| Hormone | Source | Stimulus | Target Organ | Response |
|---|---|---|---|---|
| Estrogen (Estradiol) | follicle cells of the ovary (and later the corpus luteum) *Placenta, during pregnancy* | levels of FSH in plasma *presence of the foetus* | various organs associated – esp. the uterus during the follicular phase | stimulates secondary sex characteristics and the building of the endometrium |
| | ❑ stimulates growth of the endometrium (begins the development of the uterine lining)<br>❑ stimulates the corpus luteum to produce progesterone<br>❑ causes female secondary sex characteristics:<br>o growth of body hair,<br>o fat distribution<br>o pelvic girdle and breast enlargement<br>❑ growth of uterus and vagina<br>❑ onset of uterine cycle<br>❑ final stages of egg maturation | | | |
| FSH Follicle Stimulating Hormone | Anterior pituitary | GnRF (GnRH) | gonads (ovaries or testes) | stimulates oogenesis (females) and spermtogenesis (males) |
| | ❑ stimulate the follicle to produce **estrogen** [***negative feedback***]<br>❑ initiates egg maturation and sperm production<br>❑ promotes spermatogenesis in the seminiferous tubules<br>❑ with the help of testosterone, prompts Sertoli cells (located in the seminiferous tubules of the testes) to take immature sperm cells to a more mature state<br>❑ causes spermatogenic cells to take up testosterone. | | | |
| GnRF (also GnRH) Gonadotropin-Releasing Factor/Hormone | hypothalamus | various hormone levels in plasma | anterior pituitary | stimulates (via ***positive feedback***) the release of LH and FSH |
| | ❑ Which of the following events results from positive feedback on the hypothalamus between days 1 to 13 of the menstrual cycle? Ovulation. | | | |
| HCG(H) (also hCG) Human Chorionic Gonadotropin Hormone | *Embryo and developing placenta during pregnancy* | implantation | ovary | maintains the corpus luteurn thus ensuring adequate levels of progesterone (***positive feedback***) |
| | ❑ prevents the degeneration of the corpus luteum during pregnancy<br>❑ hormone often used in pregnancy tests | | | |
| LH (also ICSH) Luteinizing Hormone (Interstitial Cell Stimulating Hormone) | anterior pituitary | GnRF also affected by levels of estrogen/testosterone in plasma | follicle in ovary<br><br>interstitial (sertoli) cells in testes | causes ovulation (***positive feedback***); affects release of hormones from the gonads |
| | ❑ promotes ovulation<br>❑ controls **testosterone** levels [***negative feedback***]<br>❑ stimulates cells in the testes (Leydig cells), telling them to produce testosterone.<br>❑ controls sex hormone production<br>❑ stimulates the corpus luteum to produce **progesterone** [***negative feedback***] | | | |
| Oxytocin[i] | posterior pituitary (produced in the hypothalamus), *also the uterus during pregnancy* | uterine contractions | uterus | stimulates uterine contractions (and male ejaculation) and milk secretion (***positive feedback***) |
| | ❑ causes the uterus to contract during childbirth<br>❑ promotes spermatogenesis in the seminiferous tubules<br>❑ female – associated with a sense of calm relaxation and bonding with child during breast feeding | | | |

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|---|---|---|---|---|
| | ❑ male – associated with a sense of calm relaxation (after-glow) after orgasm, hence why men become sleepy post intercourse<br>❑ may play a role in sexual satiety and social bonding | | | |
| Progesterone | developing follicle and the corpus luteum (unique to female)<br>*Placenta, during pregnancy* | levels of LH in plasma | endometriurn | stimulates the maturation of the endometriurn |
| | ❑ stimulates growth of the endometrium<br>❑ causes the endometrium to become secretory<br>❑ causes the uterine glands to mature, producing a thick mucoid secretion<br>❑ brings about and maintains the secondary sex characteristics in females | | | |
| Prolactin | anterior pituitary | surges after intercourse, during pregnancy and breast-feeding | Ovary, mammary, brain | promotes milk production in females, maintains secretion of estrogen and progesterone by ovary, has inhibitory effect on male sexual behaviour, and stimulates the growth of new brain cells in the front regions the brain involved in smell. |
| Prostaglandins[ii] | Various organs, notably seminal vesicle, (and endometrium) | a normal component of semen | uterus | stimulate uterine contractions following intercourse |
| | ❑ found in seminal fluid, and stimulates uterine contraction | | | |
| Testosterone (androgen) | Interstitial (Leydig) cells of the testes | level maintained by LH (aka ICSH) release from the anterior pituitary | various organs | stimulates and maintains secondary sex characteristics in males and contributes to aggressive behaviour in males and females |
| | ❑ causes sperm maturation<br>❑ promotes the normal development of the primary sex organs<br>❑ brings about and maintains the secondary sex characteristics in males:<br>o growth of body hair<br>o larynx and vocal cords (also in female)<br>o increased muscle strength<br>❑ libidio<br>❑ increased plasma calcium concentration (bone health) | | | |

You may also wish to review Wikipedia:

- http://en.wikipedia.org/wiki/Estradiol
- http://en.wikipedia.org/wiki/Progesterone
- http://en.wikipedia.org/wiki/Testosterone

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[i] The hormone **oxytocin** is thought to be an instigator of the birth process in mammals, enabling a pregnant female to start uterine contractions during labor, to begin lactating, to bond with her newborn, and in general, to behave maternally. It is the same hormone believed responsible for sexual receptivity to begin with, both male and female, and for the bonding behavior between the two (called pair-bonding). Oxytocin also was postulated to play a vital role in male copulation and ejaculation. Oxytocin also lowers blood pressure.

[ii] The localized hormone **prostaglandin** is also associated with: uterine contractions during birthing, and cramping during menstration; in conjuction with LH, causing the follicle to rupture as a part of ovulation; and with oxytocin in the demise of the corpus luteum (luteolysis), and therefore a drop in progesterone levels in mammals, excluding primates —" *estrogen and progesterone, secreted by the corpus luteum, inhibit the release of LH by the anterior pituitary gland. This removes the luteotrophic support provided by the luteinising Hormone (LH) and the corpus luteum degrades to a corpus albicans (scar tissue) which is eventually absorbed into the ovary. Degradation of the corpus luteum will result in reduced levels of progesterone, promoting an increase in follicle stimulating hormone secretion by the anterior pituitary gland (FSH) which will trigger the development of a new follicle in the ovary.*" (Wikipedia). In males it leads to erection of the penis,. Seminal fluid is rich in prostaglandins that increases sperm motility and viability, decrease mucous viscosity at cervix, and stimulate female uterine contractions to move the semen up into the uterus (may be acting as a pheromone).

**Review:**