

NIH study describes fast, sensitive blood test for human prion disease

May 9 2011

Scientists from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), report that they have developed a method—10,000 times more sensitive than other methods—to detect variant Creutzfeldt-Jacob disease (vCJD) in blood plasma. vCJD is a type of prion disease in humans that leads to brain damage and death. The NIAID researchers also used the test to rapidly detect scrapie, a prion disease of sheep, in infected hamsters, some pre-symptomatic.

Prion diseases, also known as transmissible spongiform encephalopathies, are difficult to diagnose, untreatable and ultimately fatal. Scientists believe disease-causing prions are abnormal infectious clusters of prion protein molecules. Normally, prion protein molecules exist in every mammal in an unclustered, harmless form. In [prion diseases](#), tissue damage leaves microscopic sponge-like holes in the brain. Along with vCJD and scrapie, other forms of prion disease include chronic wasting disease in deer, elk and moose, and bovine spongiform encephalopathy, also known as mad cow disease.

Because animals and people can be infected for years before symptoms of disease appear, scientists have tried to develop a rapid and sensitive screening tool to detect prion diseases in blood, which would assist in efforts to prevent the spread of prion diseases among and between species, via the blood supply or otherwise.

Collaborating with scientists from Switzerland-based Prionics AG, the

NIAID group combined an antibody-based approach with an improved real-time quaking-induced protein conversion (RT-QuIC) reaction. RT-QuIC, developed in recent years, detects when normal [prion protein](#) converts to an abnormal form. The resulting test—which they call enhanced QuIC (eQuIC)—improves prospects for routinely detecting low levels of abnormal prions in tissues, fluids or environmental samples such as soil. The group plans to study eQuIC as a potential tool to diagnose various prion diseases in different animals.

More information: C Orru et al. Prion disease blood test using immunoprecipitation and improved quaking-induced conversion. *mBio*. [DOI: 10.1128/mBio.00078-11](https://doi.org/10.1128/mBio.00078-11) (2011).

J Wilham et al. Rapid end-point quantitation of prion seeding activity with sensitivity comparable to bioassays. *PLoS Pathogens* 6(12): e1001217. [DOI: 10.1371/journal.ppat.1001217](https://doi.org/10.1371/journal.ppat.1001217) (2010).

Provided by National Institutes of Health

Citation: NIH study describes fast, sensitive blood test for human prion disease (2011, May 9) retrieved 12 May 2024 from <https://medicalxpress.com/news/2011-05-nih-fast-sensitive-blood-human.html>

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