Employing Recombinant Adeno-associated Viral Vectors for Delivery of a Therapeutic TIMP-3 Transgene to the Equine Distal Extremity

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Laminitis by the Numbers

**Lameness**
- United States • 15.7%
- United Kingdom • 20.7%

**Euthanasia**
- Laminitis Cases • 4.7%
- Teaching Hospitals • 50.2%

(NAHMS, 2000; NEHS, 2016)
Anatomy
Sensitive Laminae attached to the Coffin Bone

In sensitive Laminae attached to the Hoof Wall
Activated Enzyme Basement Layer Destruction

AGGREGANASE

TIMP-3

DEGRADE

PRESERVE

NORMAL LAMINA

DISEASED LAMINA

DEGRADE

PRESERVE

AGGREGANASE
Rotation

Detached distal phalanx rotates and disrupts weight distribution

Common Digital

Healthy Hoof

Common Digital Extensor Tendon

Proximal Phalanx (P₁)

Middle Phalanx (P₂)

Lamellar layer

Distal Phalanx (P₃)

Hoof Wall

Distal Sesamoidean Ligaments

Superficial Digital Flexor Tendon

Deep Digital Flexor Tendon

Bulbar Cushion

Navicular Bone

Digital Cushion

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Current Study
AGGRECANASE

DISEASED LAMINA

DEGRADE

PRESERVE

NORMAL LAMINA

DEGRADE

PRESERVE

TREATED LAMINA

DEGRADE

PRESERVE

TIMP-3

AGGRECANASE
Gene Therapy
Assays

- Viral Detection
- Protein Detection
- Viral Quantification
- Protein Quantification
- Protein Function
Results

Transduction of rAAV in Equine Hoof Tissue

Viral Genome Copy Number

Control

Treated
Hope on the Horizon

- Clinical Procedure
- Specific Treatment
- Preventative
References


Questions