

**Faculty Research Interests**  
**Department of Animal and Food Sciences**  
**University of Delaware**

This web page provides information on the research interest of our faculty. Additional information is available by clicking on the name of the Faculty member.

**ABASHT, BEHNAM**, Assistant Professor

*Discipline: Integrative Food Animal Biology, Molecular and Quantitative Genetics*

*Research: My area of research interest is Integrative Food Animal Biology, with emphasis on the identification and functional characterization of quantitative trait loci (QTL) in chickens, using system-based multi-disciplinary approaches. Some of the traits of interest are meat quality and yield, adiposity and feed efficiency in meat-type chickens. I am also interested in studying the molecular genetic basis of heterosis, with application to commercial crossbred poultry breeding programs.*

**ALPHIN, ROBERT L.**, M.S., Instructor, Public Service Faculty/ Manager, Charles C. Allen Laboratory

*Discipline: Poultry Management and Microbiology*

*Research: Emergency poultry disease response (e.g. avian influenza and Newcastle disease) including emergency depopulation of poultry, in-house composting of litter/poultry carcasses and testing of disinfectants for avian disease decontamination.*

**BENSON, ERIC R.**, Ph.D., M.S., Associate Professor, Discipline: Applied Engineering in Animal Science

*Research: Development and Evaluation of Emergency Animal Response procedures including mass emergency depopulation, carcass disposal, and use of disinfectants. Application and development of novel sensors for animal welfare. Monitoring and evaluation of animal air quality.*

**BRANNICK, ERIN M.**, D.V.M., M.S., Diplomate of ACVP (Anatomic Pathology), Assistant Professor

*Discipline: Veterinary Pathology*

*Research: Diagnostic histopathology support for departmental and university laboratories engaged in research related to animal disease and animal models of human disease. Personal research interest: Informational completeness in diagnostic laboratory submission forms.*

**CHEN, HAIQIANG**, Ph.D., Associate Professor

*Discipline: Food Processing and Food Safety*

*Research: Current research focuses on high pressure processing and other non-thermal food processing technologies, antimicrobial packaging and modeling. Specific research projects include the use of non-thermal food processing technologies to improve the microbial safety of high risk foods such as shellfish, fresh produce and ready-to-eat foods.*

**COGBURN, LARRY A.**, Ph.D., Professor

*Discipline: Avian Physiology*

*Research: Endocrine regulation of growth and development in broiler chickens. Research program involves manipulation of the thyrotropic axes to enhance growth rate and improve body composition. We were the first to clone and characterize the chicken growth hormone receptor (cGHR) gene and have identified molecular defects in the cGHR gene which are responsible for sex-linked dwarfism in chickens. Recently, we have examined the developmental expression and tissue distribution of the cGHR in different strains of broiler chickens genetically selected for growth rate, high body fat or increased lean body mass. We have also discovered the expression of unique truncated transcripts of the prolactin receptor gene in the testes of sexually-mature chickens which could be important for normal sexual maturation and reproductive competence in the rooster. My overall research program is directed at the application of molecular biology to improve the efficiency and/or quality of poultry meat production.*

**DYER, ROBERT M., V.M.D., Ph.D., Associate Professor**

*Discipline: Veterinary Medicine, Production Medicine, Large Animal Immunology*

*Research: Respiratory diseases of cattle and swine. Major interests include mechanisms of viral-bacterial synergy in the lung that predispose the virus-infected lung to secondary bacterial colonization and infection. Areas of work include viral inhibition of T lymphocyte function, direct inhibition of alveolar macrophage and neutrophil effector functions by respiratory viruses. Other areas of interest include mechanisms of the immune response that control Neospora caninum infection in bovines. Major area of interest is the role of cellular and humoral immunity in controlling the expression of Neospora caninum in asymptotically infected carriers.*

**EMARA, MARLENE G., Ph.D., Associate Professor**

*Discipline: Avian Immunology*

*Research: The long-term goal of this laboratory is to identify genes that influence immune response and disease resistance of chickens to avian pathogens. Our laboratory is currently investigating the genetics of resistance to Marek's disease, an economically important disease of chickens that causes T cell cancer in birds. Collaborative studies are also underway to evaluate coccidiosis, a protozoan disease of the chicken intestinal tract. In the laboratory, there is an emphasis on the major histocompatibility complex, a gene complex whose products influence T lymphocyte function, as well as other chicken genes throughout the genome. We routinely use microsatellite DNA markers to genotype chickens and search for genes affecting immune response and disease resistance. In addition, we are focusing on a region of chicken chromosome 1 that appears to contain a chromosomal breakpoint (genetic mutation). Current research involves evaluating this mutation and its frequency in Marek's disease tumors.*

**GELB, JACK, JR., Ph.D., Professor**

*Discipline: Avian Virology*

*Research: Respiratory disease and immunosuppressive viruses of poultry and birds with emphasis on disease surveillance, diagnostics, pathogenesis, and control. Current projects address identifying avian influenza virus (AIV) genomic changes impacting host adaptation, evaluation of AIV nanoparticle vaccines for poultry, alternative methods of attenuation of herpes virus infectious laryngotracheitis, and assessment of vector vaccines for control of infectious bursal disease virus.*

**GOLOVAN, SERGUEI, Ph.D., Assistant Professor**

*Discipline: Molecular biology*

*Research: Recent epidemic in Asia and Canada have demonstrated that avian influenza (bird flu) not only results in significant monetary loss for the poultry industry, but also represents a serious risk of creating human pandemic. Together with Dr. E. Nagy (Pathobiology) we have been able to achieve inhibition of avian influenza virus up to 1000 fold in chicken CH-SAH cells and up to 106 fold in MDCK cells using shRNA constructs targeting highly conservative sites in NP and PA mRNAs of avian influenza. To improve efficiency in avian cells we have designed new microRNA based constructs with chicken promoters. Eventual goal is production of prophylactic RNAi based drugs which can be administered to poultry in aerosol form or in drinking water to provide transient protection during an outbreak. Long term goal is to produce poultry completely resistant to avian influenza infection by introducing shRNA construct into chicken genome expressed with constitutive or virus inducible promoters. Ability to manipulate gene expression with RNAi will also increase popularity of chicken as a model for developmental studies.*

**GRESSLEY, TANYA, Ph.D., Assistant Professor**

*Discipline: Dairy Cattle Nutrition and Immunology*

*Research: Examination of aspects of dairy cattle nutrition and the effect of nutrition on immune function. Project areas include: effects of post-ruminal fermentation on digestive health; nutritional modification of post-ruminal fermentation; effect of feed supplements on animal performance; effect of nutritional supplements and programs on cow and calf immune function.*

**GRIFFITHS, LESA G., Ph.D. Professor**

*Research: Assessment of student learning in international education.*

**HOOVER, DALLAS G.**, Ph.D., Professor

*Discipline: Food Microbiology*

*Research: Food microbiology and food safety.*

**LI, HONG**, Ph.D., Assistant Professor

*Discipline: Animal environment and Agriculture Air Quality*

*Research: Investigation of cause-effect-relationships in the fields of animal feeding operation (AFO) systems and their environment. Major research area is air quality and emission issues relative to AFOs with special emphasis on quantification, modeling and mitigation of air emissions. Other research areas include animal environmental control and impacts of environmental and management factors on production performance, behavior, and welfare of animals.*

**JOERGER, ROLF**, Ph.D., Associate Professor

*Discipline: Microbial Genetics and Physiology*

*Research: Microbiological studies related to food production and food safety, with emphasis on poultry and poultry products. Use of molecular techniques for the detection of microbes. Study of the mechanisms by which microorganism impact food quality and safety.*

**KEELER, CALVIN L., JR**, Ph.D., Professor

*Discipline: Molecular Genetics, Virology, Avian Diseases*

*Research: Although there is a great need to understand better the involvement of mucosal immunity in disease protection in all animal systems, that holds especially true in the avian system due to the high cost of respiratory disease. Infectious laryngotracheitis (ILT) is a herpesvirus induced acute respiratory disease of world-wide importance to the poultry industry. The primary focus of this laboratory is to understand the molecular basis of infectious laryngotracheitis virus (ILTV) pathogenicity and immunity. This is based on the belief that one aspect of a rational approach to the control of viral infections require an understanding of the host's immune response to infections with the virus, the identification of viral antigens responsible for eliciting that response, and the mechanisms of their interactions with the immune system. Using ILTV as a model, we hope to enhance our understanding of nononcogenic viral immunity in the avian system. Our group is also involved in evaluating the biological function of ILTV structural glycoproteins and is developing novel poultry viral vaccines and vectors. We envision ILTV as a candidate vector which will target antigens to the upper respiratory tract and which may be particularly well suited to heightening the host's cell-mediated immune response.*

**KNIEL, KALMIA E.**, Ph.D., Associate Professor

*Discipline: Food Microbiology; Food Virology and Parasitology*

*Research: Dr. Kniel is a food microbiologist who specializes in virology and parasitology. Her research concentrates on pathogens that contaminate fruits and vegetables. She has conducted research with waterborne and foodborne viruses, protozoa, and bacteria. Much of her work has involved studies analyzing non-thermal treatments as alternatives to traditional pasteurization technologies with protozoan parasites such as *Cryptosporidium parvum* and *Cyclospora cayetanensis*. Dr. Kniel's virology work has included determinations of viable and inactivated virions. The work with viruses began at the USDA Animal Parasitic Diseases Laboratory where she first used raccoon pox virus as a surrogate for smallpox to study survival along with the development of rapid detection assays. She has received funding from the USDA-National Research Initiative and the College of Agriculture and Natural Resources, University of Delaware to study the inactivation of human viruses in foods using high pressure, ultraviolet light, and ozone. She has expertise in mammalian cell culture and has optimized cell culture infection assays for studying protozoa and viruses.*

**KUNG, LIMIN, JR**, Ph.D., Professor. *Discipline: Silage Fermentation and Dairy Cattle (Ruminant) Nutrition*

*Laboratory. Ruminant animals (e.g. cows and sheep) have large forestomachs (e.g., the rumen) where anaerobic fermentation takes place. The rumen has one of the most complex collection of anaerobic microbes on earth. These microbes are able to ferment feedstuffs high in fiber providing the animal with metabolizable energy, microbial protein, B vitamins and vitamin C and K. They are also capable of detoxifying noxious compounds found in plants that when ingested would otherwise be detrimental to the animal. Interestingly, many feeds that are fed to ruminants are also the end product of anaerobic fermentation, which occurs in a silo. However, fermentation of feed in the silo has goals that are completely opposite of what is desirable in the rumen. For example, whereas digestion of nutrients is desirable in the rumen, it is not in the silo because the*

goal is to preserve nutrients in the later. Additionally, whereas a low pH is detrimental in the rumen because it inhibits the growth of fibrolytic microbes, it is desirable in the silo because it curtails microbial activity. My lab focuses on improving our understanding of these contrasting fermentation processes in order to improve the efficiency of milk and meat production by ruminants. Research is based on using a combination of techniques in biochemistry, microbiology and nutrition. Major research areas include using novel bacteria to prevent the growth of yeasts and molds in silages and altering rumen and silage fermentation with various compounds and direct-fed microbials.

**MORGAN, ROBIN W.**, Ph.D., Dean, Professor,  
Discipline: Molecular Biology

Research: Our interests center on the molecular biology of Marek's disease virus, a herpesvirus that causes infectious T-cell lymphomas in chickens. Specific research projects include understanding the molecular mechanisms that lead to transformation of T-cells by Marek's disease virus, examining the immunological responses that result in vaccine- Induced protection from lymphoma formation, and developing vaccines to control Marek's disease. Microarray technology is being used to understand host responses to infection.

**PARCELLS, MARK**, Ph.D., Professor  
Discipline: Molecular Virology

Research: Dr. Parcels' research is focused on Marek's disease virus (MDV), a lymphoma-causing herpes virus of chickens. Dr. Parcels' uses molecular biological as well as cell culture, immunological, genomic and bioimaging techniques to study the functions of MDV gene products. The two main emphases of his research are identifying the mechanisms contributing to cellular transformation by MDV and determining the means by which MDV strains evolve in the field to become more virulent. MDV represents a powerful model for the study of lymphoma development and progression and lessons learned from MDV may provide insight into the control of human malignancies such as Hodgkin's lymphoma. Since MDV has evolved in the field in the face of vaccines that prevent tumor formation, understanding how these field strains persist and overcome vaccine-induced immunity may provide insight into future vaccine development.

**SCHMIDT, CARL J.**, Ph.D., Associate Professor  
Discipline: Molecular Biology

Research: Molecular biology of oncogenic avian viruses. DNA chip technology is being used to understand the responses of host cells to infection by these viruses. In addition, we are studying the role of specific virus proteins using a variety of methods including the yeast two hybrid system and confocal microscopy.

**SNIDER, O. SUE**, Ph.D., Professor and Extension Food Safety and Nutrition Specialist  
Discipline: Food Safety and Nutrition.

**WICKENS, CARISSA L.**, Ph.D., P.A.S., Assistant Professor, Equine Extension Specialist  
Discipline: Equine Behavior and Welfare, Equine Nutrition

Research: Stereotypic behaviors in horses, with emphasis on crib-biting behavior. Major interests include investigating the role of gastrointestinal function and irritation in the etiology of crib-biting and the relationships between stereotypic behavior and various farm management practices, as well as assessing owner perceptions of equine stereotypic behavior. Other research interests include learning in horses, human-horse interactions, and pursuit of applied equine nutrition and feeding projects.

**CHANGQING, WU**, Ph.D., Assistant Professor  
Discipline: Food Toxicology, Nutraceutical and Food Safety

Research: Current research focuses on: Separation and identification of bioactive compounds from foods, spices or medicinal herbs using column chromatography techniques, HPLC/PDA, LC/MS, GC/MS, and NMR analysis; Assessments of bioactivities of nutraceuticals and functional foods using antimicrobial tests, cell cultures, and antioxidant assays; Synergistic or antagonistic effects of bioactive compounds; Impact of bioactive compounds on obesity and heart disease.