The earlier, the better

Complex autoimmune diseases affecting various organ systems remain one of the greatest medical challenges in spite of immense advances in treatment. In particular, the diffuse symptoms at the early stage of complex autoimmune diseases make it hard to diagnose the condition early on, which in turn delays treatment. A team of researchers at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) has now demonstrated that treatment can be extremely effective if autoimmune diseases are treated as early as possible, even before the first clinical symptoms appear. The results were published in the journal iScience.

One example of a complex autoimmune disease is systemic lupus erythematosus (SLE), which predominantly affects women. As the disease progresses, the body’s own immune system attacks the skin, blood vessels and internal organs such as the kidneys. Early intervention is important to prevent severe organ damage. Treatment options include suppressing the body’s immune system as well as more targeted therapies, such as removing autoreactive cells. However, until now it has remained unclear how the timing of the various types of treatment would affect the later progression of the disease.

A team of researchers led by Dr. Anja Werner from the Chair of Genetics at FAU has now investigated this question in more detail. ‘Our aim was to target the misguided immune response as accurately and as early on as possible,’ explains Dr. Werner. ‘Many autoimmune diseases are characterised by a loss of self-tolerance years before the actual onset of the disease, for example with autoantibodies being produced which may then attack and destroy organs at a later, active stage of the disease.’ Until now, only limited research has been conducted into whether this early and in some cases temporary loss of self-tolerance may act as a possible biomarker for the later disease, thereby allowing treatment to be commenced at an extremely early stage. Dr. Werner and her team have now demonstrated that targeting and temporarily removing B cells, which are not only involved in producing autoantibodies but can also influence other cells by presenting self-antigens or using messenger substances, has a major impact on how the disease progresses.

‘We were very surprised to see that early and temporary intervention using a well-established method of treatment could have such a dramatic impact on the later progression of the autoimmune disease,’ says Prof. Falk Nimmerjahn, Chair of Genetics. ‘It really seems as if the intervention served to reset the immune system in the treated animals, not only suppressing the production of autoantibodies but also by preventing or significantly delaying severe organ damage.’

wissenschaftliche Ansprechpartner:
Prof. Dr. Falk Nimmerjahn
Chair of Genetics
falk.nimmerjahn@fau.de

Originalpublikation: