

Virus-like structure calls into question origin of diseases such as 'mad cow'

December 13 2010

(PhysOrg.com) -- A Yale University researcher has found virus-like genetic material within samples of Creutzfeldt-Jakob disease (CJD) and scrapie, a finding that challenges scientific consensus on the nature of these deadly brain-wasting diseases.

Many scientists say that transmissible spongiform encephalopathies (TSEs) — including CJD, scrapie and epidemic “mad cow” [disease](#) — are caused by a misfolded normal protein that spontaneously becomes infectious. This infectious prion form is transmitted without nucleic acid used by infectious agents such as viruses, they say.

But other scientists, such as Laura Manuelidis, professor of surgery at Yale School of Medicine, say a slow-acting [virus](#) may be the cause of TSEs.

In the study, published this week in the online edition of the *Journal of Neurovirology*, Manuelidis reports extracting new circular virus-like DNA sequences from infectious particles of three samples of CJD and scrapie. These viral signatures would not be expected to be found in CJD or scrapie samples if infected prions were the sole culprits in the disease, she said.

“These findings won’t end the TSE debate, but hopefully it will open the door to more discussions about the nature of the causal infectious agent in TSEs and other late onset neurological diseases” Manuelidis said.

While these sequences, called Sphinx elements, were only visible in preparations of the infectious particles, ultimately they were found at very low amounts in uninfected cells, the study reports. Manuelidis believes that more of these sequences may be discovered in preparations of other infectious particles.

“They are intriguing, not only for their function in TSEs, but also because they may have once been incorporated from distant bacterial viruses,” Manuelidis says.

Provided by Yale University

Citation: Virus-like structure calls into question origin of diseases such as 'mad cow' (2010, December 13) retrieved 24 April 2024 from <https://medicalxpress.com/news/2010-12-virus-like-diseases-mad-cow.html>

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