Levels of prion protein in brain may not be reliable marker for disease

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Rapid diagnostic testing used to check for the presence of prion diseases such as “mad cow disease” might fail to identify some highly infectious samples, researchers have found. Currently, scanning beef or other meat products for possible prion infection involves sampling brain tissue from the animal for abnormally folded prion protein, also called PrP; this form of PrP, which is sticky and hard to degrade, is believed to be the infectious agent behind prion diseases.

Rona Barron and colleagues tested whether abnormal PrP and infectivity was an absolute association. They injected mice with two different strains of prion-infected tissue and quantified the degree of infection in these mice. Next, they examined the amount of abnormally folded PrP in brains of the sick mice and found that it did not correlate in any way with how infectious the disease strain was; in fact, some highly infectious tissue samples had nearly undetectable levels of abnormal PrP.

These data suggest that not all abnormal PrP found in diseased tissues is infectious, and may instead be a pathologic by-product of disease. Some other agent, or a specific conformation of abnormally folded PrP, may therefore be responsible for prion disease, and current assays relying solely on abnormal PrP detection could therefore underestimate the frequency of infection. Barron and colleagues note that it’s vital to find additional disease markers to help ensure no future prion outbreaks occur.

Source: American Society for Biochemistry and Molecular Biology