

Regents Biology

** Class Notes **
(pp. 457-467)

North Salem High School

MISSION: *Engage students to continuously learn, question, define and solve problems through critical and creative thinking.*

Human Reproduction

(pp. 457-467)

Now that you know how your body makes the cells that make a baby (meiosis), we will now take a closer look at how the human male and female bodies are designed and have evolved to make babies.

Let's get to work!

If you have any problems – please sign up for extra help after school.

**Mr. Collea
Room W-19**

HUMAN REPRODUCTION

** All cells come from pre-existing cells.*

(Remember, we all started out as a single fertilized egg cell or zygote.)

Upon completion of this section the student will:

- ___ 1. Explain the major function(s) of the following structures in the human female reproductive system: *ovaries, oviduct* (fallopian tube), *uterus, cervix*, and *vagina*.
- ___ 2. Given a diagram of the human reproductive system, correctly identify the location of the organs in objective # 1.
- ___ 3. Define *hormone* and describe how hormone structure determines its function.
- ___ 4. Explain the remarkable specificity displayed by hormones (*Lock and Key Theory*).
- ___ 5. State the function(s) of the following key reproductive hormones in females: *progesterone, estrogen, FSH*, and *LH*.
- ___ 6. Define feedback mechanism.
- ___ 7. Compare and contrast *POSITIVE* and *NEGATIVE* feedback mechanisms
- ___ 8. List, in order, the stages of the menstrual cycle and discuss the major events of each stage.

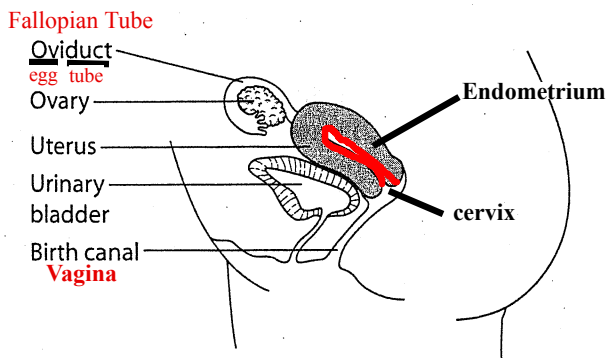
KILLER WORDS

hormone
pituitary gland
oviduct (fallopian tube)
uterus
cervix
vagina
follicle
ovaries
ovulation

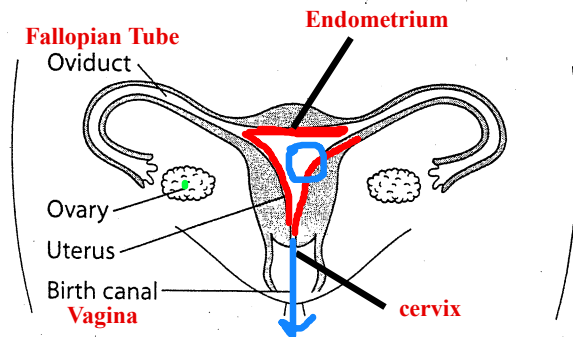
estrogen
progesterone
follicle stimulating hormone (FSH)
lutenizing hormone (LH)
corpus luteum
follicle stage
corpus luteum stage
menstruation
feedback mechanisms

I. THE FEMALE REPRODUCTIVE SYSTEM

A. TWO VIEWS OF THE HUMAN FEMALE REPRODUCTIVE SYSTEM



SIDE VIEW



FRONT VIEW

B. STRUCTURE & FUNCTION OF THE FEMALE REPRODUCTIVE SYSTEM

(1) OVARIES (female gonads)

- site of meiosis in women that produces female gametes or eggs
- produce and secrete that female sex hormone estrogen responsible for the development of secondary sex characteristics in girls

(2) OVIDUCT (fallopian tubes)

- tube that connects and carries the egg from the ovary to the uterus
- site of fertilization (union of sperm and egg)

(3) UTERUS

- site of fetal development (9 months in humans - gestation)

(4) CERVIX

- opening to the uterus - becomes widen DIALATED during birth

(5) BIRTH CANAL (vagina)

- opening through which the baby leaves the woman's body

II. THE MENSTRUAL CYCLE

In the human female, a mature egg develops in a follicle and is released from one of the ovaries about once every 28 days. Leading up to this, the muscular wall of the uterus thickens to prepare to accept a “possible” fertilized egg for development.

THIS CYCLE IS KNOWN AS THE MENSTRUAL CYCLE.

- If the egg is **NOT** fertilized, the thick muscular wall of the uterus breaks down and, along with the **unfertilized egg** and small amounts of blood, is discharged out of the women’s body through the birth canal or **vagina**.
- This discharge is called the women’s **period** or **menstruation**.
- A women’s menstrual cycle starts at **puberty** and stops at **menopause**.

Chemical Messengers

A. HORMONAL REGULATION

- **Hormones** - chemicals (proteins) produced by **endocrine glands** and carried by the **blood stream** to *SPECIFIC* areas of the body where they perform certain functions.

B. HORMONES OF THE MENSTRUAL CYCLE

1. *Pituitary (Brain) Hormones*

a) Follicle Stimulating Hormone (FSH)

- **stimulates the growth of a follicle (egg sac) in the ovary**

b) Lutenizing Hormone (LH)

- **stimulates ovulation - the release of the egg from the ovary on Day 14 of the menstrual cycle**

2. Ovarian Hormones

a) Progesterone

- maintains the thickening of the uterine lining or endometrium

(inner lining of the uterus)

b) Estrogen

- stimulates the thickening of the uterine lining or endometrium

(inner lining of the uterus)

- *Responsible for the development of female secondary sex characteristics which include:*

(1) breast or mammary gland development

(2) widening of the pelvis

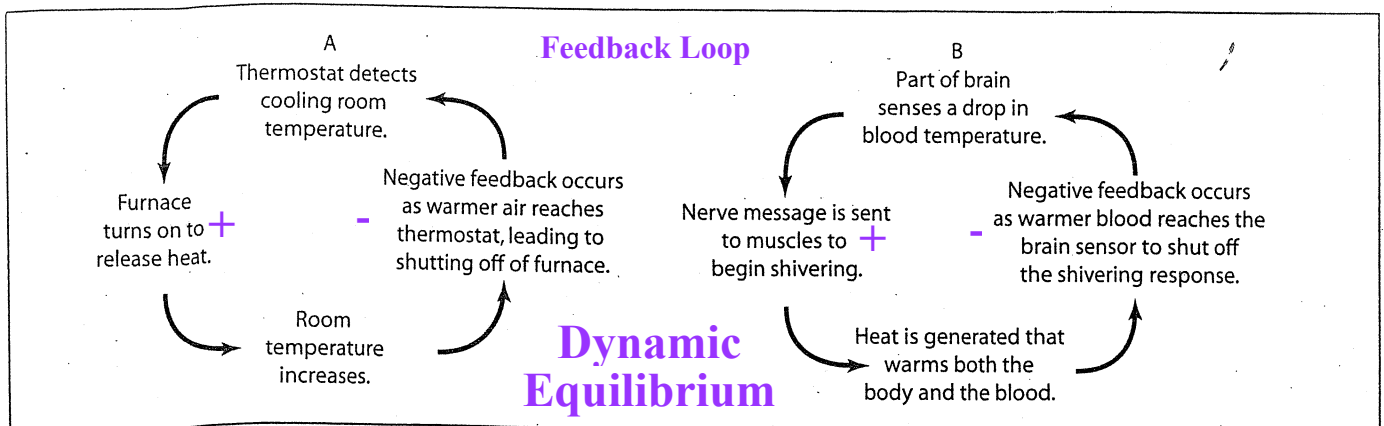
(3) distribution of body fat

C. HORMONAL FEEDBACK MECHANISMS

- A *feedback mechanism* involves a process in which the first step of a process “feeds back” to either increase or decrease the resulting action taken by that process.

1. **Positive Feedback** - resulting action INCREASES - something turns ON

2. **Negative Feedback** - resulting action DECREASES - something shuts OFF



* *Positive and Negative Feedback systems help to maintain*

stable, internal environment
HOMEOSTASIS

D. STAGES OF THE MENSTRUAL CYCLE (p. 460)

Follicle Stage (lasts about 10 days)

- **FSH** produced by the **pituitary gland** stimulates the growth of the egg sac or **follicle** in the ovary.
- The growing follicle inside the **ovary** produces **estrogen** which causes the wall of the muscular **uterus** to grow and thicken.

2. *Ovulation* (lasts 1 day)

- **Estrogen** produced by the *ovary* is carried by the **blood stream** and is detected by the *brain*. The **pituitary gland** inside the *brain* **DECREASES** its production of **FSH** and **INCREASES** its production of **LH**.
- This sudden **INCREASES** of **LH** causes the **follicle** to release an **egg** in a process called **ovulation**.

3. *Corpus Luteum Stage* (lasts about 14 days)

- **LH** causes the now empty **follicle** to turn into the **corpus luteum** or "yellow body".
- The *corpus luteum* amazingly changes into an **endocrine gland** and is now capable of producing and secreting the hormone **progesterone**.
- **Progesterone** maintains the thick wall of the **uterus**.
- *Progesterone* is often called the "**Hormone** of **Pregnancy**".

4. *Menstruation* (lasts about 4 days)

- If **fertilization** does **NOT** occur, secretion of **LH** decreases and the **corpus luteum** breaks down.
- **NO corpus luteum** means **NO progesterone**. **NO progesterone** means **NO** more maintenance of the newly formed thickened wall of the **uterus**.
- The thick muscular wall of the *uterus* starts to break down and, along with the **unfertilized egg** and small amounts of **blood**, is discharged out of the women's body through the *birth canal* or **vagina**.
- This discharge is called the women's **period** or **menstruation**.

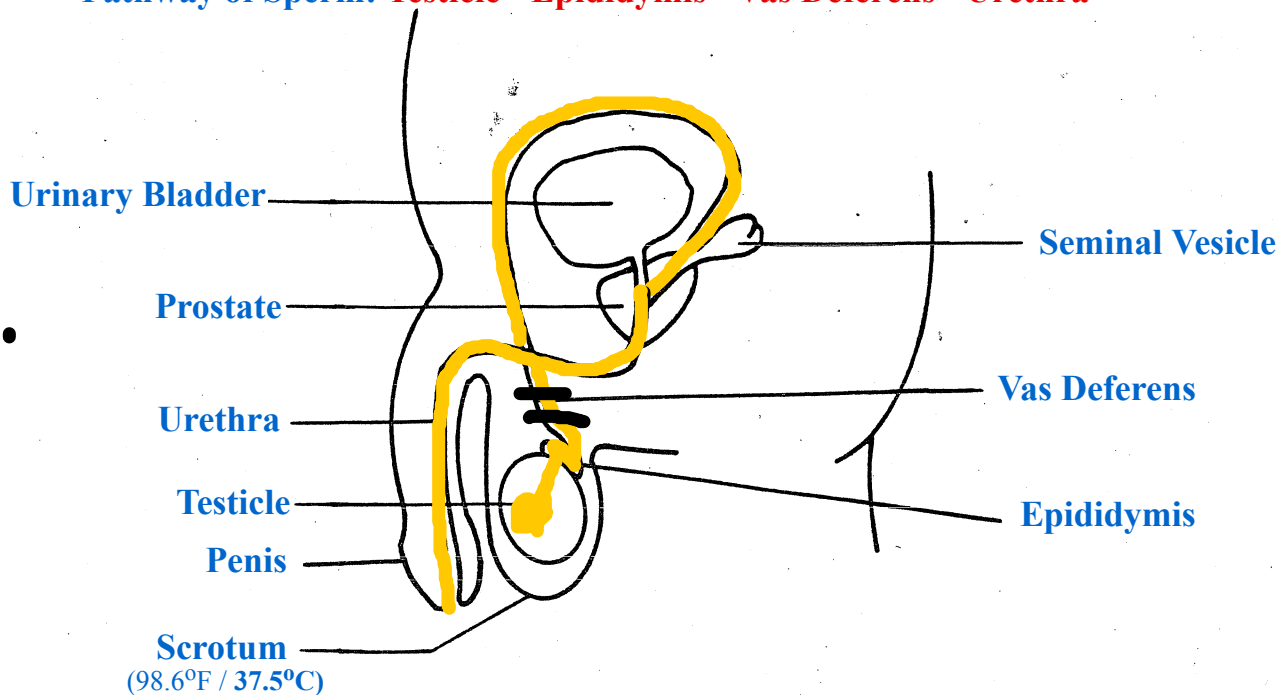
III. THE MALE REPRODUCTIVE SYSTEM

A. TWO MAIN FUNCTIONS OF THE MALE REPRODUCTIVE SYSTEM

- (1) To produce sperm and secrete testosterone.
- (2) To deposit sperm inside of the female reproductive tract or vagina.

B. STRUCTURE OF THE HUMAN MALE REPRODUCTIVE SYSTEM

Pathway of Sperm: Testicle - Epididymis - Vas Deferens - Urethra



(1) PENIS

- male sex organ used to deposit sperm (semen) within the female reproductive tract or vagina

(2) TESTES (male gonads)

(monoploid/haploid (n))

- site of meiosis in men that produces male gametes or sperm
- produce and secrete that male sex hormone testosterone responsible for the development of secondary sex characteristics in boys

(3) SCROTUM

- **sac of skin that holds the testicles outside of the man's body**
- **keeps the testicles at a slightly lower temperature to promote sperm production**

(4) EPIDIDYMIS

- **located on top of the testicle and is the site of sperm maturation - growth of a tail called a flagella**

(5) VAS DEFERENS

- **tube connecting and carrying the sperm from the epididymis to the urethra**

(6) URETHRA

- **tube located inside of the male penis which is used to release urine and semen from the body.**

(7) PROSTATE

- **gland that secretes a fluid that protect the sperm from the slightly acidic environment found inside the vagina.**
- **very prone to cancer in older men**

(8) SEMINAL VESICLE (Cowper's Gland)

- **gland that secretes a fluid that nourishes the sperm**

(9) BLADDER

- **stores urine waiting to be released from the body**