

Endocrine System: Glands and Hormones

by Sophia Tutorial



WHAT'S COVERED

The nervous system provides one major way for the body to communicate. The brain processes information that's taken from the rest of the body and sends out responses through the nerves to be carried out, providing quick, consistent sorts of responses that can be stored for later use in things like memory.

It is important to realize that the nervous system is not the only way that the body communicates. This tutorial will cover the endocrine system, specifically focusing on:

1. Hormones
2. Pituitary Gland
3. Pineal Gland
4. Thyroid Gland

1. Hormones

There is another system in the human body called the endocrine system. The endocrine system is a system which uses chemicals secreted by glands that travel throughout the body and cause certain kinds of reactions.

These chemical communicators are called **hormones**. Hormones are chemicals that are secreted by glands that affect different kinds of bodily functions and behaviors.

They're carried throughout the body by the bloodstream and the lymph system, and they can trigger different kinds of events. Conversely, they can be triggered by different kinds of events, meaning the environment might create some arousal within the body.

↪ **EXAMPLE** When you're scared by an external event, you get a surge of adrenaline. This is a hormone response created by the endocrine system.

There are also regular growth and life events which regulate the hormones that are being used in the body to send messages to the rest of the cells and the different parts.

↪ **EXAMPLE** In adolescence, there are a lot of hormones that are being sent to encourage growth in the

body, especially secondary sexual characteristic growth.

These are all aspects of hormones and the communication involved with the endocrine system.



TERM TO KNOW

Hormone

A chemical secreted by a gland that affects internal and external activities

2. Pituitary Gland

Some of the most important glands in the endocrine system are located in the head and neck area. The **pituitary gland** is an endocrine gland located towards the front, in the middle of the brain. This is what is known as the "master gland," meaning that it controls the other glands within the body.

It sends out signals telling them when they should and should not release hormones for various kinds of functions. In this way, the pituitary gland is the brain of the endocrine system.

However, it's important to note that the pituitary gland is actually being regulated largely by the hypothalamus, which is the organ that's just above it. This provides a kind of link between these two communication systems, the nervous system and the endocrine system. The hypothalamus helps to tell the pituitary gland when it should send out those controlling hormones.

The pituitary gland also has an important function in secreting **growth hormones**, which regulate the body's development over time. At certain periods of a person's life, more growth hormones are being sent out. Too much or too little of these growth hormones can lead to different conditions, like dwarfism or gigantism.



TERMS TO KNOW

Pituitary Gland

The "master gland" of the endocrine system; secretes hormones that affect other glands

Growth Hormone

A hormone secreted during childhood from the pituitary gland, that affects the physical growth of a person; too little can result in dwarfism while too much can result in gigantism

3. Pineal Gland

The pineal gland is another endocrine gland located in the brain; this one is located a bit more towards the center and middle of the brain. The pineal gland helps to regulate the body's rhythms and cycles.

The pineal gland secretes a hormone called melatonin. The pineal gland is photosensitive, meaning it is sensitive to the amount of light within our environment. It will secrete more melatonin when it is dark, and less when it is light. In other words, light dictates melatonin production, which in turn affects our level of sleepiness or wakefulness. This is why we often feel sluggish on a cloudy day.



DID YOU KNOW

Originally, a lot of people thought that the pineal gland was useless and were convinced it was something left over from a previous time in human development, like the appendix.

4. Thyroid Gland

The **thyroid glands** are located within the neck. They control the rate of metabolism within the body. In other words, they tell the body how quickly it should make and use different sorts of energy.

You may have heard of different disorders that have to do with the thyroid gland, such as hyperthyroidism, which occurs when the thyroid produces too many hormones. This can lead to feelings of fatigue, because the body is tired from using so much energy, as well as increased sweating and appetite, difficulty concentrating, nervousness or restlessness. You can see how this creates more energy in the body than a person can use.

The opposite of that is hypothyroidism, which is when there are too few hormones being produced. This can lead to feelings of depression, fatigue, weakness, as well as weight gain. Needless to say, the thyroid gland has a powerful affect on a person's personality and mood. A person with hyperthyroidism might be a very excitable or irritable kind of person.



TERM TO KNOW

Thyroid Gland

Gland located in the neck which is responsible for the regulation of metabolism



SUMMARY

The endocrine system is a system which uses chemicals, called **hormones**, secreted by glands, that affect different kinds of bodily functions and behaviors. The **pituitary gland**, known as the "master gland," controls the other glands within the body with the assistance of the hypothalamus. The pituitary gland also has an important function in secreting growth hormones which regulate the body's development. The **pineal gland** secretes a hormone called melatonin. The pineal gland is photosensitive, or sensitive to the amount of light within the environment. Lastly, the **thyroid gland** controls metabolism.

Good luck!

Source: This work is adapted from Sophia author Erick Taggart.



TERMS TO KNOW

Growth Hormone

A hormone secreted during childhood, from the pituitary gland, that affects the physical growth of a person; too little can result in dwarfism while too much can result in gigantism.

Hormone

A chemical secreted by a gland that affects internal and external activities.

Pituitary Gland

The "master gland" of the endocrine system; secretes hormones that affect other glands.

Thyroid Gland

Gland located in the neck which is responsible for the regulation of metabolism.