

Antiviral protein hampers TBE virus

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Tick-borne *encephalitis* (TBE) is a viral infectious disease caused by TBE virus and is transmitted by the bite of an infected tick to humans. TBE can lead to serious brain damages with long-lasting symptoms. Credit: Elin Berge

Research at Umeå University in Sweden presents a new discovery: the protein viperin can prohibit tick-borne encephalitis virus (TBEV) from multiplying in the cell. It also limits the amount of functional viruses that

can leave the cells.

"Through the understanding of how the antiviral protein viperin prohibits TBE virus, we were able to identify two new weaknesses of the TBE virus that will hopefully be utilised in the future to develop efficient ways of breaking TBE infection," says Kirstin Vonderstein, doctoral student at the Department of Clinical Microbiology and author of the dissertation.

Since viruses use the cell building blocks to multiply and spread to other cells, the cells have developed mechanisms to recognise and defend themselves against viruses. A key component in the cell's early defence mechanism against [viral infections](#) is the signal protein interferon, which is submitted as a warning to adjacent cells. These cells are then able to produce proteins that protect themselves against viral attacks. One of the cell protecting proteins is viperin.

Kirstin Vonderstein, together with research colleagues at the Unit for Virology, has studied how viperin is active in its defence against TBEV. Research shows that viperin prohibits viral multiplication inside the cells as well as limits the amount of functional viruses that can leave the cells. In addition, the researchers found that viperin does not act on its own, but needs other cell proteins to perform its function.

"The discovery provides us with an increased understanding of how this antiviral protein hampers the TBEV and what happens in the [cells](#) when the virus is being fought. Further research is required to elucidate the antiviral mechanisms of viperin in detail, but our hope is that this discovery will lead to an efficient drug against TBE in the long run," says Kirstin Vonderstein.

Tick-borne encephalitis (TBE) is a viral infectious disease caused by TBE virus and is transmitted by the bite of an infected tick to humans.

TBE can lead to serious brain damages with long-lasting symptoms. Annually, approximately 200 Swedes seek medical help due to TBE. Worldwide, this number reaches around 12,000. At present, there is no treatment, only certain relief to symptoms can be offered.

More information: umu.diva-portal.org/smash/record.jsf?pid=diva2%3A970523&dswid=newPopUp

Provided by Umea University

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