**PRIONS AND HUMAN DISEASE**

I. INTRODUCTION AND HISTORY
  A. SCRAPIE IN SHEEP
    1. UNUSUAL NEUROLOGICAL DISEASE IN SHEEP-THOUGHT ORIGINALLY TO BE A "SLOW VIRUS" DISEASE.
    2. DISEASE KNOWN FOR 200 YEARS
      a. INFECTIOUS NATURE DESCRIBED IN 1936
      b. LONG INCUBATION PERIODS: 1-10 YEARS
      c. SYMPTOMS: EXCITABILITY & IRRITABILITY --> BITING, ITCHINESS, SCRATCHING (SCRAPIE) --> LOSS OF COORDINATION, TREMORS --> PROSTRATION --> DEATH
      d. ONLY OLDER SHEEP AND GOATS - TRANSMISSION ??
      e. RAPID TRANSMISSION BY INJECTION
  B. DESCRIPTION OF CJD (CREUTZFELDT-JAKOB DISEASE) IN 1920
  C. DESCRIPTION OF KURU IN 1957 (GAJDUSEK & ZIGAS)
  D. PROPERTIES OF SCRAPIE AGENT (UV RESISTANCE) - 1966
  E. LINKAGE OF SCRAPIE, CJD AND KURU - 1972-1976
  F. PRION CONCEPT - 1982 - PRUSINER
    1. RAPID HAMSTER ASSAY
    2. PROTEIN PURIFICATION
    3. DNA PROBES

II. **KURU**, AN UNUSUAL HUMAN DISEASE
  A EPIDEMIC IN PAPUA, NEW GUINEA 1920-1970
  B. WOMEN AND CHILDREN AFFECTED
  C. LOSS OF MOTOR SKILLS AND DEMENTIA
  D. DEATH USUALLY WITHIN ONE YEAR
  E. DISEASE STUDIED BY CARLETON GAJDUSEK
    1. TRANSMITTED BY RITUALISTIC CANNIBALISM
    2. MOURNING OF THE DEAD
    3. PROPERTIES LIKE OTHER RARE HUMAN DISEASES, EG. CJD (CREUTZFELDT-JAKOB DISEASE) IN HUMANS & SCRAPIE IN SHEEP

III. SOME RECENT WORK ON SCRAPIE, CJD AND KURU--PRIONS
  A. THE PRION CONCEPT
    1. RAPID ASSAY WITH HAMSTERS
    2. THE "PARTICLE" IS A PROTEIN: NO NUCLEIC ACID
    3. PROTEIN WAS PARTIALLY SEQUENCED
    4. A DNA PROBE WAS MADE: AA SEQUENCE ---> NUC SEQ.
    5. THE HAMSTER GENE WAS ISOLATED USING THE PROBE
    6. THE PRION GENE WAS SEQUENCED
    7. THE "INFECTIOUS PARTICLE" IS A HOST PROTEIN
    8. HETERODIMER CAUSES NORMAL PROTEIN TRANSFORMATION
  B. EPIDEMIOLOGY
    1. HUMAN TRANSMISSION
      a. HUMAN GROWTH HORMONE - >70 CASES
      b. IATROGENIC TRANSMISSION
      c. CORNEAL TRANSPLANTS
    2. ANIMALS
      a. NATURAL TRANSMISSION OF SCRAPIE ???
      b. FEEDING OF PROTEIN SUPPLEMENTS (OFFAL)
  C. BEEF, GREAT BRITAIN, AND BSE - MAD COW DISEASE