COURSE SYLLABUS
PATB 5120 - Prions and the mysteries of infectious neurodegenerative diseases
Spring Semester 2011

Instructor(s): Hermann M. Schatzl
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Office Hours: on request

Course Information:
Monday and Friday, 11:00 a.m. to 11:50 a.m., AgC room 6014. Lecture schedule will be available before course and posted on homepage (http://uwacadweb.uwyo.edu/uwmolecbio/Faculty/H_Schatzl.asp; http://uwadmnweb.uwyo.edu/vetsci/Schatzl.asp). Supplementary materials (recommended books, PDFs of reviews and scientific articles) will be provided electronically.

Prerequisites: Semester of molecular biology such as MOLB 3000, or a semester of biochemistry such as CHEM 2300 or a semester of zoology such as BIOL 2022, OR consent of the instructor.

Course Description:
The course will cover all relevant aspects of prion diseases in humans and animals (CWD in deer and elk, scrapie in sheep, BSE in cattle, and CJD/vCJD/kuru in humans). The course will cover also recent scientific findings in areas of infectious proteins and selected protein-misfolding/conformational diseases. Critical reading of articles, its discussion in groups and/or presentation by students is included.

Objectives/Outcomes/Standards:
In this class students will get insights into the basic concepts of prion infections. Prion diseases are infectious and strictly fatal neurodegenerative disorders of man and animals which are characterized by spongiform degeneration in the central nervous system. They are characterized by the accumulation of a misfolded isoform (PrPSc) of the host-encoded prion protein (PrPc), the former being associated with pathogenesis and transmission. Examples are Creutzfeldt-Jakob disease (CJD/vCJD) in humans, scrapie in sheep, bovine spongiform encephalopathy (BSE) in cattle, and chronic wasting disease (CWD) in elk and deer. The disease is characterized by a rapidly progressing clinical course that leads inevitably to death, usually within a few months. Typically, this is preceded by a long incubation time entirely free of symptoms, lasting for years to many decades in humans. Although prion diseases are usually rare, they have the potential to be transferred within and also between species by infection processes, giving raise even to epidemic scenarios. CWD is presently the most infectious prion disease; it tremendously spreads and is hardly to control, with wild living animals also being affected. Whereas BSE clearly had zoonotic potential, resulting in the variant form of CJD, this question is still open for CWD. Prions use a unique mechanism of propagation which is based solely on conformational changes of proteins and is without using nucleic acids for encoding information. Nevertheless, there are a number of striking similarities with other neurodegenerative disorders and prion diseases have therefore often model character.

As outcome a decent level of familiarization with the most basic concepts and an understanding of the complexity and the many facets this infectious agent provides and the problems prion diseases can present are expected.

Text(s) and Readings:
Selected review articles by the instructor and other authors (as recommended and provided as PDF by the instructor).

Course Requirements/Assignments: It is expected that students attend this course on a regular basis, participate in group discussions, perform the assigned oral presentations, and pass the final written examination. There will be also written assignments on weekly discussed articles (1/2 to 1 page).

Attendance/Participation Policy: University sponsored absences are cleared through the Office of Student Life.

Course Outline: Will be provided timely.