

Zweig

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



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Antczak attends Ascot horse races with the royals

By Olivia Hall

The recent death of Britain's Queen Elizabeth in early September had special poignancy for one Cornell alumnus. In April of this year, Dr. Doug Antczak '69, the Dorothy Havemeyer McConville Professor of Equine Medicine at the James A. Baker Institute for Animal Health, received an unexpected email. The message was from the Deputy Master of the Household and Equerry to Her Majesty the Queen of England, who inquired politely whether Antczak and his wife Wendy "might be persuaded to come over to the UK to join Her Majesty as her guests" for lunch at Windsor Castle and an afternoon of horseracing at the nearby Ascot Racecourse. "Her Majesty appreciates that it might be a tall order to come over from Cornell just for a day's racing but would be delighted if you could," the letter added.

Wondering if this might be a scam, Antczak telephoned Buckingham Palace the next day. It was confirmed: The invitation from the queen, who had a notable passion for horses, was genuine. "The queen was interested in learning about new discoveries in the fields of equine genetics and genomics," Antczak said. The invitation then made sense to Antczak, who is recognized internationally for his research achievements in equine reproduction, immunology and genetics.

For over two decades, Antczak has been part of the Horse Genome Project, an international collaboration between more than two dozen laboratories working

on horse genetics. The Antczak Lab has made important contributions at many stages of the global effort to sequence the genome of the horse. Perhaps most notable is the Cornell horse-breeding program that produced the Thoroughbred mare, Twilight. Since the early 1980s, Antczak has bred horses selected for genes of the Major Histocompatibility Complex, the genomic region that controls many aspects of immune responses. These special Cornell-bred horses have helped advance knowledge of equine immunity, reproductive biology and regenerative medicine. Twilight was selected as the DNA donor for the horse genome sequence, known as the Equine Reference Sequence. This was the first full horse genome sequence ever completed. Today, equine geneticists from across the world use the Twilight Reference Sequence to help them interpret a wide array of equine genetic studies. "Twilight is the most famous research horse in the world," Antczak explained. "That puts Cornell on the map for our contribution to the Horse Genome Project."

"But why invite me and not one of the many other outstanding equine genomics specialists from



Dr. Doug Antczak '69 and Wendy Antczak arrive at the summer 2022 Royal Ascot Races in an open Ascot Landau carriage with Queen Elizabeth's granddaughter, Princess Beatrice, and her husband, Edoardo Mapelli Mozzi. Photo: Getty Images

around the world?" he said. They never learned the answer from the queen's staff at Windsor Castle, but it may have been in part because of Antczak's personal involvement with horse sports, and the Ph.D. that he earned at Cambridge University in the 1970s. "One of my favorite Winston Churchill quotes is this – A polo handicap is a passport to the world," said Antczak, who was captain of the polo team as a Cornell undergraduate. Antczak later met and played with then-Prince Charles a few times during his years at Cambridge.

On June 18, Antczak and his wife — in traditional top hat and tails and an elegant dress — drove into Windsor Castle for what would be a magical day. Prior to their arrival in England, little information was provided to Antczak and his wife, other than the dress code and very general expectations of the day's events. This resulted in several surprises. "I had anticipated a large luncheon group, and that perhaps I would meet the queen and have a short conversation, and that would be all," said Antczak. Upon arrival at Windsor Castle, Antczak learned that the luncheon party was very small, only three tables of eight, and that he would be seated at the right hand of the queen herself. Many of the guests had strong interest and deep involvement with horses. "It dawned on me that this event had been arranged by the queen so that she could be surrounded by people who shared her passion for the horse," Antczak reflected. "The realization that I was among fellow horsemen and horsewomen made conversation easy."

Antczak spent his time with the queen discussing the state of horse genetics, his research at Cornell, and many other topics. "She was very, very knowledgeable about horses, and through her passion she elevated the stature of horses in England and the world. The queen was very well informed and kept me on my toes with her questions. She was gracious, down to earth and



Dr. Doug Antczak '69 and Wendy Antczak at the summer 2022 Royal Ascot Races. Photo: Mr. Sandy Dudgeon/Provided

refreshingly direct." Even the queen's beloved corgis made an appearance, coming in at the end of the hour to collect some table scraps.

While the queen — limited in her mobility — remained at the castle to watch the races on TV in her private rooms, the remaining guests were transported first by car, and then horse-drawn carriages for the 45-minute, seven-mile ride through Windsor Great Park to the Ascot Racecourse. For the journey, the Antczaks were seated in an open

Ascot Landau carriage with the queen's granddaughter Princess Beatrice and her husband Edoardo Mapelli Mozzi. "We had no idea we'd be riding in carriages," Antczak said, "let alone with members of the royal family." Along the way, members of the public lined up to catch a glimpse of royalty. "So, we went along for the ride and waved to people as if we did this regularly," Antczak remembered.

The racecourse itself was packed with some 70,000 people, and as one of the most formal of the British horseracing calendar, "Royal Ascot was fancy beyond belief," Antczak said. Royal Ascot dress code calls for morning dress for men — top hat and tails —

and elegant attire for women. Racing enthusiasts filled the grandstand and surrounding areas, and the Antczaks enjoyed a spectacular backdrop to a day of racing that featured many of the finest Thoroughbreds in the world.

Reflecting on the event, Antczak described it as, "a bittersweet memory — the queen was such a great advocate for the horse throughout her life, and she had sincere concern for horse welfare. The equine world is diminished by her passing. It was an honor to have been invited by the queen to represent the global community of equine geneticists who have worked together for over a quarter century to advance the state of horse genomics. I wish that my colleagues could have joined me on that day." ●



Twilight was the star attraction at the International Havemeyer Foundation Horse Genome Workshop that Cornell hosted in July of this year. Photo: John Enright/CVM

Recent publications from Zweig-funded projects

Jager MC, Tomlinson JE, Henry CE, Fahey MJ, Van de Walle GR. "Prevalence and Pathology of Equine Parvovirus-Hepatitis in Racehorses from New York Racetracks." *Virology Journal*, Nov. 2022.

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Miller JL, Kanke M, Rauner G, Bakhle KM, Sethupathy P, Van de Walle GR. "Comparative Analysis of MicroRNAs that Stratify in Vitro Mammary Stem and Progenitor Activity Reveals Functionality of Human miR-92b-3p." *Journal of Mammary Gland Biology and Neoplasia*, Oct. 2022.

Rojas-Núñez I, Gomez AM, Selland EK, Oduol T, Wolf S, Palmer S, Mohammed HO. "Levels of Serum Phosphorylated Neurofilament Heavy

Subunit in Clinically Healthy Standardbred Horses." *Journal of Equine Veterinary Science*, March 2022.

Thomas MA, Fahey MJ, Pugliese BJ, Irwin RM, Antonyak MA, Delco ML. "Human Mesenchymal Stromal Cells Release Functional Mitochondria in Extracellular Vesicles." *Frontiers in Bioengineering and Biotechnology*, Aug. 2022.

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From roaring to racing, Zweig researchers showcase latest discoveries at annual meeting

By Lauren Cahoon Roberts

On Nov. 9, the Harry M. Zweig Memorial Fund for Equine Research held its annual meeting at the Cornell University College of Veterinary Medicine. College faculty, trainees, students and Zweig committee members gathered to present and discuss the latest research in horse health.

After welcoming remarks from Dr. Robert Weiss, associate dean for research and graduate education, attendees listened to a series of research presentations that covered a wide gamut of equine research.

Dr. Eileen Hackett, professor of surgery in the Department of Clinical Sciences, gave her talk, "Putting Some Evidence Behind Surgical Treatment of Pharyngeal Collapse." She noted that there are no studies on airway dynamics in horses with pharyngeal collapse. There are several procedures that practitioners employ to treat the issue, but "despite routine performance, no studies to date have evaluated surgical treatment of this condition," said Hackett. "We need evidence-based recommendations." For next steps, Hackett will be looking for ways to reproduce the condition and measure success of each surgical technique in a study setting.

Dr. Kelly Knickelbein, assistant clinical professor in the Department of Clinical Sciences, presented her talk, "Using Genetics to Improve Equine Ocular Health," in which she discussed how some of the

most common eye diseases found in horses can have a genetic connection. For example, ocular surface squamous cell carcinoma is associated with a gene mutation that is prevalent in certain breeds, including Haflingers, Rocky Mountain Horses and Belgians. Knickelbein has also studied congenital cataracts, and through whole genome sequencing, is investigating variants in relevant genes and hopes to accumulate enough cases to conduct a genome-wide association study.

Next, Dr. Scott Palmer, New York state equine medical director and adjunct professor in the Department of Population Medicine and Diagnostic Sciences, presented "Update on the Use of Wearable Biometric Sensors to Identify Horses at Risk for Catastrophic Injury," in which he shared the latest findings from work done in collaboration with college colleagues, including Drs.

John Piggott and Alan Nixon, in using Stride Safe GPS biometric sensors to measure racehorses' acceleration on the track. The sensor can create a 'fingerprint' of an elite racehorse's gait at high speed, showing what a sound horse should look like while racing. From this, Palmer created three levels — red, yellow and green — each associated with the level of an equine's deviation from the ideal G-forces while running. Sensors were placed on every horse that raced at Belmont and Saratoga during the summer of 2022, yielding key insight. "We learned that these sensors are reliable screening tools," said Palmer. "We can detect gait abnormalities before catastrophic breakdowns."

Moving forward, Palmer will investigate the correlation of data between different types of

exercise, and will continue to refine his algorithm for an 'animal welfare index' for each racehorse that will identify each animal's overall risk for breakdown.

Dr. Julia Felipe, professor in the Department of Clinical Sciences, then discussed her work in her presentation, "Early Diagnosis of Placentitis in Mares," describing her efforts to pin down biomarkers to identify the condition before it's too late. "Initial clinical signs of placentitis can be detected using transrectal ultrasonography, but this type of diagnosis relies on ongoing inflammation of placental tissues," Felipe said. Her research looked to identify blood parameters in mares that would sign for the early stages of ascending placentitis, before inflammation establishes. She found estradiol 17-beta concentration was a potential candidate for an early diagnosis, which would allow immediate treatment and improved pregnancy and foaling outcomes.

The final presentation was given by Dr. Gillian Perkins, clinical professor in the Department of Clinical Sciences, who gave a brief overview of the Cornell student chapter of the American Association of Equine Practitioners. Perkins has been the faculty advisor for the group for roughly two decades, and has overseen the group's many events, including a welcome-back barbecue and a 5K around the

Cornell Equine Park track. Students have also had chances to participate in equine-specific labs on colic, reproduction, lameness, acupuncture and dentistry. "It's been 20 great years of working with wonderful students," Perkins said.

The symposium wrapped up with a poster session and reception, during which attendees dined, mingled and discussed the broad array of research projects on display. The session featured a contest for best poster, with Ph.D. student Erica Secor '09, D.V.M. '13, winning the popular vote.

"Once again, the Zweig meeting inspired and energized everyone there," said Weiss. "It's gratifying to see the breadth and depth of research going on all in the name of equine health, and I look forward to seeing the next series of discoveries when we all gather again." ●



Poster presentations at the annual Zweig event. Photo: Carol Jennings/CVM



Dr. Robert Weiss, associate dean for research and graduate education, welcomes everyone to the annual Zweig event. Photo: Carol Jennings/CVM



The Harry M. Zweig Memorial Fund for Equine Research Committee, excepting absent members Laura Jausicas, Patricia Wehle and William Wilmot. Photo: Tessa Brown/CVM

Cornell Ruffian veterinarians save older horse from severe colic

By Christina Frank

Colby Prokop and her horse, Astrid, essentially grew up together. The two are both 25 years old now, but they met when they were 13.

At the time, Prokop had a job exercising Astrid — a retired Thoroughbred racehorse — at a farm in Jamesport, New York, near her home on Long Island. Astrid's original owner lived in Manhattan and was finding it difficult to visit her on a regular basis. Eventually, Prokop became her owner. "She's my heart horse," says Prokop. "She's such a special nugget."

In December 2018, Prokop was studying for finals at the University of Richmond in

Virginia when she got a call from her mother saying that Astrid was suffering from severe colic, a general term for experiencing abdominal pain. Their local veterinarian felt strongly that Astrid needed to be evaluated by doctors at Cornell Ruffian Equine Specialists (CRES) in Elmont, New York — a two-hour drive from where the family lives.

Prokop flew home immediately. By the time she arrived, Astrid had been admitted and was undergoing surgery. An ultrasound had revealed thickening and distension of her small intestine due to a bowel obstruction.

According to John Pigott, D.V.M. '09, hospital director of CRES, many horses with colic are successfully treated with an anti-inflammatory medication and fluids on the farm, with about 30 to 40 percent needing more aggressive treatment in the hospital. Pigott cared for Astrid after the procedure, which was performed by Michelle Delco '98, D.V.M. '02, Ph.D. '16, the Harry M. Zweig Research Professor in the Department of Clinical Sciences at the Cornell University College of Veterinary Medicine.

"The surgery went great," says Pigott. "They found an adhesion in the front of her abdomen and the bowel got trapped against that scar tissue. They were able to remove the scar tissue

and free up the bowel. Nothing needed to be cut out, which improved the prognosis."

While recovering, however, Astrid experienced some complications. She developed ileus, a transient decreased motility in the gut. This was followed by an aggressive case of pneumonia. "Pneumonia after severe colic can happen in some horses, particularly with cases of small intestinal obstruction," Pigott says.

With aggressive treatment, Astrid recovered completely. "She is a very tough horse. She had a severe colic event and pneumonia and was able to heal with intensive therapy," Pigott says.

In total, Astrid was at CRES for almost a month. She was admitted Dec. 8, 2021, and discharged Jan. 2, 2022.

"The worst day was Christmas Eve," says Prokop. "That was when Dr. Pigott told me that if she didn't turn a corner, it was not looking good. It was the pneumonia that almost got her."

When Astrid did turn a corner, she turned it quickly. Prokop, who drove two hours each way to see Astrid every day during her hospitalization, went to visit her horse on Christmas morning. "She was up at the gate and wanted to eat carrots and looked so great," Prokop says. "She was like our Christmas miracle."

On the day she was discharged, Prokop says, the staff had a little going away party for her. Two

of her technicians even gave her handfuls of peppermints, which are her favorite treats.

It took another three months of stall rest, daily hand walking and overall monitoring of her health before she was fully healed.

"They definitely set us up for success at Cornell Ruffian," says Prokop. "The vets there were just completely out-of-this-world impressive. I never once doubted that she was in the best of hands when she was there."

Almost four years after her ordeal, Astrid is currently living the good life in California. Prokop was offered a dream job as an animal care crew manager at the Marine Mammal Center in Sausalito, and

the two picked up and drove across the country.

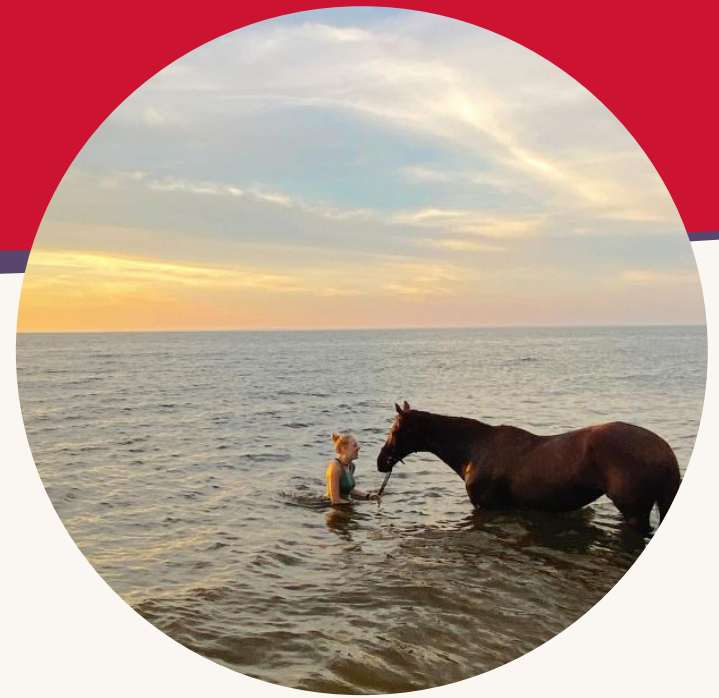
"I never wanted to put her through something that would potentially be adverse to her health, but at 25 [approximately 75 in human years], she shipped across the country like a well-seasoned traveler," says Prokop. "She's still a handful for me under the saddle. She has so much energy that I can barely hold her back because she wants to gallop everywhere!"

Astrid with Colby Prokop. Photo provided.

Prokop continues, "Our family will be forever thankful to Dr. Pigott, Dr. Delco and the entire team. Without them, I would never have been able to bring Astrid with me." ●



Astrid and Colby Prokop at Cornell Ruffian Equine Specialists. Photo provided.



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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 at 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.

Visit us online
bit.ly/ZweigFund

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.

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