Fimbriae
Ureter
Uterus
Cervical canal
Cervix
Vagina

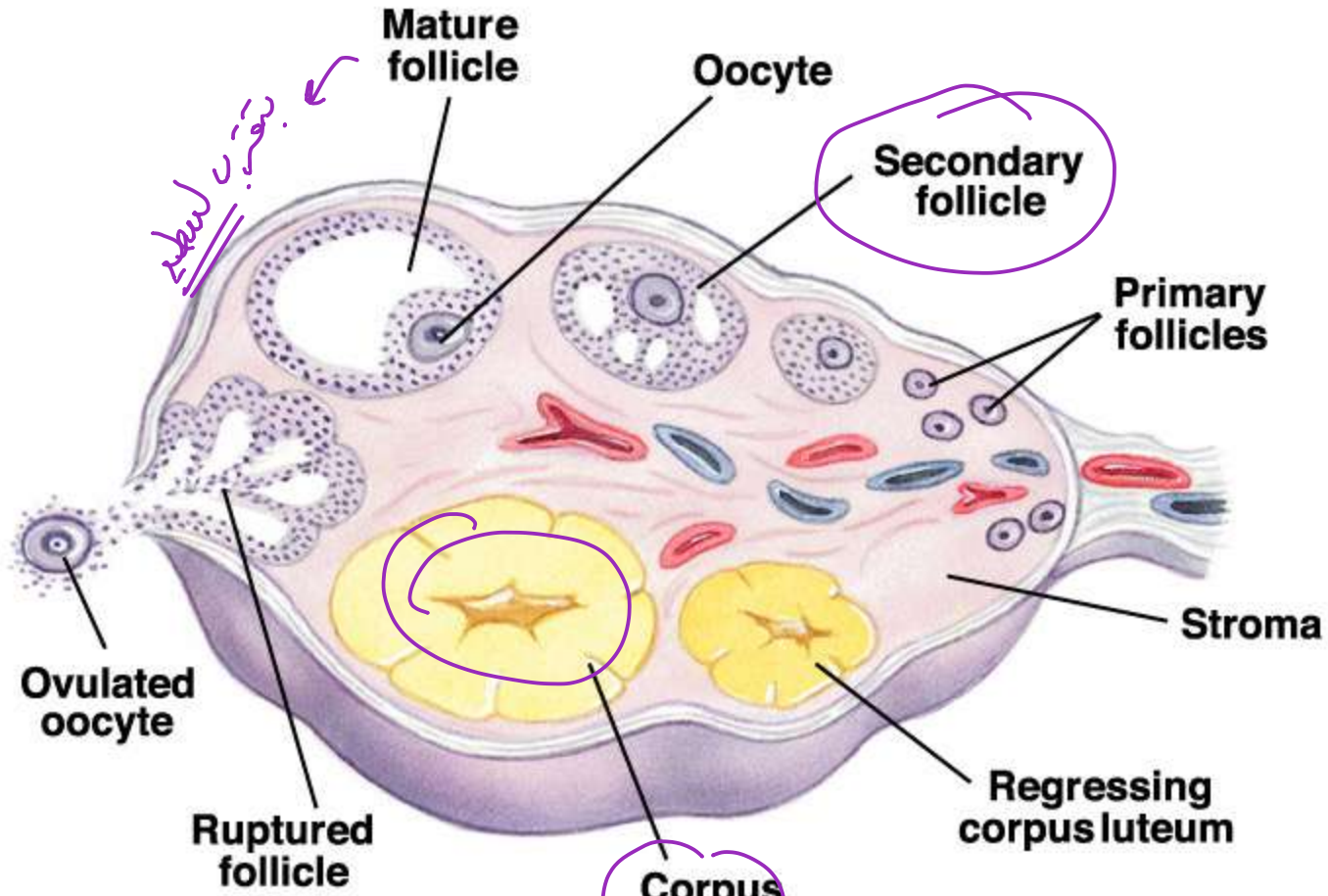
Cycle is a hormonal cycle.



Internal lining of uterus + every month sheets

Period

Number of oocytes is determined

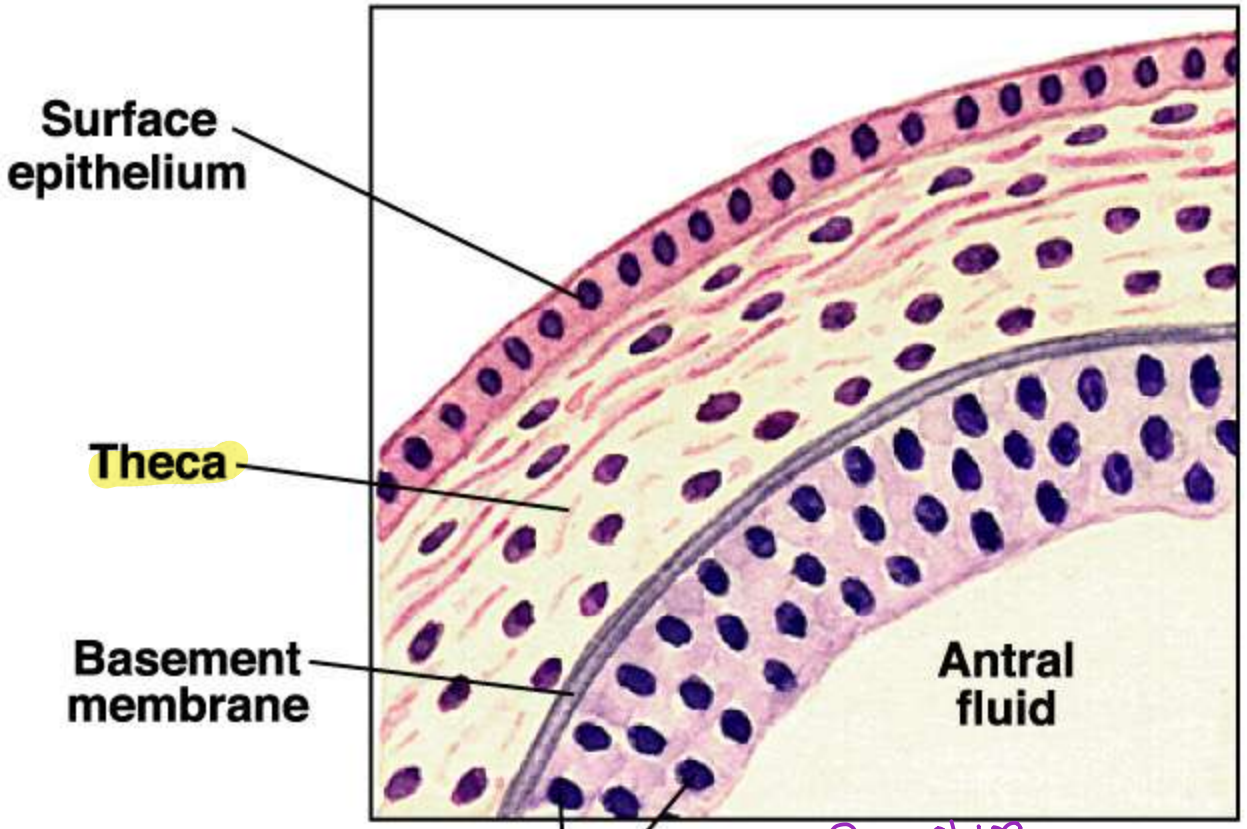


Human Coriomic gonadotropin
↓
the Hormone Released by Fetus.

Release estrogen + progestrone

if there was a message of Pregnancy → the corpus luteum stays alive
the message comes from the fetus itself → A Hormone Released by it

* if there was no Progastrone → Period



LH Receptors

↳ Release estrogen + Progesterone

Feedback Mechanisms in Ovarian Function

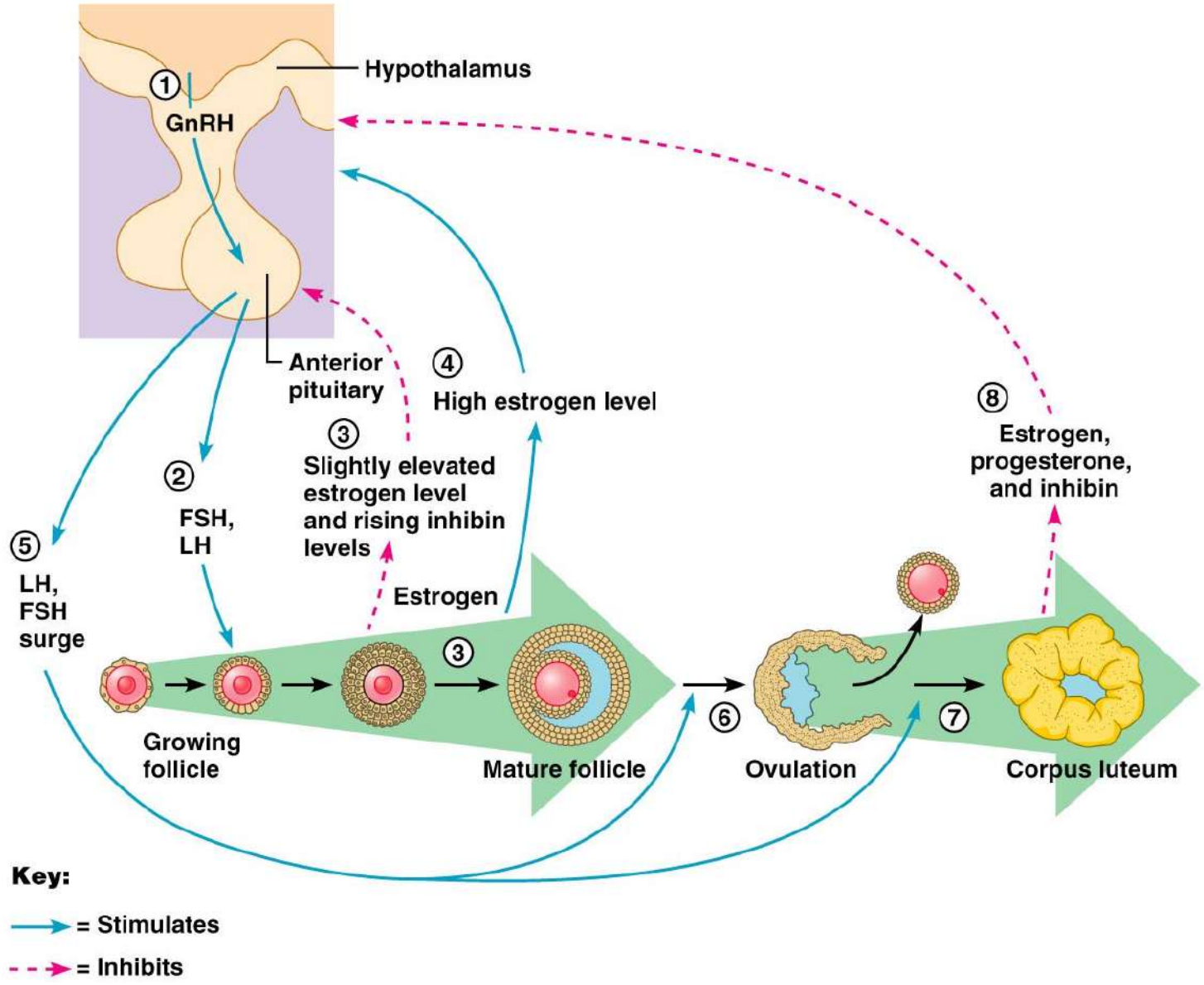


Figure 27.21

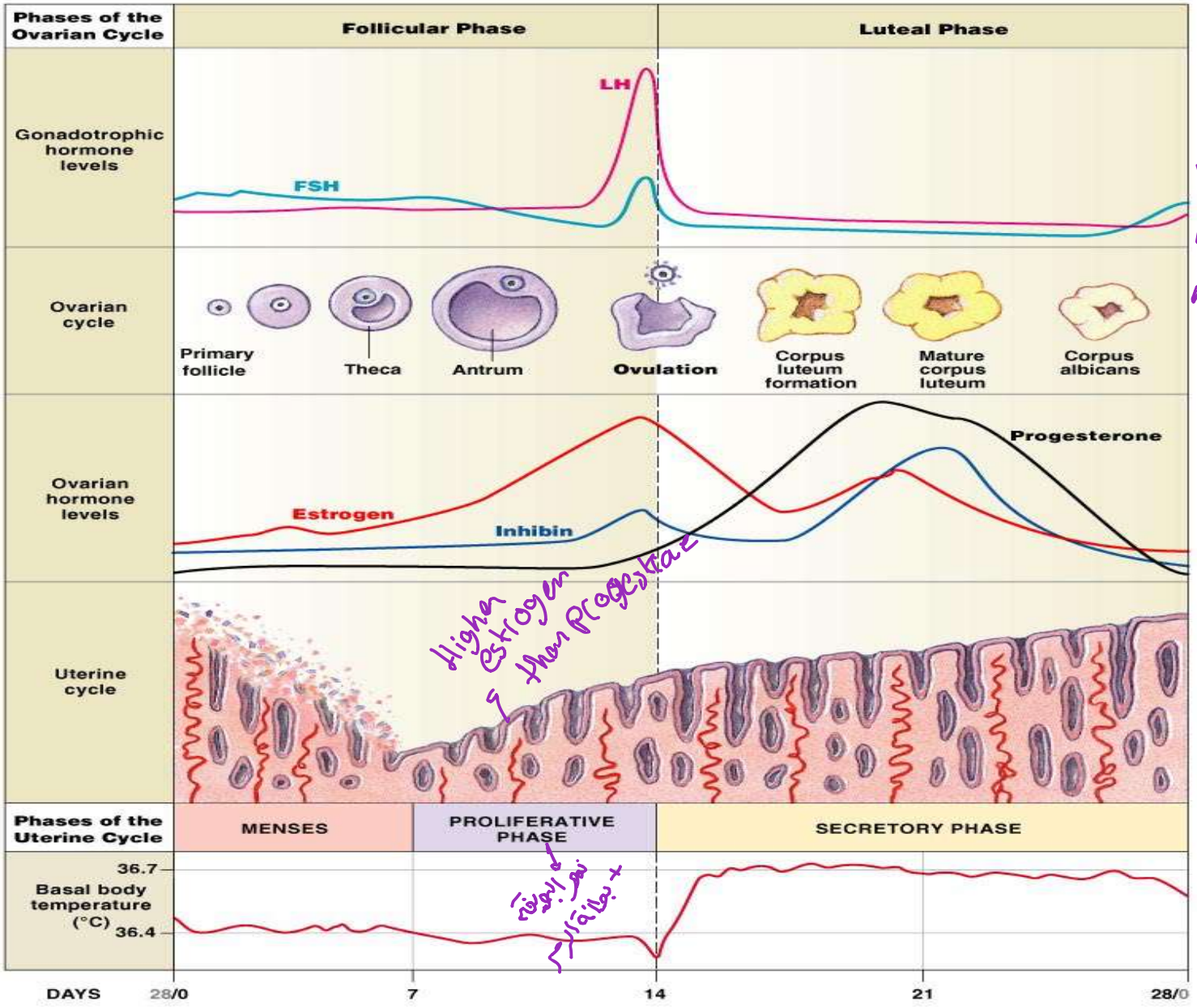
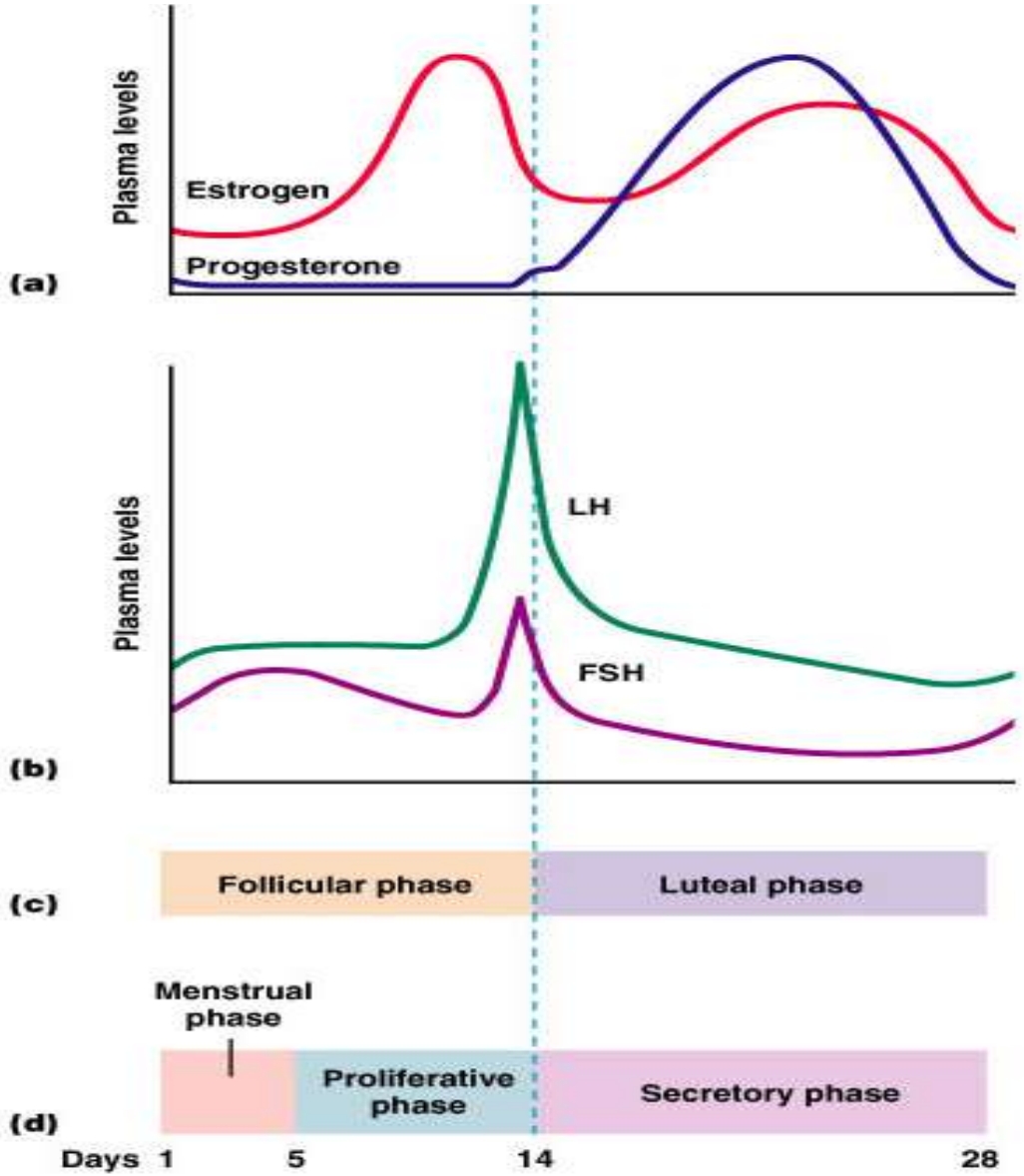
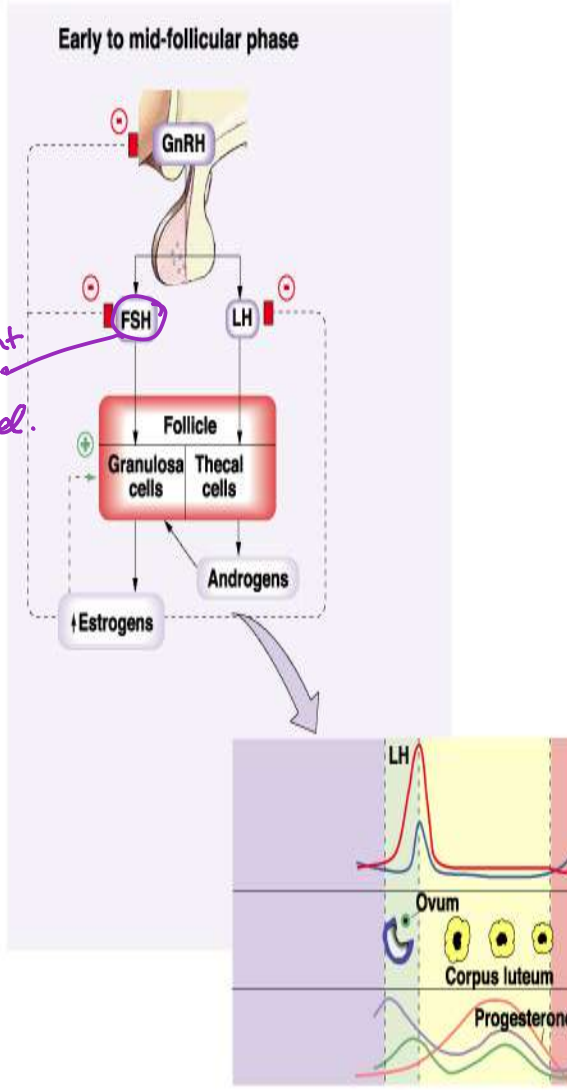


Figure 26-13

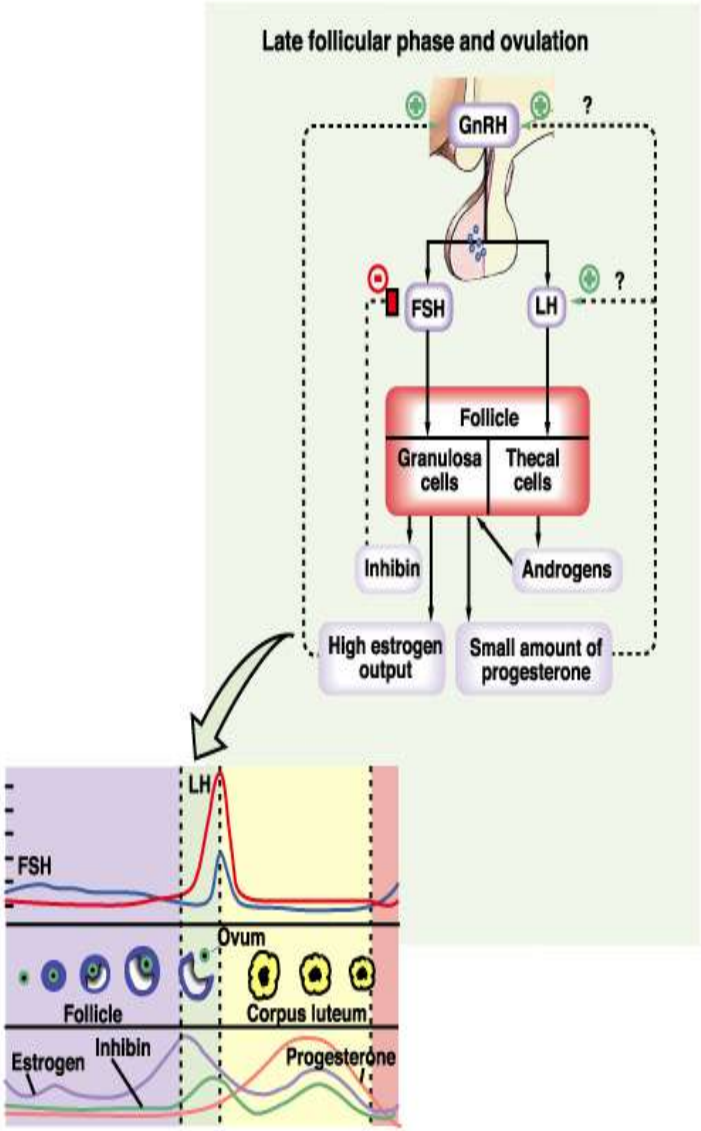
Hormonal Changes During Menstrual Cycle

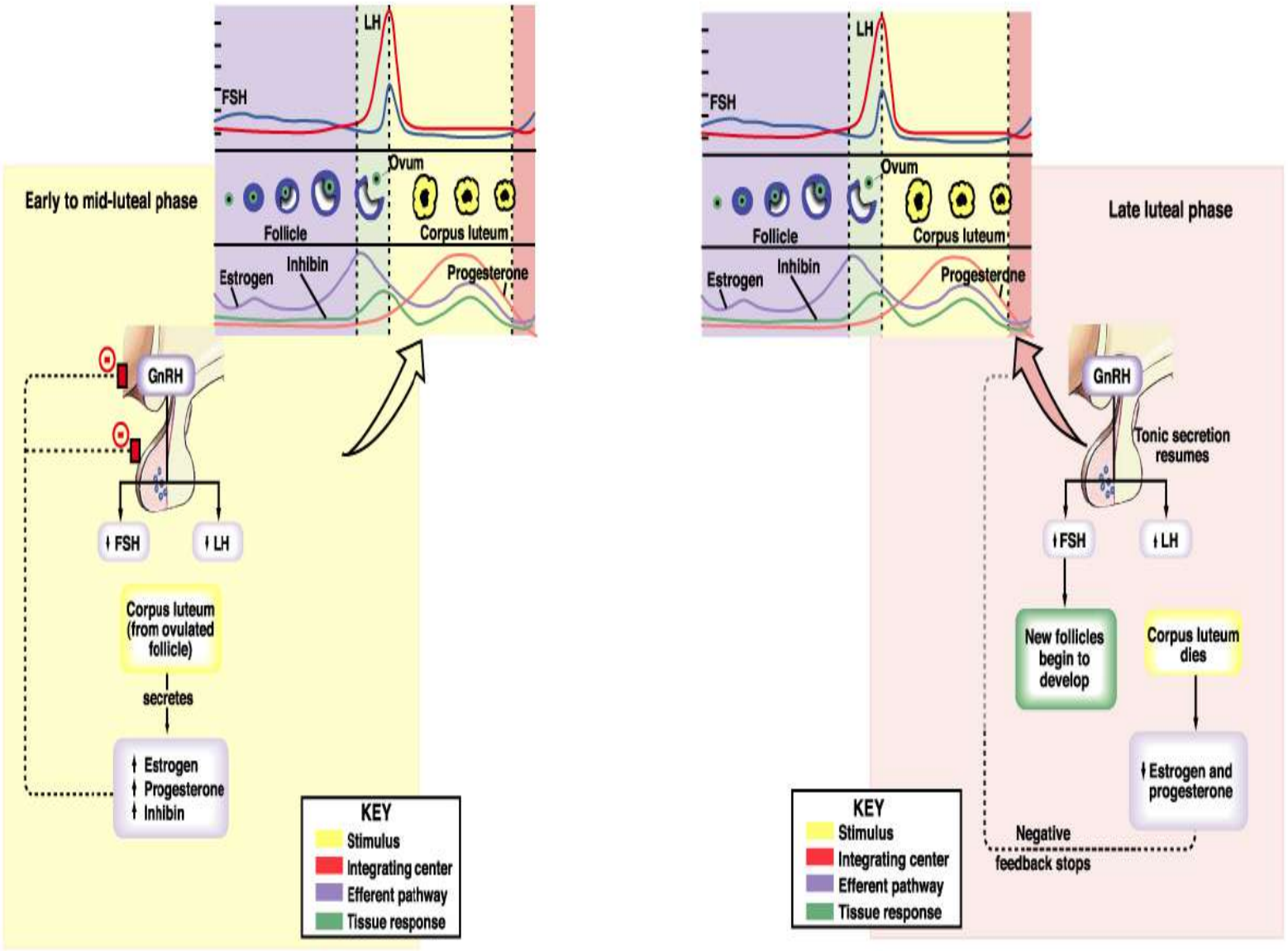


- Estrogen secreted from follicle 1st, then corpus luteum
- Progesterone secreted from corpus luteum
- LH and FSH secreted from anterior pituitary
- Estrogens and progesterone inhibit LH and FSH secretion



development of oocyte and follicel.

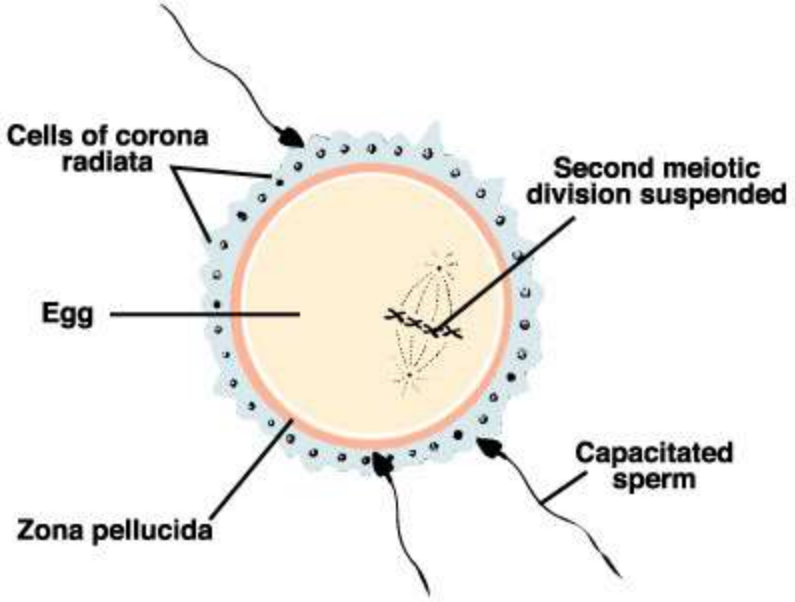



Early to mid-luteal phase
LH
FSH
Ovum
Follicle
Corpus luteum
Estrogen
Inhibin
Progesterone
GnRH
FSH
LH
Corpus luteum (from ovulated follicle)
secretes
Estrogen
Progesterone
Inhibin
KEY
Stimulus
Integrating center
Efferent pathway
Tissue response
Late luteal phase
LH
FSH
Ovum
Follicle
Corpus luteum
Estrogen
Inhibin
Progesterone
GnRH
Tonic secretion resumes
FSH
LH
New follicles begin to develop
Corpus luteum dies
Estrogen and progesterone
Negative feedback stops
KEY
Stimulus
Integrating center
Efferent pathway
Tissue response

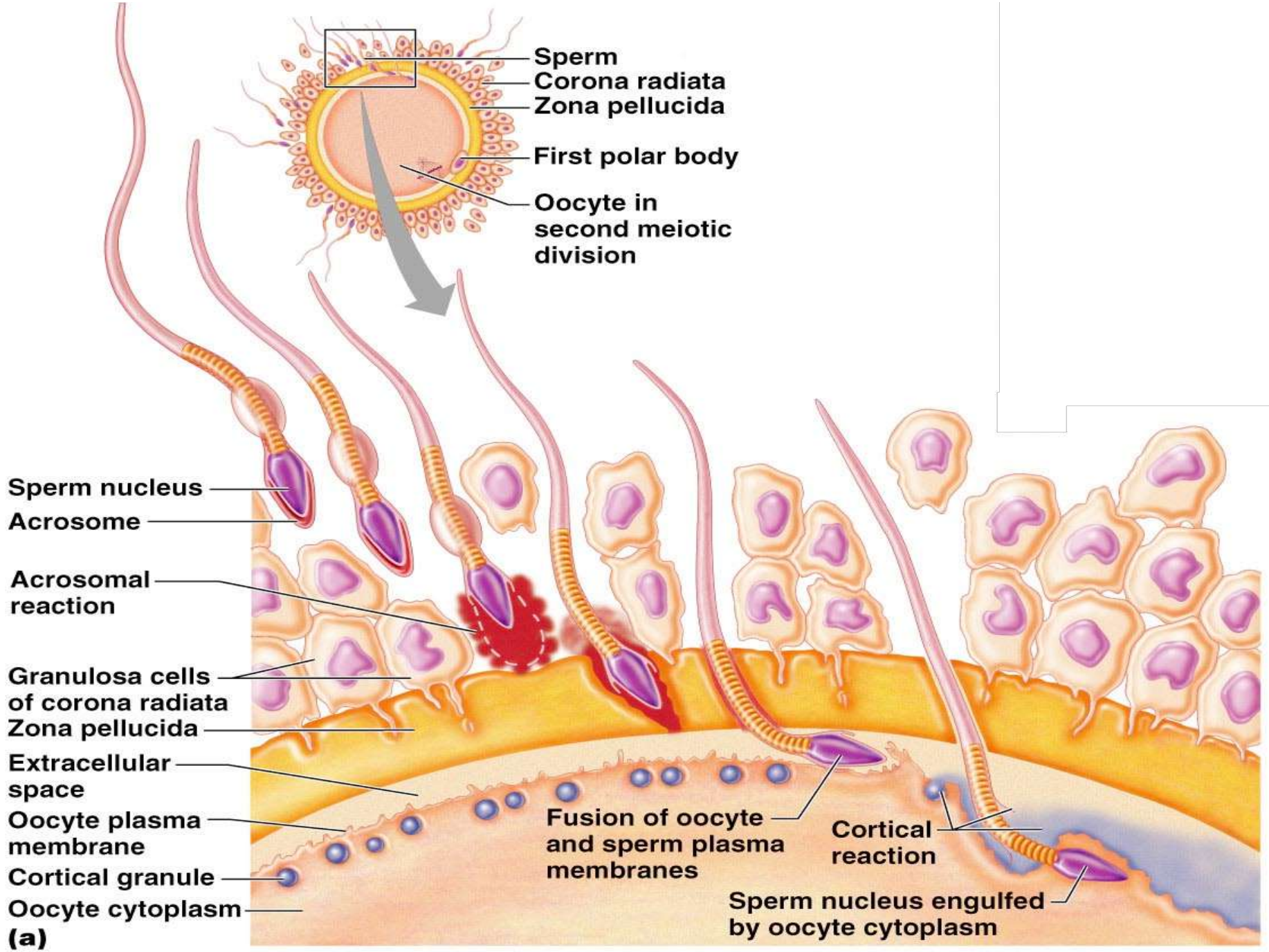
Fintilization

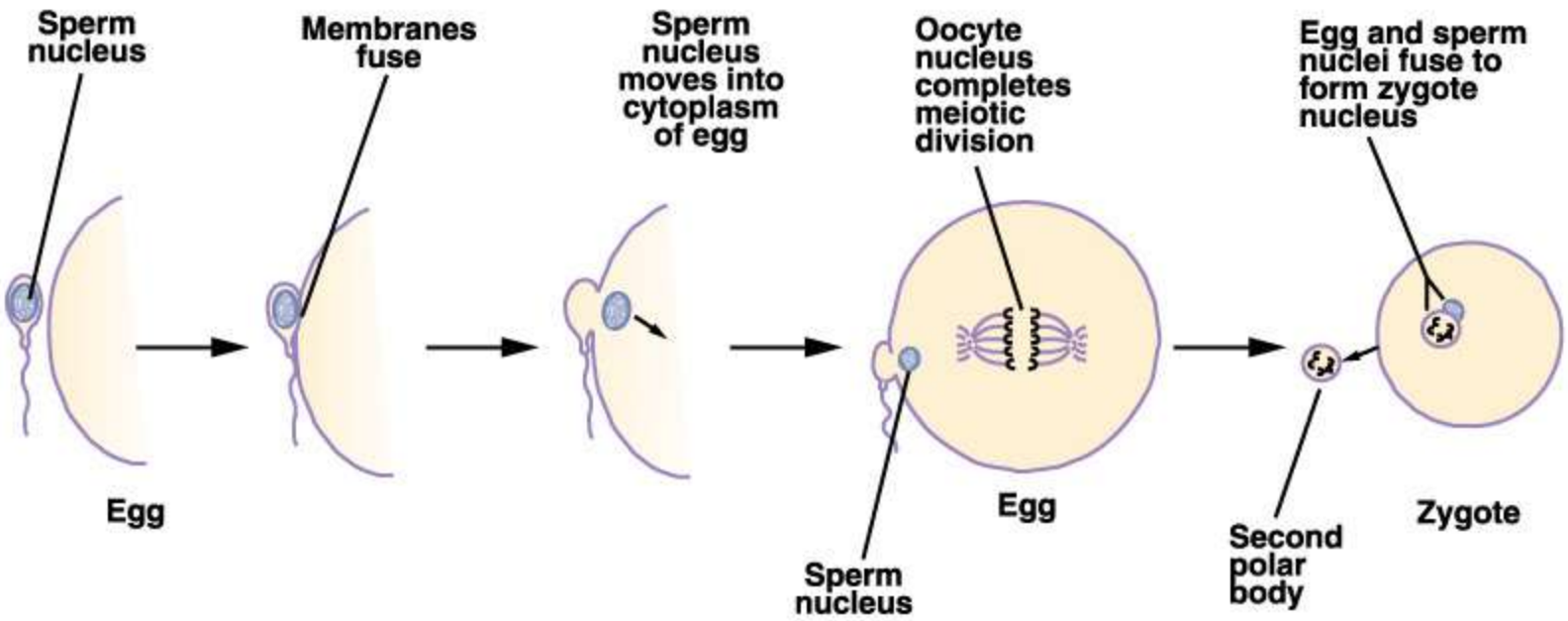
Semen is ejaculated to the last Part of vagina
↳ want Reach the uterus.

*Semen Coagulate to. Prevent the acidity in vigina
↓
Protect itself.



due to acidity Semen → Clot ✓.


Sperm
Corona radiata
Zona pellucida
First polar body
Oocyte in second meiotic division
Sperm nucleus
Acrosome
Acrosomal reaction
Granulosa cells of corona radiata
Zona pellucida
Extracellular space
Oocyte plasma membrane
Cortical granule
Oocyte cytoplasm
(a)
Fusion of oocyte and sperm plasma membranes
Cortical reaction
Sperm nucleus engulfed by oocyte cytoplasm


Sperm nucleus
Membranes fuse
Sperm nucleus moves into cytoplasm of egg
Oocyte nucleus completes meiotic division
Egg and sperm nuclei fuse to form zygote nucleus
Egg
Sperm nucleus
Egg
Second polar body
Zygote

Events Immediately Following Sperm Penetration

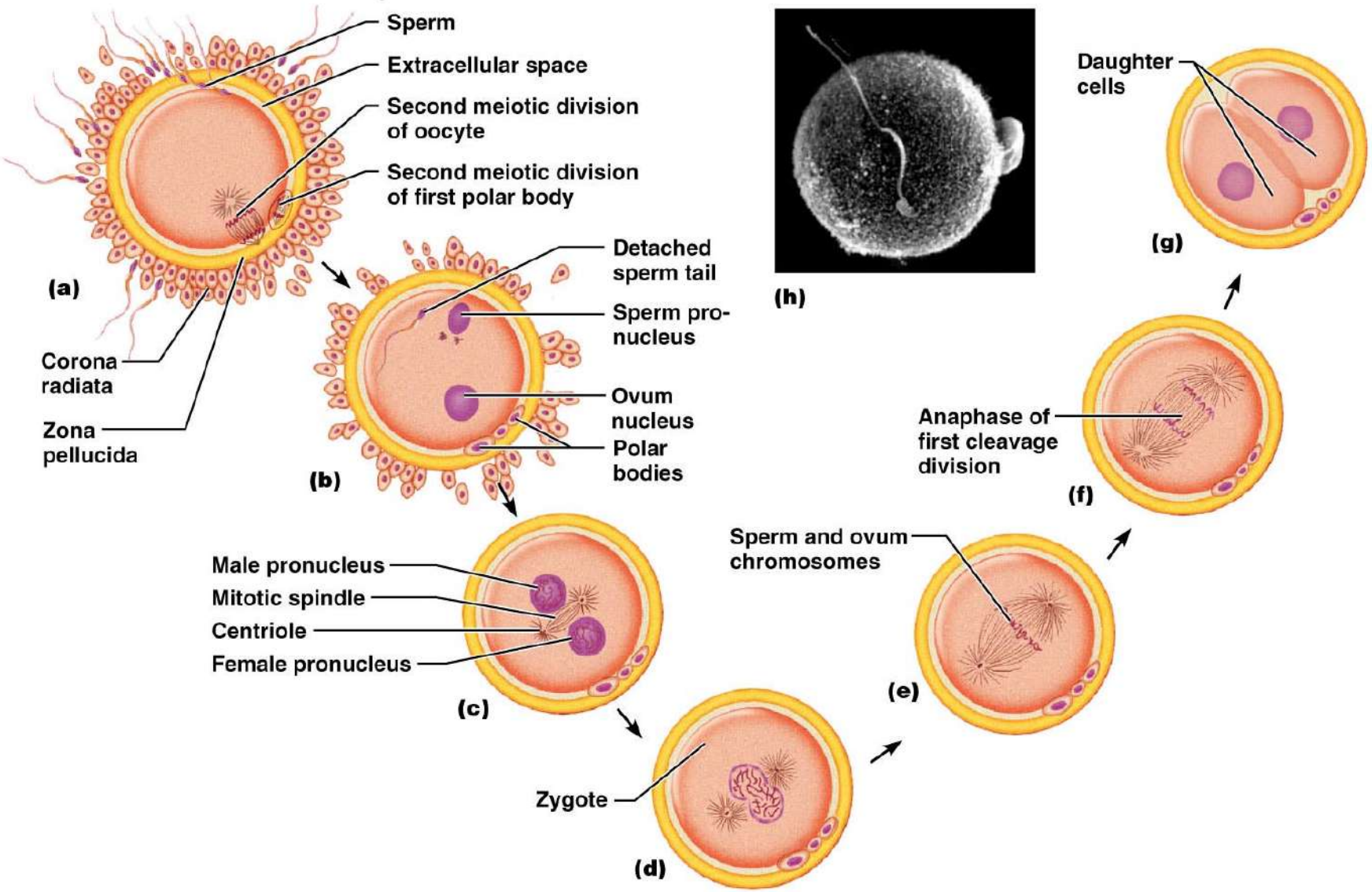
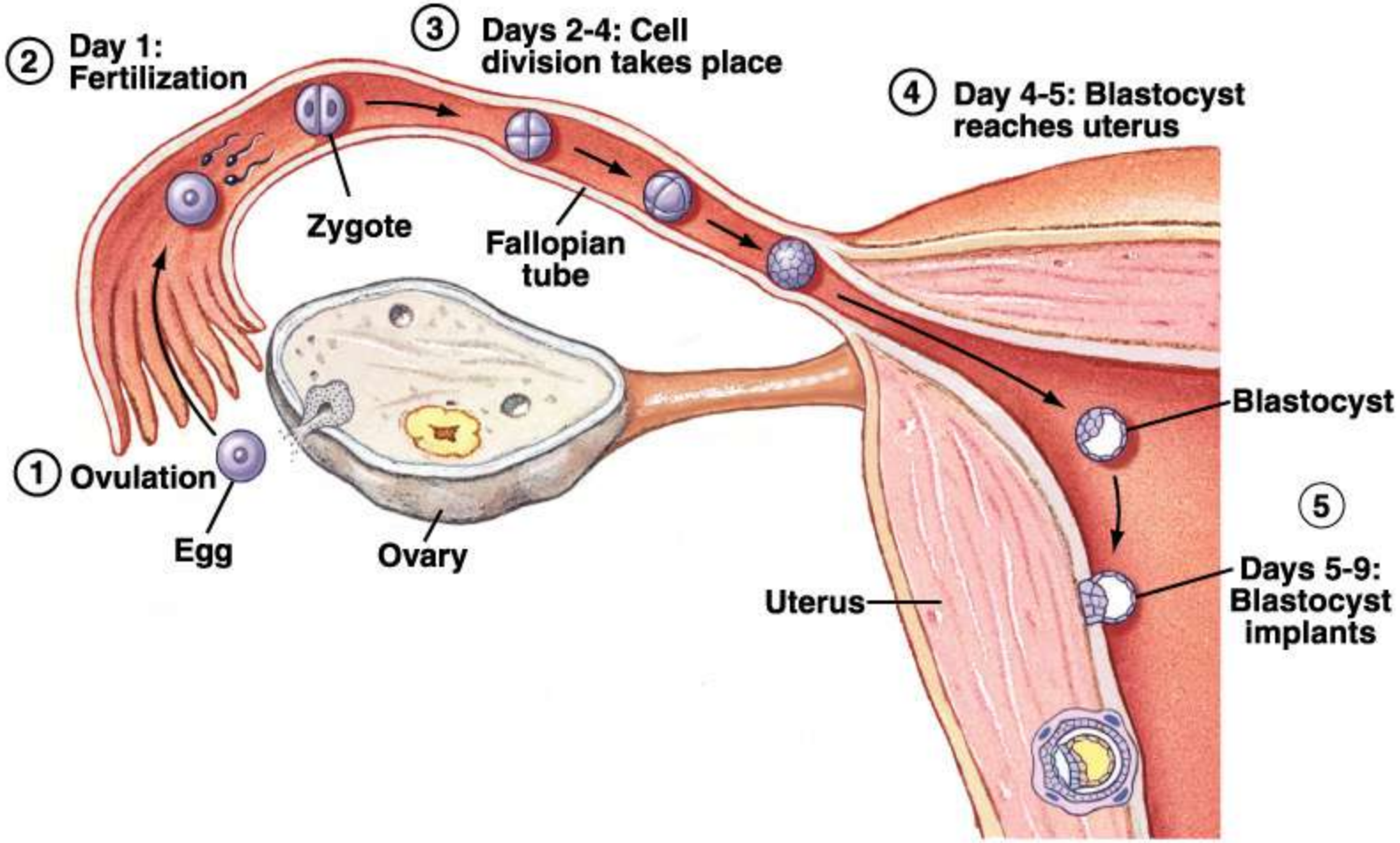


Figure 28.3


2 Day 1: Fertilization
3 Days 2-4: Cell division takes place
4 Day 4-5: Blastocyst reaches uterus
Zygote
Fallopian tube
Blastocyst
1 Ovulation
Egg
Ovary
5
Uterus
Days 5-9: Blastocyst implants

Implantation of the Blastocyst

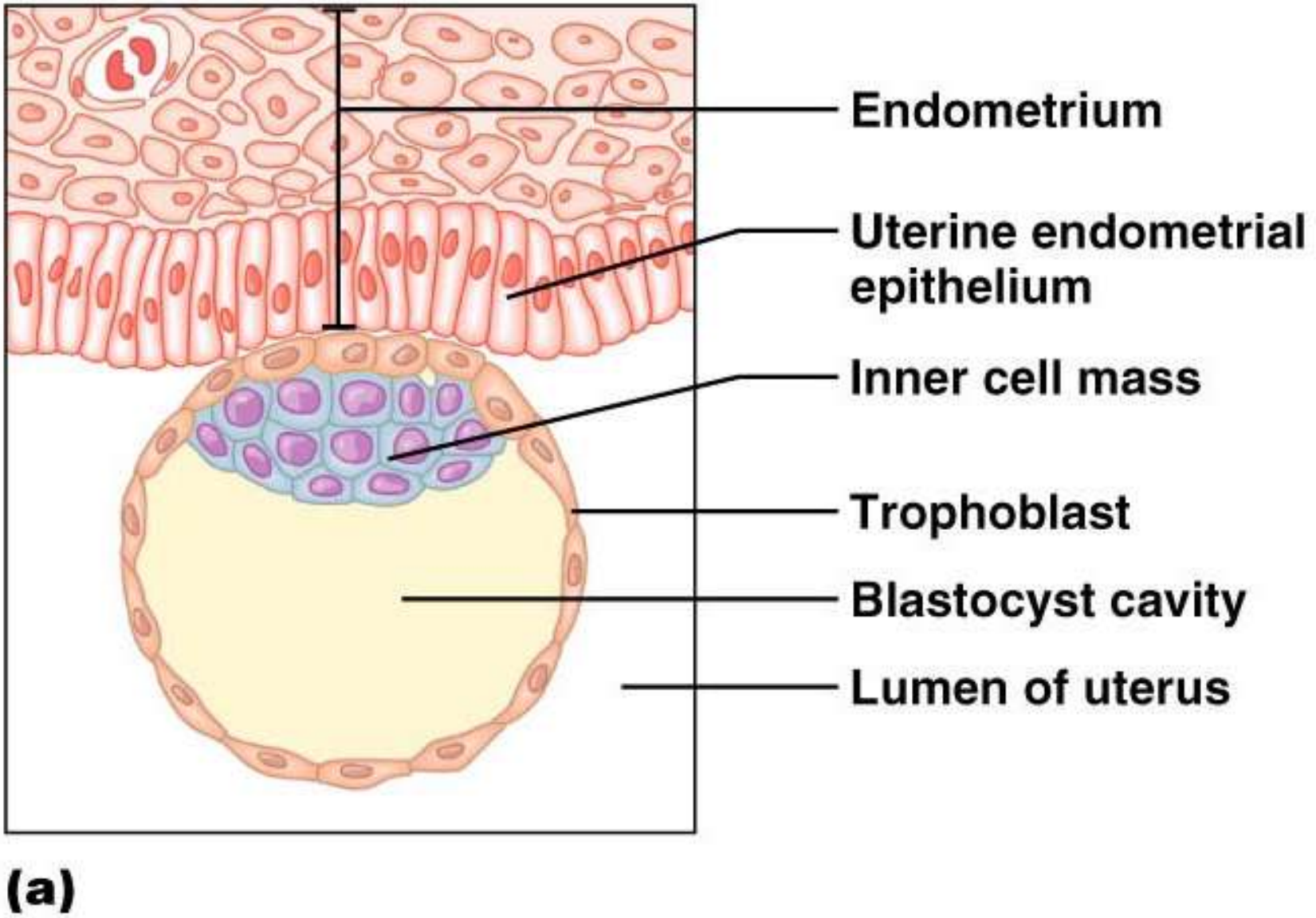
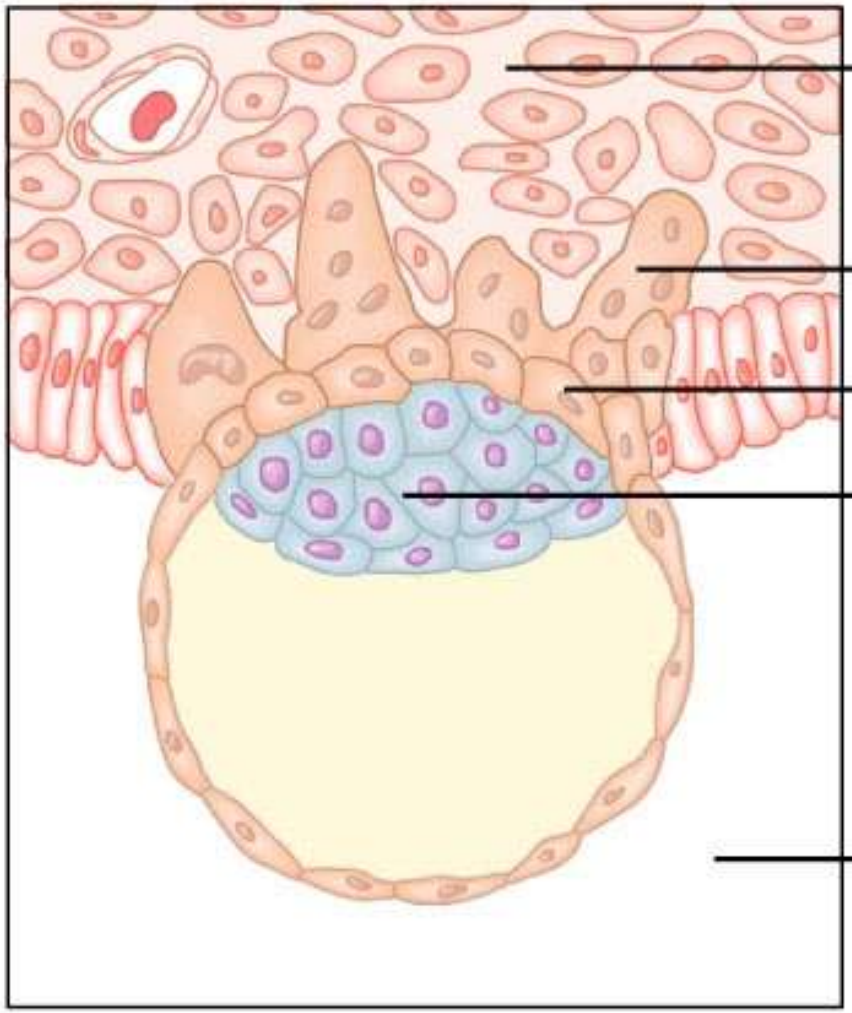


Figure 28.5a

Implantation of the Blastocyst



Endometrial stroma with blood vessels and glands

Syncytiotrophoblast

Cytotrophoblast

Inner cell mass (future embryo)

Lumen of uterus

(b)

الجدار الداخلي ← سنسيشيوتروفوبلاست

Figure 28.5b

Hormonal Changes During Pregnancy

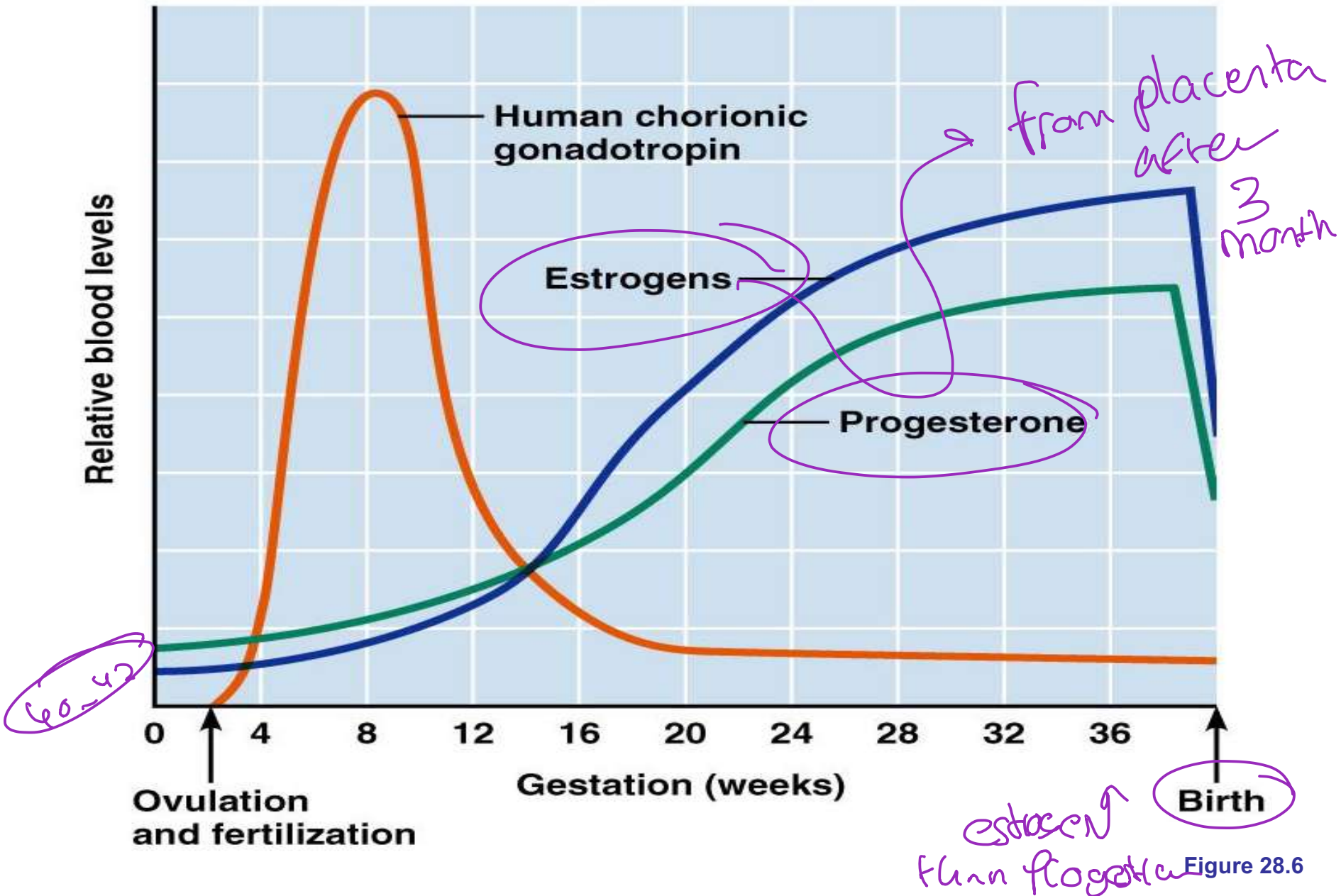
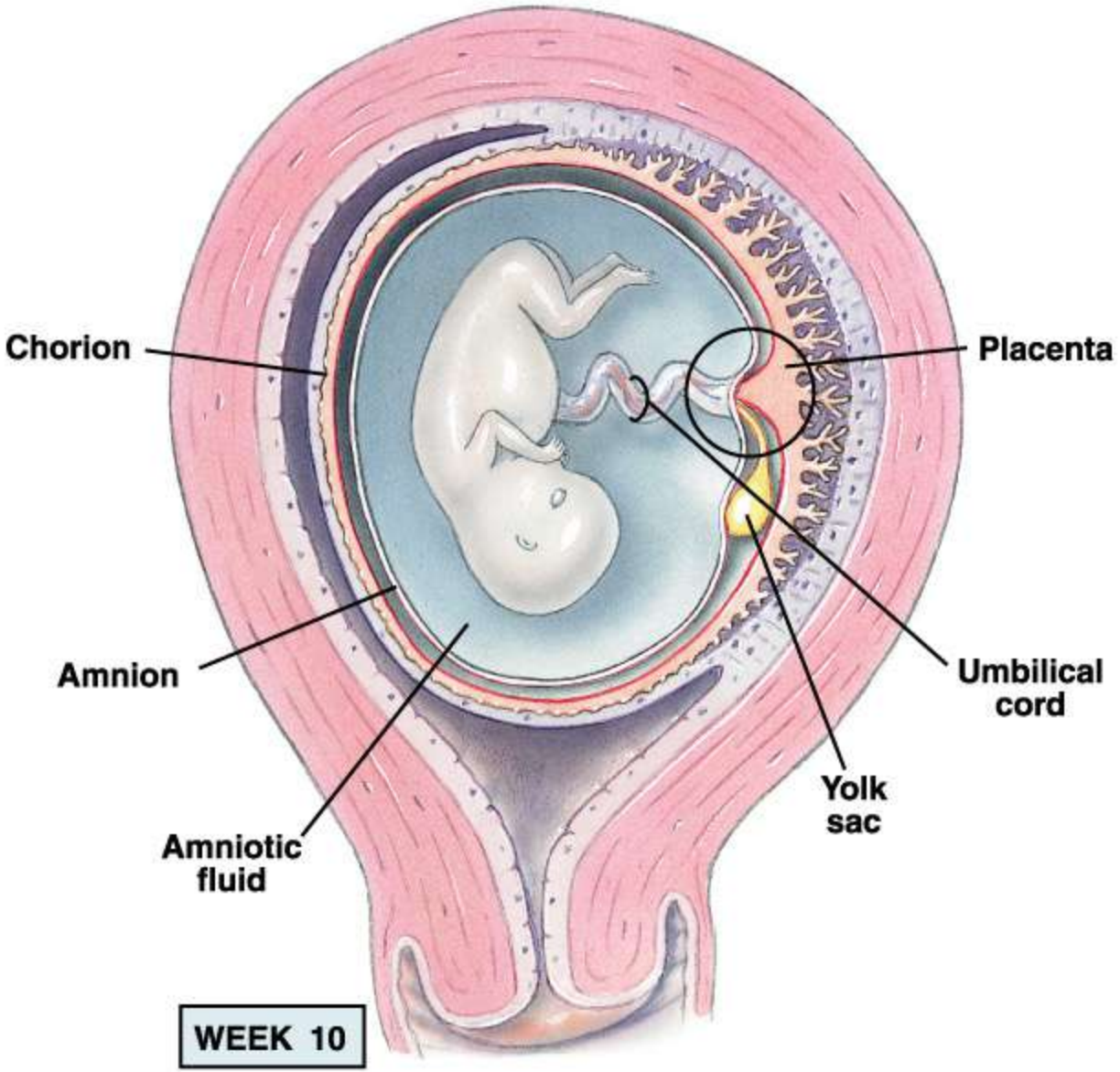
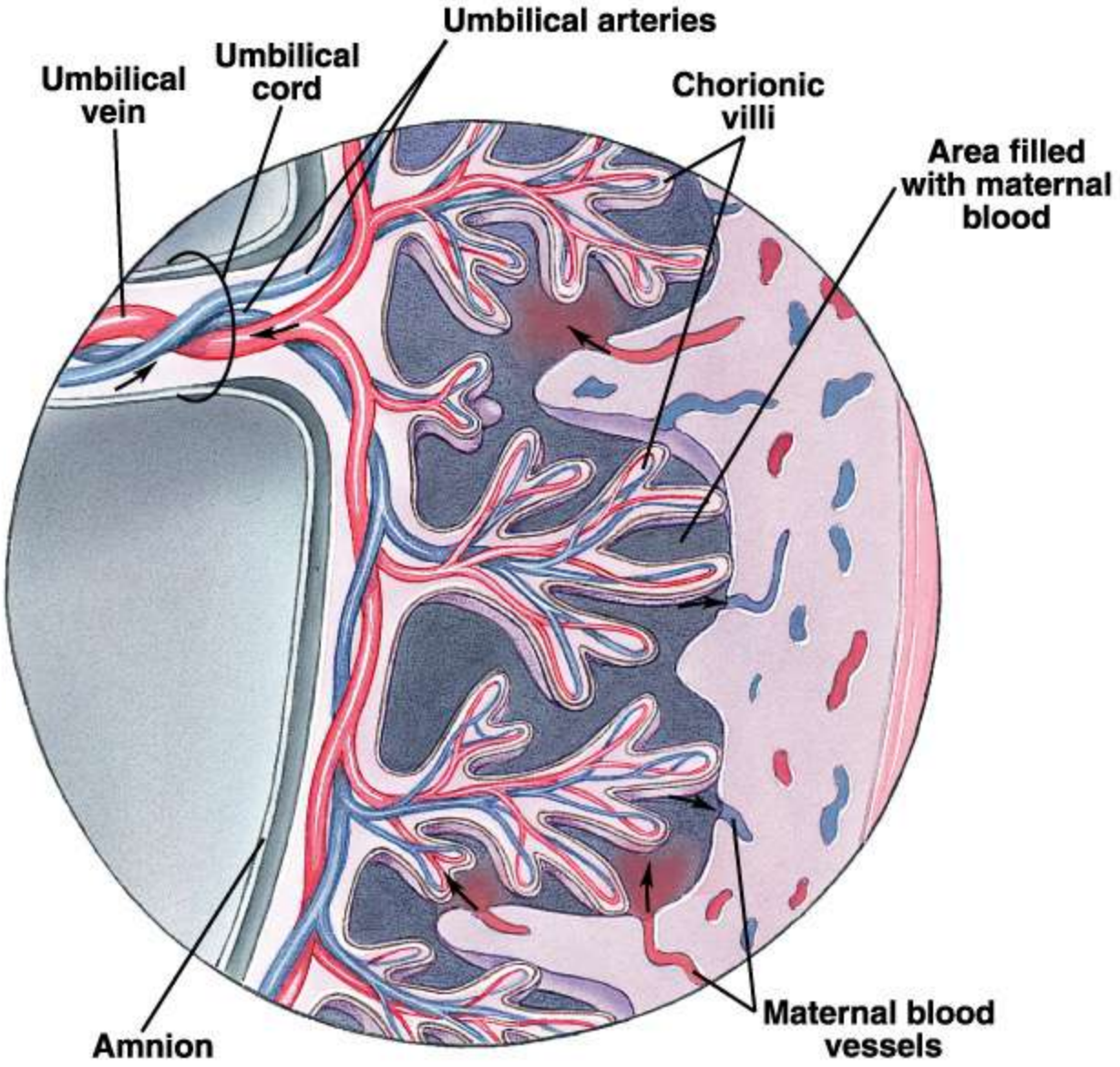
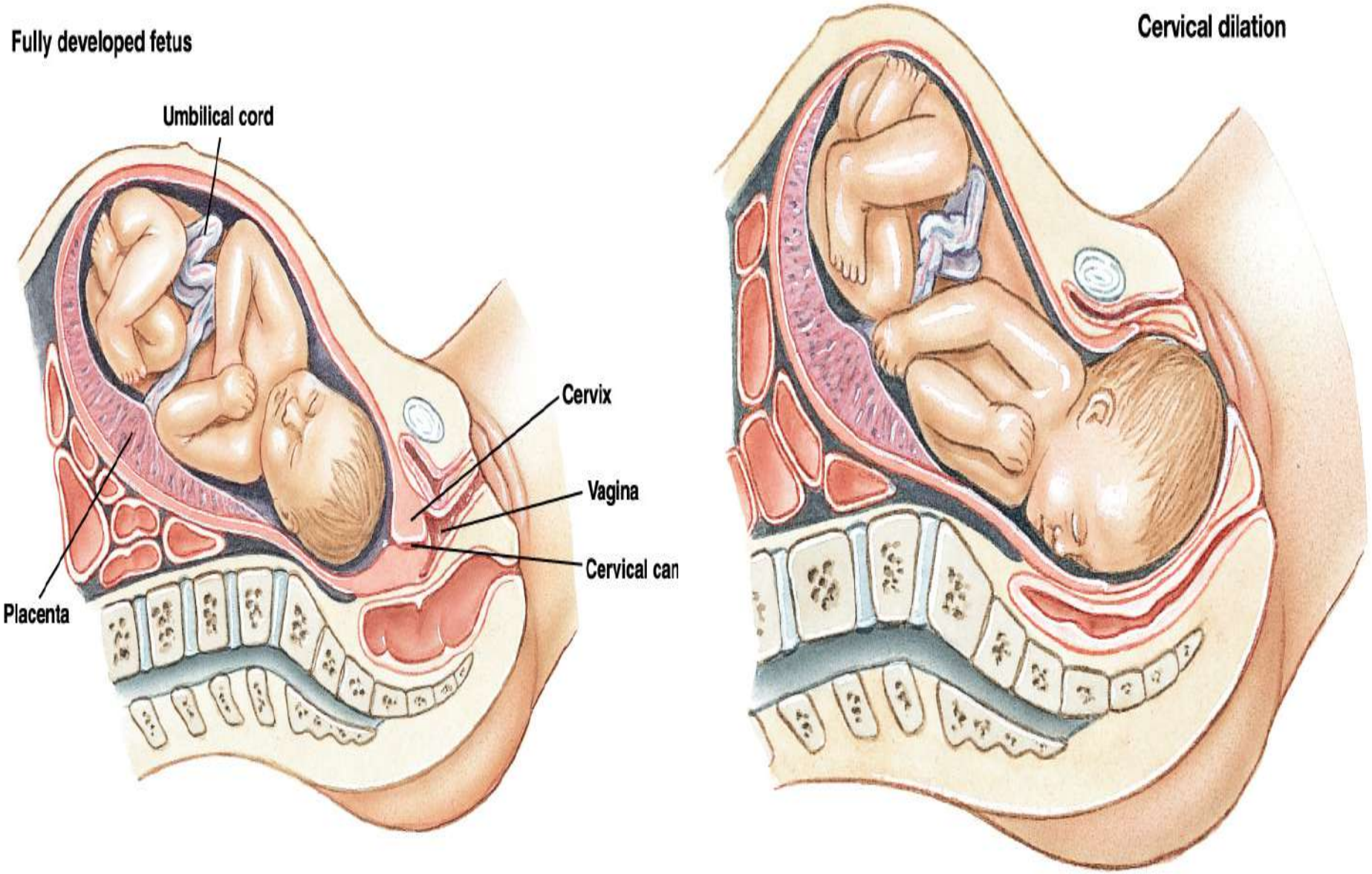


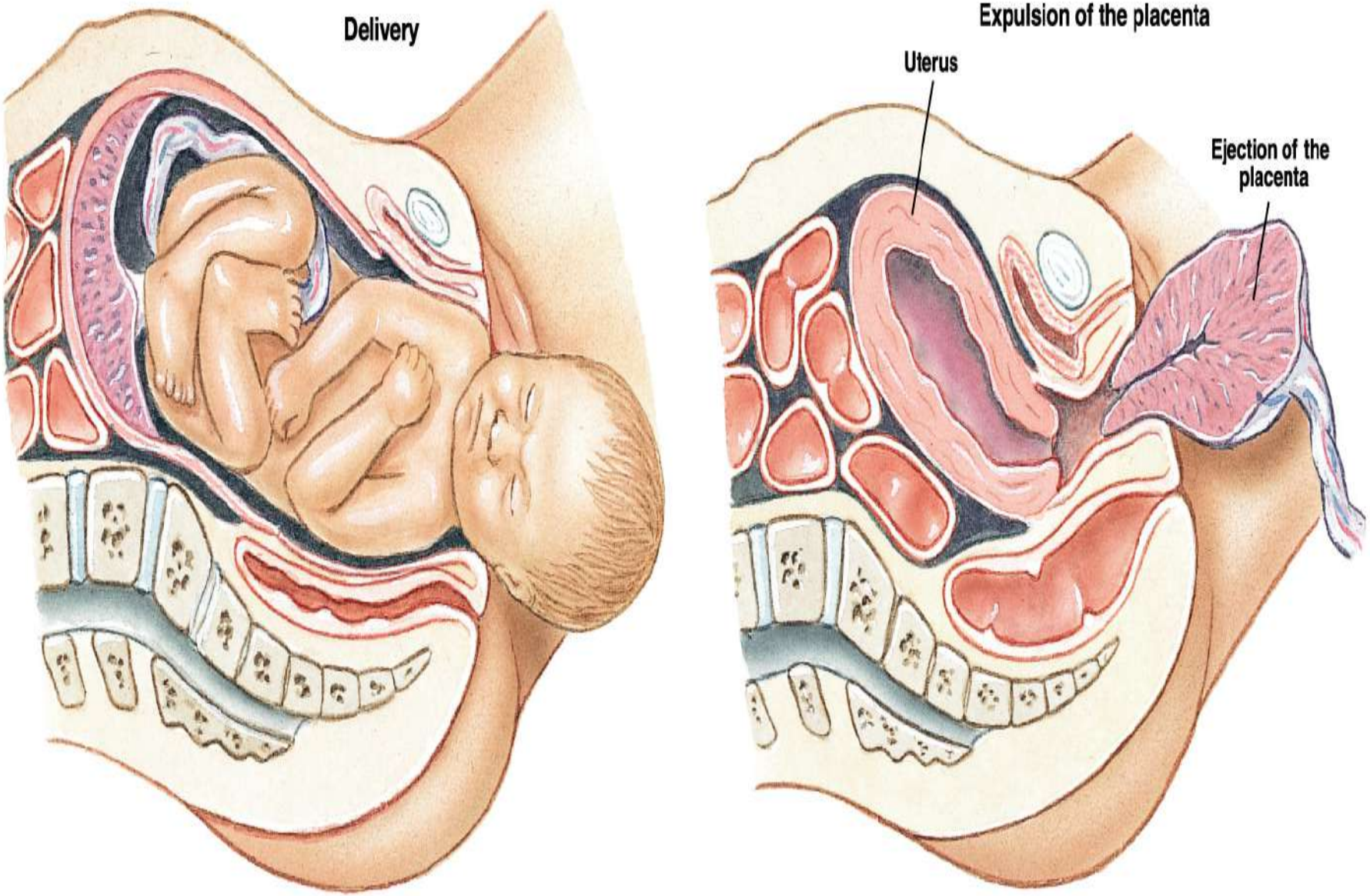
Figure 28.6

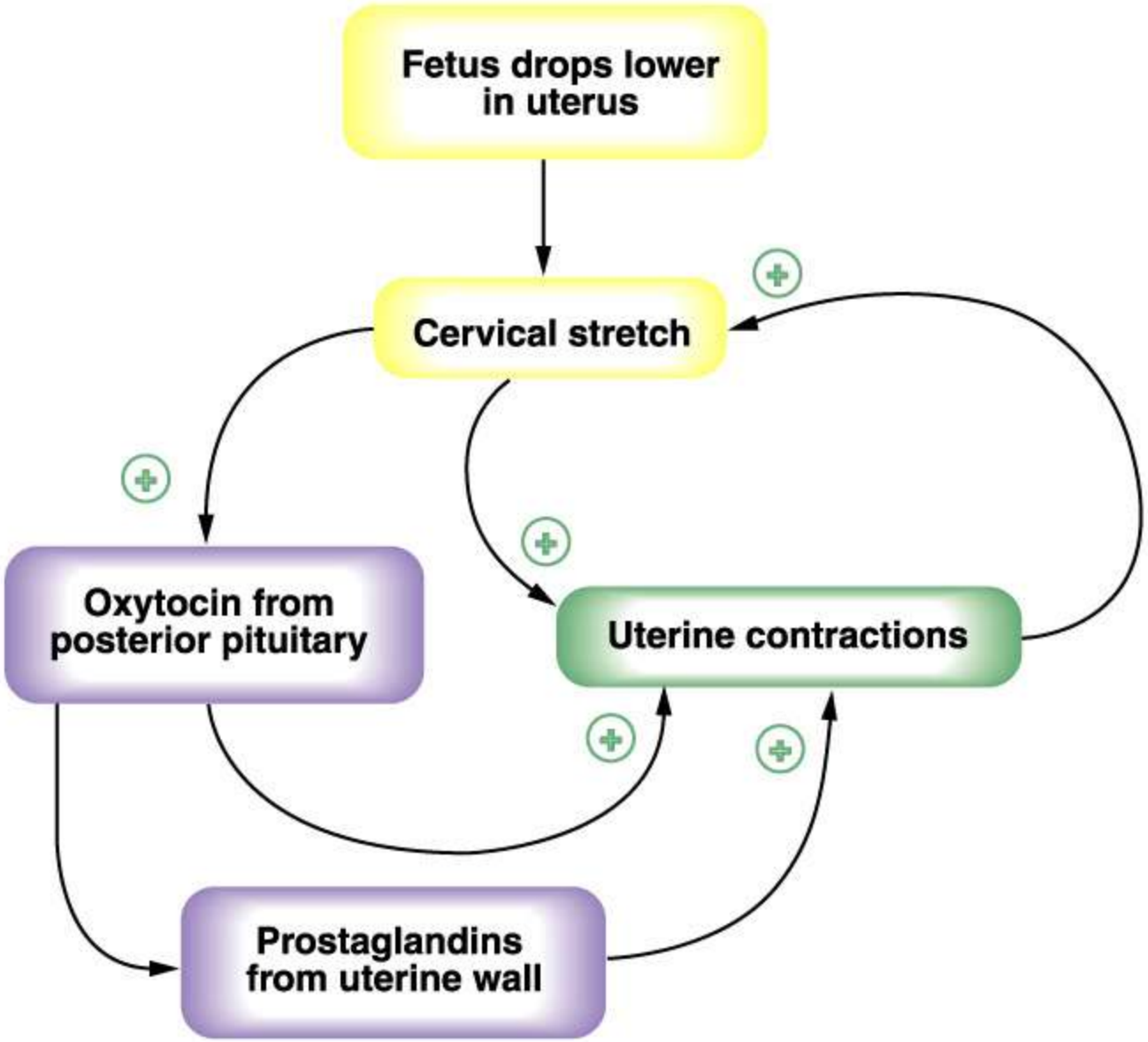


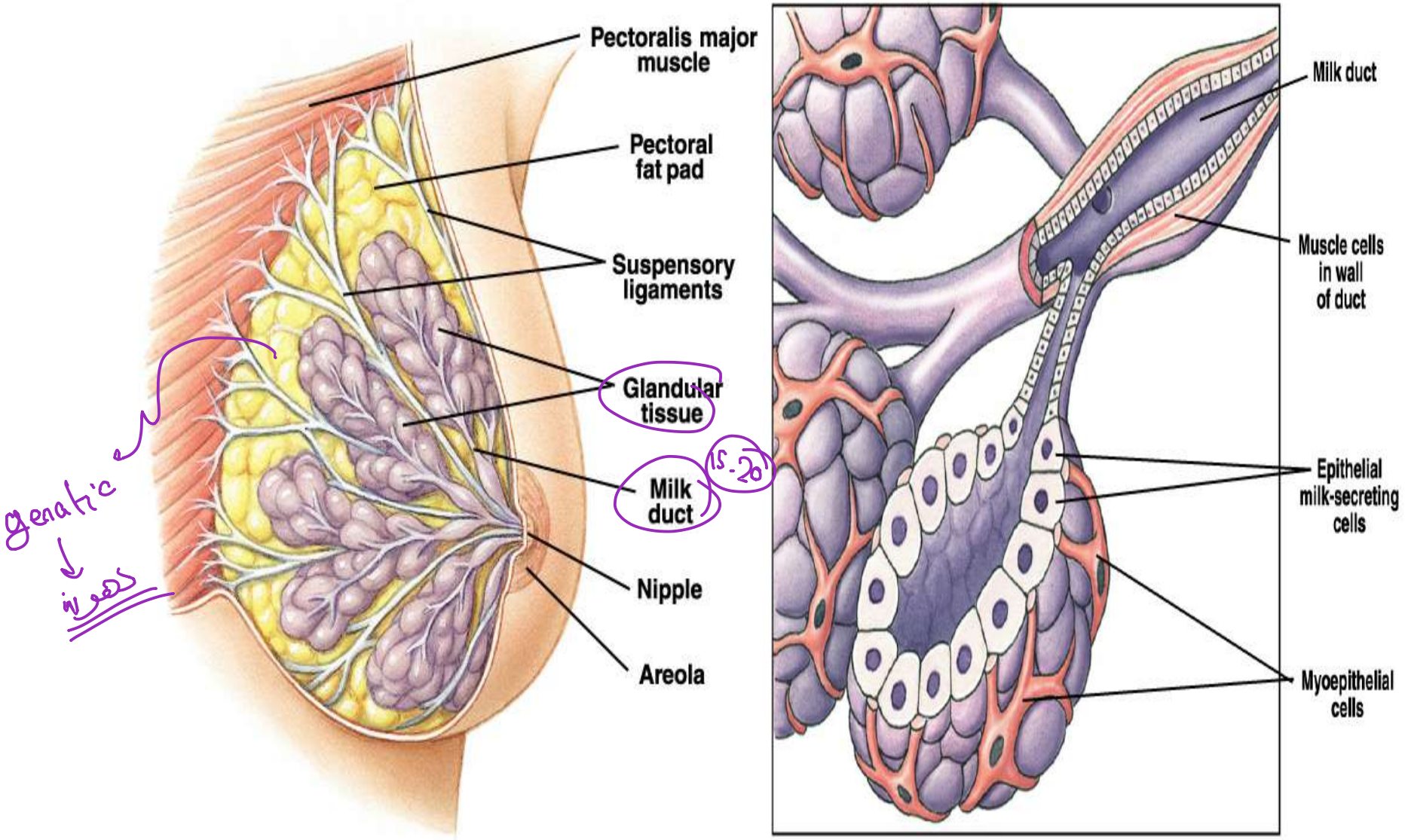
The process of dilation and formation of


Umbilical arteries
Umbilical vein
Umbilical cord
Chorionic villi
Area filled with maternal blood
Amnion
Maternal blood vessels


Fully developed fetus
Umbilical cord
Cervix
Vagina
Cervical can
Placenta
Cervical dilation


Delivery
Expulsion of the placenta
Uterus
Ejection of the placenta


Fetus drops lower in uterus
Cervical stretch
Oxytocin from posterior pituitary
Uterine contractions
Prostaglandins from uterine wall


Pectoralis major muscle
Pectoral fat pad
Suspensory ligaments
Glandular tissue
Milk duct
Nipple
Areola
Milk duct
Muscle cells in wall of duct
Epithelial milk-secreting cells
Myoepithelial cells

1 In the bath or shower:

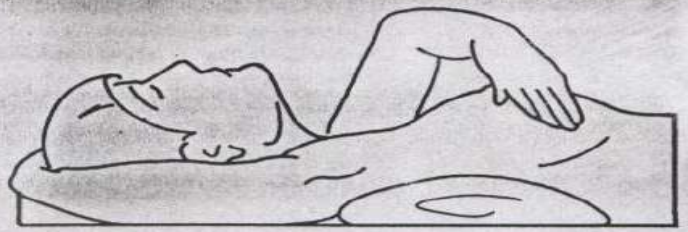
Examine your breasts during bath or shower. With flat fingers move gently over every part of each breast. Check for lumps, hard knots, or thickenings.

2 Before a mirror:

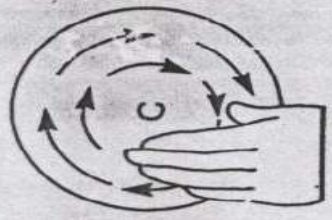
Inspect your breasts with arms at your sides and then with your arms raised overhead. Look for any changes in each breast: a swelling, dimpling of skin or changes in the nipple.

Then, rest palms on hips and press down firmly to flex your chest muscles. Regular inspection shows what is normal for you and will give you confidence in your examination.

3 Lying down:



To examine your right breast, put a pillow or folded towel under your right shoulder. Place right hand behind your head - this distributes breast tissue more evenly on the chest. With left hand, fingers flat, press gently in small circular motions around an imaginary clock face. A ridge of firm tissue in the lower curve of each breast is normal. Then move in an inch, toward the nipple, keep circling to examine *every part of your breast*, including nipple. Now slowly repeat procedure on your left breast.



Squeeze the nipple of each breast gently between thumb and index finger. Any discharge, clear or bloody, should be reported to your doctor immediately.

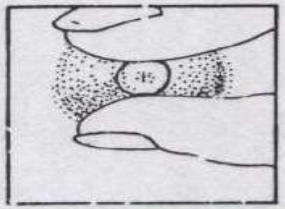
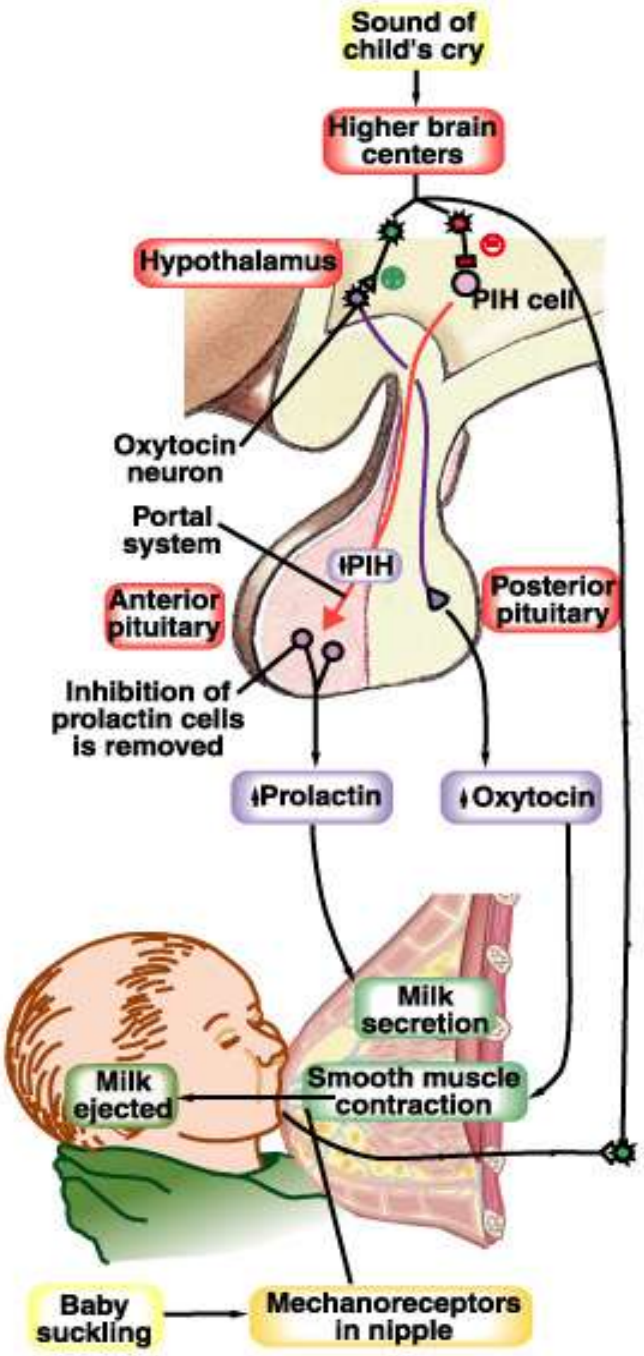
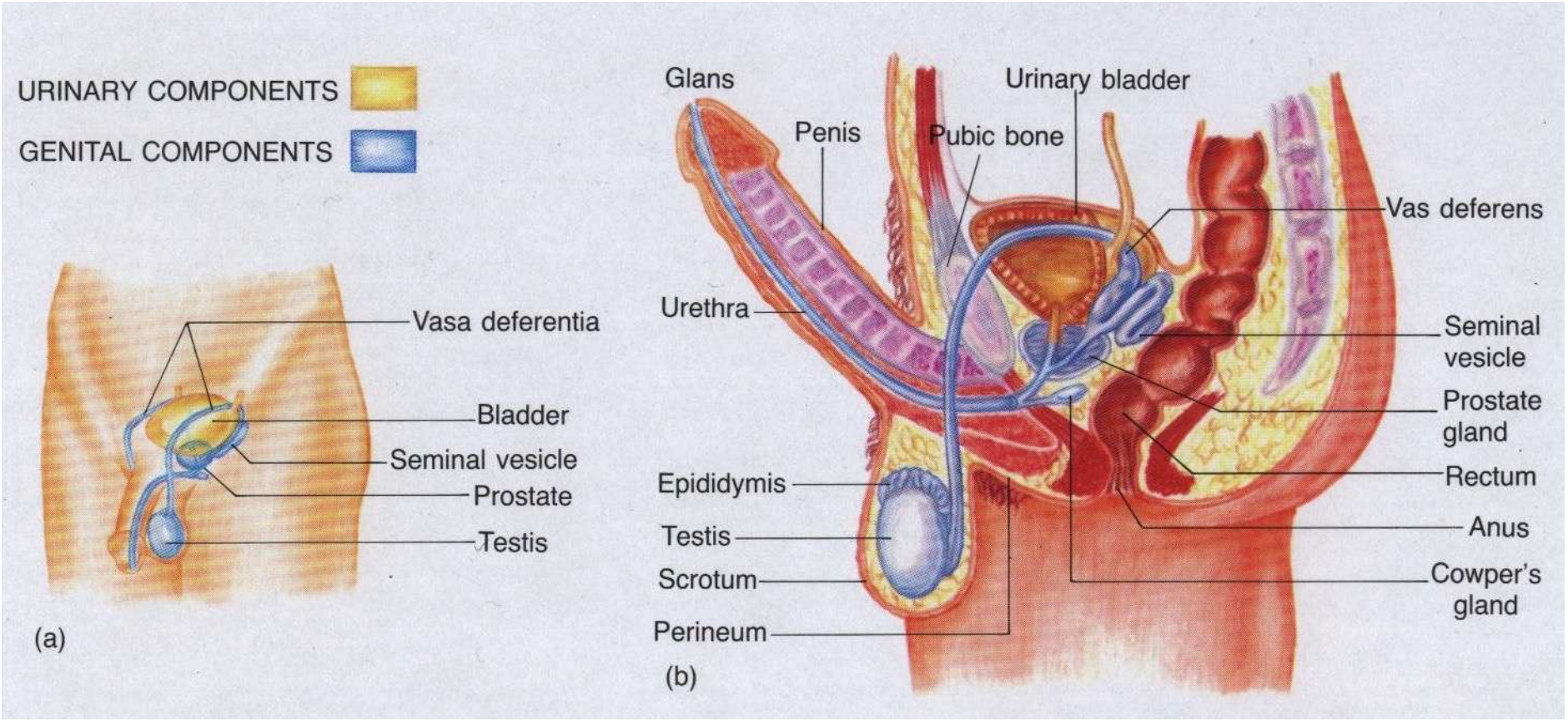
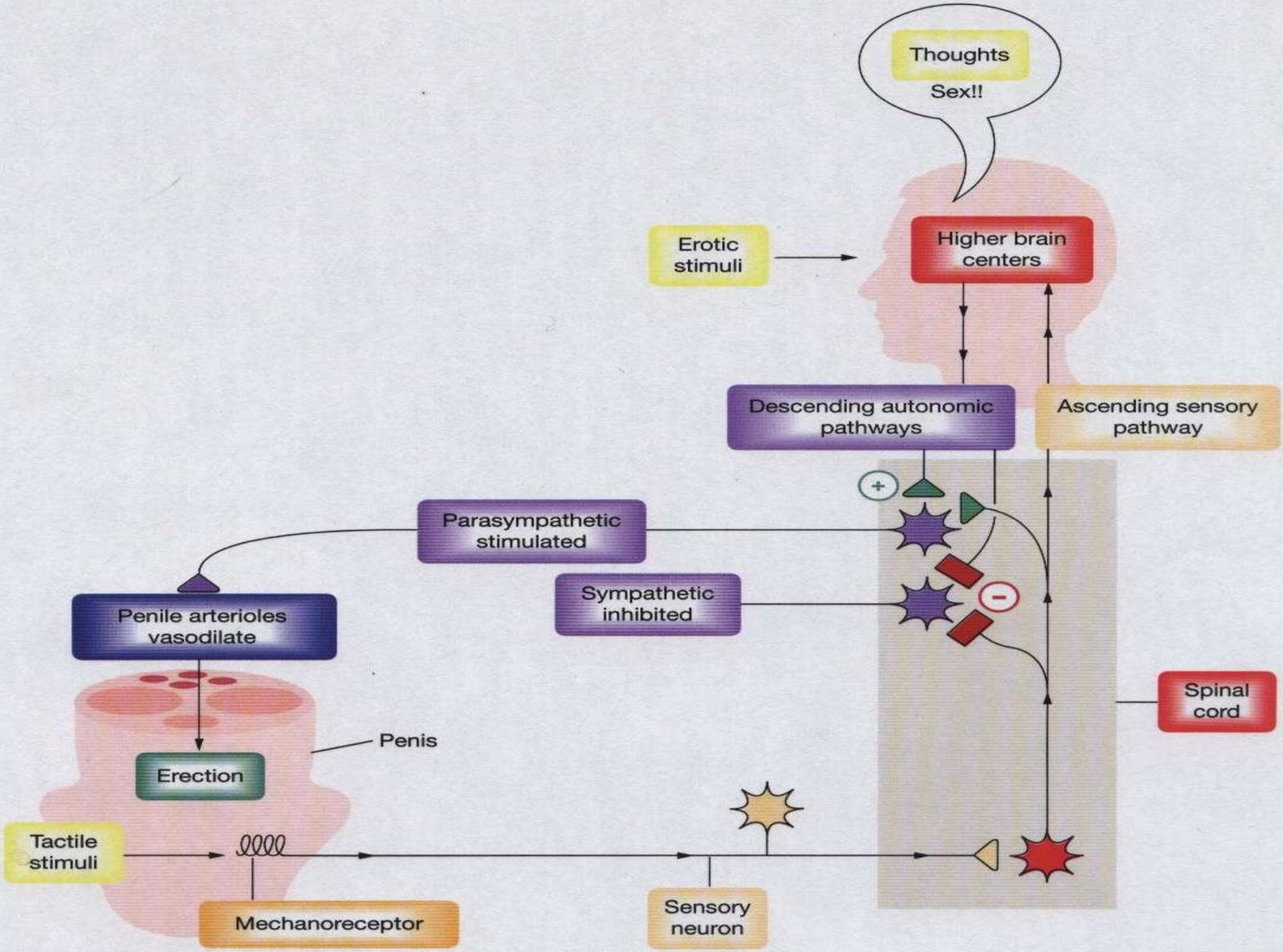
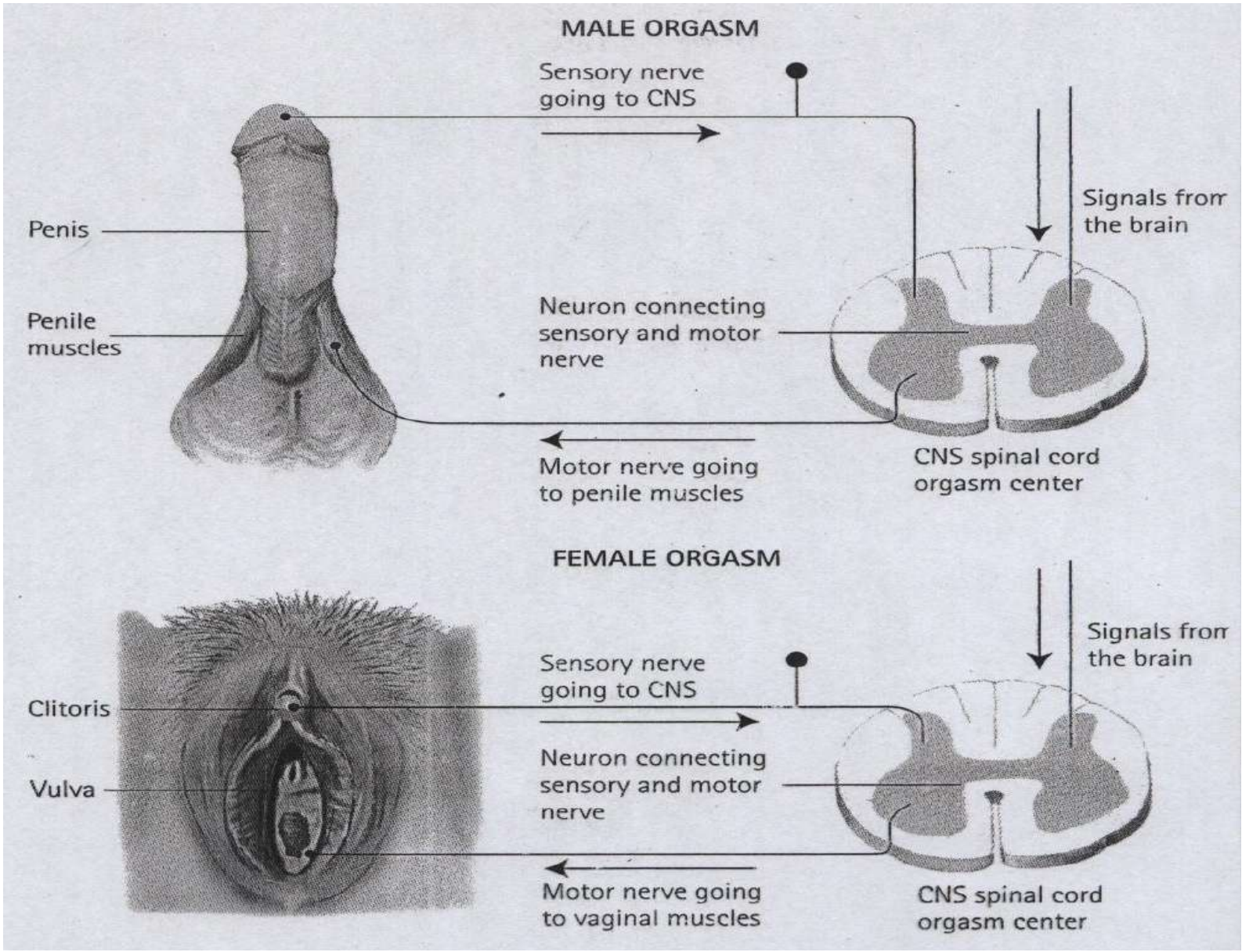


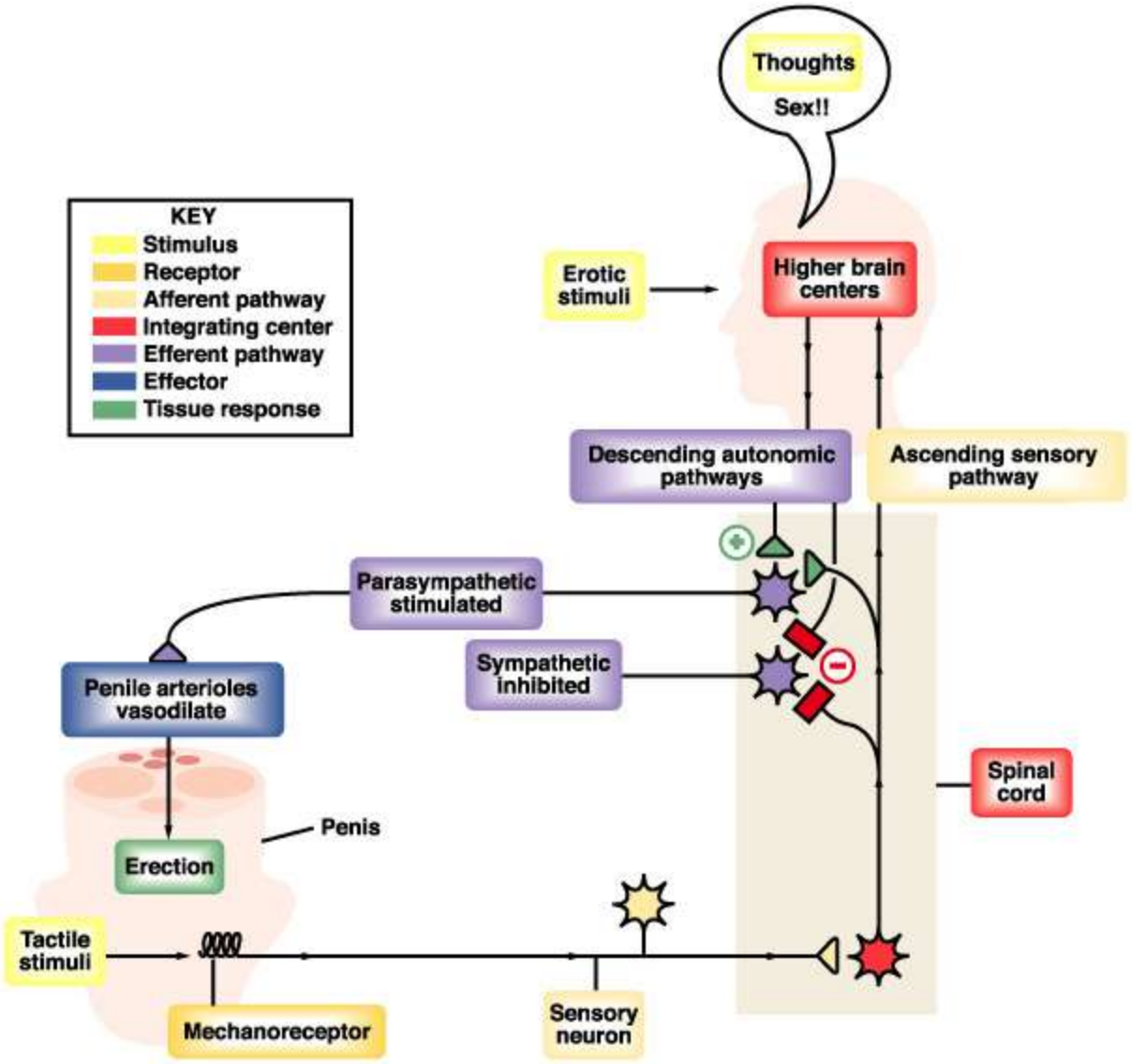
Figure 2–16 How to examine your breasts as a method to detect abnormal lumps and other changes.

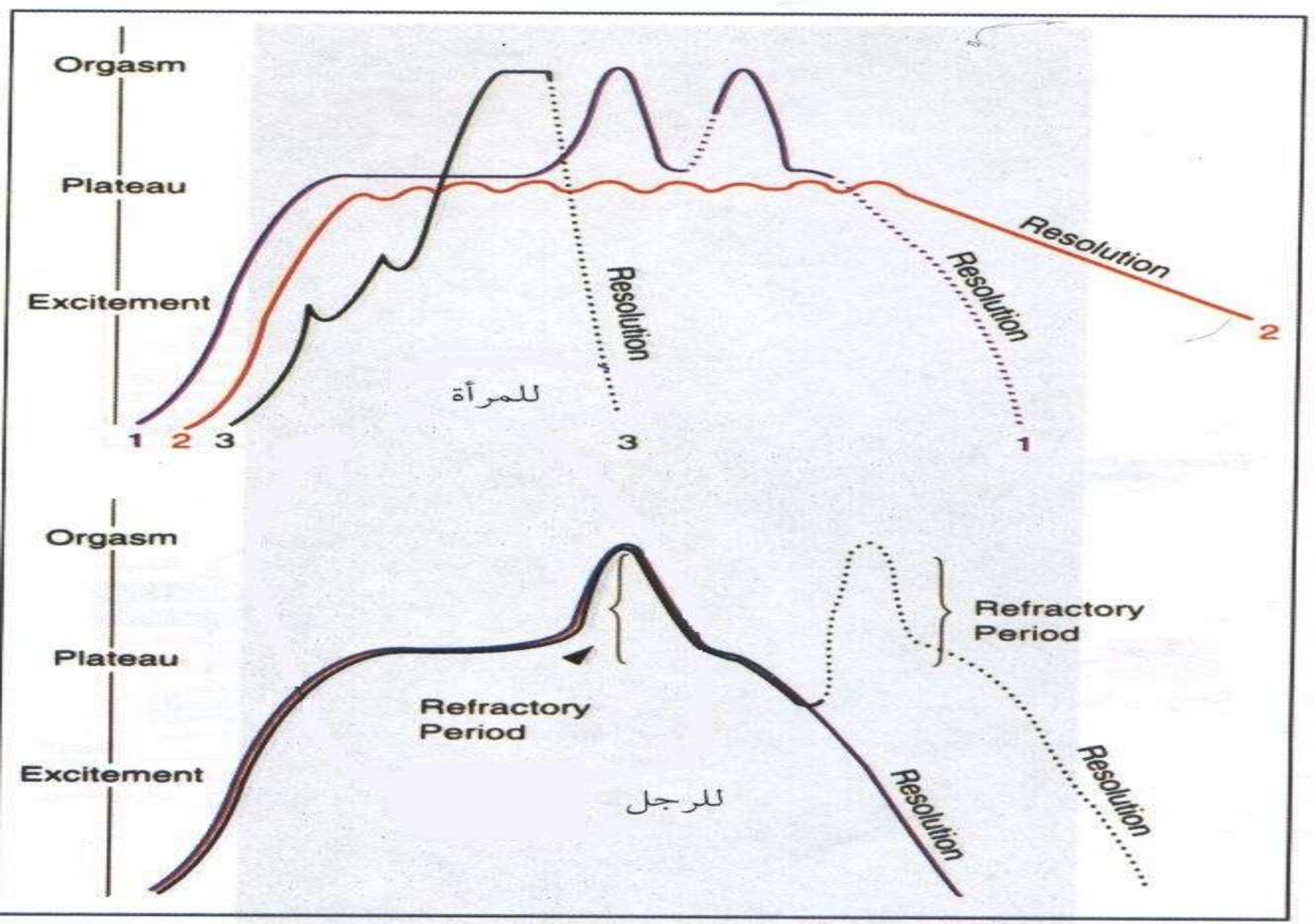

Sound of child's cry
Higher brain centers
Hypothalamus
PIH cell
Oxytocin neuron
Portal system
PIH
Anterior pituitary
Posterior pituitary
Inhibition of prolactin cells is removed
Prolactin
Oxytocin
Milk secretion
Milk ejected
Smooth muscle contraction
Baby suckling
Mechanoreceptors in nipple

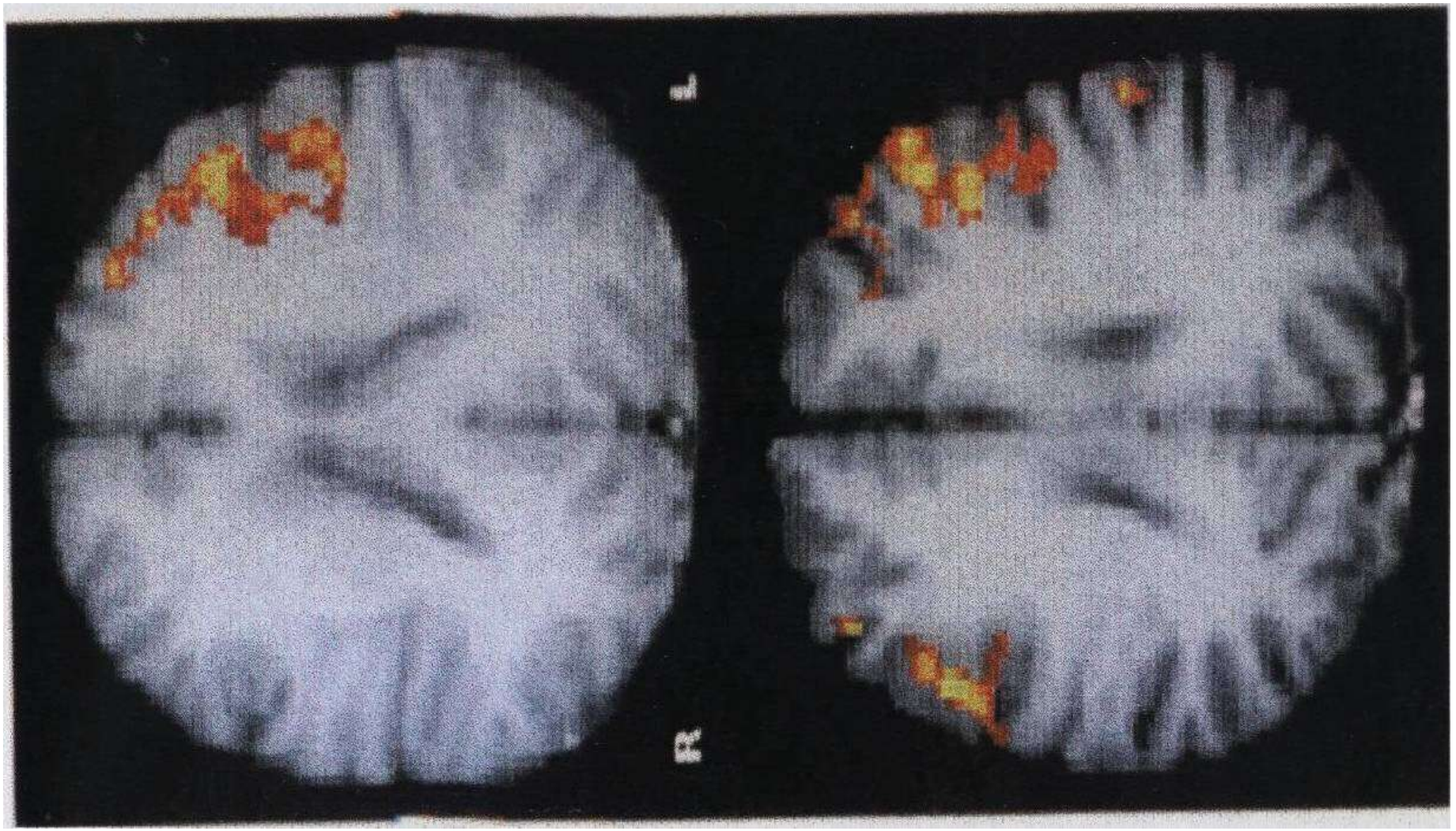

URINARY COMPONENTS
GENITAL COMPONENTS
Vasa deferentia
Bladder
Seminal vesicle
Prostate
Testis
(a)
Glans
Penis
Pubic bone
Urinary bladder
Vas deferens
Urethra
Seminal vesicle
Prostate gland
Rectum
Epididymis
Testis
Anus
Scrotum
Cowper's gland
Perineum
(b)

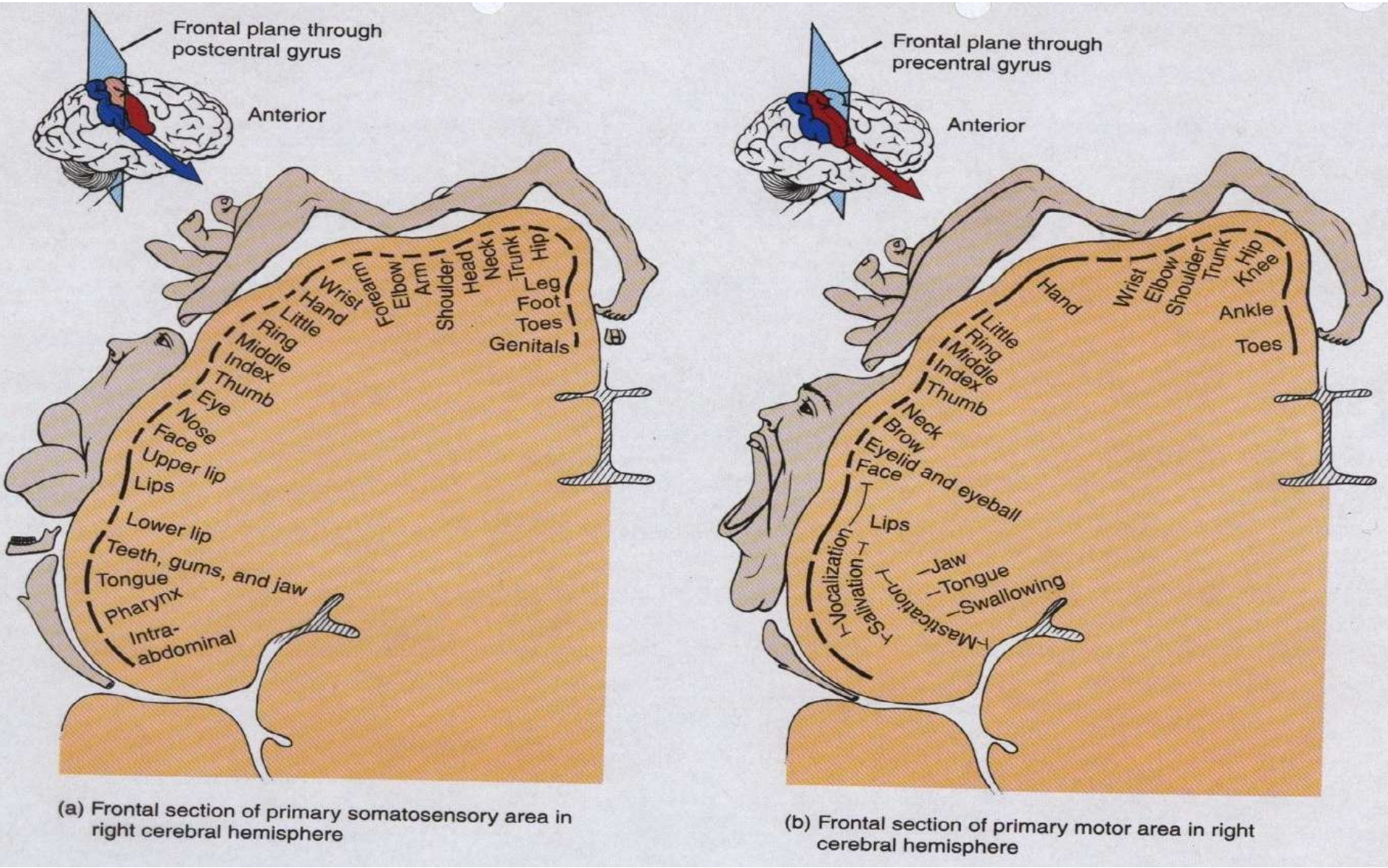

Thoughts
Sex!!
Erotic stimuli
Higher brain centers
Descending autonomic pathways
Ascending sensory pathway
Parasympathetic stimulated
Sympathetic inhibited
Penile arterioles vasodilate
Spinal cord
Penis
Erection
Tactile stimuli
Mechanoreceptor
Sensory neuron


MALE ORGASM
Sensory nerve going to CNS
Penis
Penile muscles
Neuron connecting sensory and motor nerve
Signals from the brain
Motor nerve going to penile muscles
CNS spinal cord orgasm center
FEMALE ORGASM
Clitoris
Vulva
Sensory nerve going to CNS
Neuron connecting sensory and motor nerve
Signals from the brain
Motor nerve going to vaginal muscles
CNS spinal cord orgasm center


KEY
Stimulus
Receptor
Afferent pathway
Integrating center
Efferent pathway
Effector
Tissue response
Thoughts
Sex!!
Erotic stimuli
Higher brain centers
Descending autonomic pathways
Ascending sensory pathway
Parasympathetic stimulated
Sympathetic inhibited
Penile arterioles vasodilate
Spinal cord
Penis
Erection
Tactile stimuli
Mechanoreceptor
Sensory neuron

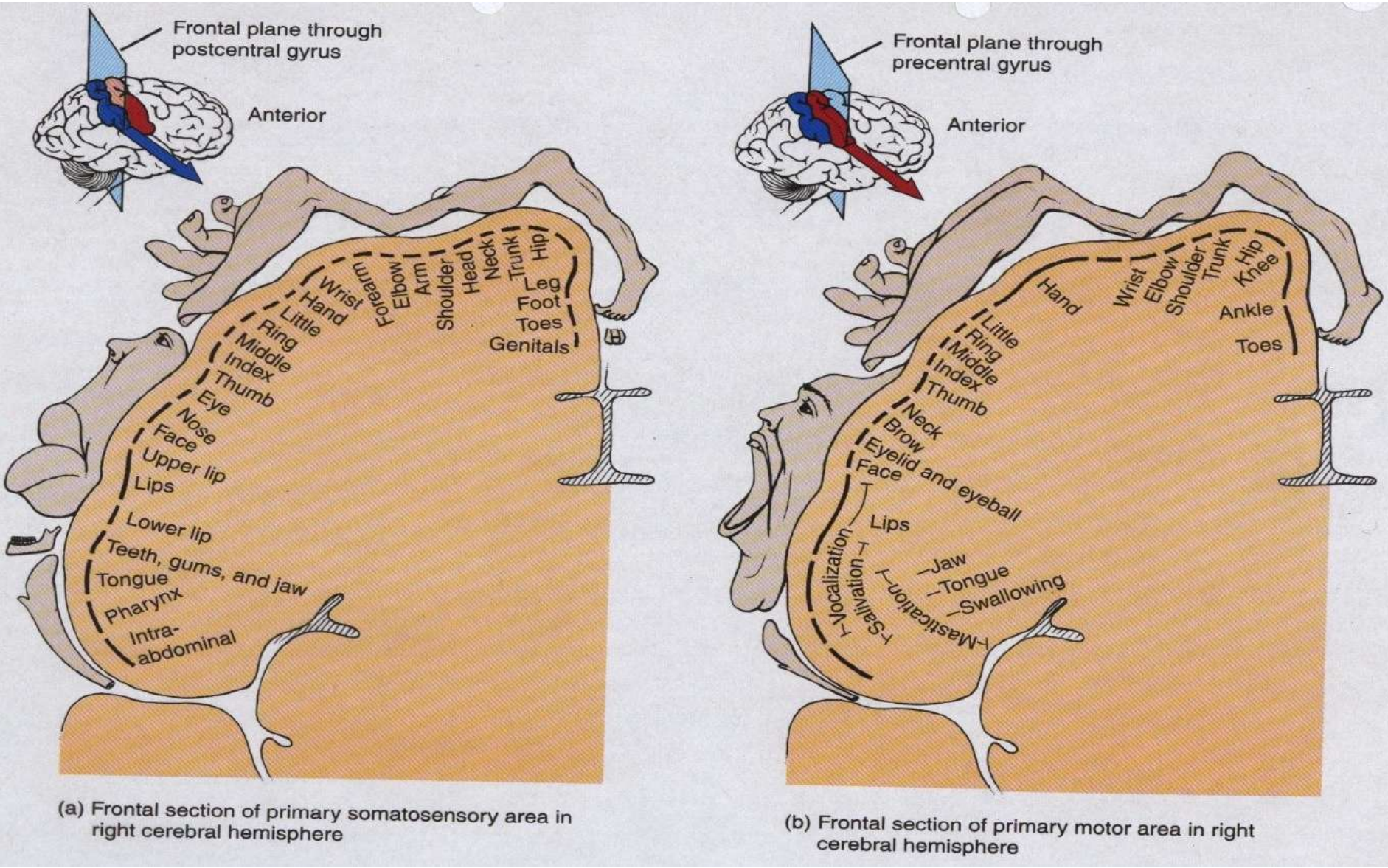

Orgasm
Plateau
Excitement
1 2 3
Resolution
3
Resolution
1
Resolution
2
للمرأة
Orgasm
Plateau
Excitement
Refractory Period
Refractory Period
Resolution
Resolution
للرجل





(a) Frontal section of primary somatosensory area in right cerebral hemisphere

(b) Frontal section of primary motor area in right cerebral hemisphere



(a) Frontal section of primary somatosensory area in right cerebral hemisphere

(b) Frontal section of primary motor area in right cerebral hemisphere