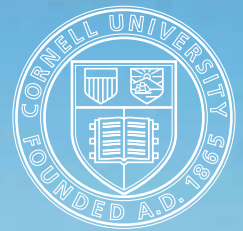


Zweig NEWS



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

No. 56 November 2013

Paternal genes make placentas

The mule has served humankind as a beast of burden from the time of Aristotle to the present day in the developing world. This hybrid between a male donkey and female horse and its lesser known relative, the hinny (a cross between a stallion and a female donkey), have made important contributions to our understanding of biology, particularly genetics.

Horsemen have long contended that mules and hinnies are distinct creatures, suggesting that their inheritance may not be equal – even though both inherit half their genes from horse and donkey parents. This presents a genetic conundrum.

The Baker Institute at Cornell's College of Veterinary Medicine has used mules and hinnies in research since the 1980s. Most recently, Baker Institute scientists used mule and hinny tissues to examine gene expression in the placenta.

For this work, Dr. Douglas Antczak and his colleagues partnered with Drs. Andy Clark and Xu Wang of the Department of Molecular Biology and Genetics at Cornell to apply cutting-edge gene sequencing techniques to placenta

samples from mules and hinnies. This approach enabled scientists to identify whether particular genes were expressed only from the father's or mother's chromosomes, or from both.

The study produced the most definitive evidence yet that there is a division of labor between genes of the mother and father in producing normal mammalian offspring. Examination of the so-called imprinted genes, a small subset of genes expressed only from the mother's or father's chromosomes, revealed that paternally expressed imprinted genes predominate in placental tissue. Such an outcome had been predicted 25 years earlier from studies of mouse embryos, but never verified experimentally.

This means that genes from its donkey father dominate the placenta of the mule, while in the hinny placenta the imprinted genes of the horse father are expressed. Because the imprinted genes of horses and donkeys carry distinct DNA sequences, this confirms that the horsemen's folk adage is true – mules and hinnies are indeed genetically different!

The research also has implications for human health, where imprinted genes have been shown to be essential for normal fetal and placental growth and development.



INSIDE: NEW RETROSPECTIVE SERIES

2 HORSE HEALTH TIPS
3 MEET N.Y.S. GAMING COMMISSION DIRECTOR

Horse health tips

Dr. Linda Mittel, senior extension associate at the Animal Health Diagnostic Center, offers tips and good practices for equine biosecurity at home, boarding facilities, show grounds, and the track.

1) **Vaccinate.** Common available vaccines can protect against rabies, strangles, influenza, tetanus, and more.

2) **Don't submerge** the ends of water hoses in water buckets. The outside of hoses often harbor disease causing bacteria or viruses. Keep them out of the water. Clean water troughs routinely.

3) **Don't share or swap** buckets of water or food or hay nets. Other horses that use it may harbor pathogens.

4) **Don't share tack** or equipment in the barn with different horses. Clean bits after use.

5) **Use separate grooming tools** for each horse.

6) **Use specially designated pitch forks** and wheelbarrows for animals that are sick in the barn. Colored duct tape can be used to color code items.

7) **Use foot baths** and ask visitors to do the same.

Prefer to receive this newsletter electronically?
Please email lam78@cornell.edu with the subject "Subscribe Zweig newsletter." We will add your email address to a list and remove your name from the print mailing list. You can read the searchable electronic newsletter online or download from eCommons at your convenience at: bit.ly/ZweigNews.



8) **Isolate / quarantine sick horses.** Have a stall or area designated as a quarantine stall prior to needing it.

9) **Decrease traffic** (people, horses, and other animals) from other barns.

2013 Equine Seminar

Cornell University College of Veterinary Medicine faculty presented a seminar on advances in equine health practices and procedures for horse breeders, owners, and trainers on August 25, 2013 at Vernon Downs in Vernon, N.Y. The seminar covered infectious diseases, platelets and equine herpes virus type-1 infections, alternative

sources of equine stem cells, diagnosis of poor performance in racehorses, and the importance of hepatitis virus to equine health. Question and answer opportunities followed. The event was sponsored by the Agriculture and N.Y. State Horse Breeding Development Fund and hosted by Harness Horse Breeders of N.Y.



New Gaming Commissioner



Robert Williams was named Acting Executive Director of the New York State Gaming Commission by Governor Andrew M. Cuomo in January 2013. He most recently served as Acting Director of the New York Lottery. He also serves as Chair of the Franchise Oversight Board, providing oversight of the N.Y. Racing Association, Inc.'s finances. Williams served in 1996 as Counsel to the N.Y. State Task Force on Casino Gambling and as the 2005 to 2007 Executive Director of the New York State Committee on the Future of Racing. More info on Mr. Williams and other Zweig members: vet.cornell.edu/Zweig/Members.cfm

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.

Zweig Committee retrospectives

For more than 30 years a diverse collection of people has dedicated time and energy to the Harry M. Zweig Memorial Fund Committee. The Zweig News Capsule will run an ongoing series of anonymous retrospectives like the notes below from current and former members. Contact lam78@cornell.edu to submit.

"We often discussed whether the research projects funded were practical and produced results that could be transferred directly and quickly to help meet industry needs. The types of research projects that did so quickly became the bread and butter of submitted proposals. Our accomplishments included getting more funding and earning greater respect for Cornell's veterinary college."

"In attending my first Zweig Fund Committee meeting, I was struck by the degree of passion all committee members had for equine science and the equine industry in general. The group is an eclectic one, with different experiences and expertise. As a "newbie," I was content to listen and learn. It was invaluable, and I look forward to this year's session with great enthusiasm."

"How fortunate the equine community is having the great team of researchers at Cornell. Dr. Zweig certainly had great insight to develop this funding for equine research. The Zweig Fund has helped retain faculty members with diverse interests in many different curricula, which seem to complement each other; they truly are the cutting edge. Every member brings a different perspective to the table when deciding on allocation of funding. The scientific reviews are very helpful, and I am overwhelmed at all of the knowledge. It is a steep learning curve for a few years to understand the review process. The reward is seeing some of the results from the studies that were previously funded. Dr. [Rick] Lesser [a former member] will be missed; he contributed a tremendous amount of insight and experience to the review process."

CORNELL UNIVERSITY COLLEGE OF VETERINARY MEDICINE 2014 HARRY M. ZWEIF MEMORIAL FUND COMMITTEE

Jean Brown

*Sr. Vice President, Operations
Blue Chip Farms, Inc.
Wallkill, N.Y.*

Gabriel Cook, DVM

*New England Equine Practice
Patterson, N.Y.*

Janet Durso, DVM

Middletown, N.Y.

Paul Kelley

*Kelley Racing Stable, LLC
Gansevoort, N.Y.*

Michael I. Kotlikoff, VMD, PhD

*Austin O. Hoey Dean of Veterinary Medicine
Cornell University College of Veterinary Medicine,
Ithaca, N.Y.*

Paul C. Mountan, DVM

Rhinebeck, N.Y.

Mike Mullaney

*Executive Director
Agriculture and NYS Horse Breeding Development Fund
Schenectady, N.Y.*

Robert M. Tugel, DVM

Avon, N.Y.

Patricia Wehle

Fairport, N.Y.

Robert Williams

*Acting Executive Director
New York State Gaming Commission
Schenectady, N.Y.*

William Wilmot, DVM

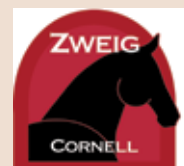
*NYS Thoroughbred Breeding & Development
Fund Corp. Saratoga Springs, N.Y.*

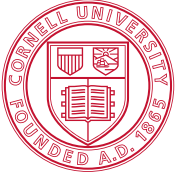
Anna Zweig

*Middlebrook Farms
Nassau, N.Y.*

Brian Zweig

Rensselaer, N.Y.





Cornell University
College of Veterinary Medicine

Winner's Circle

"Mystery Woman," winner of this year's Zweig Trot held at Vernon Downs on Sunday, August 25, 2013.

