

University of Minnesota (\$64,434.00)

RENEWAL "Genetic Analysis of Muscle Disorders in Quarter Horses"

AQHA has taken a leading role in identifying Polysaccharide Storage Myopathy (PSSM-1) as a genetic disease quite common in the Quarter Horse. Ongoing research into these disorders has led to the identification of additional such conditions: GBED, MH, PSSM-2, LSM and RER. Continued funding of this work will provide complete genetic understanding of these newer conditions and provide owners and breeders powerful tools to eliminate these diseases from the breed.

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

Texas A&M University (\$73,390.00)

"Rhodococcus equi Foal Pneumonia: Evaluation of Four Screening Methods for Early Detection and Identification of Risk Factors for Differentiating Foals with Sub-Clinical and Pre-Clinical Pneumonia"

Rhodococcus foal pneumonia remains a significant disease problem in all breeding farms. This study will evaluate and compare four diagnostic techniques for identification of disease and in addition evaluate if any methods are more predictive of clinical disease.

Investigator(s): M. Keith Chaffin DVM, Noah Cohen VMD, PhD and Glenn Blodgett DVM

Texas A&M University (\$58,160.00)

RENEWAL "Discovering Genetic Causes of Acrosomal Dysfunction in Stallions"

Sires must be selected based upon fertility as well as on pedigree, performance and conformation. The acrosome (a portion of the head of the sperm cell) is integral to successful reproduction. This study is an extension of human/mouse acrosome research to the horse. Project goals include determining the gene(s) responsible for acrosome dysfunction for eventual development of predictive tests.

Investigator(s): Terje Raudsepp PhD, Bhanu P. Chowdhary PhD and Dickson Varner DVM

University of California, Davis (\$39,819.00)

"Early Detection of Lesions that Predispose to Catastrophic Proximal Sesamoid Bone Fracture in Quarter Horse Racehorses"

Musculoskeletal injuries are the primary cause of serious breakdowns for all types of racehorses. The fetlock (ankle) and specifically the proximal sesamoid bones are the

most frequent site of injury. The goal of this project is to evaluate preexisting damage in the sesamoid bones of racing Quarter Horses. The long term goal would be better pre-race identification of injury to these bones to avoid catastrophic breakdown.

Investigator(s): Susan Stover DVM, PhD and Sarah Puchalski DVM

Colorado State University (\$22,200.00)

“Improving Diagnosis and Treatment of Stifle Disease in Quarter Horses”

Stifle disease is a common source of lameness in performance Quarter Horses, and is difficult to diagnose and treat successfully. This project is designed as a comparison of four methods (Ultrasound, X-ray, CT and Arthroscopy) to evaluate injured stifle joints in Quarter Horse during the first year of study.

Investigator(s): Christopher Kawcak DVM, PhD, Laurie Goodrich DVM, PhD, Natasha Werpy DVM and C. Wayne McIlwraith DVM, PhD

Michigan State University (\$20,433.00)

“Does Lidocaine Mitigate LPS-Induced Inflammation?”

Inflammation caused by toxemia (toxins present in the blood) is a common complication in most sick horses, including those with colic. Treatment often involves the use of antibiotics and flunixin (Banamine). It has recently become known that Banamine can also have a negative impact on intestinal healing. This project will compare the response of equine cells to lidocaine versus flunixin (Banamine) in a laboratory setting. Completion of this work will allow future application of this therapy to horses affected by toxemia.

Investigator(s): Vanessa Cook PhD, Susan Holcombe VMD, PhD and Lorraine Sordillo PhD

Colorado State University (\$10,652.00)

YOUNG INVESTIGATOR “Pilot: Effect of Bone Marrow Derived Mesenchymal Stem Cells and Fibrin Glue on Meniscal Construct Healing: an In Vivo Study in Mice”

Injury to the menisci of the stifle is a problem in human and equine athletes. Stifle injury remains a serious problem with unique diagnostic and treatment challenges in performance Quarter Horses. This young investigator pilot study will compare adhesion of harvested meniscus tissue with fibrin glue to fibrin glue plus stem cells. The initial studies placing horse meniscus grafts in mouse skin will provide a basis for future application to horses with meniscal tears.

Investigator(s): Dora Ferris DVM

University of Georgia (\$34,680.00)

“Effects of Endotoxin and Inflammatory Cytokines on Equine Adrenocortical Function in an Ex Vivo Model”

Bacterial infection in the blood stream (bacteremia) is a common cause of death in newborn foals. Previous studies regarding adrenal gland function have been performed in other young animals, but less work has been done on foals. This research will maintain equine adrenal gland cells in a laboratory setting in order to compare their responses to inflammatory stimuli. The goal is to improve understanding and treatment of foals affected by CIRCI (Critical Illness-Related Corticosteroid Insufficiency).

Investigator(s): Michelle Barton DVM, PhD, Kelsey Hart DVM and Michel Vandenplas PhD

Texas A&M University (\$69,876.00)

RENEWAL "Biopsy of Equine Embryos for Preimplantation Genetic Diagnosis III-Cryopreservation"

Based on previous research funded by AQHA, a technique has been developed to effectively test equine embryos for genetic disease prior to transfer and successful birth. Embryo biopsy allows breeders another manner in which to prevent and eliminate genetic diseases from the Quarter Horse population. This project will expand the original project to improve embryo freezing techniques and storage methods for more widespread use by the industry.

Investigator(s): Katrin Hinrichs DVM, PhD

RESEARCH GLOSSARY

(GBED) Glycogen Branching Storage Deficiency is an inherited muscle disease present in foals of many horse breeds, resultant of their body's inability to process glycogen properly (sugar stored within cells). Signs of the disease are sudden death of a foal that may have displayed lethargy or was not as active as other foals, or may have experienced rapid breathing patterns, lower limb deformities or intermittent seizures. This disease has also been linked to unexplained late-term foal abortions or stillbirth.

GBED testing site(s): University of California, Davis and VetGen

(LSM) Lipid Storage Myopathy is a newly identified, inherited muscle disease.

LSM testing site(s): Unavailable at this time

(MH) Malignant Hyperthermia is an inherited muscle disease that is present in a very small portion of the horse population. However, many horses with this disease may also have PSSM (see disease information and signs below). Symptoms of MH could include recurrent high fevers and metabolic failure. In some cases unexplained death may occur while affected horses are under general anesthesia.

MH testing site(s): University of Minnesota

(PSSM) Polysaccharide Storage Myopathy is an inherited muscle disease present in at least 20 horse breeds, including the Quarter Horse. Signs of the disease include firm, painful muscles, stiffness, weakness, gait abnormalities and muscle wasting. Multiple strains of the disease have been identified and are referenced according to the order of their identification: PSSM-1, PSSM-2, etc.

PSSM testing site(s): University of Minnesota

(RER) Recurrent Exertional Rhabdomyolysis is an inherited muscle disease within Thoroughbreds, but is now being seen within the Quarter Horse population. Horses with this disease suffer from recurring episodes of muscle cramping, stiffness, excessive sweating and reluctance to move after exercise. The disease may also be influenced by horse gender, temperament and diet as well as other factors.

RER testing site(s): Genetic tests are pending

Additional information related to ongoing industry research in these fields may be obtained through the equine medical research database at 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:

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