

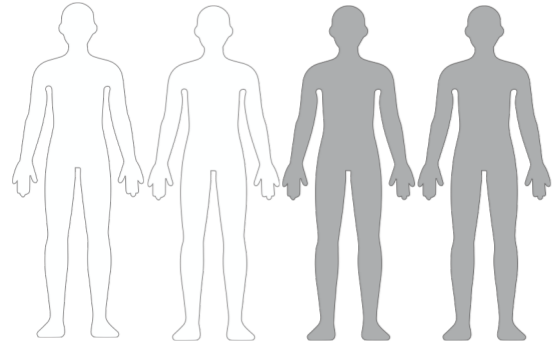
GENETICALLY ENGINEERING T CELLS TO REDUCE THE RISK OF AUTOIMMUNE CROSS-REACTIVITIES IN CANCER T CELL THERAPIES

Jose Cabezas-Caballero, Anna Huhn, Mikhail Kutuzov, Anton van der Merwe & Omer Dushek

Background: Engineering T cells to kill cancer

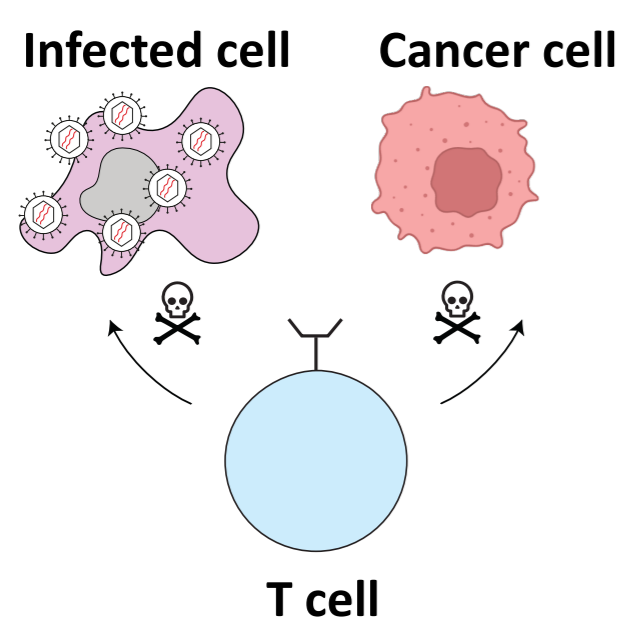
What is cancer?

Cancer is a disease in which some cells grow out of control. 1 in 2 people will develop cancer in our lifetime¹

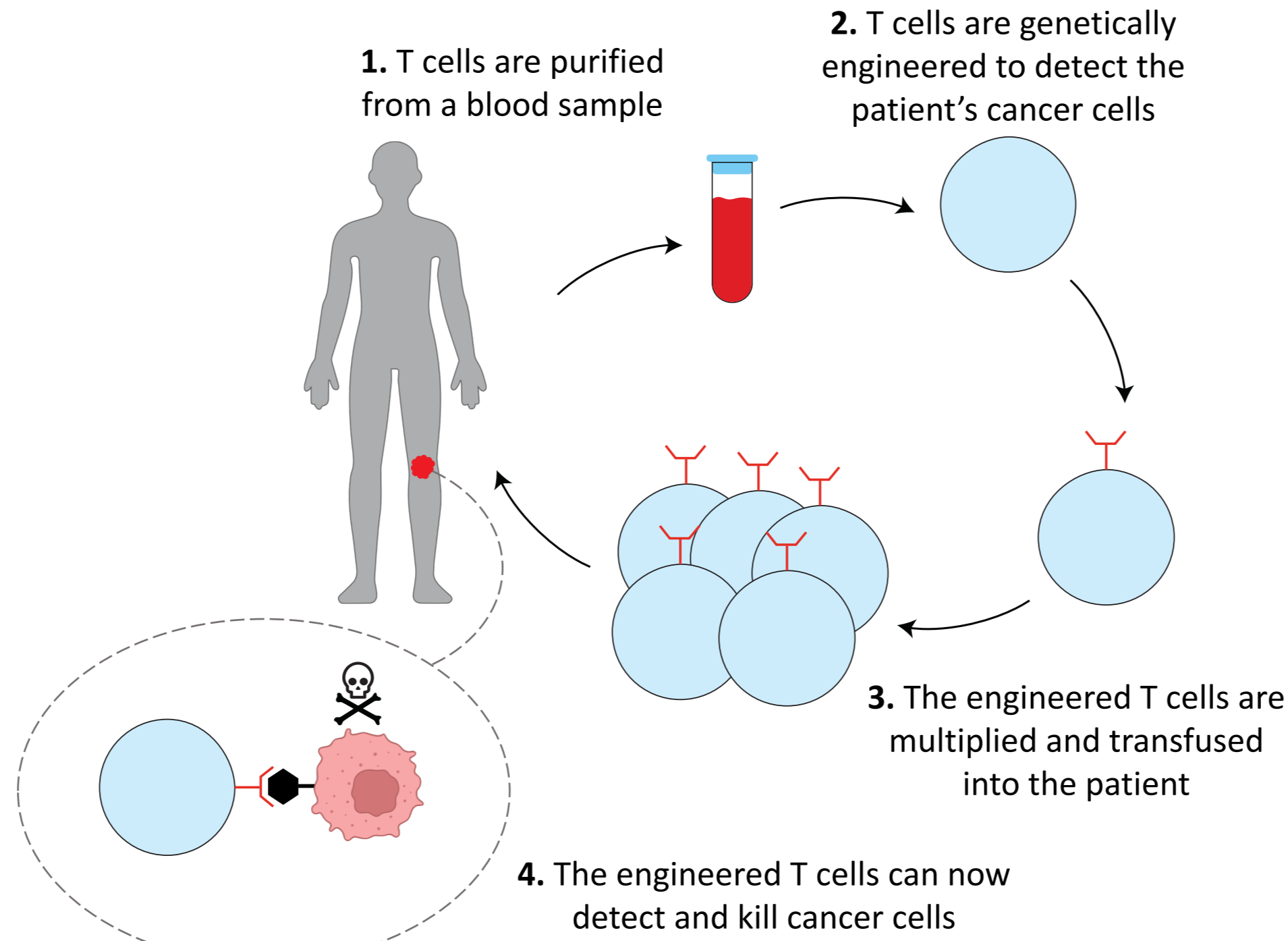


What are T cells?

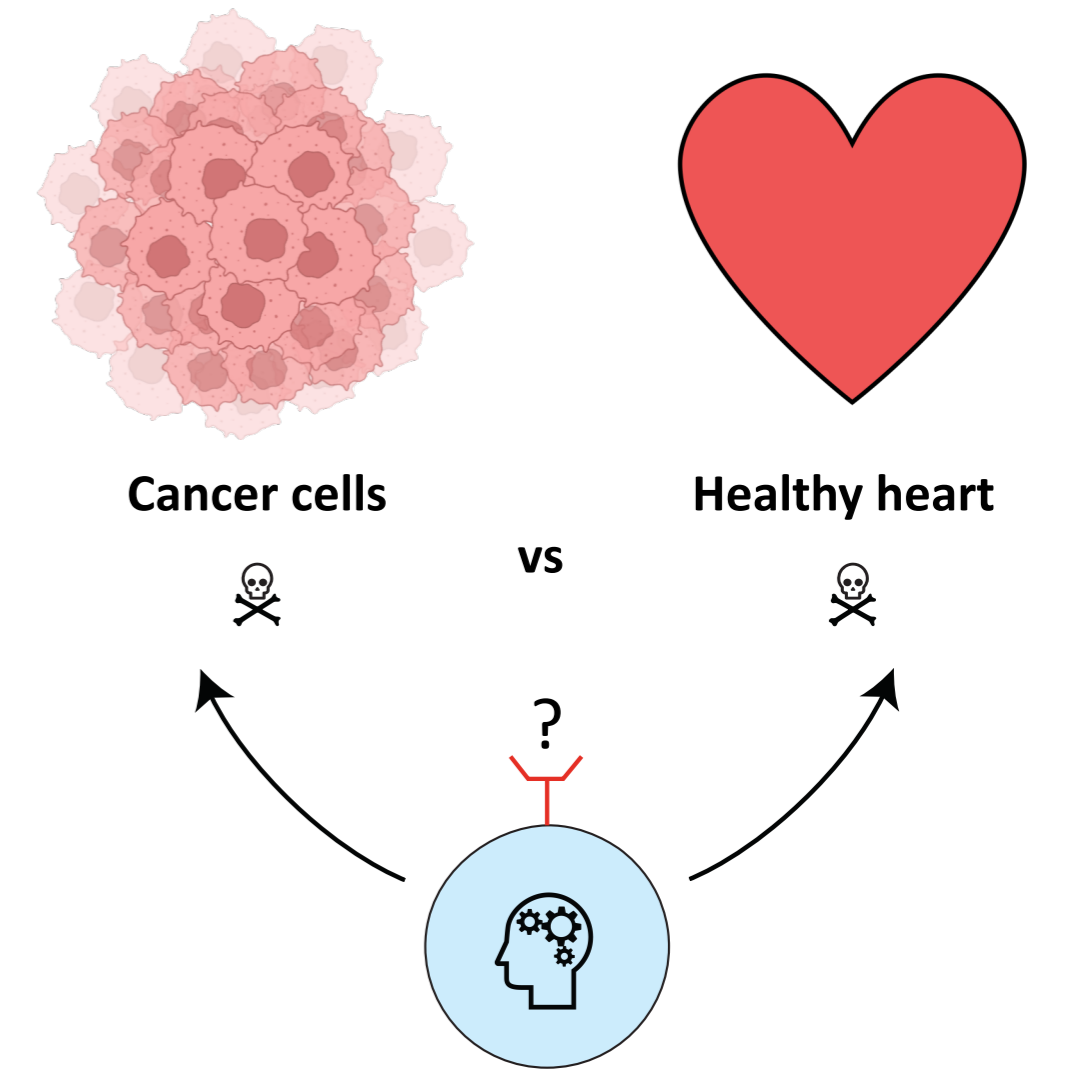
T cells are a type of immune cell that kill cells infected with viruses and cancer cells



How do T cell therapies work?



The safety problem

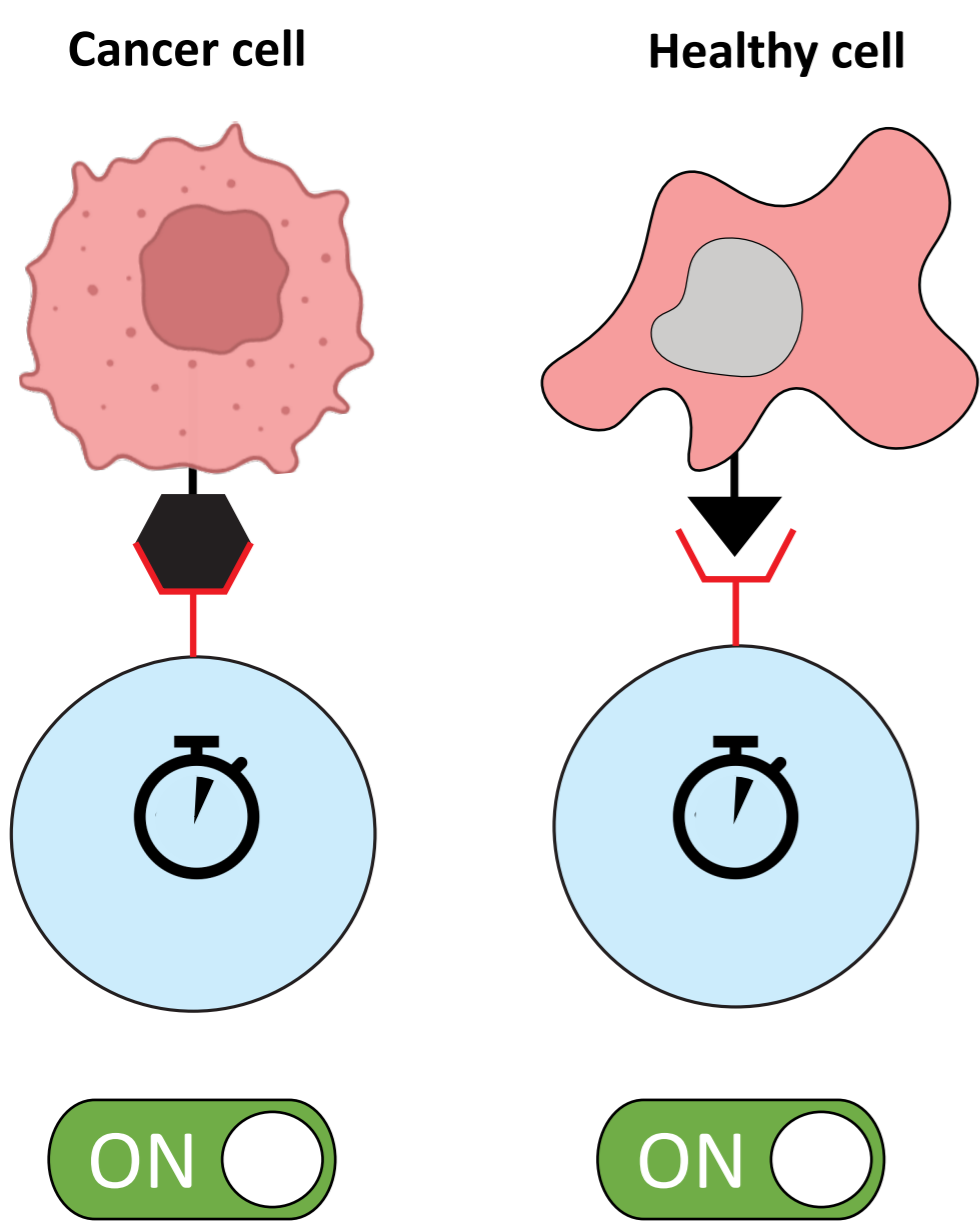


The engineered T cells can make mistakes and attack healthy tissues

Unfortunately, two patients died in a melanoma (skin cancer) clinical trial because the T cells mistakenly attacked the heart²

Our approach: Increasing T cell precision

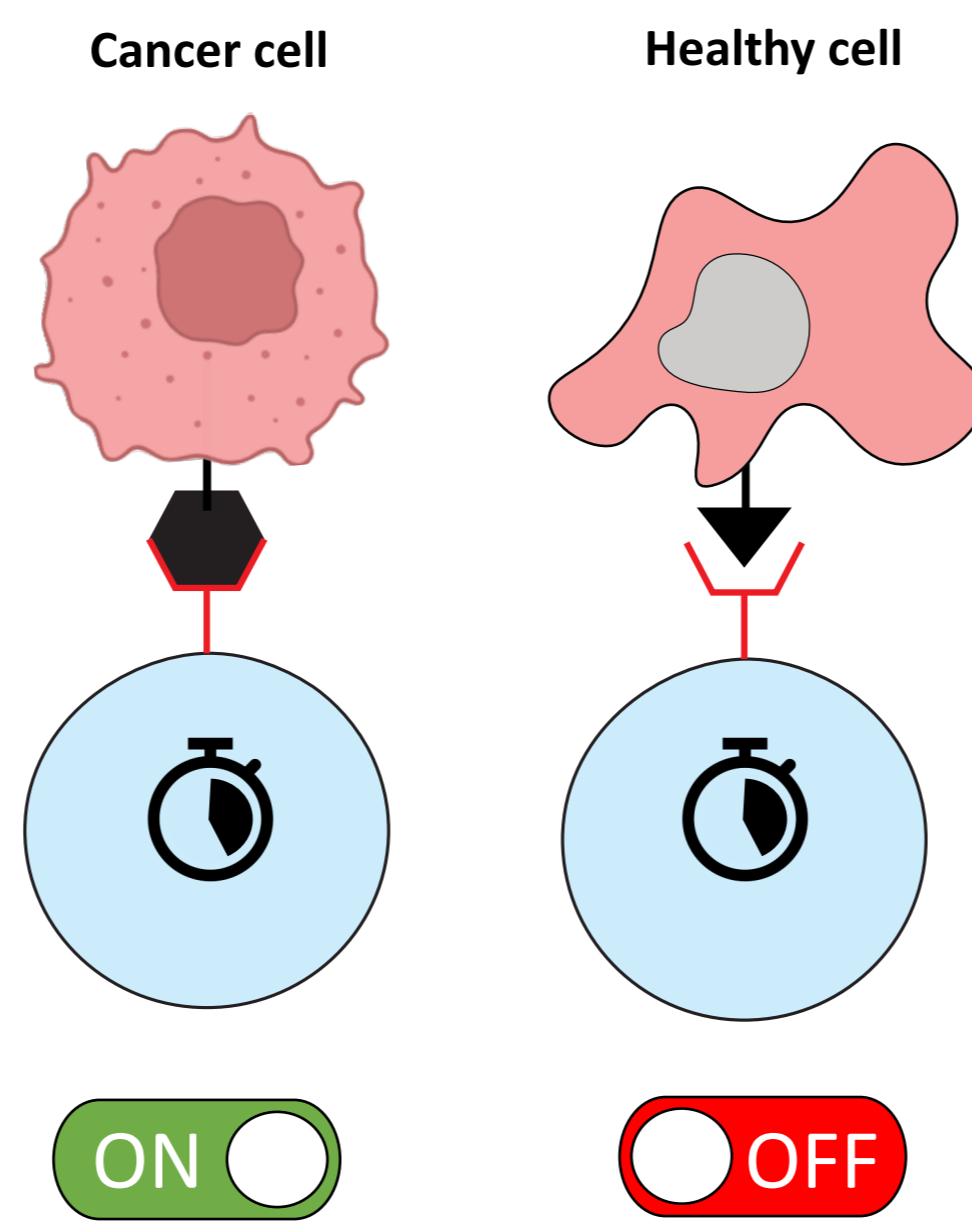
What normal T cells do



T cells screen different cells in the body and they make a **quick decision** to kill or not

Sometimes, they kill healthy cells by mistake

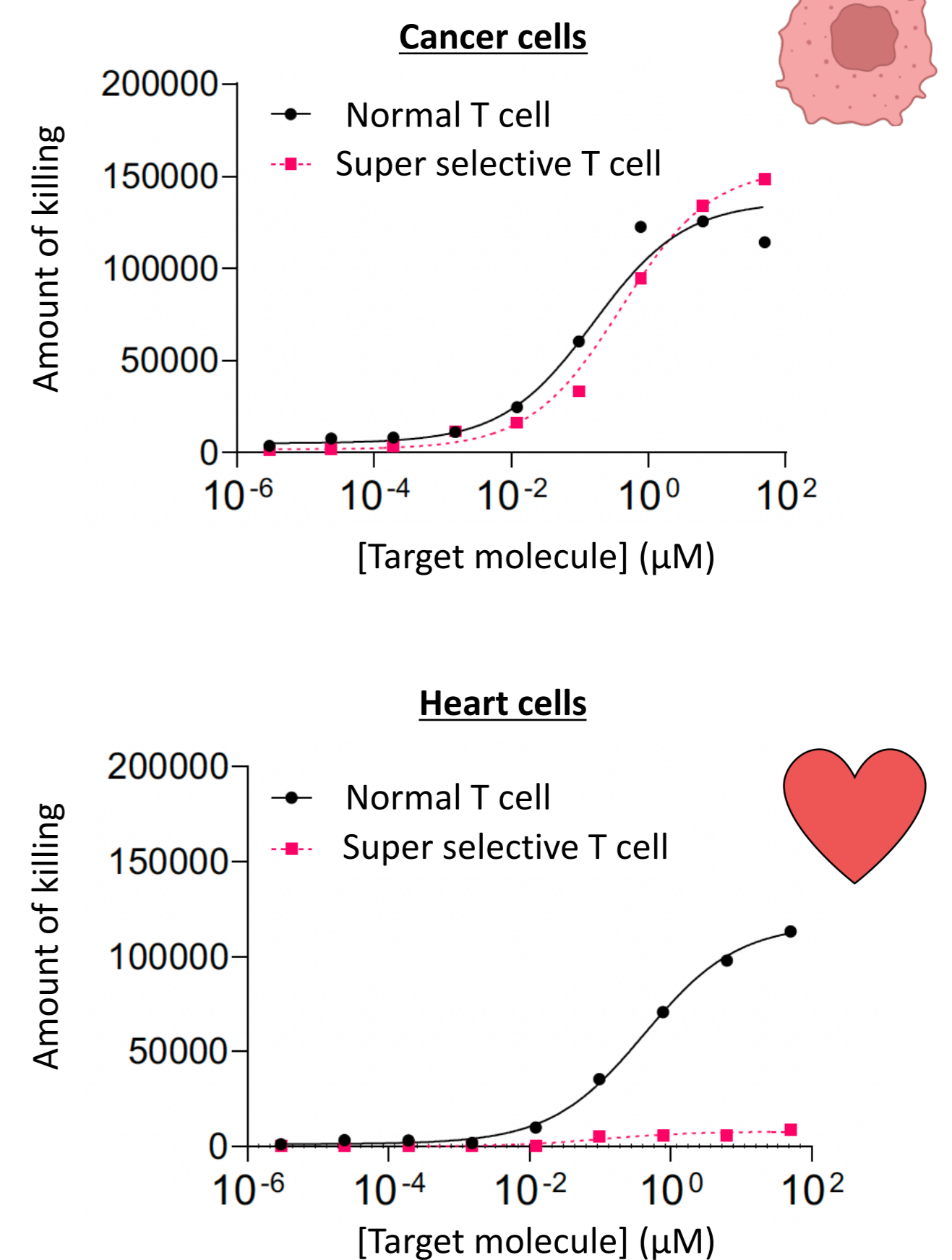
What our super selective T cells do



We generate super selective cells that make slightly **slower decisions** to kill

As a result, they need to detect their target for a longer time, making fewer mistakes

Key results



Summary

T cell therapies are a promising tool to treat any type of cancer, but they can also accidentally **attack healthy tissues**

Engineering T cells to make **precise decisions** can increase the safety of T cell therapies

References:

1. Cancer Research UK, <https://www.cancerresearchuk.org/health-professional/cancer-statistics-for-the-uk> (Accessed February 2025)
2. Cameron BJ, et al. (2013) Identification of a titin-derived hla-a1-presented peptide as a cross-reactive target for engineered mags a3-directed t cells. Science Translational Medicine.



Biotechnology and Biological Sciences Research Council

