

# **Pituitary gland**

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# Pituitary gland

- **Gland:**
- **An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva, or milk.**
- Endocrine glands release the substances directly into the bloodstream.
- Exocrine glands release the substances into a duct or opening to the inside or outside of the body.

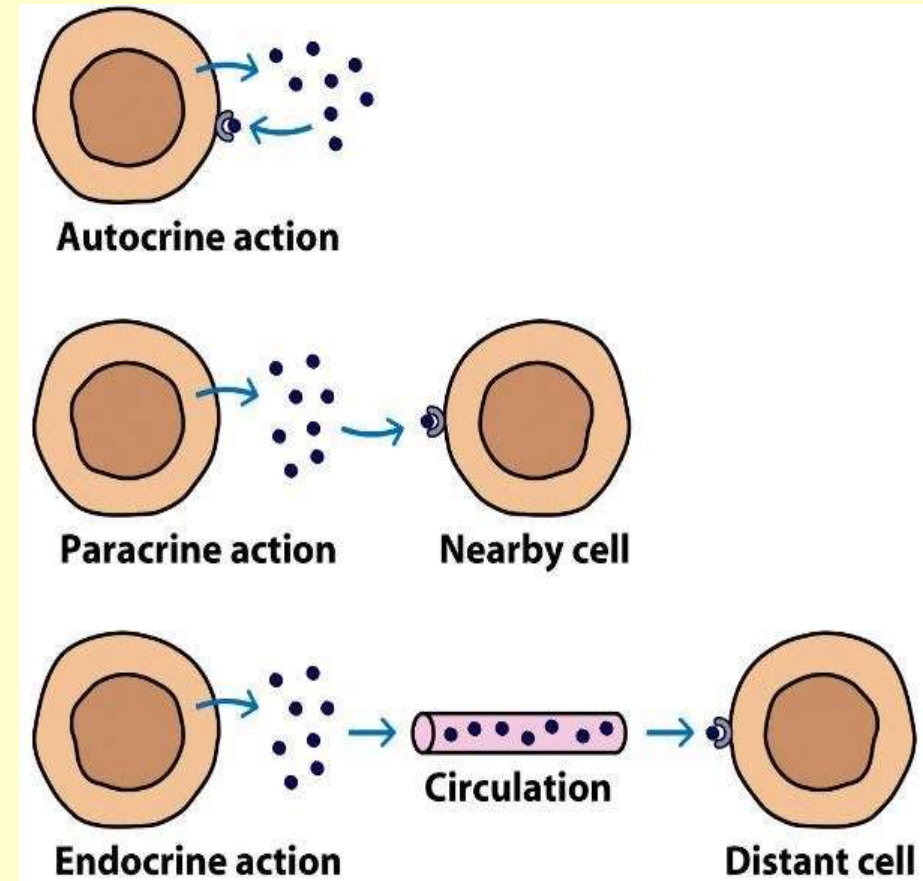


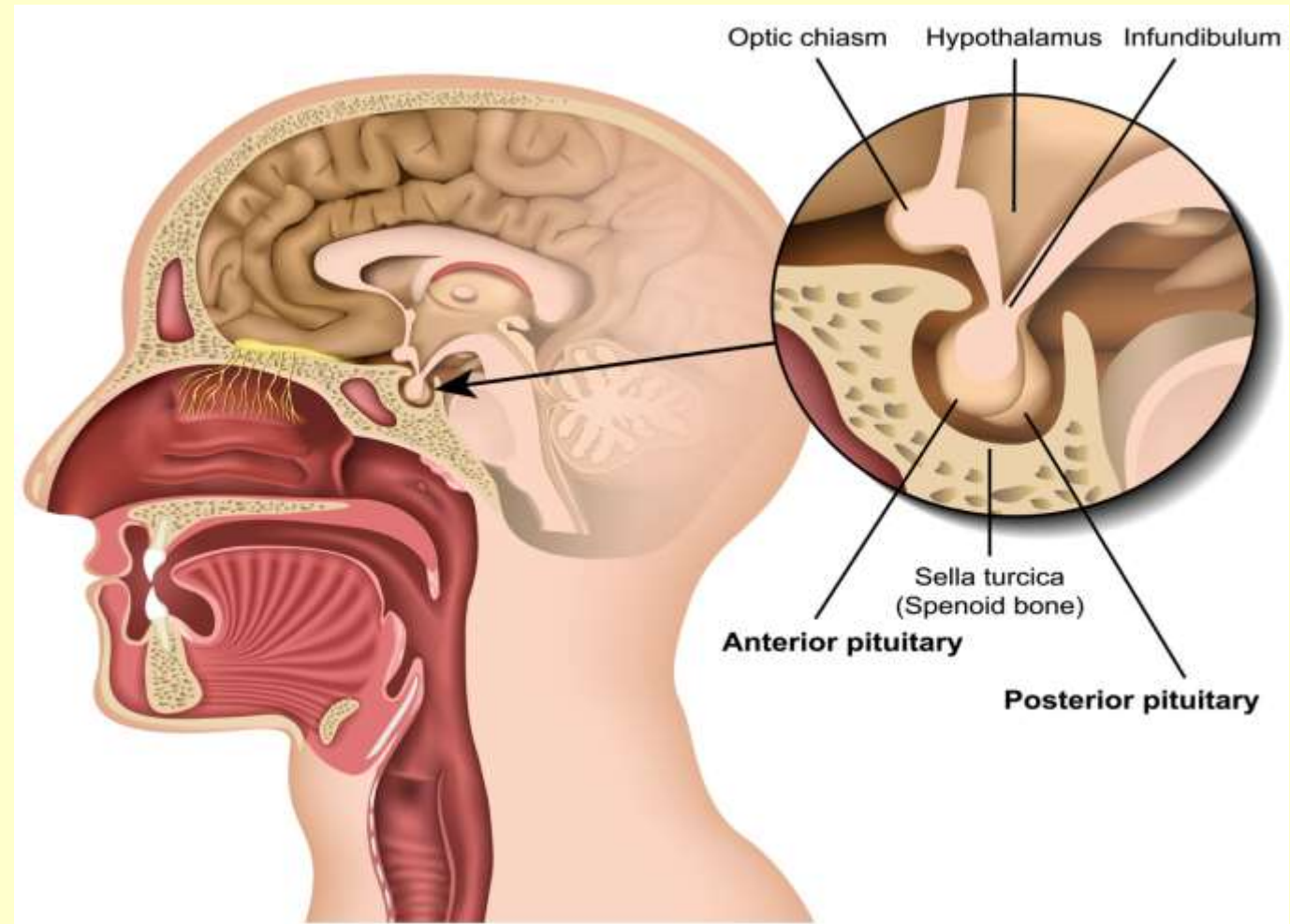
Figure 12-1b  
Kuby IMMUNOLOGY, Sixth Edition  
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# Function of endocrine gland

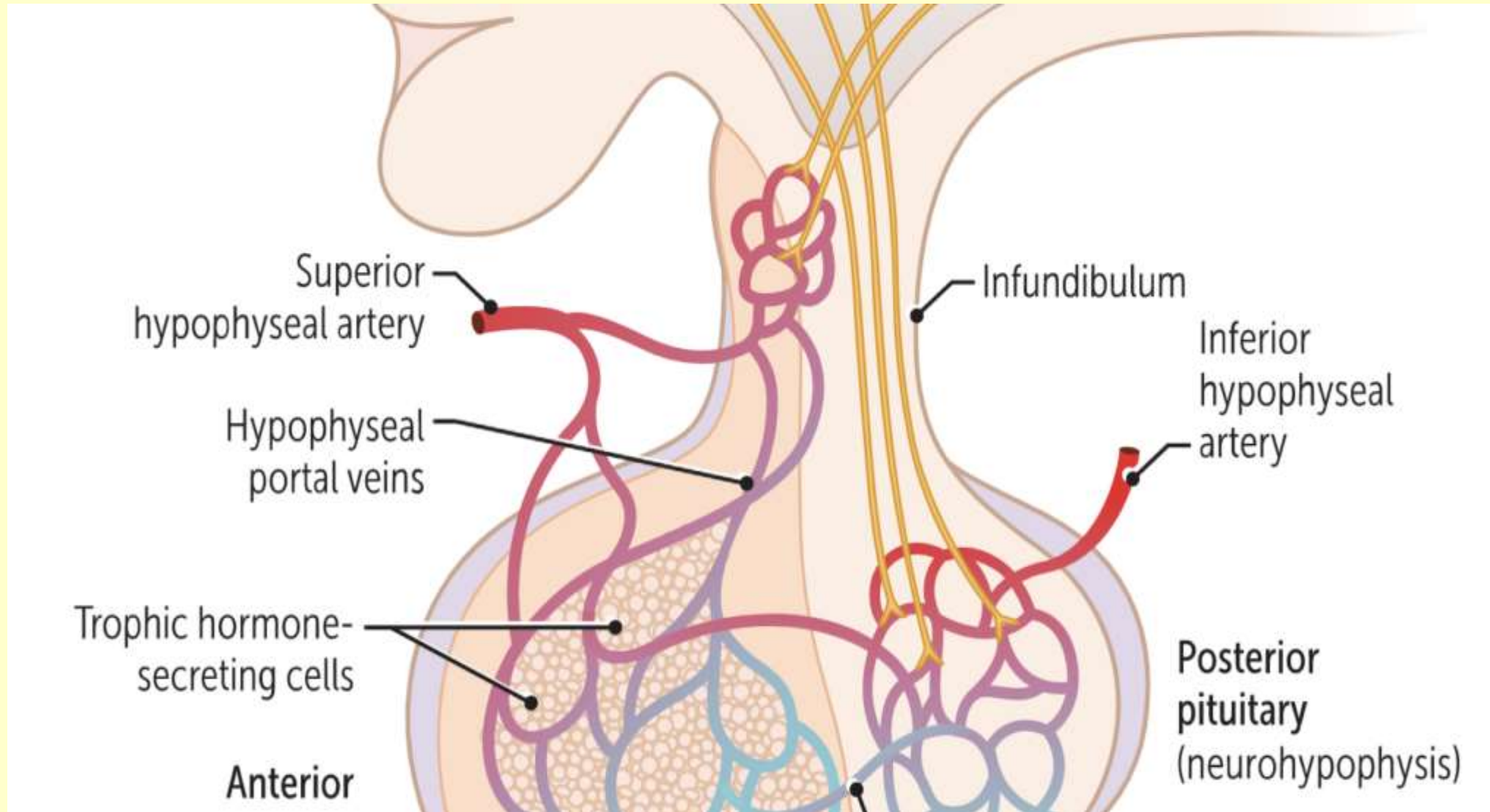
- Endocrine glands **release hormones into the bloodstream**. This lets the hormones travel to cells in other parts of the body. The endocrine hormones help control mood, growth and development, the way our organs work, metabolism , and reproduction.
- **What exactly are hormones?**
- Hormones are **your body's chemical messengers**. They travel in your bloodstream to tissues or organs to help them do their work. They work slowly, over time, and affect many different processes, including: Growth and development. Metabolism
- **Hormone made up of from Peptide/protein and Amino acids.**

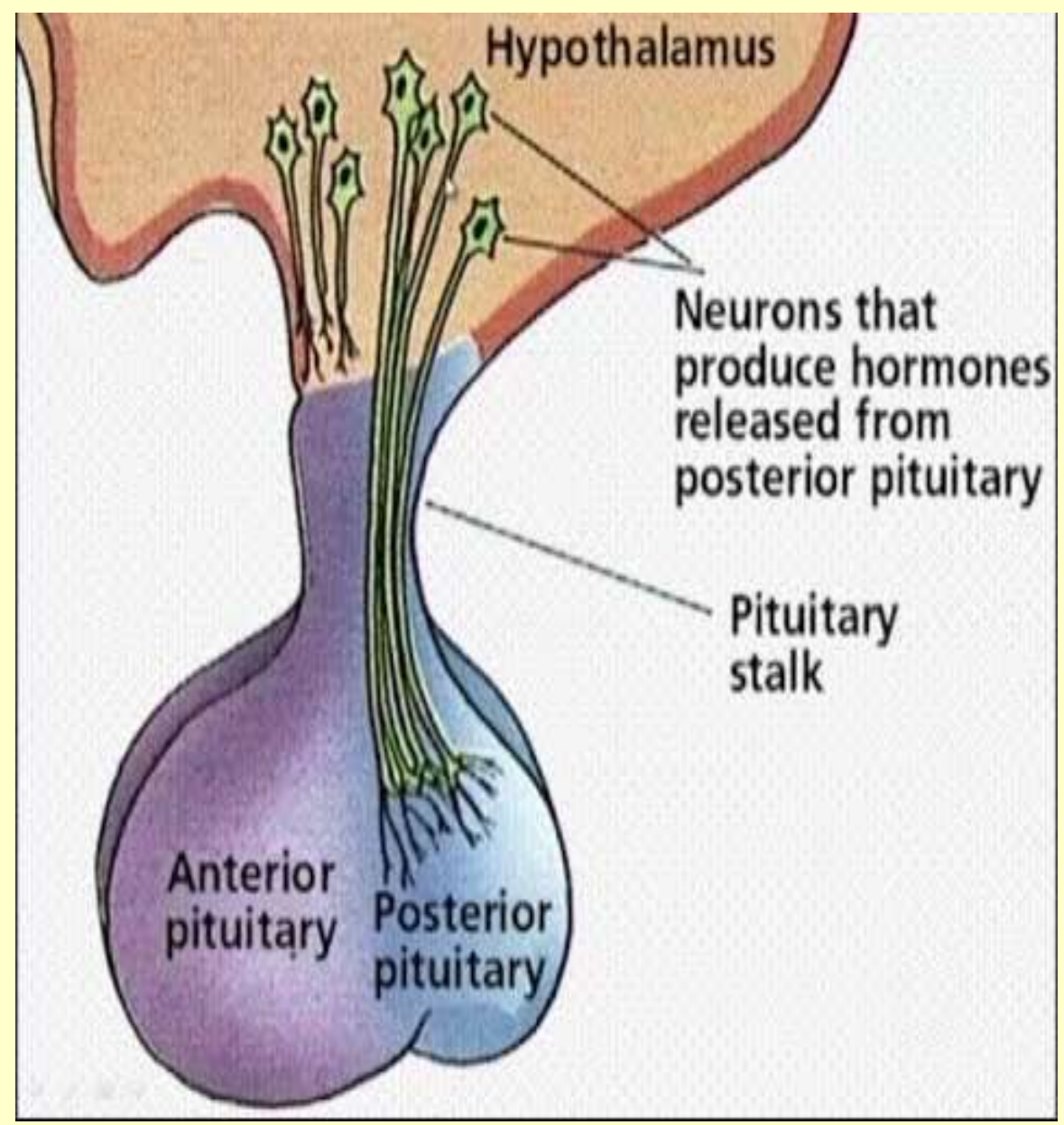
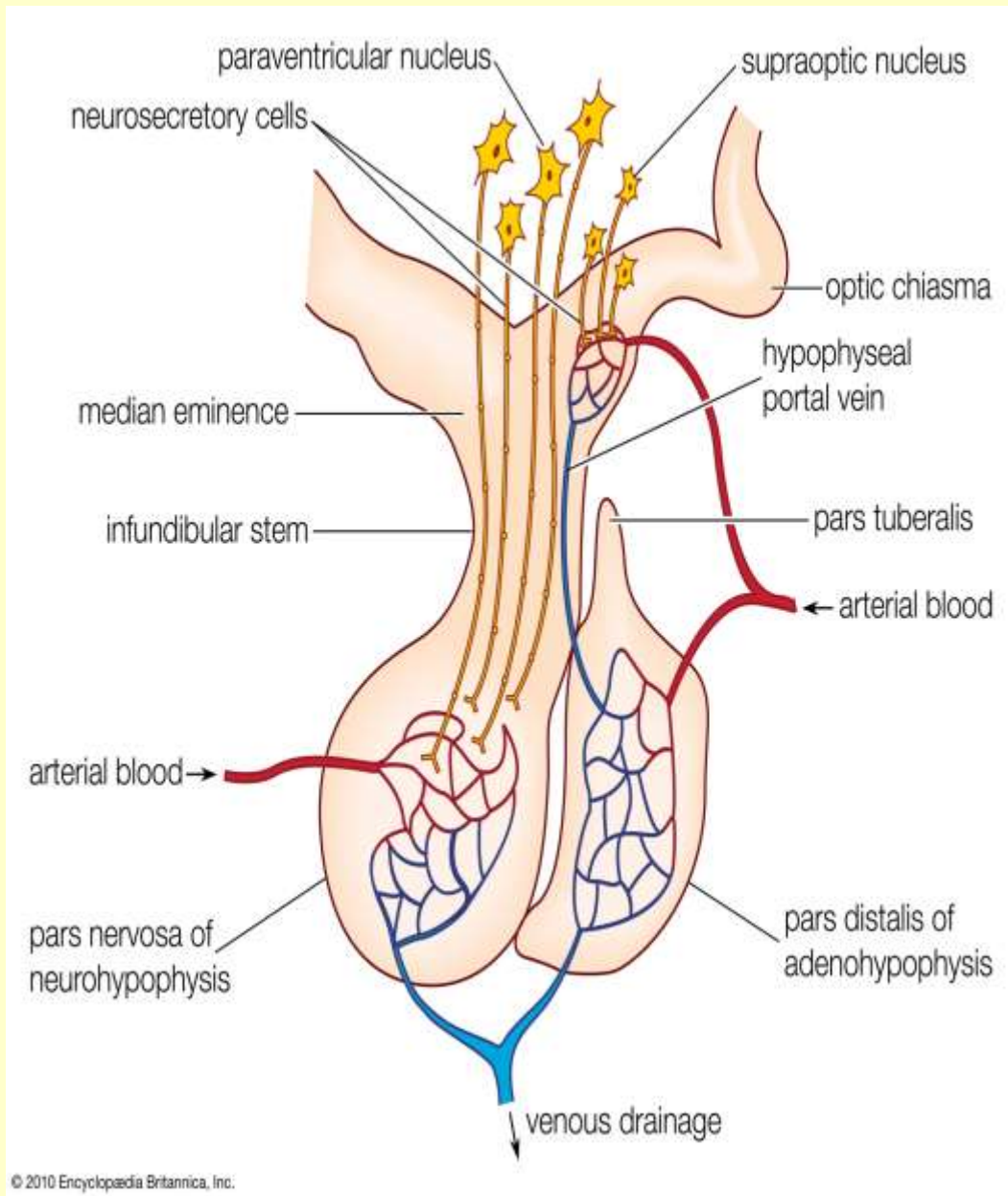
## Location Pituitary glands (Master glands)

- The pituitary gland is located **at the base of the brain**. The gland is attached to the hypothalamus (a part of the brain that affects the pituitary gland) by nerve fibers and blood vessels.
- The pituitary gland, in humans, is a pea-sized gland that sits in a protective bony enclosure called the sella turcica. It is composed of **two lobes: anterior and posterior**



# Structure of pituitary gland





## **Hypophysis/Pituitary glands/Master glands**

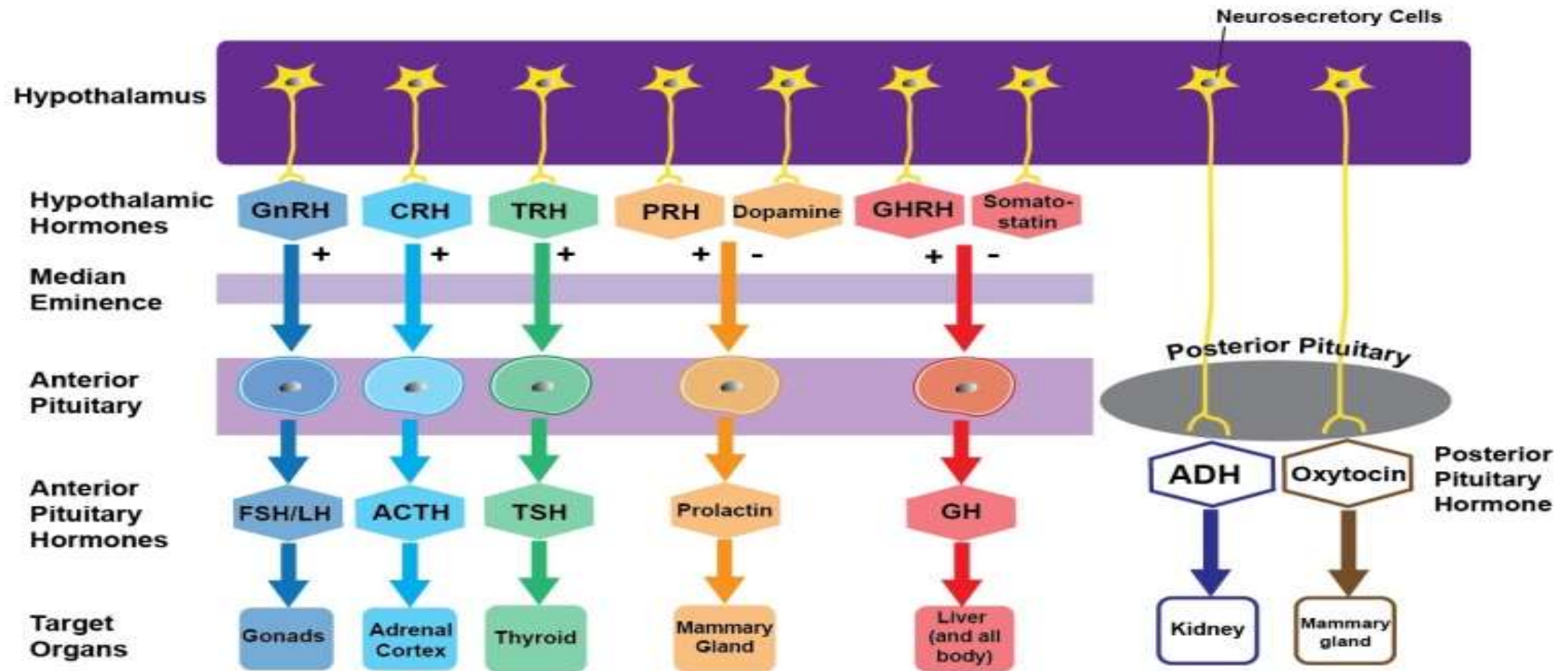
- pituitary gland is divided into three lobes: the anterior lobe, the intermediate lobe, and the posterior lobe (also called the neurohypophysis or pars nervosa).
- The anterior and posterior lobes of the pituitary are functionally, anatomically, and embryologically distinct.
- Whereas the anterior pituitary contains abundant hormone-secreting epithelial cells, the Posterior Pituitary is composed largely of unmyelinated (lacking a sheath of fatty insulation) secretory neurons.

## **The Anterior Pituitary/Adenohypophysis**

The anterior lobe of your pituitary gland is made up of several different types of cells that produce and release different types of hormones, including:

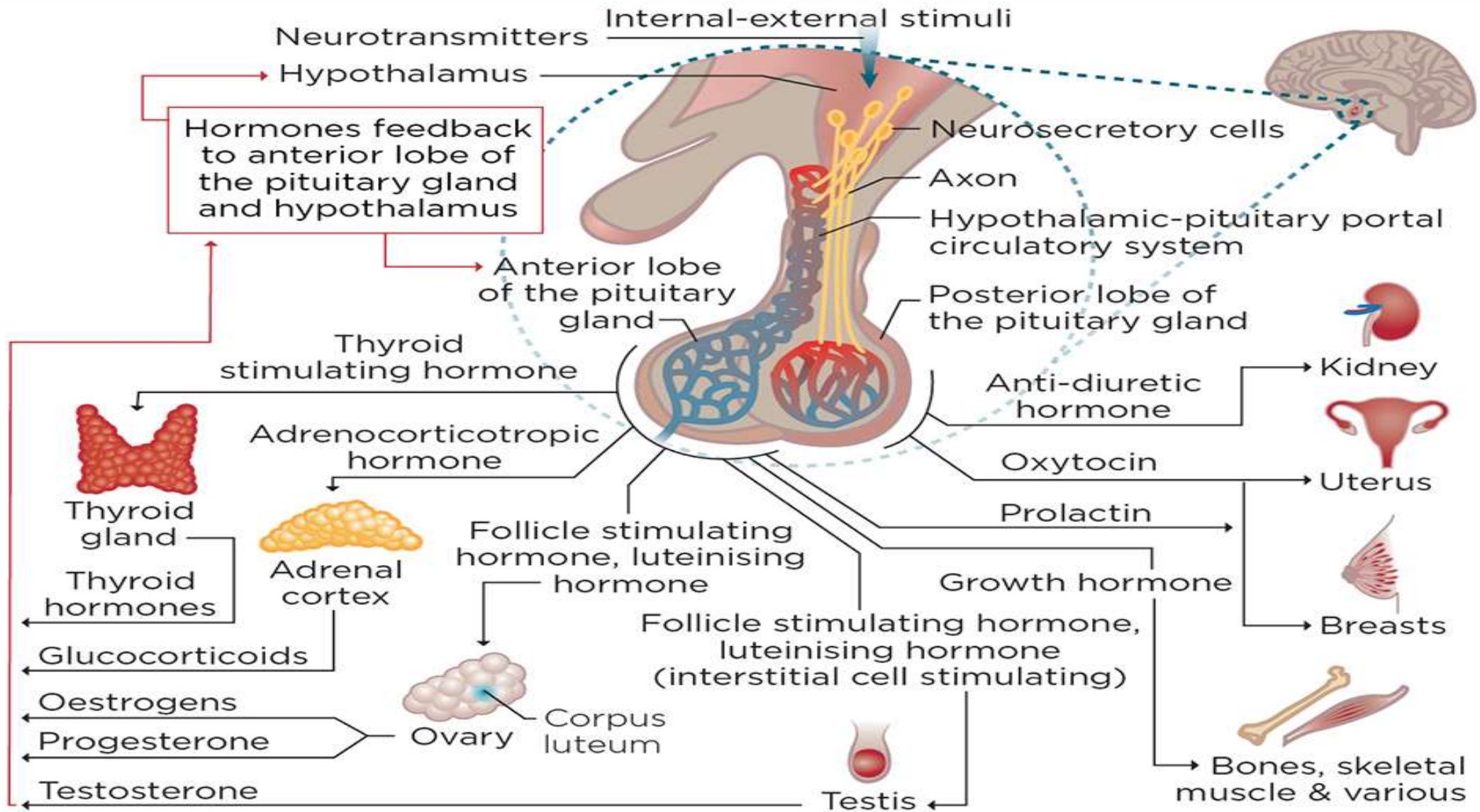
- 1. Prolactin**
- 2. Follicle Stimulating Hormone (FSH)**
- 3. Luteinizing Hormone (LH)**
- 4. Thyroid-Stimulating Hormone (TSH)**
- 5. Adrenocorticotropic Hormone (ACTH)**
- 6. Growth Hormone (GH)**





**Hypothalamic & Pituitary Hormones and Their Target Organs**

Fig 3. **Hormones of the posterior and anterior pituitary**



# **Prolactin hormone**

## **Function of hormone**

- **Two Primary Responsibilities Are Milk Production And The Development Of Mammary Glands Within Breast Tissues.**

## **Hormonal Disorder**

- **Too much prolactin in the blood causes hyperprolactinemia, a condition that can lead to menstrual disturbances, estrogen deficiency and testosterone deficiency.**
- **High prolactin levels also can cause unwanted lactation. This often occurs during pregnancy or when the thyroid is not functioning properly.**
- **Infertility (the inability to get pregnant)**

# **Follicle Stimulating Hormone (FSH)**

## **Function of hormone**

- **FSH plays an important role in sexual development and functioning. In women, FSH helps control the menstrual cycle and stimulates the growth of eggs in the ovaries.**
- **Follicle stimulating hormone is one of the hormones essential to pubertal development and the function of women's ovaries and men's testes.**

## **Hormonal Disorder**

- **Too much or too little FSH can cause a variety of problems, including infertility (the inability to get pregnant), menstrual difficulties in women and early or delayed puberty in children.**
- **primary ovarian failure or testicular failure. This is seen in conditions such as Klinefelter's Syndrome in men and Turner's Syndrome in women.**

# Luteinizing Hormone (LH)

- **Function of hormone**

**This hormone is considered a gonadotrophic hormone because of its role in controlling the function of ovaries in females and testes in males, which are known as the gonads.**

**In women, the hormone stimulates the ovaries to produce Oestrogen. Two weeks into a woman's cycle, a surge in luteinizing hormone causes the ovaries to release an egg during ovulation. If fertilization occurs, luteinizing hormone will stimulate the corpus luteum, which produces progesterone to sustain the pregnancy.**

**For men, luteinizing hormone stimulates the production of testosterone from Leydig cells in the testes. Testosterone, in turn, stimulates sperm production and helps accentuate male characteristics — like a deep voice or growth of facial hair.**

- **Hormonal Disorder**

**Low levels of luteinizing hormone can also cause infertility.**

**People who have high levels of luteinizing hormone may experience infertility**

# Thyroid-Stimulating Hormone (TSH)

## Function of hormone

- T3 and T4 are both vital to the body's healthy function. These hormones control your metabolism, brain development, bone health, heart rate, digestion, and so much more.
- More specifically, T4 is responsible for your mood, metabolism, and core temperature,
- while T3 is responsible for metabolic function and bone development.

## Hormonal Disorder

1 **Hyperthyroidism** (too much thyroid hormone) symptoms may include

- Rapid heart rate , Anxiety , Shaky hands , Weight loss
- Hair loss , Bulging eyes , Sleeping issues

2 **Hypothyroidism** (too little thyroid hormone) symptoms may include:

- Fatigue and sluggishness , Weight gain , Digestive issues, including constipation
- Hair loss , Dry skin , Slow heart rate

# Adrenocorticotrophic Hormone (ACTH)

## Function of hormone

- **Mineralocorticoids:** the most important of which is aldosterone. This hormone helps to maintain the body's salt and water levels which, in turn, regulates blood pressure.
- **Glucocorticoids:** predominantly cortisol. This hormone is involved in the response to illness and also helps to regulate body metabolism. Cortisol stimulates glucose production helping the body to free up the necessary ingredients from storage (fat and muscle) to make glucose.

## Hormonal Disorder

- **Cushing's syndrome is a hormonal disorder. The cause is long-term exposure to too much cortisol, a hormone that your adrenal gland makes. It may be caused by a tumor in the pituitary gland or the use of steroid medicines.**

**Cushing's syndrome is rare. Some symptoms are:**

- **Upper body obesity**
- **Thin arms and legs**
- **Severe fatigue and muscle weakness**
- **High blood pressure**
- **High blood sugar**

# Growth Hormone (GH)

## Function of hormone

- Growth hormone (GH), also called somatotropin or human growth hormone.
- GH helps children grow taller (also called linear growth), increases muscle mass, and decreases body fat. In both children and adults, GH also helps control the body's metabolism.

## Hormonal Disorder

- **Growth hormone deficiency (GHD)**, also known as dwarfism or pituitary dwarfism, is a condition caused by insufficient amounts of growth hormone in the body. Children with GHD have abnormally short stature with normal body proportions.
- **Acromegaly is a hormonal disorder** that develops when your pituitary gland produces too much growth hormone during adulthood.
- When you have too much growth hormone, your bones increase in size. In childhood, this leads to increased height and is called **gigantism**.



## **References:**

- 1. T.B. of Physiology-Guyton & Hall**
- 2. T.B. of Physiology- G.N. Vankhede**
- 3. References from Google**

**Thank You!**