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Today the new Christian Doppler Laboratory for Complement Research was opened at the Center for Pathophysiology, Infectiology and Immunology at MedUni Vienna. The research institute, which is funded by the Federal Ministry of Science, Research and Economic Affairs (BMWFW) is concentrating on a special protein that is thought to play an important role in controlling excessive immune reactions.

"Christian Doppler Laboratories such as this one promote the transformation of scientific know-how into practical applications. That not only helps patients but strengthens Austria's position as a centre for

research, with all the jobs that entails," says Reinhold Mitterlehner, Minister of Science, Research and Economic Affairs, thereby stressing the importance of the funding programme. "The CD Laboratory conducts high-level, application-oriented basic research. This involves outstanding scientists working closely with innovative companies," says Mitterlehner. The Christian Doppler Research Association is regarded as a global model of Best Practice in promoting this type of collaborative initiative.

Endogenous proteins display anti-inflammatory properties

As part of the immune system, the complement system, which is made up of 30 plasma proteins, plays an important role in fighting pathogens by interacting closely with other components of the immune system. It helps antibodies and phagocytes to eliminate pathogens. In addition to that, the complement system helps significantly with removal of immune complexes and apoptotic (dead) material, thereby helping to maintain immune homeostasis (equilibrium).

In autoimmune diseases and immune pathologies such as rheumatoid arthritis, psoriasis or organ rejection, inflammatory processes take place in the body, triggered by its own immune system. Whereas, up until now, activation of the complement system has primarily been associated with intensification of immune reactions and inflammation, there is now evidence to suggest that complement products can prevent excessive immune responses. An important aspect of this would seem to be that the complement system disposes of dead cells and end products of immune reactions.

Activation and regulation of the complement system results in the formation of so-called complement fragments, such as the protein C4d.

Preliminary studies at the Institute of Immunology at MedUni Vienna have provided the first indications that complement fragments such as C4d inhibit immune responses, thereby having an anti-inflammatory effect.

"The long-term goal of this Christian Doppler Laboratory is to develop therapeutic approaches based on inhibitory complement proteins so as to be able to prevent inflammatory reactions appropriately," explains Peter Steinberger of the Institute of Immunology at MedUni Vienna and director of the new CD Laboratory.

Provided by Medical University of Vienna