A failing immune system

When the immune system is working properly, it protects us from foreign bacteria, viruses and harmful substances. But sometimes it goes wrong and harms us instead. This is what happens in an autoimmune disease, when the body begins to attack itself. It is not known why more and more people are being affected by autoimmunity, despite an increasing understanding of what happens at the cellular level.

RA patients are known to have high levels of autoantibodies in the blood. This can lead to inflammation, because when antibodies bind to their antigen they form immune complexes that activate Fc receptors on the surfaces of immune cells. In patients with RA, the levels of Fc receptors are higher than in healthy people, probably as a result of the increased antibody levels. The researchers injected soluble Fc receptors into mice with RA. The aim was to test whether these added receptors could prevent antibodies attaching to the immune cells, thereby suppressing inflammation and the attack on the joints.

"The treatment reduced the disease. The autoantibodies were taken care of by the soluble receptors, before they could activate the immune system and initiate inflammation. It was exciting to discover that the injected receptors can pick up immune complexes, which makes them a potential therapy for the disease," says Sandra Kleinau.

It remains to be shown whether it works the same way in humans. A company in Germany is now testing the soluble Fc receptor clinically. It is hoped that the receptor might work, and also will be useful for other autoimmune diseases where autoantibodies play an important role in the pathogenesis. Meanwhile, blood samples from RA patients and animal models will represent valuable research tools to further investigate the mechanisms behind autoimmunity and arthritis.

Sandra Kleinau enjoys research. She worked in industry for a time, but says she feels at home at the university. One major reason is the teaching; of both master students and PhD students she supervises. And she is happy and proud when she bumps into former students in various circumstances, and they thank her for an excellent immunology course.

"That is when I feel I have succeeded, that I have spread a little of my enthusiasm for immunology," says Sandra Kleinau.

Besides her research, Sandra Kleinau sings in two choirs, and she has also taken up dancing in recent years. She became hooked after a weekend salsa course under the direction of dance pro Tony Irving. There are lots of new dances she wants to learn now, and dancing has become a big source of joy and for well-being.

"It is important to make time for fun, too. It gives inspiration and energy, which are important to bring into research," says Sandra Kleinau.