

LSU Laminitis Research

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Two equine researchers at the Louisiana State University (LSU) School of Veterinary Medicine recently received a USDA National Research Initiative Mechanisms of Disease Grant to study the cause of laminitis. This disease causes chronic lameness or death in countless horses every year. Despite the high number of patients veterinarians examine and treat for the condition, prevention and effective treatment options still are unavailable.

Rustin Moore, DVM, PhD, Dipl. ACVS, director of the Equine Health Studies Program and Associate Professor of Equine Surgery, and Susan Eades, DVM, PhD, Dipl. ACVIM, Associate Professor of Equine Medicine, received the \$216,000 grant for their proposal, "Pathophysiologic and therapeutic implications for endothelin in equine laminitis." Through a two-year study, they will attempt to determine if the initial factor leading to laminitis is an imbalance in blood flow to the laminae, which hold the hoof wall to the coffin bone.

Laminitis causes inflammation to these laminae, leading to rotation or sinking of the coffin bone. Once this occurs, pain is permanent until the hoof grows back into normal alignment with its inner structures, which can take a year or more. If the hoof does not re-align, the pain will continue and the horse might have to be euthanized.

"The main sign of laminitis is extreme pain, mostly in the front feet," said Eades. "Earlier signs from suffering horses include shifting their weight back and forth and a reluctance to walk as the pain becomes more severe. Eventually, the horse will lie down for prolonged periods, leading to pressure sores."

Moore and Eades believe the initiating factor in the onset of laminitis is an imbalance in blood flow to laminae caused by decreased production of nitric oxide (which normally relaxes blood vessels and increases blood flow) and increased release of endothelin-1 (which causes blood vessel contraction and subsequent decreases in blood flow). This imbalance ultimately leads to decreased laminar blood flow, laminar swelling, tissue death, and subsequent separation of the laminae.

"There has been substantial research conducted on laminitis, which has unraveled important information regarding its pathogenesis," said Moore. "However, there is a missing link in the understanding of the disease, keeping us from effective and reliable prevention and treatment. We believe the pathway we are investigating may provide this missing link."