

# *Faculty Research Interests*

College of Veterinary Medicine and Biomedical Sciences  
Texas A&M University

---

---

Veterinary Integrative Biosciences	page 1
Large Animal Clinical Sciences	page 5
Veterinary Pathobiology	page 8
Veterinary Physiology And Pharmacology	page 16
Small Animal Clinical Sciences	page 19

\*Updated August 2009

# Veterinary Integrative Biosciences

## (979) 845-2828

---

**Abbott, Louise C.** -- developmental neurobiology of the mammalian nervous system; neuroanatomy; neurochemistry; specific neurologic disorders including ataxia and epilepsy; developmental neurotoxicology with special interest in mercury toxicity and autism; environmental influences on the pathogenesis of neurodegenerative diseases with special interest in Alzheimer's disease; programmed cell death (apoptosis) in the developing and adult nervous system.

**Arosh, Joe** – central role of prostaglandins on molecular and cellular aspects of reproductive processes, gynecologic diseases and endocrine cancers.

**Banu-Arosh, Sakhila K.** – Endocrine toxicology; endocrine oncology; heavy metal endocrine disruptors on female reproductive tract development and function; vitamin C and nutrioxidants' intervention on heavy metal-induced toxicity; prostaglandin biosynthesis, signaling and transport on mammary gland cancer development.

**Bazer, Fuller W.** (Joint Appointment) -- reproductive physiology; reproductive endocrinology; uterine biology; pregnancy; reproductive immunology; and fetal-placental development.

**Bratton, Gerald R.** -- gross anatomy; neuroanatomy; nutritional influences on lead intoxication; metal effects on reproductive function; localization of central nervous system neurons and their peripheral distribution.

**Budke, Christine**-- Epidemiology; burden of disease indicators; zoonotic diseases (larval cestodes); transmission dynamics of parasitic diseases; international veterinary medicine and public health.

**Burghardt, Robert C.** -- cellular signaling and signal transduction; reproductive physiology; pregnancy and parturition; development/application on non-invasive imaging tools using biosensors and biomarkers; in vitro toxicology.

**Chapkin, Robert S.** (Joint Appointment) -- chemoprevention; dietary effects on chronic inflammation, T-cell biology and colon cancer; plasma membrane microdomain organization and protein trafficking; functional genomics and systems biology.

**Chowdhary, Bhanu** -- comparative genomics of domesticated animals; molecular cytogenetics; equine genome analysis; physical and comparative gene mapping; disease genetics; molecular analysis of equine fertility; functional analysis of the equine genome.

**Cothran, Ernest (Gus)** -- heredity basis of equine congenital defects, interrelationships of inbreeding, genetic polymorphism, and reproductive performance in horses, population genetics of feral horses, comparative aspects of genetics variation in horses under human selection and under natural selection, genetic aspects of captivity. Management of genetic polymorphism in small populations, genetic relationship among domestic horse breeds, changes in gene regulation based upon environmental factors, gene mapping of the horse, gene mapping of the alpaca.

**Dees, W. Les** -- neuroendocrinology; reproductive physiology; puberty and sexual maturation.

**Finnell, Richard H.** (Joint Appointment) -- developmental biology/embryology, gene-teratogen interactions; molecular analyses of genetic diseases and development of animal models of human genetic disorders; molecular dysmorphology; clinical genetics.

**Funkhouser, Norma** (Joint Appointment) -- information management education; organization, retrieval and database searching methods; new technology for information management; computer-aided instruction; web-based instruction/tutorials.

**Gastel, Barbara** -- science journalism; scholarly communication of science; science editing; international science communication; medical communication.

**Geller, Susan C.** (Joint Appointment) -- bioinformatics; statistics; commutative algebra / k-theory / cyclic homology.

**Ing, Nancy H.** (Joint Appointment) -- molecular endocrinology, steroid regulation of gene expression, functional genomics, uterine and testis function.

**Ivanek-Miojevic, Renata.** -- Analytical epidemiology; Mathematical modeling; Spatial epidemiology; Public health; Food safety; Risk assessment; Microarray analysis; and Epidemiology, ecology and evolution of infectious and foodborne pathogens, including antimicrobial resistance.

**Johnson, Greg A.** -- reproductive physiology; molecular, cellular, and physiological mechanisms that influence uterine function, conceptus development, and implantation/placentation in mammals.

**Johnson, Larry** -- toxicology; histology; spermatogenesis; gamete physiology; gene expression of Sertoli cells; aging of the testis; seasonal reproductive changes; infertility in males and promotion of science in youth.

**Klemm, William R.** -- neurobiology; neurophysiology; neuropharmacology; brain mechanisms of catalepsy; electroencephalography and cognition; educational technology.

**Ko, Gladys Y.-P.** -- neuroscience; cell biology; chronobiology; circadian regulation of retina physiology and synaptic plasticity; signal transduction and ion channel modulation; electrophysiology including patch-clamp, intracellular, and extracellular recordings; neuroanatomy including confocal imaging and TEM; neurochemistry; neuropharmacology; molecular biology.

**Li, Jianrong** – mechanisms underlying the effects of neuroimmune molecules in the mammalian central nervous system on oligodendrocyte development, myelination, demyelination and/or remyelination. Interactions among oligodendrocytes, microglia, neurons and astrocytes under physiological and pathophysiological conditions, and identification of key targets for therapeutic approaches.

**Lupton, Joanne** (Joint Appointment) -- cell biology; digestive anatomy; physiological effects of dietary fibers; serum lipids; colonic physiology and morphology.

**McDonald, Thomas** (Joint Appointment) -- complex mixture interactions; environmental sampling and remediation.

**McMurray, David N.** (Joint Appointment) -- cell biology; immunology; infectious disease resistance; effect of nutrition on immunity; and experimental tuberculosis.

**Murphy, William** -- Feline genomics; mammalian comparative genomics and genome evolution; mammalian molecular phylogenetics; sex chromosome genes and hybrid sterility.

**Norby, Bo** -- analytical epidemiology; epidemiology of disease detection and surveillance; risk communication; evolutionary microbiology/biology; tuberculosis and paratuberculosis in cattle; foreign animal and zoonotic disease defense (Biodefense); evolution, ecology and transmission of antimicrobial –resistant bacteria in animal and human populations.

**Phillips, Timothy D.** -- food safety; molecular toxicology; elucidation of fundamental chemical mechanisms of toxic action/interaction of food-borne carcinogens; mutagens; and developmental toxicants; and development of methods to detect and detoxify foodborne and environmental toxins.

**Pine, Michelle D.** – neurotoxicology; neuroendocrinology; the mechanism underlying the effects of pesticides (particularly synthetic pyrethroids) on neurodevelopment.

**Porter, Weston W.** -- role of transcription factors in mammary gland development and breast cancer; stromal-epithelial interactions; environmental influences on development and breast cancer; mouse models

- Ramanathan, Balaji** -- Antiviral immunity, Innate immunity, Cancer, Drug discovery (Nanotechnology) and Stem cell research
- Raudsepp, Terje** -- reproduction genomics (horse); organization, function & evolution of mammalian sex chromosomes; animal cytogenetics & gene mapping.
- Reagor, John C.** (Joint Appointment) -- clinical toxicology; nutritional toxicology; metal toxicology.
- Russell, Leon H.** -- epidemiology; medical mycology; zoonotic diseases (rabies); food toxicology.
- Samollow, Paul B.** - comparative functional genomics and genome evolution of vertebrates; genome annotation; linkage and physical map construction; mapping of genes (QTL) influencing physiologic and health-related traits; sex-specific patterns of meiotic recombination; genetic determinants of environmental carcinogenesis.
- Skow, Loren C.** -- Comparative genomics of mammals with emphasis on organization and evolution of the mammalian genome; molecular analysis of the major histocompatibility complex of hoofed animals; genetic mechanisms of inherent resistance to infectious diseases.
- Slater, Margaret R.** -- epidemiology; nutrition and chronic disease in companion animals; human-animal interaction; pet overpopulation; free-roaming dog and cat issues and control.
- Spencer, Thomas E.** – (Joint Appointment) reproductive biology; physiological genomics; molecular, cellular, and physiological mechanisms that regulate development and function of the uterus and placenta in mammals.
- Tiffany-Castiglioni, Evelyn** -- cell biology; cellular mechanisms of neurotoxicity; functions of neuroglia; astroglial response to disease and trauma.
- Welsh, C. Jane** -- neuroimmunology, neurovirology, psychoneuroimmunology, cell biology, viral infections of the central nervous system, animal models of multiple sclerosis, autoimmune diseases, effects of stress on viral pathogenesis, mechanisms of virus-induced apoptosis in the central nervous system, cerebrovascular endothelial cells and blood-brain barrier function, therapies for multiple sclerosis, factors involved in susceptibility to multiple sclerosis.
- Welsh Jr., Thomas H.** (Joint Appointment) -- endocrine physiology; investigate growth; stress; and reproductive biology; especially interactions of adrenal; reproductive and immune systems.

# Veterinary Large Animal Clinical Sciences

## (979) 845-3541

---

**Arnold, Carolyn** – Soft tissue surgery with an emphasis in upper airway and reproductive surgery, wound healing and tissue engineering.

**Bissett, Wesley T.** – Investigation of the spatial distribution of adverse effects associated with exposure to industrial pollutants with an emphasis on genotoxicity in food animals and marine species. Investigation of adverse responses in sentinel species in close proximity to industrial and Superfund sites.

**Blanchard, Terry L.** – Stallion and mare fertility and infertility.

**Brinsko, Steven P.** – Equine reproduction; semen lipids; sperm membrane function; and semen preservation.

**Carter, G. Kent** – Equine lameness.

**Chaffin, M. Keith** – Equine internal medicine; equine respiratory disease; equine pediatrics; equine ultrasonographic imaging; Rhodococcus equi foal pneumonia; and equine infectious disease.

**Cohen, Noah D.** – Equine epidemiology; equine infectious diseases; clinical epidemiology; genetic and molecular epidemiology.

**Dabareiner, Robin M.** – Joint pathology; degenerative joint disease; navicular diseases; corrective shoeing; microvascular pathology; equine lameness and gastrointestinal disease, i.e., colic; osteoarthritis; and western performance events.

**Davidson, John M.** – Beef Cattle Production Medicine, Diseases affecting beef cattle fertility, and Recruitment and Retention of Rural Practitioners.

**Dinges, Lewis R.** – Beef cattle production medicine.

**Easterwood, Leslie** – Skin tumors in horses, and equine ophthalmology.

**Eichelberger, Bunita** – Musculoskeletal MRI, musculoskeletal ultrasound, interventional radiology.

**Faries, Jr., Floron C.** – Clinical epidemiology, biosecurity, bovine parasitology, beef herd health management, and veterinary science youth career development.

**Gold, Jenifer R.** – Equine neonatology-specifically sepsis and the HPA axis; equine respiratory disease, equine immunology, emergency medicine and critical care.

**Griffin, Cleet** – Topics and clinical problems related to equine dentistry.

**Hardy, Joanne** – Gastrointestinal disorders in horses. Equine emergency and critical care. Equine guttural pouch mycosis.

**Hooper, R. Neil** – Soft Tissue Surgery.

**Lawhorn, D. Bruce** – Swine biologic safety and efficacy testing; new swine surgical techniques (research swine, show swine, pet pigs, potbellied pigs); and swine as biomedical models for human diseases.

**Love, Charles** – Equine reproduction; sperm function; evaluation of fertility; and flow cytometry.

**Martin, Michael T.** – Radiographic survey of dental disorder in miniature horses.

**Mays, Glennon B.** – Infectious disease epidemiology in livestock, theriogenology in livestock, and equine dentistry.

**Moyer, William A.** – Racetrack safety and design; foot problems and shoeing; musculoskeletal injuries; effects of training on injury.

**Mulon, Pierre-Yves** – Bovine orthopedics, minimally invasive surgery, teats surgery.

**Norman, Tracy** – Equine internal medicine; equine diagnostic ultrasound.

**Posey, R. Dan** – Beef cattle production medicine; issues associated with sustainable agriculture; instruction and teaching of non-technical competencies, and outcome assessment in teaching.

**Rakestraw, P.C.** – Post-operative complications of equine colic; gastrointestinal motility; postoperative ileus; upper airway disease in horses; equine pharyngeal cicatrix syndrome; wound healing in horses.

**Romano, Juan** – Pregnancy diagnosis in ruminants and pregnancy loss in ruminants.

**Roussel, Allen J., Jr.** – Paratuberculosis; gastrointestinal motility of domestic animals.

**Schmitz, David G.** – Diagnostic ultrasonography.

**Spaulding, Kathy** – Abdominal ultrasound: vascular anomalies; gastrointestinal abnormalities; biliary disease.

**Swor, Tamara** – Equine gastrointestinal and orthopedic surgery; equine emergency and critical care.

**Thompson, James A.** – Environmental health, reproduction and cancer.

**Varner, Dickson D.** – Fertility probes for stallions; in-vitro preservation of equine spermatozoa; capacitation of equine spermatozoa; assisted reproductive techniques; and subfertility in stallions.

**Walker, Michael A.** – Radiation oncology.

**Washburn, Kevin E.** – Developing and investigating the disposition of extra-label antimicrobials in small ruminants; pharmacokinetics of respiratory antimicrobials; comparison of different treatment modalities for small ruminant caseous lymphadenitis; the value of the HI test for diagnosis of small ruminants with caseous lymphadenitis; diagnosis of transmission of CAEV via colostrum; and antemortem diagnosis of malignant lymphoma in cattle. Investigating infection of swine with *Mycobacterium avium* subspecies paratuberculosis in attempts to create an animal model for human inflammatory bowel disease.

**Watkins, Jeffrey P.** – Equine fracture management including: intramedullary interlocking nail fixation; fracture biomechanics; biomaterials; implant design and testing; arthrodesis techniques; management of infection; and orthopedic applications of stem cell therapy.

**Young, Ben** – Small animal abdominal ultrasonography; MRI of neurologic disease.

# Veterinary Pathobiology

## 979-845-5941

---

**Adams, L. Garry** Select agents – Intracellular bacterial pathogens - Brucella, Mycobacterium, Salmonella and Mycoplasma; infectious diseases; molecular mechanisms of host-pathogen interaction in immunity and disease; intracellular pathogens; molecular basis of disease resistance; macrophage function; molecular pathogenesis; comparative host-pathogen genomics, transcriptomics and proteomics; pathomics and interactomics; food animals; diagnostics; vaccines: therapeutics; biodefense; homeland security; BSL3 and BSL3Ag.

**Ball, Judith M.** Our studies focus on the molecular and biochemical aspects of viruses, interactions of viral proteins with host cell moieties and intracellular transport. The overall goal of our work is to identify unique therapeutic targets for viral intervention. We employ a multitude of techniques such as yeast two-hybrid assays, laser-scanning confocal microscopic techniques (single and multiphoton), synthetic peptide chemistry, protein analyses and mutagenesis studies. Our primary interest is rotavirus, the single most important cause of pediatric, life-threatening gastroenteritis that annually claims ~610,000 young lives worldwide and results in hospitalization of 1 in 60 children in the U.S. at an annual cost of one billion dollars. We also study other viral systems that impact human and animal health with a focus on dissecting the association viral proteins with plasma membrane microdomains, such as caveolae.

**Bazer, Fuller W.** Reproductive biology with emphasis on uterine biology and pregnancy. Mechanisms of action of pregnancy recognition signals from the conceptus to the maternal uterus, including interferon tau and estrogen from ruminant and pig conceptuses, respectively, are studied at the molecular and cellular levels. The roles of uterine secretions as transport proteins, regulatory molecules, growth factors and enzymes and endocrine regulation of their secretion is another major research interest. The endocrinology of pregnancy, especially the roles of lactogenic and growth hormones in fetal-placental development and uterine functions are being studied. The mechanism(s) of action and potential therapeutic value of conceptus interferons and uterine-derived hematopoietic growth factors are areas of research with both pigs and sheep as models for human disease.

**Berghman, Luc** Major long-term goals are (1) to acquire fundamental new knowledge of avian immune system and (2) to apply this new knowledge toward the development of immunobiotechnological tools. Basic avian immune studies include the study of cellular and humoral interactions, especially those of immuno-neuroendocrine nature, in the bursa of Fabricius, the thymus and secondary immune organs of the chicken. This involves immunohistochemical microanatomical studies and the study of gene expression profiles. Immunobiotechnological applications include the development of monoclonal antibodies, polyclonal antibodies and chicken egg yolk antibodies for diagnostic, prophylactic and therapeutic purposes. Current projects feature the development of antibodies for the prevention of invasion and/or persistence of enteric pathogens in poultry, and the development of immunodiagnostic and analytical tools for the detection and identification of avian viruses and other antigens.

**Brightsmith, Donald J.** Avian diseases; avian ecology; geophagy (consumption of soil); avian conservation; disease threats from the live bird trade; diets of wild and captive exotic birds; role of infectious diseases in wild and endangered bird populations. Specialization in psittacines (parrots, macaws, parakeets and allies).

**Caldwell, David J.** Avian immunology; gut immunology in commercial poultry; immunopotential of the innate immune system in poultry; immunity to important poultry pathogens such as *Salmonella* and *Coccidia*.

**Clubb, Fred** Electron microscopic evaluation of myocardial and renal biopsies; qualitative and quantitative evaluation of implantable cardiovascular devices for nonGLP and GLP preclinical trials.

**Conover, Gloria M.** Our research is focused on the cell biology of muscle disease. Mutations in desmin have been identified in humans as causative for dilated and restrictive cardiomyopathies. Our goal is to decipher the molecular and regulatory mechanisms underlying how inherited single missense mutations in desmin lead to cardiac and skeletal muscle dysfunction. In particular, we are interested in studying the effect that these mutations have on sarcomere protein function and actin cytoskeletal dynamics. We use advanced cell biological and biochemical approaches to investigate the histological, physiological and ultrastructural impact that these mutations confer in live muscle cells.

**Corapi, Wayne V.** Diagnostic pathology and infectious diseases of domestic animals, particularly viral diseases and the immune response to viral infections.

**Craig, Thomas M.** Primary interest is in the epidemiology and control of internal parasites of grazing animals, including improved diagnostics, evaluation of and sustainable use of anthelmintics. Anthelmintic resistance is an increasing problem. Identifying the problem before it occurs by looking at both the worm and the hosts are important aspects of this research. Exploitation of the parasite at times of vulnerability by management is an area of interest. Research in arthropod borne protozoan infections including pathogenesis and the epidemiology of parasites of man and domesticated animals is also something I do.

**Criscitiello, Michael** I am interested in diverse mechanisms by which adaptive immunity can be mediated: novel receptors, novel cells, novel lymphoid architectures, novel paratopes and novel systems for repertoire generation and selection. These have been devised by natural selection and battle-tested in the myriad of vertebrate adaptive immune systems. By studying unconventional comparative models such as shark and frog, hypotheses of immune system origins and natural history are tested while discovering new ways of achieving lymphocyte repertoires that protect against pathogens while limiting autoimmunity and hypersensitivity.

**Cyr, Tracy** As a Med/Vet Entomologist, my research interests focus on vector borne diseases affecting humans and animals. I especially enjoy involving students in short-term directed scientific research projects with both field and lab components. My research studies include avian hemoprotozoan parasites and their insect vectors, epidemiology of fly vectors of EHD in white-tailed deer, and the utilization of molecular methods to identify flies of forensic importance.

**Dai, Susie Y.** My research interests focus on several aspects: 1) Proteomics and interactomics in cancer and bioenergy. 2) Protein structure dynamics and structure-function relationship study with a focus in nuclear receptor and cellulase enzymes. 3) Biomonitoring programs which include analyzing veterinary drugs, mycotoxins, etc., in feed and food. We utilize a variety of techniques including shotgun proteomics, hydrogen deuterium exchange mass spectrometry and mass-spec based multiple target

analysis. The major goals of the lab are: 1) Establish systems biology approaches to characterize and elucidate protein-protein interaction and mechanistic study of protein functions with the ultimate goal for novel therapies in cancer and breakthroughs for bioenergy production. 2) Develop methods for food and feed safety monitoring programs in a high throughput, multiple residue based fashion.

**Davis, Donald S.** Infectious and parasitic diseases of native, exotic and/or feral wildlife captive or free-ranging, particularly those shared with traditional domestic livestock, farmed/ranched ungulates, and/or humans, with emphasis on experimental, controlled infections to evaluate improved diagnostics vaccines suitable for wildlife, and the systems to deliver chemotherapeutic agents or vaccines to wildlife. Development of handling and restraint facilities appropriate for captive wildlife, and natural (genetic) disease resistance in wildlife. Brucellosis, tuberculosis, anthrax, hemaprotozoon, trematodes, and nematodes.

**Derr, James N.** Molecular genetics of mammals including; characterization of genetic traits and disease, population and conservation genetics, and the evolution of genes and genomes at the nucleotide level in domestic and wild populations.

**Dindot, Scott V.** My laboratory is interested in understanding the epigenetic and genetic mechanisms of gene regulation and their role in development and disease. We utilize genome-wide epigenomic and genomic profiling approaches to identify regulatory elements within the genome that are essential for proper gene expression. We combine these approaches with genetic analyses in mouse and fruit fly model systems to further elucidate the functional interplay between epigenetics, genetics, and gene regulation. In particular, my laboratory is interested in the study of genomic imprinting in domestic animals and model organisms. The long-term goals of my laboratory are to identify variable or dysregulated epigenetic modifications that are causal for phenotypic variation, disease, and disease susceptibility. Other work in my laboratory is to develop customized genomic tiling arrays to investigate the role of gene copy number variation in phenotypic variability in domestic animals and to identify pathologic rearrangements in the genomes of domestic animals to develop alternate models for human genetic conditions.

**Edwards, John F.** Diagnostic pathology, infectious diseases of domestic livestock particularly of cattle and horses; in utero teratogenicity (viral and toxic), pathology of the reproductive system and infertility; diseases of the fetus and neonate; food safety of red meat species, pathology of animals at slaughter.

**Ficht, Thomas A.** Mechanisms of invasion and survival of intracellular bacteria within host cells; study of bacterial and host gene expression during infection and its use in the development and application of biosignatures; development of improved vaccines using genetic approaches to attenuate survival and identify therapeutic targets; development of subunit vaccines. Characterization of bacterial population structures through genomic analysis.

**Giri, Dipak** My research interests focus on the human equivalent of animal diseases with an objective of establishing animal models; diagnostic pathology of domestic animals with special emphasis on neoplasms; safety and efficacy of xenobiotics, recombinant proteins, synthetic peptides, mutant bacteria and small molecules; histological evaluation of genetically modified mouse; tumor markers and metastasis; epithelial-mesenchymal interaction and the role of cytokines, polypeptide growth factors and their receptors in tumor growth. Collaborative research: assessment of skeletal and visceral metastases in xenograft and orthotopic models and the role of molecular therapeutics in containing distance metastasis.

**Halbert, Natalie D.** Population genetics and genomics of wild and domesticated species; introgressive hybridization and the detection of interspecies DNA introgression; effects of wildlife management on genetic variability and genome conservation; sources and patterns of genetic variation underlying disease susceptibility.

**Holman, Patricia J.** Molecular mechanisms driving interactions between *Babesia* spp. and their hosts; characterization of potential vaccine or drug targets for babesiosis; molecular phylogeny of the hemoparasites; genetic basis of bovine resistance/susceptibility to ectoparasitism.

**Hong, Don** Genetic basis of retinal degeneration; molecular and cellular basis of pathogenesis caused by mutations in retinal degenerative disease genes; develop gene therapy through the genetic and cellular understanding of retinal biology and disease pathogenesis.

**Jeter, Elizabeth** Animal Shelter Medicine Participates in the veterinary student rotations at the Brazos Valley Animal Shelter.

**Johnson, Mark C.** Professional courses in pathology and service/teaching responsibilities including clinical pathology hospital service. Diagnostic and investigative immunopathology with emphasis on immunohistochemistry and immunocytochemistry interpretations for characterization of lymphoma and other neoplasia.

**Khare, Sangeeta** Intracellular pathogens and its cellular and molecular interaction with host (using *in vivo* and *in vitro* models) by genomics and transcriptomics approaches. Modulation of host immune responses by natural immunomodulator/vaccination strategy. Genetic diversity within *Mycobacterium avium subsp. paratuberculosis* and new approaches for molecular diagnosis of *Mycobacterium avium subsp. paratuberculosis*. Involvement of *Mycobacterium avium subsp. paratuberculosis* in Crohn's disease.

**Kier, Ann B.** Understanding the actions of intracellular lipid binding proteins in fat and carbohydrate metabolism: using biochemical, structural and molecular biological approaches, how these proteins affect lipid and sugar absorption and metabolism, and how they may serve as ligands for second messengers or activators for nuclear transcription factors. As well as *in vitro* studies, fat and sugar absorption, trafficking, and pathology are studied in genetically altered mice over expressing the respective proteins or in gene deleted mice in which these proteins are not expressed. Collaborative research: pathology of transgenic mice.

**Lawhon, Sara** My work seeks to understand, on a molecular level, the interactions between the intestinal pathogen, *Salmonella enterica*, and mammalian hosts. I am particularly interested in how *Salmonella* spp. regulate their genes in response to environmental signals present in the gastrointestinal tract, the pathogenic mechanisms by which *Salmonella* spp. induce enteritis and diarrhea in mammalian hosts, and how the host responds to *Salmonella* infection. I am also interested in how *Salmonella* spp. survive in the external environment and are transmitted within populations of cattle and other mammals.

**Leibowitz, Julian L.** Replication and gene expression of coronaviruses, particularly mouse hepatitis virus (MHV) and the SARS coronavirus; the structure and function of the MHV and SARS coronavirus untranslated regions (UTRs); the interaction of MHV and SARS coronavirus UTRs with host cell proteins; virus-host interactions; molecular pathogenesis of MHV induced hepatitis, demyelination (a model of multiple sclerosis), and pneumonia (a model for SARS); platforms for the development of anti-virals for SARS coronavirus; intracellular signaling and patterns of gene expression during coronavirus infection.

**Libal, Melissa C.** Epidemiology of infectious disease, antimicrobial sensitivity testing, bacterial antimicrobial resistance.

**Lupiani, Blanca** Research in my laboratory focuses on the development of immunoassays for the early detection and rapid subtyping of AI viruses. We also carry out AI virus and avian paramyxovirus surveillance in wild waterfowl at wintering grounds of the Texas Coast. The viruses isolated are characterized at the molecular level and the data obtained used for epidemiological studies. Another aspect of my research includes the study of molecular mechanisms of pathogenesis of avian influenza (AI) viruses. Using reverse genetics, specific mutations are introduced in the AI genome in order to study their role in virus pathogenesis as well as to determine gene function. Using genomic approaches the host/virus interaction is also being studied.

**Mansell, Joanne** Comparative pathology with particular interest in dermatopathology. The effects of systemic disease on skin. The use of immunohistochemistry in neoplastic and inflammatory skin disease.

**Mora, Miguel** My main research area is in wildlife toxicology. My laboratory conducts basic and applied research on the effects of contaminants on animal populations, with particular emphasis on birds. We conduct field and laboratory studies to determine the effects of persistent bioaccumulative toxicants, metals and other environmental pollutants on wildlife.

**Musser, Jeffrey** Dairy production medicine, mastitis prevention and control, and quality milk production; pharmacokinetics in exotic and food animals and drug residue prevention.

**Mwangi, Waithaka** Research focuses on methods to improve vaccine efficacy in livestock and humans. Studies are primarily directed at optimizing *in vivo* antigen presentation by dendritic cells following immunization using DNA and live vaccines. Evaluating defined dendritic cell activation factors for their potency in enhancing vaccine immunogenicity in an outbred species model. Strategies for induction and maintenance of memory cellular immune responses in outbred species are also being evaluated. Defining key molecular processes involved in the development and regulation of innate immunity and the influence of these processes on the development of adaptive immune response. Interaction between dendritic cells and food animal pathogens, especially zoonotic, is an area under development and is expected to define correlates of protection needed for vaccine design.

**Nabity, Mary** Renal pathology and its relation to the urine proteome: evaluation of changes in urine proteins with naturally progressive renal disease, and identification of novel clinical biomarkers for early detection and progression of renal disease.

**Omran, Tawfik** Immunopathogenesis and host immune response to infectious and noninfectious disease; signal transduction in inflammation. Specific interests include Lyme Disease (*Borrelia burgdorferi*) infection, pathogenesis, and vaccine studies in humans and animal models.

**Osterstock, Jason** Veterinary epidemiology with emphasis on beef cattle production systems. Specific research areas include epidemiology and familial aggregation of paratuberculosis in beef cattle, genetic resistance to infectious disease, microbial ecology in intensive animal agriculture, and analytical epidemiology including application of hierarchical models to describe risk factors for infectious disease in ruminants.

**Parr, Rebecca** Rotavirus and host protein: protein interactions that are involved in the intercellular movement of viral proteins and their biological significance. Identification of tissue-specific host genes that are differentially regulated during a rotavirus infections. Morphogenesis of rotavirus interspecies strains focusing on the protein-protein interactions of viral proteins that affect the emergence of the reassorted rotavirus strains that are virulent in new hosts.

**Payne, Susan** Molecular aspects of retroviral replication, pathogenesis, and evolution focusing on equine infectious anemia virus as a model system. Specific studies include: evolution of virulence during rapid virus passage, modification of cell signaling pathways mediated by viral glycoproteins, effects of proinflammatory cytokines on virus replication and disease, detailed mapping of EIAV virulence determinants.

**Pool, Roy** Histopathologic diagnosis and investigations into the pathogenesis of spontaneous bone and joint diseases of domestic mammals with special interest in the diagnosis of bone and joint tumors and in the diagnosis and pathogenesis of musculoskeletal disorders of athletic horses.

**Porter, Brian F.** Comparative neuropathology; diseases of special interest include necrotizing meningoencephalitis of pug dogs and G<sub>M2</sub> gangliosidosis in Jacob sheep; wildlife disease and environmental conservation.

**Reddy, Sanjay** The long-term goal of my laboratory is to understand the molecular basis of pathogenesis of Marek's disease virus (MDV), a potent oncogenic herpesvirus that causes T-cell tumors in chickens. MDV codes for a protein (Meq), which shares significant resemblance with the Jun/Fos family of transcriptional factors. We have shown that this gene plays a critical role in latency and transformation of T-lymphocytes. Understanding the basic mechanism of viral pathogenesis will aid in the development of improved vaccine. We are also interested in other important poultry disease like avian influenza.

**Rice-Ficht, Allison C.** Microencapsulation research and vaccine delivery vehicles; use of proteins and protein composites in controlled release for vaccines and pharmaceuticals. Mechanisms of protein folding directed by alpha crystallins and other small heat shock proteins. Mechanisms of genetic polymorphism and diversity among *Mycobacterium avium* paratuberculosis isolates; innate immunity and host gene expression in response to paratuberculosis infection.

**Rivera, Gonzalo M.** The long-term goal of our research is to understand how extracellular signals control actin dynamics and cell motility. We are particularly interested in regulation mediated by signals that alter tyrosine phosphorylation and inositol phospholipids. Current research projects are aimed at elucidating the role of Src homology 2 (SH2) and SH3 domain-containing adaptor proteins in actin-driven protrusion formation, adhesion turnover and cell migration. These adaptors can bind tyrosine phosphorylated proteins *via* SH2 domain-mediated interactions and engage, through their SH3 domains, proline-rich effectors involved in cytoskeletal remodeling. It is hypothesized that the SH2/SH3 domain-containing adaptors play a critical role in cell migration by modulating, in space and time, the activation of key effectors involved in protrusion and adhesion dynamics. Our recent data also suggest that the SH2/SH3 domain-containing adaptors may be a critical link between signaling mediated by tyrosine phosphorylation and inositol phospholipids to the actin cytoskeleton. To test these hypotheses we employ a combination of genetics, cell biology and proteomic approaches coupled to high resolution imaging of living cells.

**Russell, Karen E.** Platelet pathophysiology and the interaction of platelets with infectious agents, with an emphasis on the thrombocytopenia associated with Equine Infectious Anemia Virus. Investigation of

platelet activation markers in veterinary species. Investigation of total and free (ionized) magnesium concentrations in veterinary species.

**Scanlan, Charles M.** Ecology and pathogenesis studies of selected foodborne pathogens of food-producing animals and poultry and their potential role in human foodborne infections. Specific pathogens include selected *Escherichia coli* and *Salmonella* serovars, *Campylobacter jejuni*, *Clostridium difficile* and *Clostridium perfringens*.

Investigations with a defined porcine culture with 15 bacterial species to prevent enteric bacterial infections in neonatal piglets are being conducted. These investigations are a component of the commercialization process for this product.

**Seabury, Christopher M.** Mammalian genetics, with emphasis on bovine and cervid genomics, population genetics, and animal disease genomics; utilization of population and quantitative genetics to elucidate host loci and relevant variation influencing differential susceptibility to disease among mammalian species.

**Smith III, Roger** Application of flow cytometry to study of animal disease and clinical veterinary medicine; core flow cytometry laboratory.

**Snowden, Karen F.** Parasites of public health importance, host-parasite interactions, development of animal models for the study of parasitologic diseases and treatments, and development of molecular and immunologic methods for parasitologic diagnosis.

**Steiner, Jörg** Studies in small animal and comparative gastroenterology as it relates to etiology, pathophysiology, diagnosis, and treatment of gastrointestinal disorders, using technologies such as protein purification, immunoassay development and validation, molecular genetics, and proteomics.

**Stoica, George** Mechanism(s) of retro viral-induced neurodegeneration. Pathogenesis of brain and bone metastases of mammary gland tumors; application of flow cytometry in the study of tumors; lectin and immunohistochemistry; chemical carcinogenesis; animal models for retro virus-induced neoplasia. Genetic alterations in tumors of the nervous system. Investigation into the mechanism(s) of neurodegeneration associated with Ataxia telangiectasia disease in a mouse animal model. Application of non-invasive technologies in biomedical science. Use of molecular markers in non-invasive optical imaging technologies.

**Tizard, Ian R.** Comparative avian and mammalian immunology and the evolution of the immune system. Avian diseases. Avian phylogeny. Role of infectious diseases in wild and endangered bird populations.

**Waghela, Surya** Immunoparasitology; infectious diseases; emerging and foreign animal diseases, especially tick-borne diseases; use molecular biology techniques to develop better diagnostic tests and immunogens for infectious diseases in ruminants of tropical areas of the world; development of biopharmaceuticals and biosensors; engineer recombinant antibodies for diagnosis and prevention of infectious diseases.

**Wagner, G. Gale** The molecular basis of virulence of protozoal parasites, including identification of functional antigens for serodiagnosis and immunization. Host-parasite interrelationships, especially the

role of the vector (if involved) in promoting infection, and in the prevalence and incidence of infections in areas of low vector populations.

**Weeks, Bradley R.** Diagnostic anatomic pathology; collaborative research of inflammatory and neoplastic gastrointestinal disease, and cardiovascular disease. Veterinary medical education, particularly general pathology.

**Wells, Gregg B.** Role of protein structure in disease, particularly in neurological disease; structure and function of the superfamily of neurotransmitter-gated ion channels that includes nicotinic acetylcholine, serotonin 5HT<sub>3</sub>, glycine, and GABA<sub>A</sub>,C receptors from eukaryotes and prokaryotes; interpreting electrophysiological properties of ligand gated ion channels in terms of structure and thermodynamics; computational models of functions of mechanotransduction channels and calcium and potassium ion channels to explain electrophysiological function of cochlear hair cells; clinical neuropathology.

**Welsh, C. Jane** Mechanisms by which viruses cause autoimmune diseases. Multiple sclerosis (MS) and Theiler's virus-induced demyelination (TVID) as a model of MS. Blood-brain barrier function. The role of stress in the neuropathogenesis of TVID. Novel therapies for the treatment of MS.

**Womack, James E.** Comparative mammalian genomics with emphasis on bovids and laboratory animals. Study of evolution of gene families and genomic variation underlying disease resistance. Investigation of genetic mechanisms in innate immunity with focus on livestock, select agents, and agricultural biosecurity.

**Zhu, Guan** Molecular biology, biochemistry and pathogenesis of parasitic protists; biosynthesis and metabolism of primary and secondary metabolites (lipids, carbohydrates, and polyketides, etc.) in apicomplexan parasites (*Cryptosporidium*, *Eimeria* and *Toxoplasma*); molecular interactions between parasites and host cells; DNA replication and regulations associated with the complex life cycle of apicomplexans; discovery and validation of molecular targets for the drug development against parasites; molecular phylogeny and evolution of apicomplexans.

**Zimmer, Danna** Mammalian intracellular calcium signal transduction pathways and their role in the pathobiology of neurological disorders and cancers; molecular mechanisms and evolution of calcium receptor protein function; development and characterization of genetically modified mouse models.

# Veterinary Physiology and Pharmacology

## (979) 845-7261

---

**Adams, H. Richard** -- cardiovascular pharmacology and pathophysiology of circulatory shock

**Bailey, E. Murl** -- toxicology; veterinary toxicology; toxic plants; wildlife, and environmental toxicology; anesthesiology; pharmacology; experimental surgery; clinical medicine; emergency medicine, bioterrorism, weapons of mass destruction

**Blue-McLendon, Alice** -- veterinary physiology, avian reproductive physiology, medicine of exotic animals, management of exotic animals teaching and research projects

**Cudd, Timothy A.** -- reflex control of endocrine and cardiovascular systems in the adult and fetus; control of the timing of parturition; fetal alcohol syndrome; eicosanoids in the brain

**Fajt, Virginia** -- clinical pharmacology, antimicrobial therapy and dose design, pharmacokinetics and pharmacodynamics, food animal therapeutics, evidence-based medicine, teaching and outcomes assessment in pharmacology

**Golding, Michael C.** -- epigenetic mechanisms that control retroviral elements and other parasitic DNA within the mammalian genome; applications using retroviral vectors to make transgenic animals; function of non-coding RNAs.

**Han, Guichun** -- Cardiovascular physiology; vascular physiology and pharmacology, especially signaling pathways for estrogen and selective estrogen receptor modulator (SERM) effects on coronary artery; molecular mechanisms of estrogen receptors in vascular remodeling and hypertension.

**Heaps, Cristine** -- Cardiovascular physiology and pathophysiology; effects of coronary artery disease and exercise training on smooth muscle and endothelial function in the coronary circulation

**Herman, James** -- evaluation of student and instructor performance; optimization of curricula and the learning environment; modeling behavior of complex systems; application of technology to the classroom

**Hinrichs, Katrin** -- equine reproductive physiology; oocyte maturation; fertilization; nuclear transfer; early developmental biology of equine embryos; and assisted reproductive techniques

**Hood, David M.** -- physiopathology of the digital cutaneous circulation

**Hunter, Jon F.** -- experiential learning in the physiology laboratory teaching environment; preparing undergraduate students for professional and graduate programs and careers in the allied health professions; development of products and the application of technology to enhance teaching and learning

**Ivanov, Ivan V.** -- genomic signal processing and mathematical modeling of genetic regulatory networks

**Jones, Daniel H.** -- veterinary and environmental toxicology

**Kraemer, Duane C.** -- gamete and embryo physiology; embryo transfer, cloning, genetic engineering of mammals; preservation of endangered animals; contraception in animal pests

**Laine, Glen A.** -- emergency and critical care medicine in trauma patients; biophysics and bioengineering; quantitative analysis of biological systems; fluid resuscitation; abdominal compartment syndrome; myocardial and pulmonary edema; cardiopulmonary bypass; lymphatic function; edema formation and interstitial fibrosis

**Long, Charles** -- developmental biology, gamete and embryo physiology, embryonic stem cells, assisted reproductive technologies, animal transgenics, somatic cell nuclear transfer, epigenetics and control of gene expression, RNA interference

**Quick, Christopher M.** -- cardiovascular engineering, modeling and simulation; interstitial fluid balance; lymphatic function, arterial hemodynamics and pulse wave phenomena; coordination of vascular adaptation in vascular networks.

**Safe, Stephen H.** -- toxicology and molecular biology of estrogenic and antiestrogenic compounds; molecular mechanisms of estrogen receptor and Ah receptor action and their crosstalk in breast cancer cells, PPAR $\gamma$  agonists and inhibition of cancer cell growth

**Sayes, Christie M.** -- physicochemical characterization of nano-scale materials and bioavailable metals; in vitro and in vivo toxicological profiling of nanomaterials; environmental health and of safety of industrially-relevant and consumer-based particles; potential medicinal applications of nano-bio conjugates

**Schroeder, Friedhelm** -- intracellular lipid transfer proteins; lipid metabolism; multiphoton imaging of intracellular lipid transport and targeting in living cells and tissues of gene targeted animals

**Scott, Maya** -- clinical pharmacology; therapeutic drug monitoring; pharmacology instruction; small animal therapeutics; adverse drug events; in vitro-in vivo correlation of drug-induced toxicity

**Stallone, John** -- vascular physiology and pharmacology; endocrinology; hypertension; gonadal steroid hormone regulation of vascular function, especially eicosanoid and nitric oxide interactions between vascular smooth muscle and endothelium

**Stewart, Randolph** -- cardiovascular physiology; lymphatic function; microvascular physiology; interstitial and cavity fluid balance

**Tian, Yanan** – epigenetic mechanisms of gene-environment interactions with emphasis on signaling cross-talk between nuclear receptor (PXR and AhR)-regulated detoxification pathways and NF- $\kappa$ B-regulated inflammatory pathways.

**Wasser, Jeremy S.** -- cardiovascular physiology; biological applications of magnetic resonance spectroscopy; comparative physiology of acid-base balance; mechanisms of hypoxia tolerance

**Westhusin, Mark E.** -- gamete physiology; developmental biology; embryo physiology; assisted reproductive techniques; in vitro fertilization; embryo transfer; cloning animals by nuclear transplantation, genetic engineering in animals, epigenetics and control of gene expression, RNA interference

**Zhou, Beiyan** – molecular genetics; genetic mapping of loci/genes underlying economic traits in poultry; molecular mechanisms of host defense against pathogens; identification and characterization of avian genes associated immunity; and phenotypic definition of genetic resistance to avian diseases

# Veterinary Small Animal Clinical Sciences (979) 845-2351

---

**August, John R.** – feline internal medicine; distance education; educational technology

**Barr, James W.** – mechanical ventilation; coagulation; fluid therapy; transfusion medicine

**Barton, Claudia L.** – oncology; small animal reproduction; aspiration cytology

**Bauer, John E.** – nutrition; lipid biochemistry; disorders of lipid metabolism; obesity; weight management

**Beaver, Bonnie V.** – normal and abnormal domestic animal behavior; human-animal interrelationships; animal welfare

**Carroll, Gwendolyn L.** – anesthesiology; assessment of pain and stress; feline osteoarthritis; rehabilitation and recovery

**Cook, Audrey** – internal medicine; endocrinology; gastroenterology

**Crist, M. A.** – anesthesiology; physical medicine; rehab; pain management; dentistry; nutrition

**Dodd, Johnathon** – dentistry

**Dziezyc, Joan** – ophthalmology; ophthalmic surgery; ocular ultrasonography; ocular inflammation

**Eckman, Stacy L.** – feline medicine; zoonotic diseases of companion animals; preventative medicine

**Fossum, Theresa W.** – cardiovascular surgery; myocardial ischemia and angiogenesis; cardiac assist devices; cardiopulmonary bypass; hypertension; canine chronic degenerative valve disease; canine cardiomyopathy

**Gordon, Sonya G.** – canine chronic degenerative valve disease; cardiovascular imaging; interventional cardiology; cardiac clinical trials

**Griffin, Sarah C.** – Emergency Medicine

**Guedes, Alonso G.P.** – clinical anesthesiology; hormonal and cytokine regulation of intracellular calcium homeostasis in smooth muscle

**Hartsfield, Sandee M.** – anesthesiology; cardiopulmonary effects of anesthetics; anesthetic equipment

**Heatley, J. Jill** – fluid therapy; emergent & critical care; electrolytes of nondomestic species; wildlife population health biomonitoring

**Hicks, Daniel G.** – biomechanics of the spine, specifically, the effect of implant stabilization in the cervical spine and lumbosacral joint in dogs; canine cervical spondelomyelopathy (wobblers); traumatic spinal cord injury; surgical neurooncology

**Hobson, H. Phil** – upper respiratory system; reconstructive surgery; urogenital surgery

**Hoppes, Sharman M.** – avian and exotic analgesia; proventricular dilation disease; aflatoxins in birds

**Howe, Lisa M.** – upper respiratory disease; soft tissue surgery; prepubertal gonadectomy

**Hulse, Donald A.** – comparative orthopedics; biodegradable implants; biomechanics of fracture fixation

**Kerwin, Sharon C.** – bone grafting; osteoarthritis; biomechanics of fracture repair; feline orthopedics; spinal surgery

**Lees, George E.** – urinary tract diseases and renal pathology in companion animals; canine hereditary nephritis

**Levine, Jonathan M.** – neurology/neurosurgery; spinal cord injury; neuromuscular disease; intervetebral disk herniation

**Loria Lepiz, Mauricio** – anesthesiology; cardiovascular & respiratory physiology; monitoring technology - anesthesia and critical care

**Martinez, Elizabeth A.** – anesthesiology; cardiopulmonary physiology; neuromuscular blocking agents

**Matthews, Nora S.** – anesthesiology; analgesics; equine cardiovascular physiology; donkeys and mules

**Miller, Matthew W.** – cardiology; cardiomyopathies; interventional catheterization; vascular stenting; ventricular assist devices; catheter based therapy of vascular malformations; hemorrhagic shock

**Nelson, David A.** – cardiothoracic surgery; thoracoscopic surgery; cardiopulmonary bypass; cardiovascular assist device development; effects of time varying electromagnetic fields on bone healing; anti-coagulation therapy

**Patterson, Adam P.** – dermatology; allergy; otitis

**Peycke, Laura E.** – soft-tissue surgery; gastrodilatative volvulus

**Saunders, Ashley B.** – arrhythmias; canine valvular heart disease; echocardiography; interventional cardiology

**Saunders, W. Brian** – joint replacement, arthroscopy, molecular aspects of osteoarthritis and fracture repair, cell-matrix interactions, MMPs

**Smith, Brooke E.** –Emergency/critical care medicine; internal medicine

**Snyder, Katherine D.** – feline medicine, gastroenterology, inflammatory cytokines

**Suchodolski, Jan S.** – comparative gastroenterology; intestinal microbial ecology; molecular microbiology

**Steiner, Jörg M.** – small animal and comparative gastroenterology as it relates to pathophysiology; diagnosis, and treatment of gastrointestinal disorders

**Stickney, Mark J.** – elective surgery; pain management; mammary cancer

**Willard, Michael D.** – gastroenterology; internal medicine; fiberoptic and rigid endoscopy

**Wilson, Heather M.** – oncology; identification of cancer stem cells; identification of neoplastic therapeutic targets; clinical trials and osteosarcoma

**Zoran, Debra L.** – nutrition; GI; feline medicine