

ANSWERS TO CHAPTER 19

CONTENT LEARNING ACTIVITY

Formation of Sex Cells

1. 2; 2. 46; 3. 23; 4. Oocyte; 5. Fertilization; 6. Zygote

Scrotum and Testes

1. Scrotum; 2. Cremaster and dartos muscles; 3. Lobules; 4. Seminiferous tubules; 5. Interstitial cells

Spermatogenesis

1. Sertoli cells; 2. Spermatogonia; 3. Primary spermatocytes; 4. Secondary spermatocytes; 5. Spermatid; 6. Sperm cell; 7. Acrosome

Ducts

1. Rete testis; 2. Efferent ductules; 3. Epididymis; 4. Epididymis; 5. Ductus deferens; 6. Spermatic cord; 7. Ejaculatory duct; 8. Urethra

Penis

1. Erection; 2. Corpora cavernosa; 3. Corpus spongiosum; 4. Glans penis; 5. External urethral orifice; 6. Prepuce; 7. Circumcision

Glands

1. Seminal vesicles; 2. Prostate gland; 3. Bulbourethral glands; 4. Semen; 5. Bulbourethral glands; 6. Seminal vesicles; 7. Prostate gland
1. Urethra; 2. Penis; 3. External urethral orifice; 4. Scrotum; 5. Testis; 6. Epididymis; 7. Ductus deferens; 8. Seminal vesicle; 9. Ejaculatory duct; 10. Prostate gland; 11. Bulbourethral gland

Male Sex Hormones

1. GnRH; 2. LH; 3. FSH; 4. Inhibin; 5. Testosterone; 6. Testosterone

Male Sexual Behavior and the Male Sex Act

1. Testosterone; 2. Orgasm; 3. Impotence; 4. Erection; 5. Emission; 6. Ejaculation

Ovaries

1. Broad ligament; 2. Mesovarium; 3. Suspensory ligament; 4. Ovarian ligament
1. Oocyte; 2. Ovarian follicle; 3. Oogonia; 4. Primary oocyte; 5. Primordial follicle; 6. Primary follicle; 7. Secondary follicle; 8. Mature follicle
1. Ovulation; 2. Secondary oocyte; 3. Fertilization; 4. Corpus luteum; 5. Estrogen; 6. Progesterone; 7. HCG; 8. Placenta

Uterine Tubes, Uterus, and Vagina

1. Uterine tubes; 2. Fimbriae; 3. Uterine tubes; 4. Cervix; 5. Cervical canal; 6. Perimetrium; 7. Myometrium; 8. Endometrium; 9. Vagina; 10. Hymen
1. Body of uterus; 2. Cervix; 3. Vagina; 4. Cervical canal; 5. Perimetrium; 6. Myometrium; 7. Endometrium; 8. Round ligament; 9. Ovarian ligament; 10. Uterine tube; 11. Ovary; 12. Suspensory ligament; 13. Uterine cavity

External Genitalia

1. Vestibule; 2. Labia minora; 3. Clitoris; 4. Vestibular glands; 5. Labia majora; 6. Mons pubis; 7. Pudendal cleft; 8. Clinical perineum
1. Prepuce; 2. Labia minora; 3. Vagina; 4. Vestibule; 5. Clinical perineum; 6. Labia majora; 7. Urethra; 8. Clitoris; 9. Mons pubis

Mammary Glands

1. Areola; 2. Gynecomastia; 3. Lobe; 4. Lobule; 5. Alveoli
1. Lobe; 2. Lobule; 3. Lactiferous duct; 4. Nipple; 5. Areola

Puberty

1. Estrogen and progesterone; 2. GnRH; 3. FSH and LH; 4. Low; 5. Cyclic

Menstrual Cycle

1. Menses; 2. Proliferative phase; 3. Ovulation; 4. Secretory phase; 5. Proliferative phase; 6. Secretory phase; 7. Menopause; 8. Female climacteric
1. GnRH; 2. LH; 3. FSH; 4. Primordial follicle; 5. Primary follicle; 6. Secondary follicle; 7. Mature follicle; 8. Corpus luteum; 9. Degenerated corpus luteum; 10. Estrogen; 11. Progesterone; 12. Menses; 13. Proliferative phase; 14. Secretory phase; 15. Menses
1. Progesterone; 2. Estrogen; 3. LH; 4. FSH; 5. Progesterone; 6. GnRH; 7. FSH

Female Sexual Behavior and the Female Sex Act

1. Psychic factors; 2. Clitoris; 3. Vagina; 4. Orgasm; 5. Resolution; 6. Fertilization

QUICK RECALL

1. Production of sperm cells, sustaining and transfer of the sperm cells to the female, and production of male sex hormones
2. Production of female sex cells (oocytes), reception of sperm cells from the male, nurturing the development and providing nourishment for the new individual, and production of female sex hormones
3. Spermatogonia, primary spermatocytes, secondary spermatocytes, spermatids, sperm cells
4. Seminiferous tubule, rete testis, efferent ductule, ductus deferens, ejaculatory duct, urethra
5. Seminal vesicles: thick mucuslike secretion that nourishes sperm cells; Prostate gland: thin, milky, alkaline secretion that neutralizes acidic secretions of the testes, seminal vesicles, and vagina; Bulbourethral glands: Mucous secretion that neutralizes the acidic urethra
6. In males, GnRH stimulates the release of FSH and LH; FSH stimulates spermatogenesis; and LH stimulates testosterone secretion
7. Enlargement and differentiation of the male genitals, spermatogenesis, hair growth (beard), increased muscle mass, increased skeletal growth, and enlargement of the larynx
8. Primordial follicle, primary follicle, secondary follicle, mature follicle, which becomes the corpus luteum after ovulation
9. Menses, proliferative phase, and secretory phase
10. In females, GnRH stimulates the release of FSH and LH; FSH stimulates follicle development; and LH stimulates ovulation and corpus luteum development
11. Estrogen: thickening of endometrium (increased number of cells) and formation of endometrial glands; progesterone: thickening of endometrium (increased cell size) and secretion

WORD PARTS

1. semen; seminiferous; seminal
2. seminiferous
3. menses; menstrual; menarche; menopause
4. spermatozoon; spermatogenesis; spermatocyte; spermatid
5. oocyte
6. spermatogenesis

MASTERY LEARNING ACTIVITY

1. A. The cremaster and dartos muscles contract. The scrotum decreases in size and the testes are pulled closer to the body.
2. D. The interstitial cells produce testosterone, the Sertoli cells nourish the developing sperm cells, and the seminiferous tubules are the site of spermatogenesis.
3. E. Sperm cells pass through the rete testis, efferent ductule, epididymis, ductus deferens, and ejaculatory duct.
4. D. The seminal vesicles empty into the ejaculatory duct, the prostate into the urethra, and the bulbourethral glands into the urethra.
5. D. All of the secretions are correctly matched with their functions.
6. D. LH in the male stimulates testosterone secretion from the interstitial cells. LH levels are lower before puberty than after.
7. E. Parasympathetic stimulation of arteries results in vasodilation and entry of blood into the sinusoids of the erectile tissue. The swelling results in compression of veins that reduces blood movement out of the penis.
8. E. A polar body is formed by the first meiotic division before fertilization. After fertilization the second meiotic division occurs to produce another polar body. Polar bodies contain little cytoplasm. The oocyte receives most of the cytoplasm.
9. D. The corpus luteum is formed from a mature follicle after it ruptures during ovulation. The corpus luteum produces progesterone and smaller amounts of estrogen. It degenerates in a few days if fertilization does NOT occur. If fertilization occurs, it persists and produces hormones until the end of the first trimester, at which time the placenta takes over the production of hormones and the corpus luteum degenerates.
10. B. Sperm cells pass through the cervical canal into the uterine cavity. From the uterus they enter the uterine tube and pass into the peritoneal cavity.

11. A. The order is clitoris, urethral opening, vaginal opening, and anus.
12. B. The female breasts enlarge and develop a duct system in response to estrogen and progesterone produced at puberty. Before puberty male and female breasts are similar.
13. A. The major secretory product of the mature follicle is estrogen. The corpus luteum secretes progesterone and smaller amounts of estrogen. FSH and LH are secreted by the anterior pituitary, and GnRH is secreted by the hypothalamus.
14. E. Increased estrogen levels produced by the developing follicles stimulate the endometrium to proliferate.
15. C. Menopause results from a decreased sensitivity of the follicles to FSH and LH. Estrogen levels in menopause are low because the follicles no longer develop and secrete estrogen.



FINAL CHALLENGES



1. The injected testosterone, by a negative-feedback mechanism, inhibits the production of GnRH from the hypothalamus. Decreased GnRH results in decreased LH release from the anterior pituitary, which causes a reduction in the production of testosterone by the testes.
2. The testosterone would cause early and pronounced development of his sexual organs. He would also have rapid growth of muscle and bone.
3. Estrogen and/or progesterone levels fall when the birth control pill is not taken, which causes menstruation.
4. In females, the microorganisms can travel from the vagina to the uterus, to the uterine tubes, to the peritoneal cavity. Infection of the peritoneum results in peritonitis. In males, the microorganisms can move up the urethra to the bladder or into the ejaculatory duct to the ductus deferens. There is no direct connection to the peritoneal cavity in the male, so peritonitis does not develop.