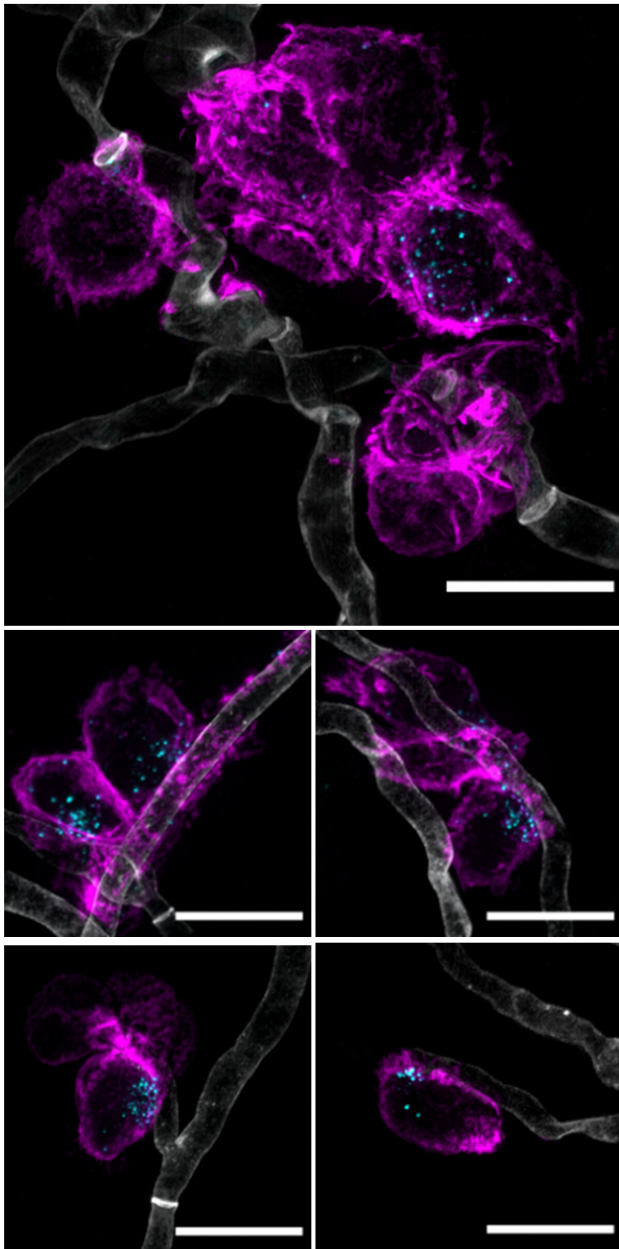


Modifying CAR T cell engineering technique to fight fungal lung infections

29 September 2022, by Bob Yirka

CD8⁺ Af-CAR-1 α T cells



Immunological synapses of the Af-CAR T cells (pink) in coculture with *A. fumigatus* hyphae (grey). Credit: *Science Translational Medicine* (2022). DOI: 10.1126/scitranslmed.abh1209

An international team of researchers has developed a way to modify the CAR T engineering process to create cells that can assist in fighting fungal infections in the lungs. In their paper published in the journal *Science Translational Medicine*, the group describes modifying the CAR T engineering process.

Chimeric antigen receptor (CAR) T cells are genetically engineered to attach to cancer cell antigens, helping the body to eliminate tumors. CAR T cells are engineered by harvesting T cells from a patient and then adding a gene receptor. Then, the CAR T cells are injected back into the same patient. CAR T cells have traditionally been engineered to fight cancer, but in this new effort, the researchers adapted the process to create CAR T cells that go after *Aspergillus fumigatus*—a type of fungus that can lead to infections in [immunocompromised patients](#) or those undergoing chemotherapy, resulting in invasive pulmonary aspergillosis. More recently, researchers have found that people with COVID-19 infections are also more susceptible to such lung infections.

The work closely mimicked the process used to create cancer-fighting CAR T cells. But instead of adding a gene receptor that targets cancer cell antigens, they added one that targets the cell wall of *A. fumigatus*.

The researchers tested their newly engineered cells first in a [petri dish](#) and found that they were able to recognize multiple strains of *A. fumigatus*. They also found that their CAR T cells were able to impede fungal growth by allowing proteins and granzyme B to escape from inside of individual fungi, thereby killing them. The researchers then tested their cells on lab mice. They found that the CAR T cells moved directly to infection sites, and in attaching to fungi, lowered fungal numbers, which in turn helped the immune system remove the infection.

The researchers suggest that T cell engineering similar to that used to treat cancer cells can also be used in other applications, such as fighting [fungal infections](#).

More information: Michelle Seif et al, CAR T cells targeting *Aspergillus fumigatus* are effective at treating invasive pulmonary aspergillosis in preclinical models, *Science Translational Medicine* (2022). [DOI: 10.1126/scitranslmed.abh1209](https://doi.org/10.1126/scitranslmed.abh1209)

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