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Institute of Rheumatology Research
Institut für Rheumaforschung
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Biology of the new interleukin-1 family cytokine IL-38

Project details

Research Leader	Gaby Palmer, University of Geneva School of Medicine and University Hospital Geneva
Participating Institutes	Department of Pathology and Immunology, University of Geneva School of Medicine; Division of Rheumatology, Department of Internal Medicine Specialties, University Hospital Geneva
Relevant conditions	rheumatoid arthritis, psoriasis, Crohn's disease
Project duration	3 years, starting October 2018
Total project cost	CHF 294'378

What are the aims of this research?

Cytokines are small proteins that act as messengers conveying essential information between cells in our body, in particular in the immune system. One type of cytokine are interleukins (IL). They are involved in the regulation of responses to external attack from viruses and bacteria. Some cytokines promote, and some inhibit inflammation. For the immune system to work properly there needs to be the right balance of inflammatory and anti-inflammatory cytokines. If the balance shifts towards an excess of pro-inflammatory signals, this can lead to the development of autoimmune diseases such as rheumatoid arthritis and psoriasis.

The aim of this project is to investigate the biology and potential anti-inflammatory effects of a cytokine called IL-38. The role of IL-38 in the control of immune responses is not yet understood, but our research indicates that it may be implicated in certain autoimmune diseases.

We recently detected IL-38 expression in three chronic inflammatory diseases, namely rheumatoid arthritis, psoriasis and Crohn's disease. We also observed anti-inflammatory effects of IL-38 in different experimental systems. In this project, we will further investigate the regulation of IL-38 production, its cellular function, mechanisms of action and anti-inflammatory properties.

Why is this research important?

Neutralization of key mediators of inflammation such as TNF-α, IL-1 or IL-6 through therapies using biological response modifiers have revolutionised the treatment for several chronic inflammatory diseases. However, not all inflammatory diseases are sensitive to the same cytokine inhibitor(s). In addition, the effectiveness of these therapies varies between patients, and a significant proportion of patients do not respond to the treatments currently available. There is thus an urgent need to design new therapeutic strategies, which might involve the identification of new pathogenic or protective cytokines.

Our working hypothesis is that IL-38 acts as a naturally occurring inhibitor of inflammation and might possess therapeutic properties in specific immune-mediated inflammatory diseases. Indeed, the related cytokine IL-1 receptor antagonist (Anakinra/Kineret) is used with success for the treatment of several inflammatory conditions.

How will the findings benefit patients?

Inflammatory arthritis is chronic, extremely painful and debilitating. Biologic drugs have revolutionised treatment and make a relatively normal life possible for many sufferers. However, they do not work for all patients. Finding effective therapy for these sufferers is an urgent, but neglected area of research. The role of the newly discovered cytokine IL-38 is not well understood but may hold the key to effective treatments for those who do not respond to the current available treatments, or whose medication initially worked, but now has lost effectiveness.