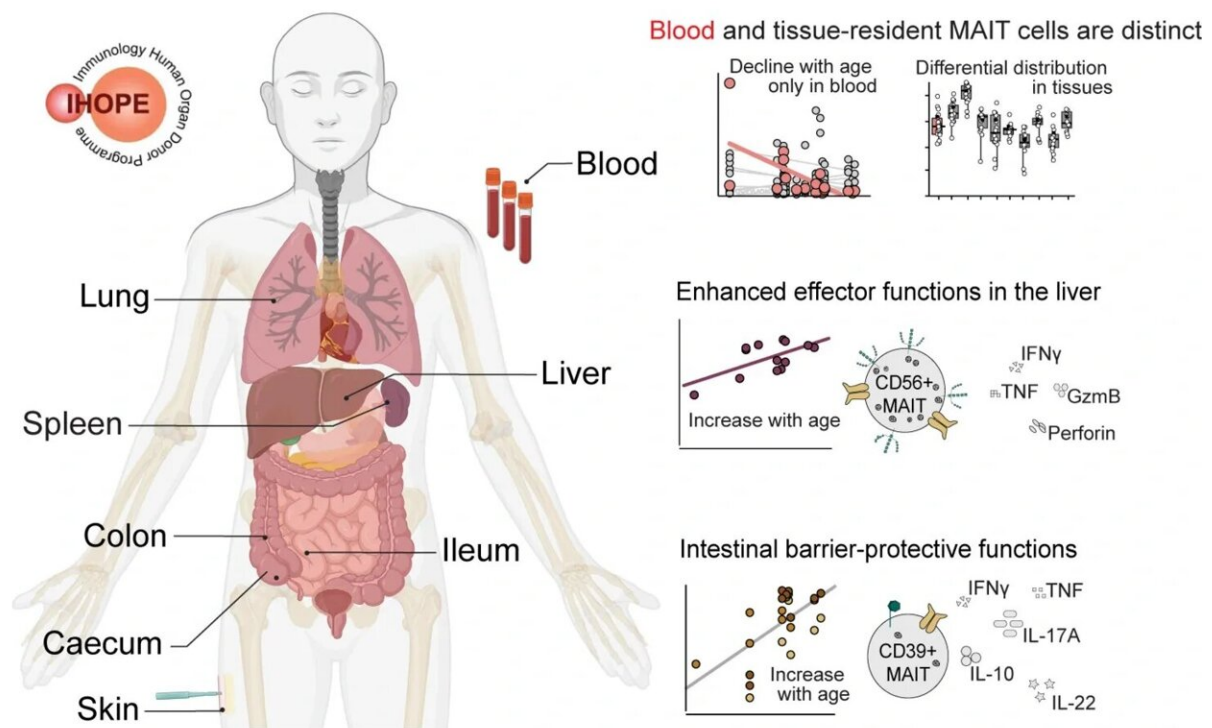


New study reveals specialization of immune cells in different tissues

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Johan Sandberg. Credit: Karolinska Institutet

A new study from Karolinska Institutet has mapped how MAIT cells, which play an important role in the body's defense against microbes, exhibit different properties depending on the tissue they are in.

MAIT cells are a type of T cell that recognize by-products formed when microbes synthesize riboflavin. This makes them unique in the way they detect and fight infections. The researchers examined MAIT cells from blood, barrier tissues and lymphoid tissue samples from organ donors to understand how these cells function in different tissues.

The findings are [published](#) in the journal *Science Immunology*.

"We found that MAIT cells in the intestines have a specialized immunoregulatory profile with high expression of the regulatory enzyme CD39, suggesting that they play a role in protecting the intestinal barrier," says Johan Sandberg, Professor at the Center for Infectious Medicine (CIM), at the Department of Medicine, Huddinge, Karolinska Institutet.

"In the liver, on the other hand, MAIT cells predominantly exhibit high expression of the marker CD56 and an increased ability to fight microbes."

The study also shows that the number of MAIT cells in the blood decreases with age but is preserved in the tissues. At the same time, [tissue](#)-adapted functions in the intestines and liver become increasingly evident with age.

"Our results highlight the functional heterogeneity of MAIT cells and their adaptation to different tissues," adds Prof. Sandberg.

The results of the study add a new dimension to the understanding of the immune system and how different types of [immune cells](#) specialize to protect different tissues against infections.

"This gives us a better understanding of how this arm of the immune system works and can help us develop new treatments for [infectious](#)

[diseases](#)," says Prof. Sandberg.

More information: Tobias Kammann et al, MAIT cell heterogeneity across paired human tissues reveals specialization of distinct regulatory and enhanced effector profiles, *Science Immunology* (2024). [DOI: 10.1126/sciimmunol.adn2362](#)

Provided by Karolinska Institutet

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