Chronic fatigue -- Clues in the blood

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Researchers at the University of New South Wales (UNSW) believe that blood may hold vital insights into what is happening in the brain of patients with chronic fatigue syndrome (CFS).

In a study unparalleled in its scope, a team led by UNSW Professor Andrew Lloyd of the Centre for Infection and Inflammation Research, has studied the differences in gene expression patterns in the blood of people who either recover promptly after acute glandular fever or develop the prolonged illness called post-infective syndrome.

The researchers examined six million pieces of gene expression information for analysis in the project, known as the Dubbo Infection Outcomes Study. The study is named after the NSW town in which the work was conducted. The team studied the expression of 30,000 genes in the blood, testing each of the 15 individuals between four and five times over a 12-month period.

The team was able to narrow its findings to the expression of just 35 genes whose pattern of expression correlated closely with the key symptoms of the illness when examined from onset through to recovery. Gene expression is significant because it is the process by which a gene's DNA sequence is converted into the proteins which ultimately determine the manifestations of disease.

The research paper has been published and selected for editorial comment in the prestigious Journal of Infectious Diseases.

Since 1999, the team has been tracking the long-term health of individuals infected with Ross River virus (RRV), Q fever infection and Epstein-Barr virus, which causes glandular fever.

“These [35] genes might point to the nature of the disease process that underlies CFS, which is currently unknown,” said Professor Lloyd, who is based in the School of Medical Sciences at UNSW. “None of them are ones that I would have predicted, except for those relating to neurotransmitters,” he concedes. “Some of them relate to transport of zinc and other metal ions within the cell, which may suggest a fundamental disturbance in cellular function.”

The researchers now hope to take narrow the focus of research onto the expression of these 35 genes in the blood of a much larger group of subjects from the Dubbo Infection Outcomes Study, with varied patterns of illness and recovery.

“There are very few complex diseases which have been comprehensively analysed, with large scale and longitudinal studies, like this,” said Professor Lloyd. “It sets a standard for highly sophisticated, comprehensive gene expression studies in the blood of all sorts of human diseases from rheumatoid arthritis and multiple sclerosis through to schizophrenia.”

Source: University of New South Wales

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