

Welcome to this lesson on the adrenal glands.

Today we will be discussing the structure and function of the adrenal glands, and the role they play in the endocrine system.

The adrenal glands, if we look on our diagram right here, are located just above the kidneys. We have two kidneys, and therefore, two adrenal glands.

Adrenal glands are located above the kidney. Adrenal glands produce hormones that help regulate various things, such as glucose levels of the blood, blood pressure, and blood circulation. These glands play a role in regulating these factors here.

If we look at a cross section of an adrenal gland here, we're going to identify the structure a little bit more. The adrenal cortex is the outer part of the adrenal gland. This part here would be the adrenal cortex, or the outer part. And the adrenal medulla is the inner part. So it's important to understand this structure of adrenal glands, because each of these parts of the adrenal glands plays different functions.

The adrenal cortex, as I mentioned, is the outer part of the adrenal gland. The adrenal cortex secretes glucocorticoids and mineralocorticoids. These are two classes of hormones that are secreted by the adrenal cortex.

Glucocorticoids help to increase blood glucose levels, and they also play a role in decreasing inflammation of tissues. An example of glucocorticoids is cortisol. Cortisol is an example of a glucocorticoid. Cortisol is the main glucocorticoid of the body, and it helps to increase glucose levels if glucose levels drop too low.

Hypoglycemia is a condition in which a person has chronic low blood sugar. This happens because too little cortisol is produced. So cortisol is important in regulating blood sugar so a person doesn't develop hypoglycemia. And as I mentioned, it also plays a role with inflammation. So cortisol also plays a role in inflammation.

Cortizone is an over the counter drug that you can buy at any drugstore, and it's a cortisol-like drug for information. And then this also stimulates the liver to synthesize glucose, which is a process called gluconeogenesis. So it plays a role in inflammation, and in controlling glucose levels of the blood.

Mineralocorticoids are the other class that are produced by the adrenal cortex. Mineralocorticoids help to adjust the concentration of mineral salts, like potassium or sodium, in your extra cellular fluids. An example of a mineralocorticoid is aldosterone. This hormone acts on the nephrons of the kidneys. And what it does is, it

stimulates sodium reabsorption, and therefore, as a result, water reabsorption. It's triggered by a decrease in blood pressure or blood volume, or a decrease in sodium levels of the blood. So it helps the water to reabsorb more sodium, therefore reabsorbing more water to increase the blood pressure and blood volume, and so on.

The adrenal medulla is the inner part of the adrenal gland. The adrenal medulla produces and secretes epinephrine and norepinephrine. Normally epinephrine and norepinephrine act like neurotransmitters elsewhere in the body, and help relay signals. However, when they're released by the adrenal medulla, they help to regulate blood circulation. So what epinephrine and norepinephrine will do is, they help to increase heart rate. They help to dilate arterials, and sometimes also help to constrict arterials, and they help to dilate bronchials. What this does is it allows oxygen to flow to cells that demand more energy when the body is stressed or excited. They're often called stress hormones, because they play a big role when the body is stressed or excited, in the flight or fight response. So the adrenal medulla produces epinephrine and norepinephrine, and also secretes them. Again, those are secreted by the adrenal medulla, which is inside the adrenal gland.

This lesson has been an overview on the structure, function, and role of the adrenal glands in the endocrine system.