CATE is an engineered, non-pathogenic E. coli strain that colonizes and kills tumors. Two built-in safety checkpoints combine molecular tumor-targeting and external control in a cancer treatment.

Intravenous Injection

1. Tumor Colonization
   CATE specifically colonizes tumors

2. Toxin Release

3. Tumor Sensor
   Cancer activates Tumor Sensor
   Molecular targeting ensured by two signals:
   1. High CATE Cell Density (only reached in tumors)
   2. High Lactate (solid tumor marker)

   AND-gate test circuit

4. Contrast Agent
   Tumor Sensor activation leads to expression of Bacterioferritin

5. Anti-Cancer Toxin
   Azurin is the Anti-Cancer Toxin
   Expression of Azurin is triggered by Tumor Sensor activation

6. Safety Checkpoint I
   Tumor dimension (cm)
   Simulation of the tumor area. CATE kills 25% of the total tumor.

7. Safety Checkpoint II
   Heat Sensor is activated by specific temperature

Library Variants Characterization

Leakiness Reduction wrt parent

One order of magnitude reduction of TPA promoter leakiness

References


Dr. Simon Ittig
University Hospital Zurich

"The fact that you would use bacteria intravenously is not absurd at all. What is absurd is the lack of data to demonstrate the idea and to prove confident in people."

Dr. med. Christian Britschgi
Oncologist, University Hospital Zurich