

## Emerging Health Threats Forum

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● News

● Journal

● Monitor

● Resources

● Forum

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### US study spots chronic fatigue virus

Genetically diverse group of retroviruses found in chronic fatigue patients and healthy blood donors



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The first study to back a controversial claim that chronic fatigue syndrome (CFS) may be linked to a retrovirus in patients' blood was published<sup>1</sup> this week in *Proceedings of the National Academy of Sciences USA*.

Shyh-Ching Lo and colleagues found gene sequences similar but not identical to xenotropic murine leukemia virus-related virus (XMRV) in 32 of 37 (86.5%) patients whose blood was collected in the mid-1990s. The virus fragments were found in just three of 44 (6.8%) healthy volunteers — a much smaller proportion that nevertheless points to the possibility of blood-borne transmission.

The percentage of virus-positive patients was higher when only those who were “rigorously evaluated” were taken into account. When the researchers tested four of these patients two years later, all of them were still positive for the virus. “On repeated testing of eight... patients ~15 y[ears] later (in 2010), seven remained positive.”

Evidence of an association between the condition and XMRV, which is related to the murine leukemia virus (MLV), surfaced last year in a **study of US patients** by Vincent Lombardi and colleagues published in the journal *Science*. It followed a separate **study linking the retrovirus with human cases of prostate cancer**. But since then, researchers testing the blood of CFS patients in the **UK** and **the Netherlands** found no signs of the virus, casting doubt on the original findings.

A suggestion that geographical differences may explain the disparate results appeared less plausible last month when research **published in *Retrovirology*** also found no evidence of the virus in US patients with the condition.

But Lo and colleagues lend new support to suggestions of a link. “Although we find evidence of a broader group of MLV-related viruses, rather than just XMRV, our results clearly support the central argument... that MLV-related viruses are associated with CFS and are present in some blood donors,” they write.

The study by Lombardi *et al.* found fragments of XMRV virus that were nearly identical, whereas the authors say they detected three different types of fragments that point to the presence of viruses that belong to the same group but differ genetically.

The research raises questions over how these retroviruses may be related to the risk of CFS, a condition whose cause is unknown. More than a million people in the USA and 250,000 in the UK suffer from persistent fatigue and other neurological or immunological symptoms typical of CFS.

Animal data suggest that XMRV and the MLV-related viruses implicated in the study bind the same receptor to enter cells, Valerie Courgnaud and colleagues write in a commentary<sup>2</sup>. “Identifying the precise origins and relatedness of both these MLV-related agents found in humans becomes of paramount importance to clarify the source and epidemiology of infection and ultimately, the potential role in disease.”

Courgnaud and colleagues call for more research into the association, as well as clinical trials to test how well the condition can be treated with antiviral drugs.

The authors stress that finding virus fragments in blood does not prove infection, and say that a larger group of patients should be tested to confirm their findings. They also caution that a link between these viruses and the condition would not necessarily mean a causal role for the virus — it could be that CFS weakens the immune system, making people more susceptible to infection.

#### References and link

1. Lo SC, Pripuzova N, Li B, Komaroff AL, Hung GC, Wang R, *et al.* Detection of MLV-related virus gene sequences in blood of patients with chronic fatigue syndrome and healthy blood donors. *Proc Natl Acad Sci USA* 2010. doi: [10.1073/pnas.1006901107](https://doi.org/10.1073/pnas.1006901107)
2. Courgnaud V, Battini JL, Sitbon M, Mason AL. Mouse retroviruses and chronic fatigue syndrome: does X (or P) mark the spot? *Proc Natl Acad Sci USA* 2010. doi: [10.1073/pnas.1007944107](https://doi.org/10.1073/pnas.1007944107)

**US Centers for Disease Control and Prevention information** on CFS

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