

2024 VMDL ANNUAL REPORT PART I – DIAGNOSTIC PROGRAMS

SUMMARY

In 2024, the VMDL handled about 63,500 total cases and conducted nearly 204,500 tests — a slight decrease compared to 2023, with 2.29% fewer cases and 1.26% fewer tests. Veterinarians, animal owners and researchers from 103 Missouri counties and cities, as well as from 51 states and provinces outside Missouri, continued to rely on the Veterinary Medical Diagnostic Laboratory’s (VMDL) diagnostic services.

The VMDL successfully passed all required proficiency tests for diseases regulated by federal and state authorities. The VMDL also completed additional proficiency tests needed to maintain its laboratory accreditations and certifications — upholding full accreditation from the American Association of Veterinary Laboratory Diagnosticians (AAVLD), along with its status as a NAHLN Level 1 and FDA Vet-LRN Tier 1 lab. The VMDL retained certifications from the National Poultry Improvement Plan (NPIP) and USDA for equine infectious anemia (EIA) testing. The OHL-Rabies Serology section maintained its Clinical Laboratory Improvement Amendments (CLIA) certification and began testing human samples for rabies antibody titers.

To stay connected with its stakeholders, the VMDL shared updates through quarterly newsletters, participated in various seminars, delivered talks at local and regional meetings. The VMDL also maintained a strong presence in national, state and local conferences, meetings and training sessions.

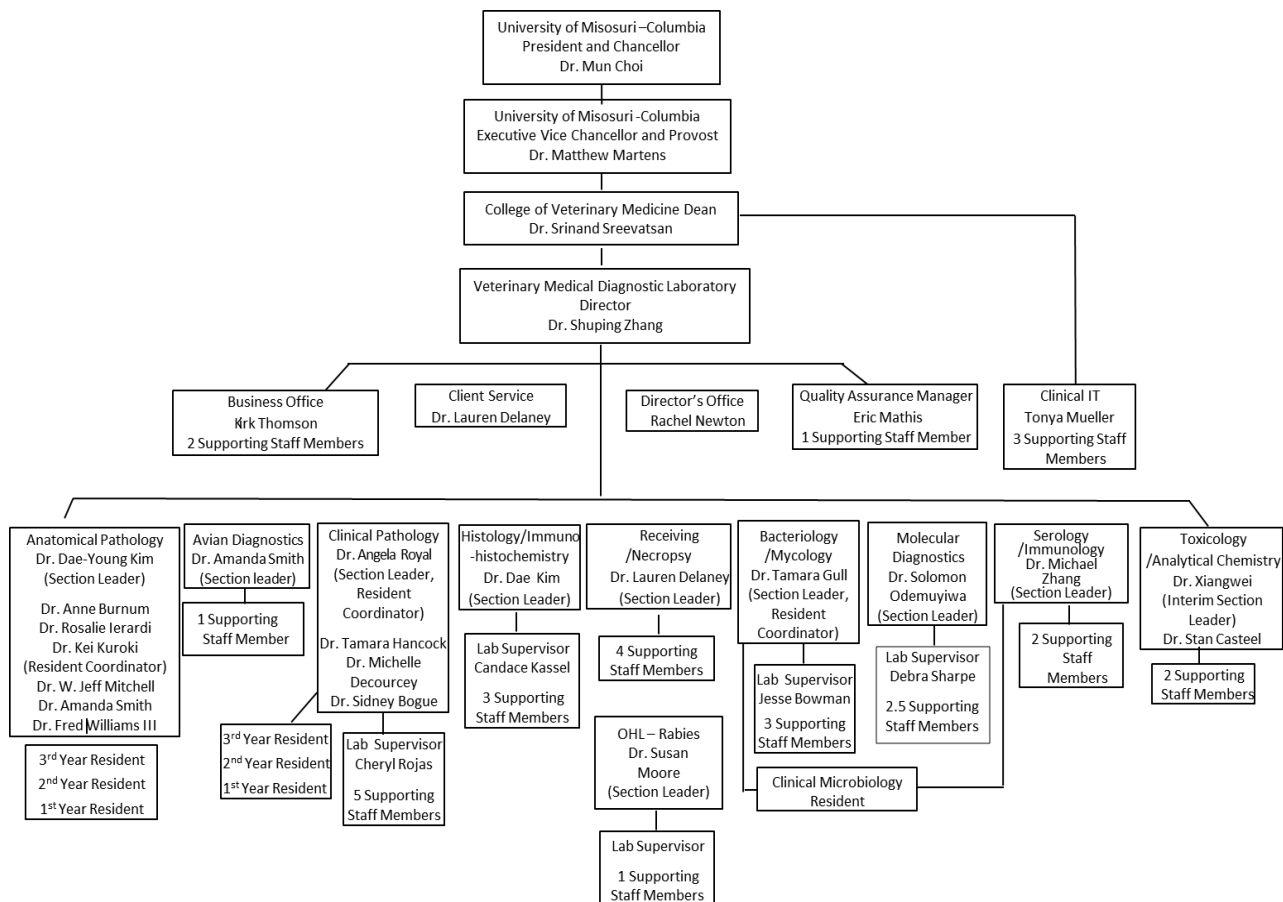
INTRODUCTION

The Veterinary Medical Diagnostic Laboratory (VMDL) is a cornerstone of the College of Veterinary Medicine and serves as one of its two clinical units. It is Missouri's only full-service diagnostic lab for all animal species and the only AAVLD-accredited lab in the state. The VMDL is also a Level 1 lab in the USDA National Animal Health Laboratory Network (NAHLN) and a Tier 1 lab in the FDA Veterinary Laboratory Investigation and Response Network (Vet-LIRN).

In addition to providing timely, relevant and cost-effective diagnostic services, the VMDL supports a strong learning environment for students and fosters excellence in teaching and research.

The 2024 VMDL Annual Report includes two sections: Diagnostic Service Programs and Academic Programs, with data from the past five years to track diagnostic trends and caseload. To track the diagnostic caseload, data for the last five years are presented.

VMDL ORGANIZATIONAL STRUCTURE



EXTERNAL ADVISORY BOARD

Mission Statement

To advise VMDL management on policies, services, strategies, and partnerships with stakeholders.

Advisory Board Membership

The Advisory Board consists of 12 members representing the Missouri Department of Agriculture, USDA, Missouri Department of Conservation, commodity groups, private practice, animal health industry, and the University of Missouri Veterinary Health Center.

Advisory Board Members

Steve Strubberg, DVM, Missouri State Veterinarian

Terry Gosch, DVM, USDA Area Veterinarian in Charge

Sherri Russell, DVM, Missouri Department of Conservation Science Branch Chief

Clark Fobian, DVM, Sedalia, MO, Past President, AVMA

Bruce Addison, MS, President, Addison Biological Laboratory, Inc.

Tony Martin, DVM, Director of Animal Health Division, MFA, Inc.

Don Nikodim, Executive Vice President, Missouri Pork Association

Sydney Thummel, Executive Director, Missouri Beef Industry Council

John Bryan, Vice President, Poultry Federation

John Dodam, DVM, MS, PhD, DACVAA, MU VHC Director, DVMS Chair

VMDL CLIENT OUTREACH PROGRAMS

A Client Care Veterinarian is available for consultation (573-882-6811).

The VMDL After-hours Sample Drop-Off is available in VMDL Phase I building.

The VMDL Courier Service is available for convenient transport of samples within the Columbia area.

The VMDL FedEx Billable Stamps program enables inexpensive next day delivery of samples to the lab.

The VMDL VetView Portal allows clients to check diagnostic results and charges in real-time. Online Bill Pay is also available to clients.

The VMDL website (<https://vmdl.missouri.edu/>) provides useful content and information, such as Tests and Fees, Submission Forms, How to Submit Samples, Test Results (Online Lab Results and Global VetLink for EIA), VMDL Alert, VMDL Newsletter, VMDL Annual Report, Potential Open Positions, Pathology Externship Opportunities, Residency program descriptions, etc.

The VMDL personnel maintain attendance at district VMA meetings.

VMDL ONE HEALTH – RABIES SEROLOGY

The OHL – Rabies Serology performs two primary assays are the Rapid Fluorescent Focus Inhibition test (RFFIT) and the Fluorescent Antibody Virus Neutralization test (FAVN) to verify rabies vaccination status in humans and animals.

The OHL meets qualification standards of the Clinical Laboratory Improvement Amendments (CLIA) and American Association of Veterinary Laboratory Diagnosticians (AAVLD). The One Health – Rabies

Lab is recognized by the USDA to perform rabies serology for the purpose of pet export/travel.

VMDL DIAGNOSTIC SERVICE ACTIVITIES

Table 1. Five-Year VMDL (Main Lab and Clinical Pathology) Accessions*

Year	Total Accessions (%)	Main Lab	Clin Path	OHL-Rabies	Main Lab-VHC (%)	Clin Path-VHC (%)	OHL-VHC (%)
2020	52,214 (0.74%)	27,189	25,025	N/A	4,264 (15.68)	23,768 (94.98)	N/A
2021	55,756 (6.78%)	29,015	26,741	N/A	4,340 (17.59)	26,043 (97.39)	N/A
2022	58,681 (5.25%)	30,691	27,875	N/A	4,070 (13.26)	27,409 (98.33)	N/A
2023	64,942 (10.67%)	33,091	31,678	173	4,411 (13.33)	31,247 (98.64)	5 (2.89)
2024	63,455 (-2.29%)	31,994	31,008	453	3,942 (12.32)	31,008 (98.75)	4 (0.88)

*A Main Lab accession may include multiple samples for various tests whereas most Clinical Pathology accessions include a single sample. From 2023 to 2024, total accessions decreased 2.29%.

Table 2. Distribution of 2024 VMDL Accessions in 103 MO Counties/Independent City

County	#	County	#	County	#	County	#
Boone	35,233	McDonald	172	Adair	76	Warren	24
Not Specified	4,966	Pulaski	166	Osage	70	Atchison	21
Saint Charles	1,865	Lincoln	160	Barry	65	Dallas	18
Saint Louis	1,377	Miller	156	Macon	64	Andrew	16
Moniteau	968	Pettis	154	Lewis	61	Shannon	16
Jackson	848	Buchanan	153	Dunklin	60	Benton	15
Greene	785	Putnam	147	Shelby	60	Maries	15
Johnson	663	Polk	146	Stoddard	56	Perry	15
Franklin	599	Howard	130	Wright	55	Saint Clair	15
Cole	590	Ray	127	Crawford	52	Ralls	9
Jefferson	523	Lawrence	125	Taney	49	Daviess	8
Callaway	382	Monroe	122	Bollinger	46	Barton	7
Christian	368	Texas	121	Henry	46	Chariton	6
Cape Girardeau	361	Cooper	120	Madison	44	Clinton	4
Marion	325	Camden	119	Platte	44	Dade	4
Saint Louis	288	Lafayette	117	Clay	43	Dekalb	3
Saint Francois	254	Montgomery	110	Sullivan	43	Douglas	3
Livingston	243	Howell	104	Bates	41	Wayne	3

Jasper	231	Phelps	104	Laclede	38	Knox	2
Gasconade	225	Oregon	103	Vernon	38	Mississippi	2
Butler	224	Saline	85	Caldwell	37	Audrain	1
Randolph	223	Grundy	83	Sainte	32	Carroll	1
Cass	220	Scott	81	Cedar	29	Gentry	1
Webster	219	Linn	80	Dent	29	Harrison	1
Newton	194	Audrain	78	Morgan	29	Schuyler	1
Pike	177	Nodaway	78	Clark	26	Washington	1

Table 3. Distribution of 2023 VMDL Accessions in 51 Non-Missouri States and Provinces

State	#	State	#	State	#	State	#
Arkansas	1,975	Hawaii	48	Alabama	19	Utah	5
Illinois	1,068	Florida	45	Maryland	19	Alberta	4
Oklahoma	649	Maine	42	Wisconsin	17	Ontario	4
Kansas	544	Minnesota	40	Nevada	12	Wyoming	4
Michigan	480	Pennsylvania	38	Mississippi	10	British Columbia	2
Iowa	217	Indiana	36	Kentucky	9	Connecticut	2
California	214	New York	35	Oregon	8	Idaho	2
North Carolina	157	Arizona	34	Georgia	7	Montana	2
Texas	131	South Carolina	31	Louisiana	7	Quebec	2
Colorado	116	Tennessee	29	New Mexico	7	New Hampshire	1
Nebraska	106	New Jersey	28	Ohio	7	South Dakota	1
Washington	83	Puerto Rico	28	Alaska	5	Vermont	1
Virginia	80	Massachusetts	21	<i>Not Specified</i>	5		

Table 4. Five-Year VMDL Testing by Animal Species*

Year	Total	Avian	Bovine	Canine	Caprine /Ovine	Cervid/ Exotic	Equine	Feline	Porcine	Misc
2020	147,547	4,164	17,029	68,744	2,673	26,541	9,191	10,347	4,887	3,971
2021	166,671	4,228	15,798	70,261	2,474	42,247	9,161	10,666	3,069	8,667
2022	176,126	10,408	16,153	76,029	2,780	44,619	9,852	11,325	3,898	1,062
2023	207,026	16,460	16,313	79,776	2,843	58,031	13,196	12,372	7,179	856
2024	204,427	23,701	15,308	80,333	2,750	36,647	12,942	13,178	7,743	11,825

Table 5. Five-Year VMDL Testing by Section*

Year	Total (% Change)	Avian Dx.	Ana. Path	Histo/ IHC	Clin Path	Micro	Mol/Vir	Sero. /CWD	Tox/ Chem	OHL
2020	147,547 (-8.35%)	1,822	13,051	45,270	35,206	13,720	7,717	27,539	3,222	0
2021	166,571 (12.89%)	1,586	15,294	44,227	37,151	13,625	8,537	43,364	2,787	0
2022	174,888 (5.74%)	1,530	13,223	46,319	39,341	13,993	15,239	44,176	1,327	978
2023	207,026 (17.54%)	3,336	13,368	47,320	52,621	16,050	18,077	47,085	8,929	240
2024	205,677 (-1.26%)	17,395	13,479	47,146	51,696	14,646	10,589	47,539	2,020	1,167

* From 2023 to 2024, the total testing numbers decreased 1.25%.

Table 6. 2023 Foreign Animal Disease and Public Health Surveillance Testing

Test Description	#
African Swine Fever (ASF) PCR	214
Brucella abortus Card Agg	395
Brucella abortus Card Agg & Pseudorabies ELISA	562
Brucella canis Rapid Ab test	379
Chronic Wasting Disease (CWD) ELISA	35,252
Classical Swine Fever (CSF) PCR	214
Contagious Equine Metritis (CEM)	92
Exotic Newcastle Disease	200
Foot and Mouth Disease (FMD) PCR	10
Influenza ELISA	1,924
Influenza PCR	2,378
Rabies serology	1,167
Salmonella culture	1,855
Salmonella PCR	184
West Nile ELISA	34
West Nile virus PCR	44
Total	44,904

Table 7. External Proficiency Tests

Bacteriology/Mycology	Classical Swine Fever Virus rRT-PCR
Contagious Equine Metritis Culture	Foot-and-Mouth Disease Virus rRT-PCR
<i>Listeria</i> and <i>Salmonella</i> in Raw Dog Food	<i>Mycoplasma gallisepticum</i> PCR

Salmonella Group D Culture and Serology

Clinical Pathology

Chemistry-Routine

Hematology

Microscopy

Urinalysis

Foreign Animal Disease Data Transmission

APMV/vNDV Electronic Messaging

ASF Electronic Messaging

CSF Electronic Messaging

FMD Electronic Messaging

IAV-A Electronic Messaging

IAV-S Electronic Messaging

Pseudorabies Electronic Messaging

Molecular Diagnostics

Avian Influenza Virus rRT-PCR

Avian Paramyxovirus -1/END Virus rRT-PCR

African Swine Fever rPCR

Mycoplasma synoviae PCR

Swine Influenza Virus rRT-PCR

One Health – Rabies

Rapid Fluorescent Focus Inhibition test

Fluorescent Antibody Virus Neutralization test
(FAVN)

Serology/Immunology

Bluetongue ELISA

Bovine Leukemia Virus ELISA

Brucellosis Serology

Chronic Wasting Disease ELISA

Equine Infectious Anemia ELISA

Johne's ELISA

Pseudorabies Virus gB & gI ELISA

Toxicology/Analytical Chemistry

Aflatoxin in Feedstuffs HPLC

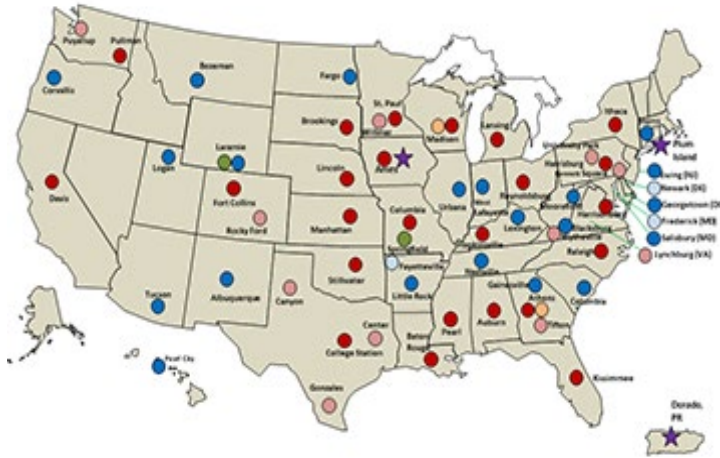
Aflatoxin M1 in Tissues HPLC

Copper in Liver ICP

Deoxynivalenol in Feedstuffs HPLC

VMDL PARTICIPATION IN NATIONAL PROGRAMS

1. USDA Antimicrobial Resistance Dashboard
2. USDA EIA Testing lab
3. USDA National Poultry Improvement Plan (NPIP)
4. Level I Lab of the USDA National Animal Health Laboratory Network (NAHLN)



5. Tier I Lab of FDA Veterinary Laboratory Investigation and Response Network (Vet-LIRN)



ENGAGEMENT & OUTREACH

1. **Delaney L.** Editor. Under the Scope – 2024 Winter MU VMDL Newsletter
2. **Delaney L.** Editor. Under the Scope – 2024 Spring MU VMDL Newsletter
3. **Delaney L.** Editor. Under the Scope – 2024 Summer MU VMDL Newsletter
4. **Delaney L.** Editor. Under the Scope – 2024 Fall MU VMDL Newsletter
5. **Delaney L.** VMDL Facility Update; MVMA Annual Meeting; Jan 27, 2024; Columbia, MO
6. **Delaney L.** Veterinary Diagnostics for the Dog Breeder; MDA/USDA Canine Care Workshop; Oct. 4, 2024; Columbia, MO
7. **Delaney L.** Prion Sampling Wet Lab; MDA/USDA Workshop; Nov 5, 2024; Columbia, MO
8. **Ierardi, R.** *Anaplasma, Theileria*, and the Invasive Longhorned Tick; January 25, 2024; Missouri Veterinary Medical Association Annual Convention; Columbia, MO
9. **Ierardi, R., Delaney L.** Johne's Disease – Not Just for Dairy Cows; Under the Scope – 2024

Winter MU VMDL Newsletter

10. **Ierardi R.** Turning Red: Watching Out for Bacillary Hemoglobinuria; April 2024; Joplin Regional Stockyards Cattlemen's News, p. 26-27
11. **Ierardi R.** More Than Just a Fluke: How Liver Flukes Can Impact Your Cattle Herd; June 2024; Joplin Regional Stockyards Cattlemen's News, p. 28-29
12. **Ierardi R.** *Anaplasma*, *Theileria*, and the Invasive Longhorned Tick; June 12, 2024; 2024 ADM Meeting; Cornett Farm (Linneus, MO)
13. **Ierardi R.** Ticks and Missouri Cattle; August 1, 2024; Northern Missouri Research, Extension and Education Center Field Day; Novelty, MO; <https://extension.missouri.edu/publications/sr606>
14. **Ierardi R.** Knowledge about a tick and the disease it spreads was shared at University of Missouri's Field Day; August 1, 2024; KTVO TV segment (Interviewed by Greg Hughes); <https://www.youtube.com/watch?v=t05-FUQ6aVM>
15. **Ierardi R.** A new invasive tick; August 29, 2024; AgProud.com (Interviewed by Gilda Bryant); <https://www.agproud.com/articles/60127-a-new-invasive-tick> Ierardi, R. An Update on Invasive Longhorned Ticks and Bovine Theileriosis; November 2024; Joplin Regional Stockyards Cattlemen's News, p. 26
16. **Ierardi R.** Active surveillance for *Theileria orientalis* and the invasive longhorned tick (*Haemaphysalis longicornis*) in three Missouri beef herds; November 9, 2024; West Central MVMA District Meeting; Columbia, MO
17. **Odemuyiwa SO.** A clinical laboratory approach to the diagnosis of feline infectious peritonitis; September 14, 2024; West Central MVMA District Meeting, Booneville, MO.

MAJOR PROFESSIONAL MEETINGS AND TRAININGS

1. AAVLD Accreditation Auditor Training
2. American Association of Veterinary Laboratory Diagnosticians (AAVLD) Annual Meeting
3. FDA Veterinary Laboratory Investigation and Response Network (Vet-LIRN) Monthly Conference
4. Missouri Biosecurity Working Group Quarterly Meetings
5. Missouri Captive Wild Animal Health Quarterly Meetings
6. Missouri Veterinary Medical Association (MVMA) Annual Convention and District Meetings
7. National Animal Health Laboratory Network (NAHLN) Preparedness Weekly Conferences
8. National Poultry Improvement Plan (NPIP) Workshop
9. Regional Practitioners Meeting in Columbia, MO
10. Swine Health Symposium & Trade Show in Columbia, MO
11. Swine Institute Meeting in Sedalia, MO



2024 VMDL ANNUAL REPORT PART II – ACADEMIC PROGRAMS

SUMMARY

In addition to fulfilling the VMDL’s primary mission in laboratory diagnostic services, its faculty and staff play critical roles in education, research, and engagement and outreach. In 2024, they made a powerful impact by teaching or co-teaching 36 courses for DVM students, graduates and undergraduates. They also led and participated in 24 clinical and diagnostic rounds and journal clubs for better patient care, communication, training and assessment of residents and clinical students.

In research, the VMDL team is breaking new ground with five new awards for leading-edge projects. They continued to make strides in nine active diagnostic research initiatives and completed 11 externally funded projects. Their contributions to the field are evident in 40 peer-reviewed publications, including two book chapters, and 31 scientific presentations at major conferences.

VMDL faculty also maintained a strong presence in their professional communities, serving as committee members, task force leaders and peer reviewers — ensuring they are always at the forefront of veterinary science and education.

TEACHING

Didactic and Laboratory Courses (N = 35; Bold: Coordinated by VMDL Faculty)

BioMED 3310	Biomedical Pathophysiology Online
BioMed 4110/V_P BIO 7110	Veterinary Cytology
LAB_AN 9437	Lab Animal Pathology
V_BSCI 5502	Veterinary Microscopic Anatomy w/ Lab
V_BSCI 5504	Veterinary Physiology
V_M_S 6001	Professional Skills I: Veterinary Student Success
MMI 8050	Mechanisms of Microbial Pathogenesis
V_M_S 6400	Food Animal Medicine & Surgery I
V_M_S 6420	Problem-Based Learning Clinic Preparation
V_M_S 6987	Problem-Based Learning Clinic Preparation
V_M_S 8036	Advanced Physiology of Dog and Cat
V_M_S 8401	Topics in Veterinary Clinical Sciences
V_M_S 8402	Seminar in Veterinary Clinical Sciences
V_M_S 8402 B	Seminar in Veterinary Clinical Sciences
V_M_S 8402 D	Clinical Veterinary Endocrinology
V_M_S 8411	Clinicopathologic Case Conference (CPC)
V_M_S 8415	Advanced Veterinary Neurology



V_M_S 8485	Problems in Veterinary Clinical Science
V_PBIO 5552	Veterinary Bacteriology 1
V_PBIO 5553	Veterinary Bacteriology 2
V_PBIO 5554	Veterinary Virology
V_PBIO 5575	General Veterinary Pathology
V_PBIO 5576	Veterinary Systemic and Special Pathology I
V_PBIO 5577	Veterinary Systemic and Special Pathology II
V_PBIO 5578	Foundations in Veterinary Research
V_PBIO 5995	Veterinary Clinical Pathology
V_PBIO 6647	Diagnostic Pathology and Special Species Medicine
V_PBIO 6679	Diagnostic Pathology and Special Species Medicine Elective
V_PBIO 8432	Advanced Histopathology
V_PBIO 8434	Advanced Clinical Pathology
V_PBIO 8436	Pathogenic Mechanisms in Veterinary Medicine
V_PBIO 8400	Histopathology Slide Seminar
V_PBIO 8440	Pathology Journal Review
V_PBIO 8450	Non-Thesis Research in Veterinary Pathobiology
V_PBIO 9090	Area Veterinary Pathobiology Dissertation Research

Clinical and Diagnostic Rounds and Seminars (N = 24)

- Chemistry Rounds
- Clinical Pathology Journal Club
- Comparative Orthopaedic Laboratory (COL) journal club
- Cytology Rounds
- Cytology-Histology Correlates (Follow Up Rounds)
- Dermatology Rounds
- Equine Journal Club
- Food Animal Journal Club
- Food Animal/ Equine Clinical Case Rounds
- Food for Thought Rounds
- Gross Pathology Rounds
- Hematology Rounds
- Human Health and the Environment
- Image Review
- Joint Pathology Center Wednesday Slide Conference
- Mentoring Externship Fellows in Anatomic Pathology



Mentoring International Students
Mentoring Pre-Vet Students (Including Pre-Vet Scholars)
Mentoring Veterinary Professional Students at VET Orientation for VM-1s
Neurology Journal Club
Neuropathology Rounds
Ophthalmic Pathology Rounds
Slide Treats
VMDL-Food Animal Monthly Rounds

Residency Training Programs (N = 3)

Anatomical Pathology
Clinical Pathology
Clinical and Diagnostic Microbiology (Bacteriology, Immunology and Virology)

RESEARCH AND SCHOLARLY ACTIVITY (Bold: VMDL faculty and staff members)

New Grants (N = 5)

1. **Moore, Susan (PI)**. CTRS FOR DISEASE CONTROL AND PREVENTION 75D30124P19680; Rabies Serology Proficiency Testing Program; 09/30/2024 – 11/29/2026; Total \$47,826 (Direct \$47,826)
2. **Shen Z (PI)**, Odemuyiwa S (Co-PI); USDA VETAH181171; Diagnosis of bovine respiratory viral disease with metagenomic next-generation sequencing; 07/01/2024 to 06/30/2025; \$17,065.
3. **Zhang S (PD)**. USDA NIFA 2024-37624-42865; NAHLN Level 1 Lab - Maintaining and Further Improving Capacity and Capabilities; 08-01-2024 to 07-31-2025; Total: \$250,000 (Direct: \$227,237)
4. **Zhang S (PD)**. USDA-APHIS- AP24VSD&B000C061; NAHLN Level 1 Lab - Maintaining and Further Improving Capacity and Capabilities II; 07-01-2024 to 06-31-2025; Total: \$106,300 (Direct: \$96,637)
5. **Zhang S (PI)**, **Shen Z (Co-PI)**, **Odemuyiwa S (Co-I)**, **Gull T (Co-I)**. FDA 5U18FD006670-06; FDA Vet-LIRN Site - Tier I Lab Renewal; 06-01-2024 to 05-31-2025; Total: \$39,900 (Direct: \$30,000)

Active Grants (N = 9)

1. **Gull, Tamara (Co-PI)**, **Odemuyiwa, Solomon Olawole (Co-PI)**, **Lim, Teng (PI)**. NATL PORK BOARD PO-001946 - PR-005838; Methodology exploration for characterizing grinder viral aerosolization and innovative cleaning and disinfection; 12/22/2023 – 06/22/2025; Total \$249,803 (Direct \$249,803)



2. **Gull, Tamara (Co-PI), Odemuyiwa, Solomon Olawole (Co-PI), Lim, Teng (PI).** SWINE HEALTH INFO CTR 23-049 SHIC; Development of an effective and practical biosecurity entrance system; 09/01/2023 – 03/01/2025; Total \$179,933 (Direct \$179,933)
3. **Kuroki, Keiichi (Co-I), Bryan, Jeffrey (PI).** EDGE ANIMAL HEALTH; Analysis of renal biopsies by University of Missouri, College of Veterinary Medicine; 10/01/2022 – 09/30/2025; Total \$35,051 (Direct \$21,703)
6. **Zhang S (Key Personnel), Almasri M (PI), Li H (Co-PI), Safranski T (Co-PI), Trout K (Co-PI), Morey A (Co-PI).** NSF Convergence Accelerator Track J Phase 2; Rapid Detection Technologies and Decision-Support Systems for Safe, Equitable Food Systems; 12-15-2023 to 11-30-2026; Total: \$5,000,000; SZ Direct: \$191,555 (Y1: \$54,090, Y2: \$89,874, Y3: \$47,591).
7. **Zhang S (PI), Tamara Gull (Co-PI), Tanya Muller (Key Personnel).** USDA APHIS AP23VSSP0000C110; Development of an Antimicrobial Resistance Dashboard to Integrate Antimicrobial Susceptibility Testing Data Generated by Missouri Veterinary Medical Diagnostic Laboratory; 09-01-2023 to 08-31-2025; Total: \$214,528 (Direct: \$193,077)
8. **Zhang S (PI), Zhang M (Co-PI), Almasri M (Co-PI).** Missouri Department of Conservation #450; Development and Application of MEMS-Based Biosensor and RT-QulC Assay for the Detection of Chronic Wasting Disease Prion in Anti- and Post-Mortem Cervid Samples; 03-01-2020 to 12-01-2025; Total: \$979,825 (Direct: \$881,842.5)
9. **Zhang S (PI).** USDA/CSU ARP NAHLN Program; 10-01-2023 to 09-30-2025; Total: \$1,000,000 (Direct: \$909,090.46)

Completed Grants (N = 11)

1. **Hancock, Tamara (Co-I), Baines, Christopher (PI).** BOEHRINGER INGELHEIM VETMEDICA INC; 2024 Veterinary Research Scholars Program; 01/01/2024 – 12/31/2024; Total \$30,800 (Direct \$30,800)
2. **Shen, Zhenyu (PI), Zhang, Shuping (Co-PI), Odemuyiwa, Solomon Olawole (Co-PI).** FOOD AND DRUG ADMN U18FD007720; Development of Metagenomic RNA-Seq Standard Operating Procedure for Variant-agnostic Whole Genome Sequencing of SARS-CoV-2 isolates from Animal Samples; 09/01/2022 – 08/31/2024; Total \$160,095 (Direct \$114,933)
3. **Du, Xiangwei (PI), Evans, Tim (Co-PI) Zhang, Shuping (Co-I).** FOOD AND DRUG ADMN U18FD007511; Enhancing food contaminant surveillance capacity using ultra-performance liquid chromatography with UV/fluorescence detection; 09/06/2021 – 08/31/2024; Total \$173,000 (Direct \$144,989)
4. **Gull, Tamara (Co-I), Lucy, Matthew C (PI).** NIH NATL INST OF CHILD HEALTH AND HUMAN R01HD092254; Uterine microbiome: Functional significance in establishing the uterine program postpartum; 08/15/2018 – 04/30/2024; Total \$1,590,694 (Direct \$1,029,802)



5. **Gull, Tamara (Co-I), Mickelson, Megan (PI).** AMER COLLEGE OF VET SURGEONS; Effect of subcutaneous lavage on bacterial contamination in dogs undergoing gastrointestinal surgery; 05/01/2021 – 05/01/2024; Total \$12,555 (Direct \$12,555)
6. **Johnson, Gayle (Co-I), Coates, Joan (PI).** AKC CANINE HEALTH FNDTN 02658; Characterization of sensory neuronal and muscle pathology in canine degenerative myelopathy to identify targets for therapeutic intervention; 06/01/2019 – 05/31/2024; Total \$153,360 (Direct \$142,001)
7. **Williams III, Fred (Co-PI), Rivera, Rocio Melissa (PI).** NATL INST OF FOOD AND AG 2018-67015-27598; Use of a Bovine Overgrowth Syndrome to Characterize the Molecular Etiology of BWS; 03/01/201/ - 02/29/2024; Total \$1,625,000 (Direct \$1,137,557)
8. **Zhang S (PD).** USDA NIFA 2023-37624-40716; NAHLN Level 1 Lab - Maintaining and Further Improving Capacity and Capabilities; 09-01-2023 to 08-31-2024; Total: \$250,000 (Direct: \$234,000)
9. **Zhang S (PD).** USDA-APHIS-AP23VSD&B000C066; NAHLN Level 1 Lab - Maintaining and Further Improving Capacity and Capabilities II; 06-01-2023 to 05-31-2024; Total: \$137,870 (Direct: \$125,336)
10. **Ierardi, R (PI).** Animal Health Formula Funds; Surveillance for *Theileria orientalis* Ikeda, an Emerging Agent of Infectious Anemia in Cattle, and its Vector the Invasive Longhorned Tick (*Haemaphysalis longicornis*) in Three Missouri Beef Herds; 11-1-2023 to 10-30-2024; \$9,976
11. **Shen Z (PI), Zhang S (Co-PI), Odemuyiwa S (Co-PI).** FDA 1U18FD007720-02; Development of Metagenomic RNA-Seq Standard Operating Procedure for Variant Agnostic Whole Genome Sequencing of SARS-CoV-2; 09-01-2022 to 08-31-2024; Total: \$160,095 (Direct: \$74,977).

Published Peer-Reviewed Articles (N = 40)

1. Abo-Samaha MI, Sharaf MM, El Nahas AF, **Odemuyiwa SO.** Innate immune response to double-stranded RNA in American heritage chicken breeds. *Poult Sci.* 2024 Feb;103(2):103318. doi: 10.1016/j.psj.2023.103318.
2. Albuquerque JB 2nd, Della Rocca GJ, Stoker AM, Bozynski CC, Sullentrop A, **Gull T**, Cook JL, Nuelle JAV. A preclinical model for osteoarticular fracture fragment preservation for delayed re-implantation. *J Orthop.* 2024 Oct 2;61:92-96. doi: 10.1016/j.jor.2024.09.019.
3. Bailey EA, Adams, MJ, Meng, KR, Zeltwanger, JM, Brake, DW, **Du X.** Interaction of an herbicide containing aminopyralid and metsulfuron and nitrogen fertilizer in tall fescue pastures grazed by stocker cattle. *App. Anim. Sci.*, 2024, 40, 103-111.
4. **Bogue SN**, Coates JR, Lattimer JC, **Royal AB.** What is your diagnosis? Cerebrospinal fluid from a Labrador Retriever. *Vet Clin Pathol.* 2024 Dec 12. doi: 10.1111/vcp.13403. Epub ahead of print. PMID: 39668668.
5. Cadmus S, Akinseye V, Besong M, Olanipekun T, Fadele J, Cadmus E, Ansumana R, **Oluwayelu D, Odemuyiwa SO**, Tomori O. Dynamics of Mpox infection in Nigeria: a



- systematic review and meta-analysis. *Sci Rep.* 2024 Mar 28;14(1):7368. doi: 10.1038/s41598-024-58147-y.
6. **Carpenter A**, Aeschlimann K, **Kuroki K**. Spindle cell cutaneous epitheliotropic T-cell lymphoma in an American Bulldog. *J Comp Pathol* 2024;210:1-4.
 7. **Carpenter AL**, Townsend KS, Johnson PJ, **Kim DY**. Disseminated pleomorphic rhabdomyosarcoma in a horse. *J Vet Diagn Invest.* 2024 Sep 20:10406387241281914. doi: 10.1177/10406387241281914.
 8. Cohen HR, **DeCoursey MA**, Davis WC, de Souza C. Transcriptomic identification of genes associated with thrombosis and coagulation in lipopolysaccharide-exposed bovine monocyte-derived macrophages. *Am J Vet Res.* 2024 Sep 30;85(12):ajvr.24.04.0116. doi: 10.2460/ajvr.24.04.0116.
 9. Cook JL, Drager J, Bozynski CC, Stoker AM, **Kuroki K**, Stannard JP, Felice H, Fahs A, Cook CR, Ramirez-GarciaLuna JL, Haidi L, Merle G, Crist BD. Iron Chelators Augment Large Osteochondral Allograft Osseointegration in a Preclinical Canine Model. *J Orthop Trauma* 2024;38(11S):S40-47.
 10. Cook JL, Stoker AM, Bozynski CC, Parola R, Della Rocca GJ, **Gull T** and Nuelle JAV. Comparison of Decontamination-Preservation Protocols for Delayed Surgical Re-implantation of Osteoarticular Fracture Fragments. *J Orthop Sci Res*, <https://doi.org/10.46889/JOSR.2024>
 11. D'Agostino AL, Giuliano EA, **Kuroki K**, Martin LM. Third eyelid cartilage eversion in an adult mare. *Vet Ophthalmol* 2024 Oct 11. doi: 10.1111/vop.13288.
 12. Danielson JA, Burzette RG, Bailey MR, Berent LM, Case H, Casey-Reed A, Dascanio J, Feinberg RA, **Hancock TS**, Kirk CA. Basic science knowledge underlies clinical science knowledge and clinical problem solving: evidence from veterinary medicine. *Adv Health Sci Educ Theory Pract.* 2024 May 16. doi: 10.1007/s10459-024-10334-2.
 13. Darish JR, Kaganer AW, Hanley BJ, Schuler KL, Schwabenlander MD, Wolf TM, Ahmed MS, Rowden GR, Larsen PA, **Kobashigawa E**, Tewari D, Lichtenberg S, Pedersen JA, **Zhang S**, Sreevatsan S. Inter-laboratory comparison of real-time quaking-induced conversion (RT-QuIC) for the detection of chronic wasting disease prions in white-tailed deer retropharyngeal lymph nodes. *J Vet Diagn Invest.* 2024 Oct 14:10406387241285165. doi: 10.1177/10406387241285165.
 14. Dark KV, Skinner OT, **Kim DY**, Karnia JJ, Mickelson MA, Maitz CA. Sodium iodide symporter immunolabelling as a predictor of clinical iodide uptake in canine thyroid carcinoma: A preliminary study. *Vet Comp Oncol.* 2024 Jun;22(2):239-244. doi: 10.1111/vco.12971.
 15. **Decoursey MA**, Davis WC, de Souza C. Use of RNA-seq to identify genes encoding cytokines and chemokines activated following uptake and processing a candidate peptide vaccine developed against *Mycobacterium avium* subsp. *paratuberculosis*. *Braz J Vet Med.* 2024 Jan 16;46:e002723. doi: 10.29374/2527-2179.bjvm002723. eCollection 2024.
 16. Fenton MB, Faure PA, Bernard E, Becker DJ, Jackson AC, Kingston T, Lina, PHC, Markotter W, **Moore, SM**, Mubareka S, Racey PA, Rupprecht CE, Worledge L. Bat



handlers, bat bites, and rabies: vaccination and serological testing of humans at risk. FACETS 9: 1–11 (2024) | dx.doi.org/10.1139/facets-2024-0056.vest. 2024 Nov;36(6):809-815. doi: 10.1177/10406387241271416.

17. Flatland B, Dehghanpir SD, Evans SJM, Freeman KP, Grimes C, **Hancock T**, Hollinger C, Hooijberg E, Korchia J, Lawson C, Matlow JR, Sample S, Viall A. Guidelines for resident training in veterinary clinical pathology. IV: Laboratory quality management-Teaching domains, competencies, and suggested learning outcomes. *Vet Clin Pathol.* 2024 Feb;53 Suppl 1:7-23. doi: 10.1111/vcp.13208.
18. Furtado AP, **DeCoursey M**, Miller MA, Chen AV, Martin LG, Guess SC, Wardrop KJ, de Souza C, Owen TJ. Cytologic features of canine melanotroph and corticotroph pituitary adenomas. *Vet Clin Pathol.* 2024 Mar;53(1):99-103. doi: 10.1111/vcp.13311.
19. **Ierardi RA**, **Burnum AL**, Camp LE, **Delaney LE**, **Gull T**, **Havis BM**, **Johnson GC**, **Kim DY**, **Kuroki K**, Mammone RM, **Mitchell WJ**, Navarro MA, Rivero LA, Shapiro K, **Smith AC**, Valerio CM, **Williams F 3rd**, **Zinn MM**, Uzal FA. Bacillary hemoglobinuria in beef cattle infected with *Fascioloides magna* in Missouri. *J Vet Diagn Invest.* 2024 Sep 20:10406387241280741. doi: 10.1177/10406387241280741.
20. Karaffa KM, **Hancock TS**, Sanford-Martens TC. Perfectionistic cognitions, self-compassion, and psychological distress among veterinary students. *J Coll Stud Ment Health.* 2024 Jun 28:1-24. doi: 10.1080/28367138.2024.2372721.
21. **Karnia WE**, **Kim DY**, Skinner OT, Karnia JJ, **Royal AB**. What is your diagnosis? Nodule in the nasal cavity of a dog. *Vet Clin Pathol.* 2024 May;53 Suppl 2:139-141. doi: 10.1111/vcp.13359.
22. Kerr NR, Mossman CW, Chou CH, Buntun JM, Kelty TJ, Childs TE, Rector RS, Arnold WD, Grisanti LA, **Du X**, Booth FW. Hindlimb immobilization induces insulin resistance and elevates mitochondrial ROS production in the hippocampus of female rats. *J Appl Physiol (1985).* 2024 Sep 1;137(3):512-526. doi: 10.1152/jappphysiol.00234.2024.
23. **Kobashigawa E**, Muhsin SA, Abdullah A, Allen K, Sinnott EA, **Zhang MZ**, Russell S, Almasri M, **Zhang S**. Comparative study of immunoassays, a microelectromechanical systems-based biosensor, and RT-QuIC for the diagnosis of chronic wasting disease in white-tailed deer. *BMC Vet Res.* 2024 Nov 18;20(1):518. doi: 10.1186/s12917-024-04351-x.
24. **Kobashigawa E**, Russell S, **Zhang MZ**, Sinnott EA, Connolly M, **Zhang S**. RT-QuIC detection of chronic wasting disease prion in platelet samples of white-tailed deer. *BMC Vet Res.* 2024 Apr 23;20(1):152. doi: 10.1186/s12917-024-04005-y.
25. **Kuroki K**, Hoang CT, Rogic AM, Rindt H, Simenson A, Noall LG, Bryan JN, **Johnson GC**, Chu S. Hotspot Exon 15 Mutations in BRAF Are Uncommon in Feline Tumours. *Vet Comp Oncol.* 2024 Sep;22(3):452-456. doi: 10.1111/vco.12997.
26. Lam K, Bozynski CC, Cook CR, **Kuroki K**, Bezold W, Crist BD, Cook JL. Comparison of reamer irrigator aspirator (RIA) suspension versus bone marrow aspirate concentrate (BMC) for percutaneous treatment of long bone nonunions-A preclinical canine model. *Injury* 2024;55:111590.



27. Moraes JGN, **Gull T**, Ericsson AC, Poock SE, Caldeira MO, Lucy MC. Establishment of the uterine microbiome following artificial insemination in virgin heifers. *Front Microbiol.* 2024 Jun 5;15:1385505. doi: 10.3389/fmicb.2024.1385505. eCollection 2024.
28. Moraes JGN, **Gull T**, Ericsson AC, Poock SE, Caldeira MO, Lucy MC. The microbiome of the pregnant uterus in Holstein dairy heifers and cows assessed by bacterial culture and 16S ribosomal RNA gene sequencing. *Front Microbiol.* 2024 May 15;15:1385497. doi: 10.3389/fmicb.2024.1385497. eCollection 2024.
29. Moraes JGN, **Gull TB**, Ericsson AC, Caldeira MO, Evans TJ, Poock SE, Lucy MC. Systemic antibiotic treatment of cows with metritis early postpartum does not change the progression of uterine disease or the uterine microbiome at 1 month postpartum. *Res Sq [Preprint]*. 2024 Apr 12;rs.3.rs-4233045. doi: 10.21203/rs.3.rs-4233045/v1.
30. Nava-Ramírez MJ, Maguey-González JA, Gómez-Rosales S, Hernández-Ramírez JO, Latorre JD, **Du X**, López-Coello C, Hargis BM, Téllez-Isaías G, Vázquez-Durán A, Méndez-Albores A. Efficacy of powdered alfalfa leaves to ameliorate the toxic effects of aflatoxin B1 in turkey poults. *Mycotoxin Res.* 2024 May;40(2):269-277. doi: 10.1007/s12550-024-00527-4.
31. Oladeji LO, Stoker AM, **Kuroki K**, Stannard JP, Cook JL. Making the Case for Hyperosmolar Saline Arthroscopic Irrigation Fluids: A Systematic Review Of Basic Science, Translational, And Clinical Evidence. *J Knee Surg* 2024;37:512-522.
32. Oluwayelu DO, Desario C, Babalola ET, Pratelli A, Daodu OB, Elia G, **Odemuyiwa SO**, Buonavoglia C, Decaro N, Diakoudi G. Genetic characterization of parvoviruses identified in stray cats in Nigeria. *Acta Trop.* 2024 Feb;250:107108. doi: 10.1016/j.actatropica.2023.107108. Epub 2023 Dec 23.
33. Pralle SJ, Gatrell SK, Keating CC, **Moore SM**. The Effect of Sample Handling on Rabies-Neutralizing Antibody Stability. *Biologics* 2024, 4(3), 232-241; <https://doi.org/10.3390/biologics4030016>.
34. Rigden BW, Stoker AM, Bozynski CC, **Gull T**, Cook CR, **Kuroki K**, Stannard JP, Cook JL. Development and validation of a preclinical canine model for early onset fracture-related infections. *Injury.* 2024 Dec;55(12):111957. doi: 10.1016/j.injury.2024.111957.
35. Saavedra A, **Carpenter A**, **Ierardi R**, Wiggen KE. *Candida tropicalis* infectious endocarditis in a dog with a patent ductus arteriosus. *J Vet Cardiol.* 2024 Aug;54:1-6. doi: 10.1016/j.jvc.2024.04.004.
36. **Shen Z**, Zhang CY, **Gull T**, **Zhang S**. Comparison of genotypic and phenotypic antimicrobial resistance profiles of *Salmonella enterica* isolates from poultry diagnostic specimens. *J Vet Diagn Invest.* 2024 Jul;36(4):529-537. doi: 10.1177/10406387241242118.
37. Silva JCC, Caldeira MO, Moraes JGN, Sellmer Ramos I, **Gull T**, Ericsson AC, Poock SE, Spencer TE, Lucy MC. Metritis and the uterine disease microbiome are associated with long-term changes in the endometrium of dairy cows†. *Biol Reprod.* 2024 Aug 15;111(2):332-350. doi: 10.1093/biolre/ioae067.
38. Skinner OT, **Kim DY**, Story AL, Karnia JJ, Selmic LE, Lapsley JM, Dornbusch JA, **Johnson C**, Oblak ML, McKenna C, Garrett CJ, Hoehn MM, Mickelson MA. Prospective



assessment of canine thyroid cancer-part I: nodal metastatic rate and impact of nodal immunohistochemistry in 70 dogs. *J Am Vet Med Assoc.* 2024 Jun 21;262(10):1-10. doi: 10.2460/javma.24.03.0223.

39. **Smith AC, Kuroki K, Ierardi RA, Delaney LE, Gull TB, Ogunbadewa AJ, Schultz LG.** Causes of mortality in farmed white-tailed deer in the midwestern United States, 2004-2023 *J Vet Diagn Invest* 2024 Nov;36(6):809-815. doi: 10.1177/10406387241271416.
40. Lake BB, McAdams ZL, Ericsson AC, Reinero C, **Gull T** and Lyons BM. Feline urethral obstruction alters the urinary microbiota and comparison to oral, preputial and rectal microbiotas. *Am J Vet Res*, accepted 2024.

In Press (N=2)

1. Johnson P, Townsend K, Martin L, Coghill L, Smith M, York M, **Gull T** and Ericsson AC. Potent effects of oral clioquinol on the fecal microbiome of horses. *J Vet Internal Med*, accepted 2024.
2. Rigden BW, Stoker AM, Bozynski CC, Schweser KM, **Gull T**, Cook CR, Kuroki K and Cook JL. Development and validation of a preclinical canine model for delayed-onset fracture-related infections. *J Orthop Sci Res*, accepted 2024.

Book Chapters (N = 2)

1. Davis, AD; Messenger, S.; **Moore, SM.** History of Rabies in the United States in *History of Rabies in the Americas: From the Pre-Columbian to the Present, Volume II*, Fascinating Life Sciences, 2024, https://doi.org/10.1007/978-3-031-25405-5_2
2. Submitted: Moore, SM. Revision to the Rabies chapter/Section 3 Summaries of Infectious Diseases in American Academy of Pediatrics *Red Book*, 8/26/2024

Abstracts and Poster Presentations (N = 31)

1. **Burnum A**, Rivero Acevedo L, Ruiz Cortes E, Adkins P. Fatal sodium bicarbonate (baking soda) ingestion in a lamb with congenital neosporosis. ACVP/ASVCP 2024 Annual Meeting, Seattle, WA. Nov. 16-19, 2024.
2. **Carpenter AL**, Townsend KS, Johnson PJ, **Kim DY.** Disseminated pleomorphic rhabdomyosarcoma in a horse. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. Oct. 11-14, 2024.
3. Catalina J, **Allen K, Kobashigawa E, Zhang S, Zhang MZ.** RT-QuIC detection of chronic wasting disease prion in ELISA-positive, IHC-negative cervid RPLN samples. MU CVM Research Day. Columbia, MO. May 3, 2024.
4. Catalina J, **Smith A, Williams F.** Bacterial septicemia associated with *Salmonella* group D1 in a French bulldog puppy. ACVP/ASVCP Annual Meeting in Seattle, Washington.
5. **Creelman M, Burnum A.** Clear cell adnexal carcinoma in a Tonkinese cat. ACVP/ASVCP 2024 Annual Meeting, Seattle, WA. Nov. 16-19, 2024.
6. **Du X**, Tkachenko A, Guag J, **Mossman C, Zhang S.** Extensive evaluation of a UPLC-PDA method for quantitation of cannabinoids in hemp. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. October 11-14, 2024.



7. **Du X.** Measurement of sphingolipid alterations for fumonisin exposure diagnosis in animal serum. Peoria, IL. May 31, 2024.
8. Gangi LR, Lee AJ, Hu YJ, Dinescu TA, Guo XE, Bozynski CC, **Kuroki K**, Stoker AM, Marra KG, Ateshian GA, Cook JL, Hung CT. Tissue-engineered constructs with sustained dexamethasone release as a strategy for osteochondral defect restoration in the knee. Paper No. 281. Orthopaedic Research Society 2024 Annual Meeting. Long Beach, CA. February 2-6, 2024.
9. **Ierardi RA**, Morris C, **Nunnelley J**, **Royal AB**, **Shen Z**, Raghavan RK. Active surveillance for *Theileria orientalis* and the invasive longhorned tick (*Haemaphysalis longicornis*) in three Missouri beef herds. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. October 11-14, 2024.
10. **Ierardi RA**, Osei FB, **Zhang MZ**, **Zhang S**, Raghavan RK. A retrospective Bayesian spatiotemporal analysis of bovine anaplasmosis in Missouri, 2010-2021. Mizzou Show Me Research Week. Columbia, MO. April 11, 2024.
11. **Ierardi RA**, Osei FB, **Zhang MZ**, **Zhang S**, Raghavan RK. Bayesian spatiotemporal analysis of bovine anaplasmosis in Missouri, 2010-2021. Inaugural Taylor Geospatial Institute (TGI) Town Hall Event. Creve Coeur, MO. May 22, 2024.
12. **Jo Y**, **Amelon S**, **Burnum A**. Osteoblastic osteosarcoma in a big brown bat (*Eptesicus fuscus*). ACVP/ASVCP 2024 Annual Meeting, Seattle, WA. Nov. 16-19, 2024.
13. **Johnson GC**. Histologic changes in mesenteric ganglia versus survival of dogs with dysautonomia. ACVP/ASVCP Annual Meeting, Focused Scientific Session. Seattle, WA. November 16-19, 2024,
14. Kujiraoka A, **Ierardi R**, **Zhang S**, Raghavan R. Field surveillance of host-seeking ticks on Missouri cattle pastures. Mizzou CVM Research Day. Columbia, MO. May 3, 2024.
15. **Kuroki K**, Dark K, **Johnson GC**. Canine synovial lipomatosis: 3 cases, 2021-2023. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. October 11-14, 2024.
16. Lang Y, Shi L, Gupta D, Roy S, Dai C, Khalid A, **Zhang MZ**, **Zhang S**, Webby R, Ma W. Detection of influenza A virus antibodies in cattle in the US.
17. Messler M, Austin JT, Blomstrom IG, Sather G, **Kuroki K**, Grant SA. Tendon allografts modified with Genipin and Gold Nanoparticles (AuNPs) enhance healing post ACL reconstruction. Biomedical Engineering Society 2024 Annual Meeting. Baltimore, MD. October 23-26, 2024.
18. **Moore S**, Glaser C. (Invited speakers) Rabies. American Public Health Laboratories Webinar. September 25, 2024.
19. **Moore S**. Rabies: risks, control, protection - Updates: ACIP/WHO Recommendations, rabies epidemiology/risks, role of rabies serology. 2024 MVMA Convention. Columbia, MO. January 25, 2024.
20. **Moore S**. The critical role of rabies diagnostics quality assurance to the Zero by 30 effort. Rabies in the Americas (RITA) annual conference, November 3 to 8, 2024. Buenos Aries, Argentina.



21. **Moore, S.** The critical role of rabies diagnostics quality assurance to the Zero by 30 effort. Rabies in the Americas (RITA) annual conference. Buenos Aires, Argentina. November 3-8, 2024.
22. **Muthuraj PG, Ierardi R, Odemuyiwa SO, Gull T.** *Rhodococcus equi* infection in a goat with suspect caseous lymphadenitis. Southwestern Association of Clinical Microbiology (SWACM) Symposium. St. Louis, MO. August 21-23, 2024.
23. **Ogunbadewa AJ, Shen Z, Mitchell WJ, Odemuyiwa S.** Temporal evolution of canine parvovirus type-2 isolates circulating in Missouri, United States. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. Oct. 11-14, 2024.
24. Rigden BW, Bozynski CC, Stoker AM, **Kuroki K**, Cook CR, Schweser K, Stannard JP, Cook JL. Development and validation of large animal models for acute fracture-related infections. Paper No. 242. Orthopaedic Research Society 2024 Annual Meeting. Long Beach, CA. February 2-6, 2024.
25. Sadeghi S, Skinner O, **Kuroki K**, Mickelson M. The Weishaar classification in dogs without mast cell neoplasia – is it specific? Veterinary Cander Society 2024 Annual Conference, Orlando, FL. October 17-19, 2024.
26. **Shen Z, Delaney L, Zhang S**, Lang Y, Ma W. Exploring causes of mystery canine infectious respiratory disease through sequencing. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. Oct. 11-14, 2024.
27. **Smith A, Johnson GC, Kim DY.** You've struck a nerve: ganglioneuritis in an American Quarter horse mare. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. Oct. 11-14, 2024.
28. **Smith A, Kuroki K.** Atherosclerosis with multifocal thrombosis in a dog with hypothyroidism and hypercholesterolemia. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. October 11-14, 2024.
29. **Wearmouth C**, Hong HP, **Kuroki K.** Severe Meningoencephalitis and Polymyositis associated with cyst-forming protozoa in a dog. 67th AAVLD & 128th USAHA Annual Meeting, Nashville, TN. October 11-14, 2024.
30. Young J, **Ierardi R**, Morris C, **Nunnelley J, Royal A, Shen Z**, Raghavan RK. Active surveillance for the tick-vectored hemoparasite *Theileria orientalis* in three Missouri beef herds. MU Veterinary Scholars Symposium, St. Paul, MN.
31. **Zhang S, Gull T**, Mueller T, Cermak J. Development of an Antimicrobial Resistance Dashboard to Integrate Antimicrobial Susceptibility Testing Data Generated by Missouri Veterinary Medical Diagnostic Laboratory. USDA APHIS Antimicrobial Resistance Dashboard Projects Showcase. Online, August 5, 2024.

AWARDS AND HONORS

1. **Hancock T.** 2024 American College of Veterinary Pathologists Wendy Coe Leadership Award.



INTERNATIONAL, NATIONAL, STATE, AND LOCAL LEADERSHIP ROLES

1. **DeCoursey M.** Student chapter of the ACVP Faculty Advisor, ASVCP Media and Communications Committee Member, ACVP Late Breaking Abstracts Committee Member, Washington State University Diagnostic Challenge Facilitator.
2. **Gull T.** ACVPM representative to the NAVLE Item-writing Committee; ACVM Examination Committee (Immunology subcommittee chair); ACVIM Form Writing (Examination) Committee, chair; NATRC Judges' Committee Veterinary Co-chair; University of Missouri Faculty Advisory Council; University of Missouri Military and Veterans' Committee member; University of Missouri Status of Women Committee member; NATRC Drug Committee Chair; CLSI VET09 Working Group; ACVIM/ACVPM Joint Consensus Statement Working Group; USEF Drug Testing Veterinarian; FEI Permitted Treatment Veterinarian; Colonel, U.S. Army Reserve Veterinary Corps; Boone County Large Animal Rescue Team; Missouri Volunteer Veterinary Corps member
3. **Hancock T.** Academic Veterinary Assessment Committee Member, International Council on Veterinary Assessment; Co-chair, ACVP Competency Framework Task Force; Chair, Faculty Policy Committee University of Missouri CVM; Faculty advisor, UMO Chapter of SAVMA; Member, ASVCP Quality and Laboratory Standards Committee
4. **Ierardi RA.** Academy of Veterinary Consultants (AVC), coordinator of the biannual Diagnostic Laboratory Report for the Beef Cattle Health & Well-Being Committee; October 2022-Present.
5. **Kuroki K.** AAVLD Pathology Committee Member; Japanese Group of ACVP (JaGA) Vice President; International Veterinary Pathology Coalition; ACVP Member
6. **Moore S.** WHO Rabies Experts Committee; ACIP Rabies Workgroup; National Institute for Biological Standards and Control (NIBSC) in the UK; USDA National Rabies Management Plan Blue Ribbon Committee for Rabies Serology, writing/editing the update of the US National Plan for Wildlife Rabies Management (USNP), APHL Laboratory Systems and Standards (LSS) Committee Member, American Association of Bioanalysts (ABB) Member
7. **Royal A.** ACVP Certifying Exam Board Member; Chair for Clinical Pathology Exam Assembly and Administration Group
8. **Zhang S.** AAVLD, AAVLD Award Committee, AAVLD Government Relations Committee Member, Strategic Planning Committee Member, Missouri Biosecurity Working Group, Missouri Council on Captive Wild and Exotic Animals.

MAJOR PROFESSIONAL MEETINGS AND TRAININGS

1. American Association of Veterinary Laboratory Diagnosticians (AAVLD) Annual Meeting
2. American College of Veterinary Internal Medicine (ACVIM) Annual Meeting
3. American College of Veterinary Microbiologists (ACVM) Annual Meeting
4. Combined Annual Meetings of the American College of Veterinary Pathologists (ACVP) and American Society for Veterinary Clinical Pathology (ASVCP)



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5. American Veterinary Medical Association (AVMA) Annual Meeting
6. Midwest Association of Veterinary Pathologists Annual Meeting
7. Missouri Veterinary Medical Association (MVMA) Annual Convention and District Meetings
8. North American Veterinary Dermatology Forum (NAVDF)
9. Regional Practitioners Meeting in Columbia, MO
10. Swine Health Symposium & Trade Show in Columbia, MO
11. Swine Institute Meeting in Sedalia, MO
12. USAHA/AAVLD Government Relations Meeting