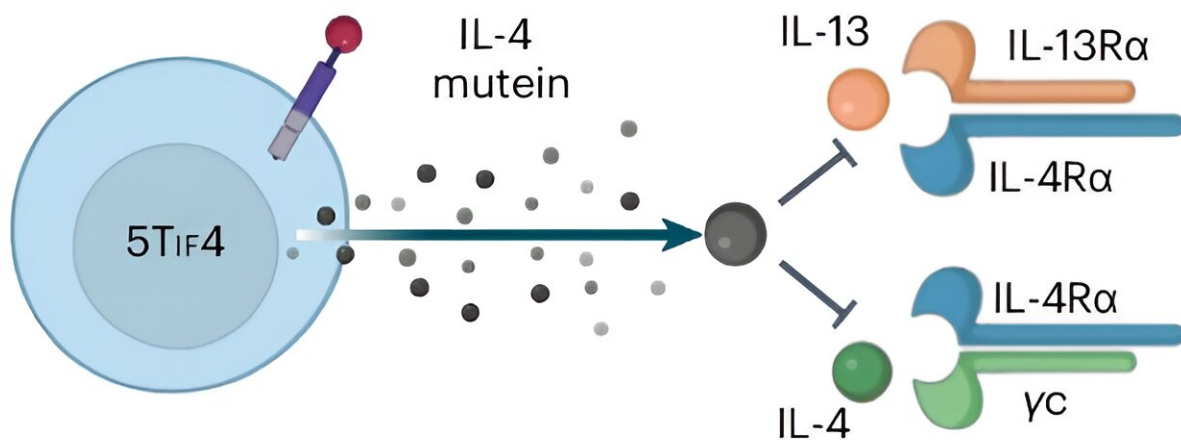


# Engineered CAR T cells repress signs and symptoms of allergic asthma in mice for a year

May 28 2024, by Bob Yirka



Cartoon illustrating the rationale behind 5T<sub>IF4</sub> inhibition of type 2 inflammation. The IL-4 mutein (Gln116Asp/Tyr119Asp) binds to but does not initiate signaling of IL-4R $\alpha$ , inhibiting the signaling of endogenous IL-4 and IL-13 that share IL-4R $\alpha$ . Credit: *Nature Immunology* (2024). DOI: 10.1038/s41590-024-01834-9

A team of molecular oncologists at Tsinghua University's State Key Laboratory of Molecular Oncology, in China, has found that engineered, long-lived and multifunctional T cells repress signs and symptoms of allergic asthma in mice for up to a year.

In their [study](#), published in the journal *Nature Immunology*, the group engineered CAR T cells to reduce the functionality of interleukins associated with type 2 high-signature [asthma](#).

Bart Lambrecht and Hamida Hammad, with the VIB-UGent Center for Inflammation Research, in Belgium, have published a [New & Views piece](#) in the same journal issue outlining the work done by the team.

Asthma is a condition in which airways become inflamed, narrow and swollen—as a reaction, the lungs produce excess amounts of mucus, making it difficult to breathe. The condition is typically treated with inhalers that reduce inflammation. Medical workers and patients would prefer a better treatment option. In this new effort, the team in China may have found one.

The researchers focused on reducing symptoms for type 2 high-signature asthma, which is typically associated with interleukin-5-driven eosinophilia, which drives increases in mucus production.

Engineering [chimeric antigen receptor](#) (CAR) T cells is most often associated with combating cancer, which is where the workers on this team usually focus their efforts. But they noted that such engineering efforts could likely help with other conditions, such as asthma.

To that end, they engineered CAR T  $5T_{IF}$  and  $4T_{IF}$  cells to make them secrete a IL-4 mutein known to block IL-4 and IL-13 signaling. They then injected the results into mice with induced human-like asthma.

The team then monitored the health of the test mice for up to a year—they found that  $5T_{IF}$  and  $4T_{IF}$  cells persisted in the bodies of the mice and that their presence resulted in continued reductions in asthma symptoms.

**More information:** Gang Jin et al, A single infusion of engineered long-lived and multifunctional T cells confers durable remission of asthma in mice, *Nature Immunology* (2024). [DOI: 10.1038/s41590-024-01834-9](https://doi.org/10.1038/s41590-024-01834-9)

Bart N. Lambrecht et al, CAR T cells put the brakes on asthma, *Nature Immunology* (2024). [DOI: 10.1038/s41590-024-01851-8](https://doi.org/10.1038/s41590-024-01851-8)

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