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Press release
For immediate release

Med Uni Graz identifies genetic risk factor for TBE
Genetic mechanism might be the key to new treatment strategies

Graz, 10 March 2026: An international research team led by Medical University of Graz scientists has identified a key target of the TBE virus in the human body. Tick-borne encephalitis (TBE) causes severe inflammation of the central nervous system; a specific antiviral therapy is not currently available.

One of the world's largest TBE studies

Under the direction of Werner Zenz, Department of Paediatrics and Adolescent Medicine, Med Uni Graz initiated an international research collaboration with partners from nine European countries. A total of 1,600 patients underwent genetic testing. "It is one of the largest studies of TBE ever undertaken worldwide," says Zenz.

Using a genome-wide association study, first authors Piyush Gampawar and Manfred Sagmeister analyzed around 700,000 genetic variants per person, comparing them with healthy control groups. In the process, they came across a genetic variant in the ABCG1 gene.

ABCG1 potentially "opens the door" for the virus

The ABCG1 gene plays a central role in the metabolism of cholesterol. It transports cholesterol out of the cell to the surface of the cell, where it is picked up by HDL particles. The study has now shown that certain variants of this gene are associated with an increased risk of TBE infection.

Even more significant is another finding from the lab. If the gene is specifically blocked in cell cultures, the TBE virus is much less able to multiply.

"Our findings strongly suggest that ABCG1 is the main target of the TBE virus in the human body," explains Zenz. "This opens up completely new perspectives for our understanding of the disease—and in the long term possibly for therapeutic approaches as well."

Relevance for Austria

Although a vaccine exists that is well tolerated and offers a high rate of protection, each year between 100 and 200 cases of TBE are reported in Austria alone. Disease progression is frequently so severe that every other adult patient has lasting impairments upon discharge from the hospital. Around ten percent suffer from temporary paralysis; the mortality rate is about one percent. There is still no specific antiviral treatment.

Looking to the future

The discovery made in Graz might have a significance well beyond TBE. Future studies should clarify whether targeted manipulation of ABCG1 can positively change the course of the disease. Equally interesting is the question of whether this mechanism also plays a role in other types of central nervous system inflammation caused by viruses.

Publication

Genome-wide association study identifies ABCG1 as a susceptibility locus for tick-borne encephalitis

<https://www.sciencedirect.com/science/article/pii/S2589004225022783?via%3Dihub>

Further information

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