

3 Effective Cancer Immunotherapies

You've probably heard that a lot of money goes into cancer research but haven't heard enough about its impacts. Through a series of coincidences at work, I found myself reading quite a bit about cancer immunotherapy - using the human immune system to better fight cancer. I was astonished by how many effective cancer therapeutics are coming out of this field and thought I'd quickly describe how a few of them work here.

**A Couple of Quick Notes* - We need new cancer therapeutics because standard cancer treatments (things like surgery to remove tumors, radiation therapy, and chemotherapy) can damage our bodies in terrible ways and are often ineffective. Also, even though the therapies below have been successful in some cases, every cancer is different, and they won't be successful for all types of cancers or even all patients with a particular type of cancer.*

3 Types of Successful Cancer Immunotherapy

1. Adoptive Cell Therapy

There are many different types of cells in the immune system. These play a variety of roles in fighting disease causing agents (pathogens) like viruses, bacteria, and cancer cells (yes, our bodies naturally fight cancer). In adoptive cell therapies, scientists take immune cells out of our bodies, make the cells better at fighting cancer, propagate them, and then put them back into our bodies.



Before the immune system can begin fighting a pathogen effectively, the cells that do the fighting need to be told a pathogen is present and what it looks like. Dendritic cells do this by showing components of the pathogen to other cells in the immune system. In one form of adoptive cell therapy, doctors take dendritic cells from a patient, load them with cancer cell components, and put them back in the patient's body where they can alert the rest of the immune system to the presence of the cancer.

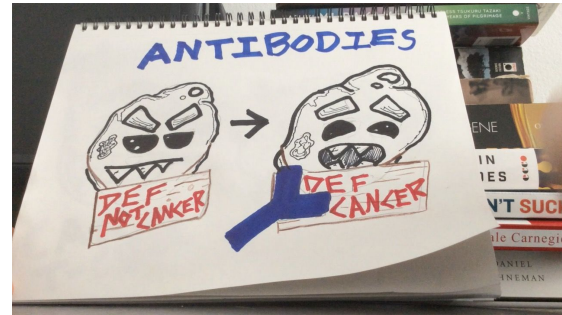
For more information, read up on [Sipuleucel-T](https://en.wikipedia.org/wiki/Sipuleucel-T) (<https://en.wikipedia.org/wiki/Sipuleucel-T>), an FDA approved adoptive cell therapy for prostate cancer.

2. Antibody Therapy

You may have heard of antibodies. These are proteins that our immune systems naturally produce. Antibodies bind to pathogens and prevent them from causing disease. Through years

of research, scientists have learned ways to produce antibodies that bind to cancer cells and slow cancer progression.

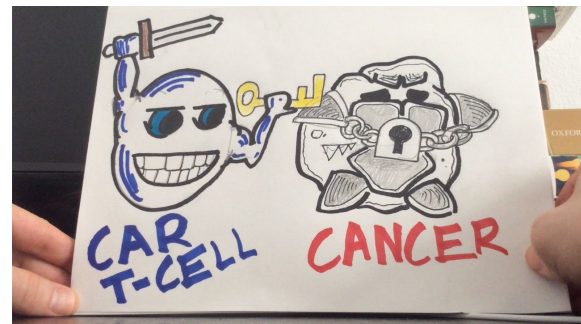
For example, some cancer cells produce a signal that tells the immune system to slow down and stop attacking them. Scientists have produced antibodies that bind to and block this signal. These antibodies have been proven effective at boosting the immune system and fighting a wide variety of cancer types.



For more information, read up on [PDL1 inhibitors](https://en.wikipedia.org/wiki/PD-L1_inhibitor) (https://en.wikipedia.org/wiki/PD-L1_inhibitor) and watch this [great video from Dana Farber](#).

3. CAR T-Cells

CAR T-cell therapy combines aspects of adoptive cell and antibody therapy. T-cells normally bind to and kill cancer cells, but can only do so if they have the appropriate binding proteins. In CAR T-cell therapy, doctors take T-cells from a patient and give them new proteins called chimeric antigen receptors (CARs) that are very similar to antibodies. CARs allow the T-cells to bind to cancer cells. Once put back into the patient, these CAR T-cells can be effective at binding to and fighting the cancer.



CAR T-cells are effective at fighting a few types of cancer and have completely cured some patients who were [otherwise out of hope](https://www.cancer.gov/about-cancer/treatment/research/car-t-cells#option) (<https://www.cancer.gov/about-cancer/treatment/research/car-t-cells#option>).

Read Up on [CAR T-Cell Therapy](https://www.cancer.gov/about-cancer/treatment/research/car-t-cells) (<https://www.cancer.gov/about-cancer/treatment/research/car-t-cells>).