# Bavarian research & innovation

for Prion

Bavarian Research Cooperation Prions

## PRIONS: NEW PATHOGENS – A MAJOR CHALLENGE

When the first few cases of BSE occurred in Bavaria, the Bavarian state government started a research initiative, the Bavarian Prion Research Cooperation (Bayerischer Forschungsverbund Prionen), FORPRION.

Prions are a new kind of pathogen, and present a major challenge to the biological sciences. They are believed to be the pathogen responsible for BSE (bovine spongiform encephalopathy) and Creutzfeldt-Jakob Disease. They consist

predominantly, or perhaps exclusively, of aberrant endogenous proteins.
FORPRION is undertaking both fundamental and applied research. The aim is to improve methods of diagnosis and associated tests and to develop therapies for combatting prion-based diseases in humans and animals.

The cooperation is taking a wide-ranging approach. In addition to human and veterinary medical experts, physicists, biologists, chemists and biochemists are also working on this pressing problem.

FORPRION is coordinating 30 projects at the universities of Erlangen-Nuremberg, Würzburg, Regensburg, LMU Munich, TU Munich and the Max Planck Institute for Biochemistry in Martinsried.

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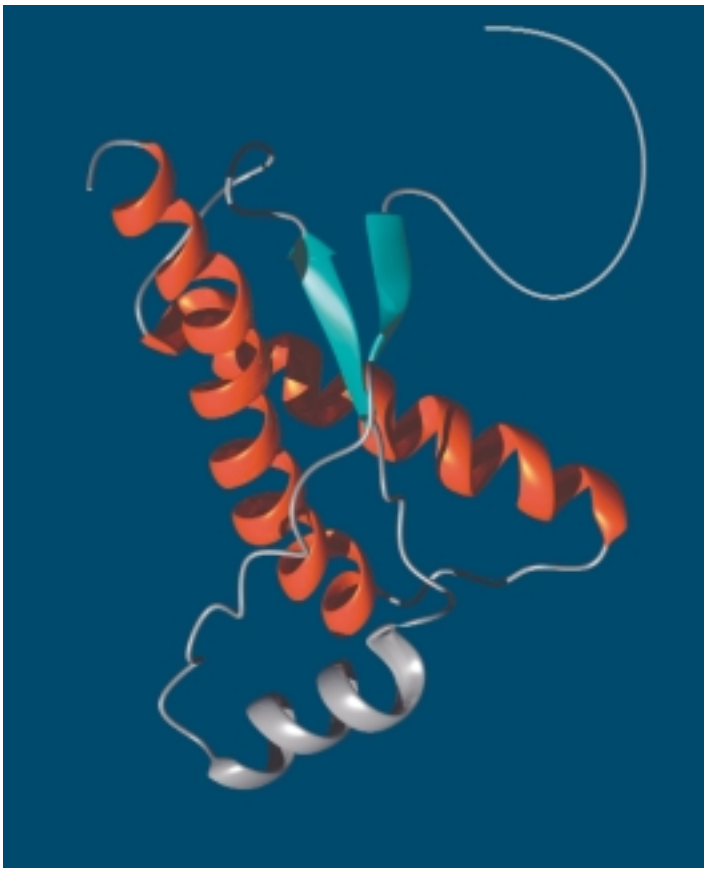
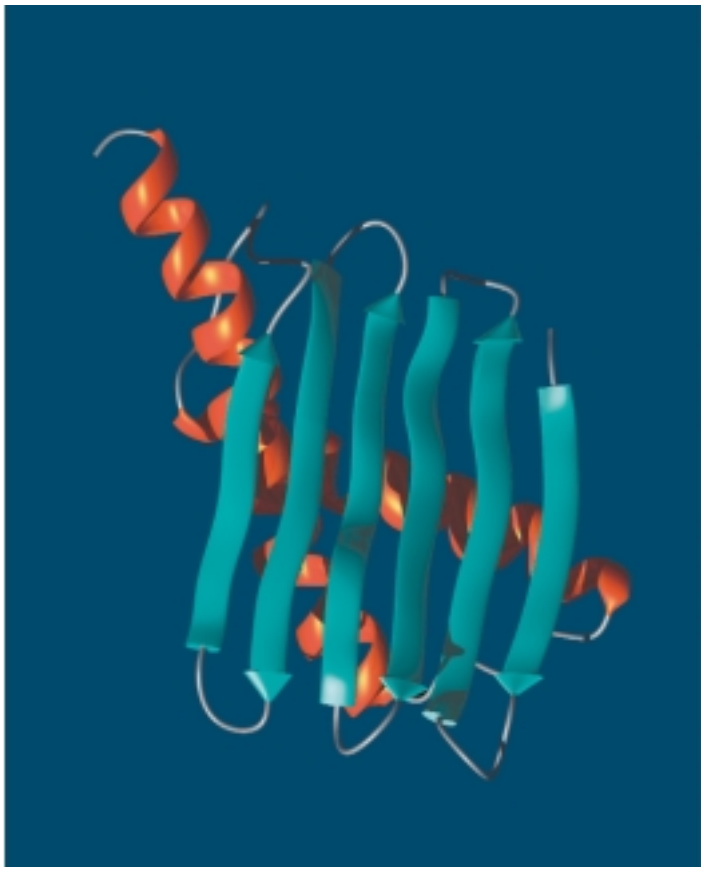
# RESEARCH TOPICS:



**PrPC is the cellular form of the prion protein.**

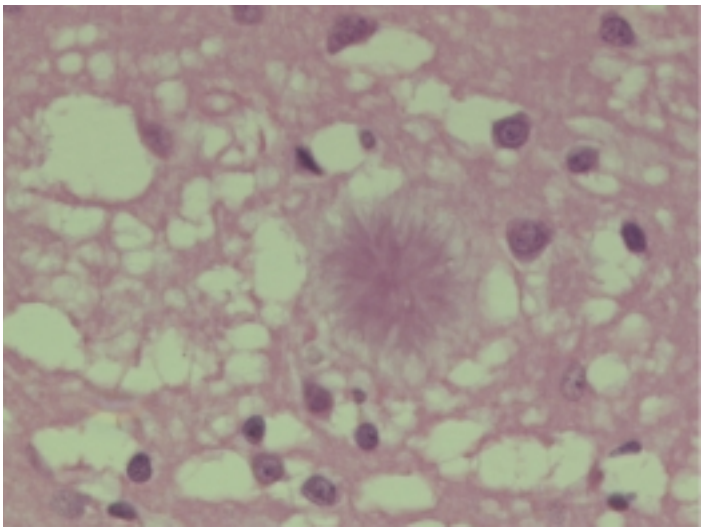


**PrPSc as an infectious isoform of the prion protein. (Photo: Dr. Ralph Zahn, ETH Zürich)**

**Fundamental research** covers all questions relating to the physiological and pathophyisiological role of the prion protein, the role of metal ions in the prion protein's metabolism and their influence on the changes in conformation and the infectivity of the prion protein.

Research into the **pathogenesis** of prion diseases is examining the uptake routes of the disease-causing proteins in the gastro-intestinal tract, the role of the immune system and of the peripheral nervous system in the development of the disease, and the mechanisms of brain damage resulting from the prion proteins.

**Therapeutic projects** are using a wide range of methods in an attempt to prevent the pathological development of the prion protein, its neurotoxic effect and the spread of prions in the body.



**Prion protein deposition and spongiform changes in the brain.**

The **diagnostics** sector is investigating possibilities of detecting the infectious form of the prion protein, with the aim of developing as sensitive as possible tests for the diagnosis of prion diseases in humans and animals.

**Epidemiological and veterinary medicine** research is examining the occurrence of BSE in Bavaria, and also the occurrence of other sporadic spongiform brain alterations in cattle. The possibility that prion diseases might occur in other animals (pigs and fish) is also being investigated.

The **genetics** sector is investigating the susceptibility of cattle to BSE. An attempt is also being made to eliminate the prion protein gene in cattle, so that they can no longer be infected with BSE.

**The consumer protection** sector is concerned with the occurrence of BSE pathogens in foods of animal origin, with the detection of animal nerve tissue, in particular from ruminants, in food and of animal protein in feeds.

All FORPRION's research groups are involved in scientific exchange with all other prion researchers in the Federal Republic of Germany through the national TSE research programme. The Research Cooperation is also linked to the German CJD (Creutzfeld-Jakob Disease) Surveillance Organisation and to Brain-Net, which is the German reference centre for diseases of the central nervous system.