What Is CAR T-Cell Therapy?

The UAE has announced that it plans to soon begin clinical trials to verify the safety and efficacy of using CAR T-cell therapy in the fight against cancer. The news comes after the Abu Dhabi Stem Cells Centre (ADSCC) was able to successfully create CAR T-cells in a laboratory setting in what is being hailed as a global breakthrough.

CAR T-cell therapy is one of the most recent and most exciting developments in cancer treatment. By reprogramming the body's anti-tumour response and immune system, its pioneers hope to be able to send the cells in question on search-and-destroy missions aimed at eradicating cancerous cells and tumours from the patient.

CAR T-cell therapy under the microscope

CAR T-cell therapy – or chimeric antigen receptor T-cell therapy, to give it its full name – is an exciting new method of immunotherapy which aims to mobilise the body against harmful attackers. Sometimes known as adoptive cell transfer, CAR T-cell therapy sharpens the ability of the immune system to find and destroy cancerous cells.

T-cells are a type of lymphocyte, which themselves are a kind of white blood cells. T-cells are very good at fighting off infection and eliminating harmful cells, but they are not as competent at differentiating between a healthy cell and a cancerous one. CAR T-cells are those which have been artificially altered in a lab to improve their ability to sniff out the invasive cells in the human body.

After extracting a sample of T-cells from a patient, they are manipulated and multiplied in a lab setting. They are then transmitted back into the patient's bloodstream, where they are better equipped to fight off the cells which cause cancers like leukaemia and other haematological diseases.

Emirati advances

The latest news from the ADSCC is highly encouraging in that it proves that it is possible to successfully manufacture and multiply autologous CAR T-cells from a volunteer. It now paves the way for clinical trials to take place which will aim to demonstrate how CAR T-cell therapy can effectively treat cancer patients without endangering their health.

“Most significantly, we have been able to achieve the cells’ expansion with the highest levels of quality control and productivity, attaining a higher-than-average cell count with no contamination,” explained Dr Yendry Ventura Carmenate, general manager of the ADSCC. “[This] demonstrates that it is possible to efficiently manufacture CAR T-cells that exceed acceptable standards of purity, viability and cell dosage for clinical application.”

The breakthrough was achieved by combining the experience and expertise of the ADSCC with the technological capabilities of the German-based biotech company Miltenyi Biotec. It represents further evidence of how the UAE serves as a pioneer in all types of medical treatments and healthcare innovations, giving hope to countless cancer patients in the UAE and abroad.