

Scientists map surface of immune cells

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The immune system must constantly adapt to its environment in order to protect a body effectively. The so-called T cells are an important example in this regard. One of their functions is to form the immune system's "memory". Researchers at the Helmholtz Zentrum München and the Technische Universität München recently examined the surface of precursors of these T cells and identified previously unknown proteins there. According to the scientists, the results, which were published in the journal *Molecular & Cellular Proteomics*, could supply approaches to new therapies in the area of asthma and allergies.

The team headed by Dr. Kathrin Suttner, who, together with Prof. Dr. Carsten Schmidt-Weber, heads the airway immunology research group at the Helmholtz Zentrum München and Technische Universität München, concentrated its work on the so-called naive CD4+ T cells. They are a precursor form of T cells and form the basis for immunological memory. Impaired development of these cells can influence the entire immune system and lead to illnesses such as allergies and asthma.

Protein atlas on T cell precursors

The scientists specifically examined proteins on the surface of the naive CD4+ T cells because these proteins play an important role in the cell development and mediate the corresponding responses to stimuli from the [environment](#). Using mass spectrometry and bioinformatic analysis in close cooperation with the Core Facility Proteomics of the Helmholtz Zentrum München and the Bioinformatics and Computational Biology

Department of the Technische Universität München, the researchers succeeded in precisely identifying a multitude of surface proteins. They also compared the compositions in the early and late activation forms of the cells. "We can understand the results as an atlas for surface proteins. The findings also presented proteins for the first time that had never been known to be associated with T cells or their maturation process," explains Anke Grässel, first author of the study.

The researchers are planning further investigations in the future in order to explain the exact role of these proteins. "We want to contribute to identifying new targets of attack that could serve as a basis for the development of therapeutic or diagnostic approaches," explains group leader Suttner. The researchers find the [surface proteins](#) of the naive CD4+ T [cells](#) to be particularly attractive primarily because their access is relatively simple. "We could be able to influence the cell directly, without introducing the active substance into the cell in a complex procedure," Suttner hopes.

More information: "A combined omics approach to generate the surface atlas of human naive CD4+ T cells during early TCR activation," *Molecular & Cellular Proteomics*, [DOI: 10.1074/mcp.M114.045690](https://doi.org/10.1074/mcp.M114.045690)

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