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College of Veterinary Medicine

Clinical Investigators' Day 2025

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Welcome to the 2025 Clinical Investigators' Day, sponsored by the Cornell University College of Veterinary Medicine and Nestle Purina. This is the 18th year of the annual event whose primary goal is to provide an opportunity for residents and interns to showcase ongoing investigations carried out at Cornell University College of Veterinary Medicine. It is our hope that greater insights will be gained in the breadth and depth of clinical investigations conducted at the College and will serve as a catalyst to promote greater interactions among colleagues with clinical and basic science research interests.

Organizing Committee

Dr. Robert Goggs, Co-Chair
Dr. Kelly Hume, Co-Chair
Dr. Elizabeth Moore, Co-Chair
Dr. Tracy Stokol, Co-Chair
Mr. Doug Fink

The organizing committee thanks the following individuals who contributed to the success of the Day:

Mr. Dave Frank
Dr. Sabine Mann
Dr. John Parker
Dean Lorin Warnick

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Program Schedule

Friday, February 28, 2025 ● Murray Lecture Hall 1

8:30 am **Welcome & Introductions** – Clinical Investigator's Day Organizing Committee

8:30 am – 9:00 am **Keynote Presentation**

- **TRANSLATING MOLECULAR VULNERABILITIES OF CANINE ORAL SQUAMOUS CELL CARCINOMA INTO CLINICAL SOLUTIONS**

  Santiago Peralta, DVM, DAVDC, Associate Professor, Section of Dentistry and Oral Surgery, Department of Clinical Sciences, Cornell University

9:15 am – 10:30 am **Session 1 Resident Presentations** – Moderated by Kimaya Bakhle

- **ACUTE MYELOID LEUKEMIA WITH PERIPHERAL LYMPH NODE INVOLVEMENT IN DOGS: A RETROSPECTIVE STUDY OF 23 CASES**
  Jaspreet Kaur – Clinical Pathology Resident Pg. 1

- **HEART AND LUNG INTERACTIONS IN RESPONSE TO CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) IN HEALTHY SEDATED BEAGLE DOGS**
  Victoria Albano – Anesthesiology and Pain Management Resident Pg. 2

- **COMPARISON OF MULTIPLANAR RECONSTRUCTION VERSUS COMPUTER-AIDED 3-D MEASUREMENTS FROM CT SCANS OF NORMAL CANINE RADII**
  Regan Stoneburner – Small Animal Surgery Resident Pg. 3

- **COMPARING TWO-DIMENSIONAL CRESCENTIC ELLIPSOID MODEL VARIANTS IN ASSESSING THREE-DIMENSIONAL RIGHT VENTRICULAR VOLUME IN DOGS**
  Robert Ciardullo – Cardiology Resident Pg. 4

- **A NOVEL DEEP LEARNING ALGORITHM TO DIFFERENTIATE FELINE INFLAMMATORY BOWEL DISEASE AND SMALL INTESTINAL LYMPHOMA USING WHOLE SLIDE IMAGES (WSI)**
  Brian LaMendola – Anatomic Pathology Resident Pg. 5

10:30 am – 10:45 am **Break**

Schedule (cont.)

10:45 am – 11:45 am **Session 2 Resident Presentations** – Moderated by Dr. Colleen Lau

- **EVALUATION OF A STALL-SIDE IGG KIT IN COMPARISON TO A LABORATORY TURBIDOMETRIC IMMUNOASSAY TO IDENTIFY FAILURE OF PASSIVE TRANFER OF IMMUNITY IN FOALS AND CRIAS**
  Taylor Burdette – Large Animal Surgery Resident **Pg. 6**

- **EVALUATING THE IMPACT OF STALL SIZE ON THE BEHAVIOR AND WELFARE OF HORSES**
  Meryem Outouil – Laboratory Animal Medicine Resident **Pg. 7**

- **INVESTIGATION OF CARDIAC TROPONIN I, ARRHYTHMIA BURDEN AND ECHOCARDIOGRAPHIC VARIABLES IN APPARENTLY HEALTHY NEONATAL FOALS**
  Hanna Sfraga – Large Animal Medicine Resident **Pg. 8**

- **THE EFFECTS OF PHOTODYNAMIC THERAPY WITH EMUNDO® AND 810NM DIODE LASER ON THE HEALTHY EQUINE CORNEA**
  Callie Rogers – Ophthalmology Resident **Pg. 9**

11:45 am – 12:30 pm **Lunch**
Panel Presentation for Dual-Degree students interested in post-PhD residency

12:30 pm – 1:30 pm **Session 3 Resident Presentations** – Moderated by Dr. Sarah Caddy

- **MORBIDITY AND MORTALITY OF BALD EAGLES (*HALIAEETUS LEUCOCEPHALUS*) ADMITTED TO A WILDLIFE HOSPITAL IN NEW YORK, 2013-2023**
  Laura St Clair – Zoological Medicine Resident **Pg. 10**

- **DEVELOPMENT OF AN IN-SITU HYBRIDIZATION ASSAY FOR THE DIAGNOSIS OF MYCOBACTERIAL INFECTIONS OF VETERINARY IMPORTANCE**
  Augustin Rebollada-Merino – Anatomic Pathology Resident **Pg. 11**

- **EVALUATING THERAPEUTIC INTERVENTIONS TO COUNTERACT BUPRENORPHINE-RELATED PICA AND MORTALITY IN RATS**
  Dahihm Kim – Laboratory Animal Medicine Resident **Pg. 12**

- **CARDIAC AUTOPHAGOSOME DYSFUNCTION IN A BREEDING COLONY OF PRAIRIE VOLES (*MICROTUS OCHROGASTER*)**
  Jimmy Guan – Anatomic Pathology Resident **Pg. 13**

1:30 pm – 1:45 pm **Break**

Schedule (cont.)

1:45 pm – 2:45 pm **Session 4 Resident PROPOSAL Presentations** – Moderated by Dr. Tracy Stokol

- **DIFFERENTIATING BACTERIAL SEPSIS FROM NON-SEPTIC CRITICAL ILLNESS IN DOGS USING METABOLOMIC PROFILING – PROPOSAL**
  Mariana Schlosser – Emergency & Critical Care Resident Pg. 14

- **COMPARISON OF A NOVEL NERVE BLOCK FOR CALF DISBUDDING COMPARED TO TRADITIONAL METHODS – PROPOSAL**
  Taylor Williams – Ambulatory & Production Medicine Resident Pg. 15

- **NEURAL TUBE DEFECTS IN DOGS AND CATS: A STUDY ON BIOPSY FINDINGS AND LONG-TERM OUTCOME AFTER SURGICAL MANAGEMENT – PROPOSAL**
  Brian Chambers – Anatomic Pathology Resident Pg. 16

- **IMMUNOHISTOCHEMICAL PANEL TO IMPROVE DIAGNOSIS AND INVESTIGATE NOVEL PROGNOSTIC INDICATORS OF PRIMARY CANINE OSTEOSARCOMA – PROPOSAL**
  Jaimeson Kass – Medical Oncology Resident Pg. 17

2:45 pm – 3:00 pm **Break**

3:00 pm – 4:00 pm **Session 5 Non-Clinical Research Presentations** – Moderated by Dr. Tracy Stokol

- **INSIGHTS INTO TRANSFER OF MATERNAL ANTIBODIES IN DOGS**
  Serena Teh – Molecular Biology and Genetics PhD student Pg. 18

- **CAPILLARY STALLING BY NEUTROPHILS IS A NOVEL MECHANISM UNDERLYING DECREASED MYOCARDIAL PERFUSION IN HEART FAILURE WITH PRESERVED EJECTION FRACTION**
  Anne Buglione – Biomedical & Mechanical Engineering PhD student Pg. 19

- **LARGE SCALE OUTBREAK OF FIP IN ANIMAL SHELTER IN THE USA IS ASSOCIATED WITH CONJUNCTIVAL SHEDDING**
  Laura Frazier – Microbiology & Immunology PhD student Pg. 20

- **IDENTIFICATION OF CANDIDATE GENOMIC REGIONS ASSOCIATED WITH FELINE CHRONIC GINGIVOSTOMATITIS**
  Arly Armas – Molecular Biology & Genetics PhD student Pg. 21

4:00 pm **Awards Presentation & Reception**

Dr. Lorin Warnick, Dean, College of Veterinary Medicine

Keynote Speaker

Santiago Peralta, DVM, DAVDC
Associate Professor, Section of Dentistry and Oral Surgery, Cornell University Department of Clinical Sciences

"TRANSLATING MOLECULAR VULNERABILITIES OF CANINE ORAL SQUAMOUS CELL CARCINOMA INTO CLINICAL SOLUTIONS"

Moderators

Kimaya Bakhle
Combined DVM/PhD Student, College of Veterinary Medicine, Cornell University

Colleen Lau, PhD
Assistant Professor, Department of Microbiology and Immunology, Cornell University

Sarah Caddy, MA ,VetMB, PhD, DACVM, FRCVS
Assistant Professor, Department of Microbiology and Immunology, Cornell University

Tracy Stokol, BVSc, PhD, DACVP(Clinical Pathology)
Professor, Department of Population Medicine and Diagnostic Sciences, Cornell University

Judges

Beth Bennett, DVM
Adjunct Assistant Professor, Department of Biomedical Sciences, Cornell University

Roy Cohen, PhD
Research Assistant Professor, Department of Public & Ecosystem Health, Cornell University

William Katt, PhD
Senior Research Associate, Department of Molecular Medicine, Cornell University

Rory J. Todhunter, BVSc, PhD, DACVS
Professor, Section of Small Animal Surgery, Department of Clinical Sciences
Director, The Cornell University Richard P. Riney Canine Health Center

Jaspreet Kaur, DVM
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Institution and Location	Degree	Year
Texas A&M University, College Station, Texas	DVM	2021
Cornell University, Ithaca, New York	Residency	2022-Present

Current Position
3rd Year Resident in Clinical Pathology

Abstract Title:
ACUTE MYELOID LEUKEMIA WITH PERIPHERAL LYMPH NODE INVOLVEMENT IN DOGS: A RETROSPECTIVE STUDY OF 23 CASES

Authors Names:
Jaspreet Kaur[1], Gabriella Diamantino[2], Katherine Morrison[2], Kristina Meichner[3], Nora L. Springer[4], Martha Hoffman[1] Dorothee Bienzle[2], Tracy Stokol[1]

[1]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York
[2]Department of Pathobiology, University of Guelph, Ontario
[3]Department of Pathology, University of Georgia, Athens, Georgia
[4]Department of Biomedical and Diagnostic Sciences, University of Tennessee, Knoxville, Tennessee

Project Mentor(s):
Mentor: Tracy Stokol, BVsc, PhD, DACVP, Department of Population Medicine and Diagnostic Sciences, ts23@cornell.edu

Abstract:

Background: Acute myeloid leukemia (AML) is considered a blood and bone marrow disease but can infiltrate extramedullary sites, which we have termed extramedullary AML (eAML). While AML infiltrates in lymph node aspirates have been described, there are few reports with details on morphology, immunophenotype and outcome.

Objective: To identify clinicopathologic features supporting a cytologic diagnosis of AML in peripheral lymph node aspirates from dogs.

Methods: Medical records of 23 dogs with a diagnosis of AML and archived lymph node aspirate smears from 2016-2024 were reviewed. Inclusion criteria were: 50% combined myeloid blasts and differentiating myeloid cells in smears and confirmation of myeloid lineage by phenotyping.

Results: Peripheral lymphadenopathy was the reason for presentation in 9 dogs (39%) or found incidentally on physical examination in 14 dogs (61%). Major hematologic findings included bi- or pancytopenia (18/23, 78%) and circulating blasts (18/23, 78%). Initial interpretations of lymph node aspirates were hematopoietic neoplasia (10/21, 48%), lymphoma (6/21, 29%), AML (3/21, 14%), lymphoid hyperplasia (1/21, 5%), and granulocytic precursor infiltrates (1/21, 5%). On repeat (n=21) or initial (n=2) evaluation of lymph node smears, cytologic features supporting eAML were >20% blasts with myeloid features, promonocytes and differentiating granulocytes, myeloid dysplasia, and a variable proportion of residual lymphocytes. Median survival was 22 days (range, 1-360 days), with significantly longer survival in dogs receiving chemotherapy (72 vs 22 days, p=0.039).

Conclusions: Our study highlights the importance of considering abnormal hematologic findings and identifying immature myeloid cells in lymph node aspirate smears to support a diagnosis of eAML.

Victoria R. Albano, DVM
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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2021
Animal Medical Center, New York, New York	Internship	2022
Cornell University, Ithaca, New York	Residency	2023-Present

Current Position
3rd Year Resident in Anesthesia and Pain Management

Abstract Title:
HEART AND LUNG INTERACTIONS IN RESPONSE TO CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) IN HEALTHY SEDATED BEAGLE DOGS

Authors Names:
Victoria Albano[1], Haider Ali[1], Manuel Martin-Flores[1], Weihow Hsue[1], Joaquin Araos[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Joaquin Araos, MV, PhD, DACVAA, Department of Clinical Sciences, jda246@cornell.edu

Abstract:

Continuous positive airway pressure (CPAP) can improve lung function in dogs. By modifying airway pressure, CPAP can induce clinically relevant hemodynamic effects. We aim to characterize the hemodynamic consequences of different CPAP levels in sedated Beagles.
Seven healthy research beagles were sedated with a standardized anesthetic protocol. Patients were fitted with a veterinary CPAP helmet to generate ascending levels of continuous pressure (5, 8, and 12 cm H_2O) compared to baseline (0 cm H_2O). Transthoracic echocardiographic measurements of left (stroke volume (SV), cardiac output (CO), and ejection fraction [EF]) and right ventricular function (systolic myocardial velocity of the tricuspid annulus [S'], fractional area change [FAC]) including right pulmonary artery distensibility (rPAD) index were measured at each level. Main outcomes were compared between CPAP levels using linear mixed models with treatment, time, and their interaction as fixed effects, and dog as random effect. A $p < 0.05$ was considered significant.
Dogs tolerated all CPAP levels. Left ventricular EF was not affected while SV ($p < 0.006$) and CO ($p < 0.0361$) decreased with increasing CPAP. Right ventricular FAC was not changed while S' ($p < 0.0014$) increased. Increasing CPAP elevated HR ($p < 0.0084$) and decreased the rPAD index ($p < 0.0031$).

Our results suggest pertinent heart-lung interactions when utilizing CPAP therapy. The highest CPAP levels impacted forward flow parameters, including SV and CO. The rPAD index was reduced, suggesting increased pulmonary vascular stiffness, while the increase in S' indicates enhanced right ventricular contractility to compensate for increased afterload.

Regan M Stoneburner, DVM
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Institution and Location	Degree	Year
North Carolina State University, Raleigh, North Carolina	DVM	2020
The University of Illinois, Champaign-Urbana, Illinios	Internship	2021
The Ohio State University, Columbus, Ohio	Internship	2022
Cornell University, Ithaca, New York	Residency	2022-Present

Current Position
3rd Year Resident in Small Animal Surgery

Abstract Title:
COMPARISON OF MULTIPLANAR RECONSTRUCTION VERSUS COMPUTER-AIDED 3-D MEASUREMENTS FROM CT SCANS OF NORMAL CANINE RADII

Authors Names:
Regan M. Stoneburner[1], Lucas Lassinger[2], Sean D. Bellefeuille[1,2], Will Byron[2], Jason A. Bleedorn[3], William M. Karlin[4], Denis J. Marcellin-Little[5], Selena Tinga[1]

[1] **Department of Clinical Sciences, Cornell University, Ithaca, New York**
[2] **Med Dimensions, LLC, Rochester, New York**
[3] **Department of Veterinary Clinical Sciences, Colorado State University, Fort Collins, Colorado**
[4] **Department of Clinical Sciences, Tufts University, North Grafton, Massachusetts**
[5] **Veterinary Orthopedic Research Laboratory, University of California-Davis, Davis, California**

Project Mentor(s):
Mentor: Selena Tinga, DVM, PhD, DACVS-SA, Department of Clinical Sciences, st284@cornell.edu

Abstract:

INTRODUCTION: Computer aided design software (CADS) measurements of canine antebrachial angles have not been related to previously accepted multiplanar reconstruction (MPR) methods. The purpose of this study was to compare CADS to MPR for radial measurements in normal dogs. We hypothesized that measurements would be different between methods and that the measurements made using CADS would be more reliable than those using MPR.

METHODS: Computed tomography scans of forelimbs of dogs with normal morphology were included. Paired measurements were made using MPR and CADS methodologies. Statistical analysis included Wilcoxon signed rank test for measurement comparisons of measurements ($P<0.05$) and intraclass correlation coefficients (ICC) to determine measurement reliability.

RESULTS: Ten right-sided antebrachii were evaluated. The median distal frontal measurement was 5.3 degrees valgus for MPR and 8.3 degrees varus for CADS ($P<0.01$). No statistically significant difference was identified in measurements of the remaining planes. CADS provided excellent reliability for sagittal and distal frontal measurements whereas MPR provided moderate (sagittal) or poor (distal frontal) reliability. Additional statistical analysis is pending.

DISCUSSION: We partially accepted our hypotheses. The distal frontal angle was different between methods, which is likely due to difference in landmarks. The reliability of CADS was equal to or better than MPR. Determining the relationship between CADS and MPR measurements should help surgeons use CADS measurements, with the ultimate goal being to train neural networks for automated measurements of bone and limb angulation to improve accuracy and reduce surgeon time commitments to measurements.

Robert Ciardullo, DVM
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Institution and Location	Degree	Year
Fordham University, Bronx, New York	BS	2016
Cornell University, Ithaca, New York	DVM	2021
The Animal Medical Center, New York, New York	Internship	2022
Cornell University, Ithaca, New York	Residency	2022-Present

Current Position
3rd Year Resident in Cardiology

Abstract Title:
COMPARING TWO-DIMENSIONAL CRESCENTIC ELLIPSOID MODEL VARIANTS IN ASSESSING THREE-DIMENSIONAL RIGHT VENTRICULAR VOLUME IN DOGS

Authors Names:
Robert Ciardullo[1], Brittany E Tagg[1], Shana B Mintz[1], Romain Pariaut[1], Weihow Hsue[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Weihow Hsue, DVM, DACVIM (Cardiology), Department of Clinical Sciences, wh446@cornell.edu

Abstract:
Background – Determining right ventricular (RV) volume typically requires three-dimensional imaging due to its complex shape. The crescentic ellipsoid model (CEM) offers a two-dimensional echocardiographic alternative, employing area- or linear-based formulas with additional variations depending on the measurement view.

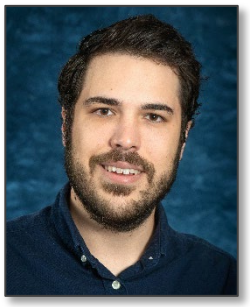
Hypothesis/Objectives – To identify which CEM variant best agrees with real-time three-dimensional echocardiography (RT3D) as a reference standard and to determine within-day reproducibility.

Animals – Sixty-seven client-owned dogs (23 normal, 44 with right-sided heart diseases) underwent echocardiograms, with 20 normal dogs receiving a repeat exam.

Methods – Prospective method comparison study. Body weight-indexed end-diastolic (iEDV) and end-systolic volumes (iESV) were calculated across eight CEM variants. Agreement with RT3D was assessed using concordance correlation coefficients (r_c) and Bland-Altman analysis, while within-day reproducibility was evaluated using intraclass correlation coefficients (ICC) and reproducibility coefficients.

Results – The area- and linear-based CEMs using RV parameters from the left apical four-chamber view and cardiac diameter from the right parasternal short-axis view ($CEM_{A4C\text{-}RPS}$ and $LCEM_{A4C\text{-}RPS}$, respectively) were the only methods to achieve moderate agreement with RT3D (r_c >0.90). The $CEM_{A4C\text{-}RPS}$ showed no significant systematic bias for iEDV (median of the differences [95% confidence interval]: 0.09 [0.00–0.13]), while $LCEM_{A4C\text{-}RPS}$ displayed no significant systematic bias for iEDV (0.03 [-0.02–0.08]) and iESV (0.04 [-0.01–0.12]). Both methods demonstrated good reproducibility for iEDV and iESV (ICC >0.75), with iESV reproducibility significantly greater than that of methods using RV parameters from the right parasternal long-axis view.

Conclusions – The $CEM_{A4C\text{-}RPS}$ and $LCEM_{A4C\text{-}RPS}$ provide clinically practical RV volume estimates that align well with RT3D.



Brian R. LaMendola, DVM
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Institution and Location	Degree	Year
University of Tennessee, Knoxville, Tennessee	DVM	2022
Cornell University, Ithaca, New York	Residency	2022-Present

Current Position
3rd Year Resident in Veterinary Anatomic Pathology

Abstract Title:
A NOVEL DEEP LEARNING ALGORITHM TO DIFFERENTIATE FELINE INFLAMMATORY BOWEL DISEASE AND SMALL INTESTINAL LYMPHOMA USING WHOLE SLIDE IMAGES (WSI)

Authors Names:
Brian LaMendola[1], Gerald Duhamel[2], Parminder S. Basran[3]

[1]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York
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[3]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Gerald Duhamel, DVM, PhD, DACVP, Department of Biomedical Sciences, ged36@cornell.edu
Co-mentor: Parminder S. Basran, PhD, FCCPM, Department of Clinical Sciences, psb92@cornell.edu

Abstract:

Accurate differentiation between feline inflammatory bowel disease (IBD) and small intestinal lymphoma can be challenging based on endoscopic biopsy specimens alone due to the perceived continuum of disease and intra- and inter-observer variability during evaluation. A novel machine-learning approach could serve to reduce this variability while also guiding diagnostic decisions and increase diagnostic confidence. We aimed to develop a deep learning (DL) algorithm to guide diagnostic decisions and increase diagnostic confidence when differentiating feline IBD and small intestinal lymphoma with endoscopic biopsy specimens. A review of the Cornell Animal Health Diagnostic Center database using a struct inclusion criteria yielded 156 cases with the diagnosis of lymphoplasmacytic enteritis (n=68) or small intestinal lymphoma (n=88). Accepted cases were reviewed by a panel of two veterinary anatomic pathologists (ACVP diplomats) to decrease inter-observer variability. Whole slide images from 122 of the cases were created and fed through a Clustering-constrained Attention Multiple Instance Learning (CLAM) deep learning algorithm that classified each whole slide image and produced a heat map to identify sub-regions of high diagnostic value that drove the algorithm's decision making. The remainder of the cases were retained for validation of the algorithm through comparison of the results against an additional panel of two anatomic pathologists. Preliminary models show promising results with a mean area under the curve (AUC) of 0.918 ±0.17. We believe that further refinement of the algorithm will result in a diagnostic tool with the potential to help guide the diagnosis of feline IBD and small intestinal lymphoma.

Taylor Burdette, DVM
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Institution and Location	Degree	Year
Virginia–Maryland College of Veterinary Medicine, Blacksburg, Virgina	DVM	2022
Cornell University, Ithaca, New York	Residency	2023-Present

Current Position
2nd Year Resident in Large Animal Internal Medicine

Abstract Title:
EVALUATION OF A STALL-SIDE IGG KIT IN COMPARISON TO A LABORATORY TURBIDOMETRIC IMMUNOASSAY TO IDENTIFY FAILURE OF PASSIVE TRANFER OF IMMUNITY IN FOALS AND CRIAS

Authors Names:
Taylor Burdette[1], Toby Pinn-Woodcock[2], Tacy Stokol[2]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York
[2]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Toby Pinn-Woodcock DVM ACVIM, Department of Clinical Sciences, tlp52@cornell.edu
Co-mentor: Tracy Stokol BVSc, PhD, DACVP, Department of Population Medicine and Diagnostic Sciences, ts23@cornell.edu

Abstract:

Serum immunoglobulin G (IgG) measurement is used for assessing passive transfer of immunity in foals and crias, with concentrations <800mg/dl and <1000mg/dl indicating failure of transfer of passive immunity (FTPI), respectively. Our goal was to evaluate the accuracy and precision of a stall-side lateral flow assay (LFA) for FTPI diagnosis in foals and crias. Serum from 50 foals and 38 crias were analyzed with the LFA and "gold standard" laboratory immunoturbidometric assay (ITA). Associations between assays, median assay concentrations and the difference between assays were determined using Spearman rank correlation (R_{sp}), Wilcoxon signed-rank test, and a Bland-Altman plot, respectively. Precision was determined by calculating the coefficient of variation (CV) of 5 replicate values of 3 different IgG concentrations. Accuracy for FTPI diagnosis was calculated as the percentage of neonates with LFA results below designated cut-offs. There was moderate to good correlation between IgG LFA and ITA concentrations in foals (R_{sp}=0.740, p=0.001) and crias (R_{sp}=0.809, p<0.001). However, compared to the ITA, median LFA IgG concentrations were significantly lower in foals (LFA: 799mg/dL, ITA: 1036mg/dL, p=0.002; median bias: -198mg/dL) and higher in crias (LFA: 3000mg/dL; ITA: 850mg/dL, p=<0.001; median bias: 1155mg/dL). Replicate analysis with the LFA yielded high variation (CV: 27-49% in foals, 42-66% in crias). Of 16 foals and 23 crias with ITA concentrations below the FTPI cut-off, 88% of foals and 48% of crias would have an FTPI diagnosis with the LFA. Our results indicate that the stall-side LFA should not be used to diagnose FTPI in foals or crias.

Meryem Outouil, DVM
mo478@cornell.edu

Institution and Location	Degree	Year
Hassan II Institute of Agronomy and Veterinary Sciences, Rabat, Morocco	DVM	2012
Cornell University, Ithaca, New York	Internship	2023
Cornell University, Ithaca New York	Residency	2024-Present

Current Position
1st Year Resident in Laboratory Animal Medicine

Abstract Title:
EVALUATING THE IMPACT OF STALL SIZE ON THE BEHAVIOR AND WELFARE OF HORSES

Authors Names:
Meryem Outouil[1], Pamella J. Perry [2], Lorin D. Warnick [3], Erin K. Daugherity [1]

[1] Center for Animal Resources and Education, Cornell University, Ithaca, New York
[2] Private veterinarian, Board-Certified Veterinary Behaviorist
[3] Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Erin K. Daugherity; DVM, MS, DACLAM, Department of Biomedical Science, ekr2@cornell.edu
Co-mentor: Pamela J. Perry, DVM, PhD, DACVB Private veterinarian, Board-Certified Veterinary Behaviorist dppdvm89@hotmail.com
Co-mentor: Dean Lorin Warnick, DVM, PhD Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York, cvmdean@cornell.edu

Abstract:

Single-stall housing is a commonly system used for horses in various settings, including racing stables, riding schools, and research facilities. The Guide for the Care and Use of Laboratory Animals (2011) and the American Association of Equine Practitioners (AAEP) recommend a stall size of 144 sq ft. Not all stalls meet this size requirement and there is limited literature that supports 144 sq ft. This study compared the behavioral and physiological responses of horses housed in 144 sq ft versus 136.6 sq ft stalls to determine if the smaller stalls are acceptable at our institution. Eight of the largest Cornell Equine Park horses (1380–1640 lbs.) were randomly assigned to either five days in a 136.6 sq ft or 144 sq ft stall, followed by 7days in pasture, then five days in the alternate size stall in a crossover design. Hay consumption and fecal output were quantified daily. Blood samples collected each morning were analyzed for serum cortisol. An accelerometer tracked locomotor activity and recumbency behavior, which were validated via 24-hour time-lapse video. No significant differences were found between stall sizes for hay consumption ($p=0.1962$), fecal output ($p=0.1934$), cortisol levels ($p=0.7662$), or accelerometer-measured behaviors, including walking time ($p=0.7090$), sternal recumbency ($p=0.7495$), and lateral recumbency ($p=0.8050$). Video observations revealed no adverse stereotypic behaviors in either stall size. Horses exhibited expected resting, eating, and exploratory behaviors, suggesting that the smaller stall size does not negatively impact equine welfare compared to the widely recommended 144 sq ft stalls.

Hanna RM Sfraga, DVM
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Institution and Location	Degree	Year
University of British Columbia, Kelowna, BC, Canada	BS	2015
Colorado State University, Fort Collins, Colorado	DVM	2021
Cornell University, Ithaca New York	Residency	2022-Present

Current Position
3rd Year Resident in Large Animal Internal Animal Medicine

Abstract Title:
INVESTIGATION OF CARDIAC TROPONIN I, ARRHYTHMIA BURDEN AND ECHOCARDIOGRAPHIC VARIABLES IN APPARENTLY HEALTHY NEONATAL FOALS

Authors Names:
Hanna RM Sfraga[1], Elizabeth Williams Louie[1], Callum Donnelly[1], Katharyn Mitchell[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Katharyn Mitchell, DVM, PhD, BVSc, DACVIM-LA, Department of Clinical Sciences, km424@cornell.edu
Co-mentor: Callum Donnelly, BVetBiol/BVetSc, DACT, DACVIM-LA, Department of Clinical Sciences, cgd43@cornell.edu

Abstract:

Introduction: Cardiac troponin I ([cTnI]) is a biomarker for myocardial insult, and reference intervals have been established for adult horses. In neonatal foals, [cTnI], arrhythmia burden and echocardiographic variables are not well characterized.

Hypothesis/Objectives: To establish [cTnI] reference intervals, arrhythmia burden, and echocardiographic variables in healthy foals.

Animals: Five University owned foals.

Methods: Blood was collected at 0, 6, 12, 18, 24, 48, 72, and 120 hrs of age, and stored at -80C. Complete echocardiograms were performed at 24 hrs, 5 days, and 21 days. An ECG was recorded for 24 hrs, beginning at 12 hrs of age. Plasma [cTnI] was measured (iSTAT-1, Abbott Laboratories).

Results: Four of five foals had [cTnI] outside the reference interval for adult horses (<0.06 ng/mL). The [cTnI] peaked at 6 hrs with a mean (standard deviation) of 0.16 (0.09); decreased at 12, 18 and 24 hrs: 0.11 (0.07), 0.08 (0.11), and 0.06 (0.06) respectively. An ECG was recorded in 4/5 foals. Analysis revealed supraventricular and ventricular arrhythmias. Echocardiographically, foals had prominent right hearts, changes in tissue Doppler variables compared to adults, pulmonary artery flow acceleration and turbulence, and the ductus arteriosus remained open on day 5 in all foals and was closed at 21 days.

Conclusions/Clinical Importance: Arrhythmia burden and [cTnI] in neonatal foals is higher compared to adults. The ductus arteriosus remained open in all foals on day 5 indicating that further investigation to characterize the timing of ductus closure is needed. Five additional foals will be investigated in spring 2025.

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Institution and Location	Degree	Year
Colorado State University, Fort Collins, Colorado	BS	2016
Texas A&M University, College Station, Texas	DVM	2021
Cornell University, Ithaca New York	Residency	2023-Present

Current Position
2nd Year Resident in Comparative Ophthalmology

Abstract Title:
THE EFFECTS OF PHOTODYNAMIC THERAPY WITH EMUNDO® AND 810NM DIODE LASER ON THE HEALTHY EQUINE CORNEA

Authors Names:
Callie Rogers[1], Eric Ledbetter[1], Abigail Reid[1], Erin Scott[1], Kelly Knickelbein[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Kelly Knickelbein VMD, DACVO, Department of Clinical Sciences, kek248@cornell.edu

Abstract:

INTRODUCTION: Photodynamic therapy (PDT) uses a photosensitizing agent and light to cause cellular damage via reactive oxygen species. PDT is utilized for the treatment of periocular neoplasia and has the potential for further ophthalmic applications, however safety and impact of treatment on ocular integrity are not described. The purpose of this study was to investigate the safety and morphologic effects of PDT on healthy equine corneas.

METHODS: One eye of 6 normal university-owned research horses underwent PDT with intracorneal EmunDo® injection and photoactivation with an 810nm diode laser. Complete ophthalmic examinations, digital and infrared photography, in vivo confocal microscopy, and ultrasound biomicroscopy were performed pre- and post-treatment on days 0, 5, 15, 30 and 103.

RESULTS: Corneal PDT treatment resulted in delayed corneal ulceration (n=6, 100%), endotheliitis (n=5, 83%), and stromal keratitis (n=5, 83%). One eye developed fungal keratitis. EmunDo® remained visible in the cornea on day 103 in 5/6 horses. Activated stromal keratocytes and inflammatory cells were still present on day 103 in all horses, indicating ongoing corneal remodeling. No horses developed blinding complications.

DISCUSSION: Corneal ulceration should be expected following corneal PDT and prophylactic ophthalmic antibacterial and antifungal drugs should be utilized. Corneal PDT induces keratitis, likely secondary to its mechanism of action to cause cell damage via generation of reactive oxygen species.

Laura M. St Clair, DVM
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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2020
Oradell Animal Hospital, Paramus, NJ	Internship	2021
Cornell University, Ithaca New York	Internship	2022
Cornell University, Ithaca New York	Residency	2022-Present

Current Position
3rd Year Resident in Zoological Medicine

Abstract Title:
MORBIDITY AND MORTALITY OF BALD EAGLES (*HALIAEETUS LEUCOCEPHALUS*) ADMITTED TO A WILDLIFE HOSPITAL IN NEW YORK, 2013-2023

Authors Names:
Laura St Clair[1], Cynthia Hopf-Dennis[1], Kenneth Tyler Wilcox[2], Elizabeth Buckles[3], Sara Childs-Sanford[1]

[1] Department of Clinical Sciences, Cornell University, Ithaca, New York
[2] College of Agriculture and Life Sciences, Cornell University, Ithaca, New York
[3] Department of Biomedical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Sara Childs-Sanford, DVM, MS, DACZM, Department of Clinical Sciences, sec15@cornell.edu

Abstract:

The bald eagle (*Haliaeetus leucocephalus*) is a large charismatic species and the official national bird of the United States. Conservation efforts have led to population recovery, however, the bald eagle remains federally protected and is listed as threatened in New York. The objective of this study was to describe causes of morbidity and mortality in free-ranging bald eagles admitted to the Janet L. Swanson Wildlife Hospital at Cornell University between 2013-2023. Records for 179 free-ranging bald eagles were identified through an electronic medical record system search. Among these 179 eagles, 225 morbidity events and 119 deaths were recorded. Trauma was the leading cause of morbidity (121/225) and mortality (75/119) in this study, with vehicular trauma being the most common identified cause (n=24). Infectious disease was the second leading cause of morbidity (58/225) and mortality (28/119). West Nile virus was the most prevalent infectious disease (17/58), while highly pathogenic avian influenza was the most frequently diagnosed infectious cause of mortality (10/28). Toxin exposure was the third most common cause of morbidity (19/225) and lead was the most common toxin identified (16/19). There were no significant associations between sex or age, and mortality in this study population. This data provides valuable insight into the health risks of bald eagles in New York and can be used to help direct policy and conservation efforts for the protection of this iconic species.

Agustin Rebollada-Merino, DVM, PhD

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Institution and Location	Degree	Year
Complutense University of Madrid, Madrid, Spain	DVM	2018
VetPatólogos Veterinaria & Experimental	Externship	2018
Autonomous University of Barcelona, Barcelona, Spain	Externship	2022
University of California-Davis, San Bernardino, California	Externship	2023
Complutense University of Madrid, Madrid, Spain	PhD	2023
Cornell University, Ithaca, New York	Residency	2023-Present

Current Position

2nd Year Resident in Anatomic Pathology

Abstract Title:

DEVELOPMENT OF AN IN-SITU HYBRIDIZATION ASSAY FOR THE DIAGNOSIS OF MYCOBACTERIAL INFECTIONS OF VETERINARY IMPORTANCE

Authors Names:

Agustín Rebollada-Merino[1], Sean P. McDonough[1] , Francisco A. Uzal[2] , Antonio Rodríguez-Bertos[3,4], Rodman G. Getchell[5], Shotaro Nakagun[6], Elena Alina Demeter[1]

[1] Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York
[2] California Animal Health and Food Safety Laboratory, University of California-Davis, San Bernardino, California
[3] VISAVET Health Surveillance Centre, Complutense University of Madrid, Madrid, Spain
[4] Department of Internal Medicine and Animal Surgery, Complutense University of Madrid, Madrid, Spain
[5] Department of Microbiology and Immunology, Cornell University, Ithaca, New York
[6] Disease Investigations, San Diego Zoo Wildlife Alliance, San Diego, California

Project Mentor(s):

Mentor: E. Alina Demeter, DVM, PhD, DACVP, Department of Population Medicine and Diagnostic Sciences, ed478@cornell.edu

Abstract:

Mycobacteria (*Mycobacteriaceae* family) are grouped into five genera (*Mycobacterium*, *Mycolicibacterium*, *Mycolicibacter*, *Mycolicibacillus*, and *Mycobacteroides*), which include relevant animal and human pathogens. Histopathology is a rapid method for diagnosing infections by mycobacteria, contributing to surveillance, control, and eradication, regardless of epidemiological context. A constraint on histopathology is the limited sensitivity and specificity of acid-fast stains as the number of detectable bacilli in formalin-fixed paraffin-embedded (FFPE) tissue is variable. Additionally, other microorganisms are acid-fast positive. Immunohistochemistry has a low specificity as antibodies cross-react among mycobacteria and with other bacteria. We developed an RNAscope® probe-based in-situ hybridization (ISH) assay, targeting a conserved sequence of the 16S rRNA gene of *Mycobacteriaceae*, and tested it on archived FFPE tissue from mammals, birds, amphibians, and fish, collected between 1999 and 2024, infected with 23 distinct species of mycobacteria of veterinary importance. *Mycobacterium* spp. (n = 17), *Mycobacteroides* spp. (n = 2), *Mycolicibacter* spp. (n = 1), *Mycolicibacterium* spp. (n = 3) confirmed infected tissue was tested and the results were compared with 2 acid-fast stains, Ziehl-Neelsen and Fite-Faraco. Hybridization signal was detected in all the FFPE tissue, archived for up to 25 years, with confirmed *Mycobacterium* spp. (17/17; 100%), *Mycobacteroides* spp. (2/2; 100%), *Mycolicibacter* spp. (1/1; 100%), and *Mycolicibacterium* spp. (3/3; 100%) infection, including in cases with few or no acid-fast bacilli observed. Hybridization signal was not identified in other bacterial infections. These results support using this ISH assay as a rapid screening and more specific diagnostic tool for FFPE tissue infected with mycobacteria.

Dahihm Kim, DVM, MS, PhD

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Institution and Location	Degree	Year
Chonnam National University, Gwangju, South Korea	DVM	2014
Seoul National University, Seoul, South Korea	MS	2016
Cornell University, Ithaca, New York	PhD	2023
Cornell University, Ithaca New York	Residency	2023-Present

Current Position

2nd Year Resident in Laboratory Animal Medicine

Abstract Title:

EVALUATING THERAPEUTIC INTERVENTIONS TO COUNTERACT BUPRENORPHINE-RELATED PICA AND MORTALITY IN RATS

Authors Names:

Dahihm Kim[1], Erica Feldman[1], Elizabeth S. Moore[1], Stephanie A. Hon[1]

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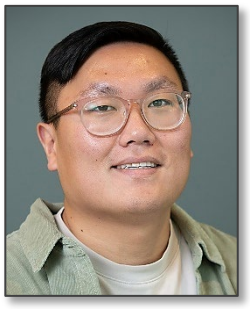
Project Mentor(s):

Mentor: Erica Feldman, DVM, DACLAM, Department of Biomedical Sciences, erf73@cornell.edu
Co-mentors: Elizabeth S. Moore, DVM, PhD, Department of Biomedical Sciences, esm84@cornell.edu
Co-mentors: Stephanie A. Hon, DVM, DACVAA, Department of Biomedical Sciences, sar299@cornell.edu

Abstract:

The optimum management of postoperative pain in laboratory animals is pivotal for animal welfare and reliable experimental results. Extended-release buprenorphine (Ethiqa) is the only FDA-approved opioid for long-term analgesia in rats. While its long duration of action confers advantages, there are significant adverse effects associated with post-operative Ethiqa administration, including pica (consumption of non-food substances) and decreased gastrointestinal (GI) motility. In a previous study, we observed fatal intestinal obstruction with bedding material in 28% of rats administered Ethiqa post-operatively, likely attributable to a combination of pica and decreased GI motility. This study aims to evaluate the efficacy of a potential pharmaceutical mitigation strategy for these adverse effects. We hypothesize that co-administering the serotonin antagonist ondansetron with Ethiqa will alleviate emetic effects induced by buprenorphine in Sprague-Dawley rats. We measure kaolin clay pellet consumption as an indicator for pica behavior, and monitor feed consumption and fecal output to evaluate GI motility. Preliminary results from two trials with one rat in each treatment group per trial (n = 4 total rats; 2 receiving Ethiqa + ondansetron, 2 receiving Ethiqa alone), revealed opposite trends in kaolin consumption between the experimental groups in the two trials. However, both groups exhibited increased kaolin consumption at the 24 hour timepoint. We are increasing our sample size currently and may also assess an alternative mitigation strategy of using bisacodyl, a stimulant laxative, if ondansetron co-administration is not efficacious in mitigating adverse effects. These studies are crucial for improving postoperative care in Sprague-Dawley rats.



Jimmy Guan, DVM
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Institution and Location	Degree	Year
Loyola University, Chicago, Illinois	BS	2018
Western University of Health Sciences, Pomona, California	DVM	2023
Cornell University, Ithaca New York	Residency	2023-Present

Current Position
2nd Year Resident in Anatomic Pathology

Abstract Title:
CARDIAC AUTOPHAGOSOME DYSFUNCTION IN A BREEDING COLONY OF PRAIRIE VOLES (*MICROTUS OCHROGASTER*)

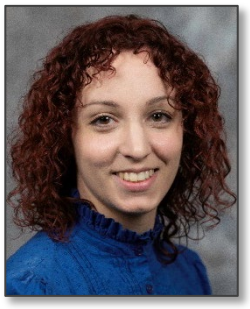
Authors Names:
Jimmy Guan[1], Dahihm Kim[1], Glenn Jackson[1], Anibal G. Armien[2], Elena Alina Demeter[1]

[1]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY
[2]University of California, Davis, California

Project Mentor(s):
Mentor: Elena Alina Demeter, DVM, PhD, Dipl. ACVP, Department of Population Medicine and Diagnostic Sciences, ed478@cornell.edu

Abstract:

Prairie voles (*Microtus ochrogaster*) are a highly social monogamous species. Due to their social behavior, they are often used as an animal model for behavioral neuroscience and cognitive studies. A breeding colony of *M. ochrogaster* from one of three facilities at Cornell University experienced an increase in unexpected acute deaths with no prior clinical signs (30 deaths/101 total animals). Significant gross findings observed included cardiomegaly (5/30) and pleural effusion (3/30). Routine histology revealed cardiomyocytes with abundant intracytoplasmic basophilic granular material in the majority of *M. ochrogaster* from this facility (25/30). Other significant histologic changes included myocardial fibrosis (16/30), myocarditis (9/30), and atrial thrombosis (6/30). Interestingly, *M. ochrogaster* from the two other facilities on the same campus (593 total) that died naturally (16/593) or were euthanized (2/593) due to other unrelated causes did not reveal similar cardiac changes.
Additional histochemical (8/29) and immunohistochemical stains (2/29) further characterized the intracytoplasmic granular material as Von-Kossa negative, periodic acid-Schiff with diastase positive, myogenin positive, and sarcomeric actin positive. Ultrastructural analysis via transmission electron microscopy (2/29) shows the granular material as autophagosomes with microtubular or filamentous dense aggregates as a product of mitochondria and myofibrillar degradation.
The affected colony are bred within the facility, but new wild-caught animals are periodically introduced to ensure an outbred status. The other two unaffected colonies on campus are housed similarly with almost identical husbandry standards. The only variation between the facilities is the use of reverse osmosis (RO) water in the affected facility and tap water in other facilities.



Mariana, Schlosser, MVM
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Institution and Location	Degree	Year
University of Tras-os-Montes and Alto Douro, Vila Real, Portugal	MVetMed	2016
Educational Commission for Foreign Veterinary Graduates certification program	ECFVG	2021
Arizona Veterinary Emergency and Critical Care Center, Gilbert, AZ	Internship	2023
Cornell University, Ithaca New York	Residency	2024-Present

Current Position
1st Year Resident in Small Animal Emergency and Critical Care

Abstract Title:
DIFFERENTIATING BACTERIAL SEPSIS FROM NON-SEPTIC CRITICAL ILLNESS IN DOGS USING METABOLOMIC PROFILING

Authors Names:
Mariana Schlosser[1], Robert Goggs[1]
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Project Mentor(s):
Mentor: Robert Goggs, BVSc, PhD, DACVECC, DECVECC, Department of Clinical Sciences, r.goggs@cornell.edu

Research Proposal Abstract:

Sepsis is a life-threatening, dysregulated host response to infection, characterized by profound physiologic derangements and is associated with mortality rates as high as 68% in dogs. Distinguishing sepsis from non-septic critical illness is clinically challenging. The utility of individual biomarkers is limited by disease heterogeneity and our incomplete understanding of pathophysiology. Metabolomics comprehensively characterizes cellular metabolic end-products in complex biological systems enabling the metabolic disturbances in sepsis to be characterized. Our previous metabolomic analyses of dogs with sepsis found alterations compared to healthy controls and identified potential diagnostic and prognostic markers. However, we do not know if these metabolic disturbances are unique to sepsis or are common to critical illness, a knowledge-gap we intend to fill.

We hypothesize that dogs with bacterial sepsis have distinct metabolomic profiles compared to dogs with non-septic critical illness and that the relative abundance of biomarkers will discriminate these groups. To test these hypotheses, stored plasma samples from 20 dogs with bacterial sepsis will be selected and matched by illness severity with 20 dogs with non-septic critical illness. After untargeted metabolomics, orthogonal partial least-squares discriminant analysis will be used to construct score plots and compare the two groups. Previously identified putative diagnostic and prognostic biomarkers will be re-evaluated to assess their utility. We anticipate identifying metabolic disturbances specific to sepsis. Moreover, if the previously identified biomarkers remain diagnostic, they will provide the foundation for a future sepsis biomarker panel, akin to that recently developed for diagnosis of sepsis in human pediatrics.

Taylor J. Williams, DVM
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Institution and Location	Degree	Year
The Ohio State University, Columbus, OH	DVM	2023
The Ohio State University, Columbus, OH	MPH	2020-Present
University of Guelph, Guelph, Ontario, Canada	Internship	2024
Cornell University, Ithaca New York	Residency	2024-Present

Current Position
1st Year Resident in Ambulatory and Production Medicine

Abstract Title:
COMPARISON OF A NOVEL NERVE BLOCK FOR CALF DISBUDDING COMPARED TO TRADITIONAL METHODS

Authors Names:
Taylor J. Williams[1], Sabine Mann[1], Luis Campoy[2], Matthias Wieland[1]

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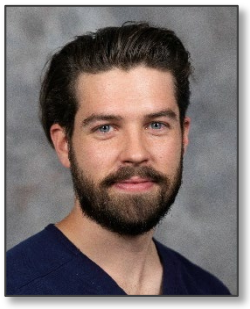
Project Mentor(s):
Mentor: Sabine Mann, DVM, PhD, DECBHM, DACVPM, Department of Population Medicine and Diagnostic Sciences, sm682@cornell.edu
Co-mentor: Matthias Wieland, DVM, PhD, DECBHM, Department of Population Medicine and Diagnostic Sciences, mjw248@cornell.edu
Co-mentor: Luis Campoy, LV CertVA, DECVAA, MRCVS, Department of Clinical Sciences, lc268@cornell.edu

Research Proposal Abstract:

Disbudding young calves is a common husbandry practice, with approximately 94% of US dairy farms employing the procedure. The horn bud is innervated by the cornual nerve, a branch of the trigeminal nerve. Currently, local anesthesia is achieved by the traditional cornual nerve block (COR). However, alternative infiltration blocks, such as rostromedial (RM), and caudomedial and rostromedial (CMRM) infiltrations, have recently been described in the literature. Our objective is to evaluate these alternative methods regarding onset and effectiveness of desensitization.

We propose a randomized controlled double masked clinical trial to compare time to complete desensitization between COR, RM, and CMRM. Sample size estimation yielded 75 calves are needed and will be enrolled following a randomized block design. Disbudding will be performed with a cordless gas dehorner and all calves will receive a dose of 1 mg/kg meloxicam orally. Local anesthesia, regardless of technique, will be performed by administering 3 mL of 2% lidocaine to each side. A custom ethogram will be used for behavioral pain assessments prior to and for 3 hours after the procedure. An algometer will be utilized to assess reactivity and pain response prior to the block, every 30 seconds following the block until lack of reactivity is noted and following the procedure. Blood samples will be collected 15 minutes and 3 hours after the block to assess serum cortisol concentrations as an indicator of acute stress responses.

We expect that infiltration blocks will lead to faster and more reliable desensitization compared with traditional cornual nerve blocks.



Brian M. Chambers, DVM
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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2022
Cornell University, Ithaca, New York	Residency	2024-Present

Current Position
1st Year Resident in Anatomic Pathology

Abstract Title:
NEURAL TUBE DEFECTS IN DOGS AND CATS: A STUDY ON BIOPSY FINDINGS AND LONG-TERM OUTCOME AFTER SURGICAL MANAGEMENT

Authors Names:
Brian M. Chambers[1], Elena A. Demeter[1]

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Project Mentor(s):
Mentor: Elena Alina Demeter, DVM, PhD, Dipl. ACVP, Department of Population Medicine and Diagnostic Sciences, ed478@cornell.edu

Research Proposal Abstract:

Neural tube defects (NTD) are a broad category of congenital malformations due to abnormal embryological development of the neural tube. NTDs can be opened, with exposed neural tissue and leakage of cerebral spinal fluid (CSF) and closed, without neural tissue and CSF. Spina bifida is an NTD resulting from the failed closure of vertebral arch(es). If the vertebral defect is large enough, the meninges (meningocele) and/or spinal cord (meningomyelocele) may protrude through the defect creating a noticeable cyst. Similarly, cranial meningoceles occur due to herniation of the meninges through defects in the cranium. Neurological symptoms vary depending on the extent and location of the NTD. This retrospective study reviews the histologic characteristics and surgical outcomes of six feline and canine patients diagnosed with NTDs between 2009-2023. The patients were between 8-weeks and 1-year old at the time of the surgery. The cases include 4 meningomyeloceles, 6 meningoceles, and 2 meningoencephaloceles. The biopsies were evaluated by hematoxylin and eosin (H&E) and immunohistochemistry aimed at characterizing the cyst wall and the presence of neural tissue (glial fibrillary acidic protein [GFAP], microtubule-associated protein 2 [MAP2], E-Cadherin) and inflammatory population (CD204, CD3, CD20, MUM1). Post-operative follow-up data is recorded and correlated with the histologic findings. The literature correlating histologic findings with surgical outcomes of NTDs are lacking. Given the variation in clinical signs associated with NTDs, histologic characterization of these lesions can provide information that could contribute to a better understanding of the conditions and patient management.

Jaimeson A. Kass, MVB, BS
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Institution and Location	Degree	Year
Denison University, Granville, OH	BS	2017
University College Dublin, Dublin, Ireland	MVB	2021
Cornell University, Ithaca, New York	Residency	2024-Present

Current Position
1st Year Resident in Medical Oncology

Abstract Title:
IMMUNOHISTOCHEMICAL PANEL TO IMPROVE DIAGNOSIS AND INVESTIGATE NOVEL PROGNOSTIC INDICATORS OF PRIMARY CANINE OSTEOSARCOMA

Authors Names:
Jaimeson A. Kass[1], Skylar R Sylvester[1], Latasha A. Ludwig[2]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York
[2]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Mentor: Latasha A. Ludwig, DVM, PhD, DACVP, Department of Population Medicine and Diagnostic Sciences, lal269@cornell.edu
Co-mentor: Skylar R. Sylvester, DVM DACVIM (Oncology), Department of Clinical Sciences, srs289@cornell.edu

Research Proposal Abstract:

Background/Rationale:
Osteosarcoma (OSA) is an aggressive bone cancer with most dogs succumbing to their disease within a year, despite aggressive treatment. OSA is the most common canine bone tumor. However, differentiating OSA from other bone cancers with different biologic behavior can be difficult on biopsy. A reliable, timely diagnosis of OSA is important as it dictates therapy and impacts outcome. A further challenge is the considerable variation in survival times with OSA, which can range from a few months to years. As such, a set of histological markers to inform prognostication and improve confidence in a diagnosis of OSA is required.

Hypothesis/scientific design:
Tissue microarrays of primary bone tumors will be prepared and used to test a panel of immunohistochemical makers (ALP, Runx2, SATB2). We hypothesize that this panel will have better sensitivity and specificity for diagnosing OSA compared to each marker alone. Markers will be assessed using a scoring system established in the literature. Statistical analysis will include Boschloo's test and ROC curves for marker performance, and multi-level modeling used for associations of marker expression with disease-free interval and overall survival. Additionally, we hypothesize that tumor ALP will be correlated with serum ALP and that these variables in combination will better predict prognosis than serum ALP alone.

Expected outcomes:
The goal of this study is to develop a diagnostic panel of immunohistochemical markers that can be offered for clinical use to assist veterinarians in making an accurate, timely diagnosis, and in better prognosticating outcomes for dogs with OSA.

Serena Teh
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Institution and Location	Degree	Year
University at Buffalo, Buffalo, New York	BA	2022
Cornell University, Ithaca, New York	PhD Student	In-Progress

Current Position
PhD Student

Abstract Title:
INSIGHTS INTO TRANSFER OF MATERNAL ANTIBODIES IN DOGS

Authors Names:
Serena Teh [ab], Lotta Truyen [ac]; Sarah Woodyear [a], Ana Pimenta [a], Jess Palmeri [a], Ella Lanman [a], Abby Reid [a], Alexis Carol [a], Sarah Caddy [ad]

[a]Baker Institute for Animal Health, Cornell University, Ithaca, New York
[b]Department of Molecular Biology and Genetics, Cornell University, Ithaca New York
[c]University of Veterinary Medicine Hannover, Germany
[d]Microbiology and Immunology Department, Cornell College of Veterinary Medicine, Ithaca, New York

Project Mentor(s):
Advisor: Sarah Caddy, MA ,VetMB, PhD, DACVM, FRCVS, Department of Microbiology and Immunology, sarahcaddy@cornell.edu

Abstract:

Neonatal puppies are vulnerable to pathogens due to their immature immune systems. Thus, mothers offer immune protection by transferring maternal antibodies (MatAb) transplacentally and via colostrum. However, the mechanisms of MatAb transfer are poorly understood. Canine antibodies have diverse subclasses, isotypes and sugar modifications ('glycans'), but these have not been studied in the MatAb context. In this project, we evaluated which MatAbs are transferred to pups.

We collected dam serum, colostrum, and umbilical cord serum from 40 dogs undergoing cesarean section at CUHA in collaboration with Theriogenology. We also collected serum from 21 non-pregnant control dogs. We quantified total IgG MatAbs and virus-specific MatAbs in each sample by ELISA. In addition, we used mass spectrometry to analyze MatAb glycans.

Total IgG and virus-specific IgG were shown to be ~10 fold higher in colostrum compared to dam serum, while cord blood contained only 4.5% of the IgG detected in dam serum. Colostrum IgG titers were closely correlated with maternal titers, but there was minimal correlation between maternal titer and cord titer. Unexpectedly, we identified high levels of sialic acid (39%) on MatAb glycans in the mother, but only 1% in non-pregnant controls.

In conclusion, we showed exceptionally high MatAb IgG titers in colostrum in dogs and verified poor placental transfer of MatAbs. We also identified pregnancy-related antibody glycan changes, which we hypothesize affects MatAb transfer. In future work, we aim to perform detailed characterization of factors affecting MatAb transfer in dogs and expand our study to species with other placenta types.

Anne Buglione, DVM
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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	BS	2015
Cornell University, Ithaca, New York	DVM	2019
Cornell University, Ithaca, New York	PhD	In-Progress

Current Position
PhD Student

Abstract Title:
CAPILLARY STALLING BY NEUTROPHILS IS A NOVEL MECHANISM UNDERLYING DECREASED MYOCARDIAL PERFUSION IN HEART FAILURE WITH PRESERVED EJECTION FRACTION

Authors Names:
Anne Buglione[1,2], David Small[1], Daniel Rivera[1], Nathaniel H. Allan-Rahill[1], Tyler Locke[1], Soseh Hovasapian[1], Chris B. Schaffer[1], Nozomi Nishimura[1]

[1]Nancy E. and Peter C. Meinig School of Biomedical Engineering, Cornell University, Ithaca, NY
[2]College of Veterinary Medicine, Cornell University, Ithaca, NY

Project Advisor(s):
Advisor: Nozomi Nishimura, Meinig School of Biomedical Engineering, nn62@cornell.edu

Abstract:

Background: Decreased myocardial perfusion is implicated in heart failure with preserved ejection fraction (HFpEF), but the underlying mechanism is unknown. Intravital multiphoton microscopy (MPM) enables direct visualization of blood flow in myocardial capillaries. We hypothesize that transient arrest of neutrophils in myocardial capillaries leads to organ-wide perfusion deficits.

Methods: Male and female 8–12-week-old C57BL/6 mice received a high fat diet and L-NAME (HFpEF) or standard diet and water (healthy control) *ad lib* for 15 weeks. MPM was performed to visualize neutrophils and capillary perfusion. MPM, echocardiography, and histology were additionally performed following antibody-induced neutrophil depletion (anti-Ly6G, 24h after 4mg/kg IP once) or treatment with the sodium glucose cotransporter-2 inhibitor empagliflozin (24h after 10mg/kg IP once).

Results: In vivo MPM revealed an increase in slow and non-flowing neutrophils in myocardial capillaries in HFpEF mice compared to healthy controls. Myocardial hypoxia, assessed by pimonidazole staining, and diastolic function, assessed as mitral E/e', were rescued with neutrophil depletion and empagliflozin. To further evaluate the mechanism underlying these rapid effects, we developed spectral imaging for in vivo measurement of tissue and blood oxygenation.

Conclusion: Neutrophil arrest in myocardial capillaries is increased in HFpEF mice. Neutrophil depletion acutely restores blood flow and improves myocardial oxygenation and diastolic function. The benefit of treatment with SGLT2 inhibitors in human HFpEF may be mediated by a similar mechanism. These findings may be relevant to diastolic dysfunction in veterinary species, such as feline hypertrophic cardiomyopathy.

Laura E. Frazier, BS
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Institution and Location	Degree	Year
Centenary College of Louisiana, Shreveport, Louisiana	BS, BS	2020
Cornell University, Ithaca, New York	PhD	In-Progress

Current Position
PhD Student, Liz Hanson Fellow in Feline Medicine

Abstract Title:
LARGE SCALE OUTBREAK OF FIP IN ANIMAL SHELTER IN THE USA IS ASSOCIATED WITH CONJUNCTIVAL SHEDDING

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Project Advisor(s):
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Abstract:

Feline coronavirus type 1 (FCoV-1) is the cause of feline infectious peritonitis (FIP). FCoV-1 infection begins with a low-pathogenicity virus (FECV) that is shed the feces and causes sub-clinical disease. FCoV-1 can switch to high-path (FIPV) when the virus gains mutations that allow it to spread systemically and infect monocytes/macrophages. FIP is considered non-transmissible, but outbreaks still occur. Our lab hypothesizes that sequencing conjunctival swabs from cats suspected of having FIP could aid in diagnosing cats.
Here, we studied a large scale outbreak which consisted of 30+ cases of FIP in a shelter in Sarasota, Florida. We provided molecular diagnostic support to better understand the outbreak in conjunction with the clinical presentation and management carried out by the shelter. We analyzed conjunctival swabs, fecal samples, and abdominal or pleural fluid. We used PCR and next-generation sequencing of the spike gene to risk assess viruses present in cats, which would inform if cats need to be isolated or treated to better control the spread of the disease. PCR and sequencing results were highly predictive of the FIP form of the virus and in good agreement with clinical presentation. Preliminary data suggests that conjunctival samples could be useful for diagnostic purposes and for tracking disease outbreaks of FIP.

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Abstract Title:
IDENTIFICATION OF CANDIDATE GENOMIC REGIONS ASSOCIATED WITH FELINE CHRONIC GINGIVOSTOMATITIS

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Abstract:

Feline Chronic Gingivostomatitis (FCGS) is an oral mucosal disease characterized by inflammatory lesions, severe anorexia, and weight loss. Current treatments, such as dental extractions and immunosuppressants, have limited effectiveness. The etiology of FCGS remains unknown; however, factors such as viral and bacterial infections, living in multi-cat households, genetic susceptibility, and immune system dysregulation have been implicated. Recent studies have revealed upregulation of inflammatory pathways, including JAK/STAT, NFKB, and SAP/JNK, along with significant infiltration of lymphocytes and plasma cells in affected tissues. While these findings have advanced our understanding of dysregulated immune responses in FCGS, no genetic risk factors have been identified to date.

To address this gap, we genotyped 100 cases and 110 controls using a 340k SNP array. Genotypes were imputed using IMPUTE5 with 336 whole genome-sequenced (WGS) cats as the reference panel. Imputed markers were filtered based on a genotype probability threshold of 0.95. Imputation accuracy was validated through concordance analysis and a positive control GWAS for the orange coat phenotype. The imputed data were analyzed using a linear mixed model to identify potential genetic predispositions for FCGS. Our analysis identified a candidate genomic region associated with FCGS. Further investigation is underway to validate this association and evaluate its role in disease development.