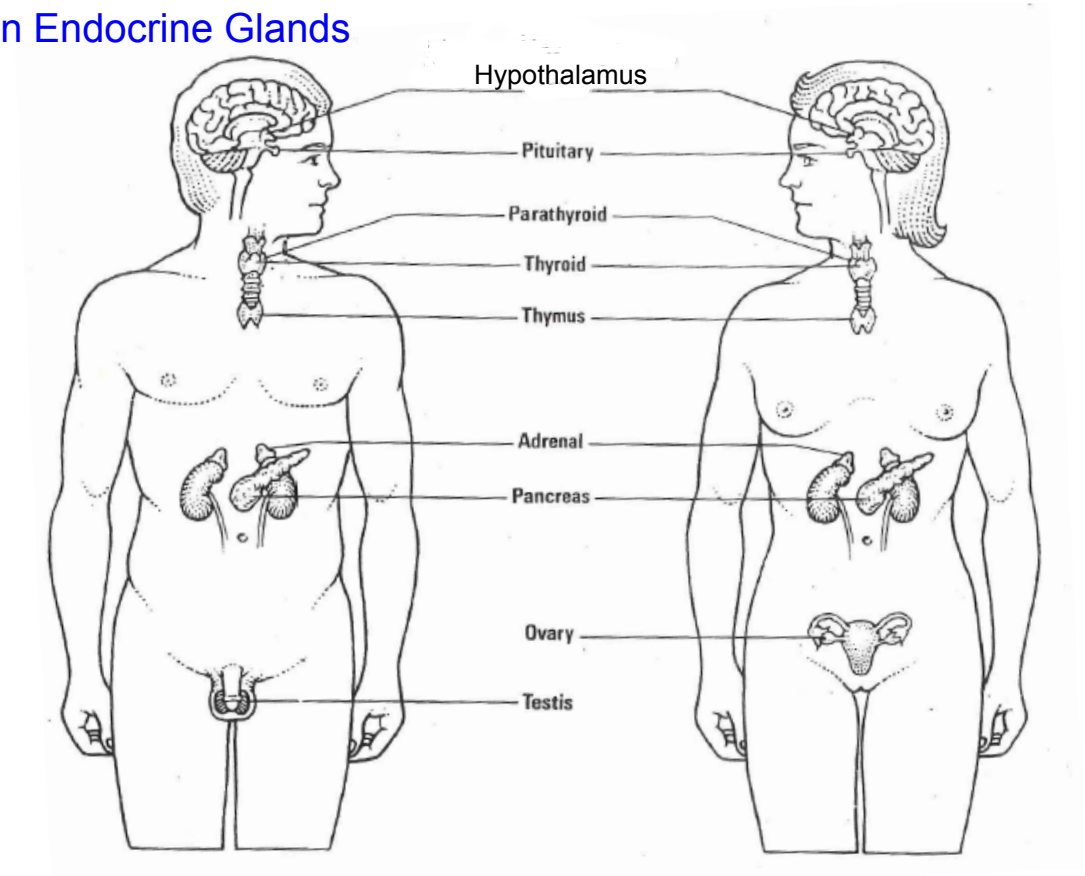
Human Endocrine Glands



Many glands are part of this system. They produce about 48 different hormones which affect all the systems in the body.

Hypothalamus and Pituitary glands

The Hypothalamus is the President of the endocrine system while the Pituitary Gland is the vice-president.

1. What is a hormone?
   A chemical
2. How does a hormone travel?
   The blood transports hormones all around the body.
3. What does a hormone do?
   It provides a chemical signal for the target organ to respond to.
4. What is one example that we have already learned about where a hormone causes changes?
   Adrenaline causing the heart to beat faster.
5. How does negative feedback control hormone production?
   When the hormone signals a target organ or target cells to do something and the response happens, the hormone is no longer produced.

Male Reproductive System

1. Which gland produces the hormones that begin puberty in the male?

   The pituitary

2. What two hormones are produced by this gland that affect puberty in the male?

   FSH and LH

3. What does each hormone cause to happen in the male?

   FSH causes the testes to produce sperm while LH causes the testes to produce the hormone testosterone.

4. Do these hormones change much during a male's lifetime?

   No. The begin to be produced in large amounts at puberty and only very gradually decrease in amounts as the male advances to old age.

Female Reproductive System

1. When does the female hormonal cycle begin?

   Puberty

2. When does the female hormonal cycle stop repeating?

   Menopause which happens on average at 50 years of age.

3. Which gland produces the hormones that begin puberty in the female?

   The pituitary

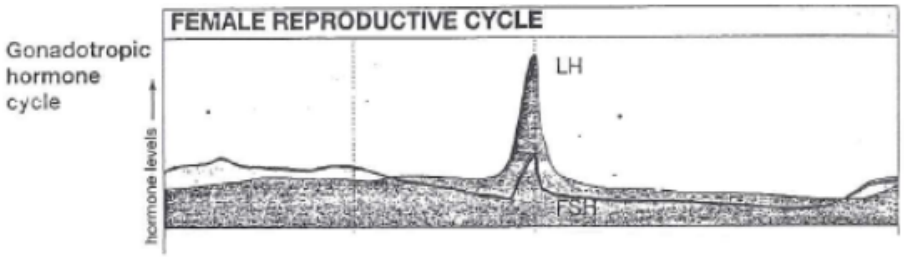
4. What two hormones are produced by this gland that affect puberty in the female?

   FSH and LH

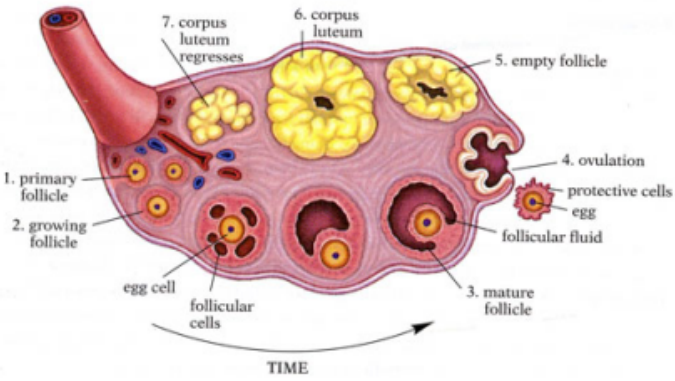
5. What do each of these hormones cause to happen during the monthly cycle?

   FSH = Follicle Stimulating Hormone causes an egg to increase in size as it is filled with nutrients.
   LH causes the egg to be released from the ovary. This is called ovulation.

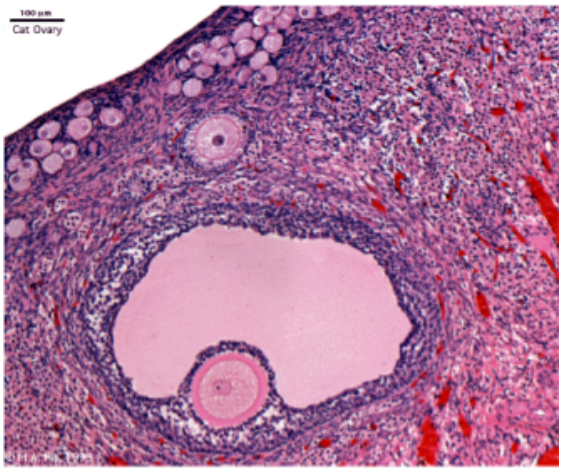
6. How do these two hormones change during the monthly cycle?



FSH is highest for most of the first half of the female's reproductive cycle. LH peaks in the middle of the cycle when ovulation happens.

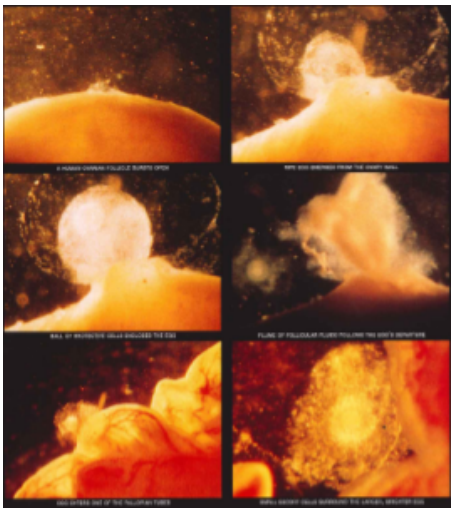


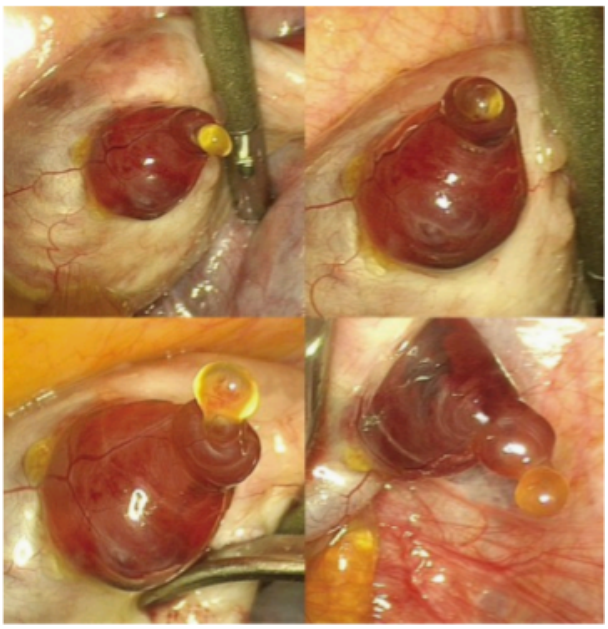
The egg begins to enlarge as it is surrounded by special cells called follicle cells. A follicle develops produces a fluid filled sac. The follicle breaks open releasing the egg. The remaining follicle cells change under the influence of LH into the corpus luteum. LH means luteinizing or yellowing hormone.



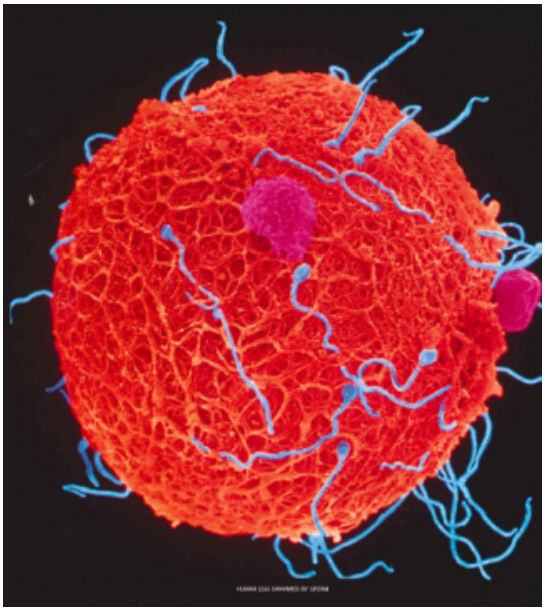
Cat ovary showing mature follicle with egg inside.

Mature follicle (red) on a human ovary (cream)

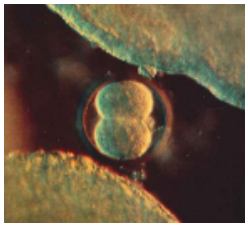




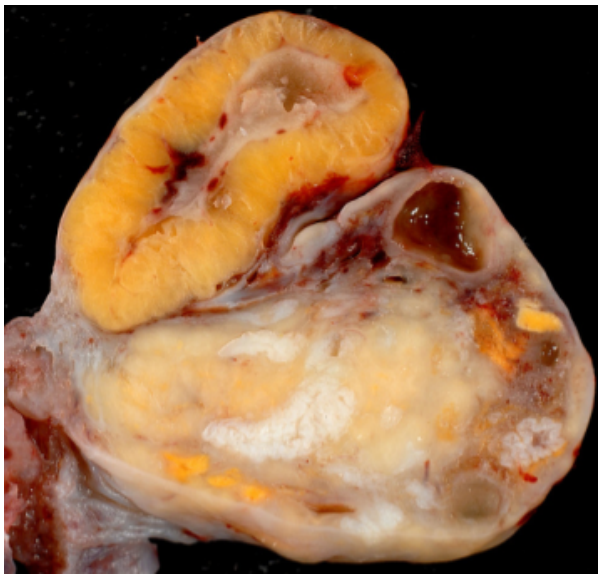
Human egg (yellow) being released from a mature follicle.



Sperm on an egg

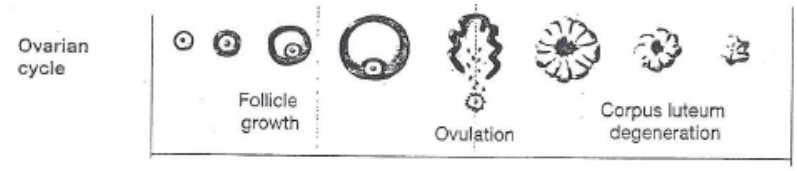


Two cell embryo in the Fallopian tube



Mature corpus luteum on a human ovary

7. What happens during the female's ovarian cycle?

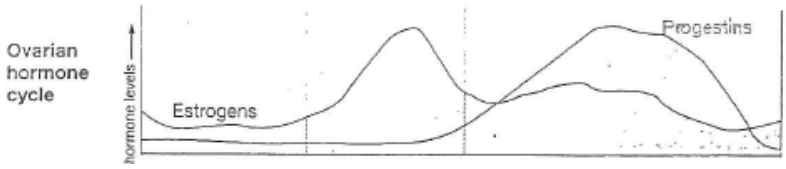


The egg begins to grow larger as it is surrounded and "fed" by the follicle cells. The follicle fills with liquid and eventually "pops" releasing the liquid and the egg. The follicle cells change into the corpus luteum.

8. What hormones are produced by the ovary during the ovarian cycle?

Estrogen and Progesterone

9. How do these hormones change during the female's reproductive cycle?

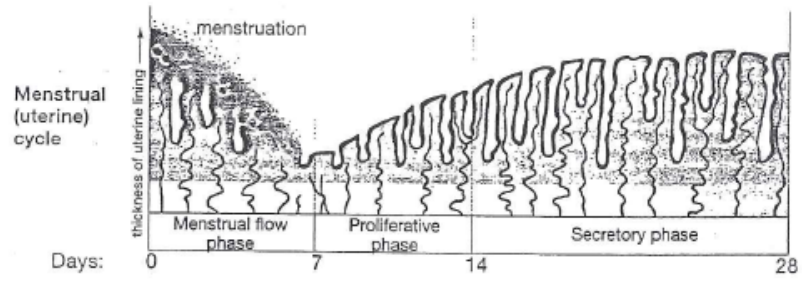


Estrogen is higher during the beginning of the cycle while progesterone is higher during the second half of the cycle.

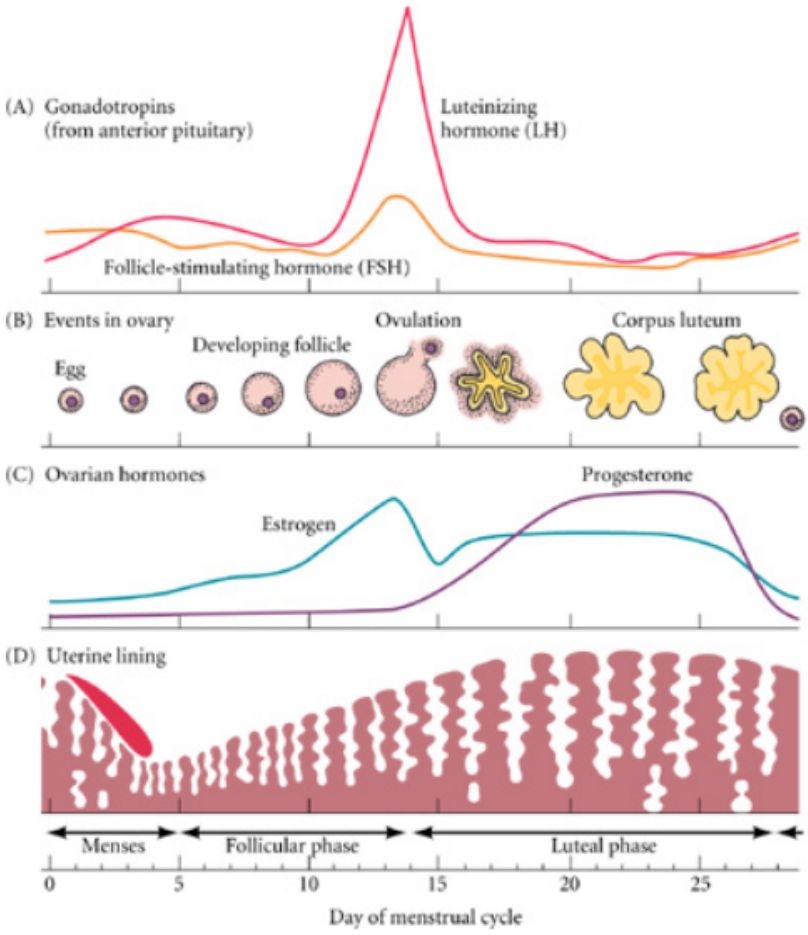
10. What do these hormones cause to happen during the female's reproductive cycle?

Estrogen is produced by the follicle cells and it lets the pituitary know that the message of FSH has been responded to by the follicle cells developing. Estrogen also tells the lining of the uterus to begin thickening as an egg is beginning to enlarge. Progesterone is produced by the corpus luteum and it continues to tell the uterine lining to thicken.

11. What happens during the female's uterine cycle?



The beginning of the monthly cycle is marked by the first day of the menstral flow. For several days the lining of the uterus is shed. After the menstral flow is finished the lining begins to thicken in preparation for a possible fertilized egg making its way to the uterus to embed in the lining.


(A) Gonadotropins
(from anterior pituitary)
Luteinizing
hormone (LH)
Follicle-stimulating hormone (FSH)
(B) Events in ovary
Developing follicle
Ovulation
Corpus luteum
Egg
(C) Ovarian hormones
Progesterone
Estrogen
(D) Uterine lining
Menses
Follicular phase
Luteal phase
0
5
10
15
20
25
Day of menstrual cycle