

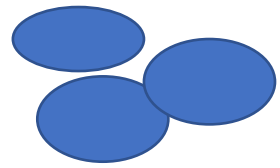
Regulation



FOLLICLE

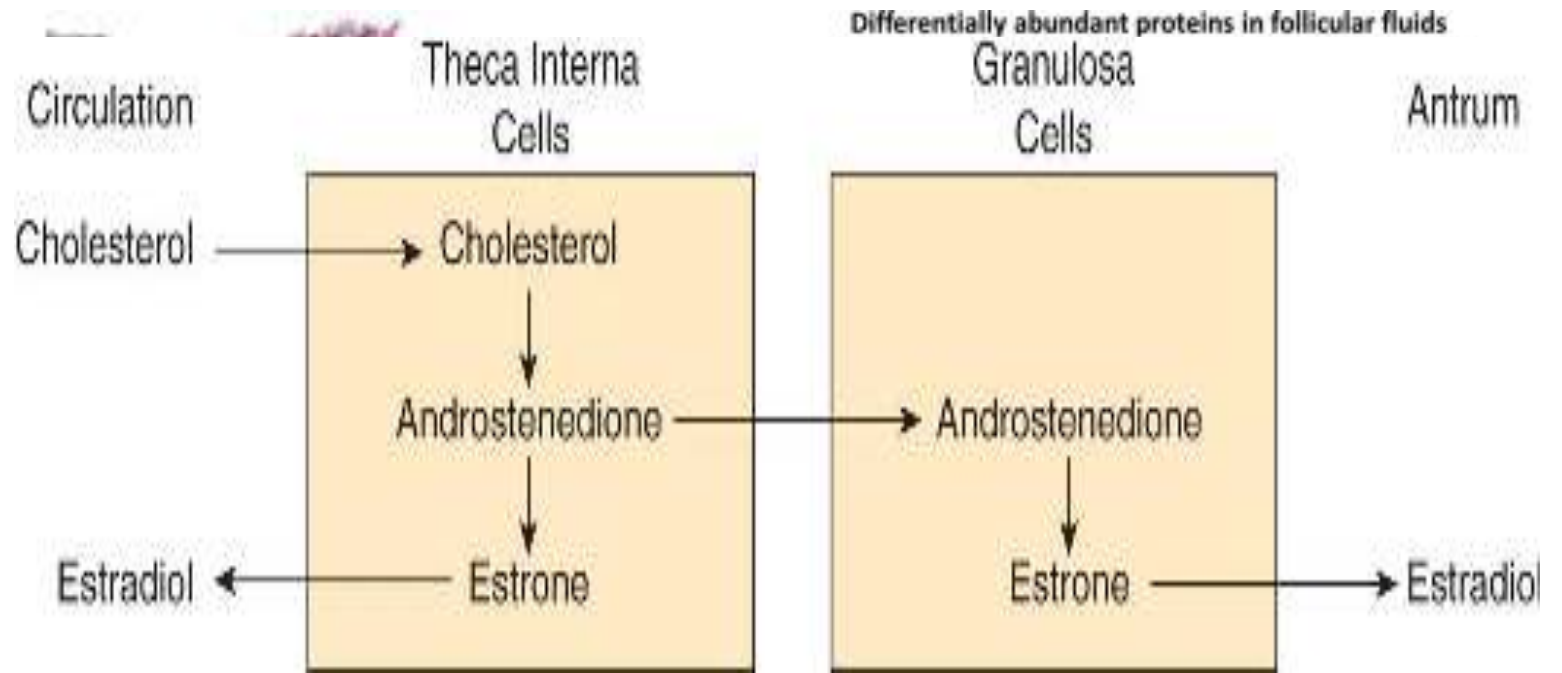
Lots of follicles may start this ripening process, but only a single dominant one will make it to ovulation. The process by which the other ones die off along the way is called atresia.



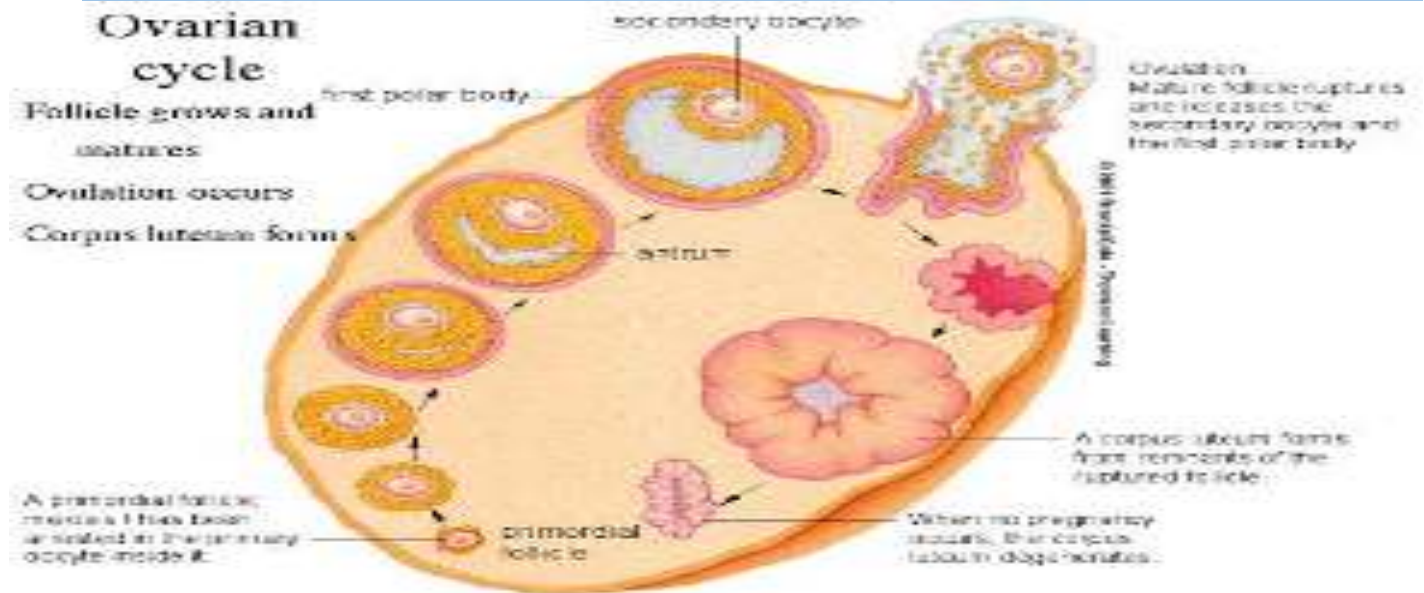


6th Day

APOPTOSIS



14th Day

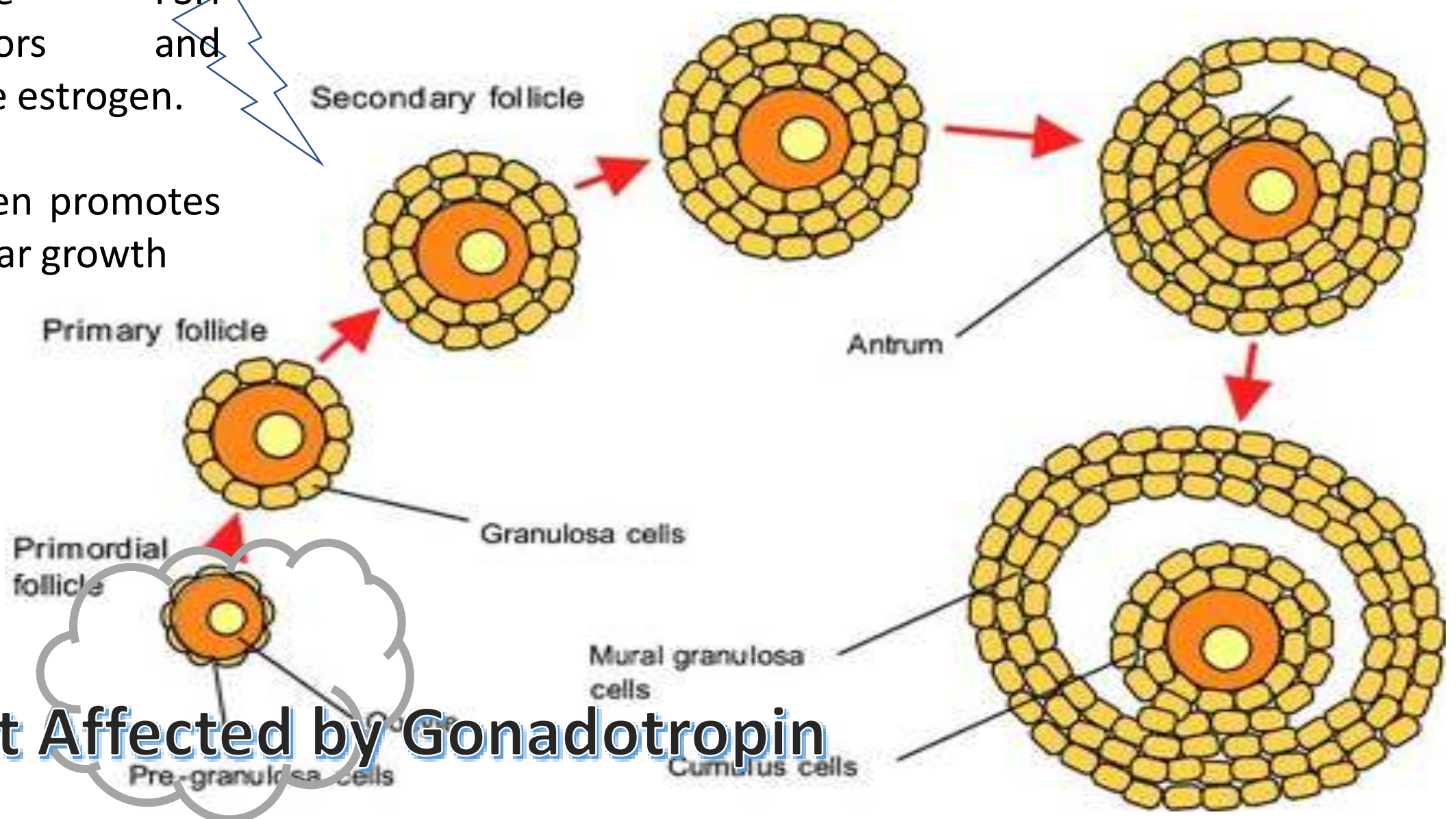


Regulation of Ovulation

Acquire receptors and secrete estrogen.

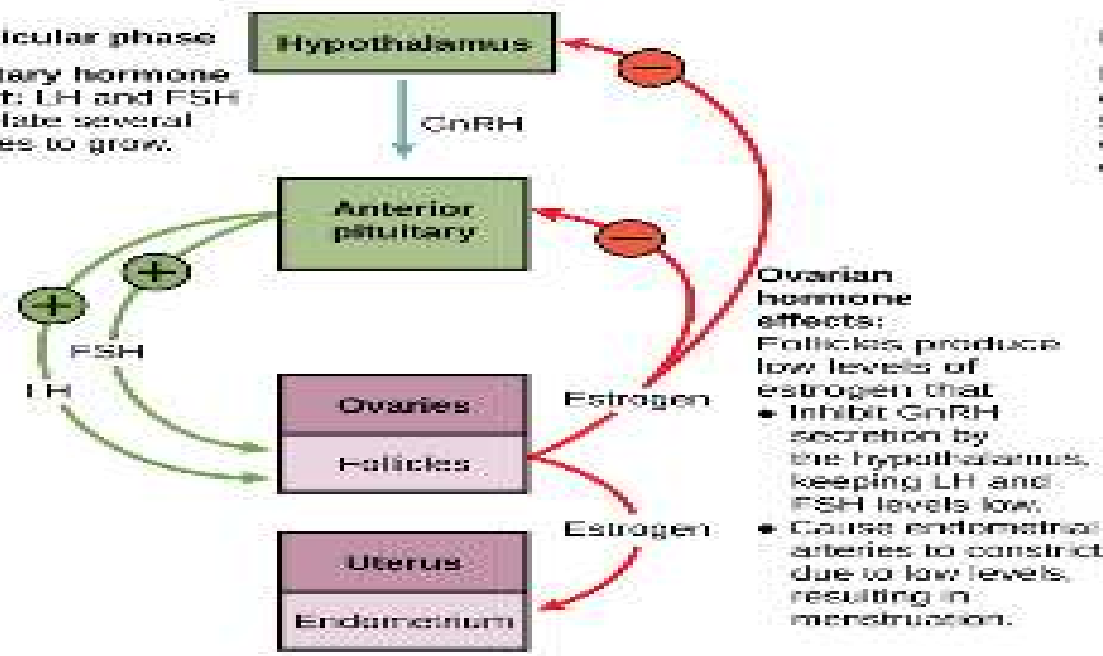


Estrogen promotes follicular growth



Not Affected by Gonadotropin

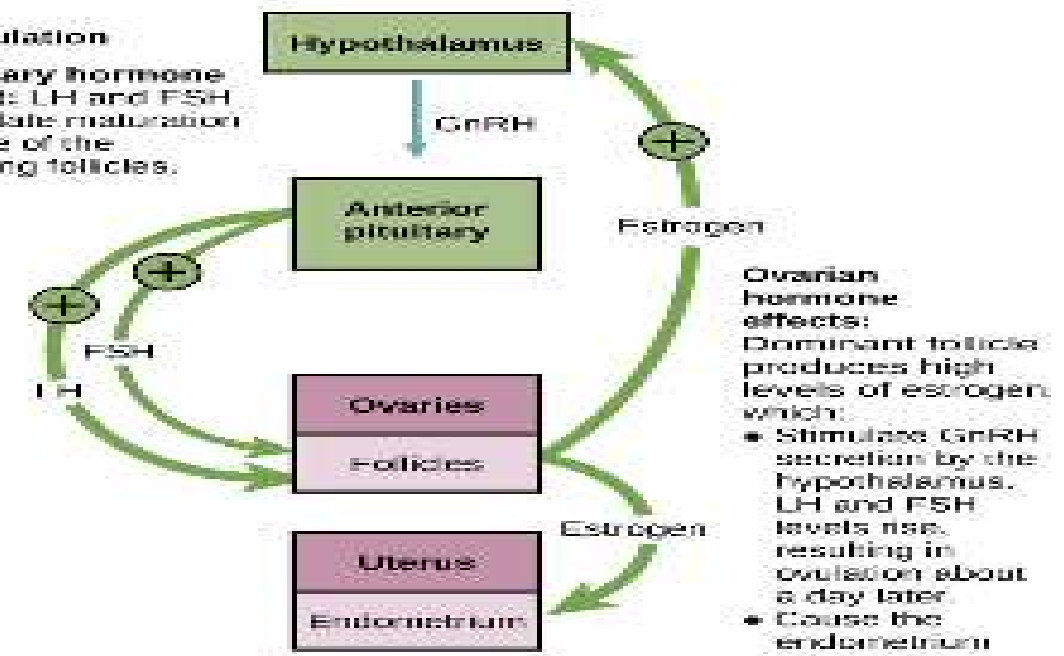
I Follicular phase
 Pituitary hormone effect: LH and FSH stimulate several follicles to grow.



Ovarian hormone effects:
 Follicles produce low levels of estrogen that

- Inhibit GnRH secretion by the hypothalamus, keeping LH and FSH levels low.
- Cause endometrial arteries to constrict due to low levels, resulting in menstruation.

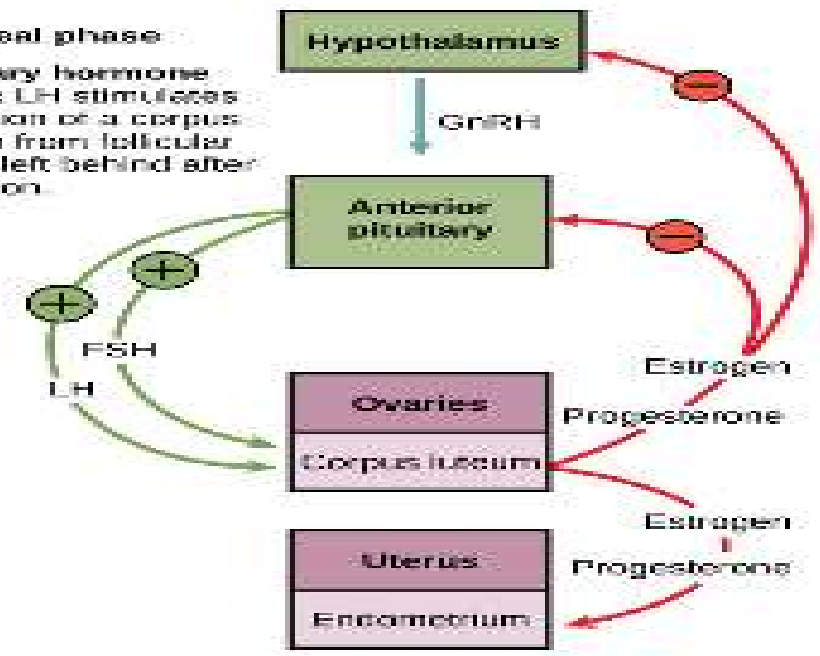
II Ovulation
 Pituitary hormone effect: LH and FSH stimulate maturation of one of the growing follicles.



Ovarian hormone effects:
 Dominant follicle produces high levels of estrogen which:

- Stimulate GnRH secretion by the hypothalamus. LH and FSH levels rise, resulting in ovulation about a day later.
- Cause the endometrium to thicken.

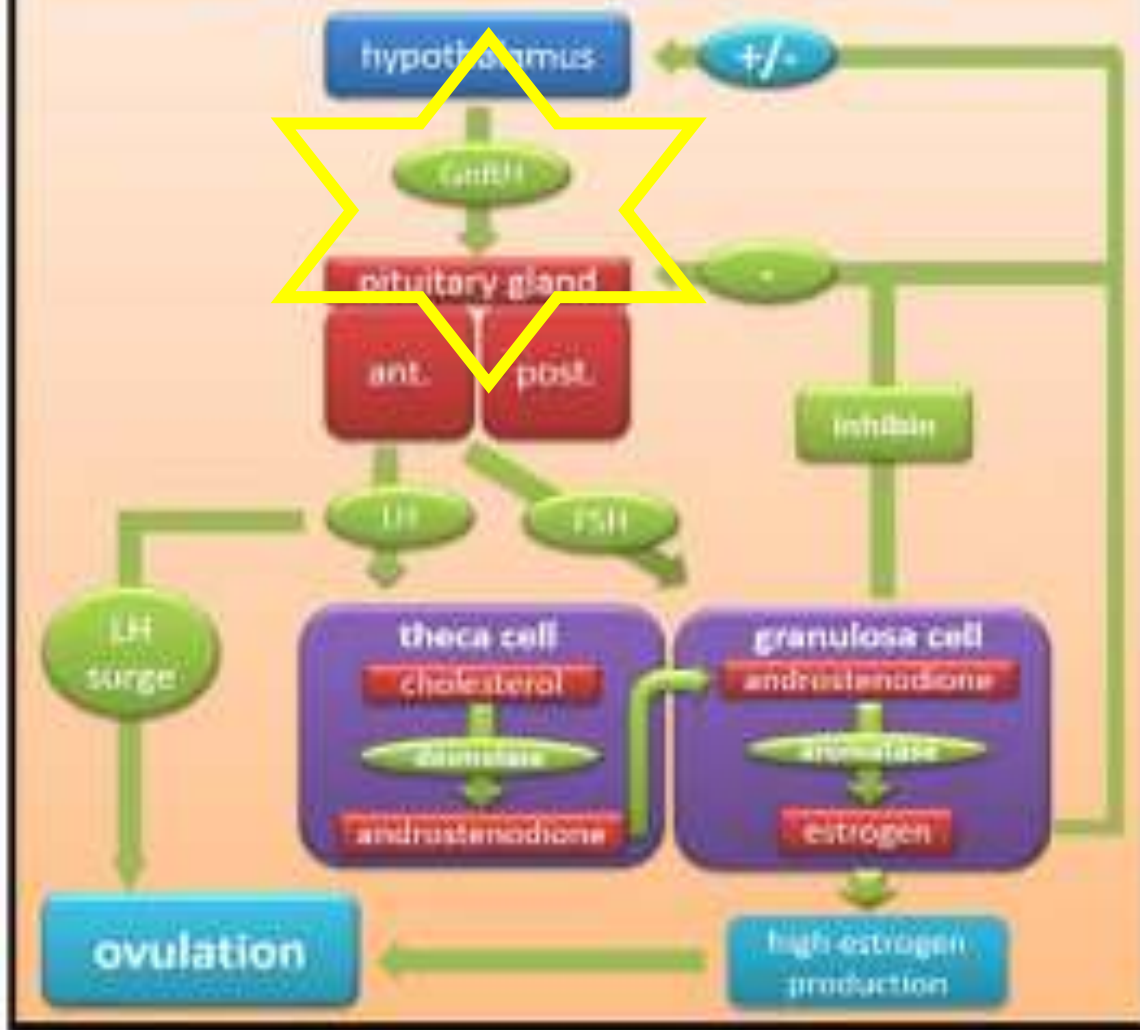
III Luteal phase
 Pituitary hormone effect: LH stimulates formation of a corpus luteum from follicular tissue left behind after ovulation.

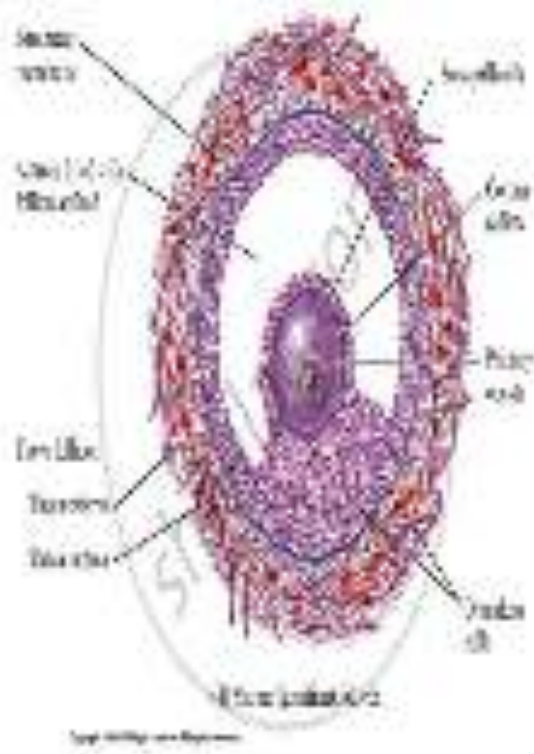


Ovarian hormone effects:
 The corpus luteum secretes estrogen and progesterone that

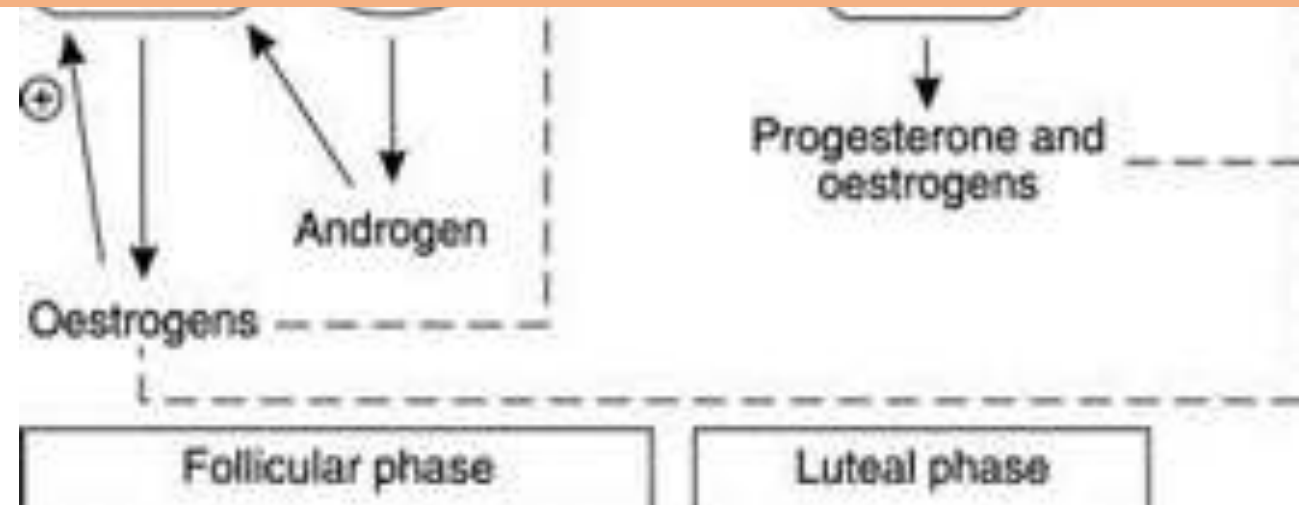
- Block GnRH production by the hypothalamus and LH and FSH production by the pituitary.
- Cause the endometrium to further develop.

Follicular phase – early and late diagram



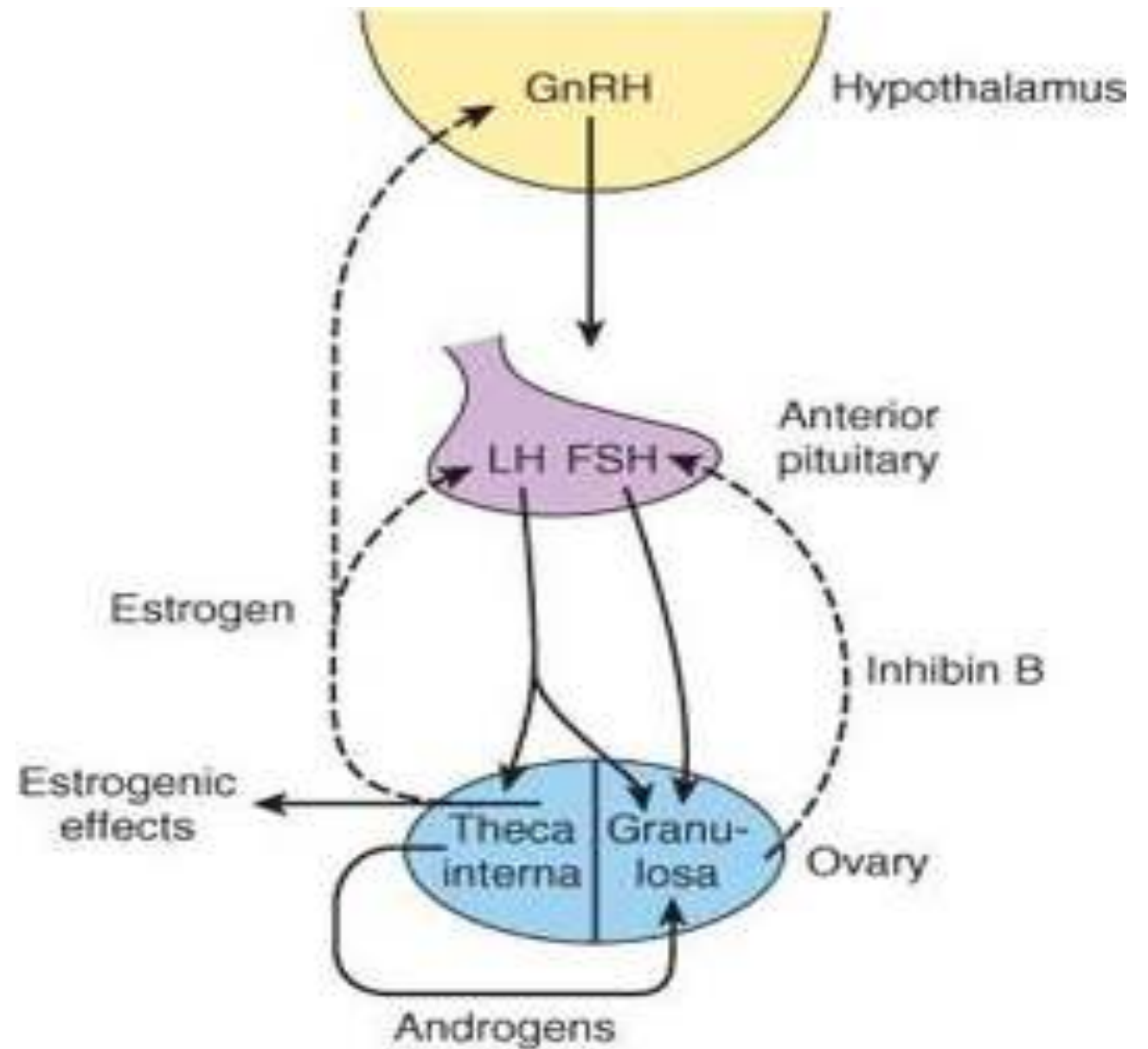


The follicle which has the highest number of FSH receptors, the maximal aromatase activity and thus produces the highest concentration of oestradiol is named the dominant follicle and will be selected for ovulation, the others gradually degenerate during a process called atresia.



During the early part of the follicular phase, inhibin B is low and FSH is modestly elevated, fostering follicular growth.

LH secretion is held in check by the negative feedback effect of the rising plasma estrogen level.



36-48 hour before OVULATION

300% (200 pg/ml) increase for 36 hour,

As follicle grows it produces larger concentrations of oestrogen.

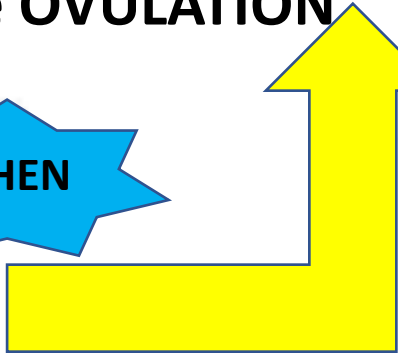
At a certain **threshold**, its effect reverses.

It now has a positive feedback effect on secretion of FSH from pituitary.

Also stimulates pituitary gland to release luteinising hormone (LH)

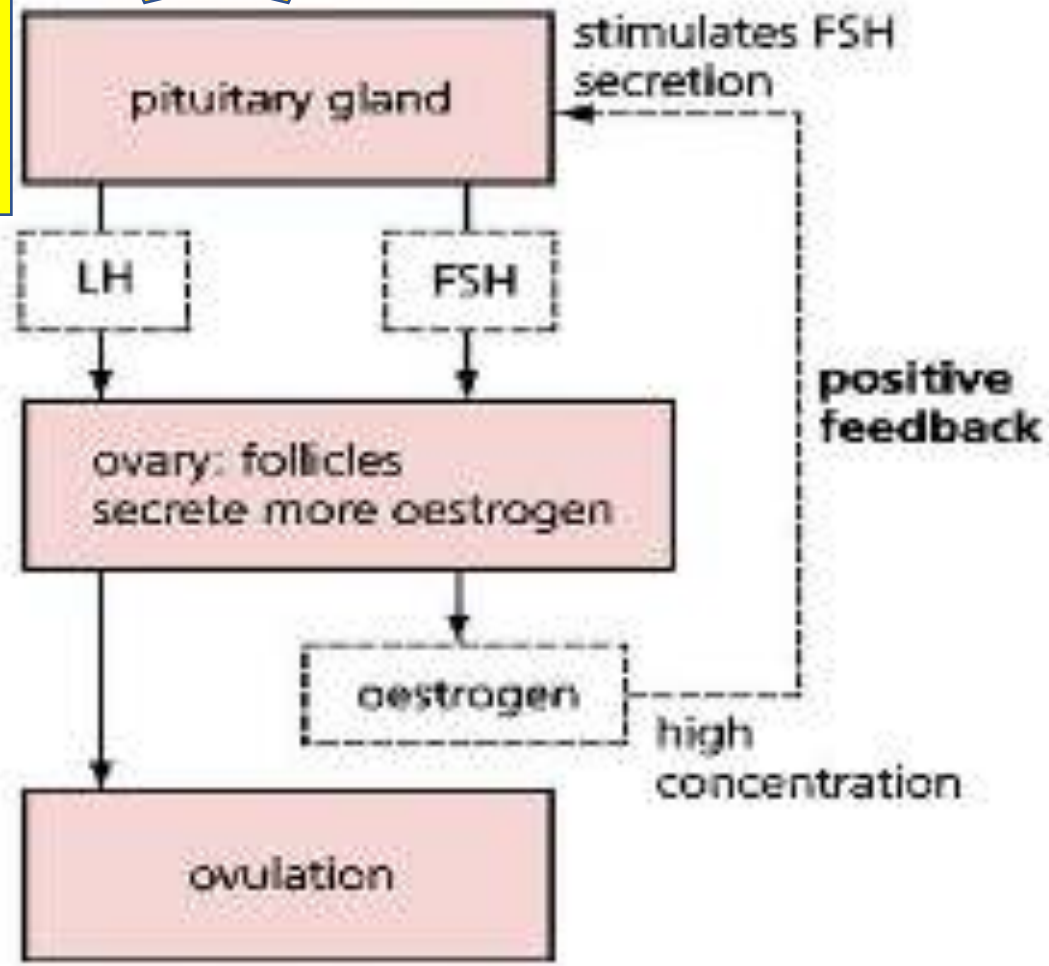
WHEN

WHAT

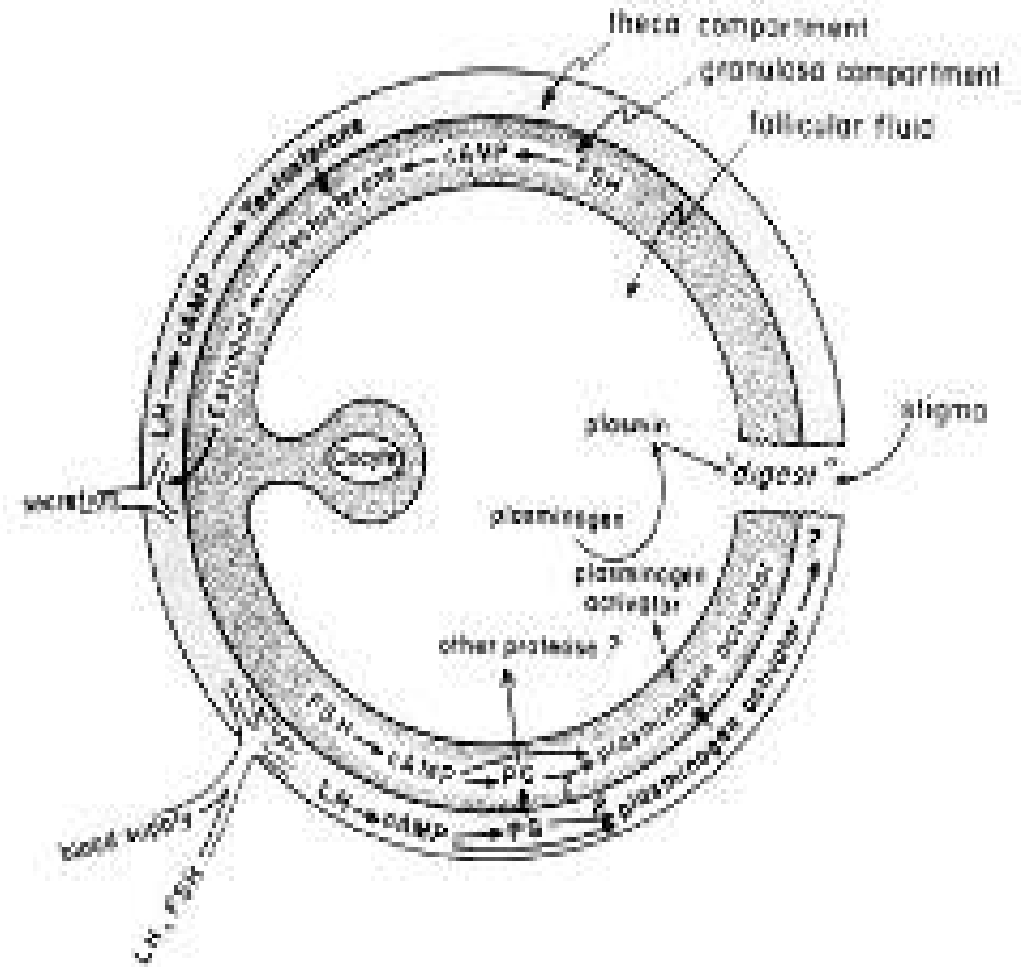
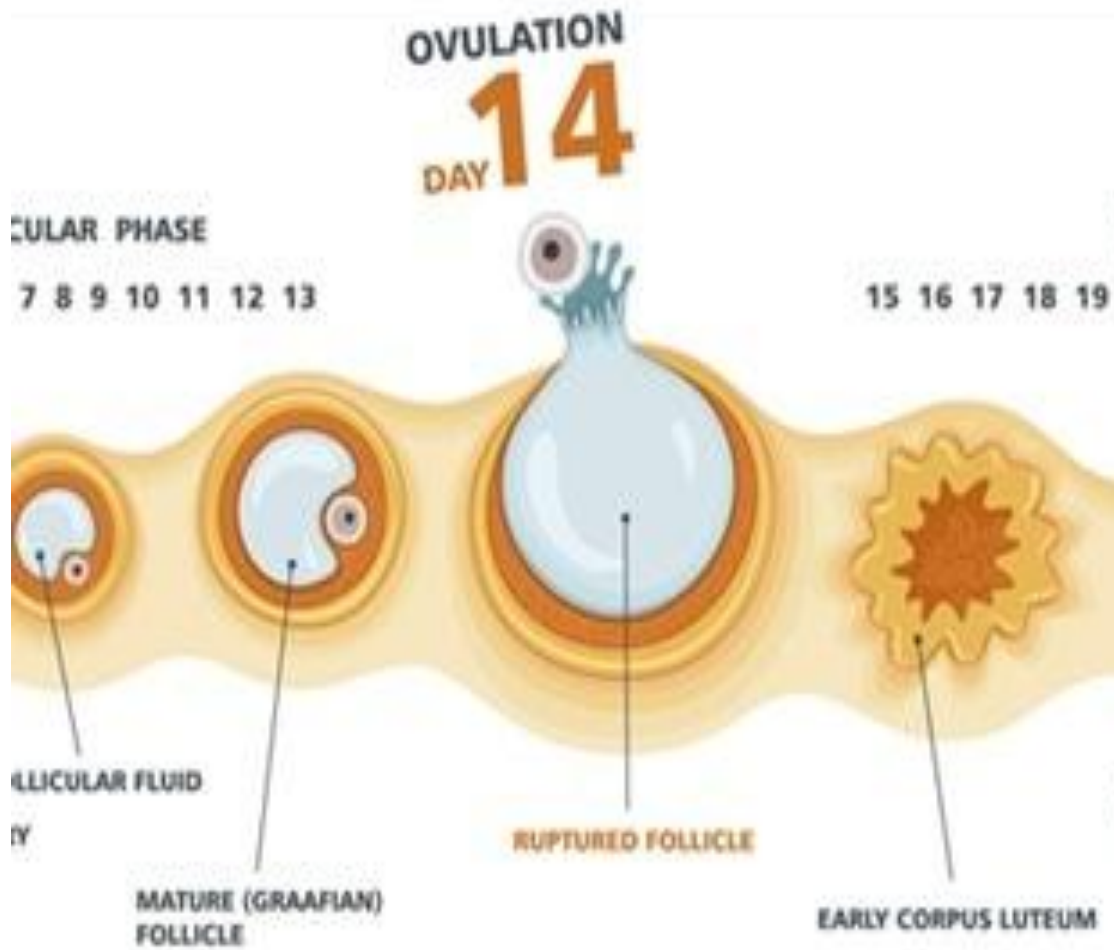


threshold

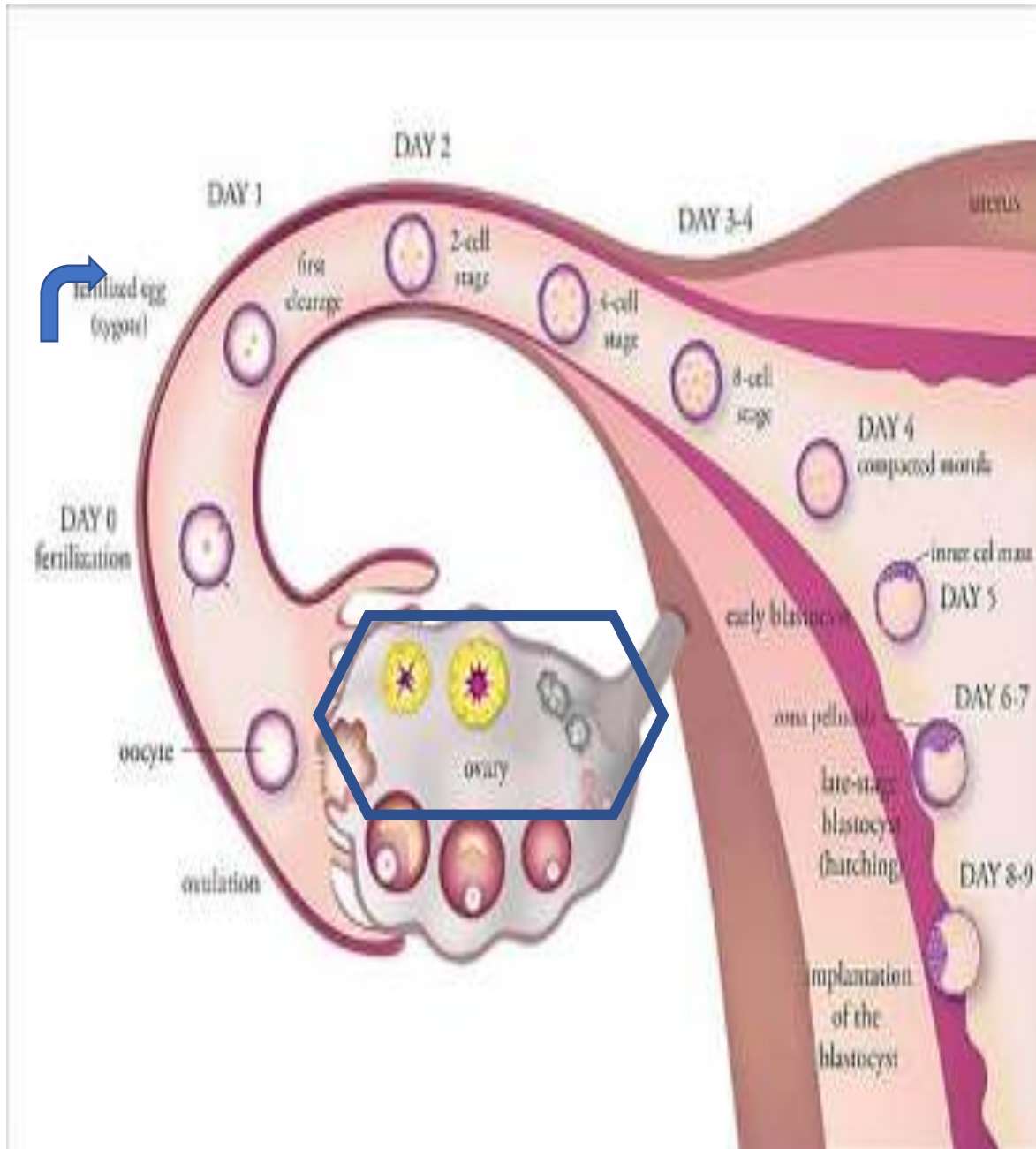
BURST OF LH SECRETION



LH SURGE



**OVULATION OCCURS ABOUT 9 hr AFTER
LH PEAK**



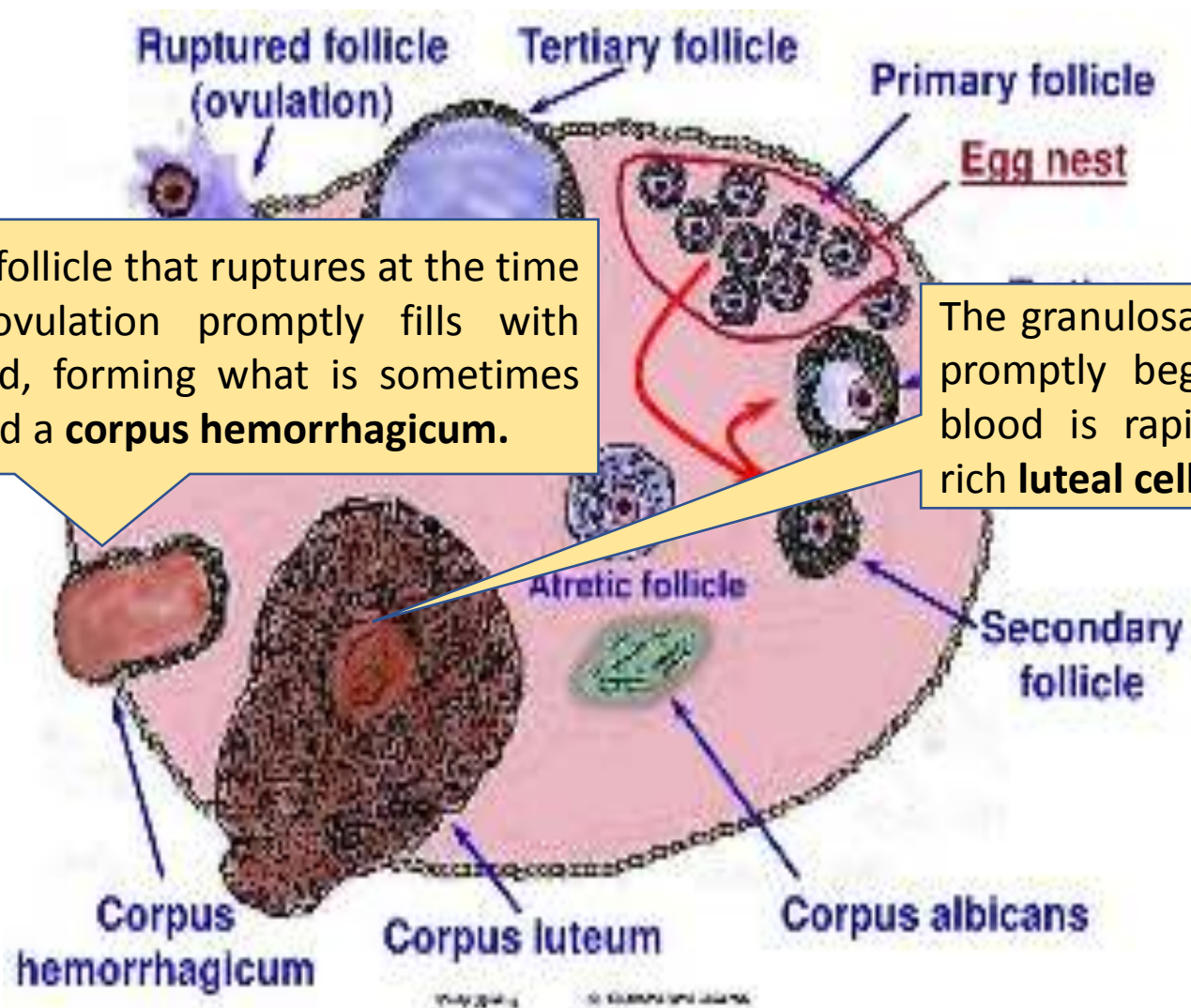
The ovum is picked up by the fimbriated ends of the uterine tubes (oviducts).

It is transported to the uterus and, unless fertilization occurs, out through the vagina.

LUTEAL PHASE

The follicle that ruptures at the time of ovulation promptly fills with blood, forming what is sometimes called a **corpus hemorrhagicum**.

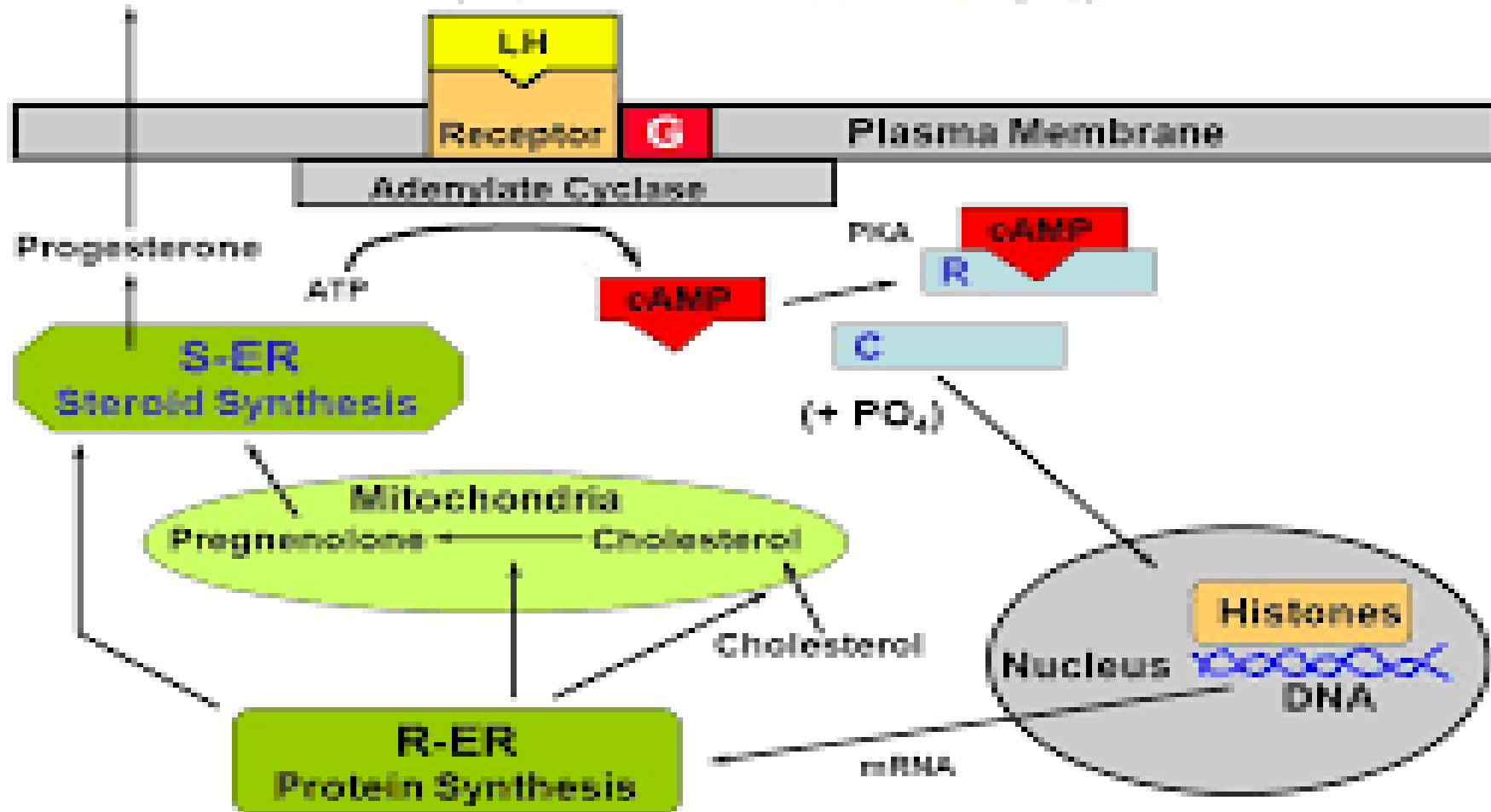
The granulosa and theca cells of the follicle lining promptly begin to proliferate, and the clotted blood is rapidly replaced with yellowish, lipid-rich **luteal cells**, forming the **corpus luteum**.

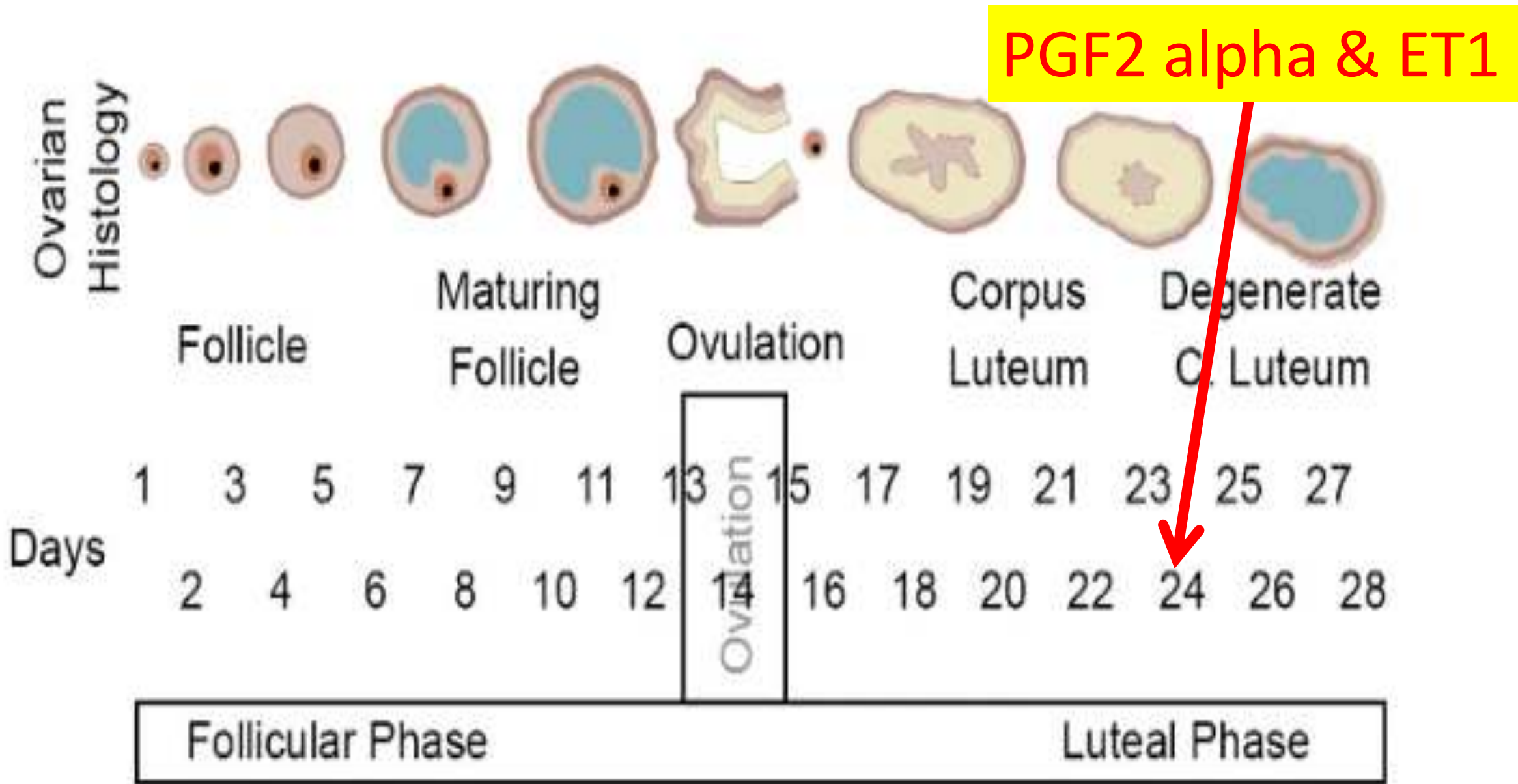


Minor bleeding from the follicle into the abdominal cavity may cause peritoneal irritation and fleeting lower abdominal pain ("mittelschmerz").

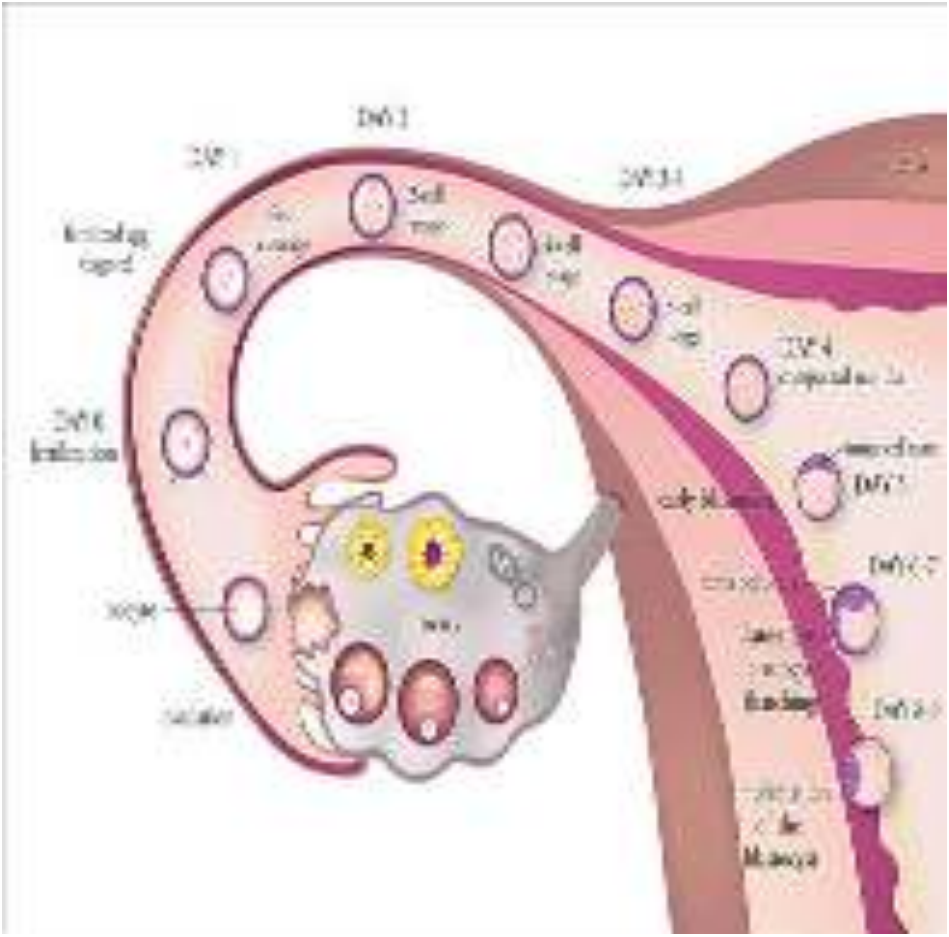
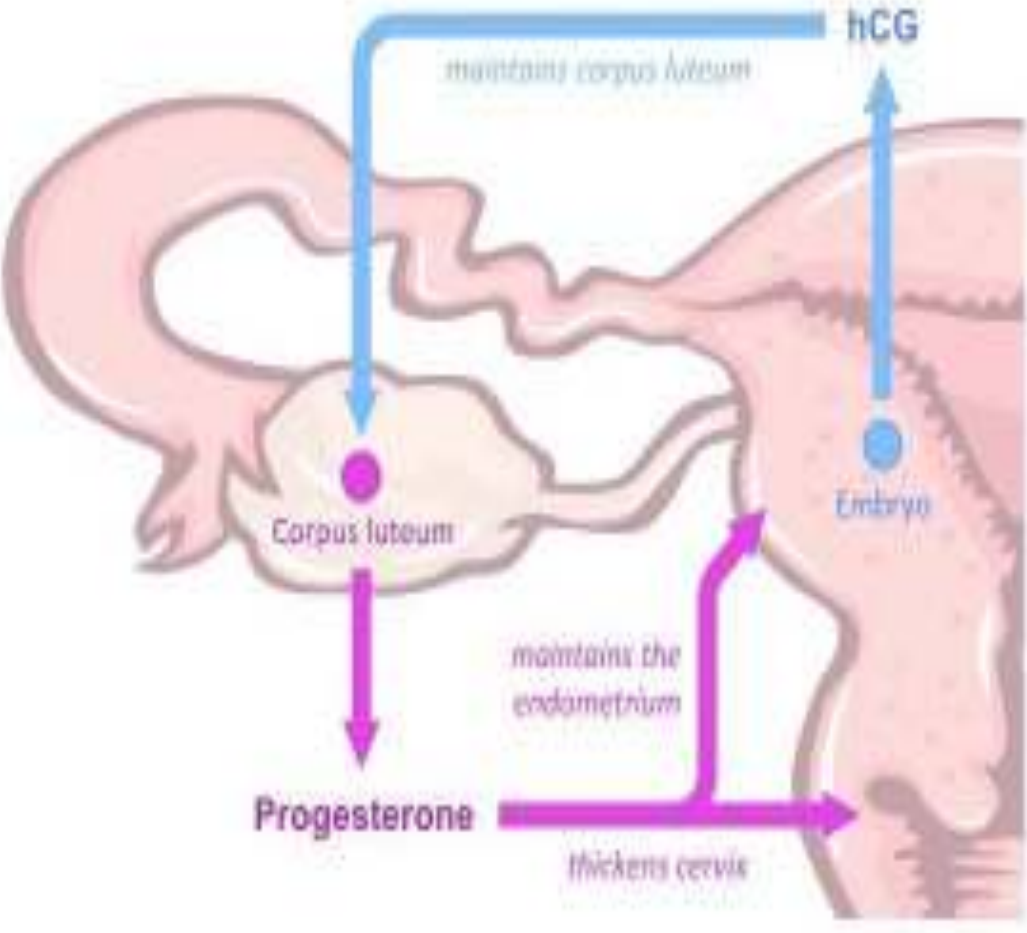
Hormonal Control

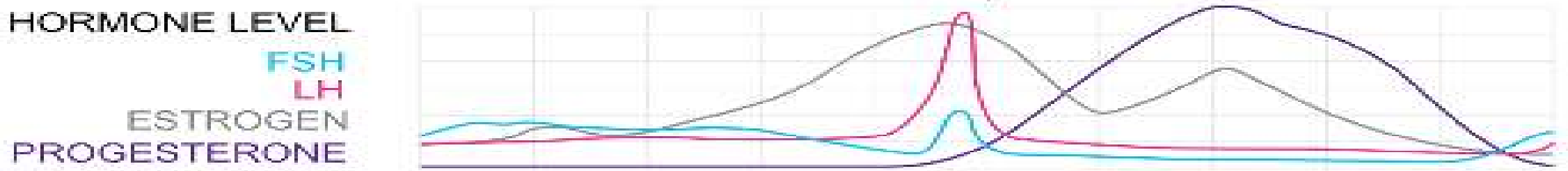
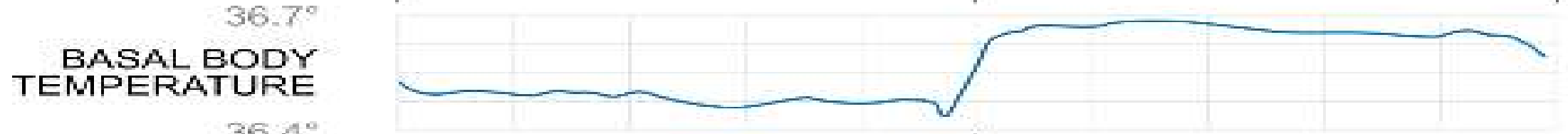
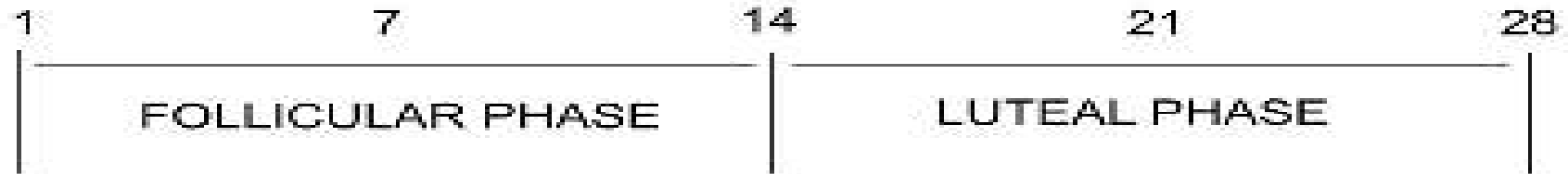
Molecular Mechanism of LH on Luteal Cell (cAMP second messenger)



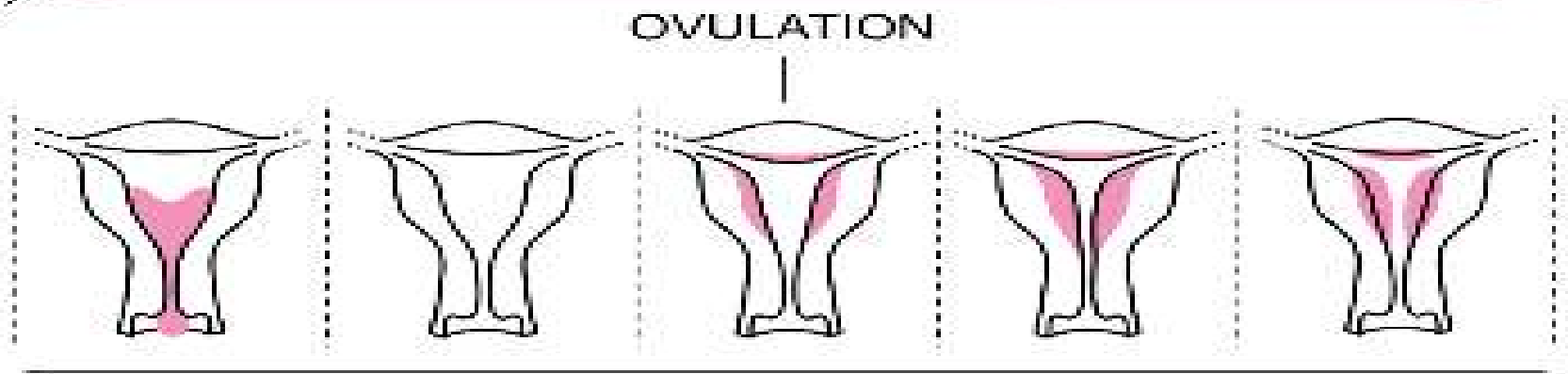


Corpus Luteum of Pregnancy





OVARIAN CYCLE



UTERINE CYCLE

MENSES | PROLIFERATIVE | SECRETORY