**AP Biology: The Endocrine System**

Concept 4: Analyzing how hormones in the animal endocrine system use feedback systems to control homeostasis (ch 40, 45)

Two major systems *control* and *coordinate* animal tissues, organs, and organ systems:

* Endocrine System (using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that travel via blood)
* Nervous Systems (using impulses along nerves and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_between nerves)

Pituitary Gland

Anterior Pituitary – a \_\_\_\_\_\_\_\_\_endocrine gland

1.  Cells in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_hormones (such as GnRH and TRH).

2.  These hormones are secreted into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and travel to \_\_\_\_\_\_\_\_\_cells in the anterior pituitary

3.  The anterior pituitary produces and releases a \_\_\_\_\_\_\_\_\_\_\_\_\_hormone to the \_\_\_\_\_\_\_\_\_\_(such as LH, FSH and TSH).

Posterior Pituitary (an \_\_\_\_\_\_\_\_\_\_\_growth of the hypothalamus)

1.  The \_\_\_\_\_\_\_\_\_\_\_\_\_\_produces some hormones that are stored in the \_\_\_\_\_\_\_\_\_\_\_\_\_of the posterior pituitary.

2.  The posterior pituitary releases these hormones when\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_Feedback – Breastfeeding and oxytocin

\_\_\_\_\_\_\_\_\_\_\_Feedback – thyroxin

Maintaining Homeostasis – Insulin and Glucagon Uses \_\_\_\_\_\_\_\_\_\_feedback

Adrenal gland Cortex – hormonal control –\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Medulla – nervous control – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Reproductive Hormones**

Hormones make it happen

|  |  |  |
| --- | --- | --- |
|  **Days** | **Ovarian Cycle** | **Uterine Cycle** |
| **1****5** | Follicular Phase- development of follicle | Menstruation- shedding of endometrium |
| **6****13** | Proliferation Phase-endometrium develops and thickens |
| **14** | Ovulation- ovum is released |
| **15****28** | Luteal Phase- development of corpus luteum | Secretory Phase- endometrium thickens, secretes mucus, becomes vascularized |
|  *Cycle will repeat if not pregnant* |

**The Female Key Players….**

GnRH: \_\_\_\_\_\_\_\_\_-releasing hormone

FSH: \_\_\_\_\_\_\_\_\_\_stimulating hormone

LH: \_\_\_\_\_\_\_\_\_\_hormone

**The hormone oxytocin: another example of a positive feedback loop!**

1) **Childbirth**

* Fetus reaches cervix
* cervix sends nerve impulses to the hypothalamus
* oxytocin is produced in the hypothalamus
* oxytocin is stored and released by the posterior pituitary gland
* oxytocin is carried by blood
* oxytocin causes an increase in uterine contractions
* Contractions cause fetus to push against the cervix

2) **Breastfeeding**

* suckling by infant stimulates the nerves in the breast
* nerve impulses sent to hypothalamus
* oxytocin is produced in the hypothalamus
* oxytocin is stored and released by the posterior pituitary gland
* oxytocin is carried by blood
* oxytocin causes muscles in mammary glands to squeeze out milk
* infant suckles to get milk

|  |  |  |  |
| --- | --- | --- | --- |
|  **When?** | **What type of feedback?** | **Hormones involved?** | **Steps of what happens:** |
| During follicular phase: |   |   |   |
| During luteal phase: |   |   |   |
| After implantation |   |   |   |
| During childbirth |   |   |   |
| During breastfeeding |   |   |   |



**Male Reproduction: Hormones**

1.    Describe the functions of testosterone:

* Development and function of male reproductive organs (\_\_\_\_\_\_\_\_\_\_\_\_\_)
* Secondary role is \_\_\_\_\_\_\_\_\_\_\_

The homeostatic regulation of testosterone levels by the hypothalamus, anterior pituitary, and testes

Testosterone and sperm production is maintained at a steady level by \_\_\_\_\_\_\_\_\_feedback.

if testosterone levels are too LOW:

* The hypothalamus secretes GnRH.
* The anterior pituitary secretes LH and FSH
* Because \_\_\_\_\_\_\_\_\_\_\_\_\_LH, the interstitial cells in the testes secrete \_\_\_\_\_\_\_\_\_\_testosterone.
* Because of \_\_\_\_\_\_\_\_\_FSH and testosterone, the seminiferous tubules in the testes produce \_\_\_\_\_\_sperm.

If testosterone levels are too HIGH:

* The hypothalamus secretes \_\_\_\_\_\_\_GnRH.
* The anterior pituitary secretes \_\_\_\_\_\_LH and \_\_\_\_\_\_\_\_FSH
* Because of \_\_\_\_\_\_\_\_LH, the interstitial cells in the testes secrete \_\_\_\_\_\_\_testosterone.
* Because of \_\_\_\_\_\_\_\_\_FSH and testosterone, the seminiferous tubules in the testes produce \_\_\_\_\_\_\_sperm.

