Equine Research Committee
2020 Report

1. To approve the following proposals, as amended, for funding in the amount of $261,406:

"Diagnosis of Type 2 Polysaccharide Storage Myopathy in Quarter Horses" at Michigan State University in the amount of $48,156
Principal Investigator: Stephanie Valberg DVM, PhD
New genetic tests for the muscle diseases, type 2 polysaccharide storage myopathy (PSSM2) and myofibrillar myopathy (MFM) are currently offered by commercial companies based on variants in genes myotilin (termed P2), filamin C (P3) and myozenin 3 (P4). The commercial genetic testing industry is not regulated and validation of the tests for P2-P4 has not been performed to the standard utilized for the 5-panel test. The objective is to perform validation studies for the P2-P4 variants that are included in the PSSM2/MFM diagnostic tests and avoid misdiagnosis which leads to ineffective or unnecessary treatment, needless loss of value, tremendous angst for owners and veterinarians and, in some cases, unnecessary euthanasia.
Executive Committee Action: Approved

"Efficacy of Xenogen-free MSCs in Equine Joint Disease" at Texas A&M University in the amount of $60,851
Principal Investigator: Ashlee Watts DVM, PhD
Stem cell therapy has excited scientists, orthopedists and veterinarians as a possible cure for osteoarthritis and other musculoskeletal injury, yet all approved stem cell therapies have eventually been taken off the market due to lack of repeatable effectiveness. The laboratory has determined that the main reason for stem cell destruction is fetal bovine serum. The objective is therefore to use a randomized and placebo controlled clinical trial to test the effectiveness of stem cells prepared with our new method to treat osteoarthritis, against the industry standard of stem cells supplemented with fetal bovine serum as the control treatment.
Executive Committee Action: Approved

"Quantification of Arginine Synthesis in the Equine Enterocyte: A Novel Approach in the Horse" at Texas A&M University in the amount of $18,933
Young Investigator Award: Rafael Martinez
The amino acid arginine (Arg), is a precursor for the synthesis of multiple biological molecules including nitric oxide, polyamines, ornithine, and creatine that are involved in cell proliferation and migration, cellular remodeling, dilation of blood vessels, and phosphocreatine production for a readily available source of energy. To date, no research has confirmed the endogenous production of Arg to support metabolic and physiological processes; therefore, the proposed experiment will quantify *in vitro* synthesis of Arg using innovative molecular techniques. Data collected from this study serves as the necessary first step to determine the Arg requirement in the horse that has overreaching implications to improve the growth, performance, reproductive efficiency, and to enhance longevity of the American Quarter Horse.
Executive Committee Action: Approved

“Understanding the Role of MHCI Compatibility in Equine Allogenic Mesenchymal Stem Cells” at the Texas A&M University in the amount of $19,980
Young Investigator Award: Aileen Rowland DVM
Stem cell therapy has been used as a possible cure for osteoarthritis and other musculoskeletal injury, yet all have failed to demonstrate long term effectiveness. These researchers have shown immune mediated destruction of transplanted stem cells in horses of two common types (A5a and A3b) when recipient horses where not matched. Alternatively, when matched injected stem cells survived. This experiment will evaluate the immune reaction to A2 stem cells, the next most common immune type of Quarter Horses. This work to help us to understand the effect of the immune type of stem cells and may help to identify a universal stem cell donor that would not require matching.
Executive Committee Action: Approved

"Effects of Graded Levels of Protein Intake on mTOR Signaling and Muscle Protein Fractional Synthesis Rates in Horses" at University of Kentucky in the amount of $72,114
Principal Investigator: Kristine Urschel PhD
In contrast to most other nutrients, protein and amino acid requirements in horses are still poorly understood, leading to frequent overfeeding of dietary protein which has a considerable environmental and economic impact. Muscle mass is determined by the balance between rates of muscle protein synthesis and degradation, with muscle protein synthesis (MPS) being more responsive to anabolic stimuli such as feeding. In order to further define the “ideal” amount of protein for horses, the objective of this project is to measure the fractional rates of protein synthesis, the gold standard, to graded levels of protein intake by means of isotopic infusion. These results will not only improve our understanding of protein requirements in relation to muscle building but will also provide invaluable data for further research projects to define optimal protein doses for horses in different life stages.
Executive Committee Action: Approved

“Epidemic Strains of Equine Influenza Virus: Cross-reactivity with Vaccine” at University of Kentucky in the amount of $32,002
Principal Investigator: Thomas Chambers PhD
Equine influenza virus (EIV) is one of the two most common viral causes of upper respiratory disease in horses and recent high level of EI activity with multiple reports of vaccinated horses contracting EI disease occurred. So, why were some well-vaccinated horses poorly protected? The implication is that testing missed some feature of these latest EIV strains that is relevant to protection. In EIV, viral neuraminidase (NA) changes over time but we do not understand the importance for vaccines of changes in NA. To fill this gap, two approaches are proposed to compare the antigenicity of NA of a recent strain with the relevant vaccine strain. The results of both will shed new light on the similarity and differences between the new EIV epizootic strains and the current vaccine strains and provide new evidence to consider with regard to the question of updating the current vaccine strain recommendations.
Executive Committee Action: Approved

"A Novel Percutaneous Surgical Technique for Tenotomy of the Deep Digital Flexor Tendon in Horses" at University of Wisconsin in the amount of $9,370
Principal Investigator: Diego De Gasperi DVM
Equine laminitis causes severe pain and has devastating consequences such as loss of athletic career or euthanasia. Therapy is intensive and can range from shoeing techniques to surgical treatment such as tenotomy of the deep digital flexor tendon (DDFT). The objective is to investigate the feasibility of a minimally invasive technique, a percutaneous looped thread technique, for tenotomy of the equine DDFT without injury to adjacent structures using cadaver limbs. If the percutaneous looped thread technique is feasible for tenotomy of the equine DDFT, it will be investigated in laminitic horses. Information from this study will allow refinement of this technique for use in equine clinical cases.
Executive Committee Action: Approved

2. To elect Dr. Jason Bruemmer as Chair.