

Minimising risks of transplants

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A bone marrow transplant is often the only therapy available to save leukaemia patients, but the risk of complications is high. Despite the considerable time and effort of finding a suitable donor, nearly half of all patients experience an unwanted immune system reaction attacking the skin and liver, and in up to 50 percent of cases, the intestines.

Researchers at FAU (Friedrich-Alexander-Universität Erlangen-Nürnberg) have succeeded in deciphering what causes some instances of this life-threatening inflammation of the intestines, possibly opening up new approaches for treatment. They have published the results of their research in the *Journal of Clinical Investigation*.

The [severe immune reaction](#) is triggered by a special form of the donor's immune cells. These so-called T-lymphocytes recognise that the recipient's cells are foreign and attack them. Researchers at FAU were able to show that this particular form of T-lymphocyte is controlled by a protein called basic leucine zipper ATF-like transcription factor (BATF). "The BATF protein acts as a central switch in the donor's T-lymphocytes," explains Prof. Dr. Kai Hildner. "If the protein is turned on, it can lead to highly aggressive immune cells that massively increase the inflammatory processes, interacting with other [immune cells](#) to cause extensive damage in the intestines after a [stem cell transplant](#)."

The researchers were also able to demonstrate another connection: T-lymphocytes from the donor that migrate into the intestines release a messenger substance called granulocyte macrophage colony stimulating factor, which triggers the inflammatory reaction in the intestines. When researchers used medication to prevent these specialised T-lymphocytes

from developing and functioning, the inflammation in the intestines disappeared.

The scientists hope that the discovery of this molecular mechanism will lead to new therapies being developed to influence inflammation in the intestines after transplants, further increasing patients' chances of survival after a stem cell transplant.

More information: Evelyn Ullrich et al, BATF-dependent IL-7RhiGM-CSF+ T cells control intestinal graft-versus-host disease, *Journal of Clinical Investigation* (2018). [DOI: 10.1172/JCI89242](https://doi.org/10.1172/JCI89242)

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