

# Fatty acids can slow down an overheated immune system

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Sometimes, the immune system mistakenly attacks the body's healthy tissue by responding to infections that do not exist. This causes chronic inflammation and leads to diseases including lupus (SLE), and this is

what happens when the body activates the STING protein. Now, researchers from Aarhus University have discovered that a new type of fatty acid can slow down this overactive protein. This has opened a new path that may possibly result in therapies for diseases that currently have no effective treatments. The results have just been published in the *Proceedings of the National Academy of Sciences (PNAS)*.

## Hope for treatment of life-threatening diseases

The discovery is relevant to all autoimmune diseases related to STING, but in particular for patients suffering from the disease STING-associated vasculopathy (SAVI) with onset in infancy. The disease was first discovered in 2014, and researchers are still uncertain how many people suffer from it.

Patients with SAVI are born with a genetic defect that causes STING to become chronically overactive, which makes them very ill. Unlike many other autoimmune diseases, the disease affects the patients in infancy, leading to stunted growth, psoriasis-like rashes on the skin and impaired lung function. The current treatment is ineffective, and the disease itself is life-threatening.

"Our results bring hope that we can develop effective medicine for the affected children. We also hope that the discovery can be of significance for the treatment of lupus, which is an inflammatory disease of the connective tissue, where STING also plays a role. It affects up to fifty out of every hundred thousand people, primarily women," says Associate Professor Christian Holm from the Department of Biomedicine at Aarhus University. He is responsible for the research results in collaboration with Ph.D. student Anne Louise Hansen from the same department, together with international partners.

The result comes after three years of work, during which the researchers

added the new fatty acid to living cells from SAVI patients in laboratory tests. They observed that STING stops forming the substances that start the inflammation. Despite the fact that there is still a long way to go before researchers know for certain whether this is also the case when testing on humans, a STING-inhibiting substance is good news among researchers and in the pharmaceutical industry, which has spent a lot of time looking for such a treatment. The fatty acid is formed naturally in the body, and could therefore be easier to develop as treatment than an artificially manufactured substance. It is currently being tested as medication.

**More information:** Anne Louise Hansen et al, Nitro-fatty acids are formed in response to virus infection and are potent inhibitors of STING palmitoylation and signaling, *Proceedings of the National Academy of Sciences* (2018). [DOI: 10.1073/pnas.1806239115](https://doi.org/10.1073/pnas.1806239115)

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