

How cellular structure orchestrates immunologic memory

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With every infection or vaccination, memory cells form that the body uses to remember the pathogen. This has been known for decades – but the structure of this cellular immunologic memory has previously proven impossible to pin down. Researchers from the University of Basel and University Hospital Basel have now identified a microanatomical region in memory cells that enables them to work rapidly in the first few hours of an immune response, as they report in the journal *Immunity*.

The human body's immune system remembers disease-causing [pathogens](#) and can react more quickly in case of renewed contact. Vaccines are a prime example of how immunologic [memory](#) can protect us from infectious diseases. In terms of its function and effect, immunologic memory is well understood – an individual remains healthy despite being exposed to the pathogen. However, the specific cellular structures that enable immunologic memory were previously unknown.

An international group of researchers led by Professor Christoph Hess from the Department of Biomedicine at the University of Basel and University Hospital Basel have now found a structure that accounts for the rapid immunologic memory of particular immune [cells](#) (CD8+ memory T cells): these important [memory cells](#) form multiple connections between mitochondria – the powerhouses of cells – and the endoplasmic reticulum, the site of protein production.

Rapid immune response

At these contact sites, the rapid immune memory response is literally "orchestrated", say the researchers. The memory cells concentrate all the signal transmission molecules and enzymes necessary for a rapid immune response here – and so are prepared when the organism is once again exposed to the disease-causing pathogen. This allows the body to quickly protect itself against the

infection.

More information: Glenn R. Bantug et al. Mitochondria-Endoplasmic Reticulum Contact Sites Function as Immunometabolic Hubs that Orchestrate the Rapid Recall Response of Memory CD8 + T Cells, *Immunity* (2018). [DOI: 10.1016/j.immuni.2018.02.012](https://doi.org/10.1016/j.immuni.2018.02.012)

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