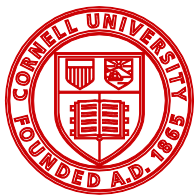


# CLINICAL INVESTIGATORS' DAY

Vincent Baldanza, VMD  
3<sup>rd</sup> year Medical Oncology Resident

Lecture Hall III  
September 30, 2016  
College of Veterinary Medicine





## Cornell University College of Veterinary Medicine

**W**elcome to the 2016 Clinical Investigators' Day, sponsored by the Cornell University College of Veterinary Medicine. The primary goal of this forum 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. Elizabeth Buckles, Co-Chair  
Dr. Jonathan Cheetham  
Dr. Erin Daugherty  
Mr. Kim Eaton  
Mr. Doug Fink  
Ms. Nancy Grossman  
Ms. Kathleen Hall  
Dr. Ursula Krotscheck  
Dr. Mary Martin, Co-Chair  
Dr. Santiago Peralta  
Dr. Tracy Stokol, Co-Chair  
Dr. Rory Todhunter

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

Mr. Dave Frank  
Ms. Nancy Rice  
Mr. Chad Westmiller  
Ms. Shawna Sheehy

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## CURRENT CVM CLINICAL TRIALS



### **Dogs**

- Prognosis in trauma and sepsis using cell-free DNA
- Septic peritonitis and effusion-biomarkers
- Platelet-rich plasma in osteoarthritis
- Lymphoma tissue banking
- Phase II: Antibiotic therapy and B-cell lymphoma
- Complement in IMHA
- Vitamin D status in immune-mediated disease
- Epidural device to deliver pain relief
- Treatment for dogs with arthritis
- Lipids and thrombosis
- Cerenia™ as an adjunct analgesic
- Monitoring pain and activity with electronic collar
- Implantable cardioverter-defibrillator (ICD) therapy
- New therapy following standard-of-care with osteosarcoma

### **Cats**

- Carboplatin in injection site sarcomas
- Phenobarbital effect on thyroid levels
- Stem-cell therapy for gingivostomatitis
- Mammary cancer stem cells and cancer
- Characterization of subgingival micro-environment
- Feline sepsis response
- Sequencing studies of coronaviruses

### **Rabbits**

- Diagnosing gastric outflow obstruction

### **Horses**

- Laryngeal neuroprosthesis with naturally occurring RLN
- Genetics of sarcoid tumors

**PROGRAM SCHEDULE**  
**Friday September 30, 2016**  
**Lecture Hall III, Veterinary Research Tower**

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<b>8:30am-9:00am</b>	Continental Breakfast (VMC Gallery)
<b>9:00am-9:15am</b>	Welcome & Introductions – Dr. Erin Daugherty
<b><u>9:15am-9:45am</u></b>	<b><u>Presentation</u></b>  STRATEGIES FOR PERIPHERAL NERVE REPAIR: FROM RECRUITMENT TO REGENERATION <b>Jonathan Cheetham</b> , VetMB, PhD, DACVS, Associate Professor Cornell University Department of Clinical Sciences
<b><u>9:45am-11:00am</u></b>	<b><u>Resident Presentations</u></b> – Moderated by <b>Dr. Kelly Hume, DVM, DACVIM</b> THE ROLE OF CANONICAL HEDGEHOG SIGNALING IN CANINE OSTEOSARCOMA <b>Vincent E. Baldanza</b> – Medical Oncology Resident Pg. 1  A RETROSPECTIVE REVIEW OF DOGS WITH ACUTE MYELOID LEUKEMIA <b>Lillie L. Davis</b> – Medical Oncology Resident Pg. 2  EFFECTS OF <i>HUS1</i> IMPAIRMENT ON TISSUE SENSITIVITY TO CISPLATIN <b>Terese E. Noe</b> – Laboratory Animal Medicine Resident Pg. 3  RANDOMIZED CLINICAL TRIAL OF TWO CALCIUM SUPPLEMENTS ON EARLY LACTATION HEALTH AND PRODUCTION IN MULTIPAROUS DAIRY COWS <b>Antonia R. Domino</b> – Ambulatory and Production Medicine Resident Pg. 4  IMPROVING UDDER HEALTH IN DAIRY HEIFERS <b>Vinicius Silva Machado</b> – Ambulatory and Production Medicine Resident Pg. 5
<b><u>11:00am-11:15am</u></b>	<b><u>Break</u></b>
<b><u>11:15am-12:15pm</u></b>	<b><u>Resident Presentations</u></b> – Moderated by <b>Dr. Andrew Miller, DVM, DACVP</b> TEMPORAL PATTERNING OF HEART BEAT DISTRIBUTION IN DOGS WITH SINUS NODE DYSFUNCTION <b>Flavia Giacomazzi</b> – Cardiology Resident Pg. 6  INHIBITING COMPLEMENT ACTIVATION AS THERAPEUTIC TARGET IN CANINE IMMUNE-MEDIATED HEMOLYTIC ANEMIA <b>Daniela Hernandez Muguero</b> – Clinical Pathology Resident Pg. 7

## (Schedule Continued)

<u>11:15am-12:15pm</u>	<i>IN VIVO</i> BIOCOMPATIBILITY ASSESSMENT OF A SYNTHETIC ARTICULAR CARTILAGE LUBRICANT (LUBRISYNTH®) FOR DEVELOPMENT AS A CLASS III MEDICAL DEVICE FOR THE TREATMENT OF OSTEOARTHRITIS <b>Dean Jeffery</b> – Laboratory Animal Medicine Resident	<b>Pg. 8</b>
	NOVEL BIOMARKERS IN CANINE SEPSIS <b>Jo-Annie Letendre</b> – Small Animal Emergency & Critical Care Resident	<b>Pg. 9</b>
<u>12:15pm-1:45pm</u>	<u><b>Lunch &amp; Presentations</b></u> Lunch (VRT Foyer/LH III)	
12:15-12:45		
12:45-1:15	GRADUATE TRAINING PROGRAM IN COMPARATIVE MEDICINE <b>Dr. John Parker</b> , Associate Professor of Virology, Baker Institute for Animal Health  -and-  RESEARCH AND TRAINING OPPORTUNITIES BEYOND YOUR RESIDENCY <b>Dr. Bettina Wagner</b> , DVM, Associate Dean for Research and Graduate Education	
1:15-1:45	PANEL DISCUSSION: OPPORTUNITIES BEYOND YOUR RESIDENCY <b>Drs. Susan Hackner</b> , Heidi <b>Reesink</b> , Nora <b>Springer</b> and Jimmy <b>Tran</b>	
<u>1:45pm-3:00pm</u>	<u><b>Resident Presentations</b></u> – Moderated by <b>Dr. Bethany Cummings</b> , DVM, PhD SENSITIVITY, SPECIFICITY, AND ACCURACY OF MAGNETIC RESONANCE IMAGING FOR THE DETECTION OF VERTEBRAL COLUMN FRACTURES IN DOGS <b>Aitor Gallestegui</b> – Diagnostic Imaging Resident	<b>Pg. 10</b>
	OPHTHALMIC EXAMINATION FINDINGS AND INTRAOCULAR PRESSURES IN WILD-CAUGHT AFRICAN GIANT POUCHED RATS ( <i>CRICETOMYS SPP.</i> ) <b>Amanda R. Heller</b> – Comparative Ophthalmology Resident	<b>Pg. 11</b>
	CHARACTERIZATION OF BALL PYTHON NIDOVIRUS IN A MIXED SPECIES SNAKE COLLECTION <b>Danielle K. Tarbert</b> – Zoological Medicine Resident	<b>Pg. 12</b>
	EVALUATION OF TACKING SUBCUTANEOUS TISSUES DURING MIDLINE LAPAROTOMY CLOSURE: A RANDOMIZED CONTROLLED TRIAL <b>Blake M. Travis</b> – Small Animal Surgery Resident	<b>Pg. 13</b>
	PARTIAL NEUROMUSCULAR BLOCK (NMB) IMPAIRS LARYNGEAL ABDUCTION DURING HYPERCARBIC CHALLENGE IN ANESTHETIZED DOGS <b>Joy Tseng</b> – Anesthesiology Resident	<b>Pg. 14</b>

## (Schedule Continued)

**3:00pm-3:15pm**

**Break**

**3:15pm-4:15pm**

**Resident Proposals** – Moderated by **Dr. Bryant Blank, DVM, MS, DACLAM**  
ETHANOL AS AN ALTERNATIVE FOR HUMANE EUTHANASIA IN *GALLUS*  
*GALLUS DOMESTICUS*

**Nathanial S. Kollias** – Laboratory Animal Medicine Resident

**Pg. 15**

BIOMARKER GUIDED DIAGNOSIS OF SEPTIC PERITONITIS

**Pia Martiny** – Emergency and Critical Care Resident

**Pg. 16**

EVALUATION OF PERCUTANEOUS DILATATION AL TRACHEOSTOMY IN DOGS

**Mariana A. Pardo** – Emergency and Critical Care Resident

**Pg. 17**

EFFECT OF TIBIAL PLATEAU ANGLE ON CRANIAL CRUCIATE LIGAMENT  
STRAIN

**Dominick Valenzano** – Small Animal Surgery Resident

**Pg. 18**

**4:15pm-5:00pm**

**Keynote Address**

PRECISION MEDICINE FOR CANINE BRAIN TUMORS: CAN WE DELIVER?

**Dr. John Rossmeisl, DVM, MS**, Associate Professor, Virginia-Maryland College of  
Veterinary Medicine Department of Small Animal Clinical Sciences

**5:00pm**

**Award Presentations**

**Dr. Lorin Warnick, DVM, PhD**, Austin O. Hooey Dean of Veterinary Medicine

**5:30pm**

**Reception** (Animal Health Diagnostic Center atrium)

## Keynote Speaker



***John H. Rossmeisl, Jr., DVM, MS, Professor of Neurology and Neurosurgery, Virginia-Maryland College of Veterinary Medicine Department of Small Animal Clinical Sciences***

Dr. John H. Rossmeisl Jr. is an associate professor of neurology and neurosurgery in the Department of Small Animal Clinical Sciences in the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech. He received his DVM in 1997 from Auburn University and his M.S. in 2003 from Virginia Tech. He completed an internship in small animal medicine and surgery at Purdue University, and residency programs in small animal internal medicine and neurology before joining the faculty in 2003.

Dr. Rossmeisl's research interests are vascular biology and tumor angiogenesis, primary brain neoplasms, traumatic brain injury, and endocrinology. He is twice board certified by the American College of Veterinary Internal Medicine in Neurology and Small Animal Internal Medicine. In addition, he is a member of several professional organizations including the American Veterinary Medical Association, the American College of Veterinary Internal Medicine, the Virginia Veterinary Medical Association, the American Association of Veterinary Clinicians, and the Society of Phi Zeta.

## Speakers



***Jonathan Cheetham, VetMB, PhD, Associate Professor of Large Animal Surgery, Cornell University Department of Clinical Sciences***

Dr. Cheetham is a 1995 graduate of both St. Catherine's College, Oxford where he received his MA in Medical Sciences, and Cambridge University Veterinary School where he received his VetMB in Veterinary Medicine. Dr. Cheetham was awarded the Ph.D from Cornell in 2008. He is board certified by the American College of Veterinary Surgeons.

His work focuses on restoring function in the larynx, nasopharynx and trachea using tissue engineering, reinnervation and functional electrical stimulation techniques. The lab's research is applied to both human and veterinary patients.



***Bettina Wagner, DVM, Dr. vet. med. Habil., Associate Professor in Immunology, Associate Dean for Research and Graduate Education, Cornell University Department of Population Medicine and Diagnostic Sciences***

Dr. Wagner was awarded her DVM in 1990 and Dr. vet. med. in Veterinary Immunology in 1993 from the School of Veterinary Medicine, Hannover, Germany. She was a visiting professor and Senior Research Associate at the Baker Institute for Animal Health prior to joining the Population Medicine and Diagnostic Sciences faculty in 2006.

Dr. Wagner's laboratory focuses on research in equine immunology. She is particularly interested in immune responses and protective mechanisms in neonates and young foals. Major pathways that are investigated by her group are adaptive T-cell immunity, antibody isotype responses and cytokine regulation. Dr. Wagner has been awarded several international patents and is the Director of the Serology/Immunology section at Cornell's Animal Health Diagnostic Center.



## (Speakers Continued)

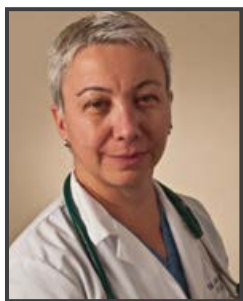


***John Parker, BVMS, Ph.D., Associate Professor of Virology, Baker Institute for Animal Health, Cornell University***

Dr. Parker received his B.V.M.S. from the University of Glasgow, Scotland, in 1983 and his Ph.D. from Cornell in 1999. Post-Doctoral research at the Baker Institute for Animal Health and Harvard Medical School followed before joining the Cornell faculty at Baker Institute for Animal Health in 2003.

Dr. Parker has been an advisor to 19 graduate students, mentored more than 20 undergraduate students, and 9 post-doctoral associates/fellows in his laboratory. Dr. Parker teaches both undergraduates and veterinary curriculum, is the director of both the Cornell Leadership Program for Veterinary Students and the NIH supported institutional research training grant entitled “Graduate Training Program in Comparative Medicine.”

Dr. Parker studies viruses and the ways in which animals respond to viral infection, including reovirus and feline calicivirus, and the results of most of his projects can be broadly applied to benefit the health of animals and humans alike. His work has been supported by the Morris Animal Foundation, the Winn Foundation, The Burroughs Wellcome fund, US–Israel Binational Agricultural Research Development Fund, and the NIH.



***Susan Hackner, BVSc, MRCVS, Chief Medical Officer, Cornell University Veterinary Specialists (CUVS)***

Dr. Hackner completed her veterinary degree in South Africa and immigrated to the US to pursue a residency in Internal Medicine at the University of Pennsylvania School of Veterinary Medicine. She also completed a fellowship there in Emergency & Critical Care. She is board certified in both Internal Medicine (1992) and Emergency & Critical Care (1994). Prior to starting CUVS, she was Chair of the Department of Critical Care & Emergency Medicine at the Animal Medical Center, NY.

Dr. Hackner’s primary area of interest is hematology, thromboembolism and bleeding disorders. She has published more than 15 chapters in major veterinary textbooks and has presented over a hundred lectures in the US and internationally. She has been actively involved in the initiation and development of Emergency-Critical Care as a specialty, establishing standards in the field, and educating and mentoring all levels of trainees.



***Heidi Reesink, VMD, PhD, Assistant Professor of Large Animal Surgery, Cornell University Department of Clinical Sciences***

Dr. Reesink received her VMD from University of Pennsylvania in 2007 and completed a large animal residency at Cornell University in 2012. She received her PhD in Comparative Biomedical Sciences from Cornell in 2016. This same year she accepted the position of Assistant Professor in the Department of Clinical Sciences.

Dr. Reesink’s laboratory aims to unravel basic mechanisms underlying the development of orthopedic disease and to pioneer innovative therapies for the treatment of joint injury and arthritis in equine and human athletes. Her clinical interests include large animal orthopedic surgery, equine sports medicine, lameness and emergency surgery. She is interested in translating novel research discoveries, including regenerative medicine, stem cell therapy, and lubricin therapy, to equine clinical patients with musculoskeletal disease.

## (Speakers Continued)



***Nora L. Springer, DVM, PhD, Post-Doctoral Graduate Fellow,  
Cornell University Department of Biomedical Engineering***

Dr. Springer has been a Post-Doctoral Graduate Fellow in the Fischbach Laboratory in the Department of Biomedical Engineering at Cornell since 2013. She received her DVM in 2008 from Kansas State University. Subsequently, she completed a companion animal medicine and surgery internship at Louisiana State University prior to coming to Cornell in 2009 to partake in a clinical pathology residency. Dr. Springer holds memberships in several professional associations including the Biomedical Engineering Society, the American Society for Investigative Pathology, and diplomate status in the American College of Veterinary Pathologists. Her research explores the link between obesity and cancer with particular focus on the biophysical similarities between the obese and tumor microenvironment. Additionally, Dr. Springer has an avid interest in science communication and outreach and actively participates in a collaborative effort with the Cancer Resource Center of the Finger Lakes to connect cancer researchers and individuals personally affected by cancer.



***Jimmy Tran, BVSc, Diplomate ACVP, Cornell Clinical Fellow,  
Department of Biomedical Sciences, Cornell University***

Dr. Tran completed his veterinary degree at the University of Sydney, Australia, and went on to work as a trainee pathologist at the state veterinary diagnostic laboratory. Pursuing his interest in pathology, he went on to complete the anatomic pathology residency program at Cornell University. After gaining board certification in anatomic pathology, he continued another year at Cornell as the senior resident before moving onto a research focused position as a Cornell Clinical Fellow in the laboratory of Dr. Kristy Richards.

Dr. Tran's research interests include understanding the tumor microenvironment, particularly the interaction between tumor cells and cytotoxic T lymphocytes. In Dr. Richards' lab, he is currently researching the role of the immune-checkpoint pathway PD1 and its role in canine lymphoma. On the clinical side, he also enjoys working with residents and diagnostic pathology.

## Judges



***Craig Altier, DVM, PhD, Professor and Chair,  
Cornell University Department of Population Medicine and Diagnostic Sciences***

Dr. Altier earned his DVM in 1985 from The Ohio State University and PhD in 1996 from Case Western Reserve University. Dr. Altier joined the Cornell faculty in 2006 as Associate Professor in the Bacteriology Laboratory of the Animal Health Diagnostic Center.

He has served on numerous University committees and national panels and is an internationally recognized expert on food safety and bacterial pathogenesis.

Dr. Altier's current research is funded by the USDA and the NIH and seeks to understand the means by which the bacterial pathogen *Salmonella* responds to its environment to express traits necessary for survival and virulence.



***James W. Casey, PhD, Associate Professor of Virology,  
Department of Microbiology and Immunology, Cornell University***

Dr. Casey received the BS degree in Biology from Wayne State University in 1966 and his PhD from the University of Chicago in 1973 studying Biology. Dr. Casey was a postdoctoral fellow at Cal Tech from 1974-1980 where he studied molecular virology in the laboratory of Norman Davidson.

Dr. Casey's research focuses in two lines of investigation. Oncogenesis in wild populations, primarily in fish and marine turtles, an understudied field that has provided new insights into viral agents responsible for this disease. More recently, Dr. Casey has turned his attention to the recent outbreak of viral hemorrhagic septicemia (VHSV) in the Great Lakes, an agent having a major impact on numerous species inhabiting these waters.



***Scott Palmer, VMD, Adjunct Professor,  
Cornell University Department of Population Medicine & Diagnostic Sciences,  
New York State Equine Medical Director***

Dr. Palmer is a renowned veterinarian who, as the New York State Equine Medical Director, oversees the health and safety of horses at all New York State Thoroughbred and Standardbred racetracks. Since graduating from the University of Pennsylvania, School of Veterinary Medicine in 1976, Dr. Palmer has worked as a staff clinician at the New Jersey Equine Clinic, serving as the Hospital Director from 1997 through 2013.

He is a two-time recipient of the New Jersey Equine Practitioners Veterinarian of the Year award, as well as a recipient of the AAEP President's Award in 2009 and the AAEP Distinguished Service Award in 2010. Dr. Palmer is board certified in equine practice by the American Board of Veterinary Practitioners and has authored dozens of peer-reviewed publications and is a featured speaker at veterinary conferences world-wide.



***Heidi Reesink, VMD, PhD, Assistant Professor of Large Animal Surgery  
Cornell University Department of Clinical Sciences***

(see page *xiii* for full bio)

## Moderators



***Bryant Blank, DVM, MS, Dipl. ACLAM***

***Assistant Director, Agriculture Animals***

***Cornell Center for Animal Resources and Education (CARE)***

Dr. Blank is a clinical veterinarian at the Cornell Center for Animal Resources and Education (CARE). He received his DVM from Kansas State University in 2009. He then completed a three-year veterinary residency in laboratory animal medicine at Cornell University. During this period he received his MS in Comparative Biomedical Sciences working on the pathogenesis of *Listeria monocytogenes*.

He currently provides clinical care for a variety of species, manages multiple rodent vivaria, maintains regulatory oversight of large agricultural facilities, and assists in CARE's residency training program and veterinary student rotations. He is involved in multiple research collaborations involving a diversity of species and fields, including reproductive physiology of the Giant Pouched Rat, safety assessment of a synthetic joint lubricant, and welfare parameters associated with trio-breeding of mice.



***Bethany Cummings, DVM, PhD, Assistant Professor,***

***Cornell University Department of Biomedical Sciences***

Dr. Cummings received both her DVM and PhD in physiology from the University of California, Davis in 2011. She was a Project Scientist and Assistant Adjunct Professor at Davis prior to her appointment at Cornell as Assistant Professor in 2013.

Dr. Cummings's lab studies the etiology and treatment of obesity, insulin resistance and type 2 diabetes. Identification of the major mechanisms underlying surgically-induced improvements of glucose metabolism may allow for the development of novel therapies for managing obesity and treating type 2 diabetes. Therefore, we are developing, standardizing and studying animal models of bariatric surgery with the goal of identifying the mechanisms by which bariatric surgery causes diabetes resolution and prevention. We approach this question using both pharmaceutical addition and ablation techniques in a type 2 diabetic rat model and genetic knockout mouse models.



***Kelly Hume, DVM, Assistant Professor of Oncology***

***Cornell University Department of Clinical Sciences and Department of Biomedical Sciences Adjunct Assistant Professor***

Dr. Hume received her DVM, Cum Laude, in 2003 from Auburn University and received her Board Certification in Veterinary Internal Medicine, Specialty of Oncology, in 2008. She completed her three-year residency at North Carolina State University prior to receiving one of the first Cornell Clinical Fellows awards made in 2008.

Dr. Hume's long term goals are to interact with clinician and basic scientists at all levels of cancer biology, recognizing the need to marry the two vital tracks. Mentoring and teaching undergraduate students, graduate students, and oncology residents in both clinical and molecular oncology is one of Dr. Hume's overarching career goals.



## (Moderators Continued)



***Andrew Miller, DVM, Assistant Professor of Anatomic Pathology and the Anne Groot Sesquicentennial Fellow,  
Cornell University Department of Biomedical Sciences***

Dr. Miller has been a Cornell faculty since 2013. He earned his DVM from Cornell and then completed a residency there in veterinary anatomic pathology at in 2008. Afterwards, he was faculty at the New England Primate Research Center, a division of Harvard Medical School, and simultaneously held an appointment in the Pathology Department of the Massachusetts General Hospital. He is a diplomate of the American College of Veterinary Pathologists (ACVP), and is involved nationally in the ACVP through the examination committee and other committees related to the national ACVP meeting.

Dr. Miller's research is focused on studying mechanisms underlying neurologic disease, especially neoplasia, in companion animals focusing primarily on dogs. This is being done through histologic, immunohistochemical, and molecular studies between analogous tumors in dog and man. He maintains numerous collaborations with researchers at Beth Israel Deaconess Medical Center, Boston College, University of Georgia, and University of California, Davis. Dr. Miller has a strong interest in training veterinary students and pathology residents and preparing them for a career in comparative veterinary pathology.





## Vincent E. Baldanza, VMD

[veb23@cornell.edu](mailto:veb23@cornell.edu)

### Institution and Location

University of Pennsylvania, Philadelphia PA

University of Minnesota, St. Paul MN

Cornell University, Ithaca NY

### Degree

VMD

Internship

Residency

### Year

2013

2014

2014-Present

**Current Position:** Resident in Medical Oncology, 3<sup>rd</sup> year

**Abstract Title:** THE ROLE OF CANONICAL HEDGEHOG SIGNALING PATHWAY IN CANINE OSTEOSARCOMA

### **Authors Names:**

Vincent E. Baldanza, Cornell University Department of Clinical Sciences, Ithaca, New York

Corri B. Levine, Cornell University Department of Clinical Sciences, Ithaca, New York

Roy A. Levine, Cornell University Department of Molecular Medicine, Ithaca, New York

Andrew D. Miller, Cornell University Department of Biomedical Sciences, Ithaca, New York

Angela L. McCleary-Wheeler, Cornell University Department of Clinical Sciences, Ithaca, New York

### **Project Mentor:**

Angela L. McCleary-Wheeler, DVM, PhD, Cornell University Department of Clinical Sciences

### **Abstract:**

**Introduction:** Canine osteosarcoma (cOSA), the most common canine primary bone malignancy, has a highly aggressive biologic behavior and is proposed as a spontaneous model for pediatric OSA, with parallels in pathogenesis, disease course, and treatment response. The Hedgehog (Hh) cell-signaling pathway has been shown to play a role in human OSA, however publications investigating this pathway in cOSA are sparse. The objectives of this study were to evaluate the expression of Hh proteins in cOSA tissues and the effect of Hh signaling inhibition in cOSA cell lines.

**Methods:** Immunohistochemistry was used to detect Hh protein expression in archived cOSA tissues. The effect of a commercially available Smo inhibitor, Vismodegib, was studied in three established cOSA cell lines (Abrams, D-17, HMPOS). Cell growth and survival were assessed by metabolic activity (MTS), colony formation, and apoptosis assays. The effect of treatment on Hh target genes was evaluated with qRT-PCR and Western blots.

**Results:** Immunohistochemistry revealed variable expression levels of Hh pathway proteins in examined cOSA tissues. All cOSA cell lines treated with increasing Vismodegib concentrations showed decreased cell proliferation and colony formation following treatment, with only HMPOS cells demonstrating a consistent decrease in Hh target gene mRNA and protein.

**Conclusion:** Canonical Hh signaling appears active in cOSA with expression of Hh pathway proteins present in tumor tissues. While treatment with the Smo inhibitor has a negative impact on cOSA cell growth and viability, the mechanism remains unclear. Further studies are warranted to evaluate the clinical significance of canonical Hh signaling in cOSA.



**Lillie L. Davis, DVM**

[lld26@cornell.edu](mailto:lld26@cornell.edu)

**Institution and Location**

Cornell University, Ithaca NY  
Purdue University, West Lafayette IN  
Cornell University, Ithaca NY

**Degree**

DVM  
Internship  
Residency

**Year**

2014  
2014-2015  
2015-present

**Current Position:** Resident in Medical Oncology, 2<sup>nd</sup> year

**Abstract Title:** A RETROSPECTIVE REVIEW OF DOGS WITH ACUTE MYELOID LEUKEMIA

**Authors Names:**

Lillie L. Davis<sup>1</sup>, Kelly R. Hume<sup>1</sup>, Tracy Stokol<sup>2</sup>

<sup>1</sup>Cornell University Department of Clinical Sciences, Ithaca, New York

<sup>2</sup>Cornell University Department of Population Medicine and Diagnostic Sciences, Ithaca, New York

**Project Mentor:**

Kelly R. Hume, DVM, DACVIM, Department of Clinical Sciences (Mentor)

Tracy Stokol, BVSc, PhD, DACVP, Department of Population Medicine and Diagnostic Sciences (Co-Mentor)

**Abstract:**

**Background:** Canine acute myeloid leukemia (AML) is an uncommon, rapidly progressive neoplasm. The aim of this retrospective study was to characterize historical, physical examination, diagnostic imaging, and clinicopathologic abnormalities in dogs with AML.

**Methods:** Medical records of 36 dogs diagnosed with AML from 2007 to 2016 were reviewed for signalment, history, physical examination findings, diagnostic test results and patient outcome. Diagnosis and classification of AML was based on >20% blasts in blood or bone marrow and supportive phenotyping results using flow cytometry and cytochemical staining.

**Results:** The predominant AML classification was acute monoblastic or monocytic leukemia (52%) with the remaining cases being acute myelomonocytic leukemia (38%), acute megakaryoblastic leukemia (4%), and acute mixed lineage leukemia (3%). The mean age of affected dogs was 7 years with more male (70%) than female (30%) dogs. Most dogs presented with inappetence (66%) and peripheral lymphadenopathy (75%). Internal lymphadenopathy was detected in 53% of dogs with diagnostic imaging. Common hematologic findings were high numbers of blasts (mean, 66,200/uL), non-regenerative anemia (mean hematocrit, 31%) and thrombocytopenia (mean, 89,000/uL). Twenty-six dogs treated with prednisone alone or additional chemotherapeutic agents had a median survival time of 30 days. The remaining 9 dogs were treated symptomatically and were euthanized shortly after diagnosis. Overall survival ranged from 1–121 days (excluding one dog lost to follow-up).

**Conclusion:** Lymphadenopathy, bi- or pancytopenia, and high blast counts were common findings in dogs with AML. Prognosis is poor. Further studies are needed to identify better therapeutic regimens for dogs with AML.



**Terese E. Noe, DVM**

[ten32@cornell.edu](mailto:ten32@cornell.edu)

**Institution and location**

University of Illinois, Urbana, IL  
Cornell University, Ithaca, NY

**Degree**

DVM  
Residency

**Year**

2014  
2014-Present

**Current Position:** Resident in Laboratory Animal Medicine, 3<sup>rd</sup> year

**Abstract Title:** EFFECTS OF *HUS1* IMPAIRMENT ON TISSUE SENSITIVITY TO CISPLATIN

**Authors Names:**

Terese E. Noe, Cornell University, College of Veterinary Medicine, Ithaca, New York  
Cleo Siderides, Cornell University, College of Arts and Sciences, Ithaca, New York  
Tina Abratte, Cornell University, College of Veterinary Medicine, Ithaca, New York  
Kelly Hume, Cornell University, College of Veterinary Medicine, Ithaca, New York

**Project Mentors:**

Kelly Hume, DVM, Department of Clinical Sciences (Co-mentor)  
Erin Daugherty, DVM, MS, DACLAM, Center for Animal Resources and Education (Co-mentor)  
Robert Weiss, PhD, Department of Biomedical Sciences (Co-mentor)

**Abstract:**

Introduction: Cisplatin is a DNA damage-inducing chemotherapeutic. However, its clinical use is limited in human and animal cancer patients by its nephrotoxic properties. The DNA damage response (DDR) factor HUS1 is critical for proper functioning of the ATR checkpoint pathway. ATR acts as a molecular sensor of DNA damage and can induce cell cycle arrest, apoptosis, and/or P53 activation. DDR impairment may be a mechanism of improving chemotherapeutic efficacy. In *Hus1* deficient mice, increased chemosensitivity to other genotoxins was demonstrated in replicative tissues. Additionally, interfering with the ATR pathway was shown to be renoprotective in cisplatin-exposed mice. Therefore, we hypothesized that *Hus1* impairment will increase cisplatin chemosensitivity while reducing renal toxicity.

Methods: An existing mouse model that incrementally decreases *Hus1* by combining a null allele with a hypomorphic allele was used. Wild-type (WT) and *Hus1* hypomorphic FVB mice were administered cisplatin intraperitoneally. Body weights were recorded daily for 7 days. Body weight loss (BWL) was analyzed via mixed model ANOVA. 7-day survival was analyzed using a Kaplan-Meier estimator and Log-rank tests.

Results: *Hus1* hypomorphs had reduced 7-day survival ( $P = .0071$ ) and increased BWL ( $P = .0485$ ) compared to WT mice. Female mice overall had greater BWL than males ( $P = 0.0047$ ).

Discussion: Overall, this data supports the claim that HUS1 impairment increases cisplatin chemosensitivity. This mechanism could potentially impact both human and animal health by improving clinical outcomes for cancer patients. Histologic analysis to determine tissue sensitivity is underway, and studies evaluating non-lethal doses in tumor-bearing mice are planned.



**Antonia R. Domino, DVM**

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**Degree**

DVM

Residency

**Year**

2013

2015-present

**Current Position:** Resident in Ambulatory and Production Medicine, 2<sup>nd</sup> year

**Abstract Title:** RANDOMIZED CLINICAL TRIAL OF TWO CALCIUM SUPPLEMENTS ON EARLY LACTATION HEALTH AND PRODUCTION IN MULTIPAROUS DAIRY COWS

**Authors Names:**

Antonia R. Domino, Jessica McArt, Cornell University Department of Population Medicine and Diagnostic Sciences, Ithaca, New York

**Project Mentor:**

Jessica McArt, DVM, PhD, Department of Population Medicine and Diagnostic Sciences

**Abstract:**

Introduction:

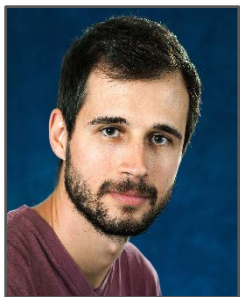
Post-partum hypocalcemia predisposes dairy cattle to ketosis, displaced abomasum, mastitis, metritis and retained placenta. Up to 50% of multiparous cows are subclinically hypocalcemic at the time of calving. Treating or preventing subclinical hypocalcemia could prevent a variety of negative health events in the transition period, and could result in greater milk production.

Objective:

Our aim was to determine the effects of oral (Bovikalc bolus) and parenteral (calcium gluconate 23%) calcium supplementation on blood calcium and health events in post-partum multiparous cows, and to compare the effects of supplementation with no treatment. We enrolled 30 cows, 10 per group, and collected serial blood samples for total calcium analysis from the time of calving until 48 hours post calving.

Preliminary results:

All cows were hypocalcemic at the time of calving. Control and parenteral treatment cows experienced a calcium nadir at 24 hours post-calving. Oral treatment cows did not experience the nadir at 24 hours. All cows had normal calcium by 48 hours post-calving. Cows in both the oral and parenteral treatment groups had significantly higher total calcium than control cows by 8 hours post-calving. Cows receiving parenteral treatment had significantly higher total calcium than cows receiving oral treatment. We are currently enrolling cows (1500 total, 500 per group) to compare the effects of the same treatments on health events and milk production in the first 60 days in milk.



**Vinicius Silva Machado, DVM, PhD**

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**Degree**

DVM

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Residency

**Year**

2009

2015

2015–present

**Current Position:** Resident in Ambulatory and Production Medicine, 2<sup>nd</sup> year

**Abstract Title:** IMPROVING UDDER HEALTH IN DAIRY HEIFERS

**Authors Names:**

Vinicius S. Machado, Rodrigo C. Bicalho, Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York

**Project Mentor:**

Rodrigo C. Bicalho, DVM, PhD, Department of Population Medicine and Diagnostic Sciences

**Abstract:**

Introduction:

Intramammary infusion of antimicrobials (IA) and application of an internal teat sealant (ITS) at the end of the lactation is a common strategy to prevent and treat intramammary infections during the dry period. In heifers, pre-calving IA has been reported to improve udder health and milk quality. However, the effect of ITS in heifers housed in free-stall barns is still unknown. The objective of this study was to investigate the effect of prepartum application of ITS and/or IA on udder health of dairy heifers.

Methods:

A total of 888 heifers were randomly allocated when they were  $250 \pm 3$  days pregnant into one of four treatment groups. Control heifers (CON) did not receive any treatment. Heifers in ITS group received the application of ITS containing bismuth subnitrate. Animals in IA group received intramammary administration of amoxicillin. Heifers in IA+ITS group received intramammary administration of amoxicillin followed by ITS application.

Results:

Preliminary results were obtained from 834 animals. Heifers in IA+ITS group had decreased incidence of clinical mastitis compared to CON heifers (8.2% vs 14.3%;  $P = 0.04$ ), but clinical mastitis incidence was not different between heifers in ITS, IA and CON groups. During the first three months of lactation, IA and IA+ITS heifers had lower somatic cell count compared to ITS and CON counterparts.

Conclusion:

The combination of ITS and IA improved udder health and milk quality by decreasing the incidence of clinical mastitis and the SCC in early lactation. Alone, ITS was not effective in improving udder health.





**Flavia Giacomazzi, MV**

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**Degree**

MV

Residency

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2006

2014-present

**Current Position:** Resident in Cardiology, 3<sup>rd</sup> year

**Abstract Title:** TEMPORAL PATTERNING OF HEART BEAT DISTRIBUTION IN DOGS WITH SINUS NODE DYSFUNCTION

**Authors Names:**

Flavia Giacomazzi, N. Sydney Moïse, Romain Pariaut, Roberto Santilli, Cornell University, College of Veterinary Medicine, Ithaca, New York

**Project Mentor:**

N. Sydney Moïse, DVM, MS, Department of Clinical Sciences (Mentor)

Romain Pariaut, DVM, Department of Clinical Sciences (Co-Mentor)

**Abstract:**

Background: Sick sinus syndrome (sinus node dysfunction) (SSS) is the second most common reason for pacemaker implantation in the dog. Electrocardiograms from affected dogs show multiple arrhythmias of bradycardia, sinus pauses/arrest, and atrial tachyarrhythmias. The sinus node of the dog has a complex structure that is responsible for its ability to initiate and propagate impulses. In the dog 2 to 4 specific conduction pathways have been identified between the sinus node and atrial myocardium. The electrophysiologic mechanisms responsible for SSS in the dog have not been identified.

Hypothesis: The electrophysiologic mechanisms for the failure of sinus impulses to control the cardiac rhythm are multiple and include both exit block and loss of impulse initiation.

Methods: Geometric heart rate variability was assessed using Poincaré plots and tachograms that were constructed from the beat-to-beat intervals retrieved from ambulatory 24-hour ECG recordings. Autonomic tone was assessed using time and frequency domain heart rate variability. Twenty-three affected dogs and 21 age/size matched control dogs were studied.

Results: Arithmetic multiples of beat-to-beat intervals indicating exit block in 11 affected dogs were identified. Modulation of these intervals by autonomic tone was verified. The remaining affected dogs had patterns consistent with loss of impulse initiation. All control dogs had patterns consistent with high parasympathetic tone without abnormal exit block.

Conclusions: At least two mechanisms were identified to explain SSS. These results suggest that the disease process in approximately half of affected dogs may be localized to exit pathways leaving the sinus node complex.



## Daniela Hernandez Muguiro, BVSc

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BVSc  
Externship  
MS  
Residency

### Year

2008  
2011  
2013  
2015-present

**Current Position:** Resident in Clinical Pathology, 2<sup>nd</sup> year

**Abstract Title:** INHIBITING COMPLEMENT ACTIVATION AS THERAPEUTIC TARGET IN CANINE IMMUNE-MEDIATED HEMOLYTIC ANEMIA

### **Authors Names:**

Daniela Hernandez Muguiro<sup>1</sup>, Erica Behling-Kelly<sup>1</sup>, Robert Goggs<sup>2</sup>

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<sup>2</sup>Department of Clinical Sciences, Cornell University, Ithaca, New York

### **Project Mentor:**

Erica Behling-Kelly, DVM, PhD, Department of Population Medicine and Diagnostic Sciences

### **Abstract:**

Introduction: Immune-mediated hemolytic anemia (IMHA) is a common, often fatal disease in dogs. In IMHA, complement fixation enhances extravascular hemolysis and leads to intravascular hemolysis. Complement inhibitors are used in the treatment of diseases characterized by uncontrolled complement-mediated hemolysis in people. Complement inhibition might reduce hemolysis in dogs with IMHA, particularly dogs with high levels of complement activation.

Objectives: Evaluate the ability of two human complement inhibitors to inhibit canine complement-mediated hemolysis *in vitro*. Validate the use of an ELISA for detection of canine complement activation in dogs.

Methods: Human complement inhibitors, C3- inhibitor (Compstatin) and human recombinant C1-esterase Inhibitor (C1-INH) were evaluated using an *in vitro* hemolytic assay. Antibody-coated sheep erythrocytes were exposed to canine complement with and without inhibitors. Dose curves were generated by plotting the percentage of hemolysis against inhibitor concentration. Complement activation in samples from 11 healthy and 13 dogs with IMHA was determined using an ELISA for detection of Terminal Complement Complex C5b-9 (TCC C5b9). The concentration of TCC C5b9 in patient samples was extrapolated from a standard curve generated using the supplied protein standard. Samples treated with snake venom were used as a positive control for complement activation.

Results: C1-INH showed dose-dependent inhibition of canine complement-mediated hemolysis. Compstatin was minimally effective. TCC C5b9 concentrations tended to be higher in control samples compared to dogs with IMHA.

Conclusions: C1-INH inhibited canine complement activation *in vitro*. Compstatin did not inhibit canine complement-mediated hemolysis at the doses evaluated. The ELISA tested did not consistently detect complement activation.



**Dean A. Jeffery, BA, BSc, DVM**

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BA  
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**Year**

2001  
2008  
2013  
2015-Present

**Current Position:** Resident in Laboratory Animal Medicine, 2<sup>nd</sup> year

**Abstract Title:** *IN VIVO* BIOCOMPATIBILITY ASSESSMENT OF A SYNTHETIC ARTICULAR CARTILAGE LUBRICANT (LUBRISYNTH®) FOR DEVELOPMENT AS A CLASS III MEDICAL DEVICE FOR THE TREATMENT OF OSTEOARTHRITIS.

**Authors Names:**

Dean Jeffery<sup>1</sup>, Bryant Blank<sup>1</sup>, Andrew Miller<sup>2</sup>, April Choi<sup>2</sup>, Ursula Krotscheck<sup>3</sup>, David Putnam<sup>4</sup>

<sup>1</sup>Center for Animal Resources and Education, Cornell University, Ithaca, New York

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**Project Mentor:**

Bryant Blank, DVM, MS, DACLAM, Center for Animal Resources & Education at Cornell University.

**Abstract:**

**Introduction**

Osteoarthritis (OA) is a significant contributor to human morbidity and carries a high economic burden. Natural cartilage lubricants like lubricin are efficacious in preventing progression of OA but manufacturing is prohibitively expensive. A synthetic analogue, Lubrisynth®, mimics the structure and function of lubricin and is cost-effective to produce. The purpose of this study is to establish *in vivo* biocompatibility of Lubrisynth® in laboratory animal species in accordance with FDA and International Standard 10993 regulations.

**Methods**

The potential for Lubrisynth® to cause acute ( $\leq 72$  hours), sub-acute (1 – 28 days), and chronic toxicity (12, 26, and 52 weeks) was studied via intramuscular (IM) injection into 8-week old male Sprague Dawley rats (n = 10, 30, and 36 respectively). Necropsy with histological and hematological analysis (CBC, serum biochemistry) was performed. The potential for Lubrisynth® to cause allergic contact dermatitis was measured on 12-week old Dunkin-Hartley guinea pigs (n = 15) using the Guinea Pig Maximization Test and Magnusson and Kligman Scale (MKS), as well as histological analysis.

**Results**

Necropsy and hematological findings suggest that Lubrisynth® does not cause acute, sub-acute, or chronic systemic toxicity in rats. MKS scores indicated that Lubrisynth® does not cause allergic contact dermatitis in guinea pigs. Histological analysis of IM and topical exposure are pending.

**Discussion**

Lack of toxicity of Lubrisynth® in multiple laboratory animal species makes it a prospective treatment for OA. This study suggests that Lubrisynth® is an appropriate candidate to continue advancement through the Class III medical device development process.



**Jo-Annie Letendre, DVM**

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DVM

**Year**

2013

Rotating Internship

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Residency

2014-present

**Current Position:** Resident in Small Animal and Emergency & Critical Care, 3<sup>rd</sup> year

**Abstract Title:** NOVEL BIOMARKERS IN CANINE SEPSIS

**Authors Names:**

Jo-Annie Letendre, Robert Goggs; Department of Clinical Sciences, Cornell University College of Veterinary Medicine, Ithaca, New York

**Project Mentor:**

Robert Goggs, BVSc, PhD, Department of Clinical Sciences

**Abstract:**

Introduction:

Sepsis causes severe illness and death in dogs, but both diagnosis and prognosis can be difficult to establish. We aimed to identify biomarkers that would aid prognostication and improve our understanding of the inflammatory response in septic dogs to provide clinicians with tools to adjust their management strategies and improve outcomes.

Methods:

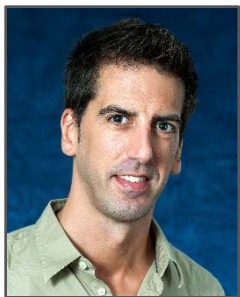
Forty-five dogs with sepsis and 15 healthy controls were enrolled. Illness severity scores were calculated. Cell-free DNA (cfDNA) in citrated plasma was measured using a point-of-care analyzer. Concentrations of plasma nucleosomes and HMGB-1 were analyzed using commercial ELISAs. Plasma cytokine concentrations were measured using a multiplex magnetic bead assay. Concentrations of biomarkers between dogs with sepsis and healthy controls were compared using Mann-Whitney U and Kruskal-Wallis tests. Independent predictors of death were identified using multivariable logistic regression. Alpha was set at 0.05.

Results:

Concentrations of cfDNA, nucleosome, IL-6, -8, KC-like, MCP-1, TNF $\alpha$ , and HMGB-1 were significantly higher in dogs with sepsis compared to controls. cfDNA concentrations were significantly higher in dogs with bacteremia. Concentrations of IL-2, -6, -8, -10, KC-like, and MCP-1 were significantly higher in non-survivors. Non-survivors had significantly higher cfDNA concentrations scaled to neutrophil count than survivors. Multivariate logistic regression suggested MCP-1 was an independent predictor of survival after accounting for illness severity.

Conclusions:

In dogs with sepsis, high cfDNA concentrations relative to neutrophil count are associated with non-survival, and measurement of cfDNA concentrations may be a useful indicator of bacteremia. In dogs with sepsis MCP-1 concentration is independently associated with outcome.



## Aitor Gallastegui, LV, MSc

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### Degree

LV  
MSc  
Residency

### Year

2001  
2011-14  
2014-present

**Current Position:** Resident in Diagnostic Imaging, 3rd year

**Abstract Title:** SENSITIVITY, SPECIFICITY, AND ACCURACY OF MAGNETIC RESONANCE IMAGING FOR THE DETECTION OF VERTEBRAL COLUMN FRACTURES IN DOGS

### **Authors Names:**

Aitor Gallastegui<sup>1</sup>, Emma Davies<sup>1</sup>, Alison L. Zwingenberger<sup>2</sup>, Stephanie Nykamp<sup>3</sup> and Philippa J. Johnson<sup>1</sup>.

<sup>1</sup>Cornell University, College of Veterinary Medicine, Ithaca – New York

<sup>2</sup>UC Davis School of Veterinary Medicine, Davis – California

<sup>3</sup>Ontario Veterinary College, University of Guelph, Guelph - ON, Canada

### **Project Mentor:**

Philippa J. Johnson, BVSc, Department of Clinical Sciences (Mentor)

Emma Davies, BVSc, MSc, Department of Clinical Sciences (Co-mentor)

### **Abstract:**

MRI and CT are commonly used in the evaluation of the spinal trauma patient. CT is considered superior for fracture detection; however, the performance of MRI for vertebral fracture detection has not been described in dogs. Images of dogs from three university veterinary teaching hospitals that underwent concurrent MRI and CT were reviewed by a single observer (PJJ) in separate sessions. Within each visible vertebra, the presence or absence of fracture was determined at: the vertebral body, caudal articular process, cranial articular process, lamina, pedicle, spinous process, and transverse process. Thirty-eight dogs were included in the study. CT confirmed 66 fractures affecting 45 vertebrae in 21 dogs; most frequent location was C3 (5/45). MRI detected 55 fractures affecting 31 vertebrae in 20 dogs. Within each vertebra the sensitivity and specificity of MRI for fracture detection was respectively; 61.5%-91.1% at vertebral body, 66.7%-89.4% at caudal articular process, 80.0%-98.4% at cranial articular process, 60.0%-93.2% at lamina, 60.0%-100.0% at pedicle, 45.5%-93.1% at spinous process, and 26.3%-98.0% at transverse process. Overall MRI had 50.0% sensitivity and 94.7% specificity, with 88.6% accuracy for detection of vertebral column fractures. When only fractures of sites associated with vertebral column stability were evaluated, MRI was 63.9% sensitive, 94.5% specific, and 91.3% accurate. The accuracy of MRI for vertebral fracture detection is variable and strongly affected by the location of the fracture within vertebra. Accuracy is high at detecting fractures associated with vertebral column instability. CT remains the gold standard for evaluation of vertebral fracture however MRI is able to provide valuable information regarding the stability of the vertebral column.





## Amanda R. Heller, DVM

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### Degree

DVM

### Year

2013

	Internship (rotating and specialty)	2013-2015
Cornell University, Ithaca, NY	Residency	2015-present

**Current Position:** Resident in Comparative Ophthalmology, 1<sup>st</sup> year

**Abstract Title:** OPHTHALMIC EXAMINATION FINDINGS AND INTRAOCULAR PRESSURES IN WILD-CAUGHT AFRICAN GIANT POUCHED RATS (*CRICETOMYS* SPP.)

### **Authors Names:**

Amanda R. Heller,<sup>1</sup> Eric C. Ledbetter,<sup>1</sup> Bhupinder Singh,<sup>2</sup> Danielle N. Lee,<sup>3</sup> Alexander G. Ophir<sup>3</sup>

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<sup>3</sup>Department of Psychology, Cornell University, Ithaca, New York

### **Project Mentor:**

Eric C. Ledbetter, DVM, DACVO, Associate Professor of Ophthalmology, Department of Clinical Sciences

### **Abstract:**

#### Purpose:

To describe ophthalmic examination findings and intraocular pressures (IOPs) in wild-caught African giant pouched rats (*Cricetomys ansorgei* and *gambianus*) from Tanzania and Ghana. Giant pouched rats are of interest as pets and are trained to detect land mines and tuberculosis by olfaction. There are no previously published reports pertaining to ophthalmic disease in giant pouched rats.

#### Methods:

After being placed under general anesthesia for examination, slit-lamp biomicroscopy before and after pharmacologic mydriasis and indirect ophthalmoscopy were performed. Eyes were fluorescein stained and IOPs measured by rebound tonometry using the TonoVet®.

#### Results:

Twenty-six sexually-mature pouched rats (52 eyes) were examined, including 13 males and 13 females. The mean IOP ( $\pm$  standard deviation) was 7.0 ( $\pm$  2.6) mmHg. Fluorescein staining was negative in all eyes. One or more ocular abnormalities were detected in 17 rats (21 eyes). These ocular lesions included: palpebral margin defect with focal trichiasis (n=2 eyes), phthisis bulbi (n=1), corneal vascularization (n=2), persistent pupillary membranes (n=5), posterior synechiae (n=1), lens opacities (n=16), and multifocal chorioretinal scarring (n=2). Lens opacities included punctate pigment on anterior lens capsule (n=3 eyes), incipient anterior cortical opacities (n=5), incipient suture tip opacities (n=2), incipient nuclear opacities (n=3), immature cataract (n=2), and hypermature cataract (n=1).

#### Conclusions:

Ocular abnormalities were common in the evaluated population of giant pouched rats; however, most of the detected lesions were mild and believed to have minimal impact on vision. Rebound tonometry with the TonoVet® was a reliable and simple technique to measure IOPs in the anesthetized rats.



**Danielle K. Tarbert, DVM**

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DVM  
Internship  
Internship  
Residency

**Year**

2012  
2012-2013  
2013-2014  
2014-present

**Current Position:** Resident in Zoological Medicine, 3<sup>rd</sup> year

**Abstract Title:** CHARACTERIZATION OF BALL PYTHON NIDOVIRUS IN A MIXED SPECIES SNAKE COLLECTION

**Authors Names:**

Danielle K. Tarbert, Rebecca Eddy, Ricardo de Matos, James Morrissey, Edward J. Dubovi, Melissa Laverick, Randall Renshaw, Joseph Malatos, Briec Cossic, Cornell College of Veterinary Medicine, Ithaca, New York  
Robert J. Ossiboff, University of Illinois at Urbana–Champaign, Illinois

**Project Mentor:**

Robert J. Ossiboff, Veterinary Diagnostic Laboratory (Mentor)  
Ricardo de Matos, Department of Clinical Sciences (Co-mentor)

**Abstract:**

*Introduction:*

This descriptive study characterizes the clinical signs and prevalence of ball python nidovirus (BPNV) in a mixed species snake collection.

*Methods:*

All available histories, examination findings, and necropsy results were reviewed for snakes in the collection that had died within the previous seven years. The remaining 425 snakes in the collection were evaluated for clinical signs associated with the virus. A swab of the oral cavity and trachea was obtained from each snake and analyzed using a polymerase chain reaction (PCR) designed for detection of BPNV. Archived antemortem oral swabs from deceased snakes were also assessed using PCR.

*Results:*

Preliminary PCR results showed a low point prevalence in the collection (1.2%). Clinical signs assessed were not specific for positive PCR results; however, all positive snakes had at least one of the signs and 60% had oral mucus or ptialism. All snakes that were PCR positive for BPNV and had oral mucus or ptialism died within three months of testing. Archived samples from ball pythons (*Python regius*) and Angolan pythons (*P. anchietae*) were positive for BPNV.

*Discussion:*

Results indicate BPNV can infect Angolan pythons in addition to ball pythons. While not specific, oral mucus or ptialism may indicate shedding of BPNV. This research provides new insight into species susceptibility to BPNV and describes clinical signs and progression of BPNV in detail for the first time.



**Blake M. Travis, DVM**

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DVM  
Rotating Internship  
Surgical Internship  
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**Year**

2013  
2014  
2015  
2015–present

**Current Position:** Resident in Small Animal Surgery, 2<sup>nd</sup> year

**Abstract Title:** EVALUATION OF TACKING SUBCUTANEOUS TISSUES DURING MIDLINE LAPAROTOMY CLOSURE: A RANDOMIZED CONTROLLED TRIAL

**Authors Names:**

Blake M. Travis, Galina M. Hayes, Cornell University, College of Veterinary Medicine, Ithaca, New York

**Project Mentor:**

Galina M. Hayes, PhD, DACVECC, DACVS, Department of Clinical Sciences

**Abstract:**

Objective:

To determine whether tacking of the subcutaneous tissues to the deep fascia during surgical closure of midline laparotomy incisions in dogs reduces the incidence of post-operative complications.

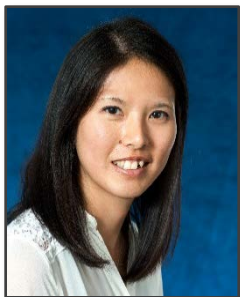
Study design: Single center, randomized blinded controlled trial conducted in a veterinary teaching hospital.

Animals: 432 dogs undergoing midline laparotomy either as part of a spay/neuter student teaching program (n=249) or for a variety of abdominal procedures via the small animal soft tissue surgical service (n=183).

Methods: Dogs were randomly assigned to tacking of the subcutaneous tissues to the deep fascia in combination with routine apposition during laparotomy closure, or to routine apposition alone. Randomization was stratified on admitting service. The primary outcomes were the pain score and incisional appearance assessed the day after surgery, and the incidence of seroma, surgical site infection (SSI) and mortality at 30 days post-operatively.

Results: In the intention to treat analysis, there were no significant between group differences in population characteristics including illness severity and surgical procedure performed. There were no significant between group differences in surgeon experience, surgical time, intra-operative complications, or methods of surgical closure other than the intervention under study. Pain score assessed 24 hours post-operatively was lower in the tacked group (p=0.03). Incidence of seroma formation was lower in the tacked group (OR=0.30, 95% CI=0.13-0.67, p=0.004). There were no differences in incisional appearance, SSI or mortality incidence.

Conclusions: Tacking of subcutaneous tissues to the deep fascia is indicated during laparotomy closure to reduce post-operative pain and seroma formation.



## Joy Tseng, DVM

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### Degree

DVM  
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2014  
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**Current Position:** Resident in Anesthesiology, 2<sup>nd</sup> year

**Abstract Title:** PARTIAL NEUROMUSCULAR BLOCK (NMB) IMPAIRS LARYNGEAL ABDUCTION DURING HYPERCARBIC CHALLENGE IN ANESTHETIZED DOGS

### **Authors Names:**

Chia (Joy) Tseng<sup>1</sup>, Daniel M. Sakai<sup>1</sup>, Madeline Libin<sup>2</sup>, Monika Mostowy<sup>1</sup>, Luis Campoy<sup>1</sup>, Jonathan Cheetham<sup>1</sup>, Robin D. Gleed<sup>1</sup>, Manuel Martin-Flores<sup>1</sup>

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### **Project Mentor:**

Manuel Martin-Flores, MV, Department of Clinical Sciences

### **Abstract:**

#### Introduction

Residual neuromuscular block (NMB) is associated with a higher incidence of respiratory complications post-operatively. The ability to abduct the larynx may be important in maintaining upper airway patency especially during respiratory challenges, but the effect of residual NMB on laryngeal opening is unknown. We studied how residual NMB affects the ability to increase laryngeal abduction in response to a hypercarbic challenge in anesthetized dogs.

#### Methods

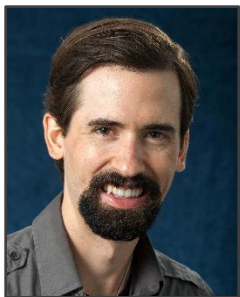
Eleven healthy adult beagles were anesthetized with propofol and dexmedetomidine infusions; the dogs breathed oxygen spontaneously. A laryngeal mask airway was inserted and videolaryngoscopy was used to visualize and measure the normalized glottal gap area (NGGA). Atracurium was infused to obtain two targeted levels of partial NMB, measured with acceleromyography. The maximal inspiratory NGGA in response to 1-minute administration of 10% CO<sub>2</sub> was measured at baseline (no NMB), at train-of-four (TOF) ratio 0.4-0.6, at TOF ratio 0.7-0.9, and 30 minutes after TOF ratio  $\geq 0.9$ . Values were compared using ANOVA for repeated measures and Tukey's post-hoc tests.

#### Results

Maximal inspiratory NGGA decreased by 17 %  $\pm$  11 and 18 %  $\pm$  10 at TOF ratios 0.4-0.6 and 0.7-0.9, respectively ( $p = 0.0004$ ). Thirty minutes after TOF ratio  $\geq 0.9$ , NGGA was indistinguishable from baseline.

#### Conclusions

Mild NMB impaired the ability to increase laryngeal abduction in response to a hypercarbic challenge, even at TOF ratio values that are typically considered adequate return of neuromuscular function (TOF ratio 0.7-0.9). Conventional neuromuscular function monitor at a limb may be insufficient at predicting laryngeal recovery in dogs.



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**Abstract Title:** ETHANOL AS AN ALTERNATIVE FOR HUMANE EUTHANASIA IN *GALLUS GALLUS DOMESTICUS*

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**Proposal Abstract:**

Introduction:

Inhalant CO<sub>2</sub> and injectable pentobarbital are currently accepted standards for euthanasia for avian species in field and research settings. However; barbiturates are controlled substances and thus challenging to use in field research settings. Additionally, there is limited literature on the use of CO<sub>2</sub> in avian species and flow rates are extrapolated from mammalian studies. Ethanol is a potential alternative euthanasia agent. It is accessible and non-controlled. Further, a recent study demonstrated the effectiveness of intraperitoneal ethanol as a euthanasia agent in mice. Finally, pilot study data in zebra finches (*Taeniopygia guttata*) provided preliminary evidence that IPc (intracoelomic) ethanol is a humane and practical form of euthanasia in avian species.

Objective:

To evaluate if IPc ethanol is an efficacious and practical method of euthanasia in *G. gallus domesticus*, as compared to IPc pentobarbital. Chickens were chosen because their body size allows telemetry implantation to monitor time to cardiac arrest. We hypothesize that ethanol will be equivalent or superior to pentobarbital as an efficacious means of euthanasia in chickens. The information obtained in this study has the potential to significantly impact euthanasia methods in avian species both in research and client owned animals.

Study Design:

Adult chickens will be videotaped and placed into four groups: IPc injection of ethanol 80%, ethanol 100%, saline, or pentobarbital. Telemetric readings will include base line vitals and time to death. Each bird will be allowed a five minute acclimation period prior to IPc injection. Post mortem analysis will consist of hematological markers and histopathology.





## **Pia Martiny, DVM**

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**Abstract Title:** BIOMARKER GUIDED DIAGNOSIS OF SEPTIC PERITONITIS

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### **Project Mentors:**

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### **Proposal Abstract:**

#### **Background**

Septic peritonitis is common in dogs and is associated with a high mortality rate (30-68%). Early recognition and aggressive management is essential to maximizing survival. Diagnosis can be challenging and hence identification of biomarkers for the diagnosis of septic peritonitis would improve our management of these patients. We have documented increased plasma cell-free DNA (cfDNA) concentrations in dogs with sepsis or with bacteremia. We propose to evaluate the diagnostic utility of this and other biomarkers for the differentiation of septic from non-septic effusions.

#### **Hypothesis**

Dogs with septic effusions have increased effusion concentrations of cfDNA, nucleosomes and inflammatory cytokines compared with dogs with non-septic effusions.

#### **Scientific Design**

In a prospective observational study, dogs with evidence of systemic inflammation and abdominal effusion will be enrolled, and 18 dogs with septic peritonitis and 18 controls with non-septic effusions analyzed. Measurement of biomarkers including lactate, electrolytes, glucose, cfDNA, nucleosomes, acute phase reactants, chemokines and cytokines will be performed to assess their diagnostic utility. Using univariate statistical analysis, differences between blood and fluid concentrations within individuals and in effusion concentrations between septic and non-septic effusions will be evaluated for their discriminant ability. Multivariate logistic regression will then be used to identify independent predictors of septic peritonitis.

#### **Expected Outcomes**

We anticipate that effusion concentrations of cfDNA, nucleosomes and inflammatory cytokines will be significantly higher in septic compared to non-septic effusions. Identification of biomarkers that differ significantly between septic and non-septic effusions will enhance our ability to identify septic peritonitis in a timely fashion.



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**Abstract Title:** EVALUATION OF PERCUTANEOUS DILATATIONAL TRACHEOSTOMY IN DOGS

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**Project Mentor:**

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**Proposal Abstract:**

Background/Rationale:

Percutaneous dilatational tracheostomy (PDT) has become standard of care for tracheostomy tube placement in people and offers advantages over conventional surgical placement (ST) including reduced procedure time and fewer complications. However, to date there are no reports of PDT in dogs.

Scientific Design:

We will assess the ability of preclinical veterinary students with no prior experience of PDT or ST to learn the procedures. They will be trained using videos, manikin training and instructor feedback. We will evaluate the accuracy and speed of tracheostomy tube placement by PDT and by ST in cadavers for true-to-life simulation. Following tube placement, we will assess complications of each tracheostomy tube placement method by explanting the trachea for evaluation. We will compare the learning rate, time to placement, and scores of ease of placement, complications and anatomical injury for PDT and ST using paired t-tests or Wilcoxon matched-pairs signed rank tests.

Hypothesis & Expected Outcomes:

We hypothesize that compared to ST...

- PDT can be learned more quickly
- PDT is faster to perform
- PDT causes fewer complications

We anticipate that this study will determine the feasibility, teachability and complication rates of PDT in dogs, compared to standard ST. This study will provide the foundation for future clinical trials evaluating this potentially life-saving procedure in dogs requiring airway management.



## **Dominick Valenzano, DVM**

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**Abstract Title:** EFFECT OF TIBIAL PLATEAU ANGLE ON CRANIAL CRUCIATE LIGAMENT STRAIN

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### **Project Mentors:**

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### **Proposal Abstract:**

#### **Background:**

Rupture of the cranial cruciate ligament (CCL) is the most common cause of hindlimb lameness and stifle osteoarthritis in dogs. The disease is often treated with a surgical procedure known as the tibial plateau leveling osteotomy (TPLO). Despite surgical intervention significant osteoarthritis (OA) progresses in 100% of patients. It has been shown that dogs with early partial CCL ruptures at the time of TPLO surgery have minimal OA progression and stable CCLs long-term. Replacing a ruptured CCL with an intra-articular (IA) graft, as done in humans, consistently fails in the early post-operative phase. It is possible that by performing a TPLO at the same time as an IA graft, the load on the graft itself can be decreased, resulting in outcomes similar to early partial CCL tears.

#### **Scientific Design:**

Canine hindlimbs will be dissected according to Haynes et al 2015. The femur and tibia will be potted in casting material and fixed to a servohydraulic materials testing machine. The TPLO cut will be performed and a custom rotational jig affixed. A microminiature differential variance reluctance transducer and strain gauge will be secured to the CCL. Strain gauge data will be acquired at 200N of compression while adjusting the tibial plateau angle (TPA) in increments of -5° to a final TPA of 0°.

#### **Objectives:**

Our goals are 1) to measure CCL strain at decreasing TPAs during stifle loading on a materials testing system, and 2) to determine the minimum amount of CCL strain achievable within the confines of a TPLO.

## NOTES