

Auburn University (\$20,000.00)

“Sustained-release Voriconazole Hydrogel for Ocular use in Horses”

Keratomycosis is a fungal infection of the cornea that is a vision-threatening disease in horses as well as humans. The purpose of this study is to develop an improved delivery and sustained application of Voriconazole to the infected eye. The combination of this drug with hydrogel should prolong the effect of the drug and lead to quicker recovery. Principal Investigator: Rosemary Cuming BVS – Young Investigator

Colorado State University (\$39,533.00)

“Regulatory microRNA Delivered to Spermatozoa during Epididymal Maturation”

This study is focused on equine epididymosomes that contain small RNA molecules called microRNAs. These microRNAs bind to mRNA thereby either regulating their translation into proteins or leading to degradation of transcripts. Results obtained from this project will provide insight into sperm maturation and potential regulation of fertilization and embryo development.

Principal Investigator: Jason Bruemmer PhD and Gerrit Bouma PhD

Iowa State University (\$32,500.00)

“Investigation of CD47 in Solid Tumors of Equids”

A protein marker (CD47) present on cells is more highly expressed in many tumors compared to normal tissue. This greater level of expression provides some protection to the tumor cells. In this way tumor cells can avoid destruction by the immune system. This project will investigate anti-CD47 antibodies that will enhance the destruction of equine skin tumor cells in vitro and live horses.

Principal Investigator: Stephanie Caston DVM, Brett Sponseller DVM, PhD, Jesse Hostetter DVM, PhD, Jessie Trujillo DVM, PhD and Douglas Jones VMD, PhD

Iowa State University (\$20,000.00)

“Age Related Immunophenotypic Shift: Enhancing Cell Mediated Immunity by Ligation of Fc γ R1”

Fragment crystallizable receptor 1 (Fc γ R1) is a cytokine expressed on the surface of macrophages that aid in phagocytosis which is required for killing intracellular pathogens like *Rhodococcus equi*. Evidence has shown that plasma products reduce the incidence and severity of pneumonia but the mechanism largely remains unknown. This study aims to gain a better understanding of macrophage response to activation within the foal.

Principal Investigator: Sarah Wiechert DVM – Young Investigator

The Ohio State University (\$50,509.00)

“Laminar Growth Factor Signaling in Equine Metabolic Syndrome-Associated Laminitis: Establishment of Therapeutic Targets”

Laminitis associated with Endocrine Disease is the primary type of laminitis encountered by horse owners and veterinarians, with Equine Metabolic Syndrome (EMS) associated laminitis being the most common form. This study will focus on a protein pathway that leads to changes in epithelial cells of the epidermal laminae that impact their ability to maintain normal adhesive function. After more knowledge is gained about this pathway, possible interventions can be researched to aid in treatment of this form of laminitis.

Principal Investigator: James Belknap DVM, PhD, Raymond Geor BVS, PhD and Susan Eades DVM, PhD

Purdue University (\$19,173.00)

“Comparison of Tapered Versus Standard Cylindrical Transfixation Pin Insertion into Equine Third Metacarpal Bones”

This study will compare the effect of two types of transfixation pin casts in the management of leg fractures, particularly fractures that are in many pieces and open with exposed bone. Pins currently used in casts are cylindrical and their initial stability is governed by the drill-hole size. This process can result in bone damage during pin insertion and loosening. By contrast, a tapered pin could lead to more precise control, stability and less bone damage, thus improving the success of fracture treatment.

Principal Investigator: Mackenzie Adams DVM – Young Investigator

Texas A&M AgriLife Research (\$45,120.00)

“Developing a Technique for Stem Cell Tracking via 19F MRI and a Fluorocarbon Label”

Despite the evidence for improved outcomes after stem cell therapy, little is known about the location and duration of cell engraftment or the mechanism of the treatment itself. This study is designed to develop and validate a technique for stem cell tracking using MRI and fluorocarbon (19F) labeling.

Principal Investigator: Ashlee Watts PhD

University of California, Davis (\$54,401.00)

“Mitochondrial DNA of Sperm as an Indicator of Sperm Function, Stallion Aging, and Cryopreservation Success”

The long term objective of this research is to provide an understanding of why reproductive success declines in aging stallions. Mitochondrial DNA damage is the focus of this research because unlike genomic DNA, mitochondrial DNA remains functional after spermatogenesis is complete. This study will examine DNA damage of sperm mitochondria in old and young stallions in order to determine the role of sperm mitochondria on sperm function. Additionally, the effects of cryopreservation on sperm of these two age groups will be evaluated.

Principal Investigator: Stuart Meyers DVM, PhD and Dickson Varner DVM

University of Minnesota (\$36,973.00)

“Optimizing Diagnostic Testing for Immune Mediated Myositis in Quarter Horses”

The Foundation’s support of genetic research has resulted in the development of genetic tests for Polysaccharide Storage Myopathy (PSSM), Glycogen Branching Enzyme Deficiency, Malignant Hyperthermia and Hyperkalemic Periodic Paralysis (HYPP), yet we have not developed a test for Immune Mediated Myositis, which appears to be a heritable muscle inflammation disease that causes severe wasting of the topline muscles in QHs, especially cutting horses. This study is aimed at identifying the genes that predispose horses to this disease and to develop a diagnostic test to identify them.

Principal Investigator: Stephanie Valberg DVM, PhD, James Mickelson PhD and Carrie Finno DVM, PhD

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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