

# North American interdisciplinary chronic wasting disease research consortium

- United States Department of Agriculture NC1209 -

October 26<sup>th</sup>, 2020

Dear Colleagues,

As members of the NC1209: North American interdisciplinary chronic wasting disease research consortium we wanted to provide the group with quarterly updates on the progress of the objectives and to communicate relevant information. Thank you for your continued efforts in moving the objectives forward. To document the benefit of this interdisciplinary group, we would like to collect information regarding publications, grant submissions, etc. that have been a result of the interactions of the members of this group. To facilitate the data collection, we have generated a google doc ([https://docs.google.com/forms/d/e/1FAIpQLSf7hSbINk7u\\_MRqQ82vOroeHdrooyltlBO9q32XGMIMASoy3g/viewform](https://docs.google.com/forms/d/e/1FAIpQLSf7hSbINk7u_MRqQ82vOroeHdrooyltlBO9q32XGMIMASoy3g/viewform)). We intend to hold the next consortium meeting during fall 2021. As the course of the pandemic becomes clearer, we will follow up on potential dates and location.

**Objective 1.** Establish a national CWD tissue database and repository with improved access for transmission and pathogenesis research and validation of CWD prion detection assays.

During our last meeting it was decided that a virtual repository with physical storage of samples at multiple locations made the most logistical and financial sense. To organize the samples one possible option is using the LIMS database that has been created at the University of Alberta that keeps track of relevant data associated with each sample. Deb McKenzie has provided a short video of the database interface ([https://drive.google.com/file/d/1Oo0e-6IXfLNxl-Oy1WcudPp9\\_JX8QJJt/view?usp=sharing](https://drive.google.com/file/d/1Oo0e-6IXfLNxl-Oy1WcudPp9_JX8QJJt/view?usp=sharing)) and she indicated the skeleton database would be available for a \$2500 training fee (the consortium would need to have an IT person for upgrading, backing up etc.) or the lab that developed it could continue to host it (and maintain it) for a fee of \$10K per year.. Distribution of samples would be governed by a committee and subject to a uniform biological material transfer agreement (<https://autm.net/surveys-and-tools/agreements/material-transfer-agreements/mta-toolkit/uniform-biological-material-transfer-agreement>). The group is also investigating possible mechanisms for funding this effort including one from NSF entitled "Infrastructure capacity for biological research" ([https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5444&org=BIO&from=home](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5444&org=BIO&from=home)). **Please contact us if you are interested in participating in contributing to the grant submission.** Finally, regarding availability of research samples from the USDA the following paragraph clarifies the process:

The USDA has a protocol in place for sample requests from the Veterinary Services sample archive for use in CWD research. Due to the difficulties of collecting adequate tissues and the limited amounts of samples

available, the USDA requires requesting scientists to fill out a sample request form. All requests are considered, however, the USDA must weigh the sample type, sample volume, project objectives, and anticipated results of a research plan prior to sharing samples. At a minimum, researchers should submit a study plan outlining why these samples are requested and details on objectives and anticipated value of any products that result from the research. In terms of receiving tissue samples from captive depopulated deer for genetic analysis, requests are also only considered if a suitable objective and product of the results would be of value.

#### Funding:

Two applications to USDA-APHIS-10025-VSSPRS00-20-0124, one of which was funded (see below). The application that was not funded was: Facilitation of inter-laboratory comparison of amplification assays: Characterization of reference tissue and excreta samples by mouse bioassay. \$199,264. PI: Joel Pedersen. USDA Animal and Plant Health Inspection Service, via Wisconsin Department of Natural Resources. 09/30/20 – 09/29/22. Agency Applicant: Dan Storm, WI DNR. Collaborator: Rodrigo Morales (University of Texas Health Science Center). Contributors: Peter Larsen (University of Minnesota), Krysten Schuler (Cornell University), Srinand Sreevatsan (Michigan State University), Dan Walsh (USGS National Wildlife Health Center).

Immobilization of CWD prions by pyrogenic carbonaceous geosorbents to reduce infectivity. MDNR-MSU Wildlife Disease Initiative. 9/1/2020 – 8/30/2023. Jason Bartz, (PI – Creighton University), Wei Zhang (Co-I – Michigan State University), Hui Li (Co-I – Michigan State University).

#### Publications:

Carlson, C. M.; Thomas, S.; Keating, M. W.; Gibbs, N. M.; Chang, H.; Wiepz, J. K.; Austin, A. G.; Schneider, J. R.; Johnson, C. J.; Pedersen, J. A. Plants as vectors for environmental prion transmission. *Nature Commun.* (revision submitted);

Chesney, A. R.; Johnson, C. J.; Nichols, T. A.; Soto, P.; Lichtenberg, S. S.; Kornely, H. J.; Morales, R.; Pedersen, J. A. Montmorillonite particles alter early tissue tropism of prions in orally inoculated white-tailed deer. *Vet. Res.* (submitted)

Shikiya, R.A., Kincaid, A.E., Bartz, J.C.\* and Bourret, T.J. (2020). Failure to detect prion infectivity in ticks following prion-infected blood meal. *mSphere*, Sep 2;5(5):e00741-20.PMID 32878935. \*co-corresponding author.

Kanga, H-E., Biana, J., Kanea, S.J., Kima, S., Selwyna, V., Crowella, J., Bartz, J.C. and Glenn C. Telling. (2020). Incomplete glycosylation during prion infection unmask a prion protein epitope that facilitates prion detection and strain discrimination. *Journal of Biological Chemistry*, 295(30) 10420–10433. PMID 32513872.

**Objective 2.** Develop large-scale research facilities for controlled CWD research using depopulated cervid facilities where CWD has been detected.

Our subcommittee identified 5 potential sites that could serve as sites for large scale CWD research. We have details on each. Our next steps will be to determine which sites have the potential to host projects in the near future, to prioritize research questions for these sites, propose study designs to address the top questions, prepare proposals and budgets, and then seek funding.

**Objective 3.** Advance diagnostic testing for CWD with a focus on facilitating adoption of the RT-QuIC assay and improved sourcing for the recombinant prion protein substrate.

A collaborative effort between the USDA Agricultural Research Service, the United States Geological Survey, University of Wisconsin Madison, the National Institute of Health Rocky Mountain Laboratory, and USDA Veterinary Services, has developed a standardized RT-QuIC protocol for use on post mortem medial retropharyngeal lymph nodes (MRPLN), and ante mortem rectal and tonsil biopsies. In the coming months, this standardized protocol will be utilized to test blinded, characterized, white-tailed deer samples to establish the RT-QuIC sensitivity and specificity for these sample types. This data will then be reviewed by the USDA Veterinary Services Cervid Health Program and the National Veterinary Services Laboratory to determine next steps.

**Objective 4.** Develop a multistate adaptive management approach for CWD to evaluate surveillance and management strategies and how deer harvest regulatory options impact deer disease dynamics.

A component of this particular subteam (USGS-WICWRU, NWHC and WDNR) selected a post-doc to work on the “Chronic Wasting Disease and Deer Management Modeling”. Dr. Ellen Brandell, PhD from Pennsylvania State University, will start November 2020. Dr. Brandell will investigate the impacts of deer harvest regulations on the realized harvest within and between states in the Midwest, integrating the analytical results into models of CWD dynamics to determine the harvest regulations most likely to have the desired outcome for managing CWD. Dr. Brandell will plan an adaptive management workshop for participating state agencies to effectively use the results of the modeling effort regarding harvest strategies.

Funding:

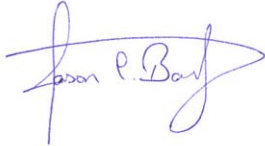
USGS Cooperative Research Unit CWD Initiative funding received by Wisconsin Cooperative Wildlife Research Unit - in collaboration with Wisconsin DNR and USGS National Wildlife Health Center.

**Objective 5.** Evaluate heterogeneous social values, motivations, attitudes, and effective communication to inform disease management decision-making at local, state, and regional levels.

We have scheduled a subcommittee meeting for October 29 to discuss activities in which we are engaged related to objective 5 and decide what funding opportunities we would like to pursue this year (including the possibilities of applications to the USDA National Institute of Food and Agriculture and to the Association of Fish and Wildlife Agencies).

Thank you for all of your outstanding work.

Sincerely,



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