

**University of Minnesota** (\$74,298.00)

*“Selective Breeding Practices in the American Quarter Horse: Impact on Health and Disease”*

Selective horse breeding has produced Quarter Horses that are highly successful in a variety of performance disciplines. Although the breed is diverse, the researchers believe that selective breeding has led to substantial genetic structure within the QH breed, with decreased diversity and potential concentrations of genetic diseases in some subpopulations. Study seeks to 1) determine if there is a detrimental decrease in genetic diversity in some subpopulations; 2) Identify disease and other genes that breeders are selecting for when they breed for a trait in halter, pleasure, cutting, reining, working cow horse and racing performance categories.

Investigator(s): Molly McCue DVM, PhD, Stephanie Valberg DVM, PhD and James Mickelson PhD

**University of Kentucky** (\$19,547.00)

*“Identifying the Role of a ‘Metabolic Master Switch’ in Equine Metabolic Syndrome and its Implications for Targeted Treatment”*

Equine Metabolic Syndrome is a complex disease that affects Quarter Horses as well as many other breeds. It typically manifests itself with increased regional and general fat deposits, systemic inflammation, insulin resistance and a predisposition toward developing laminitis. Today’s common treatment is to restrict feed intake and force the animal to lose weight, which is difficult and takes months. The study goal is to activate the “metabolic master switch” enzyme SIRT1 with resveratrol in order to increase insulin sensitivity, decrease inflammation and deposition of fat. This will be the first study to determine if an alternative treatment (SIRT1-activator, resveratrol) which mimics dietary restriction by modulating both inflammation and metabolic parameters will aid in treating metabolic syndrome.

Investigator(s): Amanda Adams PhD – Young Investigator Award

**University of Kentucky** (37,236.00)

*“Equine Herpesvirus-1 and the Type-1 Interferon Response”*

Equine Herpesvirus-1 (EHV-1) is one of the most important viral diseases of horses worldwide causing respiratory disease, abortion and neurologic disease. Herpesviruses are unique in that they are able to evade the horse’s immune system and become latent in the horse. This study is aimed at determining if EHV-1 has the ability to block the horse’s Type-1 interferon (INF) response which is a front line defense against viral diseases. They will first test whether EHV-1 infection affects the induction of Type-1 INF

when stimulated by chemicals which could lead to the development of effective antiviral drugs.

Investigator(s): Thomas Chambers PhD and David Horohov PhD

**University of Georgia (\$35,700.00)**

*“Cardiovascular Function in Horses with Acute Gastrointestinal Disease”*

Colic is the most common reason that horses are admitted to veterinary hospitals and many require surgery. The heart and nervous system are the two most common body systems that fail in human surgical patients which can result in death. Horses undergoing colic surgery are an equivalent ‘at risk’ population for heart and organ failure. The purpose of this study is to use ultrasound, electrocardiograms, blood pressure and blood samples with high sensitivity to detect and predict heart and organ failure in critically ill horses undergoing surgery. The results of the study should help practitioners to better monitor colic surgery patients as well as determine if critically ill colic patients are viable candidates for surgery.

Investigator(s): Michelle Barton DVM, PhD and Steve Giguere DVM, PhD

**Washington State University (\$20,000.00)**

*“Measurable Post-Treatment Changes in Antibody Isotype Responses to Babesia equi Predict Parasite Clearance and Removal of Transmission Risk”*

The recent outbreaks of piroplasmiasis in Florida, Missouri and Southern Texas in 2008 and 2009 which to date has affected over 400 horses has threatened the disease “free” status of the United States. Most of the horses involved in this outbreak have been Quarter Horses. Infection with piroplasmiasis can be fatal or the horses recover and develop a lifelong infection which makes them a source of transmission via ticks to other horses. Although some horses are responsive to the drug imidocarb and can clear the infection, they remain seropositive to the official ELISA test which detects antibodies against *B. equi*. The goal of this study is to compare pre and post-treatment blood of infected-imidocarb treated horses to develop a novel clearance test which can be used to declare horses free of *B. equi*.

Investigator(s): L. Nicki Wise DVM – Young Investigator Award

**University of Missouri (\$65,596.00)**

*“Dysregulation of Innate Immunity Predicts Outcome during Endotoxemia/SIRS”*

New information from the human medical field has shown that sepsis-associated complications and fatalities (in spite of treatment) correlate with inhibited white blood cell function (referred to as “immunoparalysis”), an excessive anti-inflammatory response following innate immune activation. Immunoparalysis leads to impaired bacterial clearance. Researchers believe this occurs in horses and that horses with sepsis/endotoxemia will have evidence of persistent dysfunction of their immune system during hospitalization and the severity of the immunodysfunction will correlate with disease severity and death. The study will compare blood from septic and non-septic patients to see if there is correlation.

Investigator(s): Philip Johnson BVS, Amy DeClue DVM, Nat Messer DVM, Joanne Kramer DVM, Shannon Reed DVM and Alison LaCarrubba DVM

**Oklahoma State University (\$17,670.00)**

*“Metabolic Gene Expression and Mitochondrial Function in Horses with Equine Metabolic Syndrome”*

Equine Metabolic Syndrome (EMS) is a common endocrine disorder of middle-aged horses and is characterized by the presence of regional fat deposits, insulin resistance and a predisposition to laminitis. In people a decreased capacity for energy production by the mitochondria is an early event in the development of metabolic syndrome. In addition, mitochondrial dysfunction appears to be closely related to changes in cellular control of fat and glucose metabolism. Researchers believe this also occurs in horses. The objective of this study is to determine the role of impaired mitochondrial function in EMS and to determine which metabolic pathways are abnormal in horses with EMS. It will be done using muscle biopsies from EMS and normal horses for comparison.

Investigator(s): Heidi Banse DVM – Young Investigator Award

**University of Pennsylvania (\$16,750.50)**

*“Verification of a S. equi Detection Assay for Equine Nasopharyngeal and Guttural Pouch Wash Samples”*

Strangles, a highly infectious upper respiratory disease of the horse caused by *Strep. equi* affects many horses during outbreaks and carries a high financial burden for the equine industry. Following infection, some horses will develop internal abscesses or up to 20% will become carriers of the disease with the potential to spread it to other horses. Currently strangles is diagnosed via bacterial culture, polymerase chain reaction (PCR) following nasopharyngeal washes or guttural pouch lavage. This study will compare direct PCR, flocculated swab bacterial culture and flocculated swab PCR to determine which is more accurate. Researchers believe the results will standardize test methods for the detection of *Strep. equi* and improve the detection of carrier horses.

Investigator(s): Ashley Boyle DVM, Shelley Rankin PhD, Helen Aceto VMD, PhD and Ray Boston PhD

**Mississippi State University (\$5,443.00)**

*“Arthrodesis of the Proximal Interphalangeal Joint in the Horse: A Biochemical Comparison of 5.5mm Cortical Screw Augmented 4.5mm Narrow LC-DCP and 5.0mm LCP Constructs”*

Current recommendation for performance ending osteoarthritis of the pastern joint is to fuse the joint with a stainless steel plate and 1mm lag screws. This procedure results in greater than 70% of horses returning to performance after surgery. The goal of this study is to compare the stability of two different bone/implant constructs used for pastern joint fusion in cadaver legs. The currently used dynamic compression plate (LC-DCP) will be compared to the locking compression plate (LCP), a newer plate, to determine which results in less pain and more stability.

Investigator(s): Richard Rocconi DVM – Young Investigator Award

Additional information related to ongoing industry research in these fields may be obtained through the equine medical research database at [www.equineresearch.net](http://www.equineresearch.net). Participating organizations include the American Association of Equine Practitioners

Foundation, American Quarter Horse Foundation, Morris Animal Foundation and the Grayson Jockey Club Research Foundation.

For more information on the American Quarter Horse Foundation's equine research program, please contact us at:

**AMERICAN QUARTER HORSE FOUNDATION  
EQUINE RESEARCH PROGRAM**

2601 EAST I-40  
AMARILLO, TX 79104  
[www.aqha.com/foundation](http://www.aqha.com/foundation)

(806) 378-5029 phone  
(806) 376-1005 fax  
[foundation@aqha.org](mailto:foundation@aqha.org)