

Zweig

NEWS CAPSULE

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

Challenging the Status Quo

Dr. Maria Julia Bevilaqua Felipe, associate professor of medicine at the College of Veterinary Medicine, has received an NIH Director's New Innovator Award. The \$1.5 million grant is presented over five years to stimulate highly innovative research and support promising new investigators who are studying biomedical or behavioral research conditions. A diplomate of the American College of Veterinary Internal Medicine, Felipe will use the funds to challenge current thinking on a disease that renders people and horses highly susceptible to recurrent bacterial infections: Common Variable Immunodeficiency (CVID).

CVID is the most frequent clinically relevant primary immunodeficiency in humans and is a mixed group of heterogeneous conditions linked by a lack of ability to produce antibodies that fight pathogens. CVID in human patients has challenged the field of clinical immunology in regards to etiology and, consequently, therapeutic intervention. Although traditional thinking presumes CVID is a genetic disorder, data suggest that only a minor percentage of the affected patients are known to have genetic mutations and the disease manifests later in life, leading Felipe to pursue a different line of thinking.

"We hypothesize that CVID in the horse is an epigenetic disease," Felipe said, explaining that epigenetic conditions alter the activity, or the expression, of genes without changing their structure.

Felipe became interested in the disease as a graduate student in Dr. Douglas Antczak's laboratory in 2001, where she was presented with a 12-year-old horse that contracted recurrent bacterial infections and meningitis. When the referring veterinarian checked the horse's antibodies, none



were detected. With Felipe's further investigation of the immune system status, the horse was found to be lacking a class of cells called B cells, necessary for antibody production.

"In 2001, this condition had not been characterized in equine," said Felipe. "We reviewed the literature for

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Challenging the Status Quo

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human diseases and found the link to CVID, a condition that has been studied in people for more than 40 years. The horse is an excellent natural model for the human condition. Our findings will help us improve the diagnosis of the disease and the quality of life for horses and people.”

Since 2001, Felipe’s research team, including Research Associate Dr. Rebecca Tallmadge Ingram and technician Mary Beth Matychak, has diagnosed 17 cases of equine CVID, testing from samples that have been submitted from equine referral practices across the country.

Felippe will use the award to conduct RNA-Seq, quantitative RT-PCR, and DNA methylation analyses. Felipe expects that the results from the molecular screening will allow the team to reproduce and manipulate the abnormal B cell development in controlled experimental systems, knowledge that will also enable scientists to classify individual cases into categories based on the factors that cause the disease.



A Trio of Awards

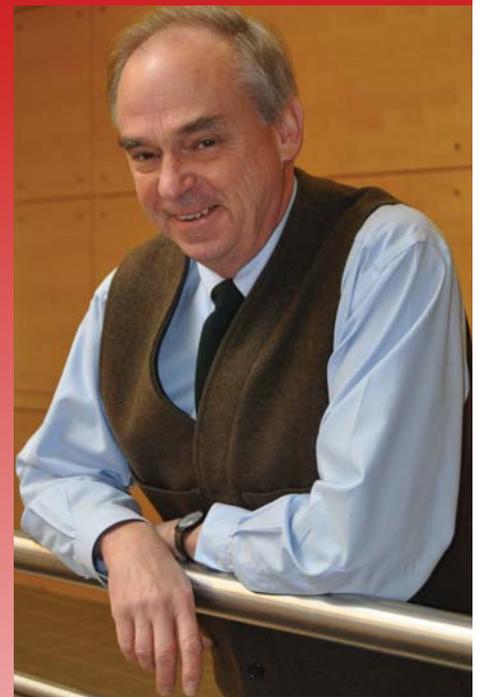
Dr. Douglas Antczak, the Dorothy Havemeyer McConville Professor of Equine Medicine at the James A. Baker Institute for Animal Health, was recently named the Distinguished Veterinary Immunologist of 2010 by the Veterinary Immunology Committee of the International Union of Immunological Societies. Offered once every three years, the award was presented in Tokyo at the International Veterinary Immunology Symposium, where Antczak, who is only the sixth person and the first Cornellian to receive the award, presented a lecture. The award recognizes his work in the area of veterinary immunology, and specifically in horse pregnancy immunology, as well as his dedication to training future scientists and his ability to attract NIH funding by demonstrating the relevance of his work to human medicine.

This recognition follows on the heels of two other awards: Antczak (along with Cornell colleague Dr. Alan Nixon, professor of orthopedic surgery) was inducted into the University of Kentucky Equine

Research Hall of Fame in October 2009 and was more recently selected for Cornell University’s Polo Club Wall of Honor.

A Connecticut native, Antczak joined the faculty at the Baker Institute in 1979. In 1994, he was appointed director of the Baker Institute for Animal Health, a post he held for 15 years. For the past 30 years, Antczak has conducted research in equine immunology, genetics, and reproduction, much of which with support from the Harry M. Zweig Memorial Fund for Equine Research. For more than 15 years, Antczak was also a major participant in the Horse Genome Project. As a Cornell student in the late 1960s, Antczak was a member of the Polo team, serving as captain his senior year.

Antczak, who is the father of two Cornell polo team alumnae, has been a strong supporter of the Cornell polo teams for many years. “Polo is a very challenging sport. It requires excellent horsemanship, good hand-to-eye coordination, and the teamwork



of soccer or ice hockey. Very few players can bring together all those skills. Cornell polo is strongly linked to the Veterinary College, through the legendary contributions of the former coach and professor of veterinary obstetrics, the late Dr. Stephen J. Roberts. Coach Roberts established an egalitarian polo culture at Cornell that has introduced generations of students from all backgrounds to this most wonderful game.”

Behind the scenes with Rebecca Tallmadge

To Keep an Open Mind

Becky Tallmadge has fallen in love with the job she never knew she wanted. After completing graduate work in Dr. Doug Antczak's lab, and finishing post doctoral work at Washington State University, she accepted a position as a research associate at Cornell's College of Veterinary Medicine. Working in Dr. Julia Felipe's laboratory, Tallmadge is committed to developing a deeper understanding of the horse's immune system, particularly of neonate foals.

"I was drawn back to Cornell by the dynamics of Dr. Felipe's lab," said Tallmadge. "Her lab is supportive, balances basic research with clinical application, promotes a positive atmosphere, and has access to all of Cornell's amazing facilities, which are a considerable strength."

In her position, Tallmadge conducts molecular tests in equine developmental immunology, writes papers and grants, works with students, and helps keep the lab running smoothly. Her work complements other research projects underway in Felipe's lab, including the work that was recently recognized with an NIH Director's Innovator Award.

"It was a boost for all of us in the lab when Dr. Felipe won the Innovator Award for her work with CVID [Common Variable Immunodeficiency]," said Tallmadge. "It validated all of the long-term efforts of the lab and reinforced the idea that we must keep an open mind about the importance of ba-



sic research. Every experiment might not represent a scientific breakthrough, but in the aggregate, the body of work could have significant implications for the quality of life."

Tallmadge has had a life-long interest in horses and veterinary medicine. It was her good fortune, she says, to be connected to Dr. Douglas Antczak, as it was under his tutelage that her career plans took shape.

"I didn't imagine my professional life in this way when I used to think about it," said Tallmadge. "But, now, I couldn't imagine it any other way. At the end of the day, what we do will hopefully positively impact horse health. When we make headway with CVID and foal immunology, we have made life better for another organism. That's very fulfilling."

Poster session highlights research

Watch for the spring 2011 issue of the Zweig News Capsule for coverage of the second annual Harry M. Zweig Memorial Fund for Equine Research Poster Session. The event will highlight equine research supported by the Fund and is scheduled for Thursday, November 18, 2010, from 3:00pm to 6:00pm in the Atrium in the Veterinary Education Center. The poster sessions follows presentations by four speakers: Dr. Lisa Fortier, Dr. Julia Felipe, Dr. Jonathan Cheetham, and Dr. Margaret Brosnahan. In addition, Dr. Yung-Fu Chang's research will be highlighted at the poster session.

Lavender Foal Blues

Cornell researchers have identified the mutated gene that causes Lavender Foal Syndrome (LFS) and developed a simple molecular assay to test for either carriers of LFS or foals afflicted with it. This test, which is available at the New York State Veterinary Diagnostic Laboratory (located at the College), will enable breeders to avoid carrier-to-carrier matings that can produce LFS foals.

LFS is an inherited disease of Egyptian Arabian horses and their descendants and is named for the unusual coat color

of affected foals. In addition to other symptoms, they are unable to stand or lie on their stomachs and often suffer seizures.

Drs. Douglas Antczak and Samantha Brooks, assistant professor in the Department of Animal Science, and their staff collaborated on this project. Their work, funded in part by the Morris Animal Foundation, was reported in the journal *PLoS Genetics* in April 2010.

The Ins and Outs of Immunity

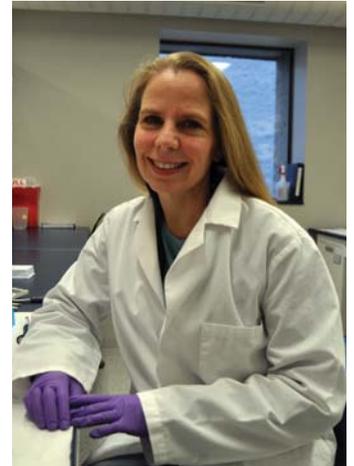
The immune system is one of nature's wonders, defending the body from a constant assault by foreign invaders. So how does a fetus, composed of foreign tissue, survive and grow inside its mother's body without being attacked by her immune defenses?

Dr. Margaret Brosnahan, a post-DVM PhD candidate at the James A. Baker Institute for Animal Health, recently received a Career Development Award from the National Institutes of Health (NIH) to support her research training in immunology. Brosnahan's research uses the pregnant mare as a model for investigating the mammalian maternal immune system. The NIH's career awards facilitate advanced research training for veterinarians, physicians

and other highly trained clinicians. As a recipient of the "Mentored Clinical Scientist Award," Brosnahan will conduct her research under the guidance of designated mentor Dr. Douglas Antczak, whose laboratory has a long-standing history of NIH funding and research in the areas of equine immunology and genetics.

Brosnahan's research model contributes to basic scientific knowledge in the fields of reproductive biology and equine immunology and genetics, with the potential to bring advances in the areas of human fertility, contraception and transplantation medicine, as well as specific equine reproductive and infectious disorders.

Brosnahan earned her B.A. from Bates College and her DVM from Tufts University, where she was awarded two summer NIH training grants to study the demographics and health issues of geriatric horses. Her work resulted in some of the earliest work published in this area. She then completed an internship in large animal medicine and surgery at the University of Minnesota followed by two years in an equine ambulatory practice in Connecticut. Brosnahan subsequently entered an equine internal medicine residency program at Oklahoma State University, and concurrently earned an M.S. in Veterinary Biomedical Sciences for work examining the emergence of antimicrobial resistance in equine populations in Oklahoma. She then became a



Diplomate of the American College of Veterinary Internal Medicine in the specialty of Large Animal Medicine. Since joining the Antczak laboratory in 2009, she has focused her research in the areas of equine immunology and genomics, already authoring a major review paper on equine clinical genomics and presenting a poster on her thesis research at the 2010 International Symposium on Equine Reproduction in Lexington, Kentucky.

Dr. Harry M. Zweig inducted into Harness Racing Immortals Hall of Fame

Dr. Harry M. Zweig, a New York native, was born in 1914. In 1938 he graduated from the Ohio State Veterinary College and returned to his hometown of Nassau, NY, to start a veterinary practice. In 1961 Zweig founded Middlebrook Farm in Nassau, NY, where he bred and raised Standardbreds eligible to compete in New York-sired racing events.

Due to his experience as a breeder, Zweig understood that there was a limited incentive to breed Standardbreds because of the large expense it entailed while offering only a small chance for a return on the investment. His passion for the industry and the sport drove him to change that. In 1965 Zweig was an instrumental figure in the passing of New York State's Laverne Law, which tapped into the state's lucrative gambling tax revenues to bring money back into the Standardbred industry. This law provided the foundation for the first state-bred racing program, the New York Sire Stakes. This initiative's incredible success, due to its innovative revenue-sharing model, caught the interest of the harness racing community across the US and around the world by introducing new motivation to breed Standardbreds. Over the next few years many others borrowed largely from New York's program to develop their own state-bred racing initiatives.

Aside from running his veterinary practice for over thirty-eight years, Zweig also served as a member of the advisory board of Cornell Veterinary College, as a president of the Harness Horse Breeders of New York State, Inc. for eleven years and as a director of the USTA for nine years.

Dr. Harry M. Zweig passed away on April 28, 1977. He was sixty-three years old. His contributions to harness racing are honored by the Dr. Harry M. Zweig Memorial Trot, previously known as the Empire State Trot, and by the Harry M. Zweig Memorial Fund for Equine Research.

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Have you visited our web site lately?

www.vet.cornell.edu/public/research/zweig/index.htm provides information on the projects and publications that have resulted from funding by the Zweig Memorial Fund. It also demonstrates the objectives of the Zweig Memorial Fund in promoting equine health with regard to the racing industry. Please encourage equine enthusiasts to visit the site.

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 Harry M. Zweig Memorial 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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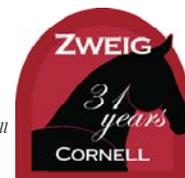
Anna Zweig

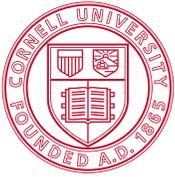
Middlebrook Farm

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Cornell University College of Veterinary Medicine

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We hope you will join College faculty and racing enthusiasts at the 2011 Harry M. Zweig Memorial Trot next summer at Tioga Downs.