LA-UR 10-01487

Licensable Technologies

Early Detection of Prions

Applications:

- Sensitive detection of PrPSc in blood
- Immunoassay for prion diseases
- Ultrasensitive detection platform for a broad range of assays
- Platform to investigate new diseases related to protein misfolding (Alzheimers)

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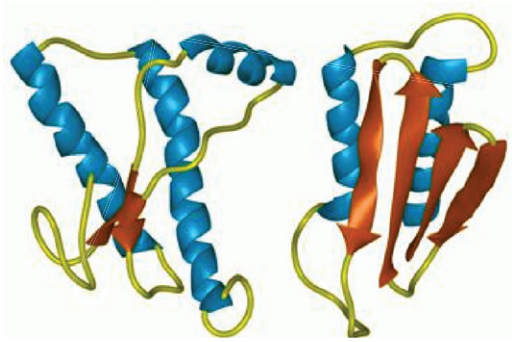
Summary:

Transmissible spongiform encephalopathies (TSEs), or prion diseases, are a group of fatal neurodegenerative diseases that both animals and humans can be susceptible to. Illness is preceded by a long incubation period of months to decades during which time there is no indication of infection. Clinical symptoms of TSEs include dementia and loss of movement coordination. Associated with TSEs is the accumulation of an abnormally-folded conformer (PrPSc) of a host-encoded cellular prion protein (PrPC) predominantly in the brains of affected animals and humans. Post-mortem neuropathological examination of brain tissue from an animal or human has remained the 'gold standard' of TSE diagnosis and is very specific, but not as sensitive as other techniques.



PrP Conformations: PrPC -helical (lef) and PrPSc -pleated (right).

We have developed a sensitive immunoassay, termed SOFIA, for the detection of PrPSc. This assay has been used for the detection of PrPSc from the brains of clinical scrapie-infected sheep, Chronic Wasting Disease (CWD)-infected cervids and TSE-infected small laboratory animals without the need to remove PrPC by proteinase K (PK) pretreatment. The sensitivity of this assay underscores its potential utility as both a preclinical assay for PrPSc in the central nervous system and a noninvasive ante-mortem assay for TSEs using body fluids. The ability to successfully and reliably assay for prion diseases using body fluids is a concern since it is dependent on both the sensitivity of an assay and the levels of target to be detected. By combining SOFIA with limited PMCA we are now able to detect PrPSc in the blood from both preclinical and clinical samples.

Development Stage:
The technology has been demonstrated in the laboratory. Extensive clinical trials have not been conducted. Los Alamos National Laboratory (LANL) is seeking a partner to co-develop and subsequently commercialize the technology.

Patent Status: Patent applications have been filed

Licensing Status:
LANL is seeking commercial partners to implement this technology and a partner to co-develop new applications for this detection platform. A successful licensee must address the interests and desired outcomes of Los Alamos National Laboratory and Thee State University of New York (SUNY) Downstate in any successful bid.

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www.lanl.gov/partnerships/license/technologies/

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