University of Mosul
Lecture No.: 4
College of Veterinary Medicine
Date:
Unit of Scientific Affairs
Website:

Lecture title: **The Endocrine System (Pituitary and Hypothalamus)**

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Summary: **The fourth lecture is a review for the anterior pituitary gland and the hypothalamus, with the hormones released by each and their actions.**

➢ ANTERIOR PITUITARY GLAND

The anterior pituitary itself synthesizes 6 peptide hormones that it releases into the blood are:

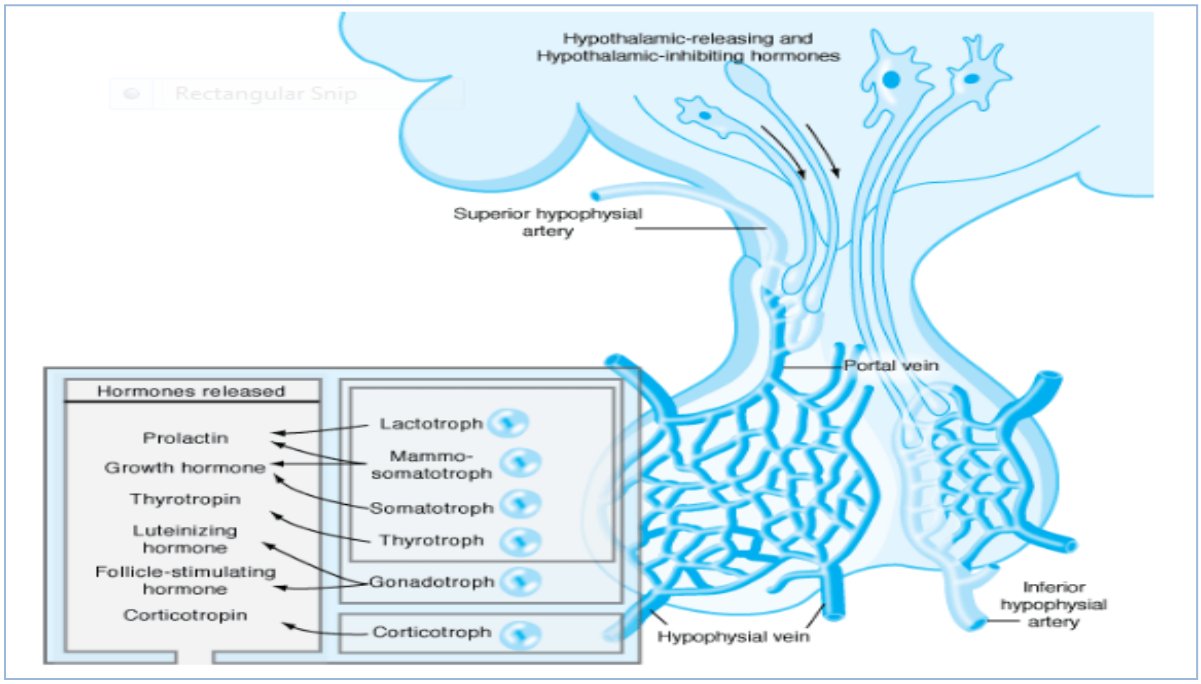
1- Growth hormone (GH, Somatotropin).

2- Thyroid –stimulating hormone (TSH, Thyrotropin).

3- Adrenocorticotropic h. (ACTH, Adrenocorticotropin).

4- Follicle –stimulating hormone (FSH).

5- Luteinizing hormone (LH).



HYPOTHALAMUS:

Hypothalamic Releasing & Inhibiting Hormones.

Hypothalamic releasing and inhibiting hormones are delivered to the anterior pituitary by the hypothalamic-hypophyseal portal system to control anterior pituitary hormone secretion.

Anterior pituitary hormones secretion controlled by

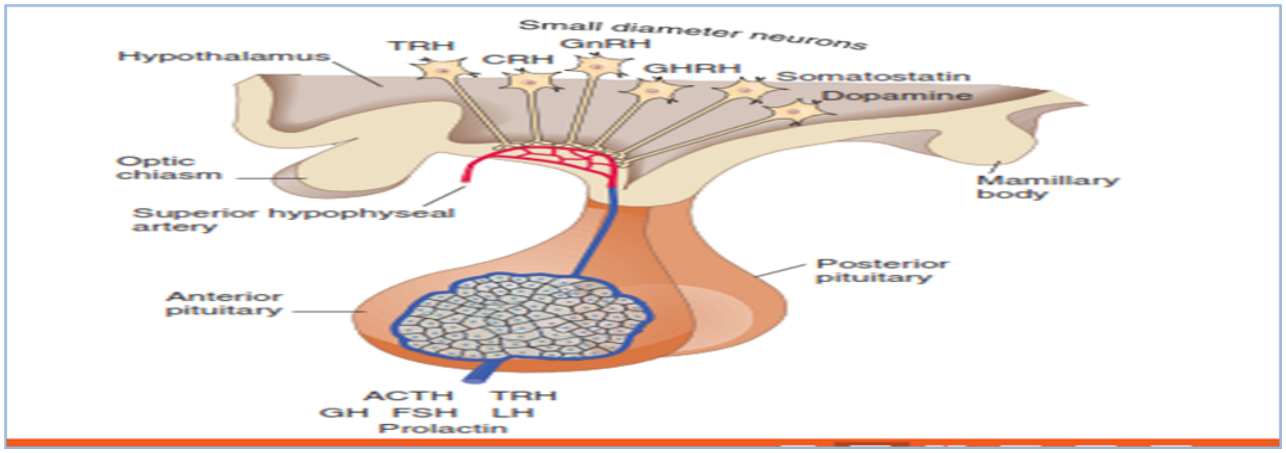
1-Hypothalamic Hormones &

2-feedback by target gland hormones.

The secretion of each of the anterior pituitary hormones is stimulated or inhibited by one or more **Hypophysiotropic Hormones.**

Hormones	Effects On The Anterior Pituitary Gland
Thyrotropin-releasing hormone(TRH)	Stimulates release of TSH(Thyrotropin & prolactin).
Corticotropin- releasing hormone (CRH).	Stimulates release of ACTH (corticotropin).
Gonadotropin-releasing hormone (GnRH).	Stimulates release of FSH&LH (Gonadotropins).
Growth hormone- releasing hormone (GHRH).	Stimulates release of growth hormone.
Growth hormone- inhibiting hormone (GHIH).	Inhibits release of growth hormone & TSH.
Prolactin –releasing factor (PRF).	Stimulate release of prolactin.
Prolactin –inhibiting hormone (PIH).	Inhibits release of prolactin.

Hypophysiotropic hormones reach the anterior pituitary gland via the portal vessels, where they control the release of anterior pituitary hormones into the systemic circulation.



GROWTH HORMONE

requires for

1-net synthesis of proteins.

2-lengthening of long bones (the bones of extremities).

Growth hormone promotes growth of the bones in both thickness and length.

3-increases in the size and number of cells in the soft tissue throughout the body.

Growth hormone exerts its growth –promoting effects indirectly by stimulating SOMATOMEDINS

Growth hormone does not act directly on its target cells to bring about its growth-producing actions.

1-increased cell division

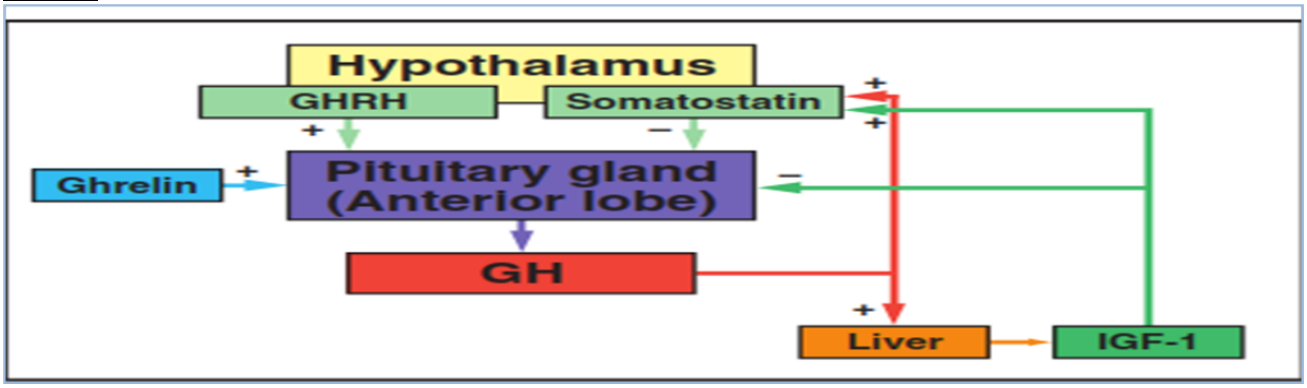
2-enhanced protein synthesis

3-enhanced bone growth

These effects are directly brought about by peptide mediators known as **SOMATOMEDINS,** whose synthesis is stimulated by GH. These peptides also referred to as **INSULIN LIKE GROWTH FACTORS (IGF).**

Abnormal growth hormone secretion results in aberrant growth patterns.

Diseases related to both deficiencies & excesses of growth hormone can occur.



DWARFISM

Hypo secretion of growth hormones in a child.

Growth hormone deficiency may be caused by

1-a pituitary defect (lack of growth hormone).

GROWTH HORMONE EXCESS:

Hyper secretion of GH is most often caused by a tumor of the GH-producing cells of the anterior pituitary.

If over production of GH begins in childhood before the epiphyseal plates are closed, the principal manifestation of the disorder is a rapid growth in height without distortion of body proportions, the condition is known as GIGANTISM.

- **Gigantism**- over secretion of somatotropin before puberty.

4.5 A 6-month-old German Shepherd bitch with growth retardation, retention of secondary hairs (puppy coat) and lack of primary hairs due to pituitary dwarfism.

- **Dwarfism**- under secretion of somatotropin.
  Causes: tumor, injury, infection, genetics