Editorial Expression of Concern

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In the issue of 23 October 2009, Science published the Report “Detection of an infectious retrovirus, XMRV, in blood cell of patients with chronic fatigue syndrome,” a study by Lombardi et al. purporting to show that a retrovirus called XMRV (xenotropic murine leukemia virus-related virus) was present in the blood of 67% of patients with chronic fatigue syndrome (CFS) compared with 3.7% of healthy controls (1). Since then, at least 10 studies conducted by other investigators and published elsewhere have reported a failure to detect XMRV in independent populations of CFS patients. In this week’s edition of Science Express, we are publishing two Reports that strongly support the growing view that the association between XMRV and CFS described by Lombardi et al. likely reflects contamination of laboratories and research reagents with the virus. In the first Report, “Recombinant origin of the retrovirus XMRV” (2), T. Paprotka et al. trace the ancestry of XMRV and provide evidence that the virus originated when two mouse leukemia viruses underwent recombination during experimental passage of a human prostate tumor xenograft in mice in the 1990s. A combination of sequencing, phylogenetic, and probability analyses lead Paprotka et al. to conclude that laboratory contamination with XMRV produced by a cell line (22Rv1) derived from these early xenograft experiments is the most likely explanation for detection of the virus in patient samples. In the second Report, “No evidence of murine-like gammaretroviruses in CFS patients previously identified as XMRV-infected” (3), K. Knox et al. examined blood samples from 61 CFS patients from the same medical practice that had provided patient samples to Lombardi et al. Comprehensive assays by Knox et al. for viral nucleic acids, infectious virus, and virus-specific antibodies revealed no evidence of XMRV in any of the samples.

The study by Lombardi et al. (1) attracted considerable attention, and its publication in Science has had a far-reaching impact on the community of CFS patients and beyond. Because the validity of the study by Lombardi et al. is now seriously in question, we are publishing this Expression of Concern and attaching it to Science’s 23 October 2009 publication by Lombardi et al.

The U.S. National Institutes of Health is sponsoring additional carefully designed studies to ascertain whether the association between XMRV and CFS can be confirmed. Science eagerly awaits the outcome of these further studies and will take appropriate action when their results are known.

References
1. V. C. Lombardi et al., Science 326, 585 (2009); published online 8 October 2009 (10.1126/science.1179052).

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