Medical Xpress

Important control mechanism behind autoimmune diseases discovered

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Researchers at the Swedish medical university Karolinska Institutet have discovered a new control mechanism in our immune system. The discovery is of potential significance to the treatment of serious diseases such as MS (multiple sclerosis), rheumatoid arthritis, and SLE (Systemic lupus erythematosus).

"Now that we've started to understand the regulatory mechanisms involved in these autoimmune diseases, we are hopeful that new treatments can be found," says Mikael Karlsson, associate professor at the Department of Medicine at Karolinska Institutet in Solna, and one of the team behind the study now published in the highly reputed periodical, the *Journal of Experimental Medicine*.

An important component of our immune defence is a type of cell called a B cell. Normally, the job of these cells is to produce antibodies, which in turn bind to and neutralise invasive microorganisms, such as bacteria and viruses. In people with an autoimmune disease, explains Dr Karlsson, these B cells actually have an injurious effect and instead of serving the body, are activated against its own tissues, which they start to break down.

Patients with SLE and other autoimmune diseases have lower levels of so-called NKT cells. Previously, it was not known what part these cells play in the origin and development of the disease; now, however, the research group at KI has shown that this deficiency is a contributory pathogenic factor.

"We've demonstrated that NKT cells can regulate how B cells become activated against healthy tissue, and that a lack of NKT cells results in greater misguided B cell activation," says Dr Karlsson. "So now we can mechanically link the NKT cell defect in patients to the disease."

The study also shows that the NKT cells directly impede faulty B cell activation, and that they do so early in the misdirected process. The team managed to inhibit the activity of pathogenic B cells by adding NKT cells - a result that may one day lead to new types of treatment.

"This means that new treatments specifically targeting the protective NKT cells can help this patient group," concludes Dr Karlsson.

More information: "Invariant NKT cells limit activation of autoreactive CD1d-positive B cells", Fredrik Wermeling, Sara M. Lind, Emilie Domange Jordö, Susanna L. Cardell & Mikael C.I. Karlsson, Journal of Experimental Medicine, online 3 May 2010, doi:10.1084/jem.20091314 , paper issue 10 May 2010, Vol. 207, No. 5.

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