New cancer therapy uses white blood cells from healthy donors

Trial to determine if allogeneic T cells can deliver more effective treatment

Josiah Tan

A new treatment using white blood cells from healthy donors that are modified to more effectively recognize and kill cancer cells will be tested at the National University Health System (NUHS).

The two-year trial at the National University Cancer Institute, Singapore (NUSCI) will test the therapy on nine to 10 patients who have lymphoma, multiple myeloma, colorectal cancer, lung cancer, breast cancer or ovarian cancer — six of the most common types of cancers in Singapore.

The new treatment, developed by local biotech firm Cytomed Therapeutics, uses cancer patients with modified T-cells — a type of white blood cell that helps the body fight infections and diseases, including cancer.

Cytomed’s new treatment potentially advances existing chimeric antigen receptor (CAR) T-cell therapies by using white blood cells from healthy, cancer-free donors instead of from cancer patients themselves, as is the current practice.

Cancers cells are occasionally able to evade detection by the body’s immune system, and this where modified immunotherapies like the CAR T-cell therapy come in.

“T cells in our body may not always be able to recognise or kill cancer cells, because the cancer cells can disguise themselves as the immune cells that can suppress the patient’s immune system in the cancer site,” said Cytomed chief operating officer Tan Yap Siew.

“Cytomed’s new product grafts an artificial receptor, known as a chimeric antigen receptor, on the surface of these T-cells to allow them to target and destroy cancer cells more effectively.”

The CAR T-cell therapy is much more targeted than conventional cancer treatments such as chemotherapy, which kills healthy cells as well.

The two CAR T-cell therapies currently available in Singapore are both autologous — meaning that the T-cells are harvested from the patient themselves.

They are approved to treat only certain relapsed or refractory types of lymphoma or leukemia. Dr Tan said: “Our treatment is allogeneic, which means that the T-cells are obtained from healthy donors, who do not have to be genetically matched with the intended patient.”

The allogeneic T-cells may be of higher quality since they are obtained from healthy donors as opposed to sick patients.

The trial will assess if this leads to more effective treatment.

Dr Tan also said: “We are designing a next generation CAR T-cell therapy using a different artificial receptor, known as the TCR (T-cell receptor), that may be able to tackle a wider range of cancers.

The trial will also evaluate if there are any specific types of cancer that respond better to the treatment.

While existing CAR T-cell therapies have shown promising results in treating patients who are given a shot of healthy T-cells, there are concerns about their success in treating patients who have been exposed to the cancer.”

Dr Eunice Lim, a senior consultant at Singapore General Hospital, said: “If this works, patients may be too weak to have their own white blood cells collected as sourcing materials to manufacture CAR T-cells. If this proves to work, this off-the-shelf product could treat more patients at a time than autologous products, which are patient specific.”

Dr Neo Mei, a hematologist and stem cell transplant specialist, said: “Compared with autologous CAR T-cells, allogeneic CAR T-cells can provide patients with a faster treatment process. This is because, in theory, allogeneic CAR T-cells can be readily made products that are available off-the-shelf any time.”

Still, it remains to be seen if the allogeneic CAR T-cell products will yield superior outcomes to autologous ones, especially in terms of long-term remission. They can only be effective, she added.

“Because cancers can escape even after CAR T-cell treatment, we will have to wait for the trials data to see how long Cytomed’s new product can control the cancer for.”

The trial will involve patients whose cancers have proven to be resistant to standard cancer treatments.

Dr Eunice Lim said: “We are currently recruiting volunteers for this clinical trial. We are looking for patients who have multiple options and are interested in evaluating a new treatment.”

The trial will be expanded to include more patients if successful. Dr Tan estimated that it would take around five to eight years before the new therapy could become commercially available.

Dr Eunice Lim, an NCB senior consultant involved in the trial, said: “CAR T-cell therapy can be a treatment option for many patients who have been exposed to the cancer. We are currently doing several trials for autologous CAR T-cell therapies, but this is the first locally designed trial that uses an allogeneic method to modify cells to fight cancer.”