First proof of a direct association between coronavirus and neurological disease

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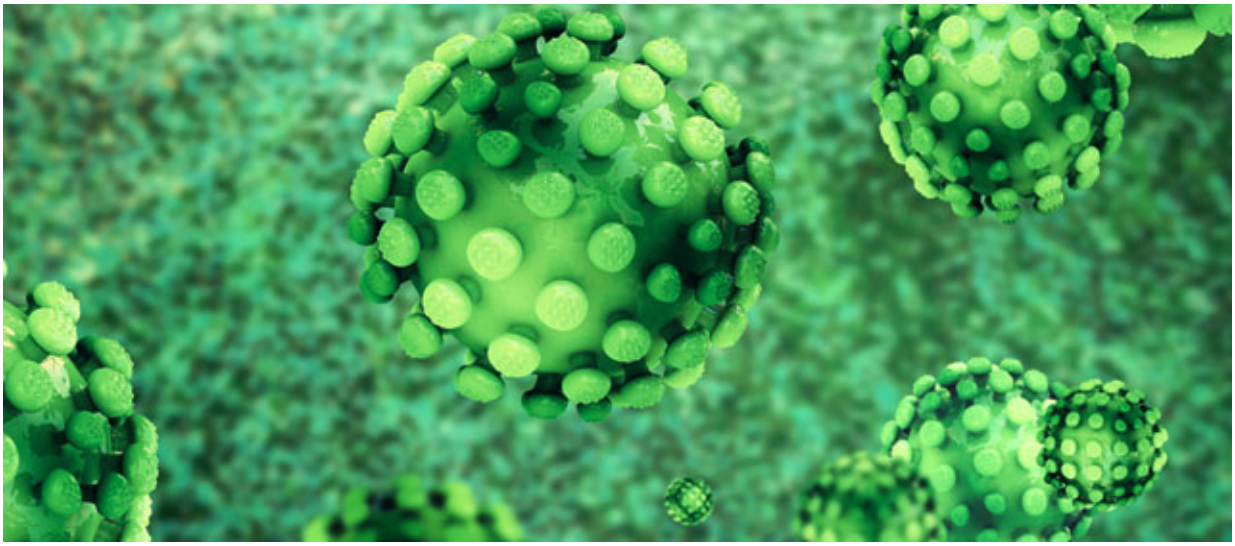

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For the first time, researchers have found proof of a direct association between strain OC 43 of the human coronavirus (HCoV) and neurological disease in humans. This major breakthrough was made by British and Quebecois researchers, including Professor Pierre Talbot of the INRS-Institut Armand-Frappier Centre, who was the first not only to demonstrate the virus's ability to invade the human central nervous system, but also to suggest the neuropathological effects of this virus responsible for approximately 20 percent of common colds and more severe respiratory conditions in certain vulnerable individuals. The

discovery was recently featured in the *New England Journal of Medicine*, one of the world's most prestigious scientific journals.

The researchers studied the case of a very young patient who died from encephalitis. The patient had presented severe immunodeficiency and received a stem cell transplant. Although most cases of encephalitis are caused by viruses or bacteria, it can be particularly difficult to pinpoint the cause in immunodeficient patients. As the case study shows, it was impossible to identify the pathogen using conventional techniques.

The researchers used various methods that allowed them to irrefutably identify the presence of strain OC-43 of the human coronavirus in the young patient's brain tissue. "Among the methods used, deep sequencing of biopsy materials provides an important tool for the diagnosis of unexplained encephalitis, particularly in immunodeficient patients who have undergone stem cell transplantation," said Professor Talbot. This breakthrough is significant because it will make it possible to use specific treatments that are better tailored to patient conditions.

The results obtained confirm Professor Talbot's hypothesis that the human respiratory coronavirus can cause certain neurological diseases of unknown origin, such as multiple sclerosis, Alzheimer's disease, Parkinson's disease, and encephalitis.

More information: Sofia Morfopoulou et al, Human Coronavirus OC43 Associated with Fatal Encephalitis, *New England Journal of Medicine* (2016). DOI: 10.1056/NEJMc1509458

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