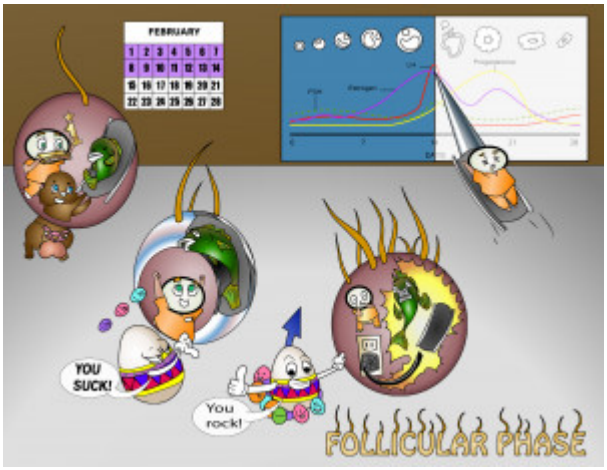
Ovulatory Hormones I - Follicular Phase

The 28-day menstrual cycle can be described by the ovulatory hormones in two phases: the follicular (proliferative) phase and the luteal (secretory) phase. The follicular phase describes balance between FSH, estrogen, LH and ovulation.



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Characteristics

0-14 Days

Days 0-14 on February Calendar

Though roughly 14 days on average, the follicular phase can vary in length. The follicular phase ends at ovulation. After day 14 (or ovulation), the luteal cycle begins.

GnRH Stimulates FSH and LH

Gonad-gopher stimulating Fish and Luge

The follicular phase begins with hypothalamic secretion of GnRH, stimulating the secretion of FSH and LH.

Follicle Secretes Estrogen

Follicle releasing Easter-eggs

As FSH increases, it induces follicle recruitment and folliculogenesis and growth of granulosa cells. Soon, these cells begin to grow and express LH receptors which then secrete Estrogen.

Negative Feedback from Estrogen

Negative feedback from Easter-egg

Initially, when Estrogen is first secreted, its levels are low. During this time in the follicular phase, low (but still rising) levels of Estrogen work via negative feedback to inhibit hypothalamic GnRH, and subsequently FSH and LH release from the anterior pituitary.

Increased Estrogen Leads to Positive Feedback

Up-arrow Easter-egg giving Positive Feedback

Though Estrogen is inhibiting production of FSH and LH, the growing size of the primary follicle (and internal theca/granulosa cells) leads to steadily increasing Estrogen levels. At high enough Estrogen levels, the negative feedback is turned off, and switched to positive feedback. This causes a sudden increase in FSH and LH production.

FSH and LH Surge

Fish and Luge Surging

Due to positive feedback from Estrogen, FSH and LH levels increase dramatically, leading to a "surge" of LH.

LH Spike Leads to Ovulation

Luge spike causing Ovulation

The event leading to ovulation is the LH spike. Under positive feedback from Estrogen, LH is secreted even more. This ensuing "spike" of LH is responsible for ovulation.