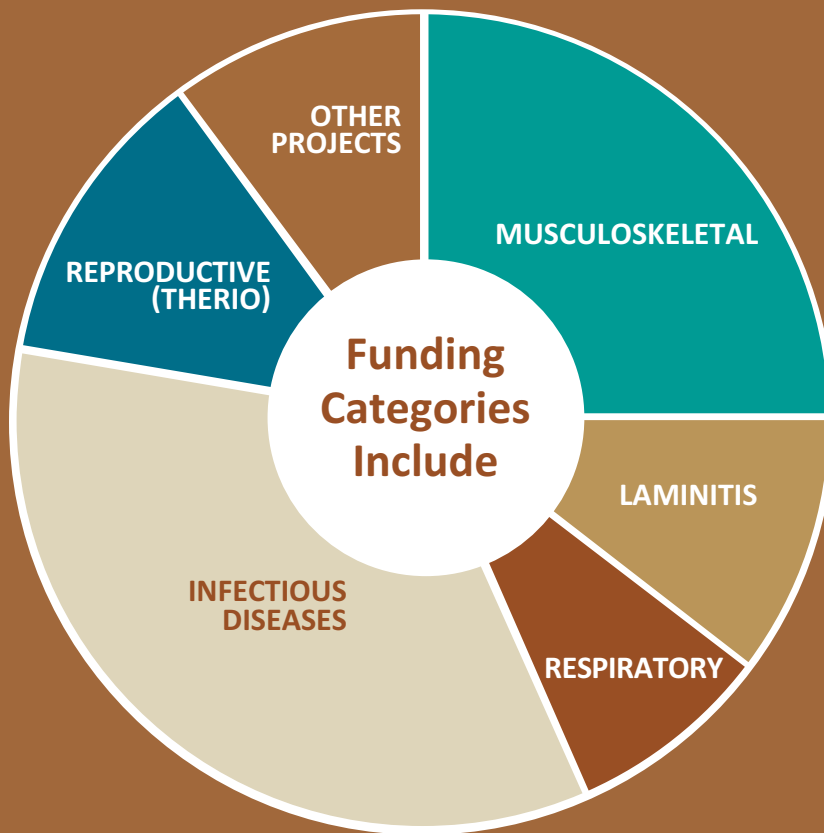




Grayson-Jockey Club Research Foundation, Inc.

2014 ANNUAL REPORT

TARGETED RESEARCH



Funding over
\$21,000,000
in research grants
since 1983



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HISTORY

Memory of a distinguished American was honored in 1940 when the original Grayson Foundation was formed. Admiral Cary Grayson had been best known as the personal physician to President Woodrow Wilson and at the time of his death, in 1938, he was chairman of the American Red Cross. He was also a racing man, whose best horses included My Own, winner of the Saratoga Cup, Saratoga Handicap, and Maryland Handicap.

Admiral Grayson owned Blue Ridge Farm in Virginia, which is continued today by grandchildren. After the death of Admiral Grayson, the \$2,500 Grayson Stakes was inaugurated at Laurel. Matt Smart, who had been training for Grayson at the time of his death, sent out the winner in Houghton P. Metcalf's High Velocity. The 1 1/2-mile Grayson Stakes was run annually through 1949, and subsequent winners included Heelfly, Pilaster, and Double Brandy.

Admiral Grayson was connected to some of the formulative stages which led eventually to the establishment of the equine research foundation named for him. He was president of an organization called the Gorgas Foundation, and he asked its director, Dr. Herbert Clark, to help advise the American Thoroughbred Breeders Association ("ATBA"). The breeder's organization in the late 1930s was exploring various ways to address the promotion of research for horses.

By 1939, a plan had been formulated whereby the ATBA would launch a campaign to raise \$100,000 and, once that amount had been pledged, the Grayson Foundation would become a reality. The Jockey Club, under direction of its chairman, William Woodward Sr., was among the initial respondents, pledging 20 percent of the total.

The Grayson Foundation became a reality in 1940, and its initial incorporators included Woodward, while John Hay (Jock) Whitney was the Foundation's initial president. The first grant was made before the year was over, a \$1,000 donation to the University of Pennsylvania Veterinary

School to continue its work on periodic ophthalmia. In 1940, the horse and mule were still deeply involved in military defense, and the scope of the Foundation's efforts went far beyond the Thoroughbred, to all breeds, although the impetus came from leaders in Thoroughbred racing.

From the beginning, the aim was to support research at existing institutions through funding rather than carry out the research itself. A statement by Woodward read in part that the formation of the Foundation is "the result of the conviction of a large number of persons devoted to the raising and breeding of horses that there is a positive need for further research in veterinary medicine and in the breeding, raising, and handling of horses." Over nearly a half-century, the Grayson Foundation operated as a separate entity, fulfilling the purposes of its founders despite constant limitations on available funding.

For much of its history, the Foundation sought to disperse \$100,000 annually in grants to specific research projects. Its success in this goal resulted in support for a number of projects which represented steps forward, among them being the development of vaccines against Equine Viral Arteritis and herpesvirus infections, determining causes of viral abortions leading to development of the most effective vaccine yet developed, and influencing estrous cycles in mares to increase fertility.

The Jockey Club created a research foundation in 1984, and five years later this was merged with Grayson, to be known since then as the Grayson-Jockey Club Research Foundation, Inc. (GJCRCF, the Foundation). Grayson had a half-century background in research matters, and The Jockey Club had more wherewithal financially, so in recent years the combined foundation has been able to disperse approximately \$1 million annually in grants.

During the 1990s, three gifts of remarkable generosity were instrumental in enhancing the success of the Foundation in fulfilling its mission. In 1991, the Robert J. Kleberg and



Helen C. Kleberg Foundation donated \$2 million to Grayson-Jockey Club Research Foundation. Mr. Kleberg had studied genetics and as head of King Ranch developed the Santa Gertrudis breed of cattle. He also was instrumental in development of the American Quarter Horse, and the many excellent Thoroughbreds he bred included 1946 Triple Crown winner Assault.

In 1993, the Foundation received another major gift when Paul Mellon donated the \$1 million bonus that his Kentucky Derby winner Sea Hero won in the Chrysler Triple Crown Challenge. Mr. Mellon requested that double that amount be raised in response, and this endowment drive was successfully concluded during the 1995-96 fiscal year. The \$1 million was double matched, as members of The Jockey Club and other contributors donated a total of more than \$2 million.

Mr. Mellon passed away in 1999, leaving \$2.5 million to the Foundation's endowment. In 2000, the Foundation created the Rokeby Circle as the designation of those who contribute \$10,000 or more in a given year. Rokeby is the name of Mr. Mellon's beloved Virginia estate, where he bred the champions Mill Reef, Arts and Letters, Fort Marcy, and Key to the Mint. The Sea Hero Triple Crown bonus, and resultant endowment drive, helped attain one of the other goals set by previous chairman John Hettinger, i.e., raising the Foundation's net assets to the \$10-million level. Under the current chairman, Dell Hancock, growth continued; net assets stood at \$24.5 million at the conclusion of 2014.

One key stimulus was the Oxley Challenge, initiated in 2004. Under the direction of Foundation board member John C. Oxley, his family's Oxley Foundation pledged \$1 million over four years contingent on the Foundation raising a like amount in new income sources. The Foundation was successful in that match, and so received \$250,000 from the Oxley Foundation in each of four years.

In 1999, under direction of Drs. Gary Lavin and Larry Bramlage, the Foundation's process of evaluating grants was reorganized. Instead of having separate committees of academicians and practicing veterinarians, a single Research Advisory Committee ("RAC") was created. The Committee includes 32 individuals representing various research specialties and veterinary practices from across North America. Each year, the committee is convened in January, having read all proposals submitted by the research community. The RAC spends three days poring over the projects and rates them top to bottom, recommending the best to the board of directors. The board then meets to determine how many projects can be funded in that year.

In 2006, in collaboration with The Jockey Club, the Foundation coordinated and underwrote the first Welfare and Safety of the Racehorse Summit ("Summit") hosted by Keeneland. That meeting, and a second gathering of industry experts in 2008, generated a number of recommendations which the industry has embraced to a large extent. The Jockey Club's Thoroughbred Safety Committee endorsed recommendations of the Summit, and the National Thoroughbred Racing Association's race track accreditation program is based in part on those recommendations. Also, the Summit helped organize the Equine Injury Database™ which is designed to provide the industry much needed epidemiological analysis of trends, aimed at improving injury rates nationally. Summit's were held in 2010, 2012 and in July 2014.

Since 1983, Grayson-Jockey Club has individually provided more than \$20.9 million to fund a total of 310 projects at 41 universities in North America and overseas.



**Research
Advisory Committee
established**

1999

*Drs. Gary Lavin and Larry Bramlage
develop the process that is considered
the gold standard in peer review*



**\$1,000,000
Oxley Challenge**

2004

*Mr. & Mrs. John Oxley
through the
Mary Oxley Foundation*



**5th Welfare & Safety
of the Racehorse
Summit**

2014





REVIEW OF ACTIVITIES IN 2014

The core mission of Grayson-Jockey Club Research Foundation (GJCRF, The Foundation) is providing funding for the best research projects, as evaluated by the Research Advisory Committee and approved by the Board of Directors. In 2014, The Foundation funded 16 projects for \$958,590. Details on each of these projects are provided in this Annual Report, beginning on page 10. In addition, GJCRF in 2014 funded three Storm Cat Career Development Awards. Explanation of this program and details of the selected projects appear on page 7.

WELFARE AND SAFETY OF THE RACEHORSE SUMMIT V



The Jockey Club and the Foundation held the fifth Welfare and Safety of the Racehorse Summit on July 8-9 at Keeneland Race Course in Lexington, Kentucky.

Among the accomplishments that have evolved from the previous four summits are creation and development of the Equine Injury Database™; the Jockey Injury Database; the Racing Surfaces Testing Laboratory, which provides science-based testing of racing surfaces to enhance safety for horse and rider; a uniform trainer test and study guide; the publication of stallion durability statistics; and the movement by state racing commissions to create regulations that void the claim of horses suffering fatalities during the conduct of the race.

Topics addressed during the 2014 Summit included:

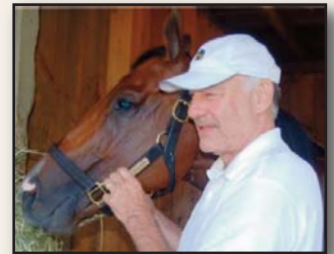
- Using Data to Keep Horses Safe
- Today's Thoroughbred — What Animal Are We Dealing With?
- National Uniform Medication Program Update
- Training and Bone Development in the Racehorse
- Making Safety a Priority in Your Racing Enterprise
- Jockey Injury Database
- Racetrack Surfaces and Technology Integrations
- Advanced Horsemanship

During 2014, it was announced that the Welfare and Safety of the Racehorse Summit would become an annual event, rather than being conducted approximately every 18 months as in the past.

STARLIGHT RACING'S LARGE COMMITMENT TO LAMINITIS RESEARCH

Starlight Racing partners, in memory of Intense Holiday, which recently had succumbed to laminitis, announced it would donate \$75,000 to GJCRF (earmarked for laminitis research) provided the Foundation raised matching funds for their research projects.

"Intense Holiday illustrated one of the most frustrating and tragic aspects of laminitis," said Jack Wolf, founder of Starlight Racing. "That is when an injury seems to be treatable, even to the point where a horse appears to be out of the woods, but then laminitis develops and the horse is lost. Intense Holiday had a condylar fracture, which we were confident could be dealt with, but laminitis developed and he lost a hard-fought battle to the disease. Our impetus to donate and raise money for this research really arose, not just from our loss, but from the overwhelming outpouring of support from the racing community. We heard hundreds of stories from people who, like us, lost horses prematurely."



The Foundation successfully met the challenge to match Starlight's \$75,000 by the end of 2014.

OAK TREE RACING ASSOCIATION PLEDGE

Another challenge opportunity was launched late in 2014 when Oak Tree Racing Association announced it would match donations made to the Foundation in honor of Dr. Jack K. Robbins. The pledge will cover donations up to a total of \$100,000 that are made through December 31, 2015.



Dr. Robbins, a Thoroughbred owner and breeder and a pioneer in the field of veterinary medicine, died November 29, 2014, after battling pulmonary and respiratory disease. He was 93.

Dr. Jack Robbins was a founder of the Oak Tree Racing Association and a standard-bearer for the association's dedication to the betterment of racing and the good of the horse. He was also a champion of equine research who had a long association with Grayson-Jockey Club Research Foundation and was director emeritus at the time of his passing.

GRAYSON DIRECTORS HONORED BY AAEP

Grayson-Jockey Club Chairman Dell Hancock was presented the George Stubbs Award by the American Association of Equine Practitioners. Hancock accepted the award from AAEP President Jeff Blea during the December 9 President's Luncheon at the AAEP's 60th Annual Convention in Salt Lake City, Utah. The George Stubbs Award recognizes the contributions made to equine veterinary medicine by individuals other than veterinarians.

The award is named for George Stubbs (1724-1806), an artist and teacher who played a vital role in veterinary education. Stubbs' reference book, *Anatomy of the Horse*, published more than 200 years ago, is still universally recognized as an authoritative anatomical presentation.



Also during the AAEP convention, a Service Award was presented to Dr. Larry Bramlage, currently a member of the Grayson board of directors and founding chairman of its Research Advisory Committee (RAC). The President's Award at the AAEP was presented to Dr. Rick Arthur, also a member of the Grayson board of directors and a participant with the RAC.

FIRST COMEBACK AWARD



As part of its sponsorship of the National Horse Show, via Rood & Riddle Veterinary Hospital's Kentucky Experience, the Foundation presented the first Comeback Award.

The winner selected was the Irish Sport Horse show jumper Flexible, owned by Sam and Mollie Chapman and trained and ridden by Rich Fellers. Flexible is well known for his triumphs, including his World Cup victory, and his Olympic performances. The Comeback Award, however, honored the horse along with his owners, trainer, and veterinarians who brought him through three distinct and seemingly career-ending lameness problems over the last decade. In 2014, at the age of 18, Flexible (with Fellers) won the \$55,000 Land Rover Grand Prix of Sacramento.

SUCCESSFUL FUND RAISERS

Under direction of Mrs. Nancy Kelly, vice president of development, the Foundation's fund raisers netted \$242,000 in 2014. The fund-raising events were the Belmont Celebration, the annual golf tournament in Saratoga, and the sale of Elizabeth Locke Jewelry.



OTHER HIGHLIGHTS OF THE YEAR

Cot Campbell's Dogwood Stable designated one percent of the net purse from any graded stakes victory by Palace Malice. The horse won four graded stakes during the year, highlighted by the \$1,250,000 Metropolitan Handicap. The Foundation received \$8,671.64 from those victories.

The Foundation solicited items to be sold on Ebay for the benefit of GJCRF. The subsequent Ebay auction grossed \$9,400.

Activities in 2015 and Future Plans



The addition of Garrett Gleeson to the staff provides the Foundation with widely enhanced fund raising capacity. Mr. Gleeson is Director of Development and Major Gifts. He began work on March 1. Mr. Gleeson will be having face to face meetings with present and potential donors. Part of his efforts will be to develop relationships with individuals and organizations in various activities and breeds in addition to the Thoroughbred industry, which has been the largest source of support for GJCRF.

In 2015, the Foundation board of directors approved a budget of \$1,100,500 to fund research during the year. The budget covers 10 new projects and seven second-year projects, two career development awards, and a call for a special project on Exercise Induced Pulmonary Hemorrhage.



BOARD OF DIRECTORS



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Rick Arthur, DVM
William M. Backer
Larry R. Bramlage, DVM
Charlsie Cantey
Adele B. Dilschneider
Donald Dizney
William S. Farish Jr.
John K. Goodman
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A. Gary Lavin, VMD
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John C. Oxley
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Hiram C. Polk, MD
Daisy Phipps Pulito
Geoffrey Russell
Joseph V. Shields Jr.

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Edward L. Bowen
President

Laura Barillaro
Treasurer

Shannon Kelly
Development Manager



Nancy C. Kelly
*Vice President of Development;
Secretary*

Resia L. Ayres
Operations Manager

Johnny Mac Smith, DVM
Veterinary Consultant



The Storm Cat Career Development Award, inaugurated in 2006, is a \$15,000 grant designed as an early boost to an individual considering a career in equine research. It has been underwritten annually by Mrs. Lucy Young Hamilton, a GJCRF board member whose family stood the champion stallion Storm Cat at Overbrook Farm. In each of the last two years, the Foundation board had authorized two Storm Cat Awards in addition to the award provided by Mrs. Hamilton.

Bradley B. Nelson, Colorado State University

Contrast CT For Cartilage Injury In Impact OA Model

Osteoarthritis (OA) is a well-recognized disease in horses and humans. Currently, MRI is the gold standard imaging method to evaluate cartilage in horses and humans, but presents difficulties that can lead to false positives. With the advent of multi-slice computed tomography (CT), costs and scan length have decreased while having improved spatial resolution compared to MRI.

Contrast agents can be injected into the joint to help outline articular structures for X-ray based imaging including contrast enhanced computed tomography (CECT). We hypothesize that decreased equine articular cartilage GAG content will be detectable and correlative with CT attenuation using a CA4+ contrast agent in an impact model of osteoarthritis. To test, we aim to determine correlations between articular cartilage GAG content and CT attenuation (CECT) with cationic contrast agent (CA4+) in horses where degenerative GAG concentrations in articular cartilage are created by an impact injury.

Heidi Reesink, Cornell University

Lubricin As A Biotherapeutic For Equine Joint Disease

Joint injury and osteoarthritis (OA) rank second only to tendon injury as the leading cause of racehorse retirement. A significant unmet need in research is the evolution of better intraarticular medications that have a more regenerative effect that might bolster both cartilage restoration and quell the reaction in the joint that follows impact injury.

We hypothesize that lubricin may enhance functional repair throughout the joint, and in-so-doing, reduce pain and the progression of disease. The broad objectives of this proposal are to examine the lubricin levels in joints with various stages of joint damage (from normal through reactive to obvious arthritis), to assess the organization of lubricin on the cartilage surface, and to determine the impact of

lubricin on cartilage and joint lining tissues. Studies so far suggest that lubricin protects articular cartilage from fibrillation by functioning as a boundary lubricant and by preventing joint lining cell overgrowth and protein deposition. We seek to understand the underlying mechanisms by which lubricin confers these properties in the joint.

Katarzyna Dembek, The Ohio State University

Adrenal Steroids And Neurosteroids In Sick Newborn Foals

Sepsis is the number one cause of foal mortality. The prognosis of survival in septic foals ranges from 35-60%. Critically ill foals are sent to intensive care units with hypotension, poor tissue perfusion, energy dysregulation, acid-base and electrolyte abnormalities, and organ failure.

In response to stress, the hypothalamus releases corticotropin-releasing hormone (CRH) and vasopressin (AVP) to stimulate the pituitary gland to secrete adrenocorticotrophic hormone (ACTH), which induces the adrenal cortex to release cortisol, aldosterone, and sex steroids. Except for cortisol, information on adrenocortical function in sick foals is limited.

The overall goal of this project is to elucidate the role of hypothalamic regulatory factors (e.g. BDNF) and their interaction with adrenal steroid precursors / neurosteroids in the development of RAI in critically ill foals. We hypothesize that while in critically ill foals AI is mainly the result of adrenal failure (primary RAI), in a number of foals impaired secretion of steroid precursors/neurosteroids and BDNF leads to hypothalamic (tertiary RAI; ↓AVP, ↓CRH) and subsequently pituitary (secondary RAI; ↓ACTH) and adrenal gland dysfunction, which will be associated with multiple clinical derangements and a worse prognosis for survival.



Since
2006
13 Individual
Career Awards
Totalling \$200,000



RESEARCH ADVISORY COMMITTEE IN 2014

The Research Advisory Committee evaluates research proposals and advises the Foundation's Board of Directors on the basis of the needs of the industry and scientific quality of each project. For the 2014 grants allocation, the committee was comprised of the following persons who served the Foundation without compensation.



CHAIRMAN

Paul Lunn, BVSC, MS, PhD MRCVS, DACVIM

Dean, College of Veterinary Medicine
North Carolina State University
Raleigh, NC
Graduate - University of Liverpool, England

CONSULTANT

Johnny Mac Smith, DVM

Founding Partner
Peterson & Smith Equine Hospital
Ocala, FL
Graduate - Auburn University



EX-OFFICIO COMMITTEE MEMBERS AND MEMBERS OF THE BOARD OF DIRECTORS



A. Gary Lavin, VMD

Private Practice
Goshen, KY
Graduate - University of Pennsylvania

Rick Arthur, DVM

*Equine Medical Director,
California Horse Racing Board*
Sierra Madre, CA
Graduate - University of California, Davis



Kathleen M. Anderson, DVM

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Equine Veterinary Care, Fair Hill Training Center • Elkton, MD
Graduate - Western CVM Saskatchewan, Canada

Doug Antczak, VMD, PhD

Dorothy Havemeyer McConville Professor of Equine Medicine
Baker Institute for Animal Health, Cornell University • Ithaca, NY
Graduate - University of Cambridge

Jim Belknap, DVM, PhD, DACVS

Professor, Equine Surgery
The Ohio State University • Columbus, OH
Graduate - Colorado State University

Jerry Black, DVM

Director of Equine Sciences Undergraduate Programs
Director of Equine Reproduction Laboratory
Colorado State University • Fort Collins, CO
Graduate - Colorado State University

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Graduate - Virginia-Maryland Regional CVM

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Graduate - University of Florida

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Graduate - University of Pennsylvania

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Graduate - University of Cambridge

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Graduate - Virginia-Maryland Regional CVM

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Equine Sports Medicine Consultants • Newark, DE
Graduate - University of Georgia

James Gilman, DVM

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Gillman & Associates • Barrington, IL
Graduate - University of Illinois

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Associate Professor in Equine Surgery and Lameness
Colorado State University • Fort Collins, CO
Graduate - University of Illinois

Kurt Hankenson, DVM, MS, PhD

Professor
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Graduate - University of Illinois

Ashley Hill, DVM, MPVM, PhD

Associate Professor
University of California, Davis • Davis, CA
Graduate - University of California, Davis

Mary Hondalus, DVM, PhD

Assistant Professor
University of Georgia • Athens, GA
Graduate - Michigan State University

David Horohov, PhD

Jes E. and Clementine M. Schlaikjer Endowed Chair & Professor
University of Kentucky • Lexington, KY
Graduate - University of Tennessee

Lloyd Kloppe, DVM, ACT

Private Practice
Durango Equine Veterinary • Buckeye, AZ
Graduate - University of Missouri

Kim Kuhlmann, DVM

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Belmont, CA
Graduate - Colorado State University

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Director, Lab for Equine & Comparative Orthopedic Research
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Graduate - University of Wisconsin

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Internist
Hagyard Equine Medical Institute • Lexington, KY
Graduate - University of Pennsylvania

Robert MacKay, BVSC, PhD, DACVIM

Professor, Department of Large Animal Clinical Sciences
University of Florida • Gainesville, FL
Graduate - Massey University, New Zealand

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Graduate - Michigan State University

Pat McCue, DVM, PhD, DACT

Iron Rose Ranch Professor of Theriogenology
Colorado State University • Fort Collins, CO
Graduate - University of California, Davis

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Washington State University • Pullman, WA
Graduate - Colorado State University

Stephen Reed, DACVIM

Head of Equine Medicine & Surgery- Rood & Riddle;
Emeritus Professor, The Ohio State University and
Adjunct Professor, Gluck Center, University of Kentucky
Rood & Riddle • Lexington, KY
Graduate - The Ohio State University

Liz Santschi, DVM, DACVS

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The Ohio State University • Columbus, OH
Graduate - University of Illinois

Charles Scoggin, DVM

Resident Veterinarian at Claiborne Farm
Claiborne Farm • Paris, KY
Graduate - Colorado State University

Hugh Townsend, DVM

Professor, Dept of Veterinary Microbiology & Large Animal Medicine
University of Saskatchewan • Saskatoon, SK Canada
Graduate - University of Saskatchewan

Ed Voss, DVM, PhD

Private Practice
Chandler, AZ
Graduate - Kansas State University

Joie Watson, DVM, PhD

Associate Professor and
Chair Department of Medicine and Epidemiology
University of California, Davis • Davis, CA
Graduate - University of California, Davis



FUNDED PROJECTS IN 2014

WEIGHT BEARING; PERFUSION & BIOENERGETICS IN LAMINITIS

Dr. Andrew van Eps, University of Queensland

Equine laminitis continues to be a devastating complication to multiple equine diseases. Laminitis is reported to affect 2–7% of horses annually. Due to frequency and severity of the disease, it has been listed as the number one priority for equine research by the members of the American Association of Equine Practitioners. From research performed in the past decade it has emerged that there are three distinct major forms of laminitis. One of them is supporting-limb laminitis. Although it has never been proven, supporting limb laminitis is suspected to occur as a result of reduced blood supply to the connection between hoof and bone (the lamellar tissue). It is proposed that horses rely upon regular loading and unloading of the foot in order to move blood through it. Our research groups (Queensland, University of Pennsylvania, and Ohio State) now have strong preliminary data that supports this suspicion. This next step will utilize a protocol that combines real-time monitoring of lamellar tissue blood flow and energy balance with a suitable and humane model of preferential weight bearing on one limb. We seek to confirm the cause of supporting limb laminitis and to test potential therapeutic interventions. It is anticipated that the results of this study will directly guide the design of devices and/or protocols that can be used in the clinical setting to prevent supporting limb laminitis. An effective preventative strategy would be a significant step forward for the welfare of horses and for the horse industry.

EVENTS AFFECTING LAMINAR ADHESION IN EQUINE SEPSIS

Dr. James Belknap, The Ohio State University

Sepsis-related laminitis (SRL) is a common type of laminitis which occurs in animals experiencing a large breadth of diseases such as infectious diarrhea, pneumonia, intestinal compromise from colic, grain overload, and retained placenta/acute uterine infection post foaling. Although we have discovered some of the central laminar events occurring in SRL (including the same initial inflammation as occurs in organ injury and failure in human sepsis patients), we still have not established the events or signaling that result in laminar failure.

After many decades of frustration with failures of multiple therapies, we now have one therapy, continuous digital hypothermia (CDH), which has proven effective in the laboratory and clinical setting in many horses. We will use routine biochemistry techniques, but will also use two cutting edge research tools including kinome arrays and metabolomics analysis. The results will provide targets

for pharmaceutical therapies to either replace or augment CDH, and will also for the first time determine effects of CDH in the normal digit (important to know for any commonly used therapy).

Advancing laminitis therapy will allow more at-risk animals to avoid the crippling consequences of SRL and return to their previous level of function in the equine industry as was witnessed with Paynter.

R. EQUI PNEUMONIA: CAN A NOVEL VACCINE PROTECT FOALS?

Dr. Noah Cohen, Texas A&M University

Pneumonia caused by *Rhodococcus equi* remains an important cause of disease and death in foals at equine breeding farms worldwide. Currently, there is not an approved vaccine available in North America to protect against *R. equi* pneumonia. To date, the only vaccination strategy that has been demonstrated to be effective for protecting against experimental challenge with *R. equi* has been oral administration of live strains of *R. equi* to foals. This approach is not acceptable because of concerns for environmental contamination with live bacteria excreted in foal feces, and the potential for these live organisms to cause disease in some foals.

We have developed a novel method for generating bacteria that are unable to reproduce but that remain structurally and metabolically intact by using electron-beam technology. Moreover, we have demonstrated that e-beam-irradiated isolates of *R. equi* administered orally can stimulate *R. equi*-specific immune responses in very young foals.

We propose to evaluate the ability of this vaccine to protect foals against infection with *R. equi* as an essential next step in our efforts to develop a vaccine against *R. equi*. and subsequently other infections such as *Strep equi*, the causative agent of strangles.

“Research can provide answers to many questions if researchers receive support.”

Dr. Paul Lunn

*Dean, CVM North Carolina State University
Former RAC Committee Chair*



ANHIDROSIS IN FOALS TREATED WITH MACROLIDES

Dr. Robert MacKay, University of Florida

Whereas most foals affected by R equi pneumonia used to die with this disease, they now can be treated successfully with erythromycin or similar drugs. Treatment typically takes several weeks and recovering foals often are turned out for part of the day. Two important side-effects detract somewhat from the effectiveness of erythromycin: diarrhea and overheating. Diarrhea is typically mild but the apparent inability of treated foals to regulate body heat effectively can sometimes be fatal.

We presume that these deaths are caused by heatstroke. Our theory is that the overheating problem is similar to anhidrosis (nonsweating), in that the ability to sweat is impaired. We have good evidence for this in the case of erythromycin, based upon studies done in preparation for this proposal. We have developed a way to measure precisely the ability of horses to sweat. We plan to use this simple test to show that impaired sweating is the cause of overheating in foals given erythromycin or similar drugs. Some additional studies will be dedicated to trying to sort out how this class of drugs affects sweating.

If we are right, we hope that these results will serve as a wake-up call for all concerned that foals on erythromycin-like drugs including azithromycin, clarithromycin, and gamithromycin are at risk for heatstroke during and even after treatment and they therefore need to be protected by implementation of common-sense heat control measures.

CHARACTERIZATION OF INTRA-ARTICULAR ISOFLUPREDONE

Dr. Heather Knych, University of California- Davis

Corticosteroids are potent anti-inflammatory agents and as such are commonly used to prevent and treat performance related injuries in equine athletes. Due to their ability to affect performance and potential to allow a horse to compete when it otherwise should not, corticosteroid use is regulated in performance horses. Over the last 2 years, a concerted effort has been made to establish standardized regulatory thresholds and withdrawal times for this class of drugs. To date, recommendations have been made for methylprednisolone acetate, triamcinolone acetonide and betamethasone acetate. The extended withdrawal time for methylprednisolone in particular, has led some veterinarians to seek out alternative corticosteroids, such as isoflupredone acetate; however, comparable data, upon which to make regulatory recommendations does not exist for this drug.

Data gathered in this study will provide valuable information for establishing a threshold concentration and withdrawal

time for intra-articular isoflupredone acetate in horses. Additionally, this proposal outlines a unique approach for assessing the duration of effect of this drug in the horse by measuring up-regulated genes and inflammatory proteins. If, as we have theorized, this drug has a prolonged effect relative to detection times, results from this study may support less frequent administration of intra-articular corticosteroids, which may ultimately prove beneficial to the health of the joint.

OPTIMIZATION OF RACETRACK SURFACE PROPERTIES

Dr. Susan Stover, University of California- Davis

Evidence indicates that race surfaces affect the likelihood for injuries in racehorses. Race surface design has the potential to significantly reduce injuries because race surfaces affect all racehorses training and racing on a surface. Therefore, race surface design is an attractive factor to manage to reduce racehorse injuries.

Mild and severe injuries to the fetlock are very common. Catastrophic injuries to the fetlock are the greatest cause of death in racehorses, causing about 50% of injury related deaths. Fetlock injuries are due to circumstances that cause the fetlock to extend beyond its normal range of motion (hyperextension). We hypothesize that fetlock hyperextension, and related injuries, can be prevented by developing race surfaces that change the way the limb interacts with the surface. Our objective is to determine the characteristics that a race surface should have to prevent fetlock injuries.

It is not economically practical to build the number of race surfaces needed to determine the ideal surface for injury prevention, thus computer modeling and simulation approach is being used. This approach will assess the effect of surfaces presently installed, as well as those surfaces that do not presently exist. Racehorse fetlock motion will be predicted for a large number of surfaces with different characteristics. Because the predictions are only as good as the computer model, the model will be evaluated for accuracy (validated) by comparing predictions with actual race surface behavior and racehorse fetlock motion that we previously measured simultaneously at two racetracks, one with a dirt surface and one with a synthetic surface. After validation, the model will be used to determine race surface characteristics that prevent fetlock hyperextension. These race surface characteristics can be used as a standard guide.



FUNDED PROJECTS IN 2014

CONTRAST ENHANCED CT FOR DETECTION OF CARTILAGE INJURY

Dr. Chris Kawcak, Colorado State University

Osteoarthritis is the most common musculoskeletal problem in horses and leads to lameness, decreased athleticism, and early retirement. Proteins in articular cartilage (glycosaminoglycans, GAGs) are important for articular cartilage structure in that they provide a smooth gliding surface for normal joint mobility. GAG loss is one of the early signs of osteoarthritis. When that occurs, the articular cartilage becomes weaker and is more prone to tearing due to continued joint inflammation. Once articular cartilage becomes damaged it has limited ability to repair itself and therefore, the disease will progress and worsen over time. Because of this, early detection of articular cartilage injury is critical to successful long-term outcomes.

Unfortunately, routine diagnostic methods (radiographs, ultrasound, MRI, CT) all have shortcomings in evaluating articular cartilage. However, when contrast agents are injected into the joint prior to imaging (CCECT), they can provide more information. In preliminary experiments we have demonstrated that the amount of CCECT contrast in the cartilage is strongly related to the amount of GAG content within articular cartilage in normal joints. Our hypothesis is that CCECT is a safe and useful method to improve early diagnosis of joint disease. We will test this hypothesis by determining GAG concentrations in normal and diseased articular cartilage and comparing those amounts to CCECT attenuation. We will also test the safety of CA4+ by evaluating articular cartilage samples for toxicity and lastly, compare the CCECT imaging modality to MRI. It is anticipated that in these experiments we will be able to demonstrate that decreasing GAG content is comparable to CCECT attenuation allowing for the early detection of cartilage injury.

The completion of this project will allow for the critical evaluation of CCECT as a method for the detection of early osteoarthritis in horses and will allow for applications of its use in clinical patients. If this method proves to be effective, it can be a useful tool for monitoring future treatment protocols in horses as well as future cartilage research as it offers a way of ante-mortem in depth evaluation of cartilage health.

PLATELET INHIBITORS POTENTIAL ANTITHROMBOTICS FOR EHV1

Dr. Tracy Stokol, Cornell University

Equine herpesvirus type 1 (EHV1) is a prevalent respiratory pathogen that is increasingly recognized as a cause of neonatal deaths, abortion, and neurological disease in performance horses. While viremia is common to mild and severe forms of EHV1, major gaps exist in our current understanding of how EHV1 targets the reproductive tract and spinal cord, and how to render infected horses resistant to this attack. Our preliminary data reveal that platelets act as a "Trojan Horse" to enable EHV1 tissue targeting and that inhibiting platelet activation represents a novel approach for EHM prevention.

Under experimental conditions, we have shown that equine platelets exposed to EHV1 undergo a procoagulant activation response and then bind to and transfer EHV1 infection to equine endothelial cells. Our proposal builds on these observations to test the hypothesis that experimental infection with EHV1 induces an in vivo procoagulant platelet phenotype, and that administration of phosphodiesterase inhibitors will abrogate EHV1 induced platelet activation. Results from EHV1 infected and sham infected horses will be compared and we will relate changes in platelet and coagulation parameters to recorded clinical signs (e.g. fever), platelet counts and level of viremia.

We expect to find evidence of platelet and coagulation activation during the acute phase of EHV1 infection and that horses demonstrating more profound activation response will also have more severe fever.

We will also compare the inhibitory effects of 4 antiplatelet drugs on EHV1 induced platelet activation. We expect that, of these drugs will have the most inhibitory action on the ability of EHV1 to induce platelet procoagulant activity. EHV1 infection results in microvascular thrombosis that contribute to the clinical syndromes of abortion and EHM. For instance, horses that have severe neurological symptoms, such as paralysis or paresis, frequently have to be euthanized. Horses that do survive may not be able to race or may have decreased future racing performance due to the persistence of neurologic signs. By preventing or minimizing thrombosis, we can potentially decrease or eliminate these two severe clinical manifestations of EHV1 infection.

Successful completion of this study will show that, for the first time, platelets are activated in vivo in horses with EHV1 infection and that we can potentially inhibit platelets from participating in thrombosis, using available

phosphodiesterase inhibitors. These affordable drugs, which are currently used in horses to treat airway disease, endotoxemia, laminitis and navicular disease, could readily be administered to exposed or known infected horses, including pregnant mares, to reduce or prevent the devastating sequelae of EHV1 infection. By inhibiting platelet function, we have our first real chance of preventing thrombosis and the clinical syndromes of abortion and EHM in horses.

ASSESSMENT OF A RHODOCOCCLUS EQUI VACCINE IN FOALS

Dr. Jose Vazquez-Boland, University of Edinburgh

The pathogenic bacterium *Rhodococcus equi* produces a severe lung disease in foals that causes significant losses to the equine industry. Research efforts have failed so far in developing an effective vaccine against this disease. Understanding the intimate mechanisms used by pathogens to cause infection can lead to the identification of microbial “Achilles’ heels” that could be targeted by novel vaccines and diagnostics. We recently deciphered the composition of the *R. equi* genome (the entire repertoire of genes that make up this bacterium) and used sophisticated analytical techniques and molecular experimentation to identify suitable targets on a rational basis.

Our work with the genome led us to find that *R. equi* produces specific appendages termed “pili” that mediate attachment to host cells. We also found that these pili are essential for lung colonization and confer full protection when used as a vaccine in mice. This project aims to test the protective efficacy of this novel *R. equi* pili vaccine candidate in foals. *R. equi* infection is contracted during the first days of life and the immune system of young foals is incapable of stopping the pathogen once it is established deep in the lung tissue, resulting in life-threatening purulent pneumonia. We believe that protection against this pathogen can be achieved by targeting the pili with a vaccine that will prevent infection when still at its initial “colonization” stages in the airways before the bacteria become established in the lung. If the trial that will be conducted in this project is successful, the *R. equi* pili will form the basis of a commercial vaccine to control rhodococcal infection in stud farms.

ETIOLOGY OF IAD AND PERFORMANCE IN RACEHORSES

Dr. Laurent Couetil, Purdue University

Inflammatory airway disease (IAD) is the second most common cause of poor performance in athletic horses. Inflammation and accumulation of mucus in the airways interferes with the movement of oxygen from the lung into the blood stream, limiting the performance of horses during strenuous exercise. The type of inflammation in the lung varies with the age of the horse. Younger horses most often exhibit airway inflammation characteristic of an allergic reaction with eosinophils and mast cells. In mature horses, airway inflammation usually is marked by neutrophils, which is considered a non-allergic response.

The triggering factors for IAD are not known but studies have implicated exposure to barn dust. On the other hand, studies have also supported a role for bacterial infection of the airways. The levels of airborne irritants horses are exposed to in the barn environment can be measured, and airway secretions can be sampled in order to classify the type of airway inflammation present in an individual horse. Combining these techniques will allow examination of the relationship between barn exposure and airway inflammation. In the past, investigations of the role of bacteria in IAD have relied upon time-consuming and relatively insensitive culture of mucus. Currently, DNA sequencing is a highly sensitive method that can be used to identify all the bacteria present in mucus, thereby characterizing the entire airway microbe population, or so-called “microbiome.” In addition to bacteria, viruses may cause airway inflammation. Again, DNA sequencing has improved the ability to detect viruses. This study is designed to explore the possibility that the various types of airway inflammation differ in their impact upon racing performance in horses and are due to different causes. Studying these differences is important to develop targeted prevention and treatment strategies.

“There is a huge amount of work being done in regenerative medicine. Many of the answers on stem cell (in equine research) will provide significant information on the human medical condition.”

Dr. Dean Richardson
University of Pennsylvania New Bolton Center





FUNDED PROJECTS IN 2014

PHARMACOKINETIC/PHARMACODYNAMIC EVALUATION OF OMEPRAZOLE

Dr Paul Mills, University of Queensland

The horse's stomach is a single chamber with two different linings. The top half of the stomach is lined by a squamous mucosa, akin to the lining of our esophagus. It is well recognized that ulcers in this area are the result of increased acid exposure to an area unaccustomed to acid exposure. The bottom half of the stomach is lined by a glandular mucosa, akin to the lining of our stomach. It is thought that ulcers in this area more closely resemble gastric ulceration in humans. The architecture of the lining of the bottom half of the stomach is significantly more complex than that of the top half and the cause of ulcers in this area is believed to be related more to a failure of normal defense mechanism than increased acid exposure per se. Omeprazole at a dose of 4 mg/kg once daily is well documented for the treatment of ulceration in the squamous mucosa with success rates of 70 – 80% consistently reported.

More recently a clinical trial reported success rates of 89% and 94% for 1 and 2 mg/kg once daily, respectively, with a number of factors potentially contributing to the efficacy of the lower doses observed. Of these factors it is possible that the administration immediately prior to work favored the low doses as exercise is the period in which the most damage to the squamous mucosa occurs. Likewise, administration following fasting may have been beneficial since fasting will improve omeprazole absorption. However, in a study comparing pre- vs. post-exercise administration of an alkaline-buffered omeprazole formulation (similar to GastroGard®), no clear benefit of these two factors was observed, which suggested that the formulation of omeprazole was responsible for the improved efficacy at lower doses. However, while direct comparison of the formulations has not been reported, preliminary data from an ongoing study suggests, at least indirectly, that absorption of the two formulations is similar. If equivalence could be demonstrated then the cumulative effect of the above discussion is that lower doses of omeprazole could be used in the treatment of squamous ulceration. This, combined with the imminent expiration of the GastroGard® patent and entry of generic formulations onto the market, would greatly increase affordability of the drug for the treatment of horses worldwide.

With the above in mind the aims of the study are: (1) to compare absorption of a range of commercially available omeprazole formulations; (2) to investigate the magnitude and duration of acid suppression achieved following administration of two doses of omeprazole under two different feeding conditions; (3) to develop a pharmacokinetic/pharmacodynamic model, where the concentration of drug in a blood sample is used for the prediction of an individual's therapeutic response, for omeprazole in the horse; and (4) combining the findings from 1 – 3, develop a revised set of treatment recommendations for the treatment of gastric ulcers in the horse.

CONTINUING PROJECTS FROM 2013

EVALUATION OF A RAPID TEST FOR SALMONELLA

Dr. Paul Morley, Colorado State University

DEVELOPMENT OF ALTERNATIVE MODELS TO STUDY EHM

Dr. Gisela Soboll Hussey, Michigan State University

RAPHY TO MONITOR INJURED EQUINE TENDON

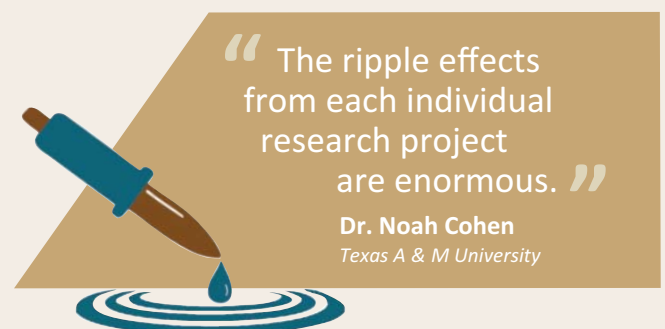
Dr. Sabrina Brounts, University of Wisconsin–Madison

MOLECULAR DETERMINANTS OF EHV-1 FUSION AND SPREAD

Dr. Arthur Frampton, University of North Carolina Wilmington

SERUM BIOMARKERS FOR EQUINE LAMINITIS

Dr. Hannah Galantino–Homer, University of Pennsylvania



“ The ripple effects from each individual research project are enormous. ”

Dr. Noah Cohen
Texas A & M University

REPORT OF INDEPENDENT AUDITORS



Board of Directors
Grayson-Jockey Club Research Foundation, Inc.
New York, New York

REPORT ON THE FINANCIAL STATEMENTS

We have audited the accompanying financial statements of Grayson-Jockey Club Research Foundation, Inc., which comprise the statements of financial position as of December 31, 2014 and 2013, and the related statements of activities and cash flows for the years then ended, and the related notes to the financial statements.

MANAGEMENT'S RESPONSIBILITY FOR THE FINANCIAL STATEMENTS

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

AUDITOR'S RESPONSIBILITY

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

OPINION

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Grayson-Jockey Club Research Foundation, Inc. as of December 31, 2014 and 2013, and the changes in its net assets and its cash flows for the years then ended, in accordance with accounting principles generally accepted in the United States of America.

A handwritten signature in black ink, appearing to read "Crowe Horwath LLP".

CROWE HORWATH LLP

New York, New York
May 26, 2015



STATEMENTS OF FINANCIAL POSITION

December 31, 2014 and 2013

	2014	2013
ASSETS		
Cash and cash equivalents	\$ 549,039	\$ 487,508
Investments at fair value	23,887,933	23,057,922
Contributions receivable	62,414	25,480
Other receivables	16,894	20,895
Prepaid expenses	4,548	11,294
Inventory	1,598	195
Fixed assets, net	6,927	13,834
	<u>\$ 24,529,353</u>	<u>\$ 23,617,128</u>
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts payable and accrued liabilities	\$ 73,349	\$ 105,132
Deferred income	-	1,870
Total liabilities	<u>73,349</u>	<u>107,002</u>
Net Assets		
Unrestricted	14,264,626	13,750,671
Temporarily restricted	4,282,093	3,850,170
Permanently restricted	<u>5,909,285</u>	<u>5,909,285</u>
Total net assets	<u>24,456,004</u>	<u>23,510,126</u>
TOTAL LIABILITIES AND NET ASSETS	<u>\$ 24,529,353</u>	<u>\$ 23,617,128</u>

See accompanying notes to financial statements.

STATEMENTS OF ACTIVITIES



Year ended December 31, 2014

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
REVENUE				
Contributions and membership dues	\$ 1,012,452	\$ 90,470	\$ -	\$ 1,102,922
Proceeds from fund raisers, net of direct benefit costs of \$385,900	242,138	-	-	242,138
Investment income	131,033	94,927	-	225,960
Net realized and unrealized	593,771	431,923	-	1,025,694
Other	38	-	-	38
Net assets released from restrictions	185,397	(185,397)	-	-
Total revenue	2,164,829	431,923	-	2,596,752
EXPENDITURES				
Grants	995,822	-	-	995,822
Professional fees	471,255	-	-	471,255
Travel and meetings	52,405	-	-	52,405
Investment fees	67,395	-	-	67,395
Seminars and summits	9,500	-	-	9,500
General and administrative expenses	54,497	-	-	54,497
Total expenditures	1,650,874	-	-	1,650,874
CHANGE IN NET ASSETS	513,955	431,923	-	945,878
NET ASSETS, BEGINNING OF PERIOD	13,750,671	3,850,170	5,909,285	23,510,126
NET ASSETS, END OF PERIOD	<u>\$ 14,264,626</u>	<u>\$ 4,282,093</u>	<u>\$ 5,909,285</u>	<u>\$ 24,456,004</u>

See accompanying notes to financial statements.



STATEMENTS OF ACTIVITIES

Year ended December 31, 2013

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
REVENUE				
Contributions and membership dues	\$ 678,705	\$ 264,940	\$ -	\$ 943,645
Proceeds from fund raisers, net of direct benefit costs of \$374,505	211,613	-	-	211,613
Investment income	152,140	106,992	-	259,132
Net realized and unrealized	2,396,026	1,641,996	-	4,038,022
Other	457	-	-	457
Net assets released from restrictions	233,238	(233,238)	-	-
Total revenue	3,672,179	1,780,690	-	5,452,869
EXPENDITURES				
Grants	917,123	-	-	917,123
Professional fees	422,704	-	-	422,704
Travel and meetings	65,337	-	-	65,337
Investment fees	47,359	-	-	47,359
Seminars and summits	10,000	-	-	10,000
General and administrative expenses	54,453	-	-	54,453
Total expenditures	1,516,976	-	-	1,516,976
CHANGE IN NET ASSETS	2,155,203	1,780,690	-	3,935,893
NET ASSETS, BEGINNING OF PERIOD	11,595,468	2,069,480	5,909,285	19,574,233
NET ASSETS, END OF PERIOD	<u>\$ 13,750,671</u>	<u>\$ 3,850,170</u>	<u>\$ 5,909,285</u>	<u>\$ 23,510,126</u>

See accompanying notes to financial statements.

STATEMENTS OF CASH FLOWS



Years ended December 31, 2014 and 2013

	2014	2013
Cash flows from operating activities		
Change in net assets	\$ 945,878	\$ 3,935,893
Adjustments to reconcile change in net assets to net cash used in operating activities		
Depreciation	8,360	7,748
Net realized and unrealized gains	(1,025,694)	(4,038,022)
Changes in assets and liabilities		
Contributions receivable	(36,934)	50,917
Other receivables	4,001	(2,784)
Prepaid expenses	6,746	(6,186)
Inventory	(1,403)	621
Accounts payable and accrued liabilities	(31,783)	40,470
Deferred income	(1,870)	1,870
Net cash used in operating activities	<u>(132,699)</u>	<u>(9,473)</u>
Cash flows from investing activities		
Additions to fixed assets	(1,453)	(3,231)
Proceeds from sales of securities	6,878,862	10,448,536
Purchases of securities	<u>(6,683,179)</u>	<u>(11,475,425)</u>
Net cash provided by (used in) investing activities	<u>194,230</u>	<u>(1,030,120)</u>
Net change in cash and cash equivalents	61,531	(1,039,593)
Cash and cash equivalents, beginning of period	<u>487,508</u>	<u>1,527,101</u>
Cash and cash equivalents, end of period	<u><u>\$ 549,039</u></u>	<u><u>\$ 487,508</u></u>

See accompanying notes to financial statements.



NOTES TO FINANCIAL STATEMENTS

NOTE 1 - ORGANIZATION

On August 3, 1989, Grayson Foundation merged with The Jockey Club Research Foundation to create the Grayson-Jockey Club Research Foundation, Inc. (the "Foundation"). The purpose of this organization is to further research and education in the equine industry. The Foundation is exempt from Federal income taxes under Section 501(c)(3) of the Internal Revenue Code and is also exempt from state and local income taxes.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES

Net Assets

The accounts of the Foundation are maintained on the basis of unrestricted, temporarily restricted and permanently restricted net assets. Unrestricted net assets are available to support research programs approved by the Board of Directors (the "Board") and to fund general operations. Temporarily restricted net assets relate to donations that have been either pledged, but not yet received, and/or subject to donor restrictions as well as related gains and losses of the endowment fund and are reclassified to unrestricted net assets once the restriction has been released. Permanently restricted net assets are subject to donor restrictions and require that the principal remain invested in perpetuity and the income earned therefrom be available in temporarily restricted net assets to fund research programs and general operations.

Any donor restricted contributions that are satisfied in the same reporting period received are classified as unrestricted contributions in that period. At December 31, 2014 and 2013 \$138,694 was temporarily restricted based on donor requirements the funds be used for a specific research project that has not yet been funded.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that impact the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents

Cash and cash equivalents consist of short-term, highly liquid investments, which are readily convertible into cash and have original maturities of three months or less when purchased. The Foundation maintains amounts on deposit with various financial institutions, which may, at times, exceed Federally insured limits. The Foundation periodically evaluates the creditworthiness of those institutions, and the Foundation has not experienced any losses on such deposits.

Investments

Investments are reported at fair value. The fair value of such investments is based on quoted market prices.

Fixed Assets

Fixed assets are comprised of office and computer equipment. Depreciation is calculated using the straight-line method over the estimated useful life of the assets ranging from three to five years.

Revenue Recognition

Contributions are recorded when an unconditional promise to give is made by the donor. As of December 31, 2014 and 2013, contributions receivable as reported on the Statements of Financial Position are all due within one year.

Membership Dues

Annually individuals who contribute at least \$100 to the Foundation are deemed to be members of the Foundation and receive the right to vote in the annual election to the board of directors. In addition, they are listed in the annual report of the Foundation at the level of their contribution based on membership level thresholds the Foundation sets.

Grants

Grants are recorded on an accrual basis, which is generally when the funds are disbursed.

Professional Services

The management and staff of the Foundation are employees of The Jockey Club and their related salaries and fringe benefits are billed to the Foundation pursuant to agreements between the parties. These costs totaled \$357,493 and \$372,700 in 2014 and 2013, respectively, and are included in Professional fees in the accompanying Statements of Activities. Additionally, certain administrative services (e.g., accounting and certain office space in New York) are provided by The Jockey Club. These services are not reflected in the accompanying Financial Statements since such amounts would not be material.

Income Taxes

Accounting principles generally accepted in the United States of America prescribes recognition thresholds and measurement attributes for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. Tax benefits will be recognized only if the tax position is more likely than not sustained in a tax examination, with a tax examination being presumed to occur. The amount recognized will be the largest amount of tax benefit that is greater than 50% likely of being realized on examination. For tax positions not meeting the more-likely-than-not test, no tax benefit will be recorded. The Foundation has concluded that it is unaware of any tax benefits or liabilities to be recognized at December 31, 2014 and 2013.

The Foundation would recognize interest and/or penalties related to income tax matters in income tax expense. There were no amounts accrued for interest or penalties as of December 31, 2014 and 2013. For the Foundation's major tax jurisdictions, the 2011, 2012, and 2013 tax years remain subject to examination. The Foundation does not expect significant changes in unrecognized tax benefits in the next twelve months.

Accounting Pronouncements

The adoption of recently effective accounting standards did not have a material effect on the Foundation's Financial Statements. The Foundation is reviewing the impact, if any, that any other recently issued, but not yet effective, accounting standards will have on the Foundation's Statement of Financial Position or Statement of Activities when adopted.



NOTES TO FINANCIAL STATEMENTS

NOTE 3 - INVESTMENTS

Investments at fair value consist of the following:

	2014	2013
Mutual funds	\$ 12,794,437	\$ 11,957,389
Equities	3,664,689	3,370,620
Fixed income - corporate	2,630,171	2,854,499
Fixed income - U.S. government and federal agency	4,798,636	4,875,414
	<u>\$ 23,887,933</u>	<u>\$ 23,057,922</u>

Interest and dividend earnings on these investments were \$225,691 and \$258,764 in 2014 and 2013, respectively. Net realized and unrealized gains from investments reported in the accompanying Statements of Activities totaled \$1,025,694 and \$4,038,022 in 2014 and 2013, respectively.

NOTE 4 - FAIR VALUE MEASUREMENTS

ASC 820-10 establishes a hierarchal disclosure framework which prioritizes and ranks the level of market price observability used in measuring investments at fair value. Market price observability is impacted by a number of factors, including the type of investment and the characteristics specific to the investments. Investments with readily available active quoted prices or for which fair value can be measured from actively quoted prices generally will have a higher degree of market observability and a lesser degree of judgment used in measuring fair value.

Investments measured and reported at fair value are classified and disclosed in one of the following categories:

Level I - Quoted prices are available in active markets for identical investments as of the reporting date.

Level II - Pricing inputs are other than quoted prices in active markets, which are either directly or indirectly observable as of the reporting date, and fair value is determined through the use of models or other valuation methodologies.

Level III - Pricing inputs are unobservable and include situations where there is little, if any, market activity for the investment. Fair value for these investments is determined using valuation methodologies that consider a range of factors, including, but not limited to, the price at which the investment was acquired, the nature of the investment, local market conditions, trading values on public exchanges for comparable securities, current and projected operating performance and financing transactions subsequent to the acquisition of the investment. The inputs into the determination of fair value require significant judgment. Due to the inherent uncertainty of these estimates, these values may differ materially from the values that would have been used had a ready market for these investments existed.

In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, an investment's level within the fair value hierarchy is based on the lowest level that is significant to the fair value measurement. Management's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment, and considers factors specific to the investment.

The following tables summarize the valuation of the Foundation's investments by the ASC 820-10 fair value hierarchy as of December 31, 2014 and 2013:

2014				
	Total	Level I	Level II	Level III
Mutual funds				
U.S. equities	\$ 7,304,682	\$ 7,304,682	\$ -	\$ -
Diversified	2,943,869	2,943,869	-	-
Global	2,545,886	2,545,886	-	-
Equities	3,664,689	3,664,689	-	-
Fixed income				
Corporate	2,630,171	-	2,630,171	-
U.S. government and federal agency obligations	4,798,636	-	4,798,636	-
	<u>\$ 23,887,933</u>	<u>\$ 16,459,126</u>	<u>\$ 7,428,807</u>	<u>\$ -</u>
2013				
	Total	Level I	Level II	Level III
Mutual funds				
U.S. equities	\$ 6,718,747	\$ 6,718,747	\$ -	\$ -
Diversified	2,797,684	2,797,684	-	-
Global	2,440,958	2,440,958	-	-
Equities	3,370,620	3,370,620	-	-
Fixed income				
Corporate	2,854,499	-	2,854,499	-
U.S. government and federal agency obligations	4,875,414	-	4,875,414	-
	<u>\$ 23,057,922</u>	<u>\$ 15,328,009</u>	<u>\$ 7,729,913</u>	<u>\$ -</u>

In 2014, equities included in mutual funds or separate accounts totaling \$16,459,126 were diversified among the following asset classes: 44.4% domestic growth, 20.9% domestic value, 16.9% global growth, and 17.9% small/mid caps. In 2013, similar equities totaling \$15,328,009 were diversified among the following asset classes: 43.9% domestic growth, 19.8% domestic value, 18.2% global growth, and 18.3% small/mid caps.

There were no transfers between Level I and Level II during 2014 or 2013.

The fair values of mutual fund and U.S. equity investments are determined by obtaining quoted prices on nationally recognized securities (Level I inputs).

Corporate bonds are valued using a market approach based on yields currently available on comparable securities of issuers with similar credit ratings (Level II inputs).

The fair values of U.S. government notes and federal agency obligations are obtained using a market approach from readily available pricing sources for comparable instruments (Level 2 inputs).



NOTES TO FINANCIAL STATEMENTS

NOTE 5 - ENDOWMENTS

The Foundation's permanently restricted net assets consist of donor restricted investments to be held indefinitely, with the income therefrom expendable to support the purpose of the Foundation and its operations. As required by applicable standards, net assets associated with endowment funds, including funds designated by the Board to function as endowments, are classified and reported based on the existence or absence of donor-imposed restrictions. Temporarily restricted net assets at December 31, 2014 and 2013 shown below relate to investment returns on the permanently restricted net assets from donors that have not yet been appropriated for expenditure by the Foundation.

Endowment net assets composition by type of fund as of December 31, 2014 and 2013:

	2014	2013
Donor-restricted endowments:		
Temporarily restricted	\$ 4,143,399	\$ 3,711,476
Permanently restricted	<u>5,909,285</u>	<u>5,909,285</u>
Total	<u>\$ 10,052,684</u>	<u>\$ 9,620,761</u>

Changes in endowment net assets for the years ended December 31, 2014 and 2013:

	Temporarily Restricted	Permanently Restricted	Total
Net assets, January 1, 2013	\$ 2,069,480	\$ 5,909,285	\$ 7,978,765
Investment return			
Investment income	106,992	-	106,992
Net realized and unrealized gains from investments	<u>1,641,996</u>	<u>-</u>	<u>1,641,996</u>
Total investment return	<u>1,748,988</u>	<u>-</u>	<u>1,748,988</u>
Appropriation of assets for expenditure	<u>(106,992)</u>	<u>-</u>	<u>(106,992)</u>
Net assets, December 31, 2013	3,711,476	5,909,285	9,620,761
Investment return			
Investment income	94,927	-	94,927
Net realized and unrealized gains from investments	<u>431,923</u>	<u>-</u>	<u>431,923</u>
	<u>526,850</u>	<u>-</u>	<u>526,850</u>
Appropriation of assets for expenditure	<u>(94,927)</u>	<u>-</u>	<u>(94,927)</u>
Net assets, December 31, 2014	<u>\$ 4,143,399</u>	<u>\$ 5,909,285</u>	<u>\$ 10,052,684</u>

Interpretation of UPMIFA: The Foundation follows the State of New York's version of the Uniform Prudent Management of Institutional Funds Act ("UPMIFA") and has interpreted UPMIFA as requiring the preservation of the fair value of the original and subsequent gifts as of the gift date of the donor-restricted endowment funds absent explicit donor stipulations to the contrary.

As a result of this interpretation, the Foundation classifies as permanently restricted net assets

- (a) the original value of the principal designated as an endowment;
- (b) the original value of the principal of subsequent gifts to the endowment; and
- (c) the accumulations to the permanent endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund.

The remaining portion of the donor-restricted endowment fund that is not classified in permanently restricted net assets is classified as temporarily restricted net assets until those amounts are appropriated for expenditure by the Foundation in a manner consistent with the standard prudence prescribed by UPMIFA. In accordance with UPMIFA, the Foundation considers the following factors in making a determination to appropriate or accumulate donor-restricted endowment funds:

1. The duration and preservation of the fund
2. The purposes of the organization and the donor-restricted endowment fund
3. General economic conditions
4. The possible effect of inflation and deflation
5. The expected total return from income and the appreciation of investments
6. Other resources of the Foundation
7. The investment policies of the Foundation

Return Objectives and Risk Parameters:

The Foundation has adopted investment and spending policies for endowment assets that attempt to provide predictable streams of funding to programs supported by its endowment while seeking to maintain the purchasing power of the endowment assets. Endowment assets include those assets of donor-restricted funds that the Foundation must hold in perpetuity or for a donor-specified period as well as Board-designated funds. Under this policy, as approved by the Board, the Foundation relies on a total return strategy in which investment returns are achieved through capital appreciation (realized and unrealized) and current yield (interest and dividends). The Foundation targets a diversified asset allocation that places a greater emphasis on equity-based investments to achieve its long-term return objectives within prudent risk constraints.

Strategies Employed for Achieving Objectives:

The purpose of the endowment fund is to facilitate donors' desires to make substantial long-term gifts to the Foundation to develop a new and significant source of revenue for the Foundation. In so doing, the endowment fund will provide a secure, long-term source of funds to (a) carry out the Foundation's purpose of furthering research and education in the equine industry or, (b) support the operational expenses of the Foundation as deemed appropriate.

Spending Policy and How the Investment Objectives Relate to the Spending Policy:

The distribution rate is based upon withdrawing the investment income for spending each year and allowing capital appreciation to be reinvested in the fund. For the years ended December 31, 2014 and 2013, \$94,927 and \$106,992, respectively, of investment income from the endowment fund was spent and none of the capital appreciation was spent. The spending is determined by the Foundation's management, who may elect to make no distributions from the fund in any given year.

Funds with Deficiencies:

From time to time, the fair value of assets associated with donor-restricted endowment funds may fall below the level that the donor or UPMIFA requires the Foundation to retain as a fund of perpetual donation. Deficiencies of this nature that are in excess of related temporarily restricted amounts are reported in unrestricted net assets. There were no such delinquencies as of December 31, 2014 and 2013.



REVIEW OF ACTIVITIES

NOTE 6 - FUNCTIONAL CLASSIFICATION OF EXPENSES

For the years ended December 31, 2014 and 2013, the Foundation incurred \$1,650,874 and \$1,516,976 in expenses, respectively, as reported in the accompanying Statements of Activities. Those expenses by their functional classifications are as follows:

	2014			
	<u>Program Services</u>	<u>Fundraising Services</u>	<u>Management and General</u>	<u>Total</u>
Grants	\$ 995,822	\$ -	\$ -	\$ 995,822
Professional fees	150,614	257,335	63,306	471,255
Travel and meetings	48,951	16,285	2,158	67,394
Investment fees	-	-	52,405	52,405
Printing	1,157	10,181	231	11,569
Seminars and summits	9,500	-	-	9,500
Members reception	-	2,295	-	2,295
Fundraising events	-	515	-	515
Other	595	11,080	28,444	40,119
	<u>\$ 1,206,639</u>	<u>\$ 297,691</u>	<u>\$ 146,544</u>	<u>\$ 1,650,874</u>
	2013			
	<u>Program Services</u>	<u>Fundraising Services</u>	<u>Management and General</u>	<u>Total</u>
Grants	\$ 917,123	\$ -	\$ -	\$ 917,123
Professional fees	151,172	227,924	43,608	422,704
Travel and meetings	48,839	14,578	1,918	65,335
Investment fees	-	-	47,359	47,359
Printing	971	8,543	194	9,708
Seminars and summits	10,000	-	-	10,000
Members reception	-	2,315	-	2,315
Fundraising events	-	3,007	-	3,007
Other	472	10,499	28,454	39,425
	<u>\$ 1,128,577</u>	<u>\$ 266,866</u>	<u>\$ 121,533</u>	<u>\$ 1,516,976</u>

NOTE 7 - SUBSEQUENT EVENTS

The Foundation has evaluated subsequent events through the date the accompanying Financial Statements were available to be issued, which was May 26, 2015. No subsequent events have been identified that are required to be accounted for or disclosed.



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We wish to recognize donors whose generosity has created a profound impact on the Foundation over the years and has been of extraordinary benefit to the horse.

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Names and addresses of members are maintained in the Foundation's offices at 821 Corporate Drive Lexington, Kentucky 40503.

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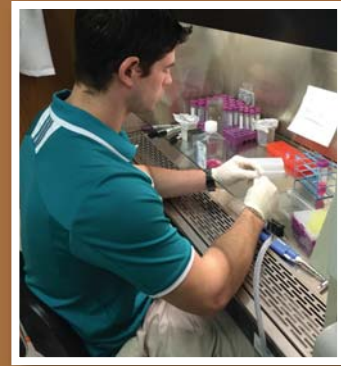
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PLATINUM CIRCLE	\$ 7,500
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SILVER CIRCLE	\$ 2,000
PATRON	\$ 1,000
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SUSTAINING MEMBER	\$ 200
ANNUAL MEMBER	\$ 100

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ACHIEVEMENTS

Since 1940 funded research
has resulted in the following:



- 1** The first vaccine for equine influenza, which allowed some control of race track cough
- 2** Identified the cause of virus abortion that led to the vaccine for that malady
- 3** Defined many aspects of passive immunity in foals
- 4** Enhanced understanding of basic aspects of Equine Infectious Anemia
(the disease for which Coggins Tests became mandatory)
- 5** Led to development of the field of biomechanics in horses
- 6** Defined the cause of Colitis X
- 7** Control of the Shaker Foal Syndrome
- 8** Defined the nature of the Wobbler Syndrome
- 9** Developed vaccine for Equine Viral Arteritis
- 10** Corrected assumptions about the actual cause of abortion in placentitis cases
- 11** Verified dosages of Xylazine as an efficient tranquilizer for horses injured during high exercise
- 12** Quantified the increased risk of injury from use of front toe grabs
- 13** Increased understanding of various aspects of Equine Protozoal Myeloencephalitis
- 14** Facilitated improvements in protecting soundness and repairing injuries
- 15** Verified caterpillars' role in Mare Reproductive Loss Syndrome



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