

18TH ANNUAL RESEARCH DAY  
**SCIENTIFIC PROCEEDINGS**

JAN. 28, 2017 | LORY STUDENT CENTER



COLLEGE OF VETERINARY MEDICINE  
AND BIOMEDICAL SCIENCES  
COLORADO STATE UNIVERSITY

OUR 18TH ANNUAL RESEARCH DAY SHOWCASES THE work of more than 150 aspiring scientists in Colorado State University's College of Veterinary Medicine and Biomedical Sciences. The day gives our rising stars vital experience presenting their research findings to a scientific audience through poster displays and talks. The day also provides young researchers with an avenue for feedback to help them develop ideas that, in many cases, will become lifelong scientific pursuits. In a sign of significance, the research projects on display are sponsored by two dozen well-respected companies, foundations, and institutions concerned with improving human, animal, and environmental well-being. Thank you for supporting and engaging with our presenters – undergraduate students, graduate students, veterinary residents, and post-doctoral fellows – as they pursue research that will help animals, people, and the planet!

#### 2017 CVMBS Research Day Organizing Committee

**Claudia Wiese** – Faculty Chair –  
Environmental and Radiological  
Health Sciences

**Kelly Santangelo** – Faculty Co-Chair  
– Microbiology, Immunology, and  
Pathology

**Ashley Turnidge** – Biomedical Sciences

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**Hailey Conover** – Environmental and  
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**Mike Mangalea** – Microbiology,  
Immunology, and Pathology

**Danielle Adney** – Microbiology,  
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**Aimee Oke** – Committee Coordinator –  
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**Gilbert John** – Committee Ex Officio  
Member – CVMBS Dean's Office

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**ON THE COVER:** Colorado State University doctoral student Nunya Chotiwan, with faculty mentor Rushika Perera, is among more than 150 undergraduate students, graduate students, veterinary residents, and post-doctoral fellows participating in the 2017 Research Day. The day gives trainees in the College of Veterinary Medicine and Biomedical Sciences a showcase for their research efforts and finding.

## SCHEDULE OF EVENTS

11 a.m.-NOON	Poster set up	North Ballroom
NOON	OPENING REMARKS – Dr. Mark Stetter, Dean	LSC 382
12:10 p.m.	ZOETIS RESEARCH EXCELLENCE AWARD WINNER – Dr. Jessica Quimby	LSC 382
12:45 p.m.	BREAK	
1-5 p.m.	ORAL SESSION 1: Clinical Science	LSC 374
1-5 p.m.	ORAL SESSION 2: Clinical/Basic Science	LSC 376
1-5 p.m.	ORAL SESSION 3: Basic Science	LSC 378
1-2:45 p.m.	POSTER SESSION I JUDGING: Odd-Numbered Posters	North Ballroom
3-5 p.m.	POSTER SESSION II JUDGING: Even-Numbered Posters	North Ballroom
5-6 p.m.	SOCIAL HOUR	Cherokee Park
6 p.m.	AWARDS	Cherokee Park

### DEPARTMENTAL ABBREVIATIONS

BMS:	Biomedical Sciences
CS:	Clinical Sciences
ERHS:	Environmental and Radiological Health Sciences
MIP:	Microbiology, Immunology, and Pathology

## CONGRATULATIONS AGAIN TO 2016 CVMBS RESEARCH DAY WINNERS!

### ORAL PRESENTATIONS

First Basic	Luke Schwerdtfeger, undergraduate student, BMS, “Intestinal – Microbial Interactions in an Ex Vivo Slice Model.” Mentor: Stu Tobet.
Second Basic	Mihnea (Mike) Mangalea, graduate student, MIP, “Breaking biofilms: nitrate inhibits biofilm formation in <i>Burkholderia pseudomallei</i> .” Mentor: Brad Borlee.
First Clinical	Laura Martin, graduate student, CS, “The impact of local weather on European badger ( <i>Meles meles</i> ) capture success: implications for bovine tuberculosis management.” Mentor: Francisco Olea-Popelka.
Second Clinical	Stacey Hunvald, DVM student, CS, “Novel immunotherapy utilizing cancer stem cell targeted vaccine for improved immune system control of cancer.” Mentor: Amanda Guth.

### POSTER PRESENTATIONS

First	Aimee Ortega, graduate student, MIP, “Detection of Prions on Plants Collected from Rocky Mountain National Park.” Mentor: Mark Zabel.
Second	Katherine Dirsmith, DVM student, “Low pathogenicity avian influenza virus maternal antibody transfer among captive mallards ( <i>Anas platyrhynchos</i> ).” Mentor: Susan Shriner.
Third	Jonathan LeCureux, graduate student, MIP, “Increased mucosal immunogenicity of <i>L. acidophilus</i> expressing HIV MPER and utilizing adjuvants IL-1 $\beta$ or FliC.” Mentor: Gregg Dean.
Golden Pipet Award	Department of Microbiology, Immunology, and Pathology

## DR. JESSICA QUIMBY: A SUCCESSFUL RESEARCH CAREER REQUIRES PATIENCE, PASSION, AND A PAWS-ON APPROACH

By Kristen Browning-Blas



Dr. Jessica Quimby discusses Sophie's chronic kidney disease with first-year internal medicine resident Dr. Kelly Benson at the James L. Voss Veterinary Teaching Hospital. (Photo by John Eisele/CSU Photography)

**DR. JESSICA QUIMBY'S WORK** at Colorado State University requires great patience. Not just because she studies the notoriously finicky feline, but because she has spent the past decade building a body of research into a little-examined area of veterinary medicine – analyzing therapies for sick cats.

“There’s not a lot of time and energy put into thinking about therapies specifically for cats. We have information about how to use medications in humans and in dogs, but there’s

almost never information on felines,” Quimby said. “So typically when we start with a drug, we have to start at the very beginning, and learn how to use it in healthy cats before we can understand how to use it in sick cats.”

As leader of the chronic kidney disease program within CSU’s Center for Companion Animal Studies, Quimby investigates the pathology of aging kidneys and whether mesenchymal stem cells and appetite stimulants can help cats with

kidney disease feel better and live longer. She is also researching the role of telomeres and senescence in the pathogenesis of chronic kidney disease in cats.

Growing up on a farm in Wisconsin, Quimby gained an affinity for the barn cats who often suffered from a variety of ailments. After earning her Doctor of Veterinary Medicine at the University of Wisconsin-Madison in 2003, Quimby came to CSU in 2006 for a residency at the James L. Voss Veterinary Teaching Hospital. She became a diplomate of the American College of Veterinary Internal Medicine in 2009, and earned her Ph.D. in Clinical Sciences from CSU in 2012.

“I came to CSU so I could have the power to do studies and learn new things. I always had the goal of working with cats, especially elderly cats, and complicated cat diseases,” Quimby said.

She is currently conducting a sixth clinical trial in a 10-year project to study the appetite stimulant mirtazapine’s effectiveness for cats. “It has taken us all this time to learn how best to use the drug in cats, and it is probably one of the most comprehensive bodies of work on how to use a medication in cats,” she said. “We had to start out learning how normal cats process the oral drug, so that was study number one. Study number two was actually proving that it increased appetite in cats. Then, we wanted to study what

happened if you were an elderly cat or a cat with kidney disease.”

Once she understood oral mirtazapine’s effect on cats, Quimby and her team began the transdermal trials to prove that it increased appetite in normal cats. Now, they are finally testing the gel on cats with kidney disease. “We’re very excited about this clinical trial because it takes us to that next thing, which is using the transdermal gel in cats with kidney disease. It’s a very long process.”

And it’s just one medication. “You would actually have to test every single medication to know if it works in the transdermal gel or not,” Quimby said. “We’ve done it for one drug. We did it for a second drug, ondansetron, and discovered that it doesn’t work at all. It proves that even when you think the drug would be absorbed through the gel, it’s not necessarily an absolute thing, so it’s important to have the evidence. We try to be evidence-based when we’re prescribing medications, so it helps to actually have proof that it helps the patient.”

Having a variety of research sustains Quimby’s interest and patience over the long course of designing clinical trials, compiling data and publishing results. As assistant professor in the Department of Clinical Sciences, and a faculty member in Small Animal Internal Medicine, Quimby has a chance to interact with colleagues, students and clients at the Veterinary Teaching Hospital.

She is mentoring first-year internal medicine resident Dr. Kelly Benson, a CSU D.V.M. graduate who recently returned to her alma mater to conduct research with Quimby. “She is such a great mentor. I feel really lucky that I can learn from her directly because she has so much real-world knowledge about veterinary medicine. She has taught me a lot about pharmacology, research design and presentation. I have learned from her how to be a veterinary scientist.”

Fellow scientist Dr. Craig Webb, head of the hospital’s Small Animal Internal Medicine Service, has collaborated with Quimby on numerous projects and clinical service: “Dr. Quimby is a rare and great combination of brilliance and humor, supported by a tremendous effort toward a deep intellectual understanding of the field and her patients, yet tempered by simple common sense.”

### 2017 ZOETIS RESEARCH EXCELLENCE AWARD

Dr. Jessica Quimby is recipient of the 2017 Zoetis Research Excellence Award and will kick off Research Day with a keynote address about her research starting at noon. She will receive a plaque and \$1,000 honorarium. Global animal health company Zoetis sponsors Research Day and the Research Excellence Award.

## SESSION 1: Clinical Science

1-5 p.m. | LSC 374

Time	Presenter	Topic	Dept.
1:00	Bacigalpo-Sanguesa	Associations between time lost to disease in dairy cattle in two consecutive lactations	CS
1:15	Bartner	Assessment of safety, toxicity, and pharmacokinetics of cannabidiol in healthy dogs.	CS
1:30	Emerson	Prevalence and characteristics of radiographically confirmed juvenile tarsal osteochondrosis in purebred Angus bulls.	ERHS
1:45	Estep	Serum GFAP levels as a predictor of prion related neurodegeneration.	MIP
2:00	Gan	A comparison of smoke estimation methods and their association with wildfire smoke and cardiopulmonary-related hospital visits during the 2012 Washington wildfires.	ERHS
2:15	Gluck	Reassessment of feline GFR parameters for classifying renal disease	CS
2:30	Gompo	Comparing the effectiveness of bovine tuberculosis surveillance among cattle slaughtered in Irish abattoirs during 2008.	CS
2:45	BREAK		
3:00	Huebner	Effects of feeding Tylosin on liver abscess rate and fecal <i>Salmonella</i> presence in finishing beef steers.	CS
3:15	Jeon	Evaluation of physiologic and behavioral parameters in anesthetized, intubated, and ventilated southern white rhinoceros ( <i>Ceratotherium simum</i> ) in a zoological park setting	CS
3:30	Krafsur	Lessons learned from a century of heartache in the beef cattle industry: beef cattle with broken hearts as a natural large animal model of pulmonary hypertension with left ventricular dysfunction owing to intense feeding and fattening regimens augmenting pulmonary hypertension, pulmonary venous and cardiac remodeling	MIP
3:45	Li	Non-targeted serum metabolic profiling of children with elevated cholesterol following dietary intervention: a randomized controlled trial	ERHS
4:00	Manchester	The impact of oral tylosin on the fecal microbiota of healthy dogs	CS
4:15	Martin	Tuberculosis surveillance of African elephants ( <i>Loxodonta africana</i> ) under human management in the Kavango-Zambezi Transfrontier Conservation Area	CS
4:30	McKeen	Tolerability and feasibility of dietary rice bran supplementation for diarrheal disease prevention and growth promotion of weaning infants in Mali, West Africa.	ERHS
4:45	Monck	Biomechanical comparison of LCP fixation to a novel pedicle screw external fixation for mandibular fracture repair	CS

## SESSION 2: Clinical/Basic Science

1-5 p.m. | LSC 376

Time	Presenter	Topic	Dept.
1:00	Morrissey	Pathogenicity of <i>Escherichia coli</i> isolated from the equine uterus	CS
1:15	Prell	Combination of antibiotic and non-antibiotic against <i>Pseudomonas aeruginosa</i> biofilm in vitro	CS
1:30	Santistevan	Accuracy of using anatomic landmarks and fiducial arrays for patient registration in neuronavigation-guided brain biopsy in the horse	CS
1:45	Sato	Impact of immune suppression on dogs with treated select vector born disease agents	CS
2:00	Shields	Evaluation of two magnetic resonance imaging protocols versus ultrasound for the diagnosis of shoulder injuries in dogs	ERHS
2:15	Simpson	Comparison of antimicrobial effects of common wound care dressings	CS
2:30	Ullal	Demographics and histological changes in a cohort group of dogs with abnormal hepatic copper concentrations	CS
2:45	BREAK		
3:00	Weinroth	Comparing traditional detection methods of antimicrobial resistance to next generation sequencing using a clinical feedlot cattle trial	CS
3:15	Wolf-Ring-wall	Development of a histopathologic and flow cytometric subclassification system in canine B-cell lymphoma	CS
3:30	Bargsten	Degradation of a toxic RNA involved in type I myotonic dystrophy	MIP
3:45	Bender	Crossing the blood brain barrier: siRNA treatment for prion diseases	MIP
4:00	Bunnag	Plasma concentrations and behavioral, physiologic and antinociceptive effects of sustained-release buprenorphine in dogs	CS
4:15	Charley	A core region of the 3' UTR of the N mRNA from Rift Valley fever virus stalls and represses the cellular XRN1 exonuclease	MIP
4:30	Chotiwan	Rapid and specific detection of Asian-lineage Zika virus	MIP
4:45	Davenport	Expression level of the normal prion protein does not dictate accumulation of the pathogenic prion	MIP

## SESSION 3: Basic Science

1-5 p.m. | LSC 378

Time	Presenter	Topic	Dept.
1:00	Eddy	Characterization of isolated ovarian canine primordial follicles	BMS
1:15	Gilliland	Antimicrobial resistant <i>Escherichia coli</i> in environmental waters in northern Colorado	ERHS
1:30	Gullberg	Discovery of metabolic signatures to differentiate dengue, chikungunya and Zika virus infections and dengue disease severity	MIP
1:45	Holder	One health approach for global surveillance of antimicrobial resistant bacteria	ERHS
2:00	Kane	The cellular prion protein is a master regulator of the adaptive immune system, which potentially explains infectious prion lymphotropism	MIP
2:15	Knappek	Maternal infection with bovine viral disease virus leads to impaired thymic gene expression in the fetus	BMS
2:30	Lakin	MEGARes: an accessible database and bioinformatics interface to metagenomic microbiome and resistome analysis	CS
2:45	BREAK		
3:00	Mitchell	Evaluation of the oral microbiome in greyhounds with periodontal disease	CS
3:15	Rückert	<i>Aedes aegypti</i> may simultaneously transmit chikungunya, dengue, and Zika viruses	MIP
3:30	Schwerdtfeger	Mucus v microbiota: intestinal infection ex vivo	BMS
3:45	Shields	Synaptotagmin 2 mutation results in a presynaptic congenital myasthenic syndrome	BMS
4:00	Sondgerath	Temporal and geographic distribution of weather conditions favorable to airborne spread of foot-and-mouth disease in the continental United States	ERHS
4:15	West	How oncogenes regulate placental development: the role of the LIN28-let-7-HMGA2 axis in trophoblast cell proliferation	BMS
4:30	Zaheer	Adaptation of a simulation model for Foot-and-Mouth Disease virus (FMDv) spread in endemic countries	CS
4:45	Mangalea	Nitrate sensing is linked to biofilm inhibition in the saprophytic bacterium <i>Burkholderia pseudomallei</i>	MIP

## POSTER PRESENTATIONS

SESSION 1 | ODD-NUMBERED POSTERS | 1-2:45 p.m.

SESSION 2 | EVEN-NUMBERED POSTERS | 3-5 p.m.

**NOTE:** The presenters listed below may be found in the Lory Student Center North Ballroom according to their assigned poster numbers.

No.	Presenter	Topic	Dept.
1	Alyami	Different factors contribute to increase expression of IGF2BP1 in human and canine osteosarcoma	CS
2	Arab	Evaluation of STAT3 siRNA-tagged gold nanoparticles as a host-directed therapy for <i>Mycobacterium tuberculosis</i> .	MIP
3	Batterton	A retrospective study on the treatment of collateral ligament desmitis of the distal interphalangeal joint	CS
4	Benka-Coker	Pesticide exposures in an agricultural community and pediatric asthma morbidity	ERHS
5	Benson	Limited sampling strategy to determine mirtazapine pharmacokinetics in cats with liver disease and age-matched controls	CS
6	Bickett	Innate immunity induced by BCG	MIP
7	Boron-Brenner	Separation of fast neutron activated titanium using extraction chromatography for post-detonation nuclear forensics application	ERHS
8	Borresen	Comparative food metabolome analysis of three dietary interventions used to treat malnutrition and environmental enteric dysfunction in Malawian children	ERHS
9	Bowers	Membrane insertion by both C2 domains of the calcium sensor, synaptotagmin, are critical for neurotransmitter release	BMS
10	Boyarko	Impact of chorionic somatomammotropin deficiency on placental nutrient transporters	BMS
11	Brady	Ability of ORF49 to disrupt Ov2/RTA modulation of viral gene expression of Ovine Herpesvirus-2	Other
12	Brickner	Effect of chronic NSAID administration on ovulation rates in mares	CS
13	Byer	Measurement of N-acetyl- $\beta$ -D glucosaminidase in equine urine and correlation to renal histology findings	CS
14	Cabral	Improving adjunctive treatment of drug resistant diabetic foot infections	MIP
15	Chow	Mechanisms of immune suppression utilized by canine adipose and bone marrow-derived mesenchymal stem cells	CS

No.	Presenter	Topic	Dept.
16	Contreras	Effects of a liposome-TLR mucosal immune stimulant on kittens infected with feline herpesvirus 1	CS
17	Cronise	Investigating the dependence of canine bladder transitional cell carcinoma on activated mutant BRAF	CS
18	Cunningham	Evaluating radiation exposure biomarkers in wild boar in Fukushima, Japan	ERHS
19	Cutcliffe	Cancer stem cell-targeted vaccine induces antibodies against conserved vaccine antigens	BMS
20	Daimon	Hypothalamic proopiomelanocortin neuron involvement in an activity-based anorexia rodent model	BMS
21	Dannemiller	Birds of a feather get sick together? A disease investigation of rainbow lorikeets	Other
22	Daum	Determination of radioisotopes in complex saline matrices using extraction chromatography	ERHS
23	Dean	Tychus: a whole genome sequencing pipeline for the assembly, annotation and phylogenetic inference of bacterial genomes	MIP
24	Doster	Comparison of <i>Salmonella enterica</i> detection in cattle feces using aerobic culture, polymerase chain reaction and shotgun metagenomics	CS
25	Evans	Development and testing of a micro-respirometer for assessment of oocyte mitochondrial function	BMS
26	Fredrickson	Viral mediated oncolysis of cancer cells isolated from canine tumors	MIP
27	Garcia	Development of a next-generation sequencing protocol for the diagnosis of infectious equine neurologic disorders	MIP
28	Glapa	Identifying and localizing uterine <i>Pseudomonas</i> biofilms	CS
29	Hartley	Regulation of tumor-associated macrophage function by PD-L1 signaling	CS
30	Haugen	Immune cell energy metabolism: a functional biomarker of TB immune protection	MIP
31	Heck	Modulation of mRNA stability through RNA methylation in stem cells	MIP
32	Heise	Evaluation of a digital anatomy program in human anatomy instruction	BMS

No.	Presenter	Topic	Dept.
33	Herndon	P16 <sup>ink4a</sup> -mediated cellular senescence is increased in geriatric cats and cats with chronic kidney disease	CS
34	Holbrook	Risk factor analysis for Rift Valley fever (RVF) in cattle in Cameroon	Other
35	Iodence	Use of pressure mapping for quantitative analysis of pressure points induced by external coaptation in dogs	CS
36	Hunter	Metagenomic sequencing analysis of Ixodes scapularis virome.	MIP
37	Johnson, T	Coagulopathy in <i>Crotalus viridis</i> envenomation, attenuation by carbon monoxide releasing molecule – 2 in vitro	MIP
38	Johnson, V	Kryptonite for superbugs: mesenchymal stem cell modulation in combination with antibiotics to treat multidrug resistant infections.	CS
39	Jong	Feline coronavirus detected in a specific pathogen-free cat colony	MIP
40	Karna	Experimental infection of ducklings with Japanese encephalitis viruses: a quest to understand genotype displacement	MIP
41	Kirkley	The first kiss: is kisspeptin a novel contributor to the integrity of the equine fetal-maternal interface?	BMS
42	Kopanke	Characterizing the genetic diversification of a segmented arbovirus in an in vitro system	MIP
43	Kumar	Ataxic horses display quantifiable gait abnormalities determined by videography	CS
44	Labadie	Hypothyroidism may confer protection against canine T zone lymphoma	MIP
46	Lawless	Endoscopic laparocystotomy for urolith removal in standing horses	CS
47	Lee	Isolation of specific blood cell phenotypes from Syrian hamster blood	MIP
48	Linde	FADS2 overexpression increases glucose intolerance in mice fed high fat diets but is attenuated with high linoleic acid content	BMS
49	LiPuma	Fads2 overexpression increases cardiovascular risk and ischemic injury in mice	BMS
50	Lowery	Does exposure to non-virulent pathogens influence host mortality from other causes?	Other
51	Martin	Busting biofilms: free-living amoeba as a tool to combat biofilm-associated infections	MIP

No.	Presenter	Topic	Dept.
52	McWhorter	Genomic and non-genomic androgen signaling in the placenta	BMS
53	Meuten	Evaluation of in vitro and in vivo efficacy of dual-inhibition of the PI3K/Akt/mTOR pathway in canine osteosarcoma cell lines	CS
54	Miedema	Investigating the role of plants in environmental transmission of chronic wasting disease	MIP
55	Millman	Validating the cell of origin of canine T-zone lymphoma	MIP
56	Nealon	Metabolome investigation revealed Lactobacillus species-level variations in the production of a profile of bioactive molecules	ERHS
57	Oppel	Dietary navy bean consumption by colorectal cancer survivors modulates the stool, urine and serum metabolome.	ERHS
58	Ozegin	Evaluation of dried blood on filter paper for amplification of <i>Ehrlichia canis</i> DNA from dogs	CS
59	Pannone	In vitro evaluation of mesenchymal stem cell therapy for primary osteoarthritis	MIP
60	Pierce	Evaluating expression of zika virus entry receptors in placental trophoblast cells grown in 3D culture	MIP
61	Pires	Characterization of homologous recombination DNA repair in canine tumor cell lines	ERHS
62	Plumley	Thermoregulation of biofilm formation in <i>Burkholderia pseudomallei</i> is disrupted by mutation of a putative diguanylate cyclase	MIP
63	Porter	Environmental reservoirs of <i>Francisella tularensis</i> : mechanisms for transmission of tularemia	BMS
64	Powers	Feline leukemia virus dynamics in a domestic-leopard cat breeding colony	MIP
65	Regan	Pre-clinical assessment of losartan as a CCR2 antagonist and translational evaluation in the spontaneous canine cancer model	CS
66	Richards	Use of sodium bismuthate for separations involving americium and curium	ERHS
67	Rocha	Detection and isolation of prion protein specific camelid nanobodies: implications for prion disease therapeutic options	MIP
68	Rodgers	Determination of specific gravity of helminth eggs in pinnipeds and optimization of diagnostic approaches in marine parasitology	MIP

No.	Presenter	Topic	Dept.
69	Rollert	Gonioscopy, SD-OCT, high-resolution ultrasound, and Pentacam® HR imaging to develop a detailed iridocorneal angle assessment in rabbits	CS
70	Romero	School water sanitation and hygiene: a pilot public health intervention in a rural Cambodian school	ERHS
71	Russo	Poly (C) binding protein 2 regulates mRNA stability to fine tune gene expression during stem cell differentiation	MIP
72	Sanchez-Hidalgo	<i>Mycobacterium bovis</i> infected free living amoebas cysts and trophozoites are carriers for mycobacteria infection in mice	MIP
73	Serex	Investigation of ferret adipose-derived mesenchymal stem cell growth, characterization, differentiation, and secretome	CS
74	Shropshire	Whole blood impedance platelet aggregometry in healthy greyhounds compared to healthy beagles	CS
75	Sieberg	Retrospective study of the efficacy of oral potassium supplementation in cats with chronic kidney disease	CS
76	Sio	The use of injectable alfaxalone in the Madagascar hissing cockroach, <i>Gromphadorhina portentosa</i> , and orange-spotted cockroach, <i>Blaptica dubia</i> : A pilot study	CS
77	Smith	Effects of donor sex and pre-conditioning on cytokine production of canine adipose-derived mesenchymal stem cells	CS
78	Summers	Serum cytokines and renal alpha-enolase immunohistochemical staining in cats after repeated administration of a parenteral FVRCP vaccine	CS
79	Tarr	Improved identification of children at high risk for lead exposure through the use of classification and regression trees (CART)	ERHS
80	Taylor	Reproductive neoplasia in the female goat: a retrospective study (2003-2013)	CS
81	Weaver	Preliminary experiences with computational analysis of data collected with inertial measurement units from xylazine-induced ataxic horses	CS
82	Worcester	Metabolites from <i>Lactobacillus paracasei</i> and rice bran extract reduce <i>Salmonella</i> Typhimurium growth in vitro	ERHS
83	Zambrana	Dietary rice bran supplementation supports growth and impacts environmental enteric dysfunction markers: a randomized-controlled trial in Nicaraguan weaning infants	ERHS
84	Zarei	Comparative metabolic profiling of global rice bran cultivars revealed by non-targeted metabolomics	ERHS

## VETERINARY SUMMER SCHOLARS PROGRAM

DVM Students Dive into Research  
**APPLY BY 2 P.M. FEB. 3, 2017!**



Dr. Kelly Santangelo, left, mentored Emily Hein in her Summer Scholars study of dietary effects on obese guinea pigs.

OUR VETERINARY SUMMER SCHOLARS PROGRAM gives D.V.M. students hands-on exposure to veterinary medical research and introduces participants to intriguing research careers.

The application deadline is Feb. 3 for the summer 2017 program!

The College of Veterinary Medicine and Biomedical Sciences received funding from the National Institutes of Health in 2013 to expand an already successful program. Partnership with the Young Investigator Awards Program has further boosted participation.

Last year, 27 veterinary students from CSU and elsewhere participated in the 2016 CSU Veterinary Summer Scholar Program. Students spent the summer working in research labs, attending weekly research seminars, and going on field trips to other CSU, federal, and state research facilities. Many of the projects conducted by CSU students last summer are being presented today at the CVMBS Research Day.

The National Institutes of Health and Merial, a multinational animal health company, support the program, along with several other organizations, the college, and faculty mentors who help provide stipends for program participants.

We encourage students to apply for experiential learning in veterinary medical research!

To view the research of students funded in 2016, or to apply for the summer 2017 program, please visit the website at:

[csu-cvmb.colostate.edu/dvm-program/Pages/Veterinary-Scholars-Program.aspx](http://csu-cvmb.colostate.edu/dvm-program/Pages/Veterinary-Scholars-Program.aspx)

### BY THE NUMBERS

- 27 scholars in the 2016 program, from CSU and other veterinary programs across the country and around the world. The scholars are selected through a competitive application process and receive financial support from program sponsors.
- 265 summer scholars since 2001
- 500+ total students mentored by CVMBS faculty in past 10 years
- 20 percent of student participants in past five years have been under-represented minorities
- Over 60 CVMBS faculty mentors

### SPONSORS OF THE 2016 PROGRAM:

- National Institutes of Health
- Merial Limited
- Morris Animal Foundation
- American Society of Lab Animal Practitioners
- University of Alaska, Fairbanks
- United State Department of Agriculture
- CSU College of Veterinary Medicine and Biomedical Sciences

## YOUNG INVESTIGATOR GRANT PROGRAM: FUNDING RESEARCH AND BOOSTING VET STUDENTS

Center for Companion Animal Studies, Department of Clinical Sciences



Young Investigator grants help students and early-career researchers like Dr. Elena Contreras pursue clinical projects, and improve the chances of securing complementary internships and residencies.

THE YOUNG INVESTIGATOR GRANT PROGRAM provides funding to support research involving Colorado State veterinary students, and many of the recently funded projects are presented during Research Day.

In 2016, corporate and non-corporate sponsors donated more than \$70,000 to the program. This funding was distributed to 25 research projects involving students in our DVM Program.

The Young Investigator Grant Program began in 2006 with a donation of \$20,000 from HESKA Corp. The program has grown to support five times the number of research projects that it supported in its first year – a credit to sponsors who understand the importance of bolstering young scientists, and a credit to our DVM students for the impressive quality of their research efforts.

The College of Veterinary Medicine and Biomedical Sciences thanks all program sponsors. These supporters are helping to advance veterinary science while also involving more DVM students in important clinical research. To view the grants funded in 2016 or to make a donation, please visit the Center for Companion Animal Studies website at [companionanimals.colostate.edu](http://companionanimals.colostate.edu).

The Center for Companion Animal Studies also thanks Boehringer Ingelheim, Nestle Purina PetCare, Royal Canin, and Zoetis for sponsoring scholar programs that fund residency/PhD programs.

### 2016 YOUNG INVESTIGATOR GRANT PROGRAM SPONSORS

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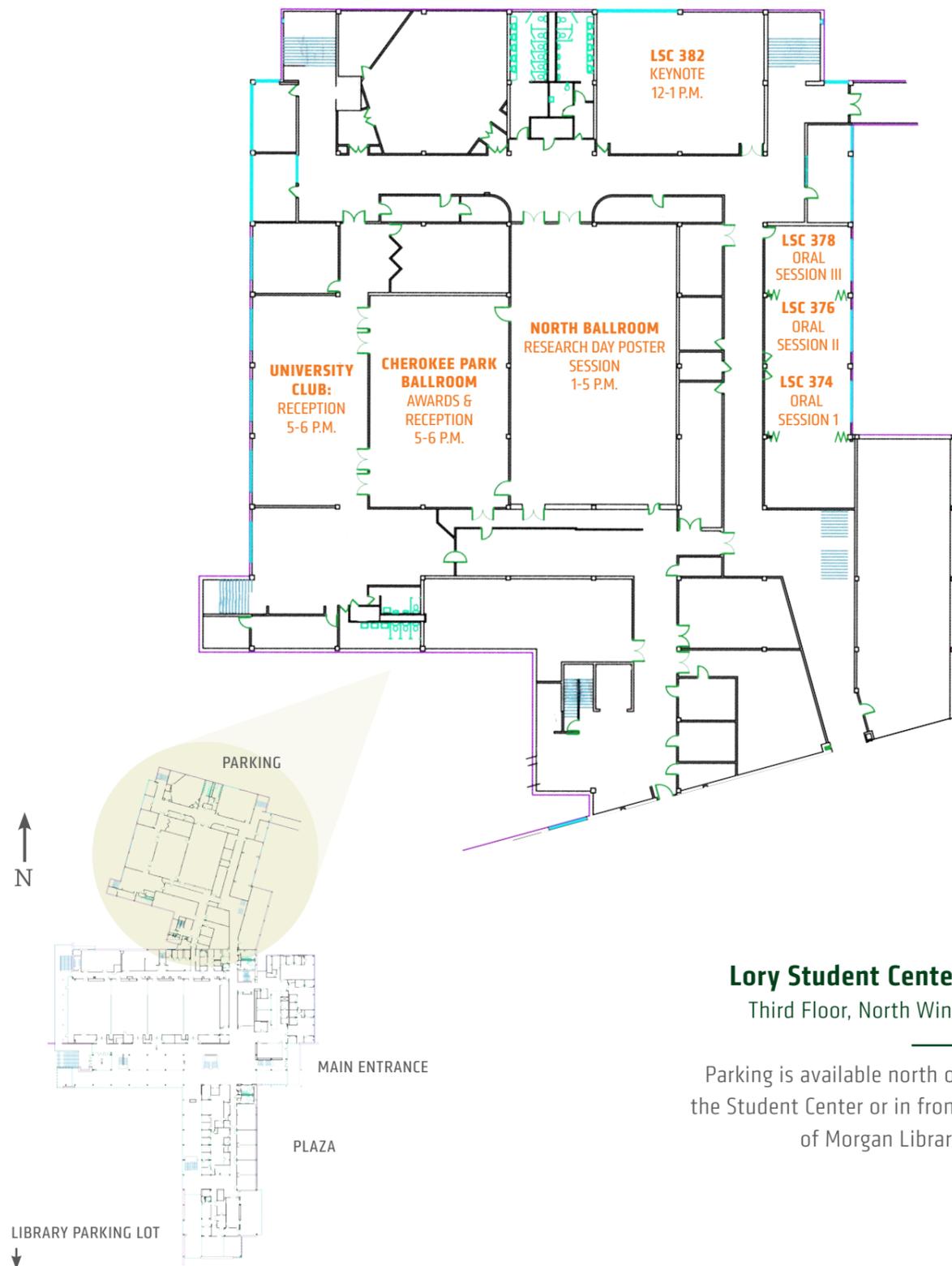
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**Lory Student Center**  
Third Floor, North Wing

Parking is available north of the Student Center or in front of Morgan Library



INFECTIOUS DISEASE  
RESEARCH CENTER  
COLORADO STATE UNIVERSITY





**COLLEGE OF VETERINARY MEDICINE  
AND BIOMEDICAL SCIENCES**  
COLORADO STATE UNIVERSITY