Uncovering a new villain in Alzheimer's Disease

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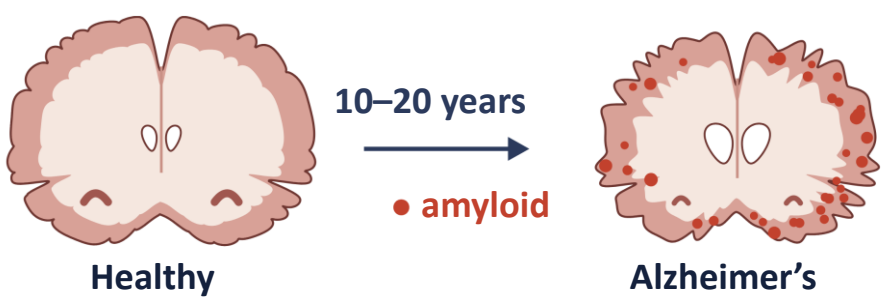
Background

1 in 3

people over 85 will develop Alzheimer's Disease

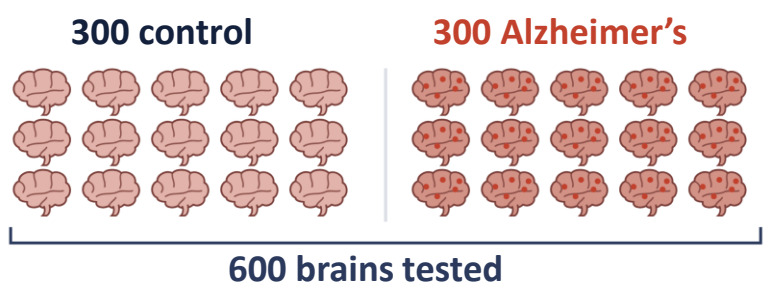
The original villain in Alzheimer's may not be the only villain



Amyloid plaques: until 2023, believed to be **the** cause.

✕ 2024 drugs cleared amyloid, but memory barely improved.

A new villain?



The **biggest** difference between control and Alzheimer's brains was a protein called **PAFAH1B3**, and it has **never** been looked at in the brain before.

OVERALL AIM

To find the "villain", other than or in addition to amyloid, that causes Alzheimer's Disease.

OVERALL HYPOTHESIS

Too much PAFAH1B3 contributes to the development of Alzheimer's Disease.

FIRST STEP **Model the overproduction of PAFAH1B3 in cells, so we can work out what too much PAFAH1B3 does to cells.**

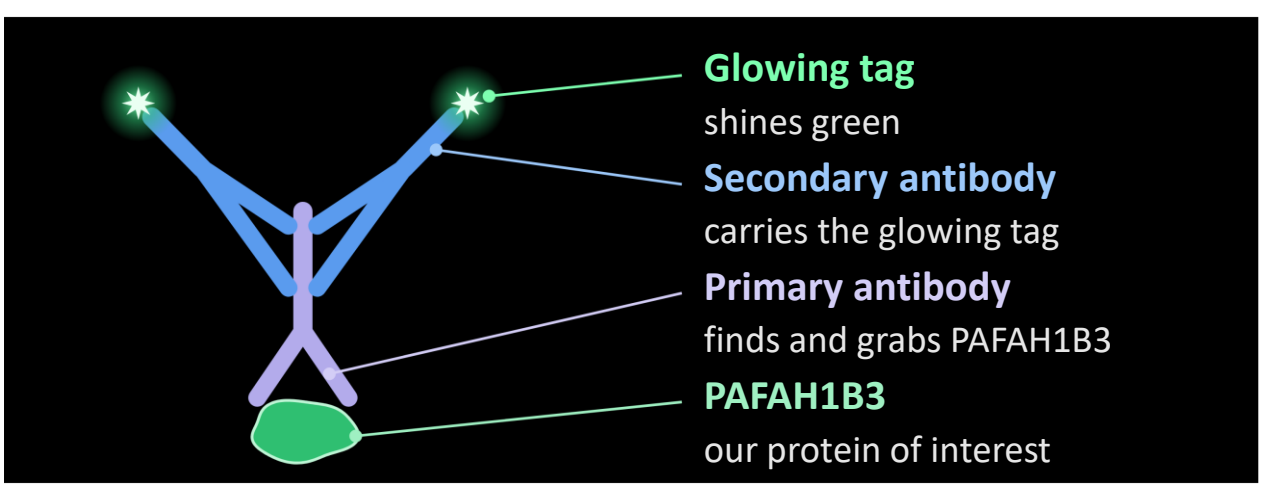
Method: using immunofluorescence to confirm that we correctly engineered cells to overproduce PAFAH1B3

How we "see" PAFAH1B3

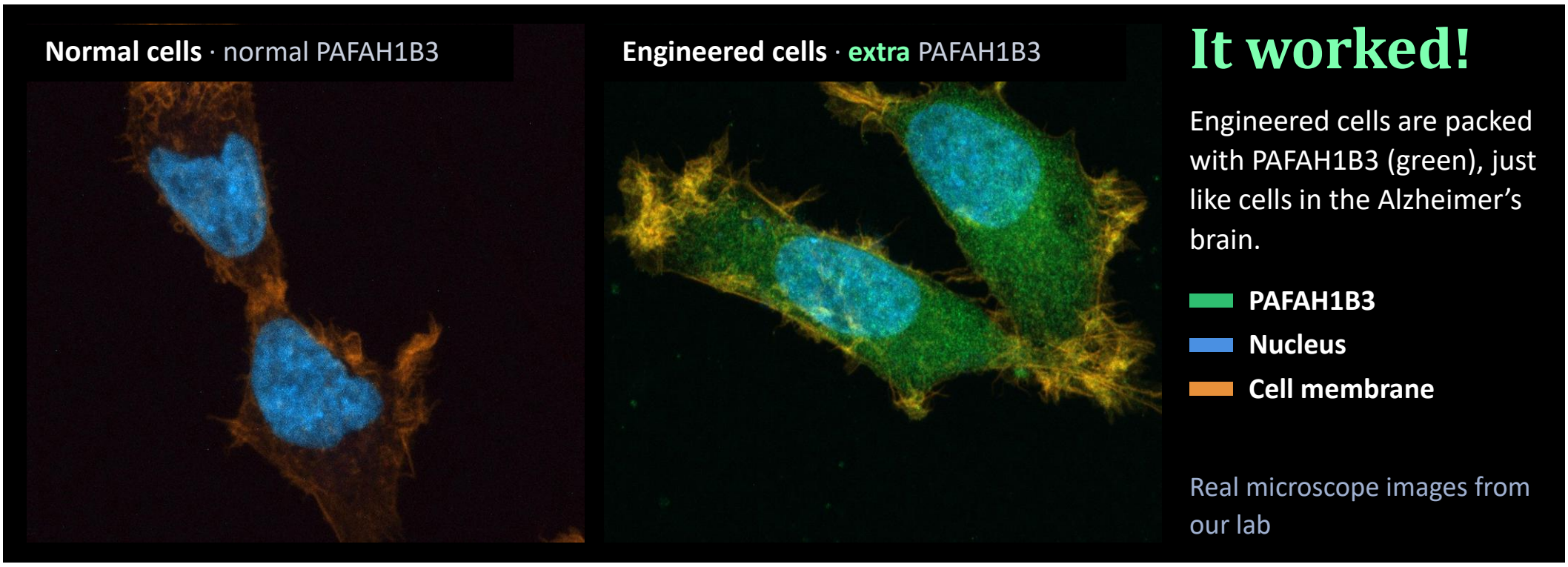
The **primary** antibody finds PAFAH1B3. The **secondary** carries a glowing tag.

What we expect

Engineered cells should glow **much more green** than normal cells.



Results



It worked!

Engineered cells are packed with PAFAH1B3 (green), just like cells in the Alzheimer's brain.

- PAFAH1B3
- Nucleus
- Cell membrane

Real microscope images from our lab

Next: what does too much PAFAH1B3 do to cells?

Stress
Cope better or worse?

Growth
Divide faster or slower?

Energy
Use fuel differently?

KEY TAKEAWAY

Dementia is common, so finding its causes is crucial. Engineering cells to overproduce PAFAH1B3 is a promising way to test whether it is a new villain.