المادة/ الكيمياء السريرية النظري

قسم تقنيات المختبرات الطبية / المرحلة الثانية

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المحاضرة التاسعة / الهرمونات

Lec. 9 (Hormones)

Hormones : a chemical messengers that are product by certain living cells in the glands and transported via the blood to the target organ.

-they interact with the target tissue by combination with a specific receptors which are present either in the cell membrane or inside the cytoplasm.

Function of hormones:

1-regulation of synthesis and metabolism of enzymes.

2- regulation of enzymes activities in the cells.

3-changing the structure of cell membrane in order to transport the metabolites via the membrane cell.

Classification of hormones:

1-tyrosin derivatives hormones such as thyroid hormones and adrenaline hormones.

2- lipids derivatives hormones such as cholesterol derivatives. Exp/ steroid hormone(progesterone).

3-simple peptides such as glucagon (29 A.A).

4-Protein hormones :contain higher number of A.A).exp/growth hormone (191 A.A),Parathyroid hormone (84 A.A).

Regulation of hormones secretion

The quantity of hormone in the blood is controlled by **feedback inhibition**.

The **feedback mechanism** of hormones / is the mechanism through which the balance of hormone in the blood/body is maintained. The increase or decrease in the concentration of that hormone can either stimulate the secretion of that particular hormone or inhibit the hormone secretion. This is called feedback.

There is a combination between hypothalamus gland ,anterior pituitary gland and target organ as shown in the following scheme:

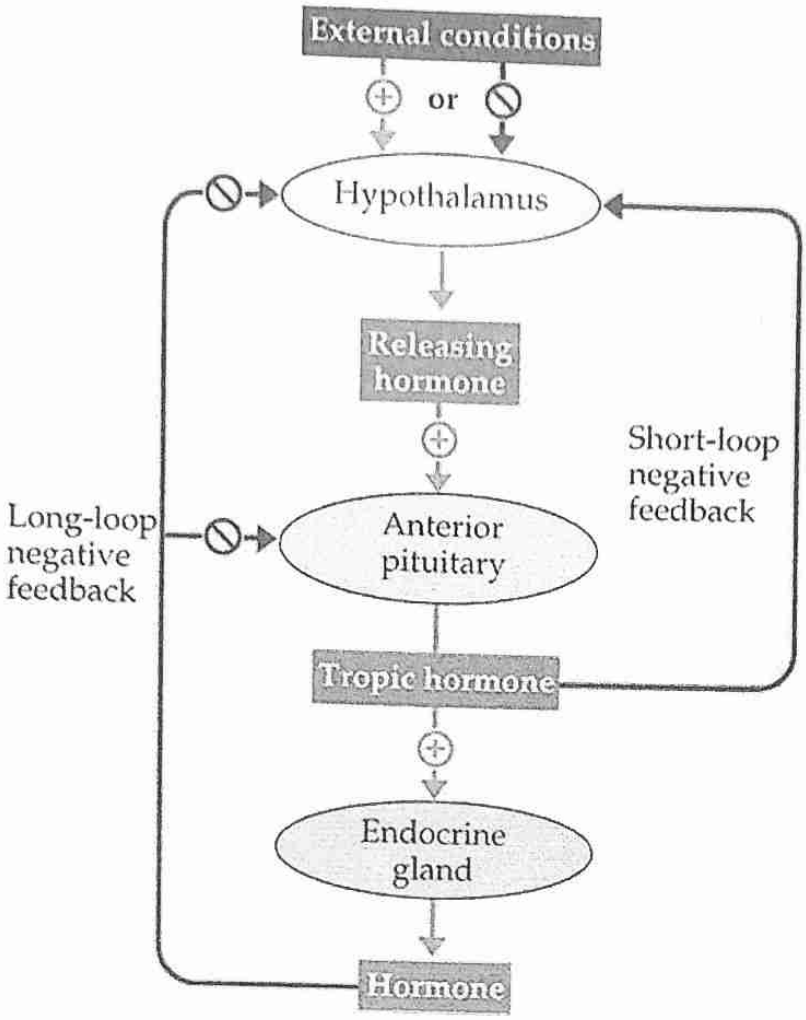
1-releasing hormone (secreted by hypothalamus gland) stimulates secretion of tropic hormone from anterior pituitary gland.

2- tropic hormone stimulates secretion of target organ hormone from target tissue.

3- tropic hormone inhibits secretion of releasing hormone (short loop F.B inhibition).

4-target organ hormone inhibits secretion tropic hormone (short loop F.B inhibition).

5- target organ hormone inhibits secretion releasing hormone (long loop F.B inhibition).



pituitary gland hormones

1-**anterior** pituitary gland/derived during embryological and development from the roof of the mouth and connected to the hypothalamus by a portal system.

-most of the hormones are released from the anterior pituitary gland.

2- **posterior** pituitary gland/derived from nervous tissue and two protein hormones released such as : **oxytocin** and **vasopressin** .

Adrenal hormones

Adrenal gland

1-Adrenal cortex (outer):produces about 50 different chemicals including;

a-mineralocorticoids(outer layer).

b-glucocorticoids , cortisol (middle layer).

c-sex hormone (inner layer) such as estrogen, progesterone and androgens.

2-adrenal medulla (inner layer).

a-dopamine → norepinephrine/epinephrine

Thyroid gland

1-too little thyroxin –hypothyroidism.

a-depression , b-memory problems.

2-too much thyroxin –hyperthyroidism.

a-weight loss.

Pancreatic hormones

Pancreas hormones / are any of various hormones produced by the pancreas, these include: insulin ,glucogon,polypeptide and somatostain.

Functions of Pancreas hormones •

1-Pancreas hormones are responsible for storage of fats and glucose after meal.

2-enables the metabolism of energy.

3-maintain the constant plasma glucose concentration.

4-promote growth.