

# Developing Seprion technology

**B**ased in London, UK, Microsens Biotechnologies has been developing diagnostics and early stage drug discovery programmes for protein aggregation diseases, initially focusing on the major prion-based diseases caused by the abnormal folding of the prion protein itself, a normal body protein that is not otherwise pathogenic. The abnormally folded protein forms toxic aggregates, which, after many years of progressive accumulation, cause clinical neuropathology in the brain. Once symptoms appear, mortality is inevitable. Protein aggregation diseases, also known as the protein conformation disorders, are an increasingly important field of medical research that includes such major conditions as Alzheimer's and Parkinson's. One of the several forms of human prion disease, sporadic Creutzfeldt-Jakob disease (sCJD), occurs in about one case per annum for every million of the population. The cause of this sporadic disease is unknown and, although there has been no documented case of transmission through blood transfusion or blood products, there has been transmission through transplanted tissues or growth hormone treatments – this is the iatrogenic (i)CJD form of the disease. Variant (v)CJD is thought to be caused by eating meat contaminated with bovine prion disease (BSE or 'mad cow disease'). Currently, there have been more than 150 clinical cases of this new variant of prion disease worldwide, with most of



these occurring in the UK. Unlike sCJD, vCJD can be transmitted through blood donations. In 2004, there were two reports of blood related transmission of vCJD in the UK. These cases illustrate that, unlike sCJD, vCJD presents a problem for safeguarding the blood supply, particularly when it is not known how many people are currently incubating the disease.

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The Microsens research and development programmes have focused on the development of a novel synthetic ligand that binds specifically to the abnormally folded conformation of several disease associated proteins, including the prion protein. This ligand, called Seprion, is now a well proven technology and is the key component in post-mortem bovine spongiform encephalopathy (BSE) detection kits recently approved by the EU and the US Department of Agriculture. Microsens has also developed two new Seprion-based products: a post-mortem assay kit for the detection of sporadic and variant CJD in human cadaveric tissue

*Ensuring the safety of the food chain, human blood donations and tissue transplant procedures...*

(for use in tissue transplant clinics and post-mortem laboratories); and a human blood screening assay. The blood screening assay has been proven in the scrapie model for vCJD, where the abnormal prion protein in the blood of infected sheep was detected up to one year before the appearance of clinical symptoms. This is an essential requirement for a successful screening product, as the assay kit will be used to exclude blood from infected, but non-clinical, human blood donors who are incubating the disease. Microsens is now ready to proceed with trialling the Seprion blood screening assay kit with samples from vCJD patients, when these are made available by the Department of Health in the UK.

The Microsens Seprion Technology™ is the result of a very successful scientific development programme and is now being used to protect the food chain in countries that have implemented routine BSE screening. In the future, this new assay technology will be used to safeguard the supply of human blood and transplant tissues.



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