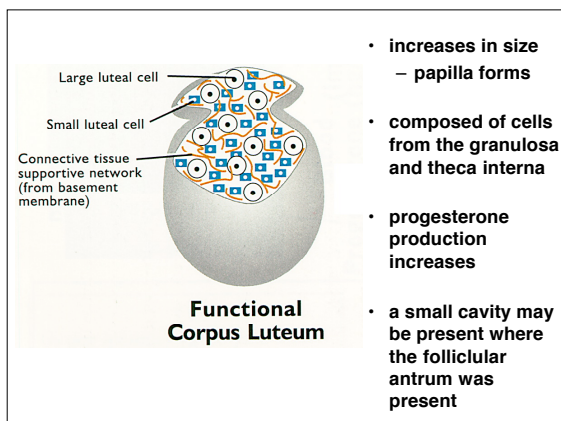
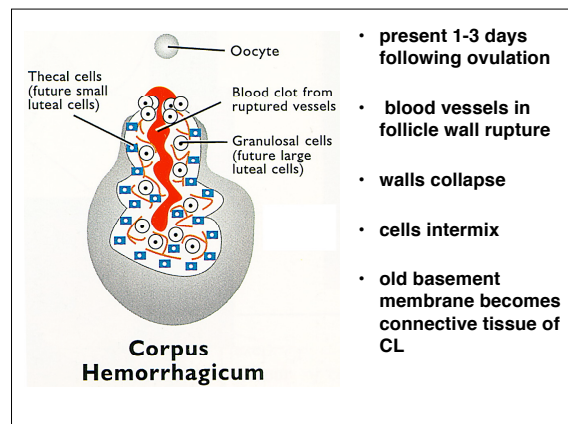
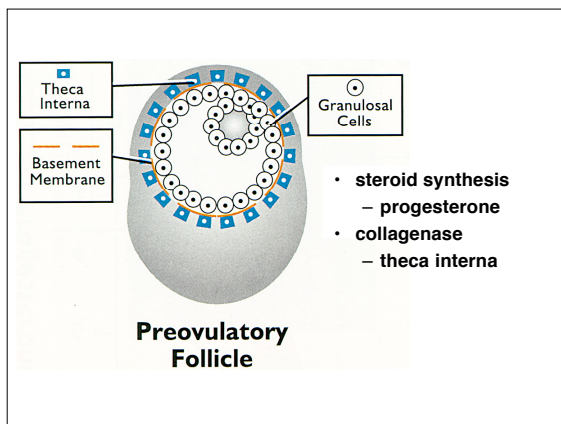
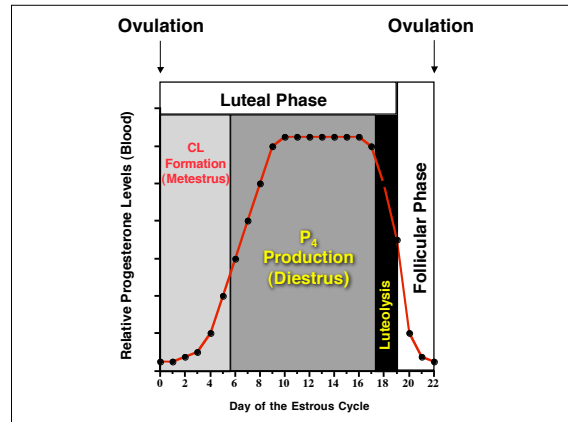


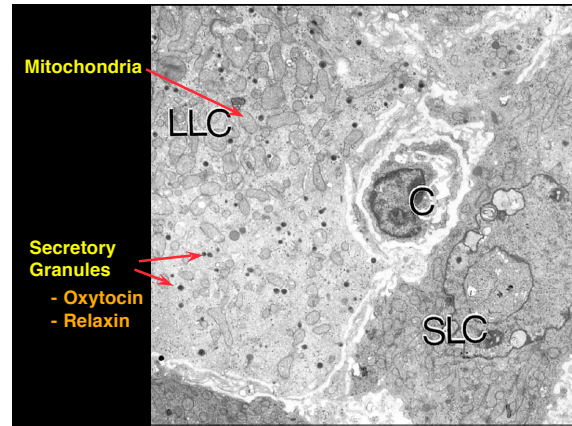
Animal Science 434

Lecture 11: The Luteal Phase of the Estrous and Menstrual Cycle



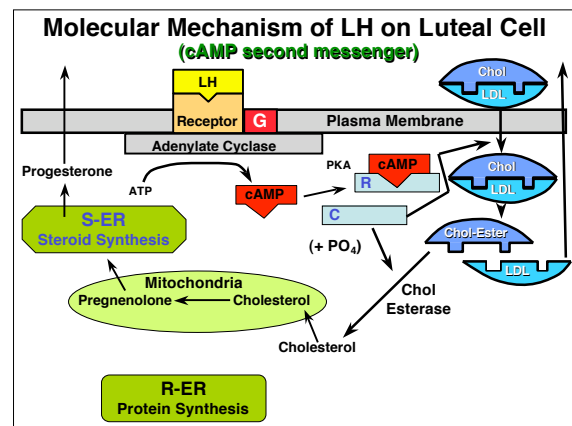
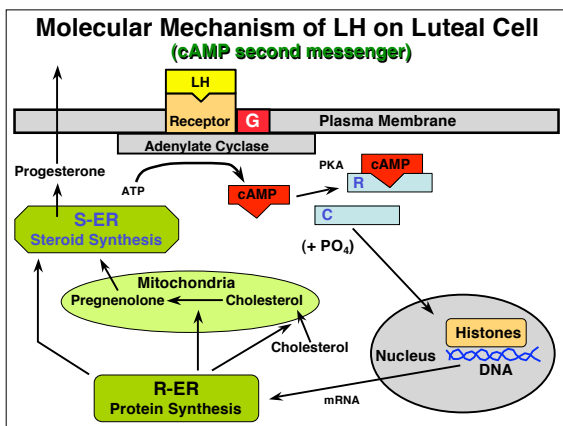
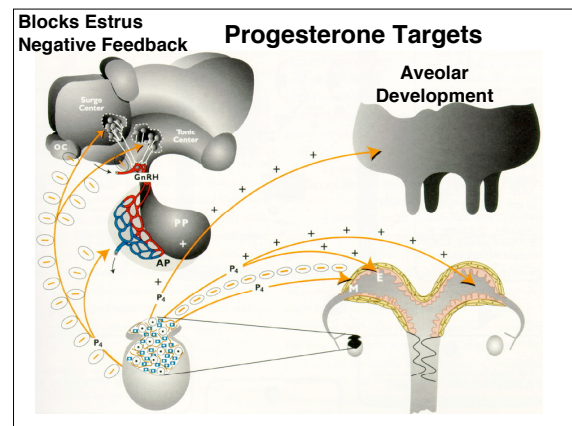
Luteal Tissue

- Large cells from granulosa
- Small cells from the theca interna



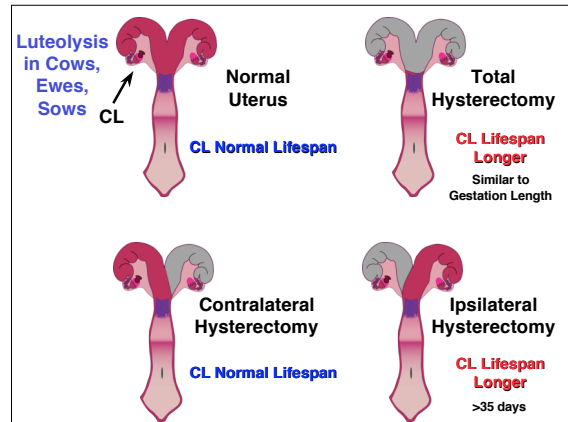
Functional Capability of CL

- the number of luteal cells
 - large cells undergo hypertrophy (3 fold)
 - small cells undergo hyperplasia (5 fold)
- vascularization of CL
 - Initiated by angiogenic factors from follicle
 - Vascularity effects CL steroid synthesis and delivery of hormones
- Insufficient CL function
 - Failure to maintain pregnancy
 - Important in domestic animals



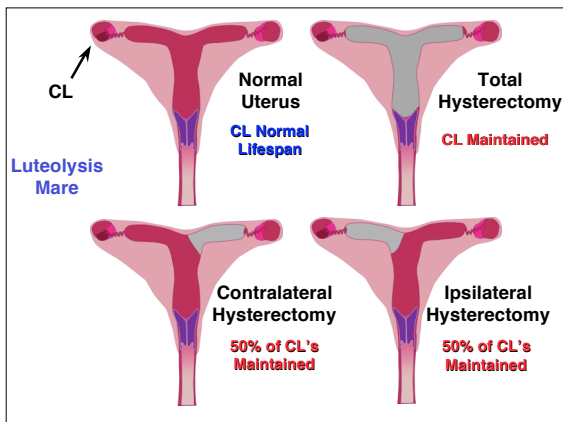
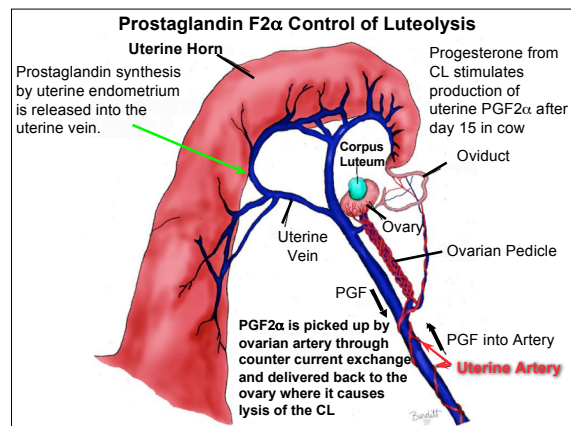
Luteolysis

- Uterus
- $\text{PGF}_{2\alpha}$
- Oxytocin

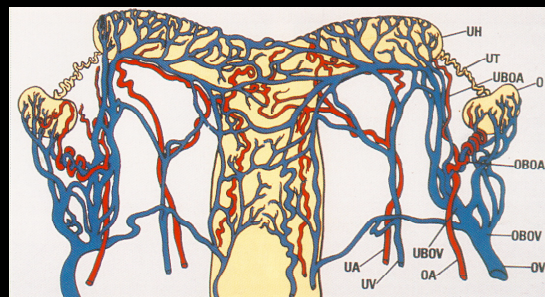


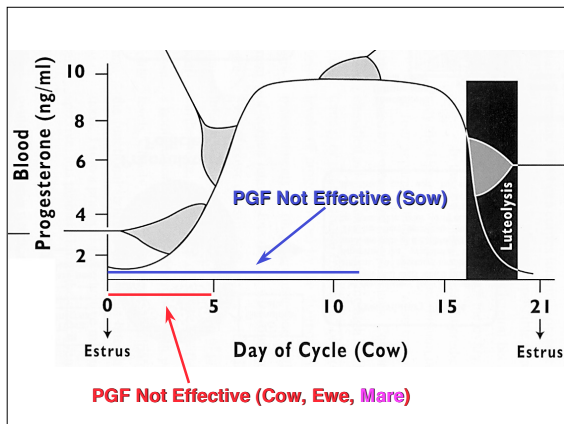
Luteolysis

- Uterus
- $\text{PGF}_{2\alpha}$
- Oxytocin



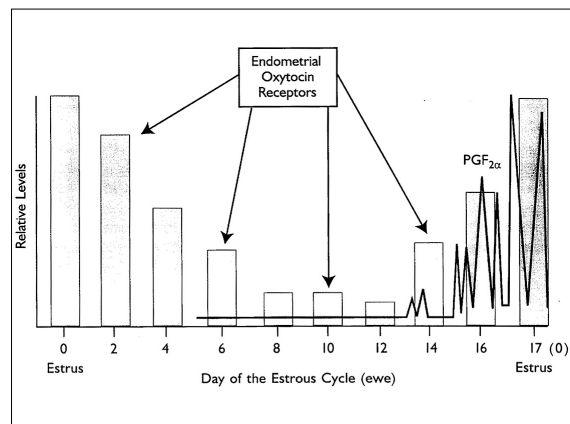
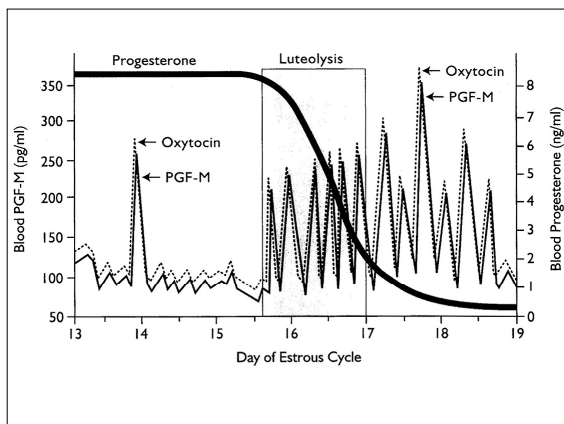
Blood Supply to Uterus and Ovary in the Mare



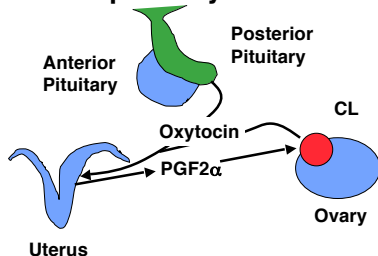


Luteolysis

- Uterus
- $\text{PGF}_{2\alpha}$
- Oxytocin

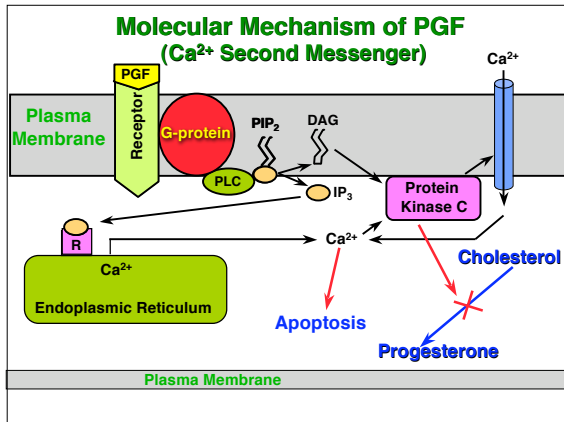


Relationship of Oxytocin and $\text{PGF}_{2\alpha}$



Luteolysis

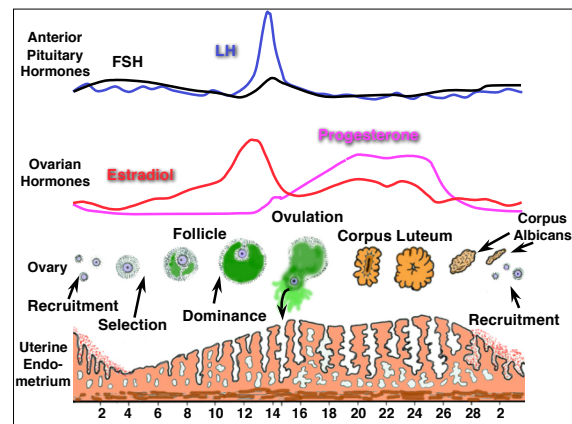
- decreased blood flow
- cellular response
 - apoptosis
 - progesterone synthesis
- Immune response
 - Lymphocytes
 - Macrophages



Luteolysis

- decreased blood flow
- cellular response
 - apoptosis
 - progesterone synthesis
- Immune response
 - Lymphocytes
 - Macrophages

Menstrual Cycle



Luteolysis in the Primate

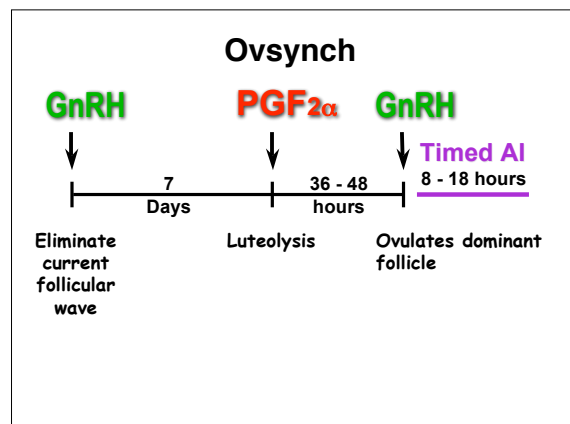
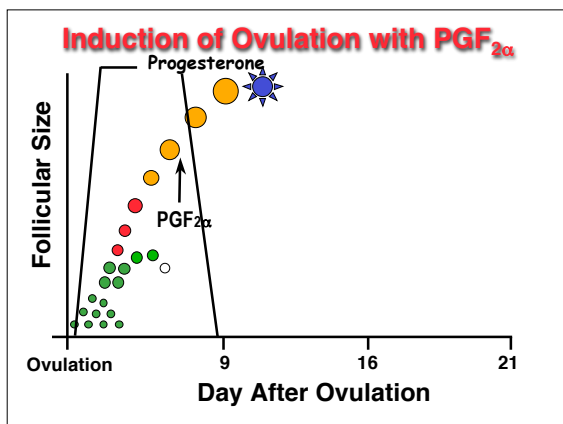
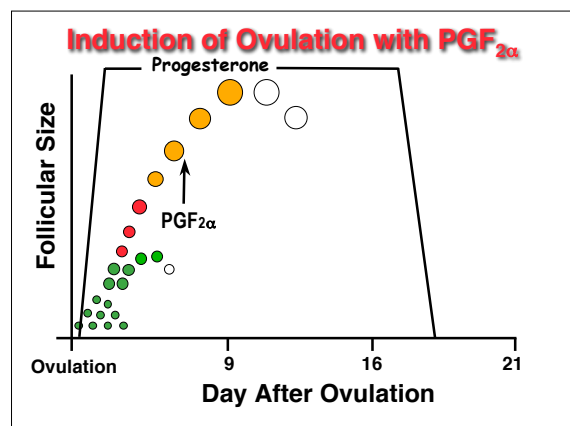
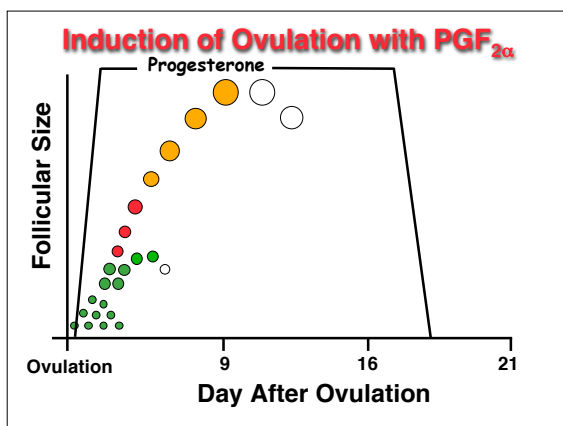
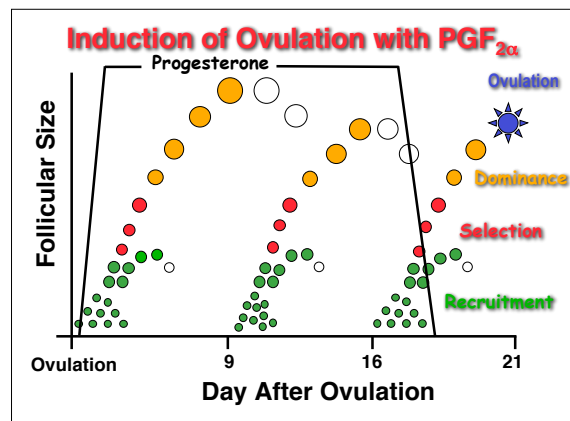
- Does not require the uterus
- CL lifespan in the human is 12-14 days unless pregnancy occurs
 - In the absence of pregnancy, CL self destructs
 - Possible intra-ovarian oxytocin receptors and PGF_{2α} production
- Menstruation
 - Drop in P₄ and E₂
 - Endometrial PGF_{2α}, vasoconstriction, necrosis
 - Endometrial inflammation and tissue degeneration

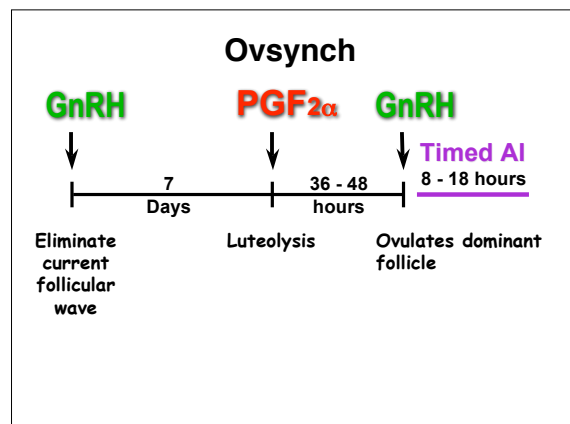
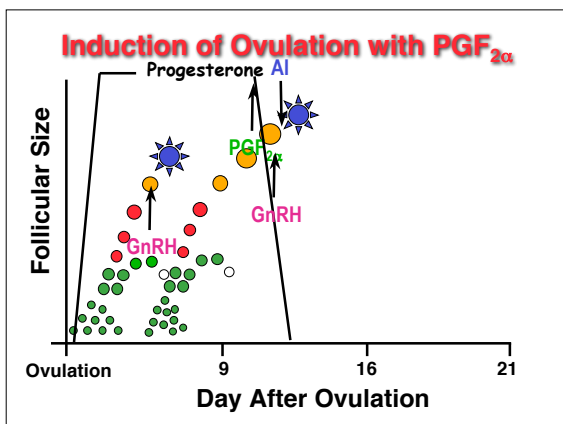
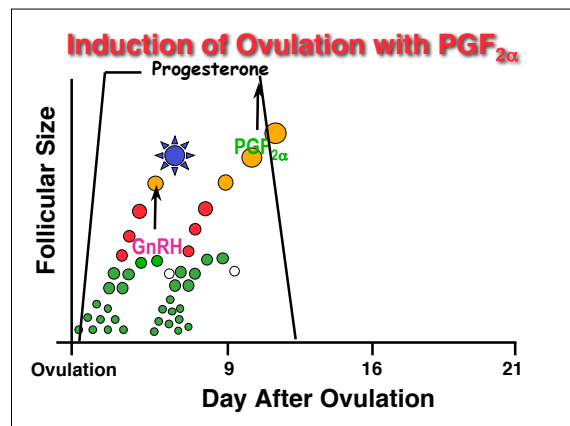
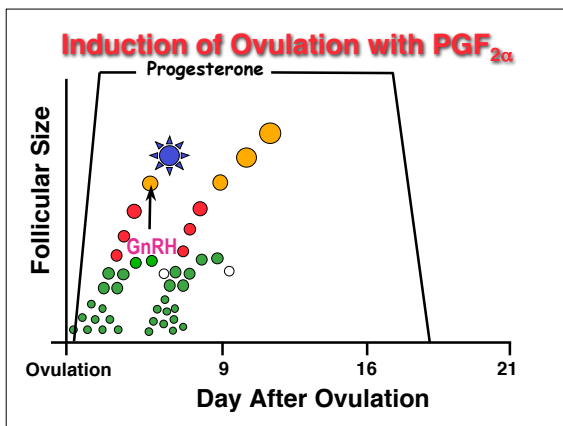
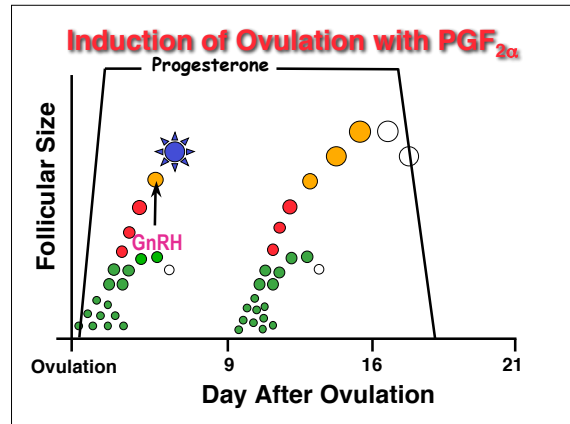
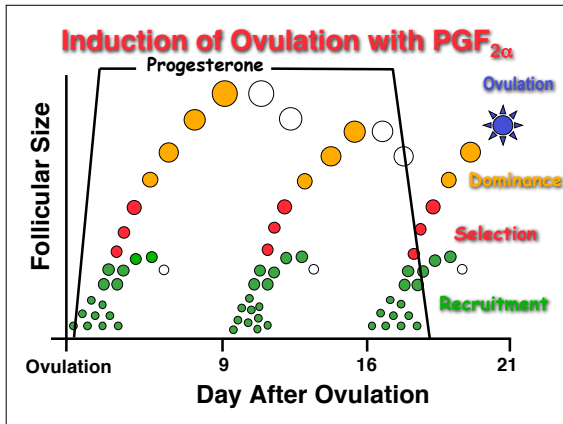
Manipulating Ovulation

- Hormonal induction of ovulation
 - PGF_{2α}
 - GnRH
 - Progestins
- Superovulation
 - FSH
 - eCG

Principle of PGF_{2α} Use

- Regress active corpus luteum
 - Only effective on a day 5 - 17 CL
 - Not effective on days:
 - ✓ 1 - 4 (CL not responsive)
 - ✓ 18 - 21 (CL already regressed)





Principle:

This does not regress the CL!!!!

- Injection
- Feed
- Implant
- Pessary or Control Internal Drug Release (CIDR)

