Prion Diseases

prions (n): proteins with at least 2 conformational states (dominating & self-perpetuating)

Infectious prions: transmissible spongiform encephalopathies (TSE)
  - nucleation sites able to induce abnormal folding
  - accumulate, expose reactive AA → cell death
  - known as contagious dementia, bovine spongiform encephalitis, scrapie
  - first disease-causing agent without nucleic acids

Creutzfeldt-Jakob Disease (CJD), Gerstmann-Straussler-Scheinker (GSS) disease, kuru
  - Sporadic, acquired, inherited...

Fatal Familial Insomnia

Diagnosis
  - Inattention, sleep loss, certain motor signs (probably also runs in the family)
  - Dysautonomia (ANS dysfunction): increased perspiration, salivation, impotence, constipation, tachycardia, hypertension, mild fever

Genetic cause
  - Dominant autosomal inherited disease
  - Linked to the miss sense mutation of codon 178 in the prion protein gene (PRNP)
  - Coupled to Met at position 129

Histopathology
  - Neuron & astrogliosis lost in thalamus (mostly anterior ventral and mediodorsal nuclei)
Hope?

**Better diagnostics**
Currently, *invasive biopsies* most common
Hopeful work in identifying prions in cerebral spinal fluids (2011)

**Treatment**
FFI: sleeping pills worsens condition
Ibuprofen & antibiotics (tetracyclic compounds) caused increased fatality in mice
Quinacrine (antimalarial) can stop spreading of the disease if diagnosed