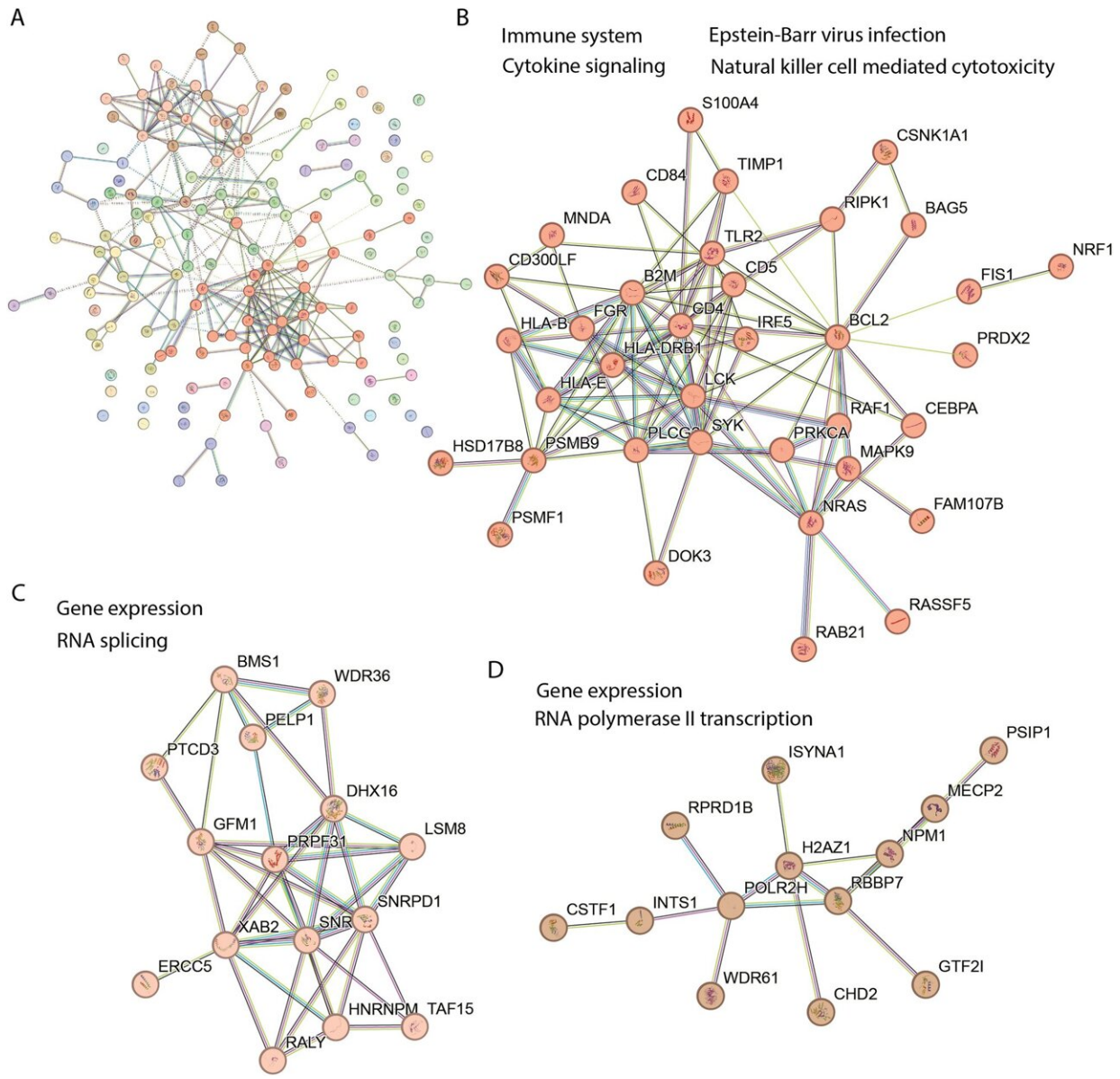
Medical Xpress

Strong links found between long COVID and myalgic encephalomyelitis/chronic fatigue syndrome

January 23 2024



Differentially regulated proteins in long COVID patients clustered into three groups. Credit: *Scientific Reports* (2023). DOI: 10.1038/s41598-023-49402-9

People suffering from long COVID or myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) could benefit from a coordinated treatment strategy, a new University of Otago study has found.

The pilot study, published in *Scientific Reports*, has confirmed what researchers have suspected for some time: the two conditions are closely related.

Senior author Emeritus Professor Warren Tate says the research—the first comparative molecular study of the immune cell proteins of both conditions—"strongly affirms" the link between the two.

"This means information from study of the pathophysiology of ME/CFS and therapeutic opportunities that have slowly accumulated over the last 30 years can be transferred to understanding and treating the now estimated 100 million cases of long COVID world-wide.

"But equally important, the immense resources put into long COVID research currently in the rich nations, while yet to produce major breakthroughs, can also benefit the many millions of 'hidden' ME/CFS patients whose numbers have increased steadily over time in the absence of their recovery from the illness."

Study results showed the immune system activity of six long COVID patients one year after a COVID-19 infection was dramatically different from five healthy controlled-group study participants, reflecting a

chronic dysfunctional state.

Data gathered from those patients was found to be similar to data gathered from a group of nine diagnosed ME/CFS patients, who had suffered the condition for 16 years on average.

The study reinforces the researchers' previously published model in *Frontiers of Neurology* to explain the complex dysfunctional physiology for both ME/CFS and long COVID: In susceptible people (determined by their health history and genetic background), the normal transitory immune/inflammatory response of the peripheral nervous system to infection or stress does not resolve quickly as in most people.

Instead, it becomes chronic and leads to a cascade effect involving the brain, immune system and central nervous system, which in turn results in multiple neurological symptoms and poor brain regulation of body physiology.

Emeritus Professor Tate says long COVID from the pandemic SARS-CoV-2 virus is a specific example of ME/CFS, that has occurred in susceptible people from endemic viruses like glandular fever, and from small historical viral outbreaks geographically contained like the SARS-CoV-1 virus outbreak in 2003.

"It highlights within our community there are significant numbers of people debilitated now with disrupted immune systems, dysfunctional energy production, and disturbed brain regulation of their overall physiology that severely disrupts their family lives, ability to work and participate in their communities long-term, and that these people need support from all levels of society."

Therapeutic targeting of the immune response/inflammatory pathways could be effective, Emeritus Professor Tate says.

"Currently, patients with ME/CFS and long COVID will understandably clutch at any potential treatment suggested to find a better quality of life in the absence of defined treatments.

"That means often multiple drugs, nutraceuticals, cognitive therapies and relaxation strategies with possible crossover adverse effects are being tried at the same time, without resulting benefit to the patient in most cases."

While potential compounds are available that target different points of the cellular energy production pathway, no systematic studies have been carried out to determine whether they show real benefit.

Investment in combined clinical trials to treat both conditions is desperately needed, he says.

"Immunotherapy for treating specific features of a disturbed immune system for many diseases is in a revolutionary phase of development and should have potential for application to ME/CFS and long COVID patients now the specific changes in their dysfunctional immune systems are being carefully documented."

Emeritus Professor Tate is calling for national guidelines with best practice disease management plans for clinicians so both patient groups have a good chance of a more fulfilling life no matter the stage of their illness, although he points out this must be accompanied by specialist clinics with a range of practitioners to support the patient's needs.

More information: Katie Peppercorn et al, A pilot study on the immune cell proteome of long COVID patients shows changes to physiological pathways similar to those in myalgic encephalomyelitis/chronic fatigue syndrome, *Scientific Reports* (2023). DOI: 10.1038/s41598-023-49402-9

Provided by University of Otago