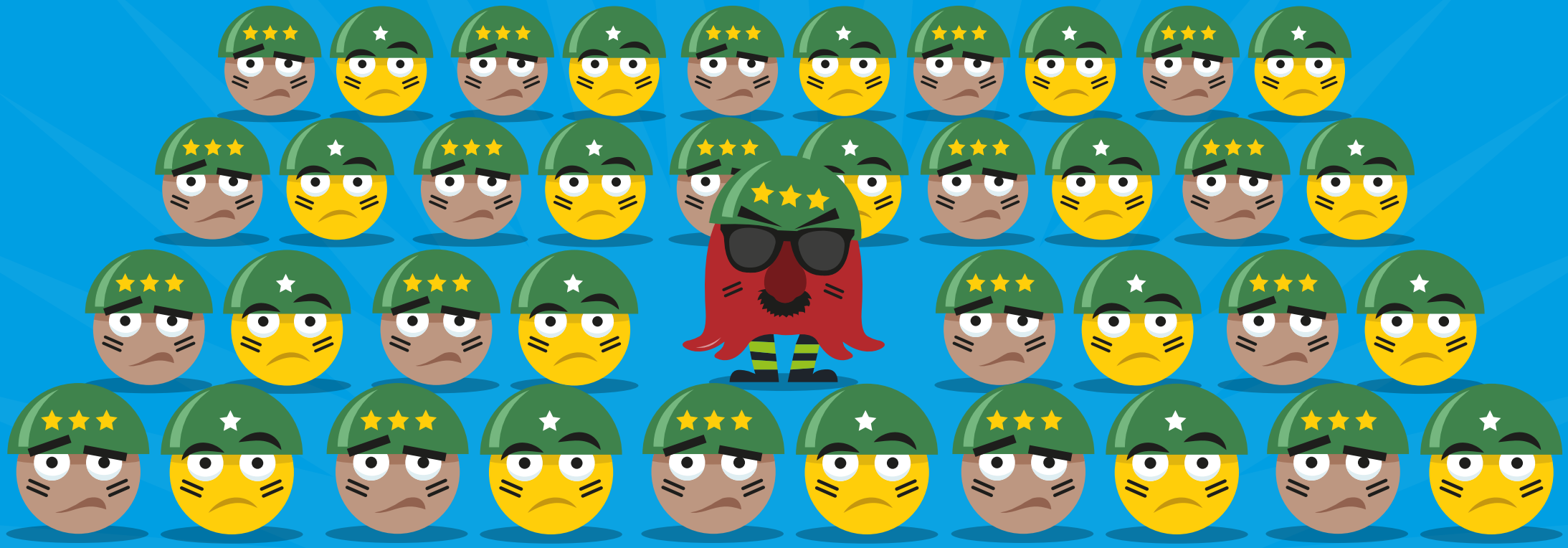
The Immune Army vs. Cancer

Did you know your immune system can fight cancer? But, sometimes harmful cancers grow and spread because they have ways to fool the immune system into letting them survive.



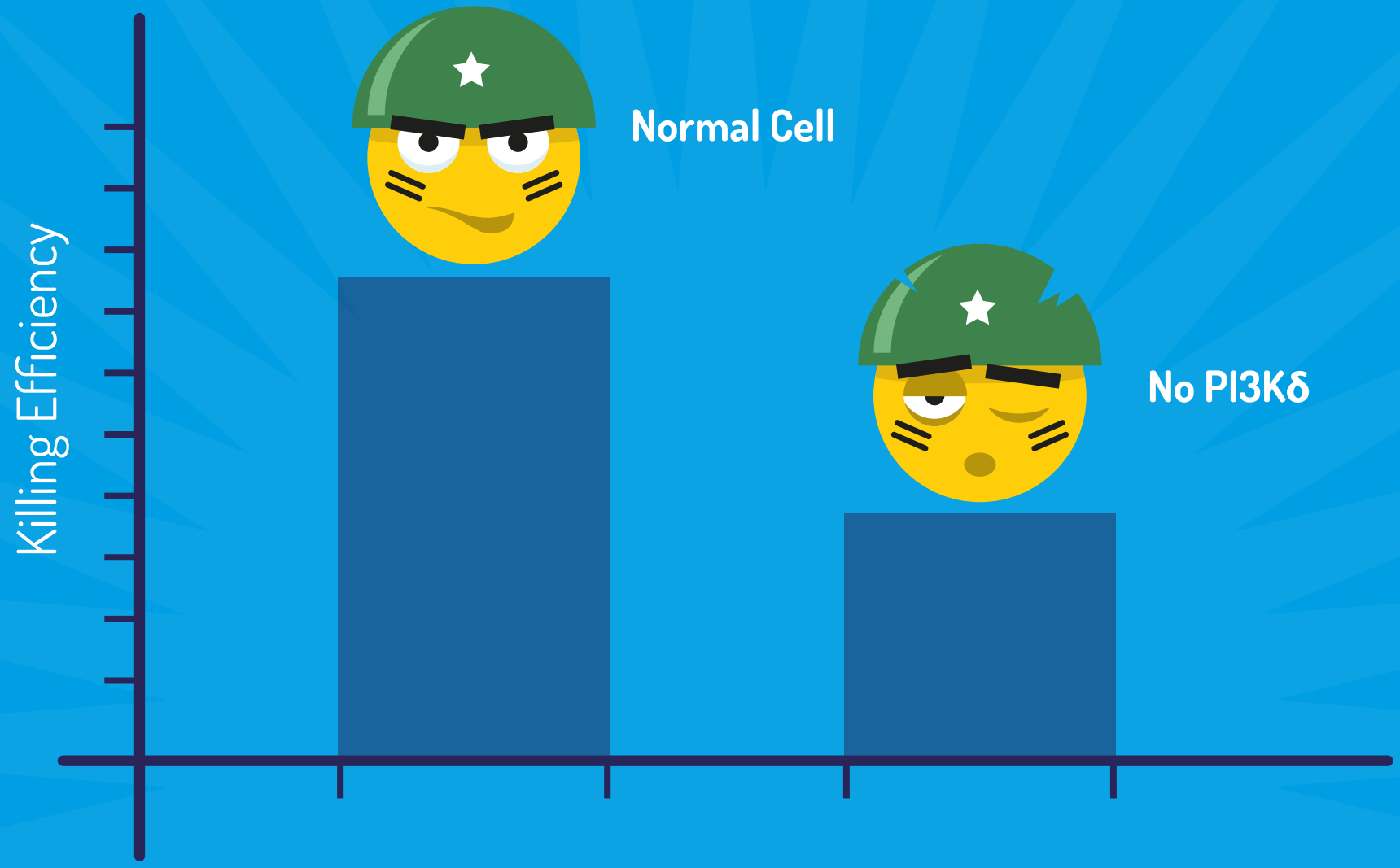
One way they do this is to **hide** from the immune system, altering their expression of **genes** so that they are not recognised as dangerous.

Alternatively, they can **recruit regulatory T-cells** to shield them, essentially corrupting the police officers into protecting them.

However, we've discovered that deactivating a protein called **PI3Kδ** in immune cells slows tumour growth.

But why does this happen?

At first we thought the change was in **killer T-cells**, but when we removed them from the body and gave them tumour cells to kill, the **cells lacking PI3Kδ did worse!**



Could it be instead that the **regulatory T-cells** are being turned off? And that the killer T-cells can get rid of cancer cells like they should (with a weaker attack)?

Regulatory T-cells usually stop our immune system from **running out of control** and damaging our bodies.

We are currently trying to build detailed **profiles** of both killer T-cells and regulatory T-cells to pinpoint the **effects of PI3Kδ deficiency** in each.

T-CELL (Killer)

Babraham Institute

CD44	10
CD62L	2
PD-1	6
G_zB	9

T-CELL (Regulatory)

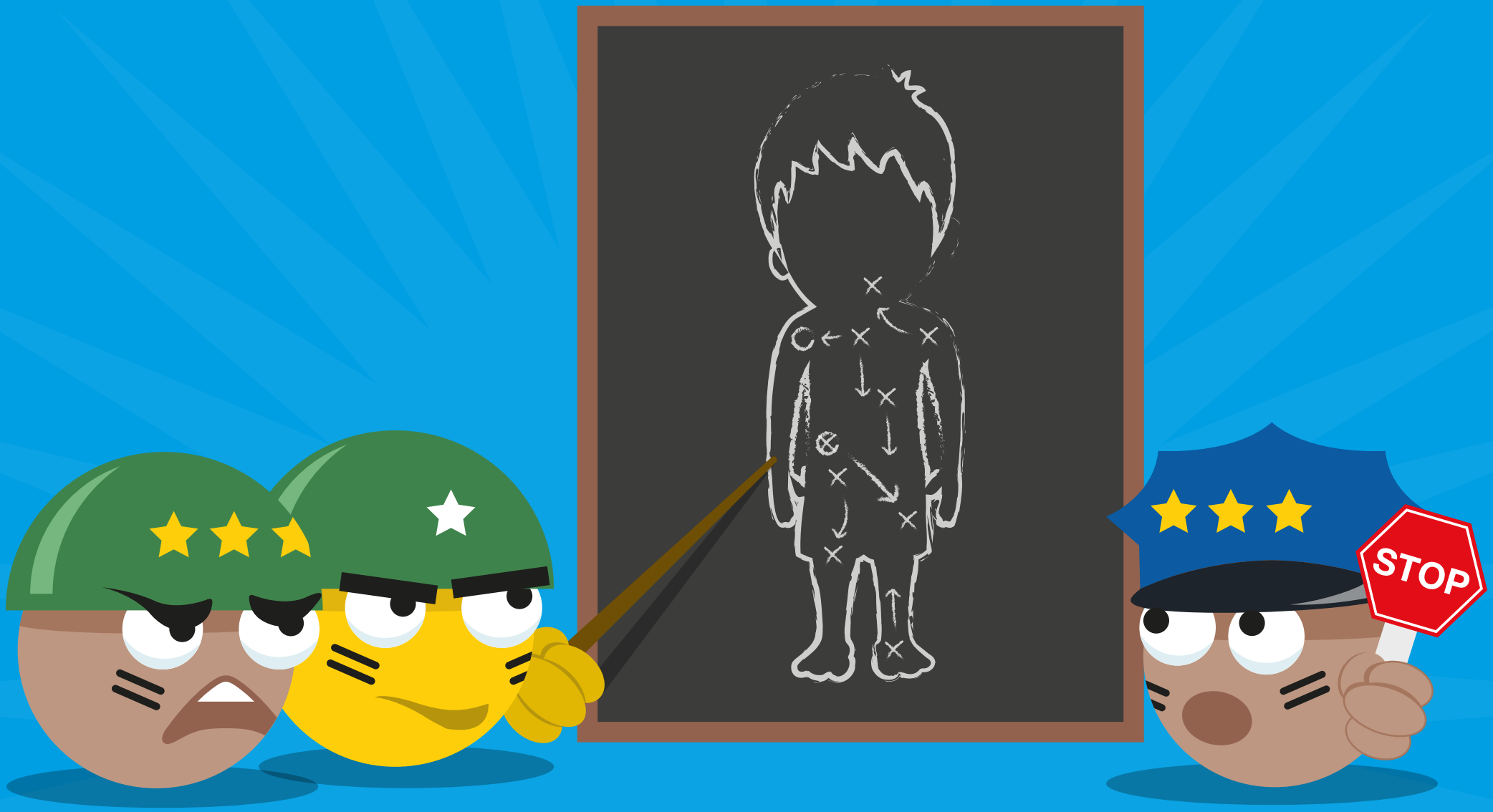
Babraham Institute

CD25	9
CTLA-4	10
PDL-1	6
G_zB	4

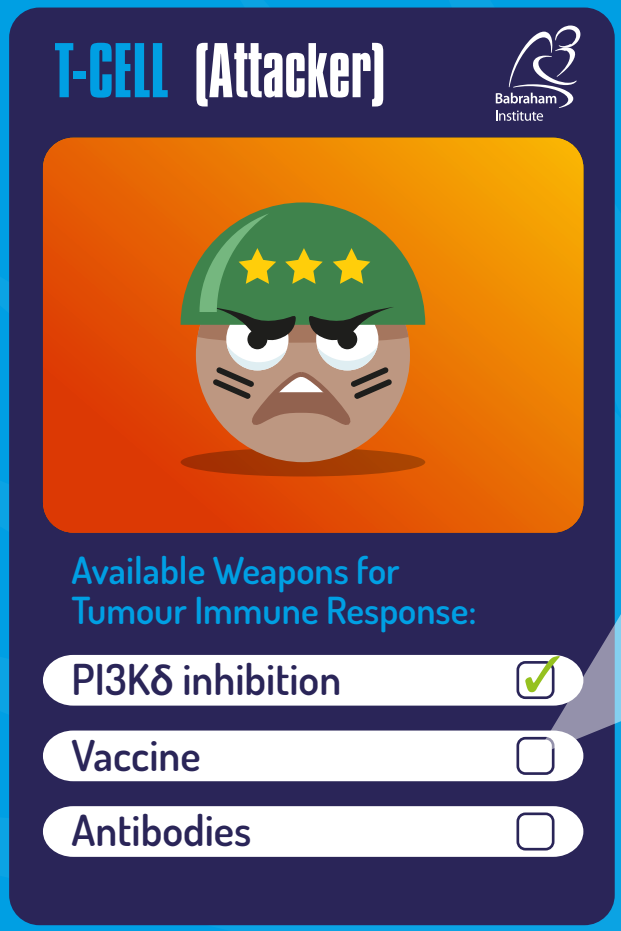
To complicate matters, **no two tumours are the same...**

...and PI3Kδ inhibition **doesn't work equally** against all of them.

We are trying to develop PI3Kδ inhibitors into a **cancer therapy**. Understanding why some cancers respond better than others will allow us to use inhibitors in the most effective way.



We may be able to improve the effect of PI3Kδ inhibition by combining it with other treatments, such as tumour vaccines or antibody therapies.



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Research in the Okkenhaug Lab focuses on how a group of enzymes called PI3Ks are used by cells of the immune system.
www.babraham.ac.uk/our-research/lymphocyte/klaus-okkenhaug