



Zweig

From the Harry M. Zweig
Memorial Fund for Equine
Research at Cornell University
College of Veterinary Medicine



No. 65 June 2018

Doug Antczak gives talk on equine genetics at Arabian Horse Festival

By Starr Todd

The first annual Asharqia Arabian Horse Festival drew 40,000 breeders, horse owners, artists, and tourists to Dammam, Saudi Arabia for four days of horse shows, races, art exhibits, and talks, all celebrating the majestic Arabian horse.

Doug Antczak, the Dorothy Havemeyer McConville Professor of Equine Medicine with the Baker Institute for Animal Health, was an invited speaker at the festival, where he presented his research on the genetic relationships between Arabians and other horse breeds.

“Legend has it that the Arabian is the oldest recognized breed of horse,” said Antczak. Bred by Bedouin tribes on the Arabian Peninsula, the horse has long been a fixture of Arabian culture. They even appear in rock art dating



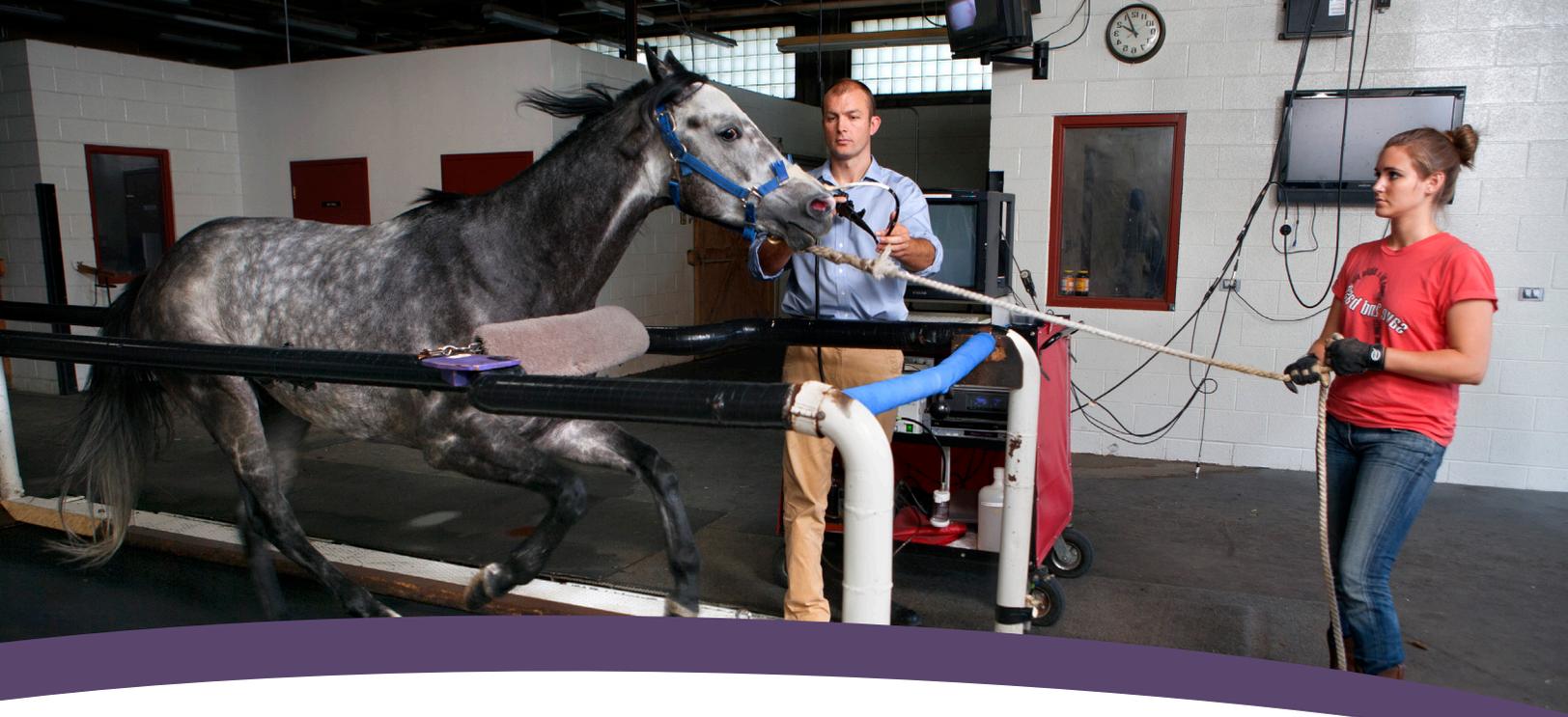
Doug Antczak. Photo by University Photography

to 3,500 years ago. The breed has a distinctive “dished face,” high tail, and arched neck, and its endurance and toughness make it popular for long-distance racing events.

During the workshop component of the festival, Antczak spoke with horse breeders from Saudi Arabia and other countries in the Middle East, Europe, and the U.S. about the basics of horse genetics. He presented his latest research into the genetic and historical relationships between Arabians and other horse breeds. “That project has involved sample collection from horses in the Middle East, Europe, and the United States,” he said. “We spent many days of travel in the Middle East meeting horsemen and gaining their trust, often over cups of tea and plates of Arabian dates.”

He began the project in 2013 with Samantha Brooks, a former Cornell faculty member and colleague at the University of Florida, when they received funding from the Qatar National Research Foundation to study the genetics of the Arabian horse, dromedary camel, and Arabian oryx. Antczak first gained entry to the world of Arabian horses through his work on lavender foal syndrome, a deadly genetic defect that causes foals to be born with severe neurological problems and a lavender-tinted coat. In 2010, Antczak and Brooks discovered the mutation that causes the syndrome. They also developed a molecular genetic test that is used widely by Arabian breeders to identify carriers of the mutation. This allows breeders to select sires and dams that cannot produce affected offspring, and thus prevent the birth of foals with this lethal inherited disease.

Breeders were very interested to learn the results of Antczak’s work on genetic relationships between different horse breeds. “It has already lead to new invitations to speak to other Arabian breeders,” said Antczak, “and to potential new collaborations to collect samples from rare strains of Arabians that we haven’t studied yet.”



Harry M. Zweig Memorial Fund for Equine Research Awards

NEW

\$37,997 to Jonathan Cheetham for “Accelerating Recovery after Laryngeal Nerve Graft”

\$79,006 to Thomas Divers for “Characterizing Tropism and Transmission of Equine Parvovirus-Hepatitis (EqPV-H)”

\$55,000 to Alan Nixon for “Next Generation Arthritis Control through Lubricin and IL-1 Receptor Antagonist Overexpression in Carpal Osteoarthritis”

\$60,054 to Heidi Reesink for “Intra-Articular Recombinant Lubricin to restore Joint Lubrication and Prevent Osteoarthritis in Horses”

\$67,136 to Gerlinde Van de Walle for “The Mesenchymal Stem Cell Secretome against Equine Herpesvirus Type 1 Infections”

\$99,314 to Bettina Wagner for “Towards a Neonatal Vaccine against Equine Herpesvirus Type 1 (EHV-1)”

CONTINUED

\$60,083 to Douglas Antczak for “Functional Gene Annotation in the Horse”

\$48,899 to Jonathan Cheetham for “Regenerative Approach to Recurrent Laryngeal Neuropathy”

\$16,528 to Susan Fubini for “The Relationship Between Obesity and Post-Operative Incisional Infections Following Abdominal Surgery in the Horse”

\$49,634 to Heidi Reesink for “Quantitative Computed Tomography and Bone Quality Assessment for the Prediction of Fetlock Breakdown Injuries in Racehorses”

\$56,399 to Gerlinde Van de Walle for “Microencapsulated Stem Cells to Promote Wound Healing”

Pictured above: Jonathan Cheetham studies horse airways by having a horse run on a treadmill. Photo by University Photography.

Opposite page: A horse grazes at the Cornell Equine Park. Photo by University Photography.

M. Kelly Young named executive director of the Agriculture & NYS Horse Breeding Development Fund

By the Agriculture and NYS Horse Breeding Development Fund

The Agriculture and New York State Horse Breeding Development Fund Board of Trustees, which runs the New York Sire Stakes series, unanimously approved the appointment of harness racing expert M. Kelly Young as the Fund's Executive Director.

Young, a fifth-generation participant in harness racing, grew up on a leading horse breeding farm outside Goshen. She most recently served as Deputy Director of Public Policy for the New York Farm Bureau where her legislative and regulatory portfolio has included dairy, forestry, aquaculture and food policy, and access. She has held various positions over the past decade with the Farm Bureau and has expertise in general agricultural matters, which are critical to the Fund's mission to support the state's harness racing industry.

"I am excited to help New York's storied harness racing industry grow and thrive in this new position," said Young. "I thank the Board of Trustees for their confidence in my abilities, and look forward to working with horsepersons, breeders, tracks, fans, and everyone in the industry to uphold harness racing's important place in our state's agricultural sector."

Richard A. Ball, Commissioner of the New York State Department of Agriculture and Markets and Fund Trustee, said, "Kelly's extensive knowledge and understanding of both the Standardbred breeding industry and New York agriculture make her a great fit for this position. I have no doubt that she will be a tremendous asset to the Fund. Her energy, enthusiasm, and focus will help us identify new opportunities for New York's Standardbred farms to prosper and strengthen the overall racing industry for years to come. I am excited to work with her as she takes on this new role."

Barry Sample, Chairman of the New York State Gaming Commission and Fund Trustee, said, "Kelly's knowledge

of New York's harness racing is second-to-none, and her dedication to the sport is commendable as evidenced through her career including service on the New York Racing Fan Advisory Council. Her leadership skills are exactly what the industry needs at this exact time and I look forward to continuing to work with her in her new role."

Young previously served as Executive Director for the Harness Horse Breeders of New York State and was Associate Editor of *The Horseman and Fair World*, where she developed and wrote stories on harness racing.

Young was selected for a 2013 McCloy Fellowship in Agriculture and was a member of Class 13 of the Empire State Food and Agricultural Leadership Institute. She received multiple awards for her writing from the American Farm Bureau Federation, the U.S. Harness Writers Association, and the New York Agricultural Society.

Young is currently a member of the New York State Racing Fan Advisory Council, which provides recommendations to the New York State Gaming Commission on matters related to growing the fan base of horse racing. She also serves as president of the Saratoga Harness Hall of Fame and is a member of the U.S. Harness Writers Association. Young holds a B.A. from Boston University.

Established in 1965, the Fund's primary mission is to promote and preserve agriculture through the promotion of horse breeding and equine research in New York state. It directs the state's premier harness racing program designed to stimulate the breeding, buying, and racing of Standardbred horses in New York. Because of the state's unparalleled breeding industry, there is strong international demand for New York-bred Standardbred horses.

The Fund provides assistance to county agricultural societies to maintain and repair racing facilities and also contributes to both the 4-H program and the Dr. Harry M. Zweig Memorial Fund for Equine Research at Cornell University.

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Equine stem cells rein in bacteria

By Melanie Greaver Cordova

Researchers are exploring the use of stem cells to treat skin wounds in horses with techniques that may eventually translate to human patients.

Rebecca Harman '92, M.S. '11 and a team of researchers in the Van de Walle Lab at the College of Veterinary Medicine are finding that factors secreted by adult stem cells, also known as mesenchymal stromal cells (MSC), are able to fight bacteria commonly found in skin wounds.

Bacteria often complicate the treatment of chronic skin wounds in humans, driving a need for new therapies that reduce bacteria in wounds. Although previous research has explored the therapeutic value of MSC in wound healing, few studies examined the potential for MSC to inhibit bacterial growth. Harman and the Van de Walle Lab are examining the antibacterial properties of equine MSC secreted factors, like antimicrobial peptides, to develop therapies for horses and to serve as a model for human studies.

"This equine skin wound healing model offers a readily translatable example for MSC therapies in humans," said Harman, a research support specialist at the Baker Institute for Animal Health. "Although mice are smaller and less expensive model organisms, the horse is more physiologically relevant when it comes to human skin wound healing."

MSC are already commonly used as a biologic therapy for equine joint and tendon injuries. Practitioners isolate MSC from bone marrow and inject them at injury sites. However, bone marrow extraction is an invasive technique, and injection-site complications – such as immune responses against the MSC – may reduce the efficacy of the therapy.

Harman's work sidesteps these issues by isolating MSC from blood rather than bone marrow, making the collection of MSC less invasive. In addition, she is applying the factors secreted by MSC, rather than the cells themselves, to the wounds, which reduces the chance of a host immune response against the therapy.

MSC provide a range of benefits that extend beyond those of conventional antibiotics. Their secreted antimicrobial peptides can directly inhibit the growth of bacteria in skin wounds, and other secreted factors fight bacteria indirectly by attracting resident immune cells that are primed to clear pathogens.

By further experimenting with different delivery methods, the lab's research may make things easier on the practitioner as well. The antimicrobial peptide molecules secreted by MSC have proven to be fairly stable and can maintain their activity through a variety of conditions, such as extended freezing or being dried into a powder. This enables long-term storage options that are more efficient for practitioners than having to isolate MSC and collect secreted factors every time a wound needs to be treated.

The research team will soon partner with Bettina Wagner, chair of Population Medicine and Diagnostic Sciences at the College, to begin in vivo testing on her equine herd. Every summer, Wagner's Icelandic horses naturally develop skin wounds as part of an allergic reaction. The wounds will be directly treated with the secreted factors of MSC and the lab will monitor bacteria levels over time to see if there are differences between treated and untreated wounds.

"What we learn from the Icelandic herd about the wound-healing properties of MSC secreted factors could reasonably be tested in human medicine," said Harman.



Rebecca Harman. Photo by Rachel Philipson

Longtime committee member steps down

Paul Mountan DVM is stepping down this year from the Harry M. Zweig Committee. After 22 years of service, Mountan has made his mark on the committee with his leadership and dedication.

Members of the committee had nothing but praise for Mountan and expressed gratitude for his work over the years.

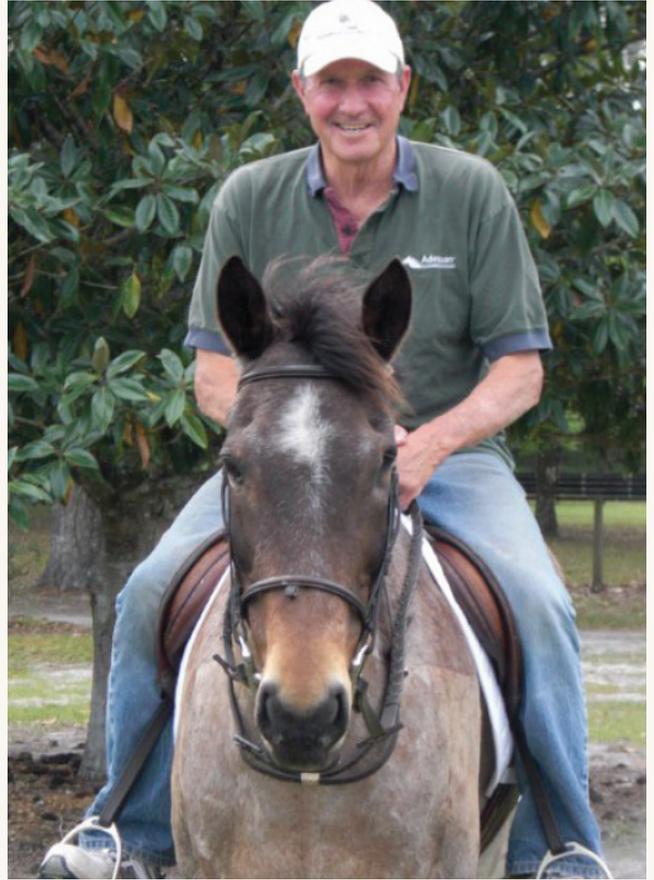
“No way to replace an old-school, wise, and practical veterinarian with a golden touch on this committee. Your presence will be missed!” said Gabriel Cook.

“In your long and storied career, you have really helped support the health and welfare of horses through your work as a practitioner, your influence in the sport horse arena, and your committee work for the Zweig Fund. Salut!” said Ann Dwyer. Patricia Wehle seconded these comments.

“You are a great mentor and will be missed,” said Robert Tugel.

“Paul has been a standout member of the Zweig Committee for a long, long time. We will miss him!” said William Wilmont, with which Brian Zweig wholeheartedly agreed.

Pictured on this page: Paul Mountan DVM after a trail ride with Theresa, a retired Argentine polo mare he adopted from her former owner after her eye was injured in a polo game. Photo provided.



To mark the 40th anniversary of the Zweig Fund and its partnership with Cornell University, we have many events planned for late 2019, including research presentations by faculty supported by the fund, lectures on other equine-related research topics, a tour of the new facilities, and a reception to commemorate the event.

Wednesday, November 14, 2019

Cornell University College of Veterinary Medicine | Ithaca, New York 14853



Zweig Memorial Trot 2018

Vernon Downs, Vernon, N.Y. | Friday, August 17, 2018 | Post time: 6:45 p.m.

Information: 1-877-888-3766 | www.vernondowns.com/racing

Project pioneers equine osteoarthritis therapy

By Elvina Yau and Melanie Greaver Cordova

Heidi Reesink is doing big-picture research at a microscopic level to improve equine joint health. "Horses are often confronted with bone and joint injuries that have limited treatment options," said Reesink, assistant professor at the Cornell University College of Veterinary Medicine. "I want to develop therapies that will restore joint function and prevent the development of career-ending arthritis."

Zweig awarded funds to Reesink for her study "Intra-Articular Recombinant Lubricin to Restore Joint Lubrication and Prevent Osteoarthritis in Horses," which will determine if recombinant lubricin is an effective therapy for horses. Naturally produced by the body, lubricin, a sugar-coated glycoprotein, helps lower friction in joints and protects cartilage. Reesink's project looks to use recombinant lubricin – lubricin produced in the lab – in treating joint inflammation and lameness.



"We're working on ways to restore effective joint lubrication through sugar-rich lubricating molecules," she said in reference to the glycoprotein. Lubrication is paramount to joint health; joint fluid nourishes and preserves cartilage structure for decades. Cartilage and bone injury can lead to lameness, which is the leading cause of retirement in horses. Around 60 percent of those cases are due to arthritis, said Reesink.

The two-year study will analyze how hyaluronic acid and recombinant lubricin behave in horses. "My long-term objective is to translate lubricin therapy to equine clinical patients," said Reesink.

Although results have been promising in rodent and mini pig models, this therapy has yet to be tested in horses, in part due to technical challenges associated with producing sufficient quantities of recombinant lubricin in the lab for such a large animal, and because of competing demands for testing recombinant lubricin in human clinical trials.

"As a large animal orthopedic surgeon and clinician scientist, my objective is to translate promising basic research from the bench to stallside," said Reesink. Her work has been largely interdisciplinary, and she's collaborated with researchers across the university, specifically chemical and biomedical engineers, to apply engineering principles to the field of osteoarthritis and joint lubrication. She currently runs an additional Zweig-funded study to leverage these collaborations in a project called "Quantitative Computed Tomography and Bone Quality Assessment for the Prediction of Fetlock Breakdown Injuries in Racehorses."

Photos by Elvina Yau

IN CASE YOU MISSED IT

Lecture Schedule at the 9th Annual Harry M. Zweig Memorial Fund for Equine Research Poster Session & Talks, held on Wednesday, November 29, 2017:

- How Zweig Funding Changed Accepted Paradigms in Regenerative Medicine (Lisa Fortier, James Law Professor of Large Animal Surgery)
- The Mesenchymal Stem Cell Secretome in Equine Wound Management (Gerlinde Van de Walle, Harry M. Zweig Assistant Professor in Equine Health)
- Regenerative Approaches for Recurrent Laryngeal Neuropathy (Jonathan Cheetham, Associate Professor, Section of Large Animal Surgery)
- Equine Biobanking - Paving the Way to Personalized Medicine (Marta Castelhana, Director of the Cornell Veterinary Biobank)
- 6 • Vaccination of Horses with Lyme Vaccines for Dogs Induces Short-Lasting Antibody Responses (Cassandra Guarino, Extension Associate)

The Harry M. Zweig Memorial Fund for Equine Research honors the late Dr. Harry M. Zweig, a distinguished veterinarian, and his numerous contributions to the state's equine industry. In 1979, by amendment to the pari-mutuel revenue laws, the New York State Legislature created the fund to promote equine research at the College of Veterinary Medicine, Cornell University. The Harry M. Zweig Committee is established for the purpose of administering the fund and is composed of individuals in specified state agencies and equine industry positions and others who represent equine breeders, owners, trainers, and veterinarians.

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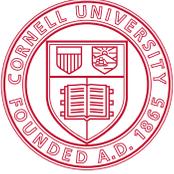
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Correction - In the October 2017 story "Zweig funding enables advanced treatment for horses with atrial fibrillation at Cornell," Dr. Bruce Kornreich's name was misspelled on the page five photo caption.



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Welcome to our new Zweig Committee members



Chad Brown

While in high school, Brown got his first experience around horses working with standardbred trainer Paul Kelley. While at Cornell University, Brown worked summers for Hall of Fame trainer Shug

McGaughey. While intending to undertake veterinary studies - even interning with Steve Allday - he instead took fulltime employment with Hall of Fame trainer Bobby Frankel following graduation.

Brown opened his own racing stable in November 2007. In ten years, Brown has achieved over 1,000 wins including eight Breeders Cup races and the 2017 Preakness Stakes. This year's Preakness success follows a career year for Brown. In 2016 he was the leading trainer in America by earnings and number of graded stakes wins, and earned the Eclipse Award for Outstanding Trainer.



M. Kelly Young

In the two decades since she graduated from Boston University with a biology degree, Young has worked on horse or farming issues. She first started as an Associate Editor with The Horsemen and Fair World,

before moving on to the position of Executive Director of the Harness Horse Breeders of New York State. For the last decade, Young has been affiliated with the New York Farm Bureau, working up to her most recent position as Deputy Director of Public Policy from Associate Director of Communications and Senior Associate Director for National Affairs.

Young is a three-time winner of the John Hervey Award for Journalistic Excellence, awarded by the United States Harness Writers Association and is presently the President of the Saratoga Harness Hall of Fame. Young is a fifth-generation horseperson and grew up on Castleton Farm of New York, a Standardbred breeding farm located just outside Goshen, NY.

Visit us online
vet.cornell.edu/zweig

Our site provides information on the projects and publications resulting from the Zweig Memorial Fund, and demonstrates the objectives of the Fund in promoting equine health in the racing industry. The Zweig News Capsule is published twice a year, and can be downloaded at bit.ly/ZweigNews. Please encourage other equine enthusiasts to visit the site.