

## **Stopping Cellular Death, Post-Colic Surgery**

*Project Title:* "Apoptosis in the Equine Intestine following Ischemia-reperfusion Injury"

*University:* Virginia Tech, Virginia-Maryland Regional College of Veterinary Medicine

*Principal Investigator(s):* Mark Crisman, D.V.M.; Jolynne Tschetter, Ph.D., Nat White, D.V.M., Anthony Blikslager, D.V.M., Ph.D.

*Amount Funded:* \$46,583

*Year Awarded:* 2006-2007

*Results Expected:* Late 2007

### **The Need**

Most cases of death caused by colic involve some type of strangulating obstruction of the intestine. A study of 2,385 horses with colic referred to 14 veterinary teaching hospitals showed that "18.4 percent had strangulating intestinal obstruction with an overall mortality of 79.9 percent."

The strangulation cuts off the blood supply to the tissue causing cellular death and compromising the integrity of the intestinal lining. Yet, even when the strangulation is surgically corrected, further cellular damage often occurs with the body's inflammatory response when the blood supply is restored. The damage to the intestinal lining often results in endotoxic shock, multiple organ failure and death.

### **The Goal**

"Apoptosis" is "a distinct form of cell death" that involves breakdown of the cell's nucleus and membrane collapse. The intestinal lining's ability to recover may depend on the rate of apoptosis in its cells. It has been observed in other species after similar strangulation injury in the intestines and other organs. But it has not yet been studied specifically regarding equine strangulation colic.

Previous studies have shown that angiotensin converting enzyme (ACE) plays a role in stimulating apoptosis in the intestinal lining, specifically with the inflammatory response after strangulation. They have also shown that ACE inhibitors reduce apoptosis.

With this study, researchers intend to characterize apoptosis in the horse, induced by a strangulation obstruction of the intestine. They also want to study the effect that ACE inhibitor treatment has on apoptosis.

They believe that ACE inhibitors could increase post-colic surgery survival rates by reducing cellular damage in the intestinal lining caused by apoptosis.

### **The Results**

Pending