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LETTER TO THE EDITOR

# Main reasons that cancer is too difficult to treat

## Principales razones por las cuales el cáncer es tan difícil de tratar

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**Mr. Editor:**

Cancer is one of the largest global causes of death worldwide. In 2018 alone, around one in six deaths will be caused by cancer; 9,6 million people worldwide have been afflicted by cancer. While cancer has been detected since the 18th century, for this deadly disease we still do not have a standardized cure. The current approach to battling cancer care is on-going, pending major progress. The purpose of this study is to figure out why it is so difficult to treat cancer.[(1)]

Treating cancer isn't easy because it ultimately involves fighting your own body. Under the influence of the environment, genetics and unhealthy lifestyle, some cells break out of control. These cells start growing and quickly multiply while carrying a genetic mutation that allows them to divide uncontrollably. Eventually, they become tumors and start invading different tissues and organs. Cancer cells turn into hidden enemies within us. Newly formed cancer cells create an entire microenvironment around themselves. Cancer cells stimulate the formation of neovessels, which proliferate rapidly in most types of cancer. These vessels are then used to feed cancer cells and help them grow. This process of blood vessel formation is called angiogenesis. The new blood vessels support cancer cells by providing them with oxygen and nutrients.[(1)]

Another dangerous property of cancer cells is their ability to escape from the immune system. They do so by targeting T-cells that are tasked with killing infected and cancerous cells. Cancer cells target T-cells and deactivate them; this allows them to become hidden from the immune response. Cancer, on the other hand, can mimic healthy cells and remain unrecognized by the immune system. This suggests that scientists need to find new ways of attacking cancer cells without harming healthy cells, as they are both increasingly surprisingly similar.[(2)]

Another challenge comes from cancer cells developing drug resistance over time. Cancer cells can adapt to drugs and learn to block their activity or eject them out of the cell. Most drugs need to undergo some changes within the cell to be activated. These drugs utilize chemical pathways that happen inside the cell. These receptors, though, can be shut down by cancer cells. And worst they will grow to modify the molecular properties attacked by these drugs. As a result, cancer therapies must continuously adapt to recognize new targets to resist the defense structures of the tumour.[(3)]

Another reason why dealing with cancer is hard, that tumors come in so many different types. Sometimes cancer cells within the same tumors are also different from each other. There are 4 stages of cancer progression; stage four is most aggressive where tumors become incredibly hard to treat. During this stage of cancer, cells migrate from the original site to other parts of the body. This process is called metastasis because cancer cells are good at hiding from the immune system. Via the lymphatic system they charge their cellular structure and flee. They eventually colonize new tissues within the body. It

becomes impossible to determine where they will end up after cancer cells have passed. That makes early cancer detection a daunting task.[4]

When cancer cells spread to new parts of the body, they form new tumors that have different properties from the site where they originated. The original and the second tumors can be very different from each other even on a genetic level. These massive variations between different types of tumors make it difficult to create a universal cancer drug instead. Each type of cancer requires different treatment approaches. That is why diagnosing cancer early and preventing its movement can substantially improve the treatment. These factors make cancer a complicated malady to treat.

Additionally, in a given area, all available medications are unable to kill any cancer cell. It is beneficial to improve selective therapeutics, but it is unlikely to be widely available due to some main biological variations in the development of cancer cells.[5]

Researchers are also training our immune cells to seek out and destroy tumors with more efficiency. Not to mention newly developed diagnostic tests that allow detecting multiple types of cancers up to 4 years in advance. All these innovations will eventually help us improve our chances of survival from cancer. Despite its convoluted nature, cancer will eventually be defeated. It's just a matter of time, knowledge, and technological innovation. The Food and Drug Administration (FDA) approved the immunotherapy drug pembrolizumab (Keytruda) for the treatment of solid tumors such as lung, kidney, stomach, liver, intestine, skin cancer, and some kinds of lymphoma.[6]

Despite significant advances, the current approach to combating cancer treatment remains on-going. Nevertheless, cancer research is constantly developing, it is finding new ways to distinguish between healthy and cancerous cells and target them selectively while also avoiding devastating side effects.

## CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

## AUTHORSHIP CONTRIBUTION

The author participated in the conceptualization, writing of the initial draft, review and editing of the final version.

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