



Endocrine

434 Physiology team
presents to you:

Hypothalamo-Pituitary axis and regulatory mechanisms

- Important
- Further explanation

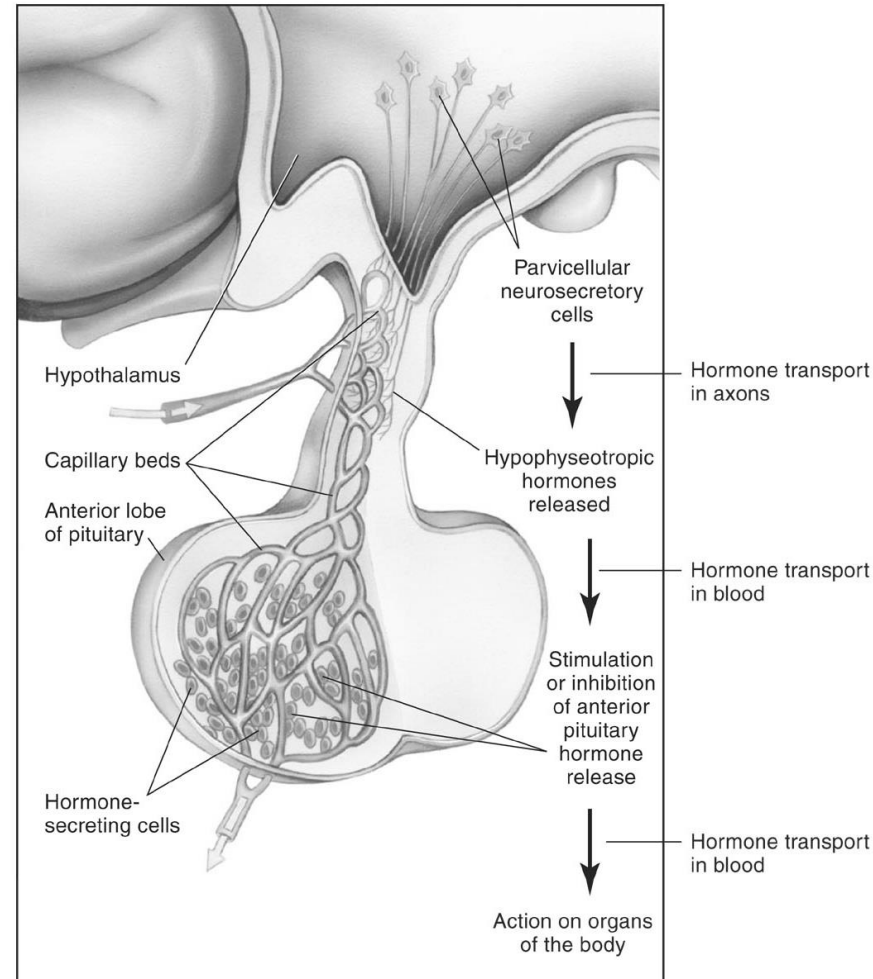
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Please check out this link before viewing the file to know if there are any additions/changes or corrections. The same link will be used for all of our work [Physiology Edit](#)

Control of anterior pituitary by hypothalamus (Hormonal control)

- There are two types of special neurons in the hypothalamus these have either:
 1. Releasing hormones.
 2. Inhibitory hormones.
- These special neurons send their axon to the median eminence which is an extension of the hypothalamic tissue into the pituitary stalk.
- The hormones secreted by these neurons will reach the anterior pituitary cells by a way of hypothalamic-hypophysial portal vessels.



Control of anterior pituitary by hypothalamus (Hormonal control)

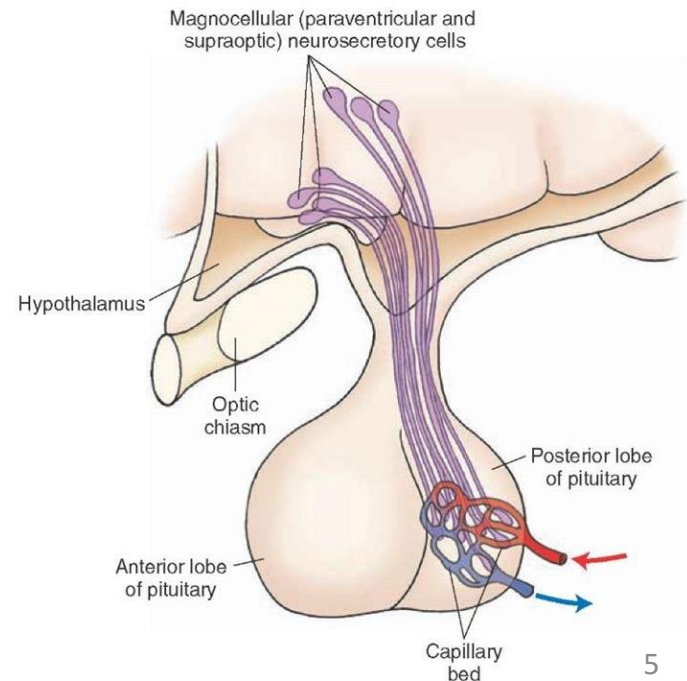
NOTE THAT :

- **Hypothalamus hormones** = hormones release by these special hypothalamus neurones to hypothalamic-hypophysial portal vessels.
- **Target cells** = The cells of anterior pituitary gland cells
- **Hormones released by target cells** = the hormones of the anterior pituitary glands.

Hypothalamus hormones	Target cell	Hormones released by target cells
Growth hormone releasing hormone (GHRH)	Somatotropes	Growth hormone (GH)
Growth hormone inhibiting hormone (GHIH) also called Somatostatin	Somatotropes	No release of Growth hormone
Thyrotropin-releasing hormone (TRH)	Thyrotropes	Thyroid stimulating hormone (TSH)
Corticotropin-releasing hormone (CRH)	Corticotrops	Adrenocorticotropic hormone (ACTH)
Gonadotropin releasing hormone (GnRH)	Gonadotropes	Luteinizing hormone (LH) Follicle-stimulating hormone (FSH)
Dopamine (called also prolactin inhibitory hormone)	Lactotropes	Prolactin

Control of posterior pituitary by hypothalamus (neurohypophysis)

- There are neurosecretory cells that are called magnocellular cells (paraventricular and the supraoptic cells) that descends from the hypothalamus to the posterior pituitary and they release hormones there.
- NOTE : **The are no secretory cells that release hormones in the posterior pituitary ,thus the posterior pituitary act as storage place for the hormones of the magnocellular cells.**
- Two hormones release by the magnocellular cells these are:
 - **Oxytocin** → mediate the contraction of uterine muscles + release of milk from the mammary gland.
 - **ADH** → it effect the renal tubule.



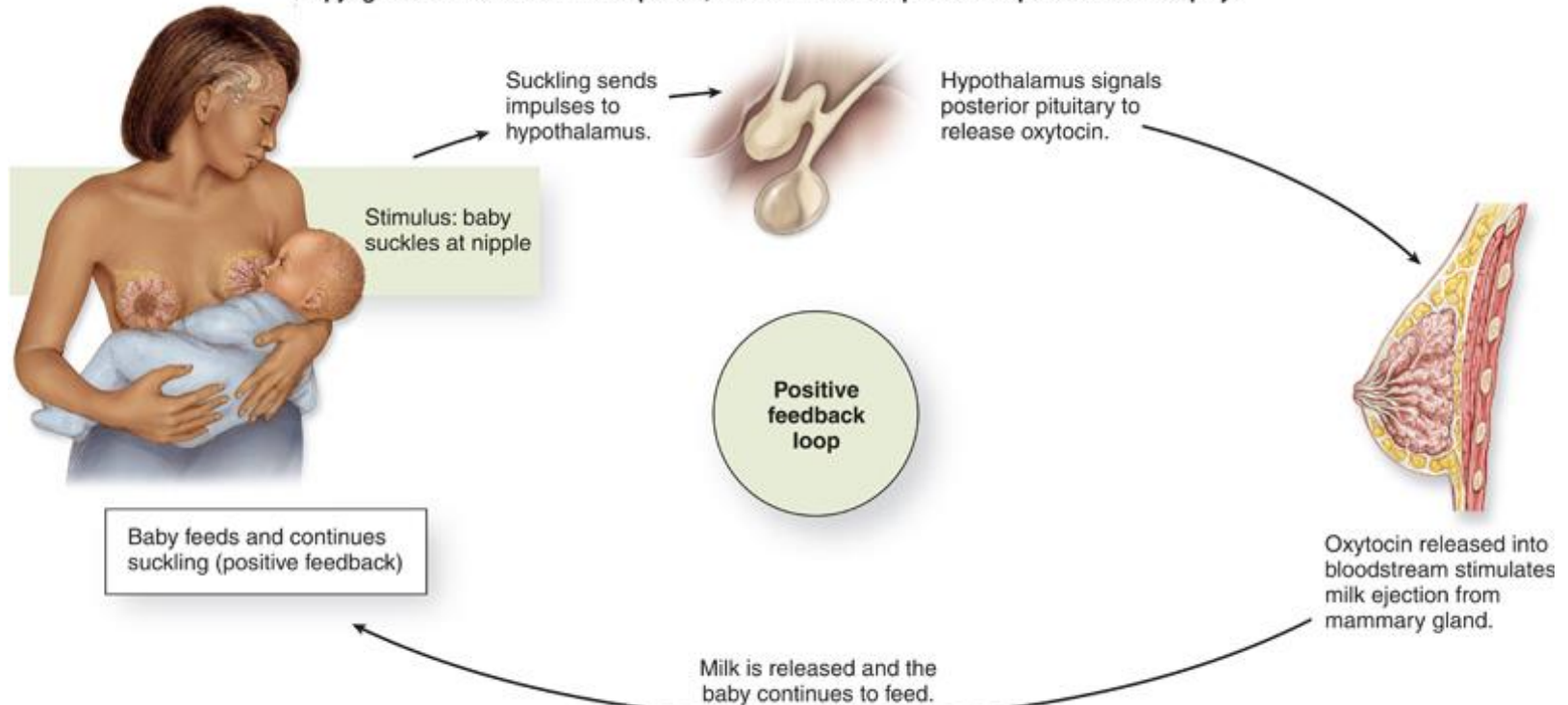
Feedback mechanism

1. The positive feedback mechanism:

Release of hormone A → stimulate Hormone B



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(b) Positive feedback

Feedback mechanism

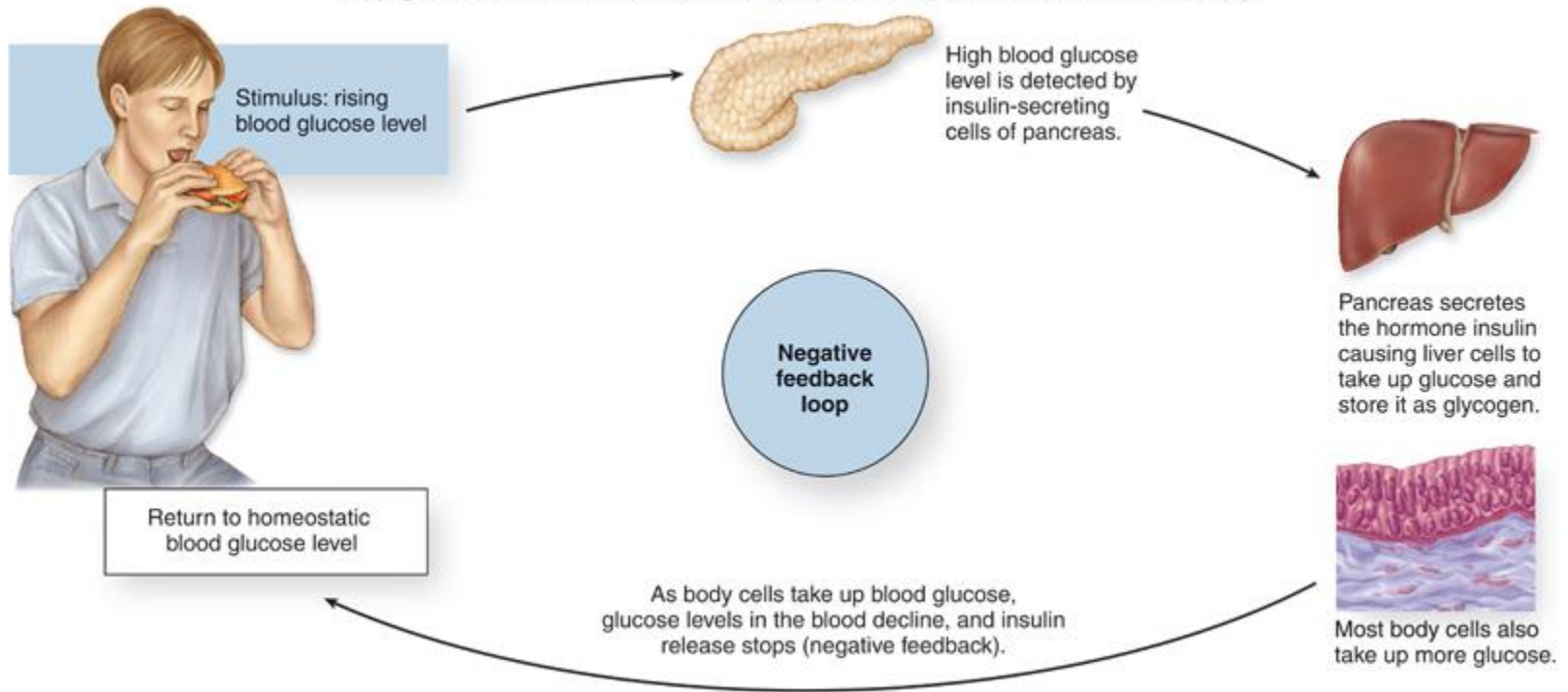
2. The Negative feedback mechanism:

Release of hormone A → stimulate Hormone B



Inhibit further Hormone A

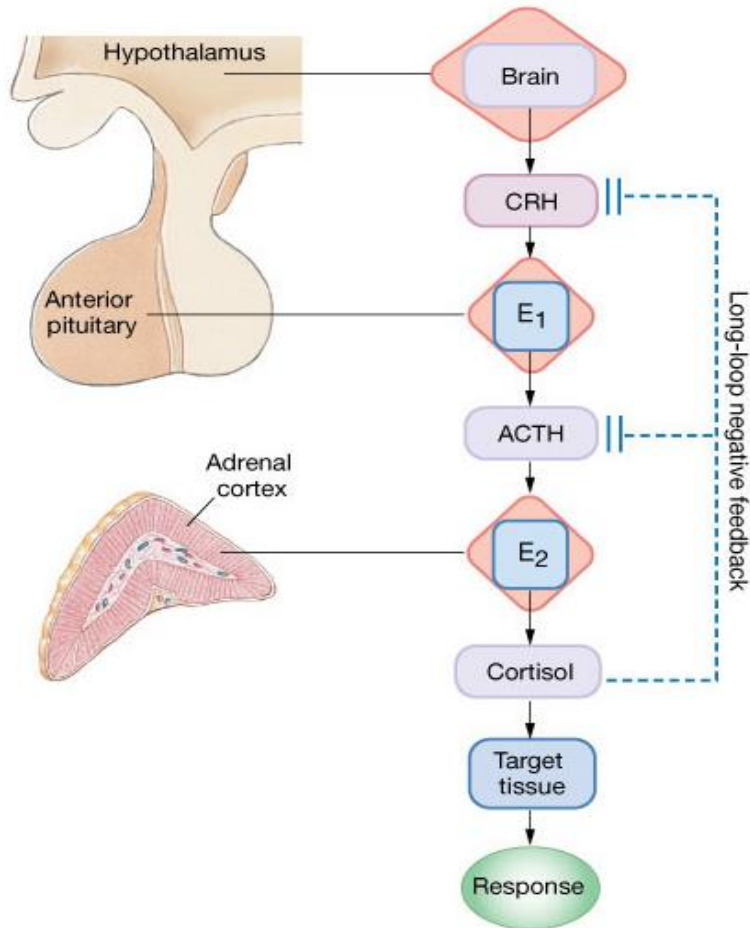
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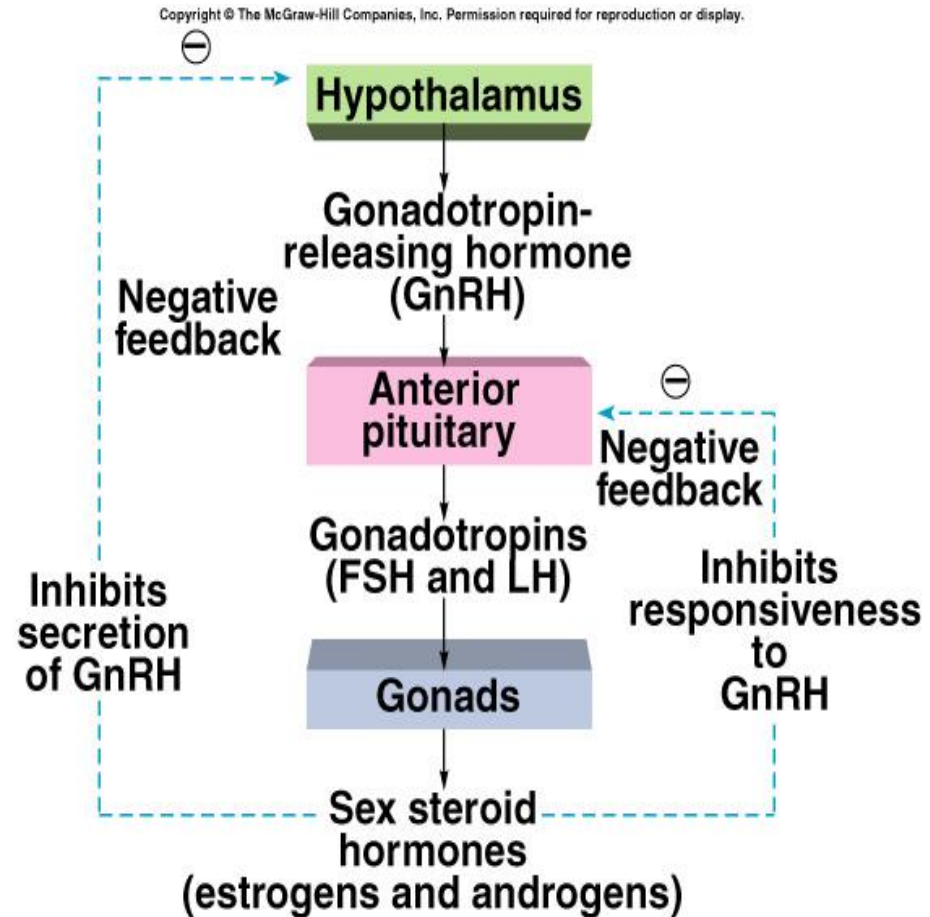
(a) Negative feedback

Several examples of negative feedback

❖ Cortisol



❖ Sex steroid



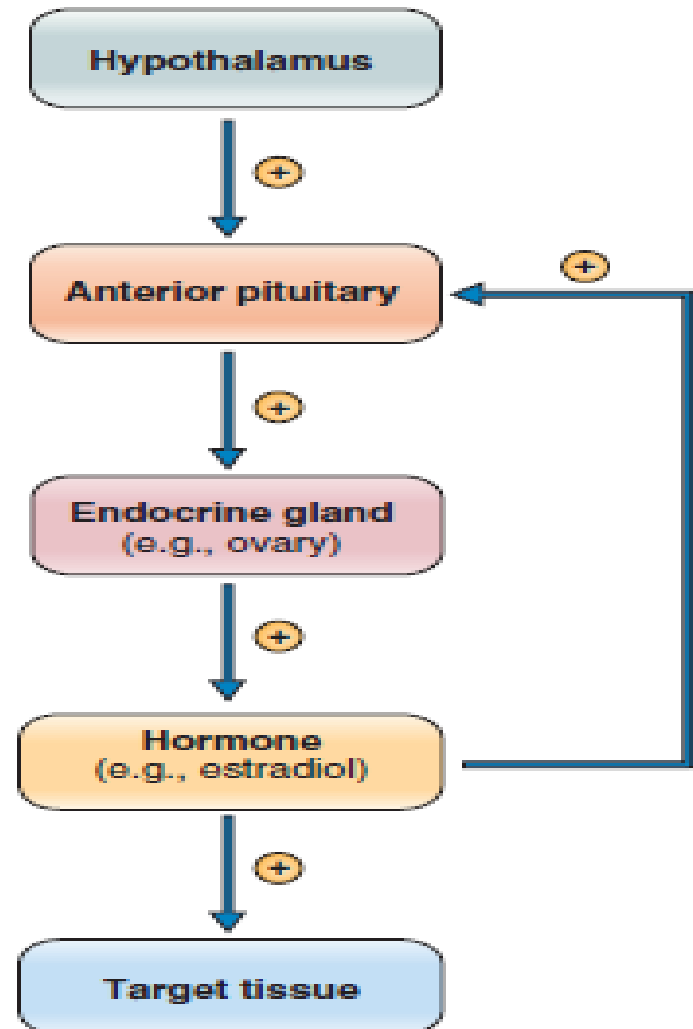
1. The release of cortisol inhibit the release of ACTH and CRH.
2. Sex steroid hormones (estrogens and androgens) inhibit the the secretion of GnRH and inhibit the the response of anterior pituitary to GnRH.
3. Also, T3 “release by the thyroid ” inhibit the release of TRH and TSH. (NOT SEEN IN THESE DIAGRAMS)

examples of Positive feedback

1-Estrogen (Estradiol) during **ovulation**.

2-Oxytocin During Pregnant Delivery.

POSITIVE FEEDBACK



Answer key: 1.C, 2.A, 3.B, 4.D, 5.C

1-Which area of the pituitary gland acts as a storage place for hormones?

- A. Pars distalis of the anterior lobe
- B. Pars intermedia
- C. Pars nervosa of the posterior lobe
- D. The infundibulum

2- The hormone Corticotropin-releasing hormone (CRH) act on which of the following cells?

- A. Corticotrops
- B. Somatotropes
- C. The adrenal cortex cells
- D.The adrenal medulla cells

3- Patient with erectile dysfunction, infertility, gyncomastia diagnosed with hyperprolactenimia. What is the most likely finding in this patient?

- A. High Dopamine
- B. Low dopamine
- C. High CRH
- D. Low CRH

4- The function of somatostatin?

- A. Increase the release of Thyroid stimulating hormone (TSH)
- B. Inhibit the release of Thyroid stimulating hormone (TSH)
- C. Stimulates release of growth hormone
- D. Inhibits release of growth hormone

5- Which of the following hormones originate from the anterior pituitary gland?

- A. Growth hormone-releasing hormone
- B. Somatostatin
- C. Thyroid stimulating hormone
- D. Oxytocin

Q1: Give ONE hormone that is secreted by gonadotropins cells?

Ans: Follicle-stimulating hormone (FSH)

Q2: Give the name of the cells that secrete thyroid stimulating hormones

Ans: Thyrotropes

Q3: The effect of ADH is seen on which tissue?

Ans: Renal tissue

Q4: What is the effect of Dopamine on the release of prolactin from the anterior pituitary gland ?

Ans: Inhibit the release of prolactin

Q5: What is the effect of the rise of T3 and T4 hormones of the TRH and TSH?

Ans: Inhibit the release of these hormones

Thanks for checking our work

Good Luck

Done by:

❖ Moath aleisa