

Welcome to this lesson on steroids and non-steroid hormones. In this lesson today, we are going to be discussing the characteristics of both steroid and non-steroid hormones. So, these are the two major groups of hormones: steroid versus non-steroid. So, the difference between these two we're going to get into a little bit more depth a little bit later in this lesson. But the chemical structure between the two and the way that these hormones affect cells is a little bit different.

But first of all, we're going to start talking about specifically just what a hormone is. So, hormones are substances that interact with target cells to signal the cell's activity to change. So, these are chemicals made within the body that will interact with specific types of cells, signaling that cell's activity to change in some way, depending on what the hormone is and what the cell type is. So, cell receptors are specific to the hormones they interact with. So, certain types of hormones can only affect certain types of cells. So, what this means is that not every hormone affects every type of cell. Cells have certainly receptors that will only interact with certain types of hormones.

So, we're going to be filling out this little chart right here, so that you can see the differences between steroid and non-steroid hormones. So, we're going to start out by talking about steroid hormones. So, steroid hormones are one of the two classes of hormones. And these type of hormones are lipids that are made from cholesterol. So, steroid hormones are lipids that are made from cholesterol and they're produced in the adrenal glands and reproductive glands. So, an example of a steroid hormone, then, would be estrogen and testosterone.

Now estrogen and testosterone are examples of steroid hormones because they're produced the reproductive glands and they're lipid-based, made from cholesterol. So, because steroid hormones are lipids made from cholesterol, they're lipid soluble. So, what this means is that they can move through the plasma membrane easily. And because they're allowed to move through the plasma membrane, they will then move through the cell and bind with receptors that are on the nucleus of that cell.

So, in this way, they can interact with the cell's DNA. So they'll bind to these receptors that are on the nucleus and this will allow them to affect the behavior of the DNA. So they can turn genes and DNA on or off, which controls protein-making mechanisms and can affect the target cell's function. So, steroid hormones interact with cell's DNA by binding to receptors on the nucleus. So, again, they're allowed to travel past the plasma membrane because of their structure and they'll bind to receptors on the nucleus. And then, in that way, that is how they will then affect the target cell.

Non-steroid hormones are our other class of hormones. So, non-steroid hormones are a little bit different in their structure and how they interact with their target cells. So, non-steroid hormones are derived from proteins. So, because they are derived from proteins, they are water soluble and therefore they cannot enter the cell. They

cannot pass through the cell's plasma membrane because they're water soluble. So, what's going to happen, in this case, with non-steroid hormones, is that they're going to bind to receptors in the target cell's plasma membrane.

OK. So, when we talked about steroid hormones, we talked about how they're going to bind to receptors on the nucleus. Non-steroid hormones are going to bind to receptors in the target cell's plasma membrane. Because again, they're not able to pass through the plasma membrane. So, then what has to happen is something called a second messenger.

Something called a second messenger will then relay the information to the interior of the cell. So, non-steroid hormones will bind with these receptors on the plasma membrane and then a second messenger will deliver the information to the inside the cell, where the cell's function can then be altered because of the steroid. So that's the main difference between steroid and non-steroid hormones and how they interact with the target cells which they bind with. So, this lesson has been an overview on steroid and non-steroid hormones.