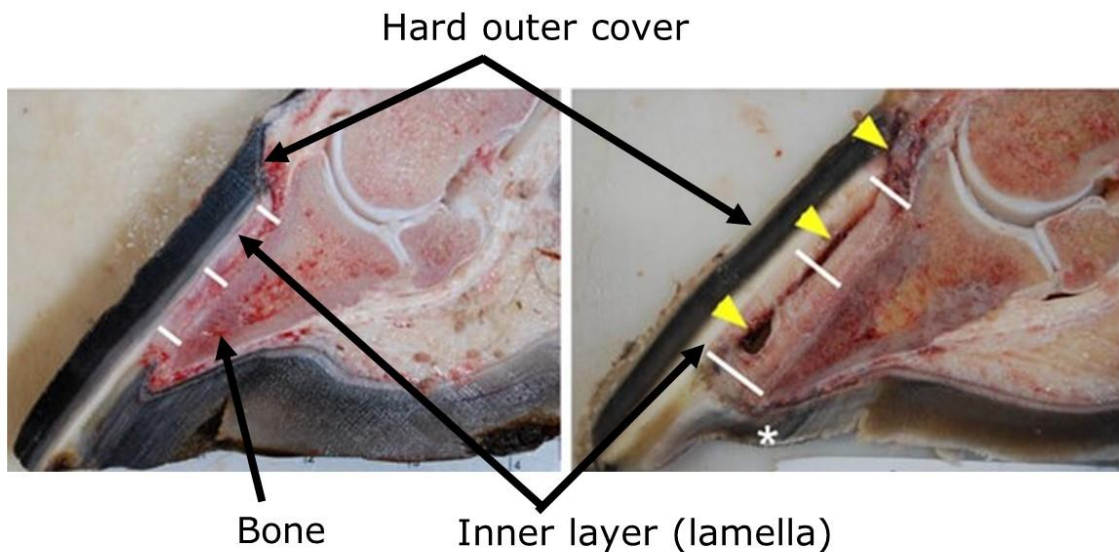


Background: Laminitis

Did you know that horses get sore feet? The condition is called “laminitis,” in which a bone pulls away from the inner surface of the hoof when the foot is damaged. Hemorrhage results from this tearing, as seen in the photo below. The left hand picture shows a normal hoof in cross section. A hoof with laminitis is on the right. The white lines show the separation distance between inner layer of hoof and the adjacent bone. Yellow arrows show a zone of hemorrhage (red) in the space. Source: University of Pennsylvania College of Veterinary Medicine.

Hoof of Horse, Normal vs. Laminitis



This kind of damage can occur from physical trauma or certain metabolic conditions. The damage causes the lipids in cell membranes to break down into smaller fatty acids that are irritating to surrounding tissue, adding still more damage.

Two chemical breakdown pathways are involved, one that yields the irritating chemicals and a second pathway that yields an anti-inflammatory chemical, but it is destroyed by another enzyme (epoxy hydrolase) so that the net result is that of the irritants in the other pathway. However, if a drug could be found that blocks this enzyme, it would allow its concentration in the area to increase, and it would counteract the inflammation and pain caused by end products in the other pathway. The purpose of this study is to test in horses a drug that others had found in rodent studies to block the enzyme that destroys the anti-inflammatory epoxy hydrolase. In this horse study, investigators modeled laminitis by injecting horses with an irritant chemical into a joint just above the hoof. This caused inflammation and pain that normally went away after a day or two and did not cause real laminitis. But this approach models laminitis and provides a way to see if the enzyme blocker reduces the pain.

There are other drugs, like ibuprofen and other so-called non-steroid anti-inflammatory drugs (NSAIDs) that interfere with pain-inducing breakdown products in the first pathway, effective doses may cause gastro-intestinal or kidney damage.

Based on this and other research, the principal investigators have been awarded a patent for using the epoxy hydrolase inhibitor for the treatment of horse laminitis. This drug is now in clinical trials with humans to see if it has practical use in reducing inflammation and pain.