UNIVERSITY OF MINNESOTA

Twin Cities Campus

Office of Sponsored Projects Administration

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October 22, 2024

LCCMR
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Title: Highly pathogenic avian influenza virus in Minnesota wildlife

To Whom It May Concern:

A proposal for the above referenced program is hereby submitted on behalf of Arno Wuenschmann at the University of Minnesota. It has been administratively reviewed and approved on behalf of the Regents of the University of Minnesota.

Questions involving programmatic concerns should be directed to the Principal Investigator. If you have fiscal or contractual questions, please contact me at 612/626-7441.

Sincerely,

Brett Carlson
Sr. Grant & Contract Officer
Office of Sponsored Projects Administration

Enclosure

LCCMR Emerging Issue Proposal: Highly pathogenic avian influenza in free-ranging birds and mammals in Minnesota.

PIs: Drs Wuenschmann (wunsc001@umn.edu) & Schroeder (dcschroe@umn.edu)

Justification: Highly pathogenic avian influenza (HPAI) virus is an emerging and ongoing disease threat to the health of MN wildlife, poultry, livestock and humans. Previous HPAI outbreaks such as the 2015 outbreak, were short-lived, having ceased within a few months of it's introduction to the Minnesota wild bird population. The current H5N1 HPAI outbreak continues as best evidenced by the detection of the virus on 22 poultry premises in Minnesota in 2024, alone (172 affected premises since March of 2022).

taken from ***https://www.bah.state.mn.us/hpai***

To make matters worse, the 2022 H5N1 HPAI variant has manifested itself in unpredicted forms such as the death of wild mammals (including foxes, bears, mice and others) and in dairy goat kits. Furthermore, the virus has caused widespread infection of dairy cows since March 2024. As resources are being allocated for HPAI-related research on the agricultural and human side, surveillance of wildlife meanwhile has been largely discontinued so that the impact of HPAI on Minnesota's wildlife populations is currently impossible to assess. In this sense, the detection of the virus in a red fox kit in Minnesota in May 2024, likely represents the tip of the iceberg. Although it is well established that newly introduced HPAI viruses exchange genome segments with lowly pathogenic avian influenza (LPAI) variants circulating in the local waterfowl populations, the specific cause for the persistence of the current H5N1 HPAI variant and its ability to find new hosts and niches is unknown. The University of Minnesota is uniquely positioned to study the diversity of HPAI viruses because it has one of only very few Select Agent Biosecurity Level 3 (BSL-3) labs in the nation permitted to work with HPAI viruses. Moreover, the fall and winter months present more opportunities for virus spread and detections are higher in the fall and following spring because we continue to see wild birds spreading virus as they migrate to their seasonal homes. **Therefore the time is now to establish a Minnesotan wildlife virus surveillance program so as to be ready for a potential resurgence in cases in Spring 2025**.

Proposed Action:
Activity 1: Establishing a wildlife health network throughout Minnesota consisting at its core of DNR-approved wildlife rehabilitators and tribal biologists. ***Activity 2:*** Creation of materials to train rehabilitators and tribal biologists in collecting appropriate samples with the necessary metadata and submitting the samples to Minnesota Veterinary Diagnostic Laboratory (MVDL) in a biosecure fashion. ***Activity 3:*** Collecting and testing of 9,000 samples from free-ranging birds and mammals Minnesota-wide for HPAI virus via RT-qPCR of oropharyngeal and/or cloacal swabs at MVDL. ***Activity 4:*** Running a newly estalished assay developed in the Schroeder Lab that quickly confirms the presence of live HPAI infection in samples. ***Activity 5:*** Performing virus isolation in the secure BSL-3 Veterinary Isolation Facility at the College of

Veterinary Medicine of the University of Minnesota for any samples that tested positive in activity 4. ***Activity 6:*** a) Reporting results to the submitters in real time. b) Reporting anonymized results to the public in weekly updates in the form of maps and an updated summary of wildlife data tested on a publicly accessible webpage of the University of Minnesota after authorization by the authorities (DNR, BAH, tribal nations)

Dissemination: Target podcasts, website posts and publications in peer reviewed journals.

Description of the organization: The University of Minnesota System is driven by a singular vision of excellence. We are proud of our land-grant mission of world-class education, groundbreaking research, and community-engaged outreach, and we are unified in our drive to serve Minnesota.

Budget:

BUDGET ITEM	Budget	Amount Spent	Balance
Personnel (Wages and Benefits)			
	$432,583	$0	$432,583
Professional/Technical/Service Contracts & Subawards			
	$254,409	$0	$254,409
Equipment/Tools/Supplies			
	$351,188	$0	$351,188
Capital Expenditures Over $5,000			
	$150,000	$0	$150,000
Printing and Publication			
	$0	$0	$0
Travel Expenses In Minnesota			
	$0	$0	$0
Travel Expenses Outside Minnesota			
	$0	$0	$0
Other			
	$78,699	$0	$78,699
COLUMN TOTAL	**$1,266,879**	**$0**	**$1,266,879**

Summary: The proposed study aims at better understanding, whether wild animal species and if so, which wild animal species, may serve as reservoir for HPAI virus and to begin a Minnesota wildlife virus surveillance program with reference library of HPAI virus isolates that can be used in the future to characterize the virus with the goal to identify specific mutations. Knowledge of the viral diversity is necessary in guiding mitigation strategies (preventative or remediative) for wildlife and in formulating warnings for the public (agriculture community and health community). This Minnesota wildlife virus surveillance program can serve as a new resource for future virus outbreaks in Minnesota, whether of HPAI virus origin or new emerging diseases.

Attachment A:
Environment and Natural Resources Trust Fund Budget:
M.L. 2023 Budget Addendum Spreadsheet
Legal Citation:
Project Manager: Dr. Arno Wuenschmann
Project Title: Highly pathogenic avian influenza virus in Minnesota wildlife
Organization: Regents of the University of Minnesota
Project Budget: $1,266,879
Project Length and Completion Date: 2 years, 7/1/2025 - 6/30/2027
Current Date: 10/21/2024

BUDGET ITEM	Budget	Amount Spent	Balance	Justification for Generally Ineligible Expenses (If appliable)	List of Generally Ineligible and Prohibited Expenses
Personnel (Wages and Benefits)	$ -	$ -	$ -		
Arno Wuenschmann, PI, Professor, 10%/year for 2 years	$ 51,963				
Declan Schroeder, Co-PI, Associate Professor, 16%/year for 2 years	$ 111,298				
Tiffany Wolf, Co-I, Associate Professor, 10%/year for 2 years	$ 31,369				
Kristin Bondo, Researcher, 10%/year for 2 years	$ 19,928				
Michelle Mackey, Program Admin, 5%/year for 2 years	$ 8,915				
Adam Clemens, IT Professional, 3%/year for 2 years	$ 6,866				
TBN Researcher 6, 100%/year for 2 years	$ 181,132				
TBN VPH Resident, 20% year for 2 years	$ 21,112				
TOTAL	$ 432,583				
Professional/Technical/Service Contracts & Subawards					
Subaward to Wildlife Rehabilitation Center (2 years)	$ 254,409				
TOTAL	$ 254,409				
Equipment/Tools/Supplies					
RT-qPCR tests (9,000 @ $38.50/each)	$ 346,500				
Culturette swabs (9,000 swabs)	$ 3,366				
BHI broth powder for 9,000 tubes	$ 517				
5ml tubes (9,000 tubes)	$ 494				
Labels for 9,000 tubes	$ 311				
TOTAL	$ 351,188				
Capital Expenditures Over $5,000					
Dedicated qPCR 2plex machine (Qiagen) with service agreement included	$ 55,000				
Dedicated -80C for sample storage (TermoFisher ultralow)	$ 15,000				
Dedivcated Viral extraction system (ThermoFisher KingFisher Apex Dx)	$ 80,000				
TOTAL	$ 150,000				
Other Expenses					
Bacteriology	$ 700				
Shipping costs	$ 10,000				
PCR lab tech services	$ 2,799				
Standard and Viability RT-qPCR: chemistry and molecular grade plastics for maximum 600	$ 15,000				
Virus culturing_ max 50 (culture vessels, growth media, titer testing, infectivity assays)	$ 10,000				
Sequencing, max 50 (ONT kit plus 4 fow cells and 3rd party chemistry)	$ 5,000				
BSL-3 lab usage fee to work on HPAI in the lab ($400 per week) - 8 weeks per year	$ 31,200				
Printing and Publication	$ 4,000				
TOTAL	$ 78,699				
TOTAL DIRECT COSTS	$ 1,266,879				

Organization Description:

1) The Minnesota Veterinary Diagnostic Laboratory (MVDL) of the University of Minnesota and the Board of Animal Health is dedicated to the "*protection and promotion of animal and human health through the early detection and monitoring of animal diseases*" (mission statement). It is a fully accredited diagnostic laboratory specializing in the diagnosis of animal diseases. The lab is part of a nationwide network of laboratories (National Animal Health Laboratory Network). The lab has been approved by the National Animal Health Laboratory Network to perform influenza A virus testing since 1998 when its molecular lab began operating. The molecular lab at MVDL has passed every proficiency test for influenza virus testing since these test are administered by the National Veterinary Services Laboratories (NVSL) in Ames, Iowa. Currently 18 technicians of the molecular laboratory at MVDL are proficiency tested for the specific qPCR test.
2) The Biosafety Level 3 Laboratory in the Veterinary Isolation Facility at the College of Veterinary Medicine of the University of Minnesota was completed in 2019 in response to the 2014-15 outbreak of highly pathogenic avian influenza virus in Minnesota. Since 2023, Dr. Declan Schroeder is approved by the USDA to conduct work with highly pathogenic influenza (HPAI) virus in this laboratory under strict USDA guided Select Agent protocols. This facility is suitably equipped to ensure that HPAI virus is contained and can be studied under controlled conditions. However, investments for updating existing equipment and acquiring newer technologies is also ongoing.