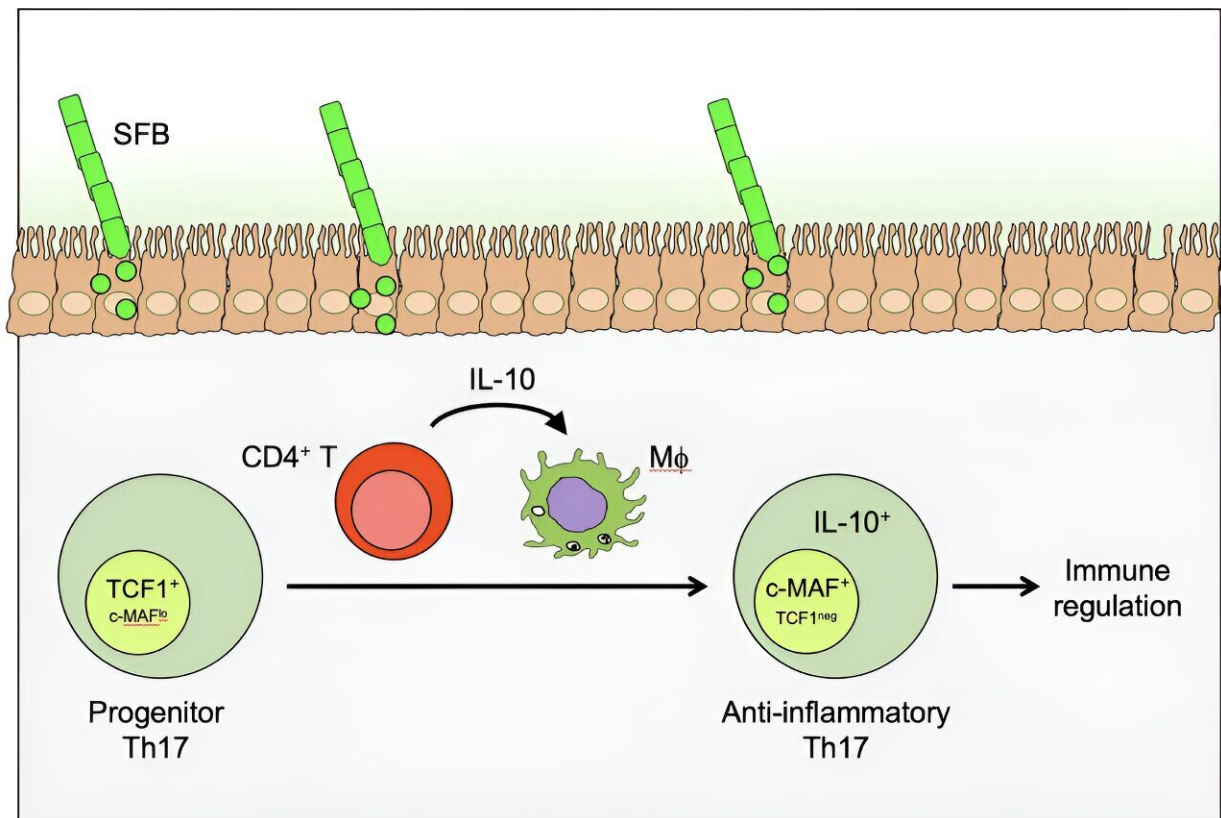


Commensal T cells: How a healthy microbiome reduces gut inflammation

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Graphical abstract. Credit: *Immunity* (2023). DOI: 10.1016/j.immuni.2023.11.003

The microbiome has a profound influence on our health, but exactly how our resident bacteria wield their power is still unclear. A type of T cell

appears to provide some answers for gastrointestinal health, a [study](#) of the mouse microbiome finds.

The study, appearing in the journal *Immunity*, found that when friendly, commensal microbes set up residence inside the gut, their host produces T cells that maintain the health of the gut by counteracting [inflammation](#).

The finding could lead to new treatments for inflammatory bowel diseases (IBD).

"If we can replicate how friendly microbes induce anti-inflammatory commensal T cells, we might be able to develop new therapies to prevent intestinal inflammation related to IBD," says study leader Ivaylo Ivanov, Ph.D., associate professor of microbiology & immunology at Columbia University Vagelos College of Physicians and Surgeons.

Multitasking T cells

Ivanov had previously found that the host produces specific T cells when friendly, or commensal, microbes set up residence inside the gut. The T cells act to keep the microbes under control. "We wanted to know if these T cells had any additional functions," Ivanov says.

The study, conducted in [tissue culture](#) and in mice, determined that the commensal T cells reduce inflammation by producing a cytokine called IL-10.

The commensal T cells are unusual because they perform functions that counteract each other.

"Normally tissues contain two types of T cells: one that promotes inflammation and clears infection and another that suppresses inflammation and helps quench the immune response once infection is

cleared," Ivanov says. "We found that commensal-induced T cells have features of both, probably because commensal microbes do not need to be eliminated and the [immune response](#) to them has evolved to be less inflammatory."

The study also found that commensal T cells can suppress other types of T cells, which suggests they represent a backup, or additional, system to prevent autoimmunity, which occurs when excessive inflammation triggers the [immune system](#) into attacking the body's own cells.

Potential role in obesity, diabetes

In addition to suggesting therapies for IBD, the study may also show how the gut [microbiome](#) influences health in people with obesity, diabetes, or metabolic syndrome.

"We previously found that these T cells improve health in mice with obesity and diabetes, and these improvements could be due to the T cells' anti-inflammatory activity we describe here," Ivanov says.

The lab is now investigating this possibility.

More information: Leonie Brockmann et al, Intestinal microbiota-specific Th17 cells possess regulatory properties and suppress effector T cells via c-MAF and IL-10, *Immunity* (2023). [DOI: 10.1016/j.immuni.2023.11.003](#)

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[cells-healthy-microbiome-gut.html](https://doi.org/10.1093/celltox/cvz011)

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