

# PROCAR-T

## An effective CAR-T product that penetrates the solid tumour core

### Introduction

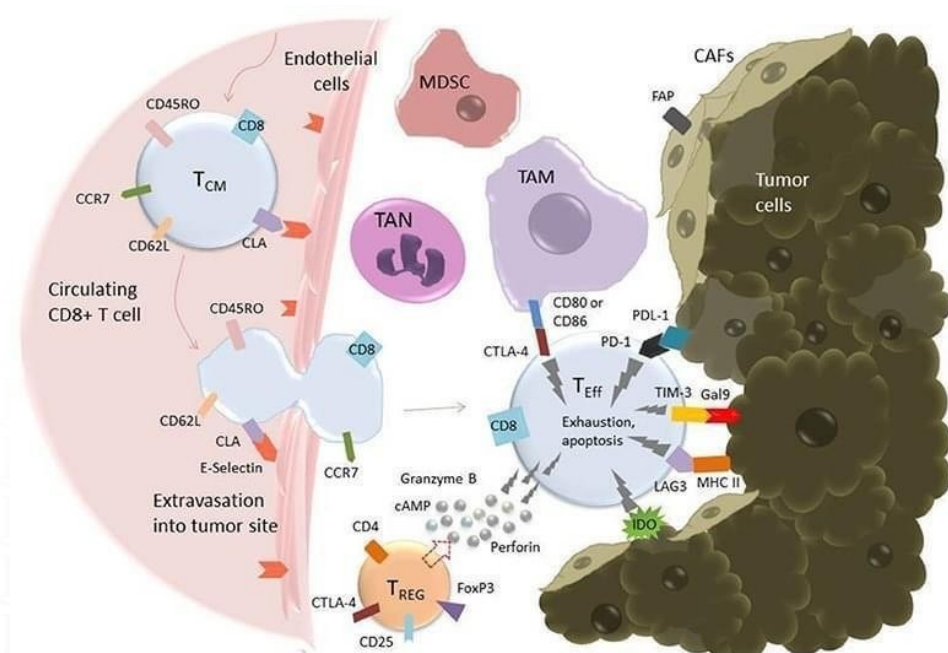
According to World Cancer Research Fund, there were 18.1 million cancer cases globally in 2020. Despite an increasing number of worldwide cancer cases, the currently available treatments are at a bottleneck to further improve the survival of cancer patients. In 2019, a breakthrough cancer immunotherapy, namely chimeric antigen receptor (CAR)-T, was approved by the FDA for the treatment of large B cell lymphoma. To date, scientists are optimizing CAR-T constructs in targeting solid tumours. The next generation of CAR-T products will succeed in targeting solid tumours through the enhancement of T cell survival.

### Cancer Immunotherapy Obstacles

- ⊗ Immunosuppressive tumor microenvironment (TME)
- ⊗ Post-treatment adverse side effects such as cytokine storms

### Objectives

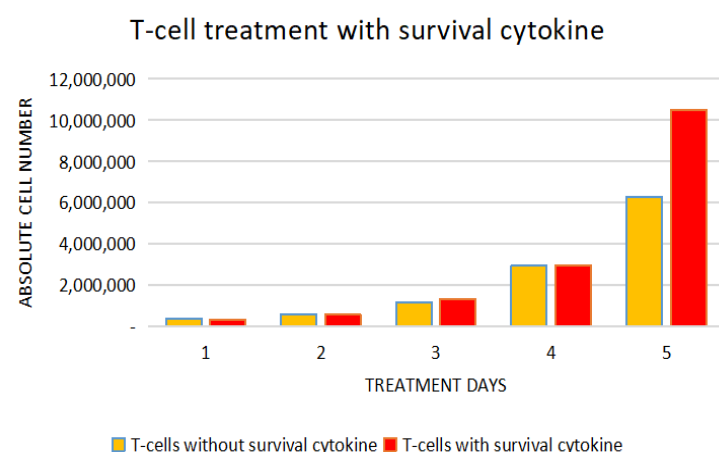
- ✔ Utilize survival cytokine to enhance the longevity of T cells
- ✔ Switch off cytokine production after treatment



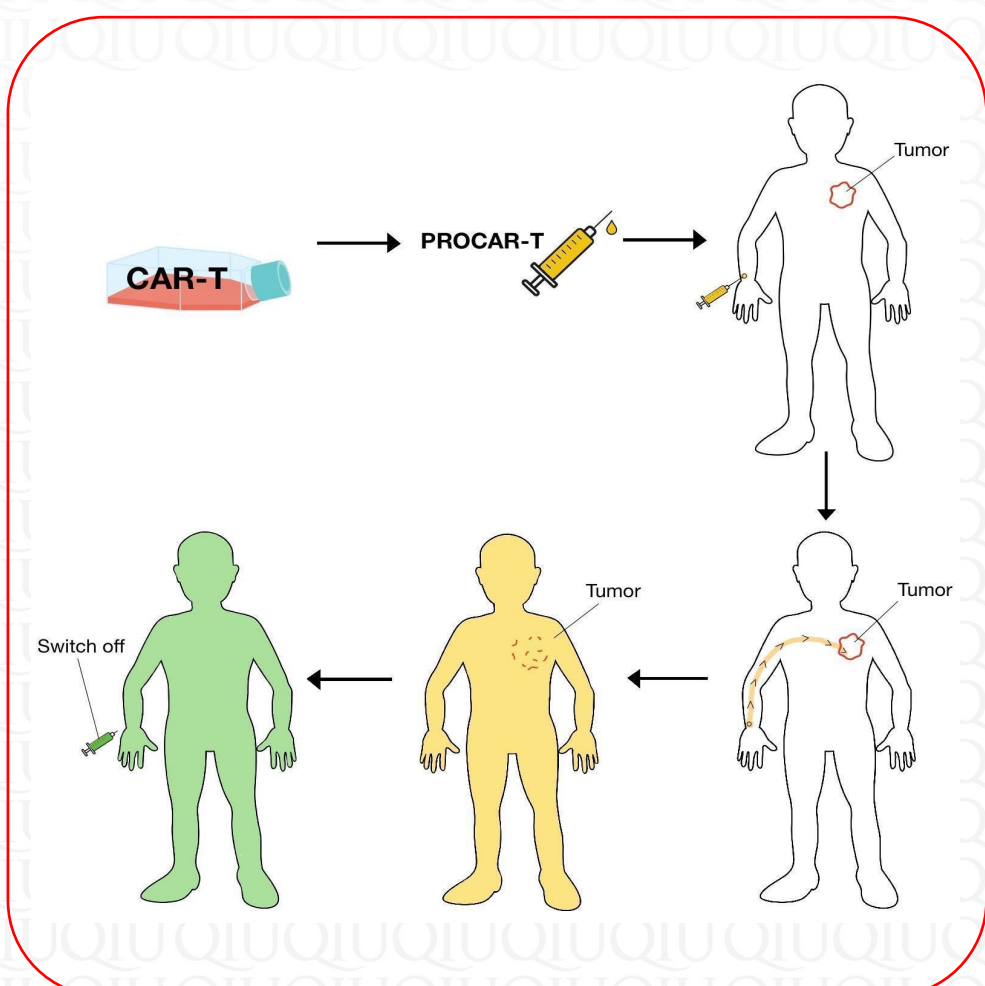
**Figure 1:** T-cell extravasation into the TME and subsequent exhaustion mediated by inhibitory ligands on tumor and tumor-associated cells. [Martinez M and Moon EK (2019). Front Immunol.]



**Figure 2:** The bullet, activated T-cell morphology in a cell cluster.



**Figure 3:** Survival cytokine enhances T-cell survival. The graphic data shows an increment of absolute cell numbers on day 5 when T-cells are treated with survival cytokine.



**Figure 4:** Schematic diagram describes the principle of the PROCAR-T concept. T-cells from the cancer patient will be purified and genetically modified in the laboratory. The cells, namely PROCAR-T, will be activated and infused back into cancer patients. Upon detection of the solid tumour, PROCAR-T will penetrate into the tumour core and exert T-cell function with the help of survival cytokines to overcome immunosuppressive TME. PROCAR-T will turn off survival cytokine production once the cancerous cells are destroyed.

### Contribution to Healthcare

1. Improve the survival of cancer patient through cancer immunotherapy.
2. Reduce the adverse effects of cancer immunotherapy.
3. Adoption of a new technique for cancer immunotherapy.

