ALBERTA INNOVATES

CLEAN RESOURCES

AGRI-FOOD INNOVATION

PRION RESEARCH

Mechanisms of Genetic Resistance to CWD Infection in White-Tailed Deer and Caribou

Chronic wasting disease (CWD) is a fatal prion disease affecting deer, elk, reindeer and moose. A factor in determining whether deer and caribou will be infected with CWD is the structure of the normal prion protein. Deer and caribou with specific changes in the structure of their prion protein live longer following infection with CWD. The research team will examine how these changes in the prion protein affecting shedding of prions in saliva, urine and feces of infected animals and determine how they affect disease transmission. Together, these data will provide government, policy makers and future researchers with more information on how changes in the normal prion protein affect CWD prion replication and transmission.

White Tailed Deer: Susceptible or Resistant?

FUNDING DETAILS

RECIPIENT:
University of Alberta, Dr. Debbie McKenzie

PARTNERS:
Margaret Gunn Endowment, University of Calgary, Parks Canada

TOTAL BUDGET:
$312,500

AI FUNDING:
$250,000

PROJECT DATES:
JAN 2022 – DEC 2023

PROJECT TRL:
Start: N/A
End: N/A

APPLICATION

Given that CWD has long persistence of infectivity in the environment (perhaps longer than 10 years), strategies to reduce disease transmission and shedding are needed. This project will determine how different prion protein variants affect disease progression and whether animals with slower disease progression shed less infectious material.

ALBERTA INNOVATES

CLEAN RESOURCES

AGRI-FOOD INNOVATION

PRION RESEARCH

PROJECT GOALS

- The main goal of this research is to slow prion disease progression in cervids, decrease shedding of prions, decreasing the spread of CWD within these cervid populations.
- The research team developed transgenic mouse lines that mimic deer prion disease, allowing for shorter trials and lower cost experiments compared to large animal trials.
- Further develop risks and mitigation strategies utilizing PMCA and/or RT-QuIC to identify infectivity and determine if these polymorphisms permit serial transmission of CWD.
- HQSP will be provided training between the two research groups at the Centres at the UofA and UofC.

BENEFITS TO ALBERTA

- Parks Canada will use the outcomes of this research to guide the breeding program being planned for caribou in national parks in Alberta and across Canada.
- Research is aimed to identify ways to reduce the spread of CWD in wild and farmed cervids.
- Decreased shedding will reduce environmental decontaminations.
- Team members are involved in CWD outreach and provide webinars on CWD scientific developments and diagnosis.

1-2 Publications

1-3 Students Trained

2-4 Project Jobs

1-2 New Products/Services

10 Future Jobs

CURRENT STATUS

APR 2023

The team has demonstrated that, in the lab, these polymorphisms in both white-tailed deer and caribou reduce the ability of animal-to-animal transmission of disease. Transmission of different CWD prion strains in transgenic mouse lines suggests that the strains replicate differently in the periphery affecting the onset of clinical disease.