SAES-422

Accomplishments Report

Project/Activity Number: Project/Activity Title: Period Covered: NC1209

Date of This Report: Annual Meeting Date(s): North American Interdisciplinary Chronic Wasting Disease Research Consortium

Participants: Our current list of members is:
Debbie McKenzie, Jason Bartz, Kurt VerCauteren, Hui Li, Mark Ruder, Mark Zabel, Qingzhong Kong, Pam Skinner, David Walter, Wei Zhang, Scott Wells, Justin Greenlee, Eric Cassman, Allen Herbst, Daniel Storm, David Hewitt, Dwayne Etter, Miranda Huang, Patrice Klein, Steve Demarais, Tom DeLiberto, Jennifer Malmberg, Krysten Schuler, Peter Larsen, Rodrigo Morales, Marc Schwabenlander, Shigetoshi Eda, Tracy Nichols, Michael Zhang, Shuping Zhang, David Schneider, Sonja Christensen, Christopher Jennelle, Daniel Grove, David Williams, Daniel Walsh, Evelyn Merrill, Julie Blanchong, Kim Pepin, Lisa Muller, Russ Mason, Noelle Thompson, Rachel Ruden, Scott Hull, Tyler Harms, Don White, Mandy Kamps, Bryan Richards, Neelam Poudyal, Rich Stedman, Becky McPeake, Bruce Lauber, Tricia Hebdon, Tiffany Wolf, Binod Chapagain, Tabitha Graves, Michelle Gibison

Brief summary of minutes of annual meeting: In consultation with our membership, our annual meeting has been moved from October to late May to coincide with the International CWD Symposium.

Accomplishments: This past year the Consortium has several notable accomplishments. Five "state-of-the-science" papers have been drafted and reviewed by members on the following topics: 1) zoonotic potential of CWD; 2) regulatory requirements for obtaining a USDA approved diagnostic test for CWD; 3) a description of the strengths and weaknesses of real-time quaking induced conversion assay (RT-QuIC); 4) a description of the strengths and weaknesses of protein misfolding cyclic amplification (PMCA); and 5) environmental transmission of CWD. The intent will be to disseminate these papers via a peer-reviewed journal.

In addition to the associated subcommittees meeting regularly, the Consortium continues to make progress on five focus areas of CWD identified at its inception meeting. These five include i) development of a national CWD tissue and reagents repository, ii) create large-scale research facilities for controlled CWD research, iii) improve CWD diagnostics, iv) evaluate management strategies across state boundaries and v) use social science to inform CWD management. The Consortium has made several accomplishments around these 5 objectives. Under the first objective, members held a Panel Discussion at the The Wildlife Society Annual Meeting to discuss ideas and scoping of a tissue database and repository. Subsequently, a contract was established with USGS to prepare the backbone of the National Tissue and Reagents Repository, and a poster on the repository was presented at the International Wildlife Disease Association meeting in Madison, WI in July. Under the second objective, members met with Kansas Department of Agriculture to discuss potential research collaborations with captive cervid farmers affected by CWD. Under the third objective, the USDA Agricultural Research Service (ARS), the United States Geological Survey, University of Wisconsin Madison, the National institute of Health Rocky Mountain Laboratory, and

USDA Veterinary Services, developed a standardized RT-QuIC protocol for use on ante mortem rectal and tonsil biopsies and postmortem medial retropharyngeal lymph nodes (MRPLN). Members also conducted a rectal biopsy RT-QuIC cross-laboratory reproducibility study with six NAHLN diagnostic laboratories (MO, WI, Cornell, PA, MN, MI). This study is a required component for official USDA diagnostic assay evaluation. Under the fourth objective, we have had several meetings to discuss objectives of this initiative. We also have hired a full-time coordinator to help push this objective forward. Under the fifth objective, several coordinating meetings have been organized and work is underway to develop collaborative projects.

The second main accomplishment of the Consortium is facilitating interdisciplinary collaboration. Past meetings, both in person and zoom, have been professionally facilitated allowing for richer interactions between the members that share common interests. These interactions have led to scientific collaborations that would not have been possible without The Consortium. Members of The Consortium have submitted grants to the National Science Foundation, the United States Department of Agriculture, the United States Geological Survey and the National Institutes of Health.

The Consortium also continues to conduct communication and outreach on CWD-related topics. The Consortium has built and maintains a web page (https://www.cwd-research.com/home) that contains a public facing area containing general information regarding CWD, the projects and a members-only section of the web page that houses information and notes about past meetings and other information for members.

Impacts: The impacts of the above accomplishments are multi-fold. Each of the objectives which are the focus of Consortium activities were selected because they are CWD research priorities and will impact the field. For example, the tissue repository will be a repository of CWD field isolates from a wide-ranging geographic location across North America that will permit the assessment of the distribution and frequency of CWD strains in North America. Second, this repository can provide uniform standardized CWD-infected and uninfected sources of tissue for diagnostic development, mitigation testing and for basic research purposes. The establishment of large-scale CWD research facilities is important for evaluating potential management actions at a scale that will allow for normal ecological and epidemiological processes to occur while still permitting experimental manipulation. The improvement of CWD diagnostics is foundational to answer key questions about the epidemiology of CWD and permitting rapid and efficient detection of CWD prions. Evaluating management strategies across state boundaries is critical to organize CWD response efforts and accelerate the identification of effective CWD management strategies. Lastly, it is becoming increasingly evident that successful CWD intervention strategies require societal support to be effective. The last objective is aimed at improving the social science tools and understanding to allow for successful implementation of CWD management. Thus, this project is having important impacts for increasing the understanding and management of CWD on multiple levels.

Publications (selected):

Block A. J. and J. C. Bartz. Prion strains: shining new light on old concepts. 2022. Cell Tissue Res. doi: 10.1007/s00441-022-03665-2.

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Herbst, A., S. Wolgemuth, J. Yang, A.R. Castle, D.M. Moreno, A. Otero, J.M. Aiken, D. Westaway and D. McKenzie. 2022. Susceptibility of beavers to chronic wasting disease. Biology 11:667.

Jennelle, C. S., W. D. Walter, J. Crawford, C. S. Rosenberry, and B. D. Wallingford. 2022. Movement of white-tailed deer in contrasting landscapes influences management of chronic wasting disease. Journal of Wildlife Management e22306. https://doi.org/10.1002/jwmg.22306

Moore, S. J., C. M. Carlson, J. R. Schneider, C. J. Johnson and J. J. Greenlee. 2022. Increased attack rates and decreased incubation periods in raccoons with Chronic Wasting Disease passaged through meadow voles. Emerging Infectious Diseases 28: 793-801.

Ness, A., Jacob, A., Saboraki, K., Otero, A., Gushue, D., Moreno, D., de Peña, M., Tang, X., Aiken, J., Lingle, S.& McKenzie, D. (2022) Cellular prion protein distribution in the vomeronasal organ, parotid, and scent glands of white-tailed deer and mule deer, Prion, 16:1, 40-57, DOI: 10.1080/19336896.2022.2079888

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