The Ovum

The ovaries prepare and release an ovum in a series of events collectively called the **ovarian cycle.** The release of an ovum from an ovary is called **ovulation** *(ahv yoo LAY shuhn).* The ovum is then swept into the fallopian tube and begins to move toward the uterus, awaiting fertilization. Although the duration of the ovarian cycle varies from female to female, the cycle generally spans about 28 days.

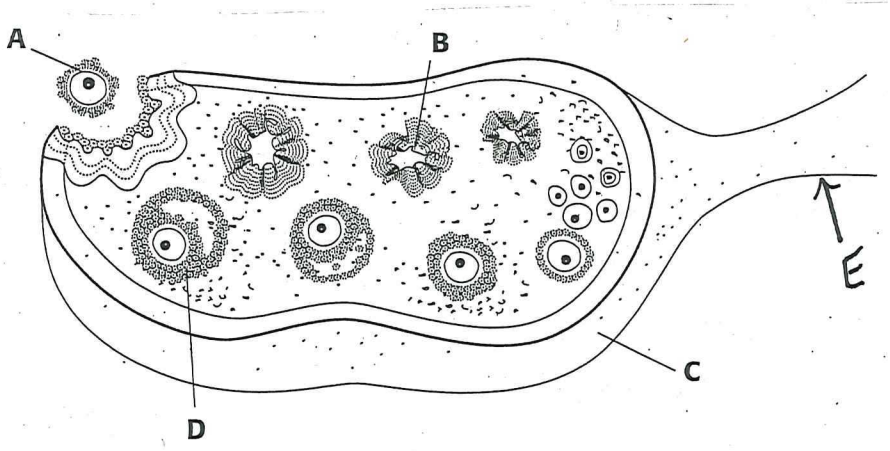
Phases of the Ovarian Cycle

Follicular phase The ovarian cycle has two distinct phases: the follicular phase *(fuh LIK yoo luhr)* and the luteal phase. These phases are regulated by hormones released by the hypothalamus and the anterior pituitary. The events of the ovarian cycle are summarized in **Figure 8.** In an ovary, egg cells mature within follicles. A **follicle** *(FAHL i kuhl)* is a cluster of cells that surrounds an immature egg cell and provides the egg with nutrients. During the follicular phase of the ovarian cycle, hormones regulate the completion of an egg cell's maturation. The follicular phase, which marks the beginning of the ovarian cycle, begins when the anterior pituitary releases follicle-stimulating hormone (FSH) and luteinizing hormone (LH) into the bloodstream. Both FSH and LH cause the follicle to produce estrogen, a sex hormone that aids in the growth of the follicle.

Ovulation At first the small increase in the level of estrogen prevents further release of FSH and LH from the anterior pituitary. This is caused by a negative feedback mechanism. But as the follicle approaches maturity, it begins to secrete large amounts of estrogen. The anterior pituitary responds to this high level of estrogen by greatly increasing secretion of LH. This increase in LH secretion is caused by a positive feedback mechanism. This surge of LH causes the egg cell to complete the first meiotic division, and it causes the follicle and the ovary to rupture. When the follicle bursts, ovulation occurs, as shown in Figure 8.

Luteal phase The luteal *(LOOT ee uhl)* phase of the ovarian cycle follows the follicular phase, as shown in **Figure 9.** After ovulation occurs, LH causes the cells of the ruptured follicle to grow, forming a corpus luteum. A **corpus luteum** *(KOHR puhs LOOT ee uhm)* is a yellowish mass of follicular cells that functions like an endocrine gland. LH causes the corpus luteum to secrete estrogen and progesterone, another sex hormone. Estrogen and progesterone inhibit the release of FSH and LH. This prevents the development of new follicles during the luteal phase.

LABEL THE DRAWING



Study the following steps in the follicular phase of the ovarian cycle. Determine the order in which the steps take place. Using the numbers 1-7 sequence the steps in the correct order of occurance.

____ Both FSH and LH cause the follicle to produce estrogen, a sex hormone that aids in the growth of the follicle.

____ As the follicle approaches maturity, it begins to secrete large amounts of estrogen.

____ The anterior pituitary releases FSH and LH into the bloodstream.

____ The follicle and the ovary rupture, and ovulation occurs.

____ The surge in LH causes the follicle to complete the first meiotic division.

____ The anterior pituitary responds to the high level of estrogen, in a positive feedback mechanism, by greatly increasing the secretion of LH.

____ In a negative feedback mechanism, the small increase in the level of estrogen prevents further release of FSH and LH.