

Promising approach for prognosis and treatment in mastocytosis

13 December 2016, by Johannes Angerer

Systemic mastocytosis is a rare, incurable disease that affects approximately one in 10,000 people. It is a haematological tumour disease, similar to leukaemia, in which the bone marrow and other organs, such as the bowel, liver or spleen, are infiltrated by mast cells. In the animal model, researchers at MedUni Vienna's Institute of Laboratory Medicine have now discovered a new prognostic and therapeutic approach that could at least help to prevent rapid progression of the disease. This has now been published in the leading journal *Blood*.

Mastocytosis is characterised by different possible courses. In the aggressive form, life expectancy is around five years. A research group led by Gregor Hörmann at the Institute of Laboratory Medicine (Head: Oswald Wagner) has now succeeded in identifying cytokines – proteins that regulate cell growth – as important factors in the progression of the disease. These cytokines affect the microenvironment of the mast cells in the [bone marrow](#) and influence angiogenesis, as well as the pathological proliferation of connective tissue. Says Hörmann: "In a complex interplay between neoplastic [mast cells](#) and bone marrow stromal cells, these cytokines play a significant role in the disease's progression into its aggressive forms."

Cytokine level as a prognostic tool

Patients suffering from systemic mastocytosis primarily display an elevated blood serum concentration of the cytokine CCL-2. "CCL-2 is an important mediator in inflammatory responses and leads to angiogenesis in solid tumours," explains lead author Georg Greiner. A joint analysis of clinical data, in conjunction with Peter Valent (Division of Hematology and Hemastology/Department of Medicine I), Leonhard Müllauer (MedUni Vienna's Department of Pathology) and Matthias Mayerhofer (Central Laboratory of Hanusch Hospital), showed that, in mastocytosis, high CCL-2 serum levels are

associated with advanced stages of the disease and a significantly shorter overall survival time.

"Measuring cytokine levels can therefore help to make a more accurate assessment of the individual prognosis in mastocytosis," says Hörmann.

Working in collaboration with the working groups of Veronika Sexl of the Institute of Pharmacology and Toxicology of VetmedUni Vienna and Lukas Kenner (Department of Pathology), they were also able to show that CCL-2 is a key factor in the growth of mast cell tumours. Antibodies are already being tested for the treatment of breast and prostate cancers, where elevated CCL-2 levels are also present, and it is possible that these can also be successfully used to treat mastocytosis or could offer a new treatment option in combination with other methods.

More information: G. Greiner et al. CCL-2 is a KIT D816V-dependent Modulator of the Bone Marrow Microenvironment in Systemic Mastocytosis, *Blood* (2016). DOI: [10.1182/blood-2016-09-739003](https://doi.org/10.1182/blood-2016-09-739003)

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