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Editorial

A "Trojan Horse" Against Metastatic Cancer

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The fight against cancer has advanced exponentially in recent years. This has allowed the development of safer, less invasive and more effective treatments against those types that were more resistant to existing therapies.

Dr. Jung-Mo Ahn of the University of Dallas has synthesized a molecule that appears capable of killing a broad spectrum of hard-to-treat cancers, including triple-negative breast cancer.

Until now, it has only been put into practice in isolated cells, cancer tissue samples and humanized animal models (human cancers implanted in mice). The study documenting this finding has been published in full in the specialized journal Nature Cancer.

The mechanism of action of this molecule marks a step forward in Ahn's work in designing small synthetic molecules that are involved in protein-protein interactions within cells. This same approach had already served him to synthesize some others that are therapeutic candidates against treatment-resistant breast cancer and prostate cancer.

Effective in ER negative breast tumors

In essence, genes are instructions for assembling certain proteins. Thus, the ERX-41 molecule binds to a cellular protein called lysosomal acid lipase, encoded in the LIPA gene. This is located in a cellular structure called the endoplasmic reticulum, an organelle (a part of a differentiated cell with a specific function) that is responsible for processing and folding proteins.

Although this protein is present in healthy cells, it is even more so in cancer cells. This is because they need to produce a large number of proteins in order to maintain their abnormal cell cycle, since cancer is a group of cells that reproduce uncontrollably due to genetic damage.

Due to this, ERX-41 prevents the processing of proteins in the endoplasmic reticulum, which becomes saturated and causes the death of the cancer cell. In this way, the molecule manages to overcome an obstacle in the treatment of certain breast cancers that were especially resistant: negative ERs (such as triple negative).

The resistance of this type of cancer is due to the fact that they lack estrogen receptors, and this is the protein that is normally used as the main target in treatments against breast cancer.

The animals used as models for the study (mice) did not suffer perceptible adverse effects after receiving the treatment, so the results of the trial have been very positive. According to the author, the most curious thing is that what took the most time was to find out how the molecule was working, not its development.

Once this is discovered, the researcher is confident that ERX-41 will have similar effects on other types of cancer that have high stress on the endoplasmic reticulum. This would include certain cancers resistant to treatment in the pancreas and ovaries or glioblastoma, the most aggressive and lethal primary brain cancer.

Although the results are very positive and Jung-Mo Ahn is optimistic about the development of the research, we must not forget that this has only been carried out on tissue samples and tissue models at the moment, and not No clinical trials have been carried out yet.

Both Ahn and the company EtiraRX (founded by himself) are now waiting for the molecule to be patented and hope to start clinical trials in the first half of 2023. Therefore, although it already represents a great advance in the fight against cancer, we still have to be patient until we see this drug become a clinical reality.