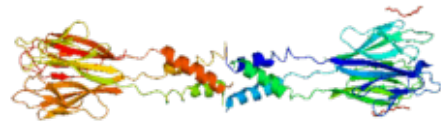
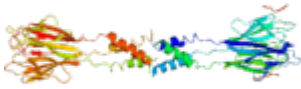


# Inflammation associated with chronic fatigue syndrome



Structure of resistin  
(Ashley Hellenbrand,  
Wikimedia Commons)

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a condition that affects millions around the world. The pathogenesis of the disease has been suspected to be linked to inflammation but little was known about what mechanisms were driving this. This study shows that individuals with ME/CFS have differences in cytokine expression compared to controls and the cytokine profiles were linked to the severity of the disease. These data could aid in the development of ME/CFS diagnostics and therapeutics.

Individuals with ME/CFS suffer from symptoms including persistent fatigue over several months which is not aided by rest, headaches, hypersensitivity and cognitive impairment.

The severity of the condition differs between patients. Many individuals with ME/CFS also suffer from symptoms which are usually associated with immune dysfunction including arthralgias (joint pain) and myalgias (muscle pain). However, the usual markers of inflammation, including levels of C-reactive protein, are usually not elevated in these individuals. There are also conflicting studies on whether the immune responses in these individuals is abnormal.

Therefore, the researchers in this study aimed to comprehensively profile cytokine immune responses in individuals with ME/CFS. They recruited 192 ME/CFS patients and 392 controls who did not have the condition. They measured serum cytokine levels in all the participants. Age, sex and race of participants were all taken into consideration. The researchers found that TGF- $\beta$  (primarily secreted by regulatory T cells) was elevated in individuals with ME/CFS and resistin (primarily secreted by peripheral blood mononuclear cells) was lower. 17 cytokines altogether were correlated with the severity of ME/CFS including IFN- $\gamma$ , IL-4, IL-5 and CXCL1. Thirteen out of these seventeen cytokines had pro-inflammatory functions and may be the cause of the symptoms experienced by ME/CFS patients.

Altogether, this study shows that the cytokine profile for people with ME/CFS is distinct from people without the condition. The elevated cytokines may be useful as a marker of the disease.

Journal Article: [Montoya et al., 2017. Cytokine signature associated with disease severity in chronic fatigue syndrome patients. PNAS](#)

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