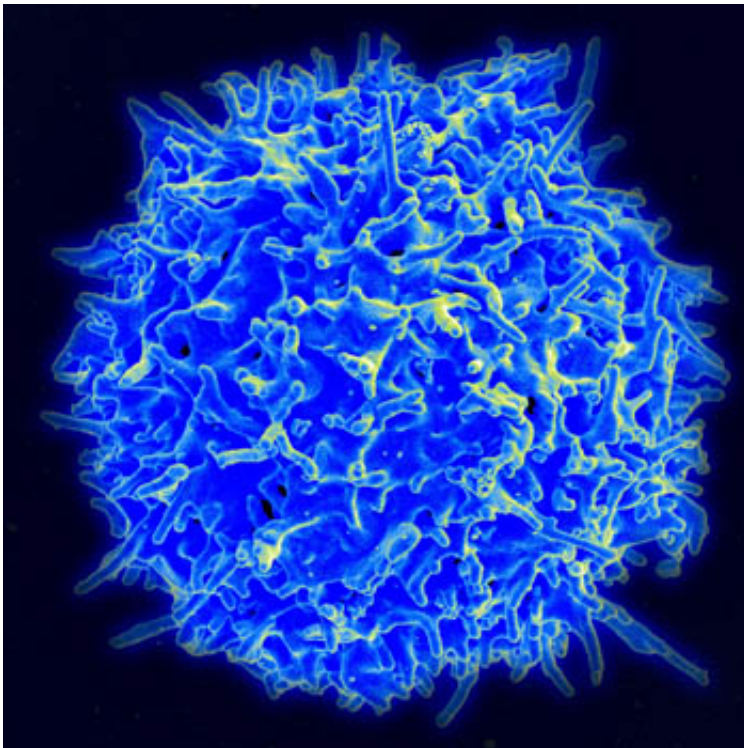


Nature of immune cells in the human brain disclosed

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Scanning electron micrograph of human T lymphocyte or T cell. Credit: NIAID/NIH

Researchers from the Netherlands Institute for Neuroscience and Amsterdam UMC have discovered how T cells protect the brain against harmful viruses. The results of the study, which are published in *Nature Communications*, are important for investigating the role of the immune system in numerous brain disorders.

The immune system protects the body against infections and cancer. The so-called T cells play a key role in this process. When T cells do not work properly, inflammation can develop, including in the brain. Until recently, little was known about the properties of these cells in healthy brains. Researcher and neurologist in training Joost Smolders says, "With this research, we have gained more knowledge about the location of T cells in the brain, how they look, what kind of [inflammatory proteins](#) (cytokines) they produce, and how they are controlled."

The scientists found that the two proteins CTLA-4 and PD-1 are present in large quantities on T cells. These proteins, the discovery of which was awarded the Nobel Prize for Medicine this year, are important inhibitors for T cells.

"If we understand the rules of the game, which T cells in the brain adhere to, then we can understand how T cells deviate from this in brain disorders. This can lead to advances in the understanding and treatment of diseases such as [multiple sclerosis](#), but also in the treatment of tumors in the brain. "

With financial support from the MS Research Foundation, the scientists have investigated T [cells](#) from brain tissue of [brain](#) donors from the Netherlands Brain Bank (NBB). "For the understanding of the role of the immune system in [brain disorders](#), a donor program such as the NBB is of crucial importance. The quality of the material makes unique research possible," says Smolders.

More information: Joost Smolders et al, Tissue-resident memory T cells populate the human brain, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-07053-9](https://doi.org/10.1038/s41467-018-07053-9)

Provided by Netherlands Institute for Neuroscience

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