

1 Intravenous Injection

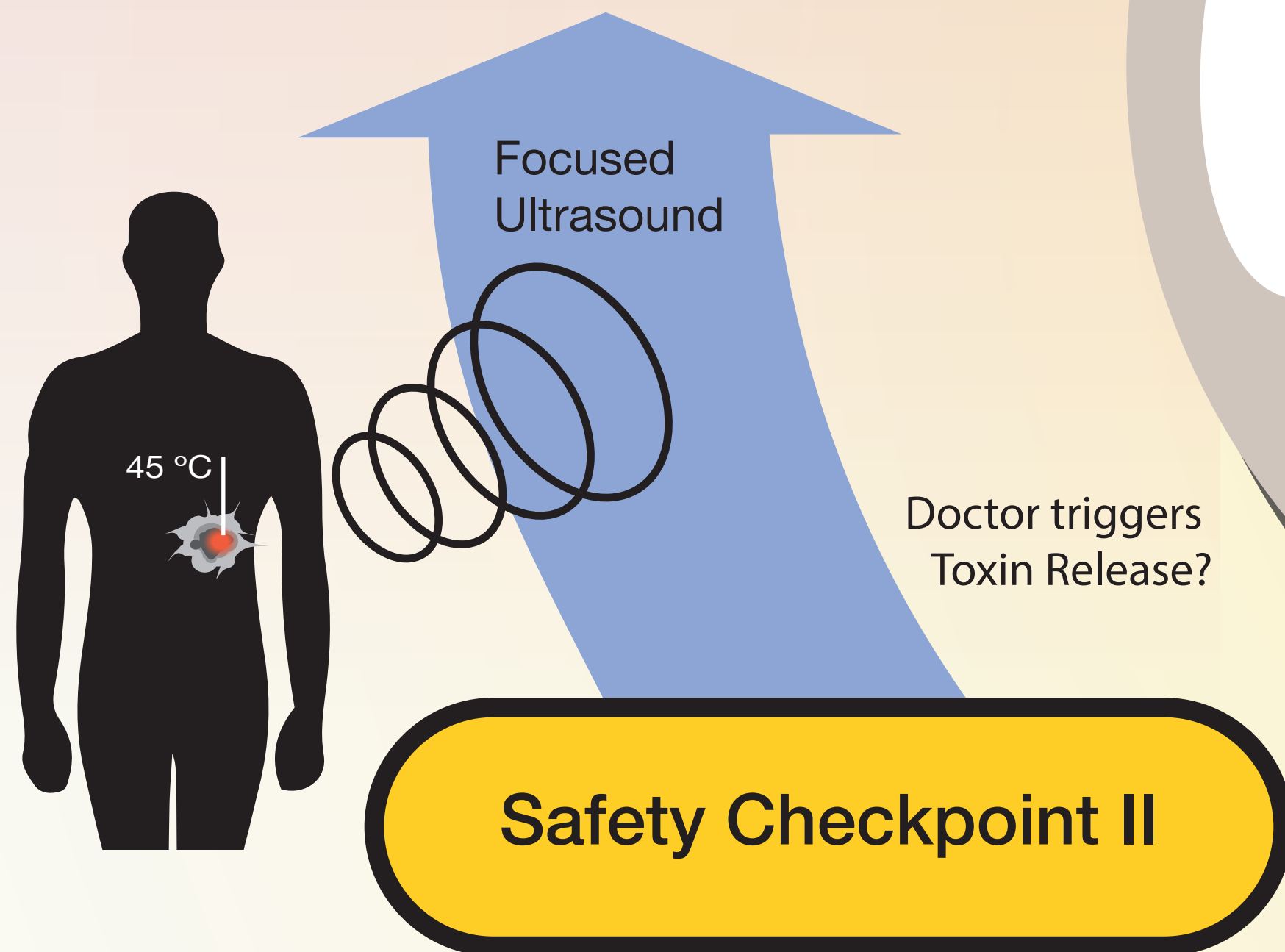
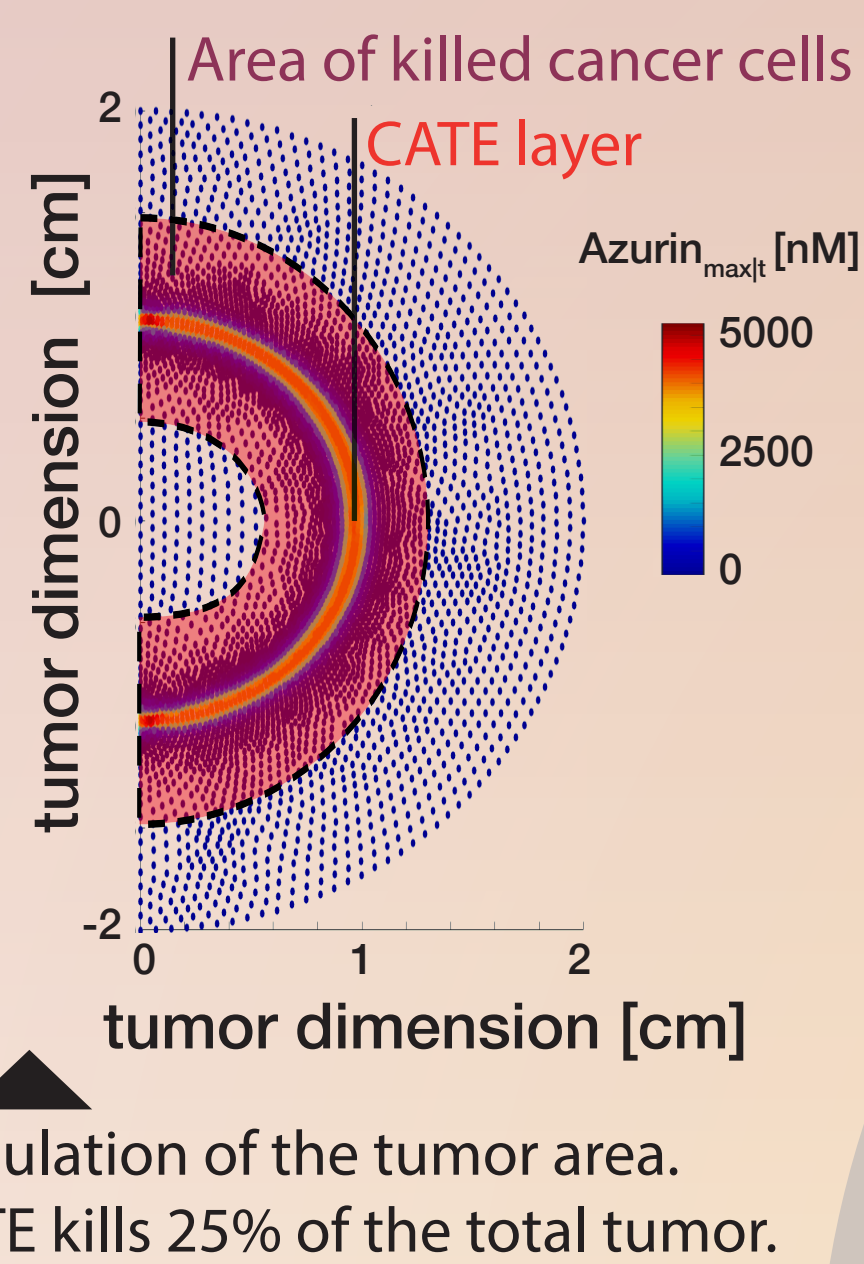
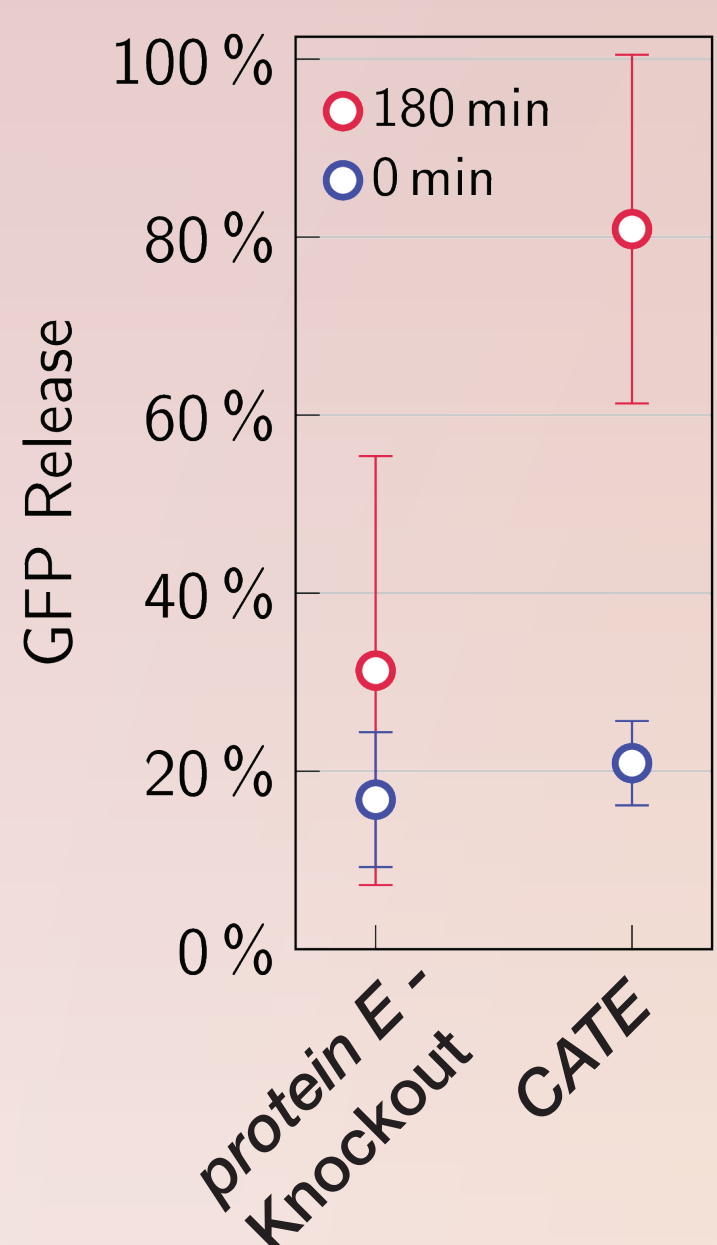
2 Tumor Colonization

CATE specifically colonizes tumors

3 Tumor Sensor

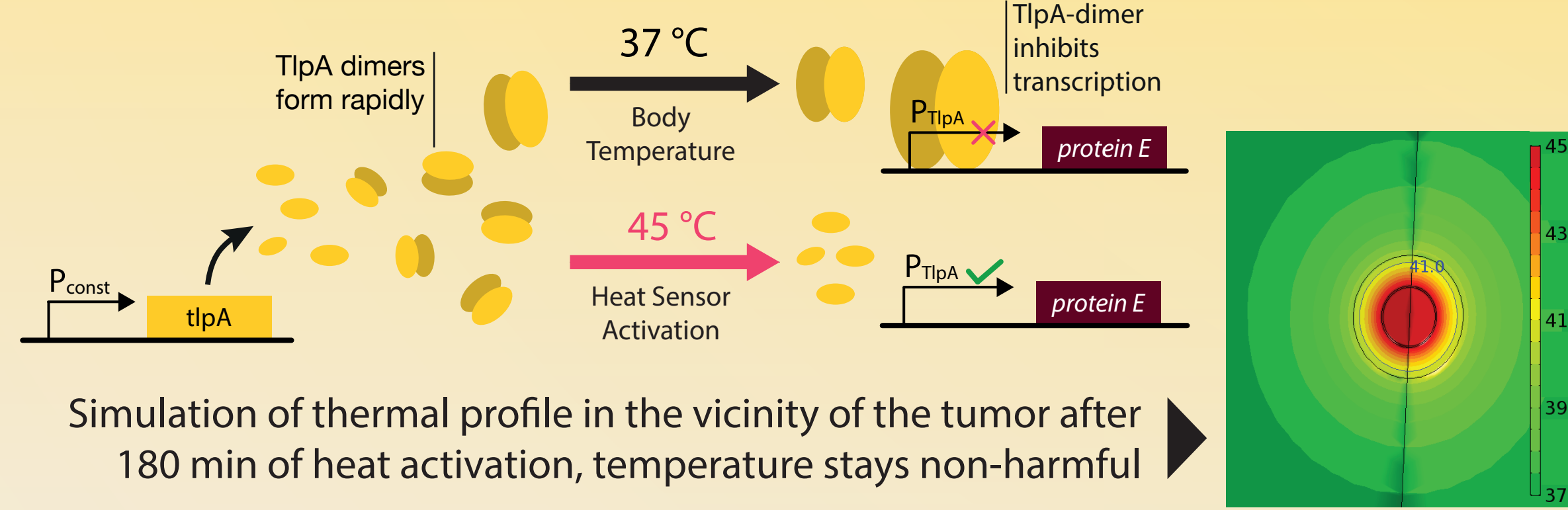
7 Toxin Release

Heat Sensor activates Toxin Release via cell lysis by protein E. Accumulated Azurin gets released.



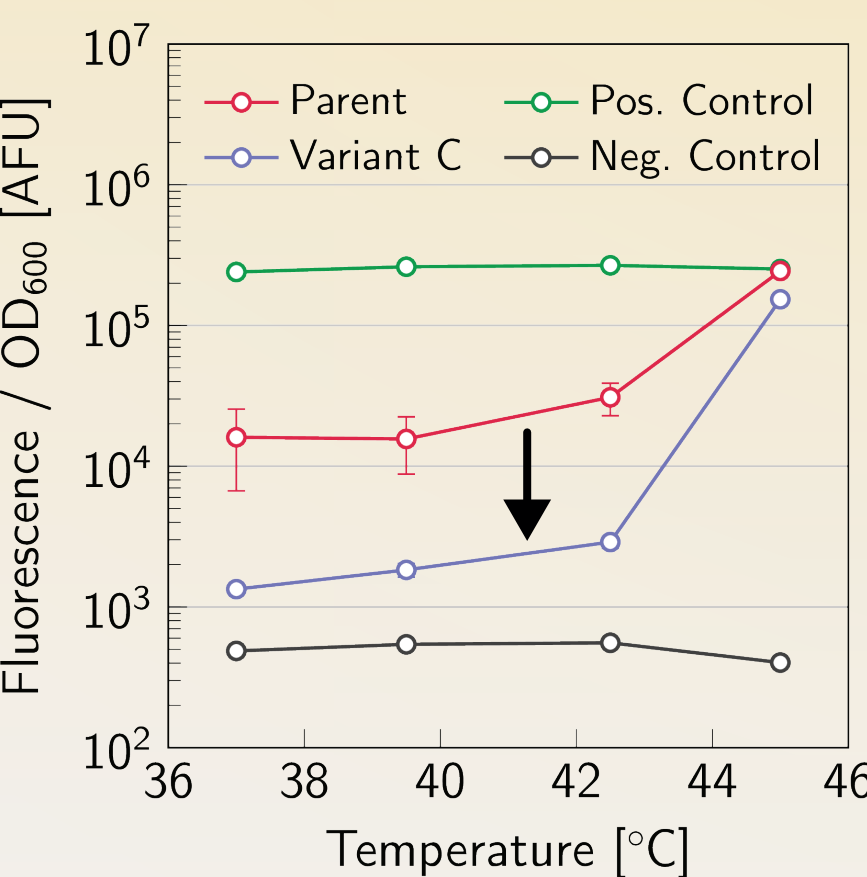
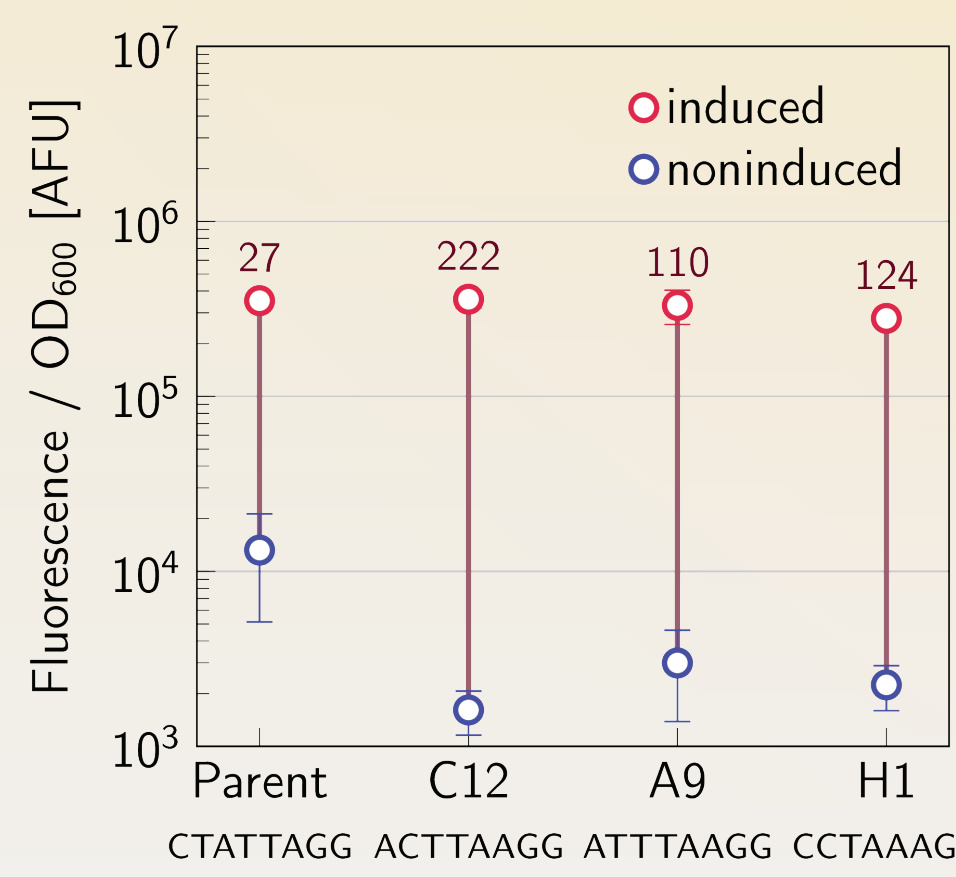
6 Heat Sensor

Doctor activates Heat Sensor



Library Variants Characterization

Leakiness Reduction wrt parent



TlpA RBS library variants improve fold-change significantly wrt parent

One order of magnitude reduction of TlpA promotor leakiness

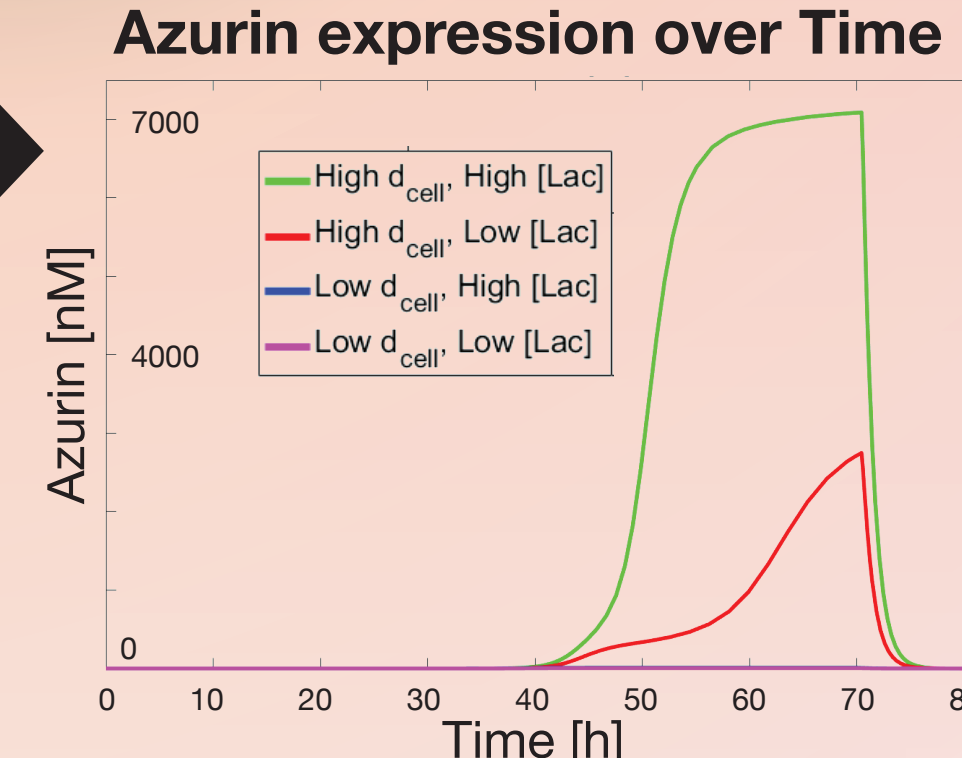
5 Anti-Cancer Toxin

Azurin is the Anti-Cancer Toxin

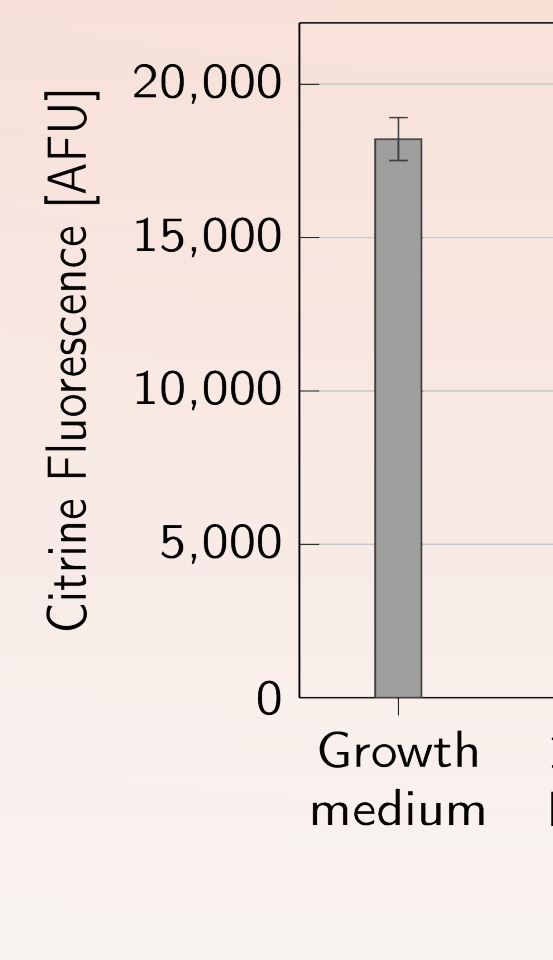
The Tumor Sensor activation leads to expression of Azurin, which then accumulates inside CATE.

Azurin is a potent cancer killing agent, effective at a concentration of 2 nM in lysed CATE.

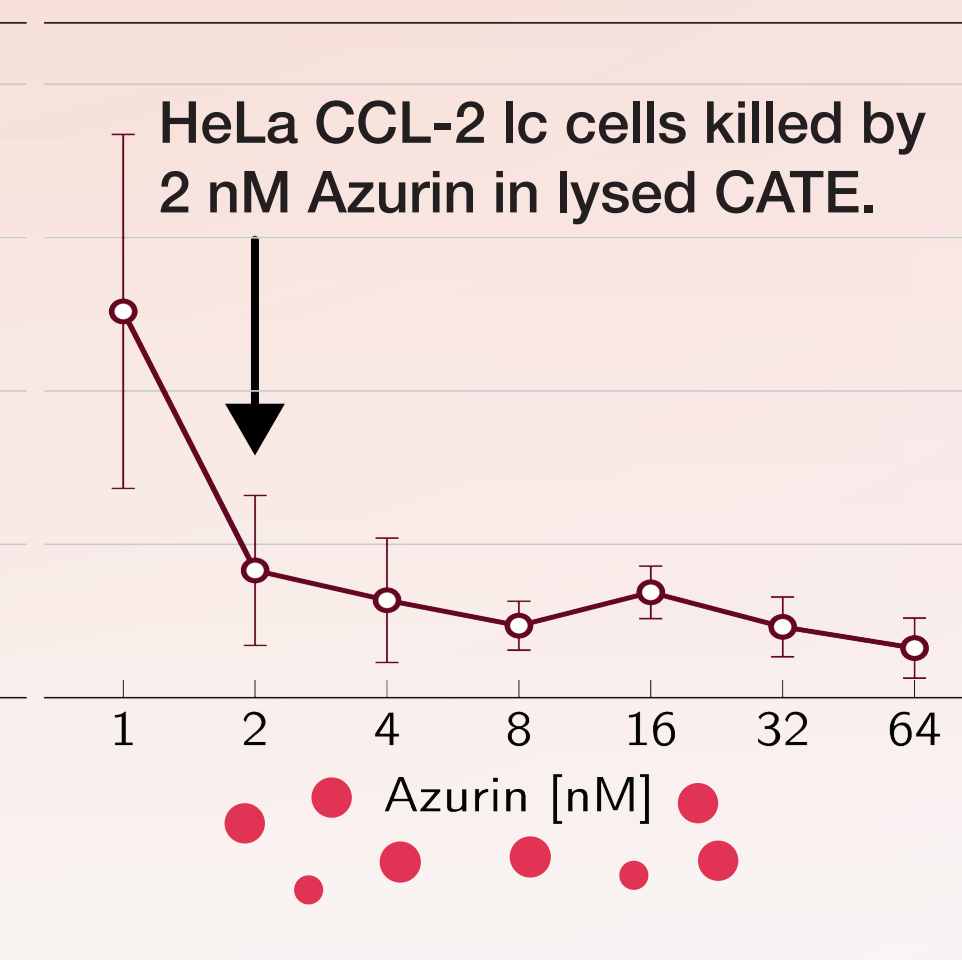
AND-Gate Model: Azurin expression over Time



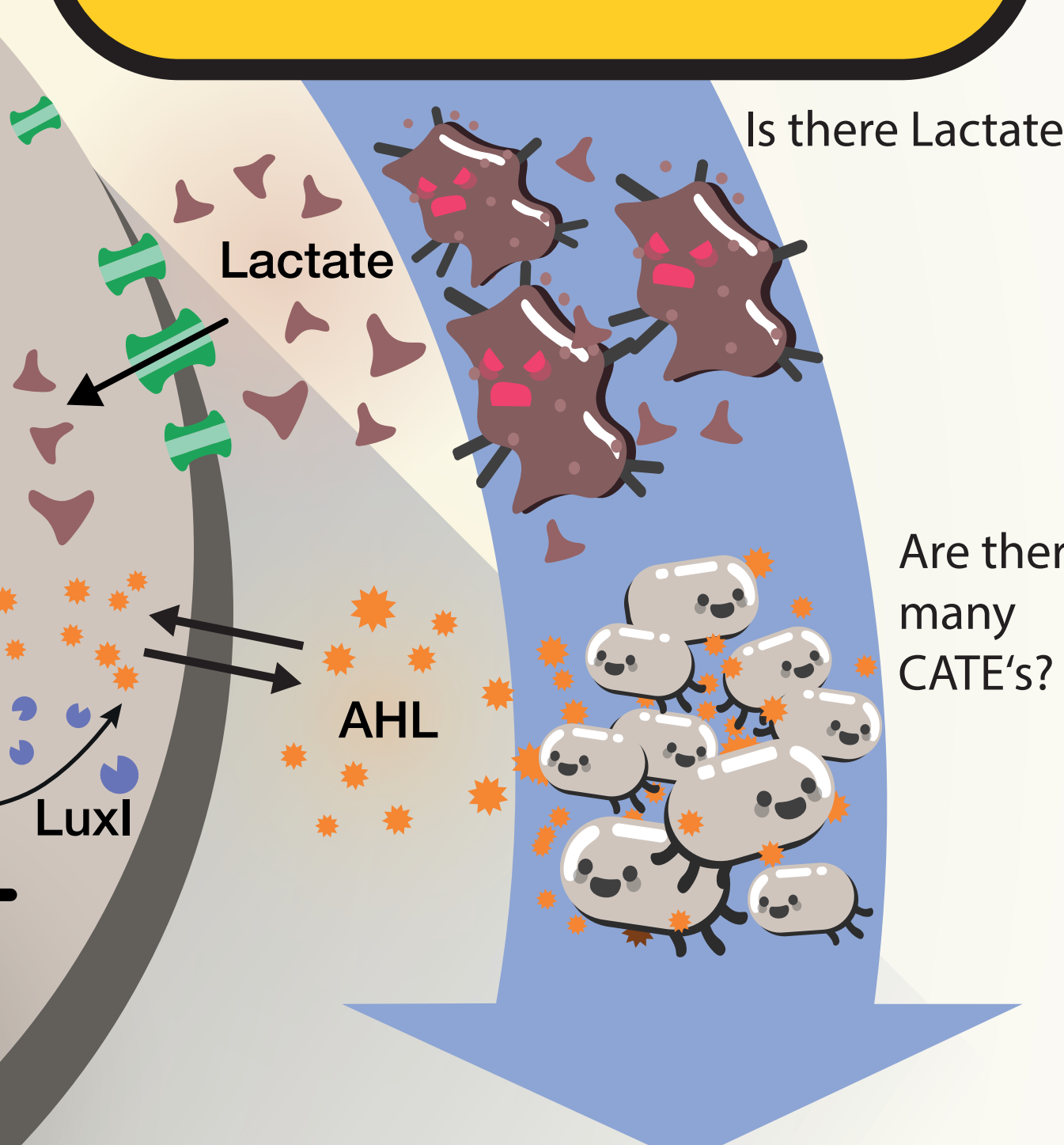
Controls



CATE lysate against cancer cells



Safety Checkpoint I

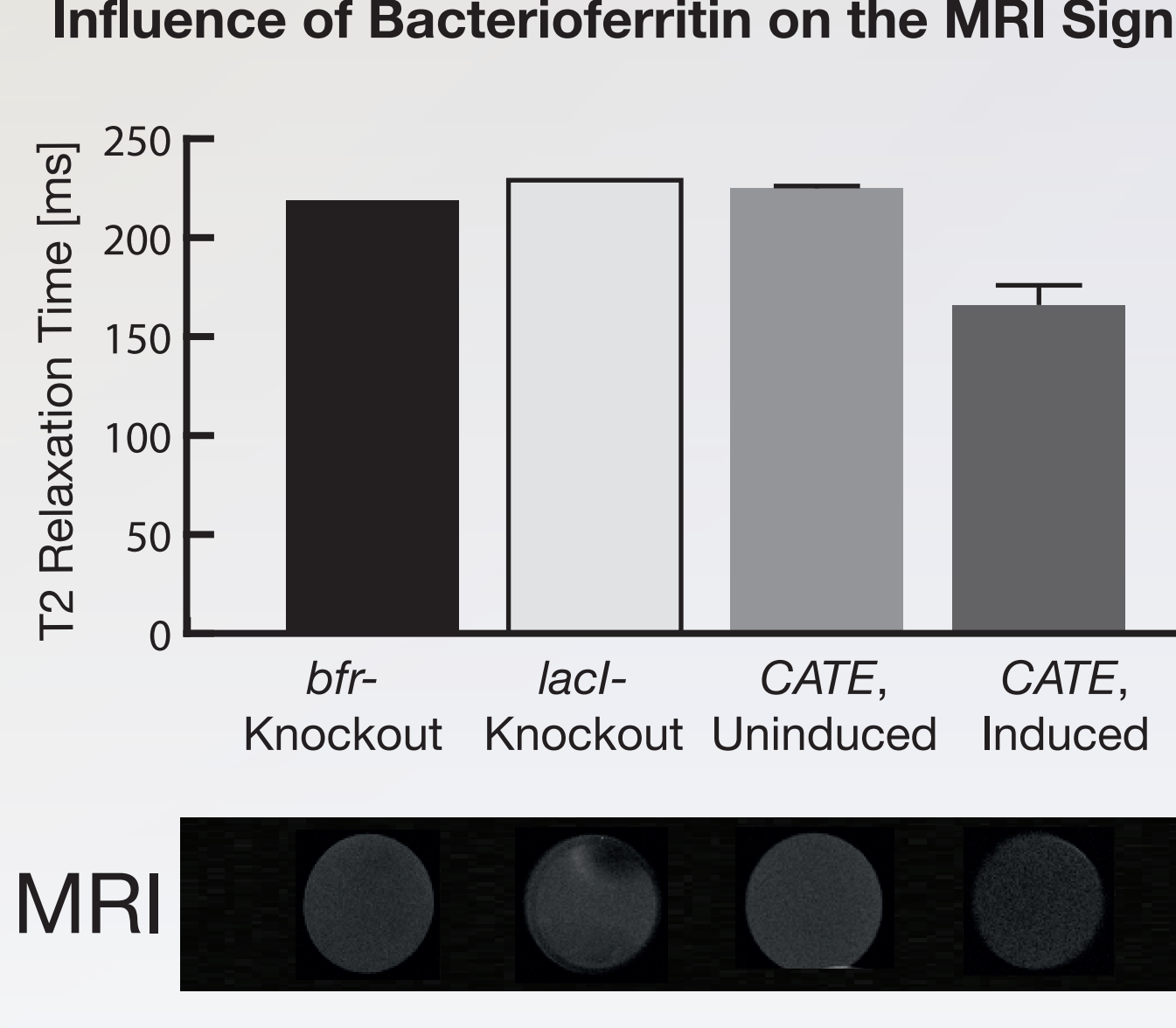


4 Contrast Agent

Tumor Sensor activation leads to expression of Bacterioferritin

- Colonization of correct area
- Sufficient number of CATE
- Start of accumulation of Anti-Cancer Toxin

Influence of Bacterioferritin on the MRI Signal



MRI

References
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Hill, Philip J., et al. "Magnetic resonance imaging of tumors colonized with bacterial ferritin-expressing Escherichia coli." PLoS One 6.10 (2011): e25409.
Piraner, Dan I., et al. "Tunable thermal bioswitches for in vivo control of microbial therapeutics." Nature chemical biology 13.1 (2017): 75-80.
Yamada, Tohru, et al. "Bacterial redox protein azurin, tumor suppressor protein p53, and regression of cancer." Proceedings of the National Academy of Sciences 99.22 (2002): 14098-14103.
Bernardes, Nuno, Ananda M. Chakrabarty, and Arsenio M. Fialho. "Engineering of bacterial strains and their products for cancer therapy." Applied microbiology and biotechnology 97.12 (2013): 5189-5199.

Human Practices

Talks



Interviews

