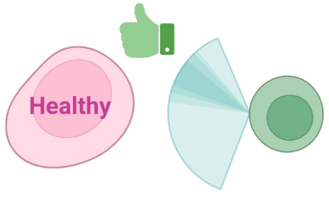
Delivering sugar-eating enzymes to sugar-coated cancer cells

James Johns (mentee) and Caitlin Margetts (mentor)

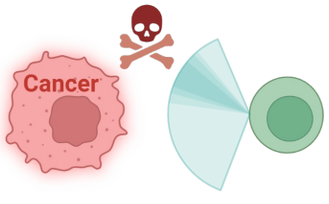
citizens of science

Background

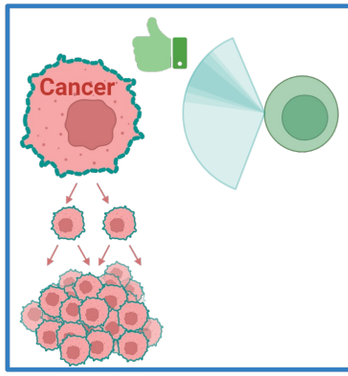
The cells of the immune system are constantly scanning for things out of place.



Healthy cells are given the all clear.



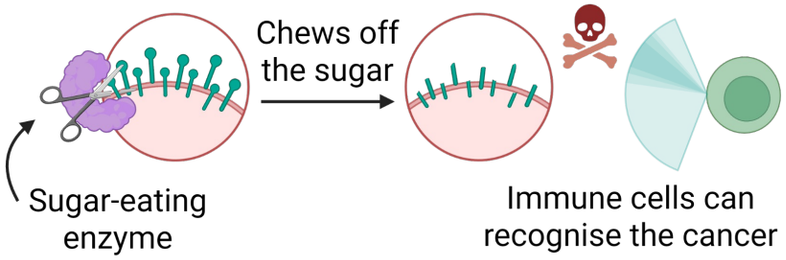
Cancerous cells are recognised and killed.



Some cancer cells mutate to gain a sugary coating which confuses immune cells

Cancer grows uncontrolled

These cells are our **targets**



Key Takeaways

Fusing enzymes to other proteins could be key to delivering to specific locations in cells. The next thing to ask is, do they work once they get there?

Aim & Hypothesis

To deliver sugar-eating enzymes to the surface of sugar-coated cancer cells.

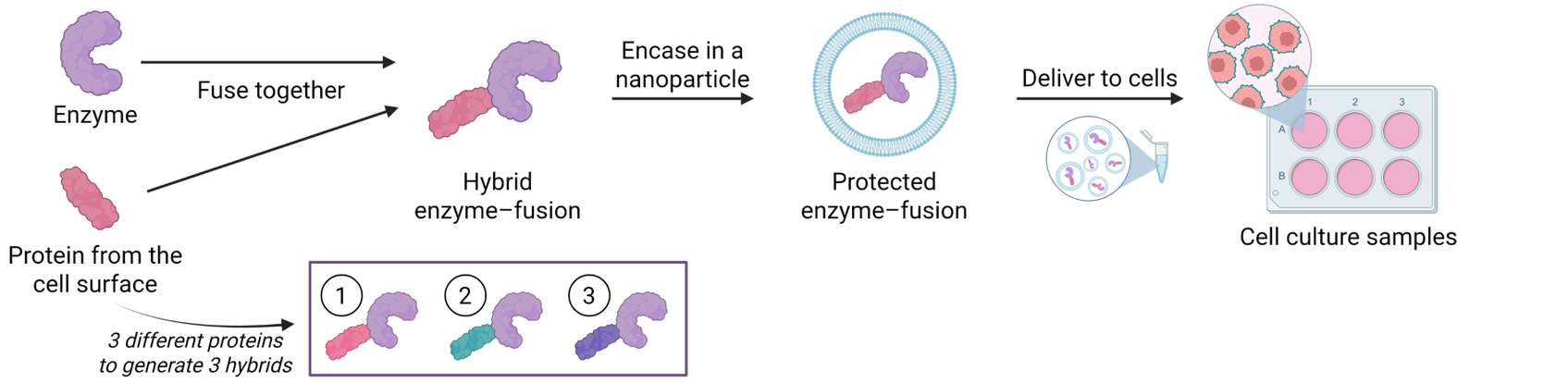
The enzyme can be delivered to the cell surface by fusing it to a surface protein and packaging it in a nanoparticle

Delivery Challenges

1. Enzymes are **fragile.** They must be protected until they get to the cancer cells.
2. Enzymes must be delivered to the **cell surface** (not inside) to have an effect.

Methods & Results

Nanoparticles protect our enzyme but deliver it inside the cell. Proteins that naturally exist on the surface of cells can be used to chaperone our enzyme to the surface of cancer cells.



Special fluorescent labels are used to tag where the enzymes are in the cells.

