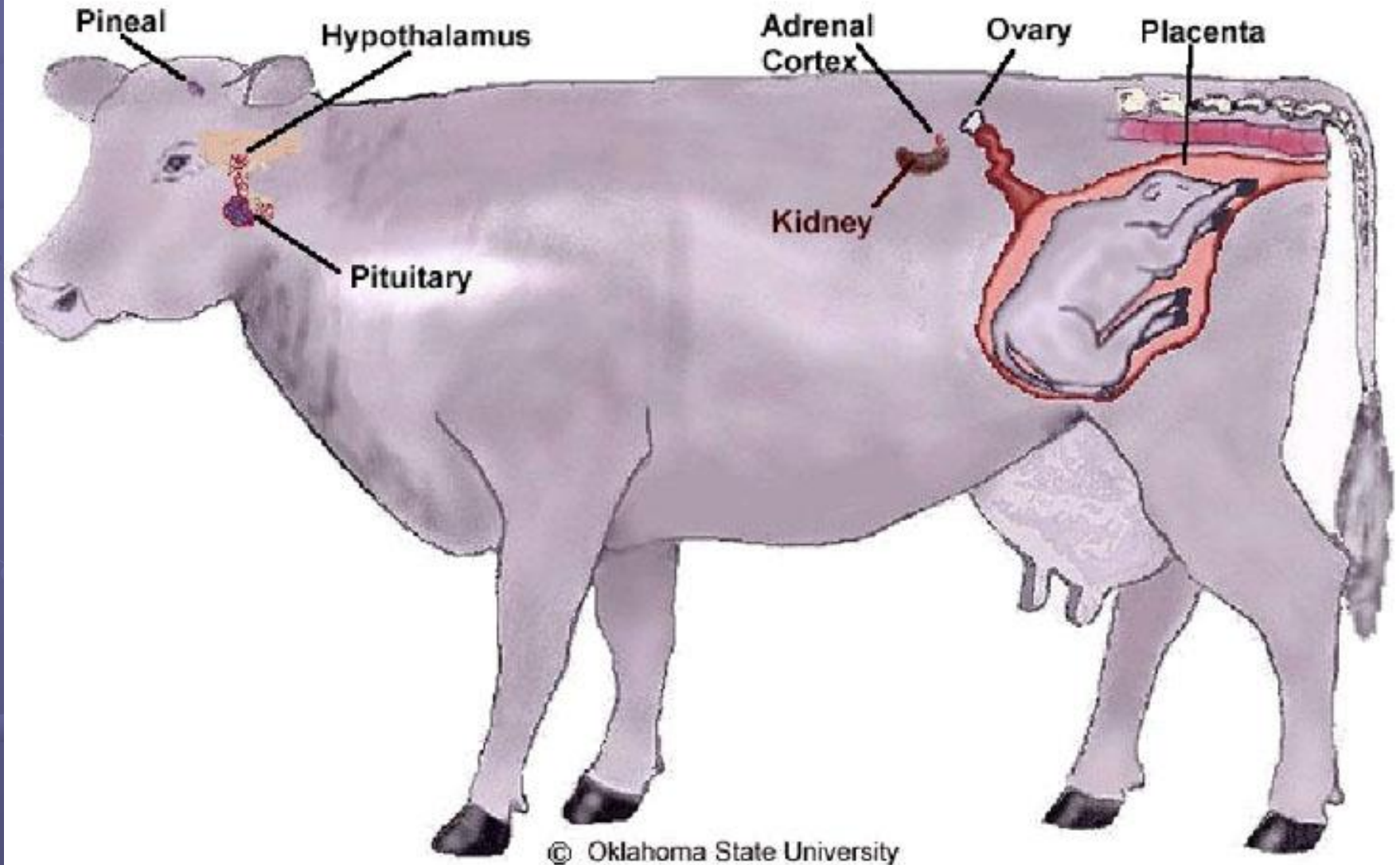


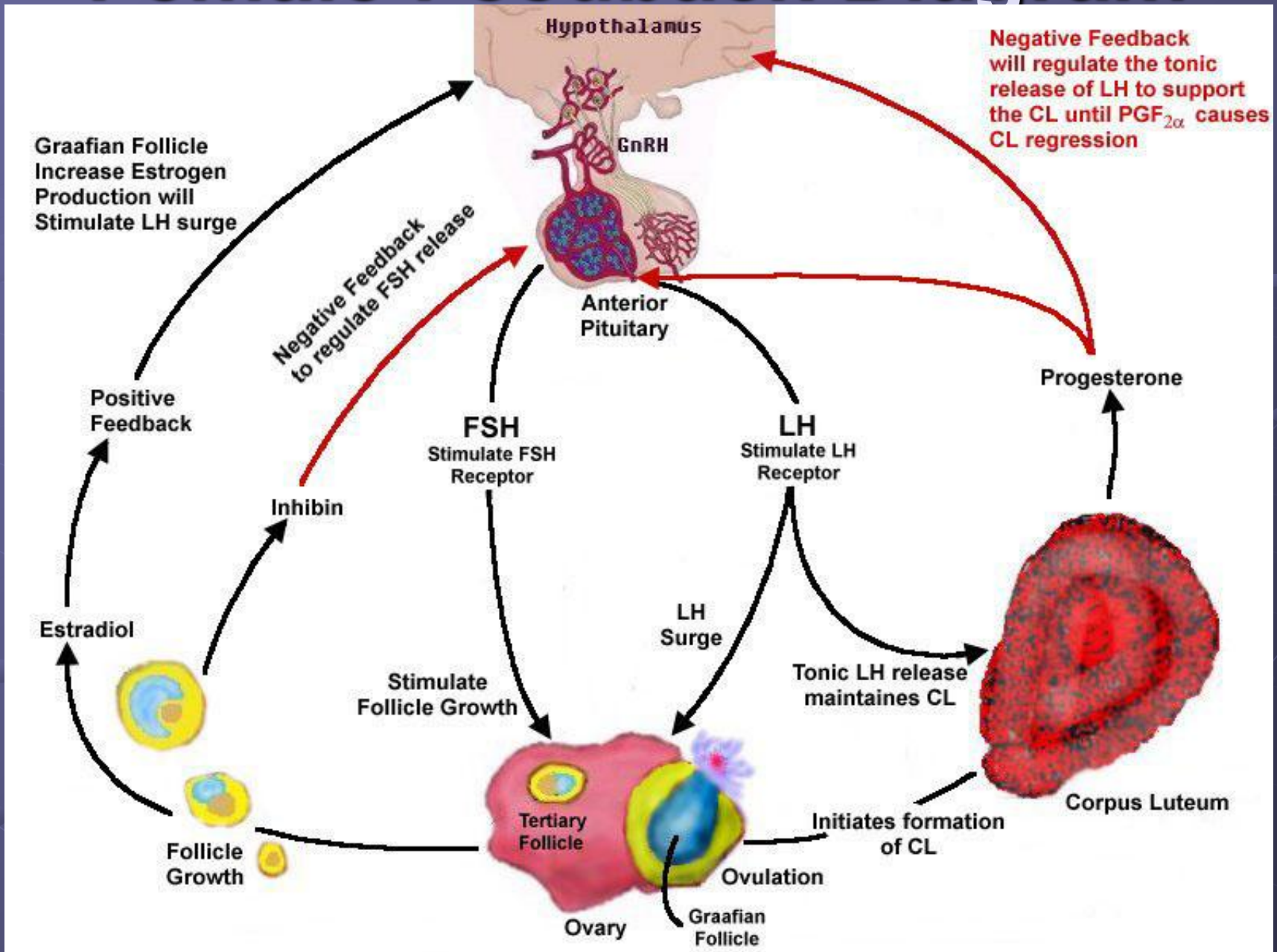
Major endocrine systems for regulation of reproductive processes:



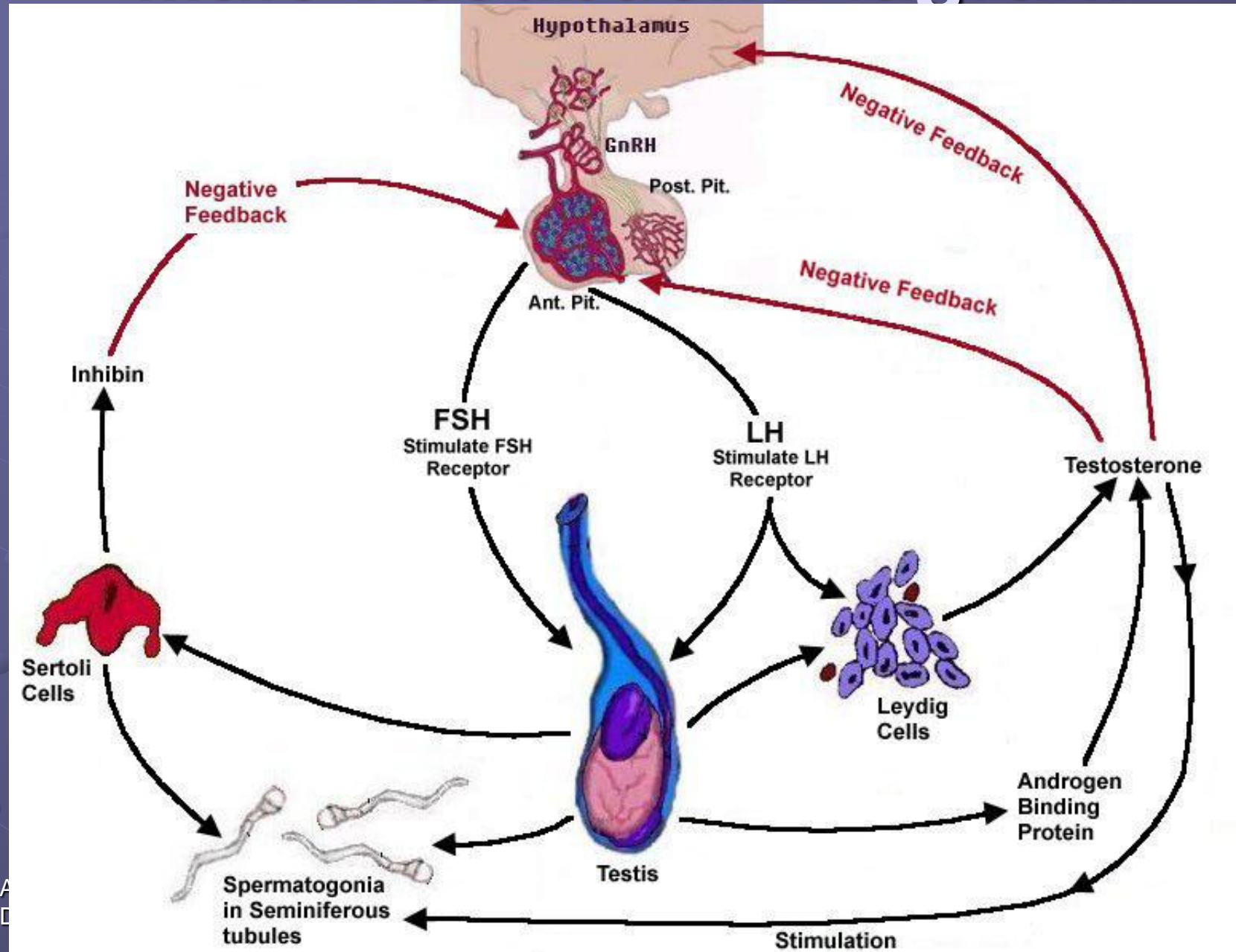
Basic anatomy and physiology

- The **endocrine system** is composed of ductless glands that secrete chemical messenger called hormones in to the blood .
- **Hormones** are chemical substances produced by cells in one part of the body and transported to another part of the body(target organ) where they influence cellular activity
- The endocrine system is controlled by a **feedback** mechanism that includes the hypothalamus , pituitary glands , and the other endocrine glands

Female Feedback Diagram



Male Feedback Diagram



Classification and Properties of Hormone

- **Chemical Structure**

- » **Polypeptides** - hypothalamic

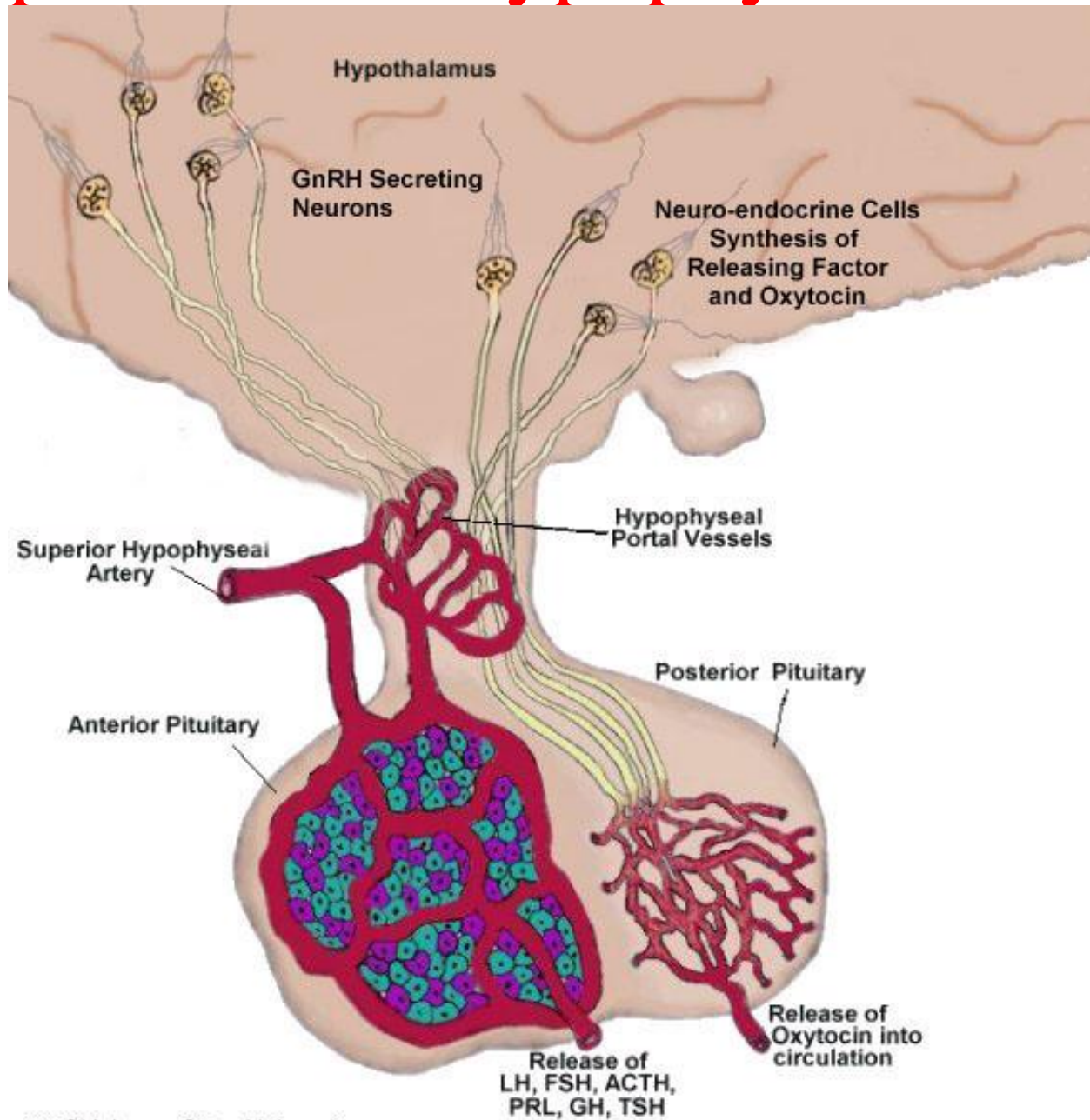
- » **Protein** - pituitary, gonad

- » **Steroids** - gonad, adrenal

- » **Fatty acid** - many sources, prostaglandins

- » **Modified amino acid (Amine H.)** - derivatives from the amino acid tyrosine -Thyroid, pineal

Hypothalamus hypophysis interrelation



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Gonadotropin releasing hormone (GnRH)	neuropeptide	Hypothalamic surge and tonic center	Anterior lobe - pituitary	Release of FSH and LH from anterior lob-pituitary	Fertagyl receptal cystoreline

used 1 – treatment of ovarian follicular cysts.

2 - treatment of inactive ovaries

3 - treatment delayed ovulation or an ovulation.

4 - in Estrus synchronization

5 -Gonadorelin: cow, 0.5 mg i.m., s.c. or i.v.

6- Fertirelin: cow, 100 µg i.m.

7- Buserelin: cow, 10–20 µg; horse 40 µg i.m



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Luteinizing hormone (LH)	glycoprotein	Anterior lobe (pituitary)	Ovary theca interna and luteal cell	Stimulates ovulation , formation of corpora lutea and progesterone secretion	Chorulon follutein

Biological source hCG(human chorionic gonadotropine) or PLH

Used 1 – treatment cystic ovary

2 –before estrous to ovulation , delayed ovulation , anovulation

3 - after insemination to increase size CL to increase progesterone

4 –super ovulation

5 - in embryo transfer to estrous synchronization

Dose:

1- Cattle & horse: 1500-3000 IU i.m.

2- Sheep and goat, 100–500 IU i.m. c



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Follicle stimulating hormone (FSH)	glycoprotein	Anterior lobe (pituitary)	Ovary granulosa cells	Follicle development and estradiol synthesis	Folligon Gonadin

Biological source PMSG (pregnant mare serum gonadotropin) or PFSH (New name eCG)

Used 1 – treatment inactive ovaries

2 – super ovulation

3 – estrous synchronization

Dose

1 – cattle : 1500- 3000 IU i.m., s.c.

**2 – sheep and goats 500 -800 IU
i.m., s.c.**



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Prolactin	protein	Anterior lobe (pituitary)	Mammary cells	Lactation material behavior	prolactin Bromocriptine (prolactin antagonist)

used 1 – in start and continue the lactation(induce lactation)
2 - maternal instinct and brooding in some species

Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Economic name
oxytocin	neuropeptide	Synthesized in the hypothalamus , stored in the posterior lobe , synthesized by CL	Myometrium and endometrium of uterus myoepithelial cell of Mammary gland	Uterine motility , promotes uterine PGF2 synthesis, milk ejection	Oxytocin pitocin

used 1 – in dystocia

2 – retained fetal membrane

3 –pyometra

4 – milk ejection

5 –induction of abortion in mare

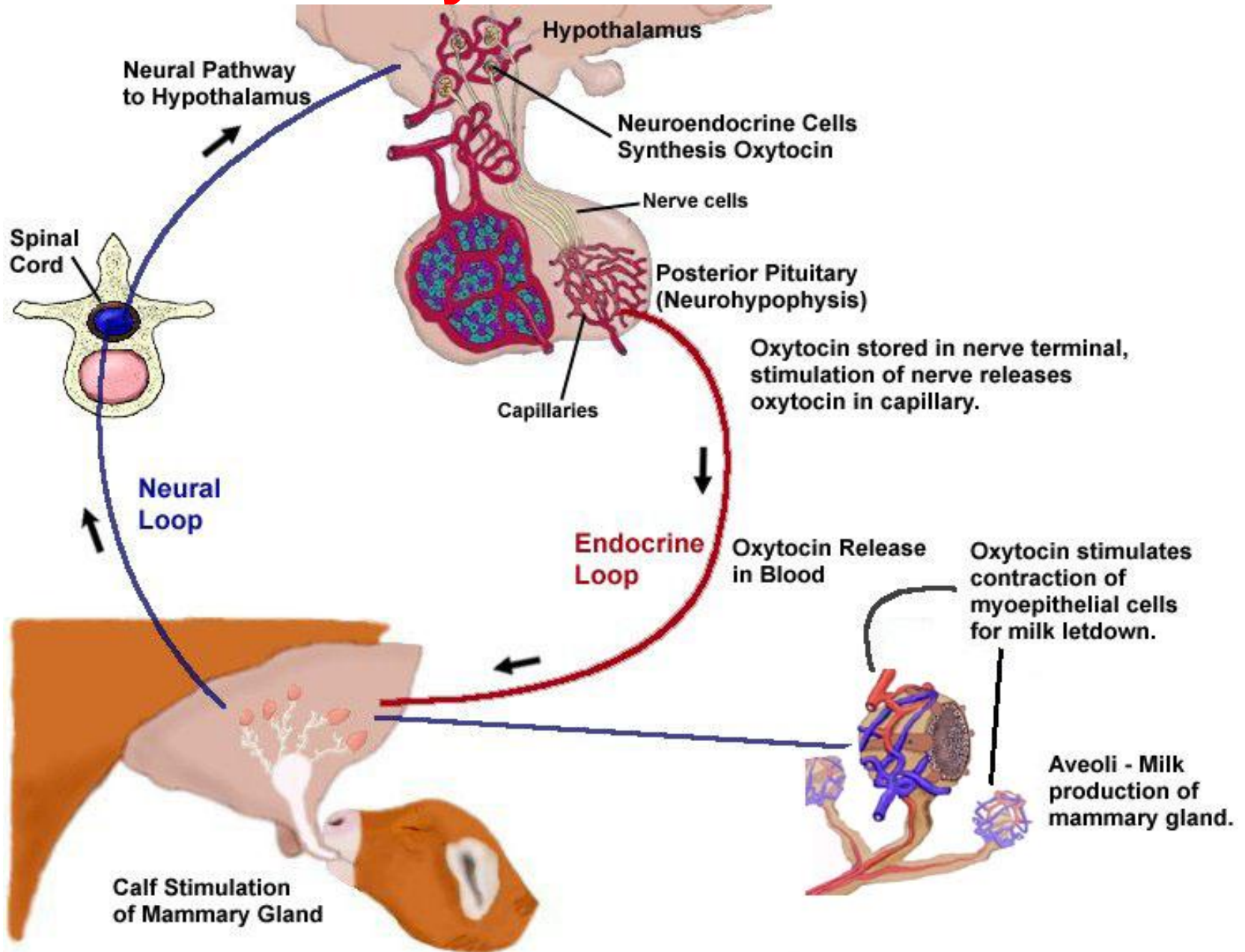
Dose:

1- Cattle: 50-100 I.U.

2- Sheep and Goats: 40 I.U.



Oxytocin release



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
estradiol	Steroid	Granulose cell of follicle ,placenta ,sertoli cells of testis	Hypothalamus , entire reproductive tract and mammary gland	sexual behavior , GNRH, elevated secretory activity of the entire tract, unhandred uterine motility	Estradiol benzoat

used 1 – retained fetal membrane

2 – uterine inflammation

3 – induction abortion

4 – mummified fetuses

5 – prevent fertilization and pseudo pregnancy in bitch

dose 1 -15 mg from estradiol

10 -150 mg from stibesterol



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Progesterone	Steroid	Corpus luteum and placenta	Uterine endometrium, mammary gland, myometrium, hypothalamus	Endometrium secretion, inhibition GNRH release, inhibition reproductive behavior, promotes maintenance of pregnancy	CAP, MAP, MGA, natural in vaginal device

used 1 – estrous synchronization

2 – treatment repeat abortion

3- decrease signs of estrous in follicular cyst (nymphomania)

use nymphalon (HCG +Progesterone)



Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
testosterone	Steroid	cells of theca interna	Brain , skeletal muscle , granulosa cells	Substrate for E2synthesis ,abnormal masculinization(hair patterns , voice , behavior ,ect)	Testosteron propionate

**used 1 – preparation teaser in estrous detection
2 – steer fattening (anabolic effect)**

Dose 50 -500 mg



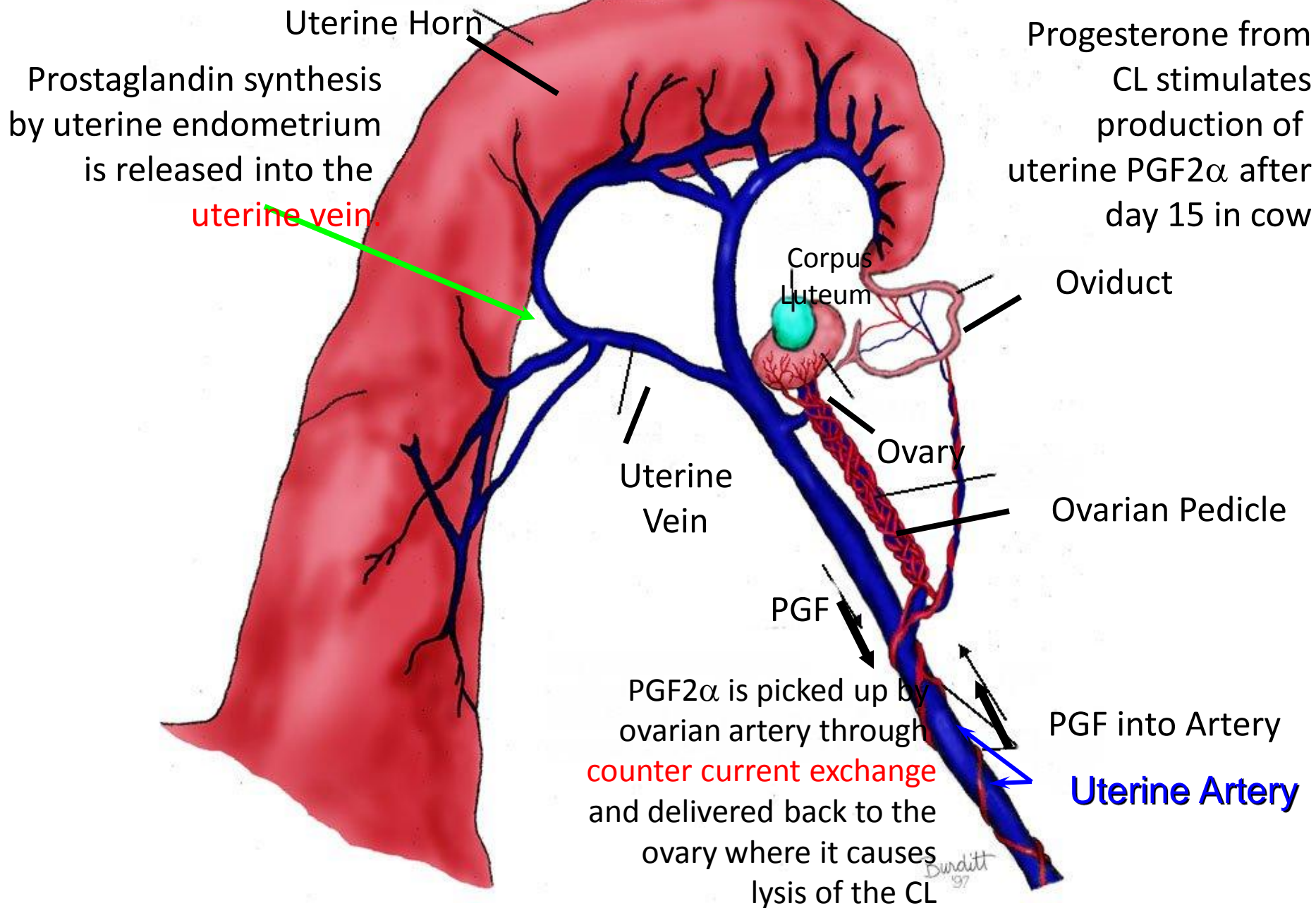
Name of hormone	Biochemical classification	source	Female target tissue	Female primary action	Commercial name
Prostaglandin PGF2<	Fatty acid	Uterine endometrium vesicular glands	Corpus luteum , uterine myometrium , ovulatory follicles	Luteolysis , promotes uterine tone and contraction , ovulation	prosolin estrumate lutalyse lupnosteole

- Used 1 –dystocia (primary uterine inertia)**
2 –induction of abortion and parturition
3 – estrous synchronization
4 – treatment pyometra
5 – treatment luteal cyst

Dose Cattle:15 – 25 mg
Sheep&goats: 7.5 – 10 mg



Prostaglandin F₂ α Control of Luteolysis



Hormone	Chemical class	Principle function
Humane chorionic gonadotropin (hCG)	Protein	LH -like
Pregnant mare serum gonadotropin (PMSG) or (eCG)	protein	FSH –like, supplementary corpora lutea in mare
Inhibin	protein	Prevent release of FSH
Relaxin	Poly peptide	Expansion of pelvic Dilation of cervix
Adrenal cortex(glucocorticoid) Cortisol	Steroid	Parturition Milk synthesis

Hormone	Chemical class	Principle function
gonadotropin releasing hormone (GNRH)	Polypeptide	FSH and LH releasing
Prolactin inhibition factor (PIF)	peptide	Prolactin retention
Prolactin releasing factor (PRF)	Peptide	Prolactin release
Corticotropin releasing hormone(CRH)	peptide	ACTH releasing
Adrenocorticotropin (ACTH)	polypeptide	Release of glucocorticoid