IMPERIAL

Biotechnology and Biological Sciences Research Council

GlycoCell
UKRI Engineering Biology Mission Hub

The glyco - microbrewery:
Crafting the perfect vaccine

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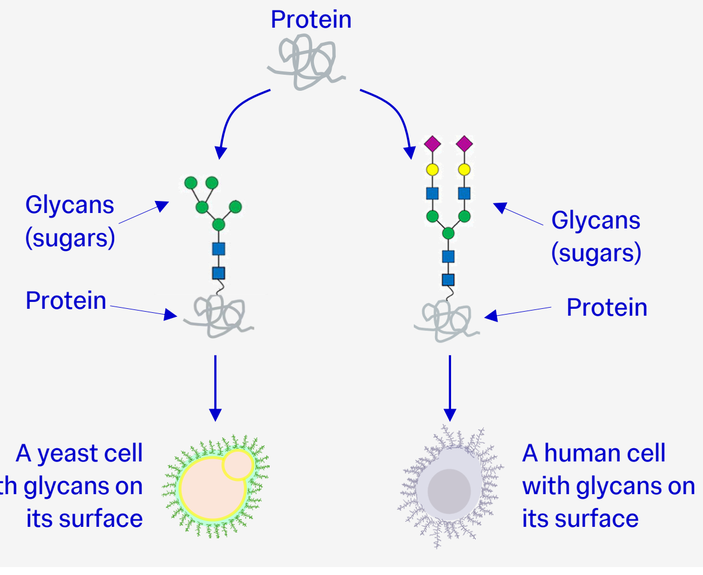
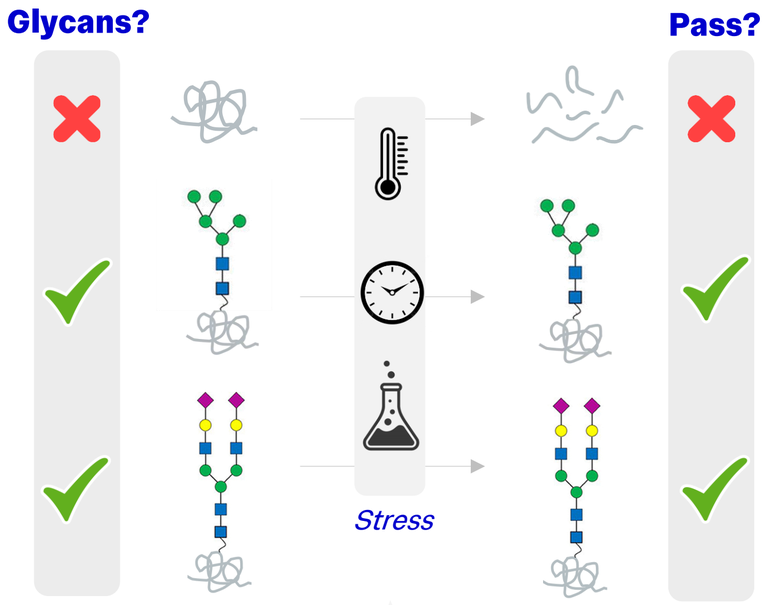
Glycosylation:

The enzymatic addition of sugars (*glycans*) to proteins for:

1. Stability of therapeutic proteins
2. Cell organisation
3. Immune system interactions





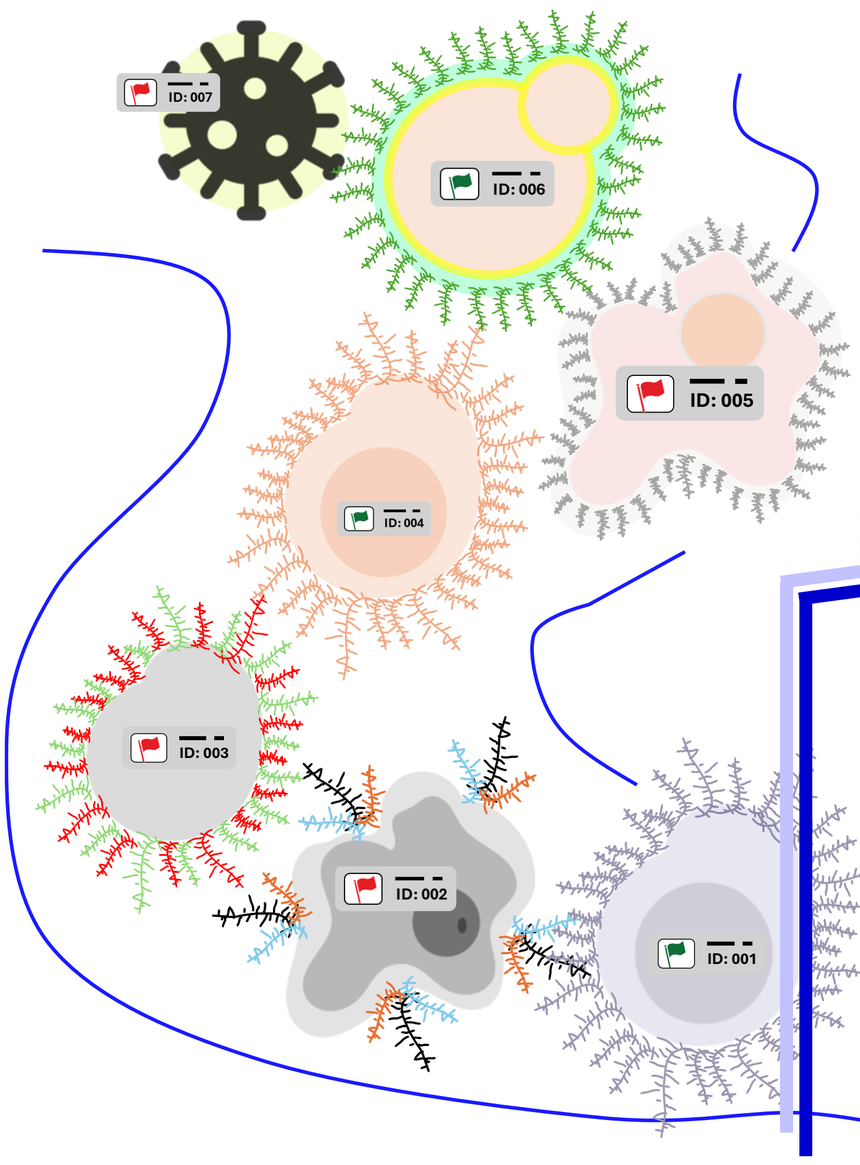
(1) Stability of therapeutics

How long will they last in the bloodstream?

(2) Cell organisation

The biological barcode

So that the cell knows where to send the cargo (protein)



(3) Know which foreign bodies are safe, and which are disease-causing

- Self / non-self
- Safe / dangerous

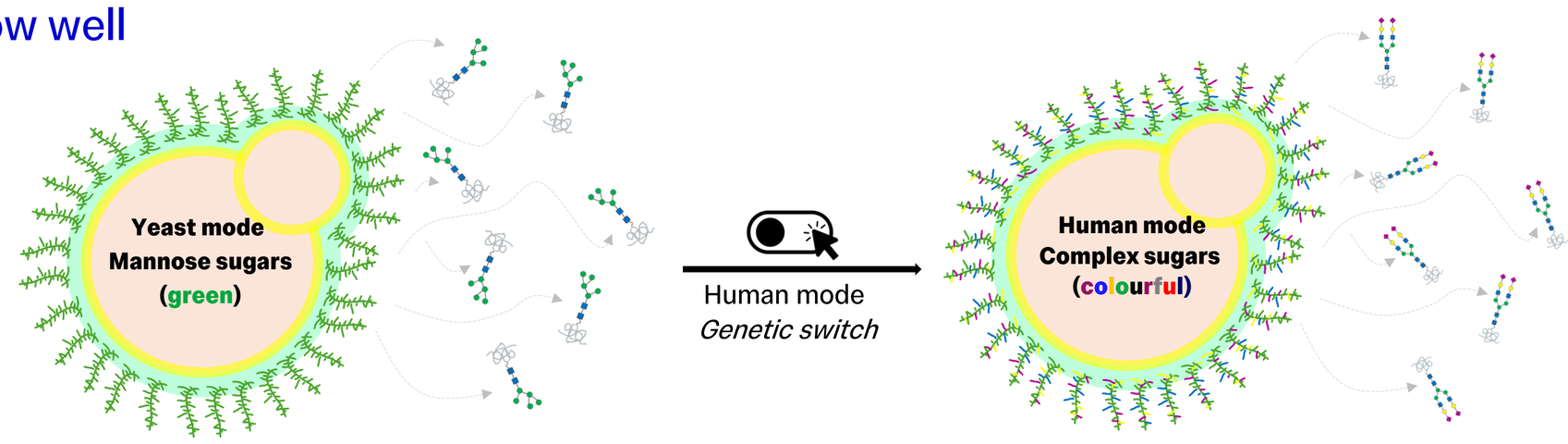
Immune checkpoint

We engineer (friendly and safe) **yeasts to make medicines**

- Yeasts make therapeutic proteins with mannose sugars (green)
- For these to be effective in humans, we need more complex sugars (colourful)
- However, yeasts don't grow well when they make complex (colourful) sugars

Solution?

Grow the yeast first, then switch on human mode



Outcomes

- Scalability
- Pandemic preparedness
- Vaccine Confidence
- Accessible therapeutics to all
- UK Engineering Biology expertise