



Dedicated to the Development of Equine Research

Article reprint courtesy of  THE PLAID HORSE

THE GRAYSON-JOCKEY CLUB RESEARCH FOUNDATION is the industry's leader in equine research funding. Since 1983, the foundation has given \$32.1 million to 45 institutions across 412 projects, with the goal to provide the highest level of research toward equine health and develop the most innovative technology to combat illness and injury.

The foundation was established in the late 1930s by a group of horsemen who not only enjoyed horses for pleasure, but also as a form of transportation. The men began gathering funds in 1939, and by 1940, they were able to give out their first grant to the University of Pennsylvania.

The foundation is named after Admiral Cary T. Grayson, who was the head of American Red Cross, personal physician to President Woodrow Wilson, and the owner of Blue Ridge Farm, home to several champion racehorses. In 1989, the foundation merged with the Jockey Club to become the Grayson-Jockey Club Research Foundation. Today, the board of directors is led by chairman Dell Hancock, who has helped the foundation grow and expand with her commitment and passion for horses.

"Disease, virus, and maladies don't go up to an animal and ask what breed it is, what discipline it participates in, or how big it is. Those things just happen to the equine community," says Jamie Haydon, President of the Grayson-Jockey Club Research Foundation. "Even though the Thoroughbred leaders were providing most of the funding and have been traditionally, all of our research benefits all horses, it is not set aside for one breed or discipline."

Since its establishment, the Grayson-Jockey Club Research Foundation has provided funding for research covering everything from joint injury to a Novel Strangles vaccine. The research is largely funded by the donations of individuals and organizations in addition to corporate partners. One recent project that was widely successful was the use of a Positron Emission Tomography (PET scan) on equines. *(see back page)*

"In 2016, a group at The University of California-Davis brought us a project and they said they would like to PET scan a horse. It had never been done outside of humans," says Haydon. "It finds tumors, but it also finds bone bruising, and the group at UC Davis was able to adapt a human PET scan, anesthetize a horse, turn him on his side and scan him. In 2019, they came back with another PET scan project that's a new machine. It has a breakaway ring where you only have to mildly sedate the horse and it goes to scan all four limbs from above the knee in about 40 minutes. There will be eight of those machines in the United States and one in Melbourne, Australia, by the end of the year. So from 2016 to 2022, we took on stuff that had never been done before in horses, and now it's going to be at eight different veterinary clinics around the world."

One project in particular has a unique origin, as researchers were able to gain valuable insight from the COVID-19 pandemic. Currently, at Texas A&M University, a team is conducting research to develop

an mRNA vaccine delivered by inhalation to protect foals against pneumonia caused by Rhodococcus equi.

A lot of information "came out of the use of mRNA with the COVID-19 vaccine, so it has helped expand into our equine research as well," says Holly White, Director of Development, Grayson-Jockey Club Research Foundation.

Most recently, the foundation received a donation of \$2 million from Dr. John Ballantyne and Fargo-Moorhead Area Foundation to go towards research focusing on a vaccine for equine herpes virus (EHV).

"This year, in addition to the \$1 million+ we hope to give out, we will also award out special grants just in the area to cover EHV," says Haydon. "The designation for this will be to develop a vaccine covering all variants. It really is just a way for us to not only further the understanding of the disease but hopefully eradicate it."

The foundation undergoes an intensive process every October in which each grant application is carefully vetted. There can be anywhere from 50 to 70 grant applications from universities across eight different countries.

The grant applications are reviewed by the foundation's Research Advisory Committee, which is made up of 32 individuals, led by veterinary consultant Johnny Mac Smith, DVM, Co-founder of Peterson & Smith Equine Hospital. The chairman of the committee is Stephen Reed, DVM, from Rood & Riddle Equine Hospital. The remainder of the committee is made up of veterinarians who are academics and private practitioners.

the team is given a timeline with certain deliverables they must provide the foundation.

"They'll complete their research, and after their manuscript has been submitted to the publications, then the peer reviewed journal publication, and after the individual investigator and research team review period, it will go to publication," says Haydon. "Usually, one-year grants will be published 12 to 18 months after the completion of the grant." Not only is the research directly impactful to the universities and veterinarians involved, but to each and every horse owner. The research the Grayson-Jockey Club Research Foundation funds is equally important to every discipline and breed within the sport.

"I had a horse that went through colic surgery and had some different treatments done to him that came out of Grayson-funded research," says White.

"We're helping the veterinarians come up with the protocols and treatment strategies, and, in some cases, life-saving strategies to protect the health of the everyday horse. If we don't have the support of the general horse ownership community, then we can't continue to do what we do to provide the practicing veterinarian the tools to help treat your horse in their moment of need."

The foundation hopes to gain support from more associations similar to their partnership with the United States Eventing Association, in addition to individual donors.

"All these associations are made up of people who love horses and love the sport, and they themselves don't have dedicated areas that are funding research," says White. "If we could get more equine groups to



CLOCKWISE FROM TOP LEFT: Storm Cat Award winner Dr. Bruno C. Merarim, A foal being nebulized for Grayson research by Dr. Cohen; Grayson Board Chair, Dell Hancock of Claiborne Farm; Dr. Amanda Ziegler from North Carolina State University with a colic patient;

When the foundation receives a grant application, Dr. Smith will review it for content and assign a group of four to each one. That team will be made up of two academics and two private veterinarians, whether they be surgeons, racetrack vets, sport horse vets, etc. "We don't ever want to fund research that's not impactful, so we want to have those practitioners there to see how we are going to implement it in the field," says Haydon. "They will debate and score those and then recommend those to the board."

The score that each grant application receives is based on scientific approach, the feasibility of the team, the probability of completion, the impact the research will have, and the budget. Once awarded,

work in partnership with us, that would significantly help fill the void."

The Grayson-Jockey Club Research Foundation aims to continue in their journey to find and develop the best equine-research and science possible, to better understand and overcome the issues the industry faces.

"We're the largest provider of equine-research funding on a yearly basis, and it's not enough," says Haydon. **"We've never left our room thinking that we've funded bad research, but we always leave wishing we had more to give out."** ❤️

Visit www.grayson-jockeyclub.org to learn more

2022 Funded Research Projects



Persistence Of Antimicrobial Resistance In Horse Farms

*Laura Huber,
Auburn University*

This project will determine the effect of antimicrobial pressure on multi-drug resistant *Rhodococcus equi* persistence in the soil of horse breeding farms in a 5 year period.

Evaluating EVs from Equine Fetally Derived MSCs

*Fiona Hollinshead,
Colorado State University*

This project will be evaluating extracellular vesicles (EVs) from equine fetally-derived mesenchymal stem cells as an endometritis therapeutic.

Trained Immunity In Foals

*Angela Bordin,
Texas A&M University*

This project will study how giving oral live bacteria protects foals against infection *Rhodococcus equi*, the cause of severe and debilitating pneumonia in foals, for future development of a vaccine.

Immunogenicity In Foals Of An mRNA Vaccine For R. Equi

*Noah Cohen,
Texas A&M University*

This study proposes to develop a mRNA vaccine delivered by inhalation to protect foals against pneumonia caused by *Rhodococcus equi*.



Development Of A Palmar Osteochondral Disease Model

*Chris Kawcak,
Colorado State University*

The goal of this proposal is to develop an experimental model of palmar osteochondral disease in horses to better study disease progression and facilitate development of improved treatment strategies.

Development Of A Vectored Vaccine To Equine Rotavirus A

*Mariano Carossino,
Louisiana State University*

A novel viral vectored vaccine against equine rotavirus A (G3 and G14), the leading cause of foal diarrhea, will be designed and evaluated in mares and a neonatal mouse model as proof-of-concept.

Immunomodulation And Exosomes To Enhance Tendon Healing

*Sushmitha Durgam,
The Ohio State University*

This study aims to characterize M1 and M2 macrophage-derived inflammatory factors and assess their impact on superficial digital flexor tendon tenocyte activities while examining the potential of extracellular vesicles/exosomes to enhance tendon healing.

Pharmacokinetics Of Oral Mycophenolate Mofetil In Horses

*Gwendolen Lorch,
The Ohio State University*

This proposal will evaluate the pharmacokinetics of orally administered mycophenolate mofetil as a safe, effective and inexpensive immuno-suppressant drug for management of equine immune-mediated disease.

Novel Strangles Vaccine Using CD 40-Targeted Delivery

*Luc Berghman,
Texas A&M University*

This project will be targeting bacterial components of *Streptococcus equi* spp. equi to the horse's immune surveillance cells (the APCs) that will result in a fast and strong immune response that will protect against strangles.

Does Antibiotic Treatment Change The Microbial Resistome

*Paul Morley,
Texas A&M University*

This research will compare four antibiotic treatments to these protocols that can be selected to treat bacterial infections while also lessening the risks for promoting antibiotic resistance.

Equine Placentitis: New Approaches To An Old Problem

*Pouya Dini,
University of California Davis*

The goal of this study is to identify pathogens involved in placentitis and investigate their interaction with the placenta using bioinformatics and in vitro studies to develop better diagnostic and treatment methods.

Motion Of The Proximal Sesamoid Bones On Uneven Footing

*Susan Stover,
University of California Davis*

This study proposes to determine how hoof conformation, shoeing, and uneven racetrack surfaces could contribute to fetlock breakdowns.

Influence Of Vitamin D And Cortisol In R. Equi Infection

*Kelsey Hart,
University of Georgia*

This study will investigate how blood levels of cortisol and vitamin D are related to the development and progression of *Rhodococcus equi* pneumonia in foals after natural exposure.

Fentanyl Matrix Patches In Horses

*Rachel Reed,
University of Georgia*

The aim is to show that fentanyl administered via patches placed on the skin is well absorbed and represents a promising means of providing clinically relevant continuous pain relief to horses.

Sirolimus For The Control Of Insulin Dysregulation

*Andrew Van Eps,
University of Pennsylvania*

This study will evaluate the drug sirolimus (a potent suppressor of insulin production) for the treatment of insulin dysregulation (the most important cause of laminitis) in horses.

PROJECTS IN THEIR SECOND YEAR

Asthma, Performance And Omega-3s In Racing Thoroughbreds

*Laurent Couetil,
Purdue University*

The main purpose of the study is to investigate the variability of asthma severity in horses racing across the United States, its effect on performance and determine if omega-3 PUFA supplementation is beneficial.

Mitigation Of Equine Recurrent Uveitis Through SOCs

*Joseph Larkin,
University Of Florida*

This project seeks to design a topical eye drop, using a natural protein, which helps to prevent pain and blindness associated with equine recurrent uveitis.

Environmental Origins Of Equine Antimicrobial Resistance

*Brandy Burgess,
University Of Georgia*

This study will elucidate how antimicrobial resistance and virulence determinants are shared among horses and hospital environment, as well as the role antimicrobial exposure plays at this interface.



Treatment Of Joint Injury With Mesenchymal Stromal Cells

*Thomas Koch,
University Of Guelph*

This project deals with the evaluation of equine umbilical cord blood-derived mesenchymal stromal cells to treat joint injuries in horses.

Optimizing Bone Growth To Reduce Equine Fracture

*Mariana Kersh,
University Of Illinois Urbana-Champaign*

Reduction in distal limb fractures through exercise in young horses would have a significant positive impact on horse welfare and the economics and public perception of the horse industry.



New Generation Equine Influenza Bivalent-VLP Vaccine

*Thomas Chambers,
University Of Kentucky*

This study proposes to create a novel, safe and effective vaccine for equine influenza based on the 21st-century technology of noninfectious virus-like particles produced in plant.

Injury Prediction From Stride Derived Racing Load

*Chris Whitton,
University Of Melbourne*

By studying patterns in bone fatigue accrual over time in racehorses, this project will help better, and earlier, identify horses at risk of limb injury, facilitating timely evidence based preventative strategies.

Predicting Exercising Arrhythmias With Resting ECGs

*Molly McCue,
University Of Minnesota*

This project will use at rest ECGs to identify horses with irregular heart rhythms at exercise that can cause sudden cardiac death (SCD), allowing for increased monitoring and improved understanding of SCD.

Understanding And Preventing Supporting Limb Laminitis

*Andrew Van Eps,
University Of Pennsylvania*

The aim of this study is to make supporting limb laminitis preventable through analysis of archived model tissues, a multi-center limb motion study of horses at risk, and development of a prototype therapeutic device.

Diagnosis Of Incipient Condylar Stress Fracture

*Peter Muir,
University Of Wisconsin-Madison*

This study will save the lives of racehorses by establishing screening using fetlock CT for diagnosis of horses with a high risk of imminent serious injury for personalized clinical care.



Research Career Development Awards

There are two Career Development Awards offered through the Foundation. With the 2022 awards, the foundation has awarded \$480,000 to 30 researchers.

The **Storm Cat Award** is named in honor of the famous Thoroughbred stallion at Overbrook Farm in Lexington, Kentucky. Mrs. Lucy Young Hamilton, whose family owns Overbrook, is a member of the Grayson-Jockey Club Research Foundation's board of directors.

The **Elaine and Bertram Klein Development Award** is named in memory of a renowned horsewoman and her late husband, a Thoroughbred owner and breeder. The grant is funded by the Klein family.

The applicant must be working under the supervision of a tenured faculty member who is responsible for directing the post-graduate fellowship experience. By approving an applicant for an award, the university agrees to provide equipment, facilities, and any other support consistent with the successful completion of the project.

The long-term goal of this annual program is to spur development of potential career researchers by allowing post-graduate and post-residency students to further their experience with techniques and general research methods in areas under investigation by their institutions.

The Research Advisory Committee reviews the applications and recommends the best candidates to the Foundation's full Board of Directors.

In 2022, three awards were provided to the following qualified candidates:

Storm Cat Career Development Awards

Rosemary Bayless,
North Carolina State University,
mentor - *Dr. Katie Sheats*

"Cell-Free DNA as a Biomarker in Equine Colic Patients."

Sarah K. Shaffer,
University of California-Davis,
mentor - *Dr. Susan Stover*
"Linking Training to Stress-Reactions in Racehorse Bones."

Elaine and Bertram Klein Career Development Award

Bruno C. Menarim,
*Gluck Equine Research Center,
University of Kentucky,*
mentor - *Dr. James MacLeod*
"PPAR-y Activation in the Treatment of Joint Inflammation."

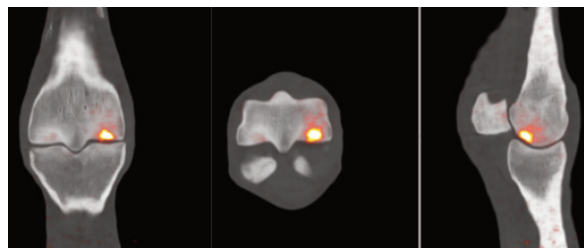


Development of PET Technology (Positron Emission Tomography)

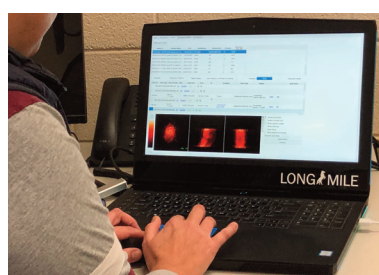
In 2016, Grayson funded the initial research to examine the use of PET in horses which required the horse be completely anesthetized.



In 2019, Grayson funded the second PET scan project when researchers returned with an updated mechanism that allowed for a standing scan of the horse with only mild sedation.



This cutting-edge research and technology is now assisting vets across the world in identifying lameness problems that are hard to locate in a safe and effective way.



As of this printing, the following locations have installed or will be installing PET Scanners

- Alamo Pintado Equine Medical Center *(in 2023)*
Los Olivos, CA
- Churchill Downs *(in 2023)*
Louisville, KY
- Kentucky Equine Hospital *(in 2023)*
Simpsonville, KY
- Ocala Equine Hospital
Ocala, FL
- Penn Vet's New Bolton Center
Kennett Square, PA
- Rood & Riddle Equine Hospital
Lexington, KY; Saratoga Springs, NY; Wellington, FL
- Santa Anita Park - *Under management S. CA Equine Foundation*
Arcadia, CA
- University of California-Davis- SVM
Davis, CA
- University of Melbourne Equine Centre - *In partnership with Racing Victoria*
Werribee, Australia
- World Equestrian Center - *Under management University of Florida-CVM*
Ocala, FL



“

Research is the fuel that drives equine clinical practice whether you are a racehorse or performance horse owner, trainer or veterinarian. The Grayson-Jockey Club Research Foundation is the leading funder of equine research worldwide. We need your help to help the horses.”

*Dr. Larry Bramlage, DVM, MS, DACVS
Rood & Riddle Equine Hospital*



“

Being married to an equine veterinarian, the health of our horses is of the utmost importance in our stable. Having a horse like Royce that can go from the show arena to the breeding shed makes me all the more appreciative of the great work Grayson is funding to keep him healthy and happy in either job.”

*Margie Goldstein Engle
10-time American Grandprix Association Rider of the Year*



“

As a jockey and a veterinarian, I have a unique appreciation for the advancement of research in the equine industry. Fans would love to see our equine athletes have longer athletic careers before retiring for breeding prospects or second careers. Let's work together for the health and well-being of our equine heroes that are giving us their all on the track.

*Ferrin Peterson
Thoroughbred Jockey and Equine Veterinarian*



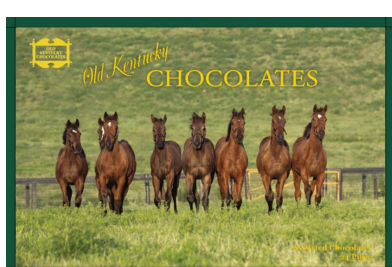
“

Equine research is helping keep our most valuable partners safe. When I am galloping around cross country on Cecelia, I know that her health and safety is not only at the forefront of my mind, but also in the minds of the team at Grayson-Jockey Club Research Foundation.”

*Daniela Moguel
International Event Rider*



Please be sure to visit these establishments from October 26 through November 29, 2022. A portion of sales will be donated to Grayson-Jockey Club Research Foundation. For more details and additional restaurants scan the QR code at the right.



Old Kentucky Chocolates is donating \$1.00 from the sale of each of their special equine box of fine chocolates to Grayson-Jockey Club Research Foundation. These boxes are available at many retailers and at all of the Old Kentucky Chocolate locations, or special order at oldkycandy.com



Grayson-Jockey Club Research Foundation

821 Corporate Drive • Lexington, KY 40503 • (859) 224-2850 • grayson-jockeyclub.org