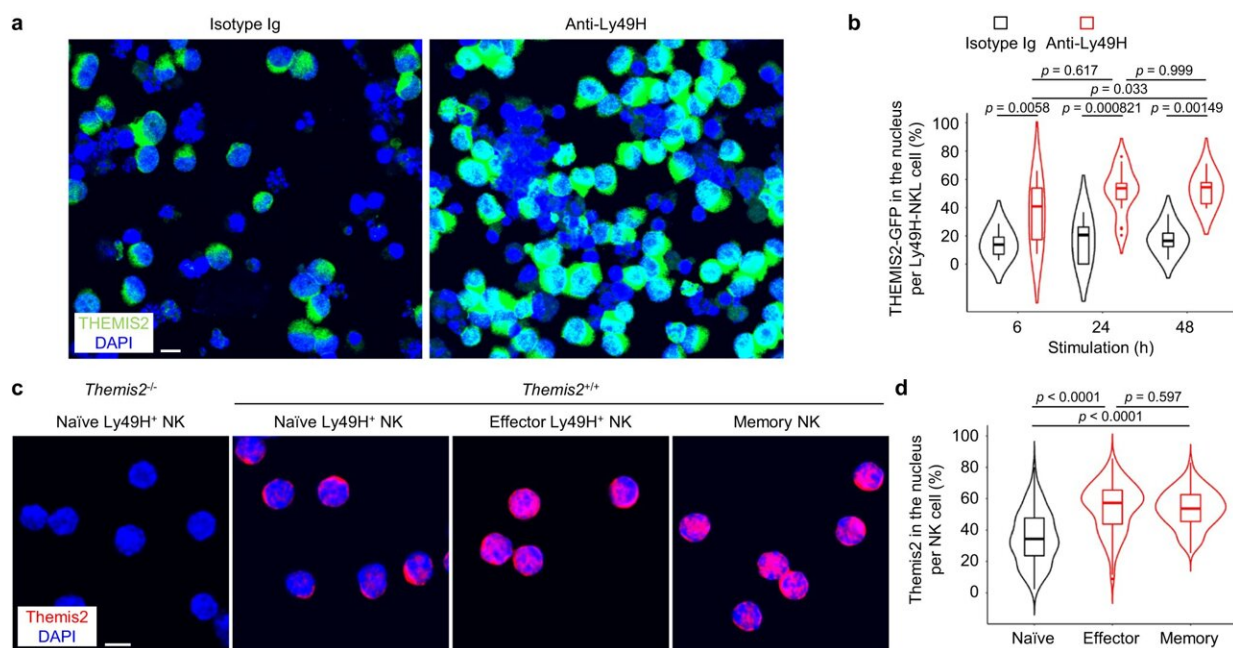


Research discovers key molecule that regulates immune memory of natural killer cells

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Themis2 is translocated into the nucleus of NK cells. Credit: *Nature Communications* (2023). DOI: 10.1038/s41467-023-42578-8

Researchers at the University of Tsukuba have identified a key molecule, Themis2, within natural killer (NK) cells. These cells play a pivotal role in eliminating virus-infected cells. Themis2 remembers viral antigens and further regulates the differentiation of these NK cells into

more potent immune memory NK cells, enhancing their killing ability and overall function.

Viral infections pose a severe threat to [human health](#), with natural killer (NK) cells acting as the primary defense against virus-infected cells.

Following a viral invasion, the [immune system](#) retains a memory of the virus, thereby persisting in the body for a long time. However, it was believed that NK cells could not differentiate into immune memory NK cells capable of robustly combating subsequent viral invasions.

[Recent research](#), published in *Nature Communications*, challenges this established theory, revealing that NK cells can indeed memorize viral antigens and differentiate into immune memory NK cells with considerable killing ability. However, the mechanism of this process still needs to be fully clarified.

The research team uncovered that Themis2, located in the cytoplasm of NK cells, plays a crucial role in regulating the differentiation and function of immune memory NK cells.

Specifically, NK cells deficient in Themis2 exhibit a more efficient differentiation into immune memory NK cells following cytomegalovirus infection compared to wild-type NK cells.

Furthermore, Themis2-deficient immune memory NK cells can efficiently eliminate cytomegalovirus-infected cells. These findings suggest the possible development of a novel therapeutic approach to [viral infections](#) by targeting Themis2 to enhance the differentiation and function of immune memory NK cells.

More information: Tsukasa Nabekura et al, Themis2 regulates natural killer cell memory function and formation, *Nature Communications*

(2023). [DOI: 10.1038/s41467-023-42578-8](https://doi.org/10.1038/s41467-023-42578-8)

Provided by University of Tsukuba

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