

BSE: A LINK TO MAN? ROGUE PROTEIN

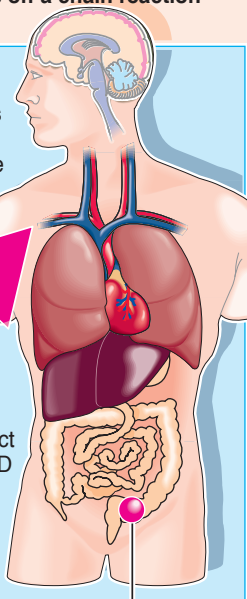
Circumstantial evidence suggests a new strain of Creutzfeldt-Jakob disease, or CJD, which has recently claimed 11 lives, may be linked to 'mad cow' disease. Both illnesses are blamed on an abnormal version of a harmless, natural, protein known as a *prion protein*. The rogue protein – found only in diseased brains – sets off a chain reaction destroying nerve cells throughout the brain

Mid 1980s: British Government deregulates legal compositional requirements of meat products, allowing bovine offal into human food chain

1989: Following outbreak of 'mad cow' disease, government bans use of brain, spinal cord, spleen, tonsils and intestines in meat pies, pasties, beefburgers and sausages

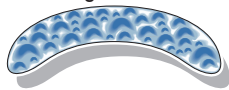
1990s: CJD suddenly starts to infect young people. Average age of previous CJD victims is over 60 years old

Scientists suspect new strain of CJD is triggered by rogue prions from BSE-infected cows

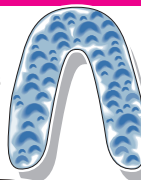


How rogue protein might infect the brain

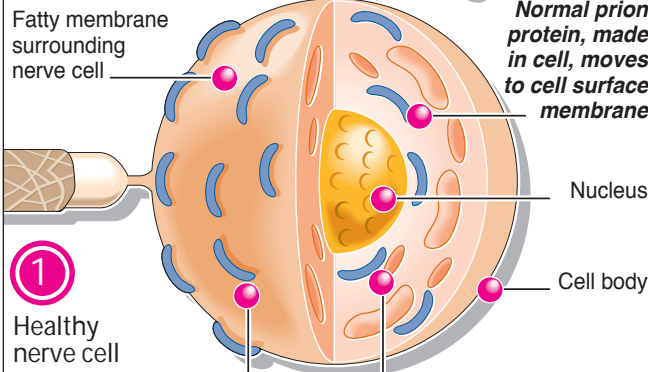
Normal prion protein: Coathanger shaped molecule containing about 230 amino acids



Rogue prion protein: Abnormal protein has identical amino acid sequences, but rogue prion adopts a different molecular shape

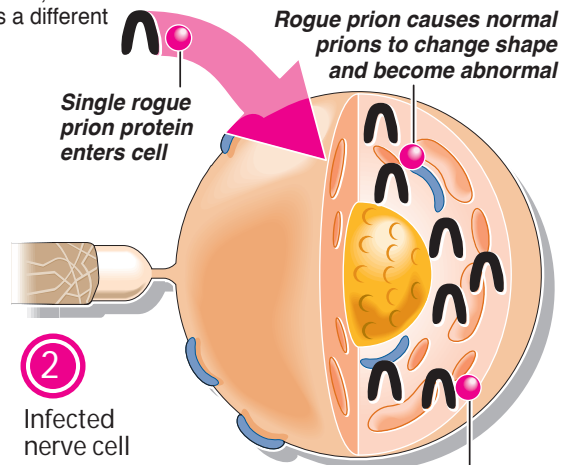


Enzymes digest normal prion protein. Rogue protein is resistant to enzyme attack and makes its way to brain

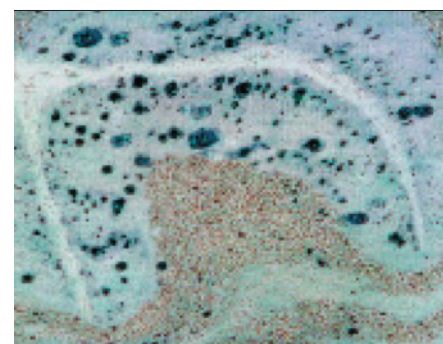
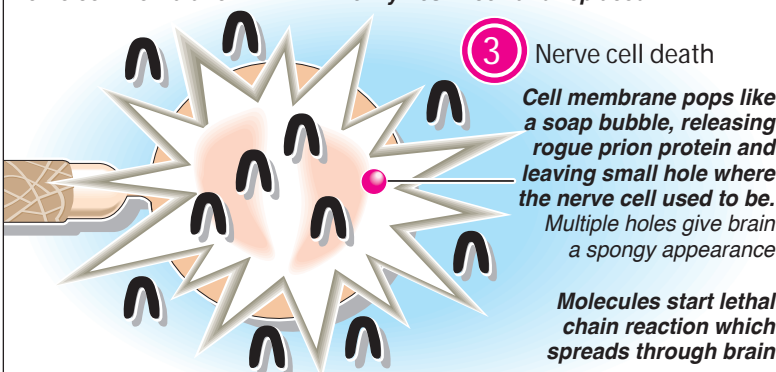


Prions believed to strengthen nerve cell membrane

Older prions digested by enzymes in cell and replaced



Abnormal prions cannot be digested by enzymes and build up within cell



Above: Dark groups of abnormal prions in brain tissue of human CJD victim

Sources: New Scientist, Institute of Animal Health, SmithKline Beecham, U.S. National Institute of Health