How super molecules can change cancer treatment as we know it today

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Since the dawn of modern medicine, the fight against cancer has always been a current issue and the treatments are always evolving. Over the last couple of decades new forms of cancer treatment have been developed, where the usage of specific molecules tablets have the ability to cure cancer. And it's one of the body's own mechanism, the receptor tyrosine kinase that is the target of these molecules.

The fight against cancer

Cancer is a subject that never goes out of time and the chase after better methods to treat and cure cancer are always up for discussion. One of the more recent strategies is to use the body's own mechanism to stop cancer. This means that we can spare the surrounding tissue form the harm that chemotherapy usually causes. This is achieved by drugs in the form of specific molecules that bind to a particular place in the body and stop the abnormal growth.

Receptor tyrosine kinase

Receptor tyrosine kinase, abbreviated to RTK, consists of two individual units that are sitting close to each other on the cell membrane. It's a big family of proteins in the body that are attached to the surface of cells. The main purpose of RTK is to transmit signals from outside of the cell into the cell. The transmitted signal tells the cell to make new cells, in other words cell growth. The signals can only get transmitted if the RTK is active, which happens when the two separate units bind together by the usage of another molecule, called a ligand.

A small molecule makes a lot of difference

The receptor tyrosine kinase is responsible for a lot of things that happen in the body including signaling for cell growth. If these receptors get modified through mutation or amplification, it may change them so they are always active and release the unregulated growth signals into the cell. This tells the cell to continue making new cells, so if the signal never stops it will then lead to tumors and we get cancer. In this method of cancer treatment, the molecules have the ability to bind to the receptor and block the signal and therefore inhibit the dangerous cell growth.

What the future holds

But before this methods works perfectly it needs to overcome some difficulties, one of these problems is resistance. The resistance may occur when the receptor changes for a second time, which prevents the drugs to bind. So the scientists and doctors are finding new molecules that does not give cause resistance, but also show more of effectivity and less toxicity to the surrounding tissue.

More information

If you are interested to know more about this subject, you can read the following article Börjeson H. 2016. Hur tyrosikinasinhibitorer används i dagens cancerterapi for more information.