Areas of Research Strength

with

Faculty Profiles
The College of Veterinary Medicine has RSCAD strengths in five general emphasis areas: infectious disease; food safety and security; beef production, welfare, and management; epidemiology and population health; and comparative translational medicine. Our specific areas of strength are summarized below.

### 1. Infectious Disease Emphasis

- **Historical and current research strengths of KSU CVM are applied and basic studies on the pathogenesis, prevention and control of important animal infectious diseases.**
- **Four focus groups in the Infectious Disease Emphasis are:**
  - Viral and Bacterial Pathogenesis of Endemic and Emerging Diseases
  - Transboundary Animal and Zoonotic Diseases
  - Vector-Borne Diseases
  - Antiviral Therapy
- **Pre-Harvest Food Safety**
- **Food Animal Residue Avoidance and Depletion (FARAD) Program**
- **Antimicrobial Resistance and Stewardship**

### 2. Food Safety and Security Emphasis

- **The goal of this research emphasis is to develop strategies to identify and mitigate food-borne pathogens, adverse drug and chemical residues, and antimicrobial resistance in livestock production systems.**
- **Three focus groups in the Food Safety and Security Emphasis are:**
  - Pre-Harvest Food Safety
  - Food Animal Residue Avoidance and Depletion (FARAD) Program
  - Antimicrobial Resistance and Stewardship

### 3. Beef Production, Welfare, and Management Emphasis

- **Kansas is home of the second greatest concentration of beef cattle per square mile of any state in the U.S. generating over $7 billion annually in cash receipts. Consequently, the beef industry is absolutely central to the state, regional and rural economies.**

### 4. Epidemiology and Population Health Emphasis

- **The health status of animal and human populations requires knowledge of detection, distribution, and determinants of disease before informed decisions can be made with confidence.**
  - As such, federal and state health officials, veterinary practitioners, livestock producers, and industry leaders require high quality information, data analysis, and advice on population health risks.

### 5. Comparative Translational Medicine Emphasis

- **Uniting veterinary medicine, human medicine and environmental concerns, comparative and translational medicine is an emphasis area of several KSU CVM scientists.**

Our specific areas of strength are summarized in the following report.
### A. Area of Strength: Bacterial Pathogenesis of Endemic and Emerging Diseases

#### B. Scope and Context:
The scope of this research strength is investigations of major virulence factors, including structure and function studies, role in pathogenesis, mechanisms of action, and host responses to virulence factors.

#### C. Current or Emerging Strength:
- Current
- Emerging
- Both

#### D. Narrative:
A college research strength because several investigators are engaged in multidisciplinary regional, national and international research collaborations to study bacterial pathogens and pathogenesis in both humans and domestic food animals. Many of these pathogens are zoonotic agents, and thus this research is also integrated with other programs. This research area is well-supported by funds and partnerships with the NIH, USDA, and human and animal health industries.

#### E. Keywords/Tag words:
- Bacterial pathogenesis
- Innate immunity
- Host-pathogen interaction
- Food safety
- *E. coli*
- *Fusobacterium necrophorum*
- *Mannheimia haemolytica*
- *Mycoplasma bovis*
- *Salmonella*

### A. Area of Strength: Vaccine Development and Field Efficacy

#### B. Scope and Context:
The scope of this research strength is the development of classical and novel approaches for livestock vaccines with applications to humans and small animals; development of vaccine challenge models; and clinical field studies for validation of efficacy.

#### C. Current or Emerging Strength:
- Current
- Emerging
- Both

#### D. Narrative:
A college research strength because several investigators are engaged in the development and use of infectious clones, subunit and vectored vaccines, and field validation and application of commercial products. Activities are supported by BSL-2 and BSL-3 facilities, the Beef Cattle Institute, and partnerships with industries.

#### E. Keywords/Tag words:
- Swine diseases
- Livestock diseases
- Zoonotic diseases
- Food safety
- Cattle diseases
- Vaccines
- Immunity
- Adjuvants
- Beef cattle health and well-being
- Beef cattle production practices
- Beef Cattle Institute
- Biosecurity Research Institute

### A. Area of Strength: Mechanisms, Management and Consequences of Antimicrobial Resistance

#### B. Scope and Context:
The scope of this research strength is antimicrobial resistance in livestock, companion animal and zoonotic pathogens. Research includes diagnostic surveillance, pharmacodynamic and population-based models, epidemiology of both genetic and phenotypic resistance, and impacts of antimicrobial use.

#### C. Current or Emerging Strength:
- Current
- Emerging
- Both

#### D. Narrative:
A college research strength because several investigators and collaborative teams are engaged in studies of the interactions between antimicrobial use and selection for resistant organisms in livestock and companion animals. A unique strength is the expertise, facilities, and industry partnerships to conduct studies across the breadth of in vitro, laboratory animals and large populations of animals. Unique collaborations involve regulatory aspects, human health, and production agriculture.

#### E. Keywords/Tag words:
- Livestock diseases
- Zoonotic diseases
- Food safety
- Cattle diseases
- Beef cattle production practices

### A. Area of Strength: Antiviral Development

#### B. Scope and Context:
The scope of this research strength is identification of virus or cellular targets for antiviral drug development for coronavirus and calicivirus infections in humans and companion animals; development of in vitro high-throughput screening assays for antiviral compounds; characterization and mechanism of action of antiviral drugs; and in vivo safety and efficacy studies.

#### C. Current or Emerging Strength:
- Current
- Emerging
- Both

#### D. Narrative:
A college research strength because several investigators collaborate to conduct studies of host-virus interactions that may lead to the identification of potential antiviral targets, screening and characterization of antiviral compounds and in vivo target validation and efficacy using animal models for coronavirus and calicivirus infections. Special emphasis is on feline infectious peritonitis and systemic, virulent feline calicivirus infection in cats and norovirus infection in humans. A unique strength is collaboration of researchers across multiple disciplines and industry partnership to conduct studies that encompass in vitro studies, antiviral drug design, chemical synthesis and selection of antiviral compounds, and animal models.

#### E. Keywords/Tag words:
- Antiviral drug
- Feline infectious peritonitis
- Feline calicivirus
- Human norovirus

### A. Area of Strength: Diagnostic Assay Development, Validation and Application

#### B. Scope and Context:
Veterinary diagnostics play an important role in the development of the one-health concept. New diagnostic tests, particularly rapid, automated and high-throughput tests, are needed for the detection of existing pathogens as well as emerging diseases, which continually threaten livestock and companion animal populations. Diagnostics are also essential for the detection of zoonotic pathogens in animal and human hosts. Diagnostic testing includes traditional approaches to whole pathogen genome sequencing and bioinformatics. Future vaccines will incorporate diagnostic tests to differentiate infected from vaccinated animals (DIVA).

#### C. Current or Emerging Strength:
- Current
- Emerging
- Both

#### D. Narrative:
The Kansas State Veterinary Diagnostic Laboratory (KSVDL) is a full service, fully accredited veterinary diagnostic laboratory. In addition to offering routine diagnostic services to clients, the laboratory is actively engaged in diagnostic test development. Also supporting test development is a group of faculty members distributed between several departments and disciplines. One example is the development of novel approaches for the detection of food-borne, foreign animal and emerging pathogens. Test development is supported by a well-developed infrastructure in immune techniques, biochemistry, molecular biology, test validation, and epidemiology.

#### E. Keywords/Tag words:
- Veterinary diagnostic testing
- Zoonotic and emerging diseases
- Rabies
- Food-borne pathogens
- Food safety
- Molecular diagnostics
- Immune-based diagnostics
- Bioinformatics
- Pathogen genome sequencing
- KSVDL
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<tr>
<th>A. Area of Strength:</th>
<th>Epidemiology and Ecology of Disease</th>
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<tr>
<td>B. Scope and Context:</td>
<td>The scope of this research strength includes the epidemiology of pathogens and syndromes in food animal production systems and companion animal species including food safety pathogens, production-limiting diseases, bovine respiratory disease complex, internal and external parasites, and swine infectious diseases. Experimental, observational, and synthesis research methods are used to study host, pathogen, environment, and management factors that contribute to risks in animal well-being, production, and/or human health.</td>
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<tr>
<td>C. Current or Emerging Strength:</td>
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<td>D. Narrative:</td>
<td>A college research strength because several well-funded investigators and collaborative teams within the college are engaged in research initiatives with local, state, national, and international impacts. The college has unique expertise and capabilities to conduct real-world studies of host-pathogen-environment interactions thereby enabling valid research results including the elucidation of mechanisms of pathogen dissemination, maintenance, and evolution within and among hosts and the environment. For food animal research, the unique blend of expertise in epidemiology and production practices, combined with access to production systems and large populations of animals, result in extremely unique research abilities and resources including the Beef Cattle Institute. Extensive collaborations with veterinary practitioners, producers, pet owners, and regulatory and industry partners enable unique research capabilities and impactful results.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Livestock diseases, Zoonotic diseases, Food safety, Cattle, Swine, Horses, Dogs, Cats, Parasites, Pathogens, Beef Cattle Institute</td>
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<th>A. Area of Strength:</th>
<th>Therapeutic Interventions for Disease</th>
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<td>B. Scope and Context:</td>
<td>Therapeutic intervention research involves in silico, in vitro, and in vivo pharmacodynamic/pharmacokinetic modeling. This work utilizes both challenge models and small and large population natural-occurring disease models. There is also a focus on the case definitions used to identify animals for disease intervention and how these definitions affect therapeutic outcomes.</td>
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<td>D. Narrative:</td>
<td>A college research strength because several investigators and collaborative teams are engaged in studies of therapeutic intervention of small and large animal diseases. The college has a unique capability to conduct investigations across the continuum from in vitro work to large population interventions. A relationship with veterinary practitioners and the food animal industries allows research to be conducted under field conditions, resulting in externally valid results. For food animal interventions, the blend of expertise in production practices with the expertise in clinical pharmacology allows response to critical research needs. For companion animals, clinicians have access to clients and patients that allows evaluation of existing and novel therapeutic interventions, again combined with the college strength in clinical pharmacology.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Cattle, Swine, Exotics, Wildlife, Zoo, Dogs, Cats, Horses, Food animal, Bovine respiratory disease, Enteric disease, Pharmacology, Clinical pharmacology, Parasitology</td>
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<th>A. Area of Strength:</th>
<th>Immune Mechanisms in Health and Disease</th>
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<td>B. Scope and Context:</td>
<td>Immunity is important for recovery from disease and for protection following vaccination. In addition, aberrant immune responses, such as inflammation, contribute to clinical disease. Diagnosing the immune status provides important information on the outcome following infection and animal models of immune protection and immunopathogenesis are often used. Because several infectious diseases lack vaccines, understanding mechanisms of protection is needed to develop additional therapeutic approaches.</td>
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<td>C. Current or Emerging Strength:</td>
<td>☐ Current ☐ Emerging ☑ Both</td>
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<td>D. Narrative:</td>
<td>A college research strength because several research teams are involved in the analysis of innate and adaptive immune responses in livestock, companion animals, and humans. These activities are supported by a state-of-the-art flow cytometry facility that supports research and diagnostics. Researchers are engaged in vaccine development, diagnostics and disease modeling. One unique asset is the availability of a severe combined immunodeficiency (SCID) pig that lacks an adaptive immune response.</td>
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<td>E. Keywords/Tag words:</td>
<td>Livestock diseases, Zoonotic diseases, Food safety, immune models, Adaptive immunity, Innate immunity, Adjuvants, Flow cytometry, Host defense peptides, Interferons</td>
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<th>A. Area of Strength:</th>
<th>Vector-Borne Diseases and Vector Biology</th>
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<td>B. Scope and Context:</td>
<td>The scope of this research strength encompasses the interactions between pathogens, tick- and mosquito-borne vectors and the vertebrate host. Tick-borne diseases studied are focused on rickettsial disease agents, Ehrlichio chaffeensis and Ehrlichia canis. Mosquito-borne viruses studied include Japanese encephalitis, West Nile, chikungunya, Western equine encephalitis, Schmallenberg, o'nyong nyong, and yellow fever viruses. This research strength is well-supported by BSL-2, BSL-3, and BSL-3Ag facilities, funding and partnerships with the NIH, USDA, the State of Kansas, human and animal health companies, and collaborations with the USDA Arthropod-Borne Animal Disease Unit focused on bluetongue virus transmitted by Culicoides midges.</td>
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<td>C. Current or Emerging Strength:</td>
<td>☐ Current ☐ Emerging ☑ Both</td>
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<td>D. Narrative:</td>
<td>Tick-borne pathogen studies encompass longstanding research focused on understanding the diseases caused by tick-borne pathogens of the genera Ehrlichia and Anaplasma causing Ehrlichiosis and Anaplasmosis. In particular, research involves understanding pathogen molecular structure, the development of an animal model to study host immunity against Ehrlichia chaffeensis, and in defining the contributions of tick and macrophage environments on the pathogen molecular structure and host responses. Research strengths focused on virus-mosquito-vertebrate host interactions of zoonotic viruses important to animal and human health are conducted at BSL-2, BSL-3 and BSL-3Ag facilities. The goal of this research is to provide a better understanding of vector susceptibility, the capacity of the virus to be transmitted, and understanding the molecular-genetic basis of virus transmission to facilitate vaccine and diagnostics design and development, and other countermeasures.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Ehrlichiosis, Anaplasmosis, Ticks, Fleas, Mosquitoes, Alphavirus, Flavivirus, Bunyavirus, Orbiviruses, Culicoides midges, Bioscience Security Research Institute</td>
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<tr>
<td>A. Area of Strength:</td>
<td>Nanomedicine</td>
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<td>B. Scope and Context:</td>
<td>The scope of this research strength is broadly based on exploring the biological interactions of nanomaterials with biological systems using cutting-edge characterization techniques coupled to innovative in vitro, ex vivo, and in vivo animal models. Specific areas of interest include dermal transport of nanomaterials, nanotoxicology and defining and quantitating the role of the protein corona on cellular uptake and biodistribution.</td>
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<td>C. Current or Emerging Strength:</td>
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<td>D. Narrative:</td>
<td>Nanomedicine is a research strength that was greatly enhanced by the establishment of the new Nanotechnology Innovation Center of Kansas State (NICKS) University in the college. This interdisciplinary team bridges research in nanomaterial characterization, cell biology and computational medicine. Newly built facilities include state-of-the-art instrumentation and cell-culture laboratories specifically developed to contribute to the emerging field of nanomedicine, including transmission and scanning electron microscopy. A unique strength of this program is its ability to conduct in vitro studies, as well as in vivo studies in larger animal species more physiologically reflective of human biodistribution, including robust models for human and animal transdermal nanomedicine delivery. Researchers in this group are internationally recognized for expertise in nanotoxicology.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Nanotechnology, Nanomedicine, Nanotoxicology, Biodistribution, In vitro, Electron microscopy, Nanoparticles, NICKS</td>
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<td>A. Area of Strength:</td>
<td>Comparative Pharmacology</td>
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<td>B. Scope and Context:</td>
<td>The scope of this research strength includes all aspects of quantitative comparative pharmacology including pharmacokinetics, pharmacometrics, clinical pharmacology, human food safety, interspecies comparisons, in vitro and in vivo extrapolations and transdermal drug delivery. Drugs focused on include antimicrobials, analgesics and nano-therapeutics.</td>
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<td>C. Current or Emerging Strength:</td>
<td>☒ Both</td>
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<td>D. Narrative:</td>
<td>Quantitative comparative and clinical pharmacology is an internationally recognized strength of this college that was bolstered by the establishment of the Institute of Computational Comparative Medicine. The USDA-supported National Food Animal Residue Avoidance and Depletion (FARAD) Program is now headquartered here. In addition to a strong program in clinical veterinary pharmacology focused on antimicrobial and analgesic drugs, research also centers on utilizing the latest mathematical, pharmacometric and bioinformatic approaches to develop novel population and physiological-based mechanistic pharmacokinetic models useful for making interspecies extrapolations. Strength also exists in developing relevant in vitro models of drug delivery across epithelial barriers including the skin and mammary tissue, analytical chemistry focused on drugs, as well as quantitating chemical-mixture and formulation interactions for transdermal delivery. A new focus is on developing computational models of drug-induced antimicrobial resistance and quantitative biodistribution of nano-therapeutics.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Pharmacology, Pharmacokinetics, Drugs, Antimicrobials, Analgesics, Nanomedicine, Analytical chemistry, Clinical pharmacology, Chemical food safety, Computational medicine, Bioinformatics, FARAD, ICCM</td>
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<td>A. Area of Strength:</td>
<td>Stem Cell Biotechnology and Physiology, Stem Cells and Regenerative Medicine</td>
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<td>B. Scope and Context:</td>
<td>This research strength is centered in the Midwest Institute for Comparative Stem Cell Biology, which exists to further basic and applied research in stem cells and related biotechnology in animals and humans and to extend that discovery through education and commercialization. The institute is uniquely situated to leverage research capabilities through collaboration among Kansas State University, the University of Kansas and the Kansas University Medical Center, and scientists with similar interests at other institutions.</td>
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<td>C. Current or Emerging Strength:</td>
<td>☒ Both</td>
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<td>D. Narrative:</td>
<td>The institute was founded on the discovery of non-controversial stem cells within the umbilical cord by K-State scientists. The Institute has a core of faculty members across the college and has had significant grant funding and commercial licensing success. The basic research discoveries made by its scientists have developed into several novel translational projects and into an on-going clinical trial at the College of Veterinary Medicine under a FDA investigational new animal drug (INAD), a planned clinical trial at KUMC and in the development of a diagnostic test for cancer being evaluated in China. The Institute has a certificate program that trains the next generation of scientists and physician scientists in stem cells and regenerative medicine.</td>
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<tr>
<td>E. Keywords/Tag words:</td>
<td>Stem cells, Regenerative medicine, Intellectual property, Certificate program, Translational research, Midwest Institute for Comparative Stem Cell Biology</td>
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### A. Area of Strength: Cardiovascular and Respiratory Physiology

#### B. Scope and Context:
The scope of this research strength is chronic heart failure and diabetes, diseases that are endemic in the developed world. Effective treatment is incumbent upon understanding the predations of these conditions on the oxygen transport system (especially organ blood flow and microcirculatory control), development of innovative and accurate models of capillary function and their plasticity to novel therapeutic interventions.

#### C. Current or Emerging Strength:
- ☐ Current
- ☐ Emerging
- ☒ Both

#### D. Narrative:
A college and university (Human Ecology) research strength as an interdisciplinary research team works in concert with scientists, administrators and national scientific funding agencies (NIH NHLBI and NIA, AHA, APS, ACSM) and international laboratories (Exeter University, UK; Kobe University, Japan).

#### E. Keywords/Tag words:
- Chronic heart failure
- Diabetes
- Aging
- Oxygen transport
- Skeletal muscle microcirculation
- Capillary hemodynamics
- Vascular control

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### Faculty Profiles

**Raghavendra Amachawadi, BVSc, MS, PhD**  
**Assistant Professor, Food Animal Therapeutics**

Dr. Amachawadi’s research interests are in the area of antimicrobial resistance in gut commensals and foodborne pathogens of swine and cattle production systems. Specifically, on understanding the mechanisms involved in the propagation and dissemination of antimicrobial resistance and on the role of non-antibiotic alternatives in contribution and mitigation of antimicrobial resistance in gut bacteria of cattle and swine.  
[Faculty Web Page](#)

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**Michael Apley, DVM, PhD, DACVCP**  
**Professor, Frick Chair in Veterinary Medicine, Production Medicine/ Clinical Pharmacology**

Dr. Apley's research is focused on food animal therapeutics, antimicrobial resistance, and pharmacokinetics and pharmacodynamics of veterinary drugs. His research is also focused on beef production medicine with an emphasis on feedlot production.  
[Faculty Web Page](#)

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**Chieko Azuma, D.V.M., Ph.D., DACVR-RO**  
**Certified Professional in IACUC Administration**  
**Clinical Associate Professor, Radiation Oncology**

Dr. Azuma’s research is focused on investigating biological effects of therapeutic and experimental radiation and evaluation of treatment response in veterinary patients. She also has interests in palliative care and pain management, and research ethics and compliance.  
[Faculty Web Page](#)

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**Jianfa Bai, MS, PhD**  
**Clinical Professor, Molecular Diagnostics of Infectious Diseases**

Dr. Bai is in charge of molecular diagnostic assay development at Kansas State Veterinary Diagnostic Laboratory for animal, zoonotic and foodborne pathogen identifications, quantifications and characterizations.  
[Faculty Web Page](#)
Natalia Cernicchiaro, DVM, MS, PhD  
Assistant Professor, Epidemiology  
Dr. Cernicchiaro’s research is focused on veterinary epidemiology, food safety, zoonoses and production medicine. Her research interests include the application of epidemiological concepts and techniques, including multi-level modeling and other statistical methods, to design, implement, analyze and interpret observational and experimental data.  
Faculty Web Page

Kyeong-Ok Chang, DVM, MS, PhD  
Professor, Virology  
Dr. Chang has more than 25 years of research experience in the field of virology, specifically on viral pathogenesis and the development of preventive and/or therapeutic measures for important human and animal pathogens. Currently, his research focuses on noroviruses and coronaviruses, and examining viral proteases as potential therapeutic targets for antiviral drug development.  
Faculty Web Page

Jeba Jesudoss Chelladurai  
BVSc, MS, PhD, DACVM, Parasitology  
Dr. Jesudoss Chelladurai’s research is focused on parasitic diseases affecting pets and large animals. Her primary focus is understanding the mechanism of action of and resistance to therapeutic drugs in nematodes and cestodes, and studying the role of the immune system in host-parasitic interactions. She is also interested in diagnosing parasitic infections in wildlife.  
Faculty Web Page

Johann (Hans) Coetzee, BVSc, PhD  
Professor and Department Head of Anatomy and Physiology  
Dr. Coetzee’s research is focused on the development of pain assessment techniques and practical analgesic drug regimens for use in food animals.  
Faculty Web Page

Warren Beard, DVM, MS, DACVS  
Professor, Equine Surgery  
Dr. Beard’s research is focused in management of postoperative colic patients, surgical treatments for dorsal displacement of the soft palate, endotoxemia, and devising new surgical methods to deal with difficult surgical problems.  
Faculty Web Page

David Biller, DVM, DACVR  
Professor, Radiology  
Dr. Biller’s research is focused on the use of diagnostic ultrasound in the diagnosis and evaluation of spontaneous animal diseases, as well as, the study of polycystic kidney disease in cats.  
Faculty Web Page

James Carpenter, MS, DVM, DACZM  
Professor, Exotic Pet, Wildlife, and Zoological Medicine  
Dr. Carpenter’s research is focused on pharmacokinetics of selected antibiotics and analgesics in exotic animals; medicine and management of captive exotic animals; physiologic and pathologic characteristics of selected species; and parasites and diseases of exotic animals, wildlife, and zoo animals.  
Faculty Web Page

Dr. Nicolette (Nicky) Cassel BSc, BVSc, MMedVet, DipECVDI  
Assistant Professor  
Dr. Cassel's primary area of research interest is developmental orthopedic diseases in small animal patients and utilizing imaging to further understand the pathology on a histopathological and physiological level. Current and prior clinical research collaborations include Equine MRI imaging, Spirocerca lupi infection in dogs and the repercussions of blunt force trauma on dogs and imaging of these patients.  
Faculty Web Page

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Faculty Web Page
Jeffrey Comer, PhD
Assistant Professor

Dr. Comer studies molecular interactions to enable design of drugs and drug delivery vehicles with the goal of improving human and animal health. His group primarily uses computer simulation to determine binding thermodynamics, supported by experiment. Major projects include design of peptides for cancer immunotherapy and understanding the behavior of nanomaterials in physiological environments. [Faculty Web Page]

Anne Sally Davis, DVM, PhD
Assistant Professor, Experimental Pathology

Dr. Davis’ research interests are in the development of tissue-based biomarkers for emerging and zoonotic infectious diseases, development of diagnostic tests and medical countermeasures against emerging and zoonotic viral pathogens, and visualization of host-pathogen interactions in order to better understand infectious disease pathogenesis. Specific areas of concentration include biospecimen quality, viral pathogenesis, virus detection assay development, whole slide imaging/image analysis and high containment research including work with small and large animals as well as select agents. [Faculty Web Page]

Elizabeth Davis, DVM, PhD, DACVIM
Professor, Equine Internal Medicine, Department Head of Clinical Sciences

Dr. Davis’ research is focused on ways to measure immune responsiveness to vaccination, particularly with an aim on characterizing an age associated response. Immunologic investigations also include characterizing the influence of antigen exposure and development of adverse reactions. Collaborative investigations have involved pharmacokinetic evaluation of drug therapy in the equine host. [Faculty Web Page]

Robert DeLong, MS, PhD
Associate Professor

Dr. DeLong’s research is focused on the impact of nanomaterials on the structure, function and delivery of physiologically or therapeutically relevant nucleic acids and proteins. His group has a keen interest in the anti-cancer properties of nanoparticles when combined with RNA and is studying the nanobio interface with both RNA and protein, for potential chemotherapeutic or immunotherapeutic application against cancer and infectious disease. [Faculty Web Page]

David Eshar, DVM, DABVP, DECZM
Associate Professor, Companion Exotic Pets, Wildlife and Zoo Animal Medicine

Dr. Eshar’s research is focused on clinical pathology of non-domestic species, molecular analysis of fecal microbiota for health evaluation of exotic and wild animal species, and anesthesia and critical patient care of wild and companion exotic animals. [Faculty Web Page]

Peying Fong, PhD
Associate Professor, Physiology

Dr. Fong’s research focuses on the structure, function, and regulation of membrane proteins mediating solute transport, as well as the impact of membrane transport on overall animal health. Of particular interest is elucidation of membrane trafficking processes and macromolecular complexes ultimately governing localization and function of transporters that subserve iodide accumulation and thyroid gland hormonogenesis. [Faculty Web Page]

Roman Ganta, MS, PhD
Professor and Director, Center of Excellence for Vector-Borne Diseases

Dr. Ganta’s research is focused on important human and animal vector-borne infectious diseases. Dr. Ganta’s studies involve assessing pathogen molecular structure, host responses, pathogenesis, the effect of tick and host cell environments on the pathogens’ adaptation, mutagenesis, diagnostics, vaccine development, and disease surveillance. Current research focuses on *Ehrlichia, Anaplasma* and *Rickettsia* species. [Faculty Web Page]

Sara Gardhouse, DVM, DACZM
Assistant Professor, Companion Exotic Pets, Wildlife, and Zoo Animal Medicine

Dr. Gardhouse’s research is focused on the pharmacology of chemotherapeutics in non-domestic species, and exotic animal pharmacokinetics and pharmacodynamics. [Faculty Web Page]
Natasha Gaudreault, PhD  
Research Assistant Professor, Microbiology

Dr. Gaudreault’s research is focused on emerging, foreign animal and zoonotic viral diseases. Her work includes vaccine and virus challenge model studies, and using molecular approaches such as transcriptomics to better understand virus-host interactions. [Faculty Web Page]

Jordan T. Gebhardt, DVM, PhD  
Assistant Professor, Swine Production

Dr. Gebhardt’s research interests involve practical problems the swine industry faces focused on production medicine, nutrition, and safety of livestock feed. Much of this research is applied in nature and involves collaboration with production systems and professionals in the field. Recent research has focused on the role the feed supply chain has as a potential route of disease transmission, specifically investigating porcine epidemic diarrhea virus (PEDV) and African swine fever virus (ASFV). [Faculty Web Page]

Stephanie Hall, PhD  
Assistant Professor, Anatomy and Physiology, Exercise Physiology

Dr. Hall’s research is focused on the mechanisms of exercise as a means to prevent and treat disease. Currently, Dr. Hall’s studies investigate the exercise-induced neuroprotection in a model of Alzheimer’s disease. The goal of this work is to not only highlight exercise as a valuable therapy but also to use exercise as a tool to identify potential pathways for pharmacological intervention. [Faculty Web Page]

Gregg Hanzlicek, DVM, PhD  
Clinical Associate Professor, Field Investigation

Dr. Hanzlicek’s research is focused on disease surveillance and monitoring systems for beef and dairy health programs and disease surveys. [Faculty Web Page]

Philip R. Hardwidge, PhD  
Professor, Bacteriology

Dr. Hardwidge’s research is focused on enteric bacterial pathogens. He studies type III secretion system effector proteins, how bacteria modulate the innate immune system, and is also characterizing novel vaccine candidates. [Faculty Web Page]

Kenneth Harkin, DVM, DACVIM  
Hodes Professor in Veterinary Medicine, Small Animal Internal Medicine

Dr. Harkin’s work includes improving the diagnosis of leptospirosis, evaluating the zoonotic risk associated with infected dogs and investigating pathogenic mechanisms of leptospiral infections. He also studies canine dysautonomia, focused both on identifying the etiology and effects on various organ systems. Other areas of interest include perianal fistulas and liver disease. [Faculty Web Page]

Jamie Henningson, DVM, PhD, DACVP  
Associate Professor and Director, Kansas State Veterinary Diagnostic Laboratory

Dr. Henningson’s research is focused on providing pathology support for collaborative studies. Past and current collaborative projects have included bovine viral diarrhea virus in cattle and alpacas, canine influenza virus, canine urethral bulking agents, swine influenza virus, pH1N1 in swine, and porcine reproductive and respiratory syndrome virus. Recently, she has provided pathology support on a mouse model for prostate cancer, classical swine fever virus, low path avian influenza and Rift Valley fever virus. [Faculty Web Page]

Brian Herrin, DVM, PhD, DACVM  
Assistant Professor, Parasitology

Dr. Herrin’s primary research objectives are focused on the epidemiology and control of ticks and tick-borne diseases. Some of his recent interests are the epidemiology of Lyme borreliosis in humans and dogs in North America, evaluation of diagnostic assays for tick-borne diseases, and surveillance of ticks and tick-borne diseases of horses. Although his research focus is on ticks, Dr. Herrin enjoys working with all parasites of veterinary importance through the diagnostic service and teaching/outreach opportunities. [Faculty Web Page]
Yan-Jang (Scott) Huang, PhD  
Research Assistant Professor, Pathobiology

Dr. Huang’s research focuses on characterizing the interactions between mosquito-borne viruses and their vectors, the influence of viral genetics on the virulence, transmission efficiency, and attenuation of different arthropod-borne viruses. The long-term objective of his research is to determine mechanisms that are responsible for the emergence of mosquito-borne viruses in nature and develop effective disease control and prevention strategies. Through collaborative research, Dr. Huang conducts research on emerging and re-emerging arboviruses such as Zika virus, chikungunya virus, dengue virus, yellow fever virus, and Japanese encephalitis virus.

Margaret A. Highland, DVM, PhD, Dipl. ACVP  
Associate Professor and Anatomic Pathologist, Kansas State Veterinary Diagnostic Laboratory

Dr. Highland's research is focused on infectious diseases with special interest in small ruminants. Specific research interests include, but are not limited to, infectious agents of the respiratory tract (in particular Mycoplasma spp.). She also has interest in assisting in the development and/or validation of diagnostic assays for use within the Kansas State Veterinary Diagnostic Laboratory, and collaboratively providing anatomic pathology expertise for other researchers’ projects.

Mary Lynn Higginbotham, DVM, MS, DACVIM  
Associate Professor, Oncology

Dr. Higginbotham’s research is focused in the clinical evaluation of novel anti-cancer therapy, evaluation of drug resistance in lymphoma, as well as, the evaluation and treatment of canine nasal tumors.

Maria Jugan, DVM, MS, DACVIM  
Assistant Professor, Small Animal Internal Medicine

Dr. Jugan’s research is focused on feline and canine gastrointestinal disease. Specific focuses include nutrient malabsorption in feline inflammatory bowel disease, as well as alterations in enteroendocrine responses in both canine and feline IBD. Additional research areas include therapeutic manipulations (e.g. fecal transplantation, probiotics) of the gastrointestinal microbiome and metabolome in both acute and chronic small animal enteropathies.

Stephen Higgs, PhD  
Associate Vice President for Research, University Distinguished Professor, Research Director, Biosecurity Research Institute (BRI)

Dr. Higgs’ research encompasses many aspects of mosquito-borne viruses, with particular interests focusing on mosquito-virus-vertebrate interactions. Using wild type and genetically engineered chikungunya, Sindbis, o'nyong-nyong, West Nile, Zika and yellow fever viruses he has been examining fundamental aspects of virus-vector interactions.

Sam Hocker, DVM, MS, DACVIM (Oncology)  
Assistant Professor, Veterinary Oncology

Dr. Hocker’s research is focused on evaluating the endocannabinoid system’s role in cancer pathogenesis and how manipulation of this system may be utilized in cancer therapy. His other research interests are in the evaluation of immunotherapeutics and novel anti-cancer therapies in companion animals.

Yunjeong Kim, DVM, MS, PhD, DACVM  
Associate Professor, Virology

Dr. Kim’s research interests include pathogenesis of human and animal viral diseases and the development of screening assay platforms for antiviral drugs and animal models of virus infections with the aim of developing antiviral drugs. Her research focus includes human and animal coronaviruses, such as feline infectious peritonitis and Middle East respiratory syndrome viruses and human norovirus and influenza virus.
Phillip Lancaster, PhD
Research Assistant Professor, Beef Cattle Nutrition
Dr. Lancaster’s research is focused on enhancing nutrient utilization through genetic selection, management and nutritional strategies to improve sustainable beef production. His research efforts include using nutrition models to identify cattle with greater feed efficiency, and alternative feeding strategies to make beef production more carbon neutral. [Faculty Web Page]

Robert (Bob) Larson, DVM, PhD, DACT, DACVPM
Professor, Coleman Chair Food Animal Production Medicine
Dr. Larson’s primary area of research is the integration of animal health, production efficiency, and economic considerations in beef cattle production. [Faculty Web Page]

Zhoumeng Lin, BMed, PhD, DABT
Assistant Professor, Toxicology
Dr. Lin’s research is focused on the development and application of physiologically-based pharmacokinetic (PBPK) models. Dr. Lin develops PBPK models for drugs in food-producing animals to predict tissue residues and withdrawal periods. He also applied PBPK models for environmental chemicals and nanoparticles in animals and humans to predict internal target organ dosimetry and to aid risk assessment. [Faculty Web Page]

Brian V. Lubbers, DVM, PhD, DACVCP
Clinical Assistant Professor, Microbiology and Pharmacology
Dr. Lubbers’ primary research interest is in antimicrobial resistance of bacteria of veterinary significance; particularly, the bacterial agents of bovine respiratory disease (BRD) complex. [Faculty Web Page]
Waithaka Mwangi, PhD
Professor, Immunology

Dr. Mwangi’s research is focused on development of subunit vaccines against African swine fever virus (ASFV) and bovine viral diarrhea virus (BVDV). Efforts are also directed at exploiting the recently discovered bovine ultralong antibodies to develop novel antiviral therapeutics. Ultralong antibodies have novel binding mechanisms with unprecedented viral neutralizing capabilities. [Faculty Web Page]

T.G. Nagaraja, BVSc, MVSc, PhD
University of Distinguished Professor of Microbiology

Dr. Nagaraja’s research interest is in the field of gut microbiology of animals, particularly beef cattle. Currently, his research program is focused on preharvest food safety, specifically Shiga toxigenic E. coli, and liver abscesses in beef cattle. In the past, he has worked on the role of microbes in ruminal function and dysfunction, particularly in animals fed high-grain diets. [Faculty Web Page]

Megan Niederwerder, DVM, PhD
Assistant Professor, Virology

Dr. Niederwerder’s research is focused on understanding how the gut microbiome plays a role in outcome following viral respiratory infection in swine as well as the role of feed and feed ingredients in the introduction and transmission of swine viruses. Research projects have included porcine reproductive and respiratory syndrome virus (PRRSV), porcine circovirus type 2 (PCV2), porcine epidemic diarrhea virus (PEDV), African swine fever virus (ASFV), classical swine fever virus (CSFV), and pseudorabies virus (PRV). [Faculty Web Page]

Jessica Meekins, DVM, MS, DACVO
Assistant Professor, Ophthalmology

Dr. Meekins’ current research is focused on evaluating the antiviral effects of naturally occurring compounds on feline herpesvirus-1. She also investigates comparative ophthalmology in exotic/non-domestic animals, establishing normative data for basic ocular diagnostic testing and clinical ophthalmic examination findings in a variety of species. [Faculty Web Page]

Matt Miesner, DVM, MS, DACVIM
Clinical Associate Professor, Livestock Services

Dr. Miesner’s research is focused on bovine lameness, pain management, and disease pathophysiology. [Faculty Web Page]

Timothy I. Musch, PhD, FACSM, FAPS
University Distinguished Professor of Kinesiology, Anatomy & Physiology

Dr. Musch’s research is focused on the mechanisms that contribute to exercise intolerance found in individuals suffering from chronic heart failure (CHF). Dr. Musch’s studies investigate the perturbations produced in skeletal muscle convective and diffusive oxygen transport associated with CHF along with potential therapeutic modalities that may be used in the treatment of this disease. [Faculty Web Page]

J Dylan Lutter DVM, MS, DACVS-LA CERP
Clinical Assistant Professor, Equine Performance Medicine, Surgery, & Rehabilitation

Dr. Lutter’s research involves investigations which may impact the clinical outcomes of musculoskeletal injury, particularly in horses. Specific areas include: in vivo/clinical use of biologic or regenerative therapies, wound healing, MRI of the equine distal limb, tendon biology and healing, rehabilitation therapies, and emergency stabilization of equine fractures. [Faculty Web Page]

Bradley L. Njaa, BSc(hons), DVM, MVSc, DACVP
Professor, Veterinary Anatomic Pathology

Dr. Njaa’s research is focused on naturally occurring diseases in domestic and nondomestic veterinary species. He is interested in infectious diseases, neoplastic disease and diseases involving special senses, particularly disease of the middle and internal ear. [Faculty Web Page]

Megan Niederwerder, DVM, PhD
Assistant Professor, Virology

Dr. Niederwerder’s research is focused on understanding how the gut microbiome plays a role in outcome following viral respiratory infection in swine as well as the role of feed and feed ingredients in the introduction and transmission of swine viruses. Research projects have included porcine reproductive and respiratory syndrome virus (PRRSV), porcine circovirus type 2 (PCV2), porcine epidemic diarrhea virus (PEDV), African swine fever virus (ASFV), classical swine fever virus (CSFV), and pseudorabies virus (PRV). [Faculty Web Page]
Rachel Palinski, PhD  
**Clinical Assistant Professor, Virology and Next-Generation Sequencing**

Dr. Palinski’s research focuses on viral population characterization and ecological factors that drive viral evolution. Her research includes identifying novel or uncommon viruses within livestock to determine the association of the particular microbe to disease. In the future, her research will combine ecological aspects with individual farm microbiomes to create individualized epidemic risk assessments. [Faculty Web Page](#)

Brandon L Plattner DVM, PhD, DACVP, Clinical Associate Professor, Anatomic Pathology, Section head (KSVDL histology and immunohistochemistry)

Dr. Plattner provides pathology services for KSVDL clients (necropsy, biopsy consultation), as well as pathology support for a variety of collaborative research projects. His interests include pathology of the alimentary and hepatobiliary systems, and innate cellular mucosal immunity during infectious disease of cattle. [Faculty Web Page](#)

Roman Pogranichniy, DVM, PhD  
**Associate Professor and Director of Virology and Serology Laboratory**

Dr. Pogranichniy’s research focuses on isolating, identifying and characterizing emerging viruses. He is currently working on an African swine fever biosecurity project in Eastern Europe and building capacity to prevent spreading of this virus in Asia. Dr. Pogranichniy also works with different influenza A viral strains, their response to vaccination, detection of the virus and immune response and the pathogenesis of these and others viruses in animals. [Faculty Web Page](#)

Lisa Pohlman, DVM, MS, DACVP  
**Associate Professor, Director of Clinical Pathology**

Dr. Pohlman’s research focuses on mechanism and classification of canine and feline lymphoma. Identification and characterization of disease in domestic species and improvement of clinical pathology laboratory needs. [Faculty Web Page](#)

David Poole, PhD, DSc  
**University Distinguished Professor of Kinesiology, Anatomy & Physiology**

Dr. Poole’s research focuses on the control of oxygen transport in health and disease such as heart failure, diabetes and cancer. His work addresses muscle function and exercise capacity in diseases where impaired muscle function reduces patient mobility and quality of life. Current projects are developing novel strategies to improve muscle/exercise function through dietary, pharmacological and lifestyle strategies that restore healthy muscle oxygen delivery in these disease conditions. [Faculty Web Page](#)

Kathryn Reif, MS, PhD  
**Assistant Professor, Vector-Borne Diseases**

Dr. Reif’s research is focused on identifying innovative solutions to combat ticks and tick-borne pathogens of medical, veterinary and agricultural importance. Reif Lab research focus areas include: i) bovine anaplasmosis - evaluating existing control measures and developing novel therapeutics to control bovine anaplasmosis; ii) evaluation of therapeutics to mitigate ticks and tick-borne pathogens on companion animals and livestock; iii) surveillance of ticks and tick-borne pathogens; and; iv) developing related outreach programs for public/stakeholder groups. [Faculty Web Page](#)

Lisa Pohlman, DVM, MS, DACVP  
**Associate Professor, Director of Clinical Pathology**

Dr. Pohlman’s research focuses on mechanism and classification of canine and feline lymphoma. Identification and characterization of disease in domestic species and improvement of clinical pathology laboratory needs. [Faculty Web Page](#)

Walter Renberg, DVM, MS, DACVS  
**Professor, Small Animal Surgery**

Dr. Renberg’s research is focused on the musculoskeletal system in dogs. [Faculty Web Page](#)

Amy Rankin, MS, DVM, DACVO  
**Associate Professor, Ophthalmology**

Dr. Rankin’s research is focused on the inhibition of intraocular inflammation. [Faculty Web Page](#)
David G. Renter, DVM, PhD  
MacDonald Professor in Veterinary Medicine, Epidemiology,  
Director Center for Outcomes Research and Epidemiology, CORE  

Dr. Renter’s research emphasizes the application and extension of epidemiologic principles and methods to enhance animal health outcomes, food safety, and the sustainability of food animal production systems. His research is primarily focused on applying epidemiologic approaches to generate industry-relevant knowledge that is used to address complex and contemporary problems in beef cattle production systems. Faculty Web Page

Emily Reppert, DVM, MS, DACVIM  
Assistant Professor, Agricultural Practices  

Dr. Reppert’s research is focused on tick-borne diseases such as Anaplasma phagocytophilum. Her primary clinical research interest is in therapy for the management of urinary disease in ruminants and management of metabolic diseases in small ruminants and camels. Faculty Web Page

Jürgen Richt, DVM, PhD  
Regents and University Distinguished Professor, Eminent Scholar  
Director, Center of Excellence for Emerging and Zoonotic Animal Diseases  

Dr. Richt’s research focuses on emerging zoonotic infections with an emphasis on animal prion diseases, animal influenza, African swine fever, Middle East respiratory syndrome and Rift Valley fever viruses. Dr. Richt studies host-pathogen interactions in various infectious disease models and his work on agents with zoonotic potential led to strategies to identify, control and eradicate such agents. Faculty Web Page

James K. Roush, DVM, MS, DACVS  
Doughman Professor, Small Animal Surgery  

Dr. Roush’s past and current research are focused in the areas of bone healing and blood supply, osteoarthritis, and canine gait analysis. Faculty Web Page

Michael Sanderson, DVM, MS, DACVPM  
Professor, Epidemiology and Beef Production  

Dr. Sanderson’s team focuses on the epidemiology of disease and decreased production in beef operations, and the application of epidemiology and simulation modeling to facilitate decision making. Their research includes: modeling biosecurity practices for beef operations to identify optimal biosecurity and management programs, livestock movement networks and the disease and economic effects of an FMD outbreak in the U.S. Faculty Web Page

Elizabeth Santschi, DVM, DACVS  
Professor, Equine Surgery  

Dr. Santschi’s research is focused on investigating the biochemical causes of, and treatments for, subchondral bone lucencies. Dr. Santschi also investigates the prevalence and causes of stifle osteochondrosis. Faculty Web Page

Thomas Schermerhorn, VMD, DACVIM  
Professor, Jarvis Chair in Veterinary Medicine, Small Animal Internal Medicine  

Dr. Schermerhorn’s research is focused on cellular and molecular endocrinology, especially the study of diabetes mellitus and related metabolic disorders in dogs and cats. Dr. Schermerhorn’s clinical interests include all aspects of canine and feline endocrinology. His major research focuses on the epidemiology, pathology and therapeutic management of feline diabetes. Faculty Web Page

Sarah M. Schneider, DVM, PhD, DACVP  
Assistant Professor, Veterinary Anatomic Pathology  

Dr. Schneider’s interests include cardiomyopathy, oral pathology and neoplastic diseases. She is primarily involved in collaborative research involving animal models of disease and veterinary clinical diseases. Faculty Web Page
Abbie Viscardi, PhD
Research Assistant Professor, Animal Behavior and Welfare

Dr. Viscardi’s research is focused on assessing and managing pain in livestock species. She aims to better understand how animals express and communicate pain, how we can effectively alleviate pain on-farm and methods to refine common husbandry procedures. She is most interested in using non-invasive techniques to assess pain, such as behavior and facial grimace analysis.  

Lihua Wang, PhD
Research Assistant Professor, Virology and Immunology

Dr. Wang’s research is focused on development of novel vaccines and diagnostic assays for high impact swine infectious diseases including classical swine fever (CSF), African swine fever (ASF), porcine reproductive and respiratory syndrome (PRRS), porcine pseudorabies (PPV), porcine circovirus (PCV), and other emerging viral diseases.

Bruce Schultz, PhD
Professor, Epithelial Cell Physiology

Dr. Schultz’s research is focused on understanding the physiological regulation of epithelial ion transport and barrier functions. Dysfunction of epithelial transport mechanisms is associated with pancreatic, renal, intestinal, reproductive and pulmonary disorders. The goal of his research efforts is to achieve a better understanding of epithelial physiology and to develop interventions that prevent or overcome such pathological conditions.

Dana L. Vanlandingham, PhD, MS, FRES
Associate Professor, Arbovirology

Dr. Vanlandingham’s research is focused on the interactions between arboviruses, the mosquito vector, and the vertebrate host. She specifically works on zoonotic arboviruses of medical and veterinary importance.

Jishu Shi, DVM, PhD
Professor, Director, U.S.-China Center for Animal Health

Dr. Shi’s lab is working on novel vaccine and diagnostic strategies that lead to the development of better control and prevention approaches targeting swine diseases that are important for the U.S. and China, including porcine reproductive and respiratory syndrome (PRRS), classical swine fever virus (CSF), porcine circovirus (PCV), African swine fever (ASF) and other emerging viral diseases of swine.

David Upchurch, DVM, MS, DACVS-SA
Assistant Professor, Small Animal Soft Tissue Surgery

Dr. Upchurch’s research is focused on suture biomechanics, cutaneous marginal shrinkage and instructional methods. He also has clinical interests in oncologic surgery, regenerative medicine, and reconstructive surgery.

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Associate Professor, Arbovirology

Dr. Vanlandingham’s research is focused on the interactions between arboviruses, the mosquito vector, and the vertebrate host. She specifically works on zoonotic arboviruses of medical and veterinary importance.

Masaaki Tamura, DVM, PhD
Associate Professor of Anatomy and Physiology

Dr. Tamura, a member of the Johnson Cancer Research Center, aims to find cures for cancers by studying cancer cell-targeted nanoparticle-based gene therapy, metastatic tumor-targeted stem cell therapy, and diet-based alternative medicine for cancer immune therapy/prevention.

Bruce Schultz, PhD
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Nora L. Springer, DVM, DACVP
Assistant Professor, Diagnostic Medicine/Pathobiology

Dr. Springer’s research is focused on the tumor microenvironment, or how cancerous cells can influence non-neoplastic cells and tissues to promote malignancy. Dr. Springer’s studies focus specifically on the role of extracellular matrix remodeling on cancer development, progression, and metastasis.

Abbie Viscardi, PhD
Research Assistant Professor, Animal Behavior and Welfare

Dr. Viscardi’s research is focused on assessing and managing pain in livestock species. She aims to better understand how animals express and communicate pain, how we can effectively alleviate pain on-farm and methods to refine common husbandry procedures. She is most interested in using non-invasive techniques to assess pain, such as behavior and facial grimace analysis.

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Mark Weiss, BS, PhD
Professor, Stem Cell Biotechnology

Dr. Weiss' research is focused on stem cell biotechnology. His lab successfully produced various stem cell lines such as rat embryonic stem cells and cells derived from umbilical cord or other tissues with the intent of using this technology to advance cellular therapy and regenerative medicine. Dr. Weiss also focuses on the mechanisms of pluripotency in rat embryonic stem cells. *Faculty Web Page*

Brad White, DVM, MS
Professor, Production Medicine, Director, Beef Cattle Institute

Dr. White's research program is directed towards cattle production and management, with an emphasis on calf health management. His program focuses on common diseases including bovine respiratory disease and bovine viral diarrhea. Research areas include utilization of production data to improve health decision making and advancing identification methods for illness in both individuals and populations. *Faculty Web Page*

William Whitehouse, DVM, DACVIM
Assistant Professor, Small Animal Internal Medicine

Dr. Whitehouse's research is focused on different aspects of kidney diseases in dogs and cats. His current research is focused on understanding the pathophysiology and improving the treatment of chronic kidney disease and acute kidney injury. *Faculty Web Page*

Raelene M. Wouda, BVSc DACVIM (Oncology)
Assistant Professor, Veterinary Oncology
MANZCVS (Small Animal Medicine)

Dr. Wouda is actively involved in pre-clinical, phase 1, phase 2, and phase 3 clinical trials. Her research interests include the utilization of new and existing chemotherapeutic agents in innovative roles, novel immunotherapeutic approaches, individualized and intensified therapeutic protocols, the development of personalized therapeutic plans, and drug resistance. *Faculty Web Page*