

KAPLAN MEDICAL

Anatomy

COLORING BOOK

THIRD EDITION

More than **450** detailed illustrations

96 tear-out muscle flashcards

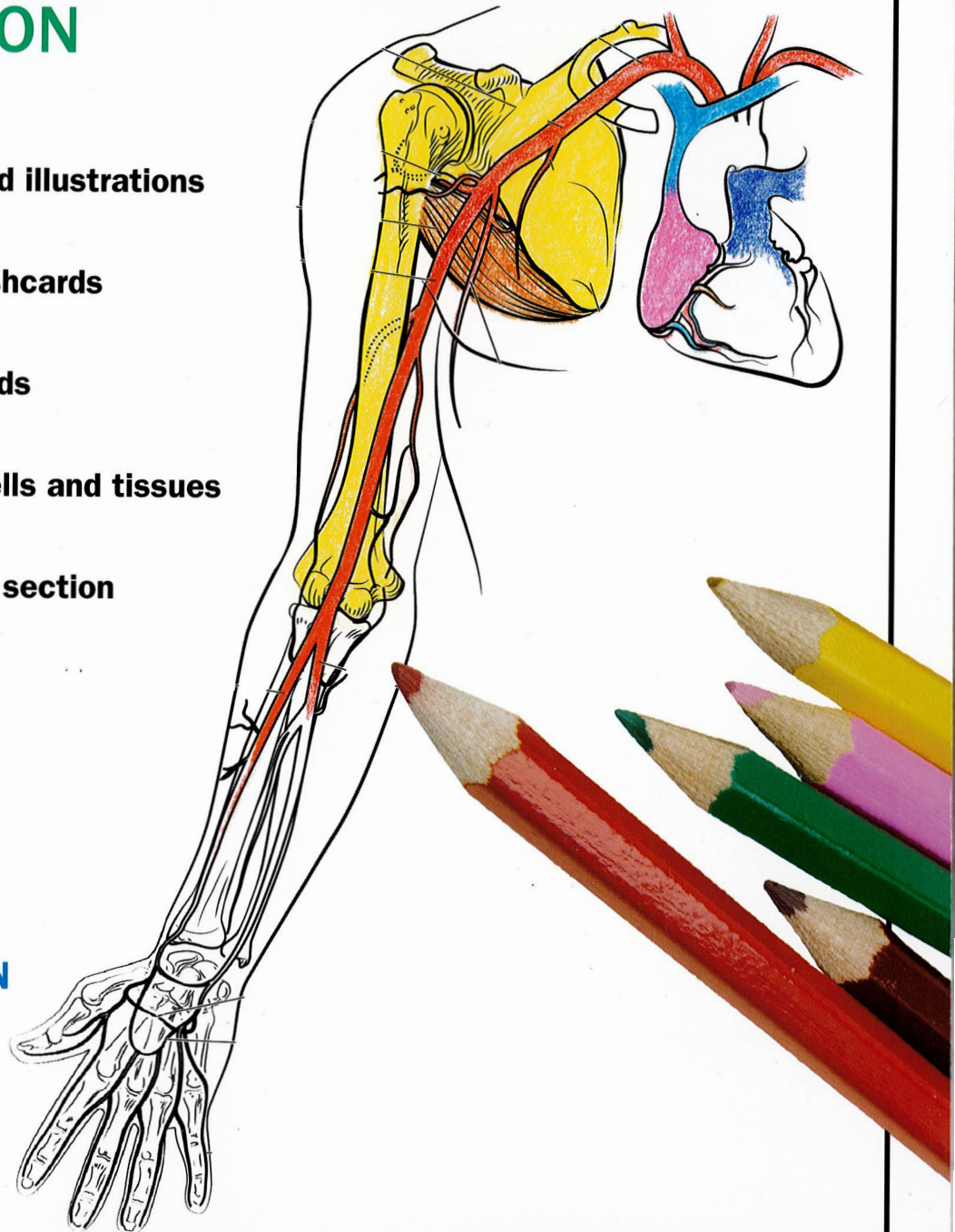
Fill-in-the-blank study aids

Microscopic views of cells and tissues

Early fetal development section

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Text by
ERIC WISE

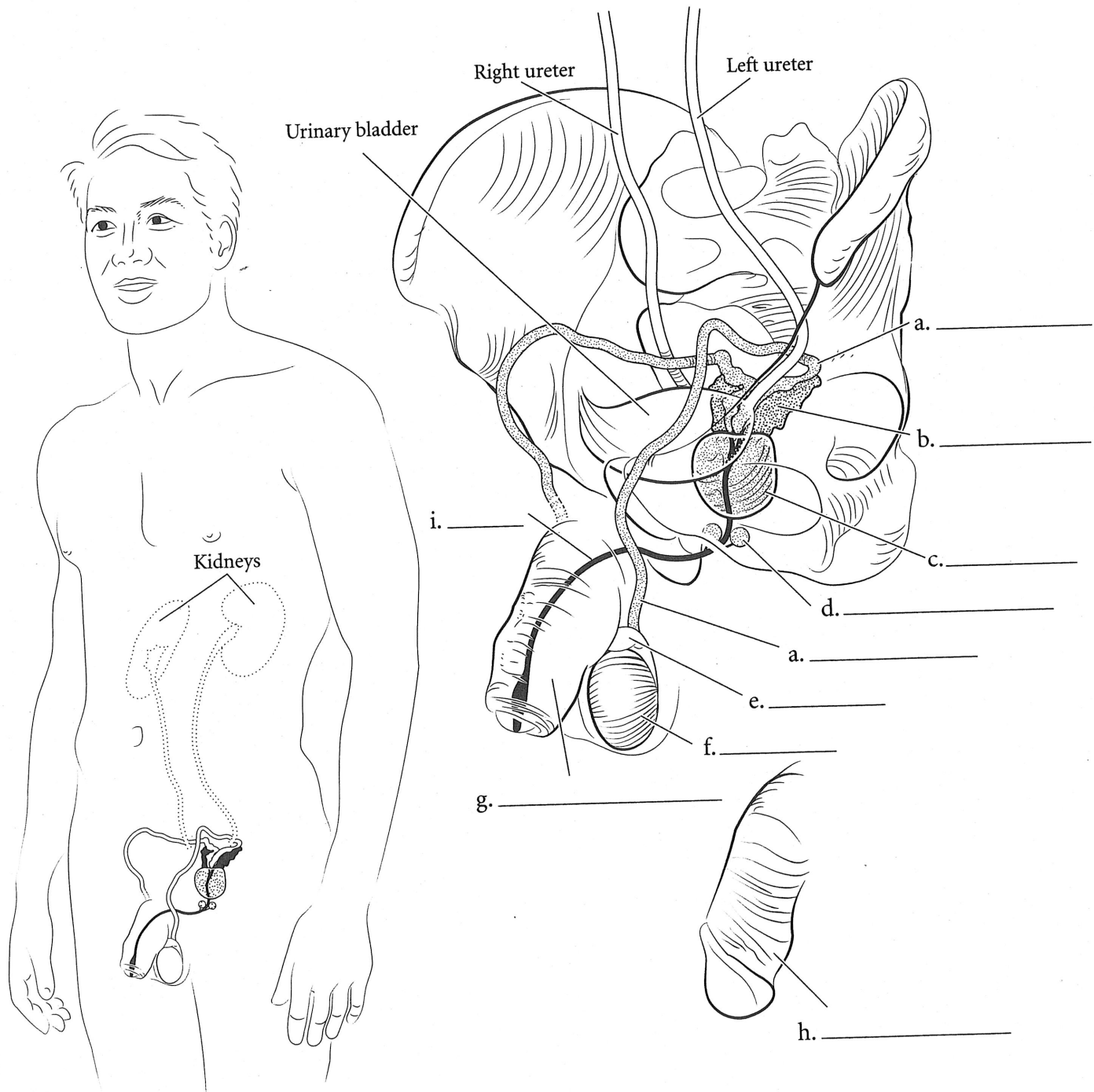


OVERVIEW OF THE MALE REPRODUCTIVE SYSTEM

The male reproductive system consists of the two **testes**, the **epididymis**, the **ductus deferens** enclosed in the **spermatic cord**, the **seminal vesicles**, the **prostate gland**, the **bulbourethral glands**, and the **penis**. The testes are the glands that produce testosterone and sperm cells. Sperm cells travel from the testes to the epididymis where they are stored and mature. From the epididymis sperm cells move into the ductus deferens, which enters the body and travels to the posterior bladder.

From here the ductus deferens turns into the ejaculatory duct, which receives fluid from the seminal vesicles. The ejaculatory duct leads to the urethra where secretions from the prostate and bulbourethral glands are added. Finally the sperm cells and seminal fluid (together these make **semen**) are ejaculated from the penis.

Label the parts of the male reproductive system and color the various structures in the illustration.



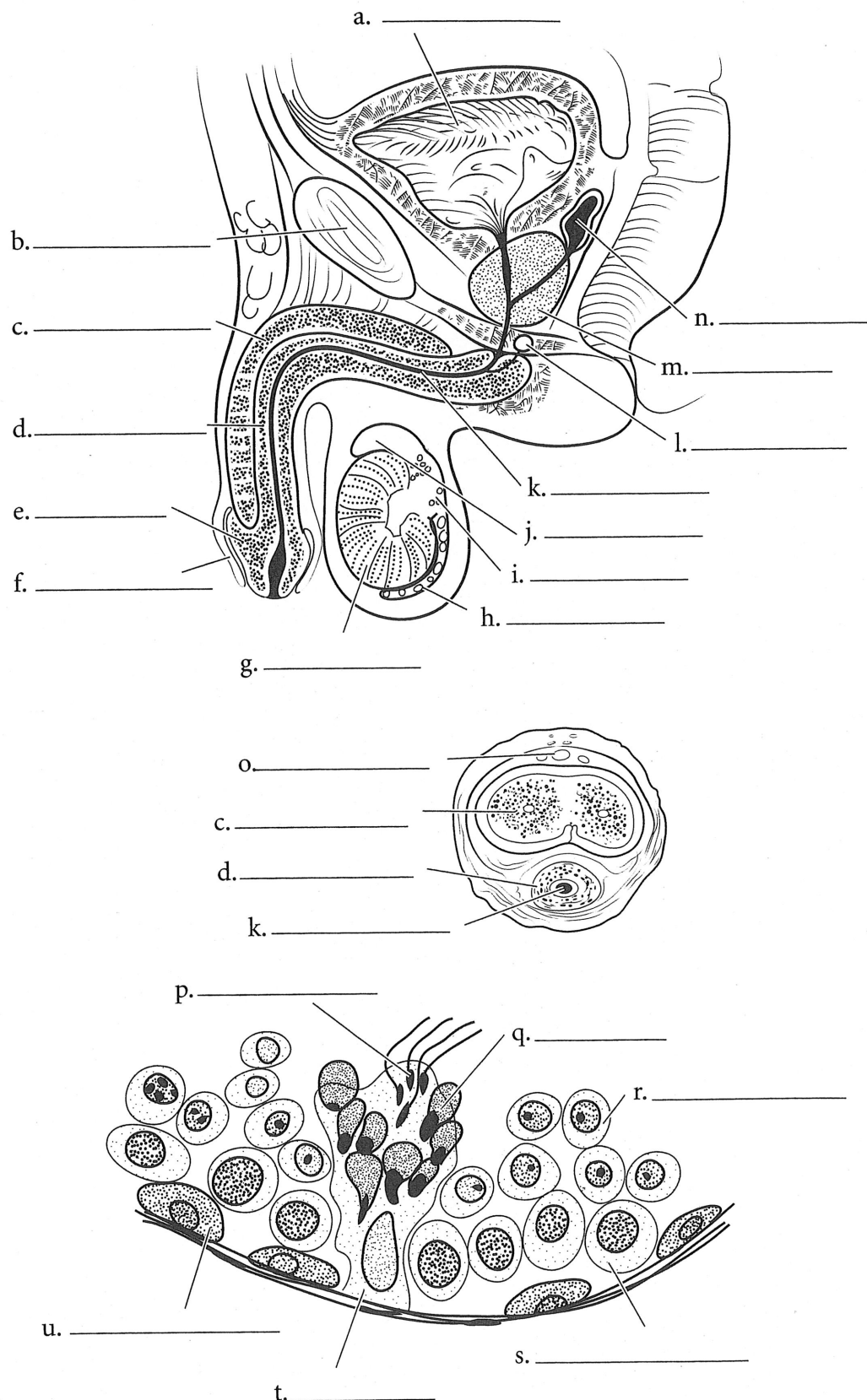
Answer Key: a. Ductus deferens, b. Seminal vesicle, c. Prostate, d. Bulbourethral gland, e. Epididymis, f. Testis, g. Uncircumcised penis, h. Circumcised penis, i. Urethra

MIDSAGITTAL SECTION OF PELVIS/CROSS SECTION OF PENIS AND SEMINIFEROUS TUBULES

When seen in a midsagittal section, the relationship of the glands that produce seminal fluid can easily be seen. The **prostate** is approximately the size of a golf ball and is located inferior to the urinary bladder. The **prostatic urethra** is the portion of the urethra that is enclosed in the prostate. The **bulbourethral glands** are located in the wall of the pelvic floor, and the **seminal vesicles** are posterior to the urinary bladder. Exterior to the body wall are the testes, and these are enclosed in the **scrotal sac**. The **epididymis** receives sperm from the testis and has three parts, a **head**, a **body**, and a **tail**. The **symphysis pubis** is an important reference point in the midsagittal section. In males, there is a flap of tissue encircling the **glans penis**. This is the **prepuce** (foreskin), and it is sometimes removed at birth in a procedure called a **circumcision**. The **corpus cavernosum** can be seen in this section along with the **corpus spongiosum** and the **spongy urethra**.

The cross section of the penis illustrates the relative position of the erectile tissue in the male. On the dorsal aspect of the penis are the paired **corpora cavernosa** (corpus cavernosum singular). These cylinders fill with blood and produce an increase in length and diameter of the penis. These, along with the **corpus spongiosum**, are involved in making the penis erect. The corpus spongiosum contains the **spongy urethra**. The **deep dorsal vein** of the penis is also seen in cross section. Label the structures seen in a cross section of the penis and color in the erectile tissue and the spongy urethra.

The formation of sperm is known as **spermatogenesis** and occurs from **spermatogonia** on the superficial wall of the seminiferous tubules. These produce cells called **primary spermatocytes**, which in turn mature into **secondary spermatocytes**. **Spermatids** derive from secondary spermatocytes, and they, in turn, become **spermatozoa** (sperm cells). **Sertoli cells** assist in the process. Label the cells and color each one in a separate color.

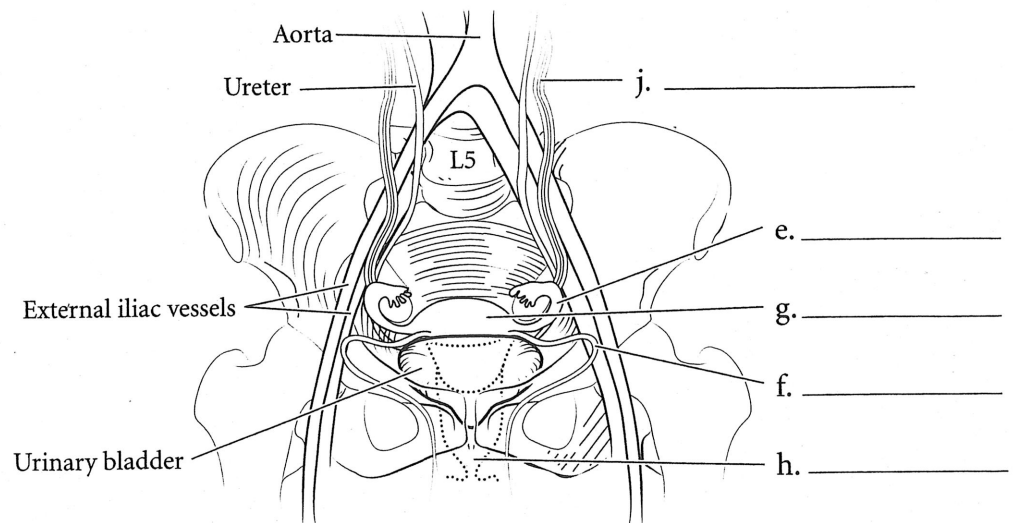
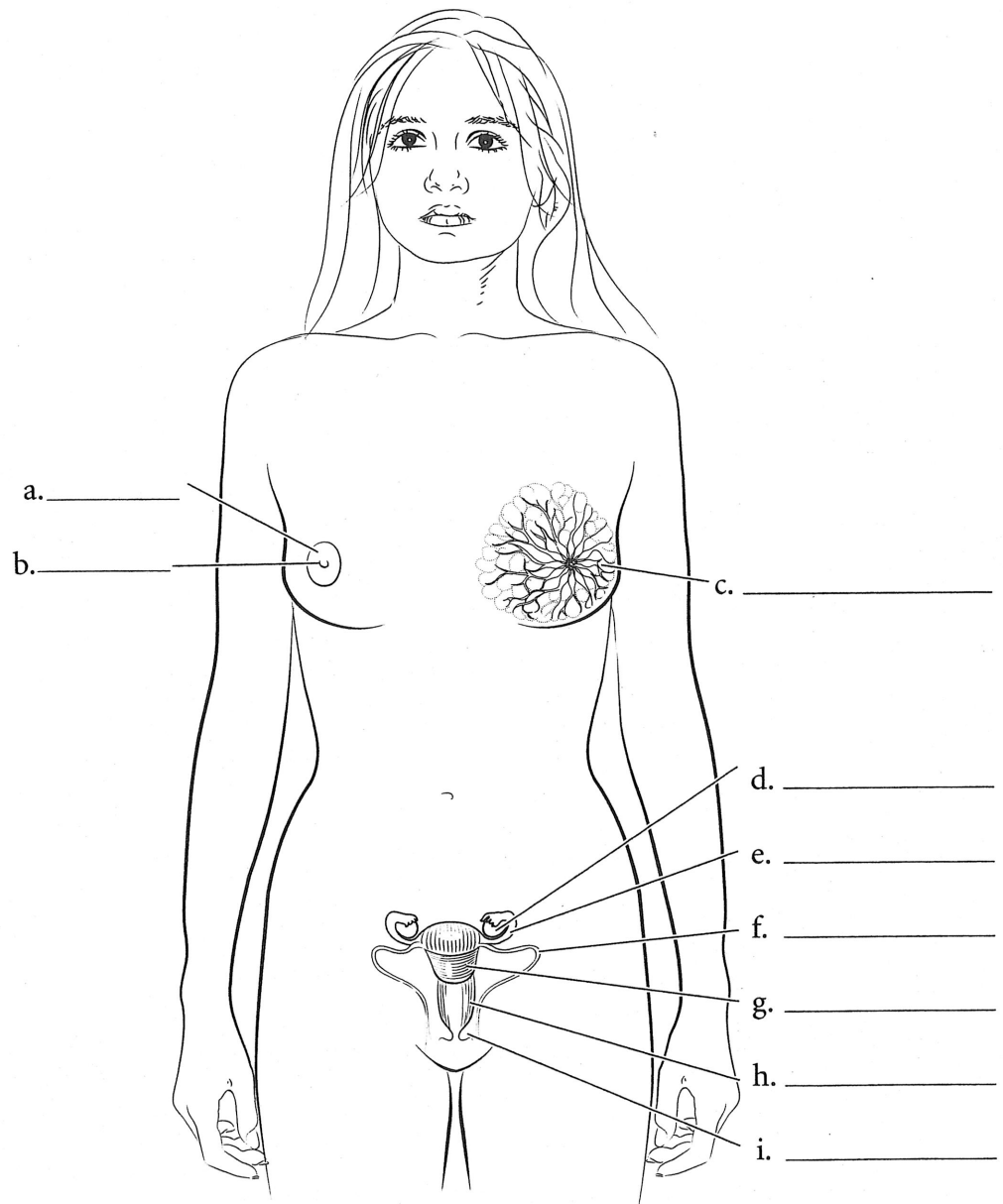


Answer Key: a. Urinary bladder, b. Symphysis pubis, c. Corpus cavernosum, d. Corpus spongiosum, e. Glans penis, f. Prepuce, g. Testis, h. Tail of epididymis, i. Body of epididymis, j. Head of epididymis, k. Spongy urethra, l. Bulbourethral gland, m. Prostate, n. Seminal vesicle, o. Deep dorsal vein, p. Spermatozoa, q. Spermatids, r. Secondary spermatocytes, s. Primary spermatocytes, t. Sertoli cell, u. Spermatogonia

OVERVIEW OF THE FEMALE REPRODUCTIVE SYSTEM

The female reproductive system consists of the two **ovaries**, the **uterine tubes**, a single **uterus**, **vagina**, and the **vaginal orifice**. The uterus is held to the anterior body by the round ligaments and held to the pelvic wall by the suspensory ligaments. Blood flows to the ovaries by the **gonadal arteries**.

The breasts are integumentary structures, and each one has **mammary glands**, an **areola**, and a **nipple**. Label the structures of the female reproductive system and color each of them in a different color.

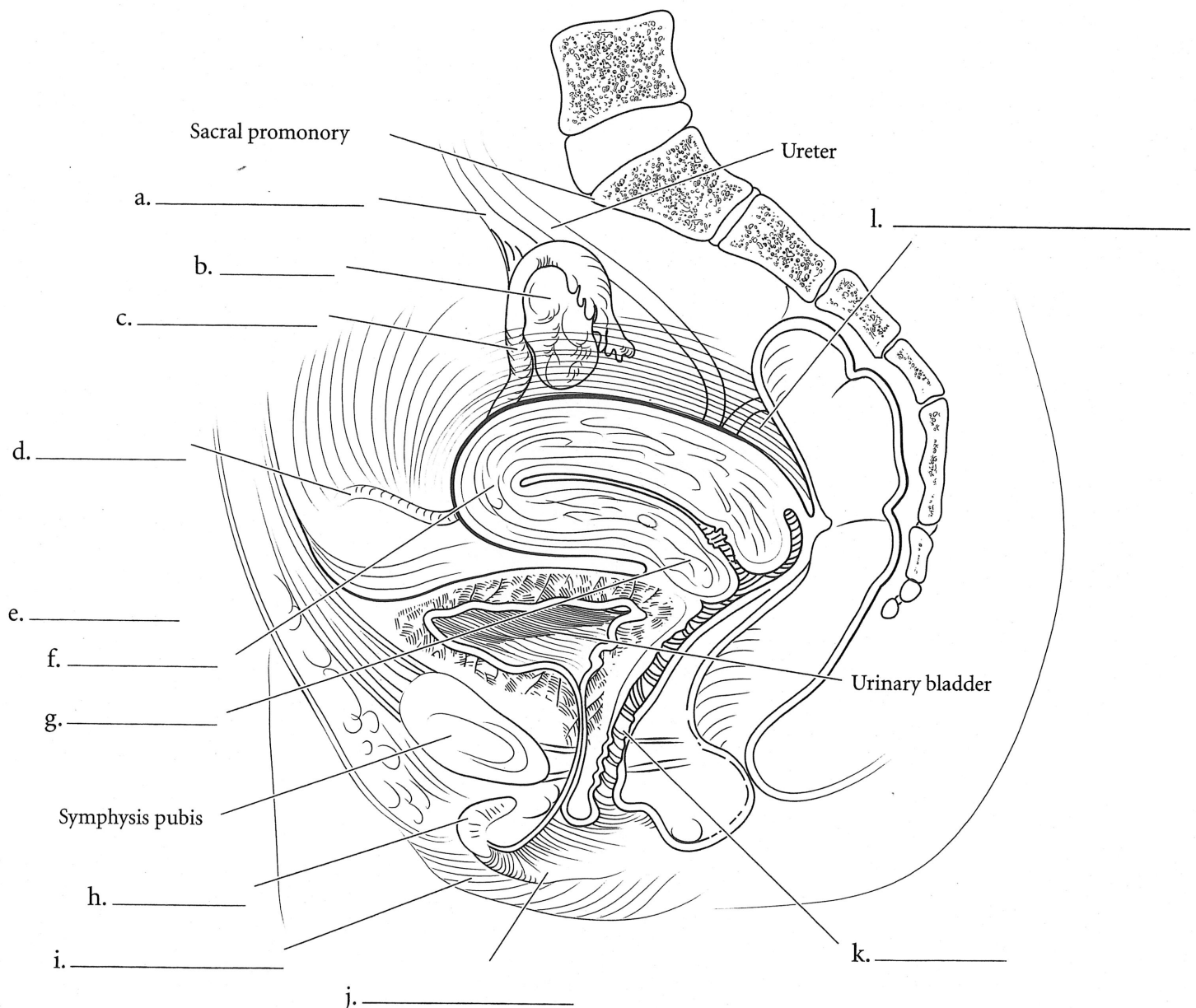


Answer Key: **a.** Areola, **b.** Nipple, **c.** Mammary glands, **d.** Ovary, **e.** Uterine tube, **f.** Round ligament, **g.** Uterus, **h.** Vagina, **i.** Labium minus, **j.** Ovarian vessels

MIDSAGITTAL

The **ovaries** produce the oocytes that are released into the pelvic cavity. Locate the **suspensory ligaments** that attach the ovaries to the pelvic wall. The **round ligament** attaches the uterus anteriorly. The oocytes travel into the **uterine tubes** and then pass into the **uterus**. The uterus has a domed **fundus** near the entrance of the uterine tubes and a **cervix** that inserts into the vagina. The depression between the uterus and the rectum is the **rectouterine pouch**. The **vagina** is inferior to the uterus and terminates with the **vaginal orifice**. Anterior to the vaginal orifice is the **urethral orifice**, the external opening of the urethra. In this section,

you can see the **fornix** of the vagina, a pocket that surrounds the cervix of the uterus. You can also see the relationship of the **labium minus** and the **labium majus** in this section. The labia minora are the inner vaginal lips and the labia majora are the outer vaginal lips. These are part of the vulva or external genitalia. Another part of the vulva is the **clitoris**, which consists of the external glans and the body of the clitoris. The body of the clitoris is imbedded in the body tissue. The glans is covered with a prepuce. Anterior to the clitoris is the **mons pubis**, a fatty pad of tissue overlying the symphysis pubis. Label the organs and other structures in the midsagittal section of the female pelvis and color the structures in using different colors for each structure or space.

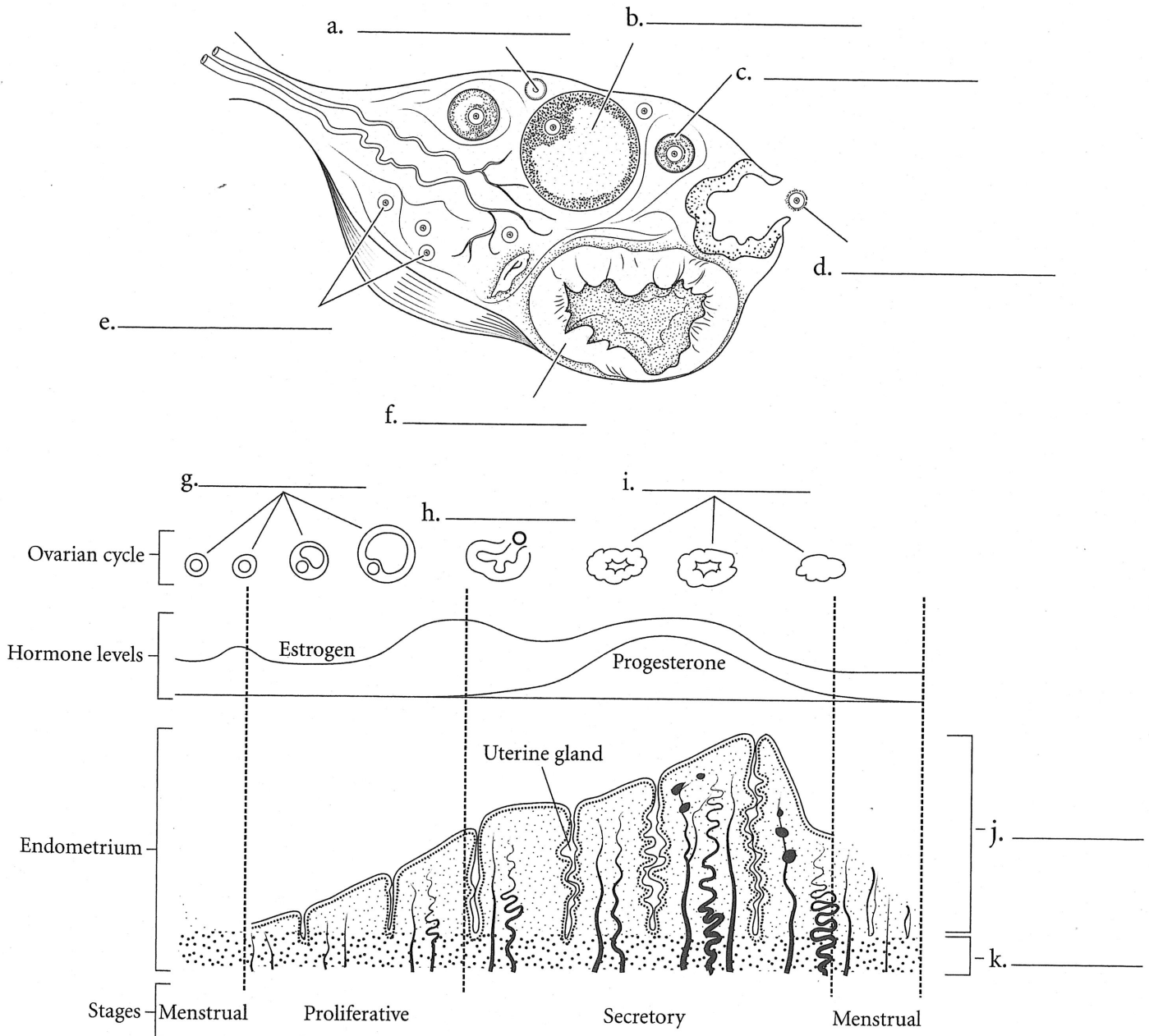


Answer Key: a. Suspensory ligaments, b. Ovary, c. Uterine tube, d. Round ligament, e. Uterus, f. Fundus, g. Cervix, h. Clitoris, i. Labium majus, j. Labium minus, k. Vagina, l. Rectouterine pouch

OVARY

The **ovary** is the gonad of the female reproductive system. The background tissue of the ovary is called the **stroma**. It produces **oocytes** in a process known as oogenesis. When they are mature, they are released from the ovary by ovulation. The ovary has **primordial follicles** that contain **primary oocytes**. When the primary oocytes get a little larger, they are located in **primary follicles**. As the ovulatory cycle progresses, some of these primary oocytes develop into **secondary oocytes**. These are enclosed in **secondary follicles**. Usually only one of these oocytes enlarges and is ovulated.

There are two cycles that occur in the female reproductive system, and they are interrelated. The **ovarian cycle** involves the maturation of the oocytes, ovulation, and the development of the **corpus luteum**. This cycle can be divided into the **preovulatory phase**, **ovulation**, and the **postovulatory phase**. The **menstrual cycle** involves the changes in the endometrium. The endometrium has a **basal layer** that stays the same thickness during the menstrual cycle and a **functional layer** that grows larger in the early part of the menstrual cycle, becomes rich in glycogen during the middle of a woman's cycle, and then is shed during menstruation.

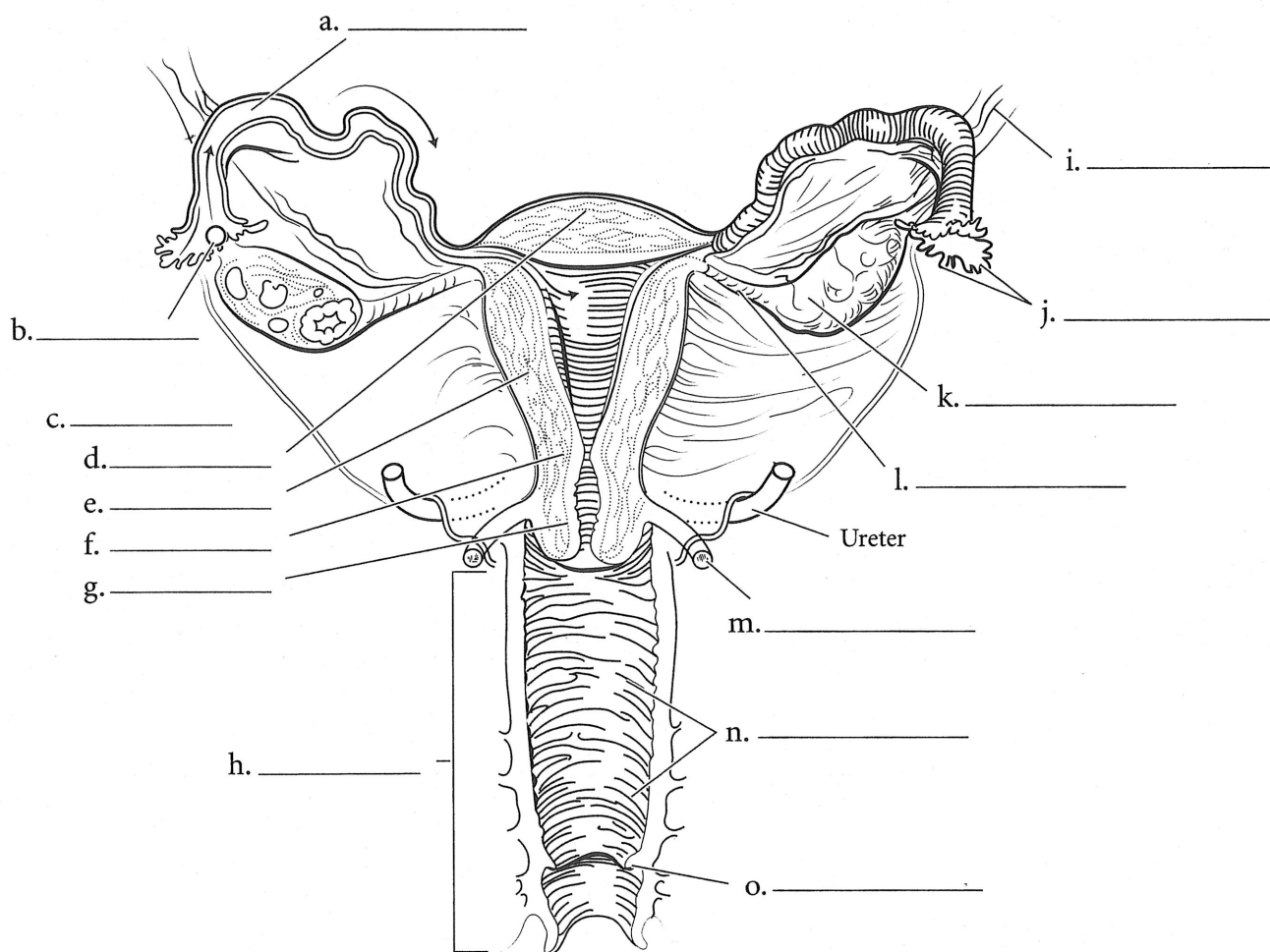


Answer Key: a. Primary oocytes, b. Secondary follicles, c. Primary follicle, d. Secondary oocytes, e. Primordial follicles, f. Corpus luteum, g. Preovulatory phase, h. Ovulation, i. Postovulatory phase, j. Functional layer, k. Basal layer

SECTION OF UTERUS AND VAGINA

The **oocyte** is ovulated from the **ovary** and moves into the **uterine tube**. The uterine tube is fringed by small cylindrical structures called **fimbriae**. The **uterus** is a small, flask-shaped organ. The uterus has a domed **fundus**, a main **body**, a narrowed **isthmus**, and an inferior **cervix**. The **uterosacral ligament** attaches the uterus to the sacrum. Most of the uterine wall is made of the **myometrium** which is a thick layer of smooth muscle. The **vagina** is approximately ten centime-

ters in length and is lined with stratified squamous epithelium and smooth muscle. A small ring of mucous membrane called the **hymen** is present in the vagina and is frequently torn during first intercourse. The hymen can rupture prior to intercourse and is not a good indicator of virginity. The vagina has **rugae**, which are folds in the vaginal wall. These stimulate the penis and allow for expansion of the vagina during delivery. Label the **suspensory ligament** and **ovarian ligament** as well as the structures of the uterus, ovary, and vagina. Color the regions of the uterus, ovary, vagina, and associated structures.

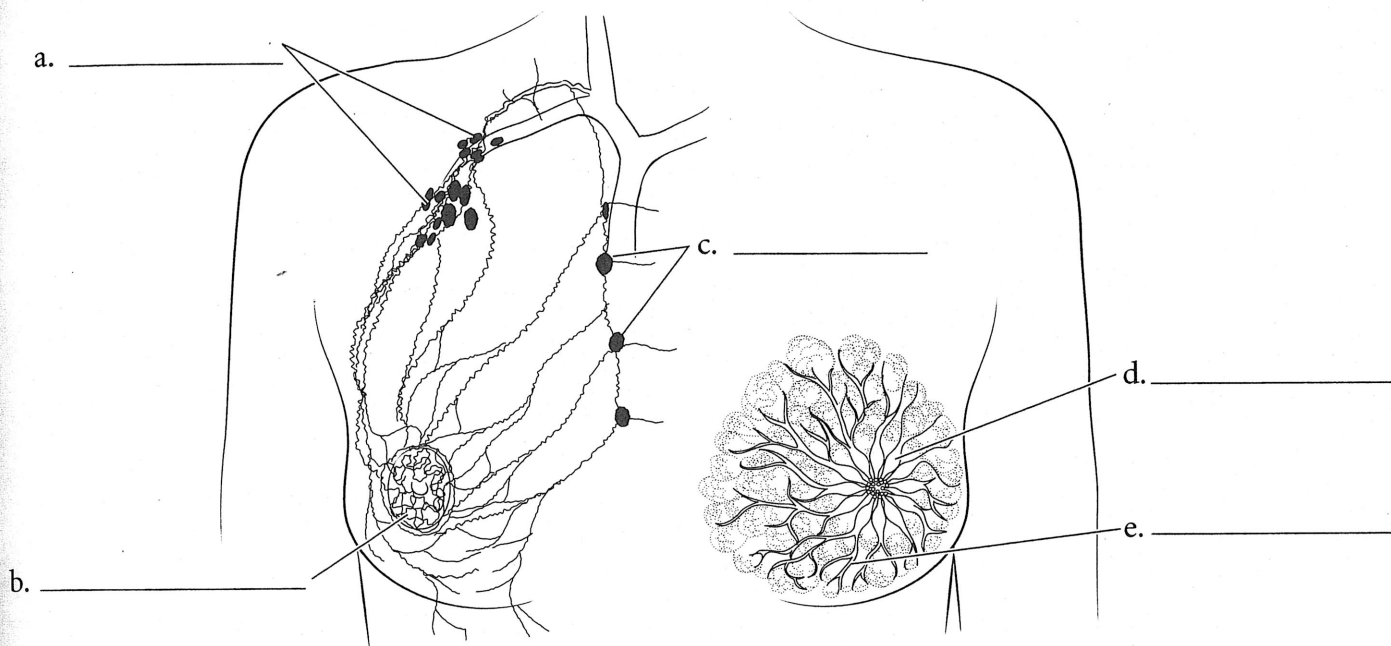


Answer Key: a. Uterine tube, b. Oocyte, c. Uterus, d. Fundus, e. Body, f. Isthmus, g. Cervix, h. Vagina, i. Suspensory ligament, j. Fimbriae, k. Ovary, l. Ovarian ligament, m. Uterosacral ligament, n. Rugae, o. Hymen

FEMALE BREAST AND EXTERNAL GENITALIA

The **mammary glands** are located in the breast. They produce milk when a woman is lactating and lead to **lactiferous ducts**. These ducts take milk to the **lactiferous sinuses**, which drain into the nipple. Because breast cancer is a significant cause of mortality in women, the lymph drainage of the breast is important. Primary tumors may originate in the breast tissue and then migrate by **lymphatic vessels** to the **axillary lymph nodes**. This is one of the main ways that breast cancer spreads. A small series of **parasternal lymph nodes** takes a small portion of the lymph back to the cardiovascular system.

The floor of the pelvis is known as the perineum and can be divided into a **urogenital triangle** and an **anal triangle**. The anal triangle contains the **anus**, and the urogenital triangle houses the **vaginal orifice**, the **urethral orifice**, and the **clitoris**. The **mons pubis** is the most anterior part of the external genitalia, and posterior to that is the **prepuce**. This structure envelops the **clitoris**. The **labia majora** and the **labia minora** encircle the **vaginal orifice**. The vagina is lubricated internally by some glands during arousal and intercourse as well as from the greater vestibular glands located laterally and posteriorly to the vaginal orifice. Label the structures of the female breast and the external genitalia and color them in.



Answer Key: a. Axillary lymph nodes, b. Lymphatic vessels, c. Parasternal lymph nodes, d. Lactiferous sinuses, e. Lactiferous ducts, f. Urogenital triangle, g. Anal triangle, h. Mons pubis, i. Prepuce, j. Clitoris, k. Labia minora, l. Labia majora, m. Urethral orifice, n. Vaginal orifice, o. Greater vestibular gland, p. Anus