CAR-T therapy Bring Hopes to Patients with Hematological Cancer

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Abstract

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CAR-T therapy, the full name is Chimeric Antigen Receptor T Cell Immunotherapy. Like other immunotherapeutic technologies, CAR-T technology has undergone a long process of development. Since Professor ZeligEshhar of the United States first proposed the CAR concept in 1989, CAR-T technology has gone from the laboratory after 29 years of quenching. Clinically, it is considered by the industry to be one of the most promising methods of cancer treatment.

Studies have shown that there are protooncogenes in the chromosomes of every somatic cell in the human body. Unactivated proto-oncogenes are not only harmless to cells, but also play an important role in the process of cell growth, division and differentiation. The normal physiological function of the cells. However, under the stimulation of diseases, viruses, physics, and chemistry, once the proto-oncogene is activated, it can cause canceration of normal cells, that is, the formation of cancer cells. If cancer cells are not effectively controlled, tumors can form after constant abnormal proliferation.

But today, as the environment worsens, there are still a few people suffering from cancer. This is because the body's immune system has an immune surveillance function. When cancerous cells appear in the body, the immune system can recognize and specifically remove cancer cells in time, thereby resisting the occurrence and development of tumors. This is the human body's immune surveillance of tumors. process. However, cancerous cells can escape immune surveillance through a variety of mechanisms under certain special conditions, thereby rapidly dividing and proliferating in the body until a tumor is formed, a process called tumor immune escape.

Human immune surveillance process on tumor cells

Then, under what circumstances does cancer cells have immune escape? There are many reasons for this, but one of the common reasons is that T cells have fewer recognition and number of cancer cells. T cells are immune cells of the human body, which can specifically recognize and bind to tumor cells, thereby killing tumor cells through various mechanisms. That is, T cells are the performers of immune surveillance. When T cells are unable to specifically recognize cancer cells, cancer cells can escape from immunity and form tumors; or when cancer cells proliferate too fast and the number of T cells is insufficient to kill all cancer cells, cancer cells can still escape the human body. Immune surveillance to form a tumor.

In order to compensate for the defects in function and quantity of T cells, CAR-T therapy came into being. CAR-T therapy extracts T cells from the blood of the human body, and assembles a receptor (ie, CAR) that can accurately recognize cancer cells on the surface of the cell membrane, and rapidly expands in vitro by cell culture technology. It is a process of training a small team of "ordinary soldiers" into a "special forces" group army. In just one to two weeks, this well-trained "special forces" group army can have a strong killing effect on tumors, and return it to the human body through intravenous and other means, which can quickly and specifically kill tumors in blood vessels. cell. Therefore, the therapeutic effect of CAR-T cells on hematological tumors is excellent, because the main lesions of blood tumors such as leukemia, lymphoma and multiple myeloma are in the blood vessels, and CAR-T cells can be directly treated by intravenous reinfusion. Cancer cells contact, bind and kill.

Global CAR-T clinical trial statistics

In order to ensure the safety and effectiveness of CAR-T, CENTER FOR DRUG EVALUATION (CDE) issued the "Technical Guide for Research and Evaluation of Cellular Therapeutic Products" on December 22, 2017. Principles, on March 13, 2018, issued a special consideration for CAR-T "Cell treatment products for clinical trial pharmaceutical research and application materials." The China Medical Biotechnology Association also released a draft for the quality management of chimeric antigen receptor-modified T cells (CAR-T cell preparation preparations) this year.

It is believed that in the near future, CAR-T will be fully applied to the clinic and benefit the majority of patients with hematological cancer. It will also be an important milestone in the history of human and cancer resistance for thousands of years.

About Creative Biolabs

As a global company, Creative Biolabs have more than 200 talented and well-trained scientists located in different continents working closely with partners from the entire world to develop and produce medicines of tomorrow. Specifically, we are the established leading expert in TCR and CAR T&NK cell immune therapy development, as we offer the one-stop custom services that cover the entire new drug development pipeline. Additionally, we also offer an exclusive line of ready-to-use TCR and CAR T&NK cell construction products, such as virus packaging, purification, expansion and titer determination kits. Furthermore, we have built up a unique unparalleled CAR construction and production platform for all four CAR generations.