Applications for Celavet

Celavet Inc., a subsidiary of Celavie Biosciences LLC, is a regenerative medicine company that develops stem cell-based therapies for the treatment and prevention of orthopedic injuries and diseases in large and small animals, restoring health and mobility. Celavet offers a faster path to market for this groundbreaking stem cell technology.

Celavie and Celavet use the latest technological breakthroughs to produce large banks of undifferentiated cells with uniform qualities utilizing closed-system bioreactors. The cells are grown in a specialized patented medium that allows them to maintain their sterility and genetic stability over the course of the manufacturing process.

Celavet uses the same standardized and controlled production methods to establish equine, canine, and feline stem cell lines as those used by parent company Celavie Biosciences in the manufacture of human cells. Stem cell lines from different species all express standard stem cell characteristics and are available to address pathologies in their respective species. Research in one area leads to innovation in another.

A Breakthrough in Veterinary Medicine

We utilize Celavie Bioscience's proprietary technology transplanting pluripotent stem cells into the ligaments and tendons of injured horses to enable them to regain their fullest potential as competitors, performers, workers, or companions. Celavet has conducted multiple studies to ascertain the viability of their stem cells as a veterinary treatment.

Multicenter Open Label Study of OK100 Stem Cells for Treatment of Equine Tendon Injuries

- **Purpose:** To accumulate safety, dosing, and efficacy data of Celavet's OK100 stem cells in tendon and ligament injuries
- **Conduct:** 35 veterinarian centers throughout US
- **Methodology:** Subjects included more than 400 horses with tendon and ligament injuries. 275 cases followed for longer than one year. 113 cases followed for 3 years post treatment. Celavet addressed measure of efficacy for musculoskeletal injury by grading lameness, exercise level, pain and swelling prior to injection and 90-120 days post injection.

  Participating veterinarians also performed a range of ultrasound measurements to observe structural changes to the lesions.
- **Time frame:** 2009-2011
- **Results:**
  - No significant long-term safety concerns associated with intra-lesional injections of OK100 revealed.
  - Clinically, the horses demonstrated a return to normal function.
  - Ultrasound examination showed reconstruction of lesions with anatomically correct fiber alignment and absence of scar tissue.
  - Significant improvement ($p < 0.05$) in ultrasound and clinical scores in both acute and chronic cases over a 120-day period post injection
  - Over 100 horses followed for 3 years post treatment showed no signs of tumors.
  - Transient swelling and/or lameness observed at site of injection in 13.5% of cases that resolved within days
  - Baseline scores of the chronic animals can be viewed as the controls for the day 90-120 scores due to their prior failure to improve

—more—

Large Veterinary Market Potential

$24.5 billion

The estimated value of the equine healthcare market in 2049[1]

<50%

Percentage of horses that will recover successfully from tendinitis[2]

$1,500 - $10,000+

Cost to fix a fracture in a horse, not including rehab[3]

6-12 months

Farm rest required for horses recovering from torn suspensory ligament and bowed tendons; little can be done medically[2]

$39 billion & 1.4 million jobs

Direct economic impact of US horse industry[4]

"Attempting to expedite healing with regenerative medicine approaches would aid in returning horses to function sooner and without the distress of prolonged layup times."[3]

"Tendons and ligaments often heal with a disorganized scar tissue formation, meaning the structure is weakened and likely won't have as wide a range of motion, predisposing it to reinjury."[3]

[1] Transparency Market Research
[2] Thoroughbred Owners of California
[3] The Horse Magazine
[4] American Horse Council

Double Blind Randomized Trial of OK100 Stem Cells for Treatment of Acute Equine Tendinitis Lesions

- **Purpose:** To evaluate the genetic, biochemical, and morphological effects of Celavet's embryonic stem cells in acute tendinitis lesions in the superficial flexor tendon of horses
- **Conduct:** Cornell University, College of Veterinary Medicine
- **Methodology:** Injection of Celavet's embryonic stem cells into lesions in horses with a collagenous induced tendinitis model
- **Time frame:** 2009
- **Duration:** 8 weeks
- **Status:** Completed
- **Results:**
  - Improved tissue architecture compared to controls
  - Decreased mean tendon lesion size compared to controls
  - Improved fiber alignment compared to controls
- **Publication:** **Click here for full text**

Pilot Study OK100 Stem Cells for Prospective Methodology for Repair of Equine Connective Soft Tissue Injuries

- **Purpose:** To investigate the safety and efficacy of Celavet's OK100 stem cells for the repair of equine connective soft tissue injuries
- **Conduct:** Single-center study conducted at Santa Lucia Farm, Inc., Santa Ynez, CA
- **Procedures:** 65 performed; tendon and ligament injuries
- **Time frame:** 2008, 6-month follow-up post transplantation
- **Results:**
  - No serious adverse events in the course of the pilot
  - Encouraging efficacy data justified proceeding to the Cornell Double-Blind Study and Multicenter Open Label Study
- **Publication:** **Download PDF**

Open Label Pilot Study of OK200 Stem Cells for Treatment of Chronic Osteoarthritis and Cruciate Ligament Injuries in Canines

- **Purpose:** To accumulate safety and efficacy data of Celavet's allogeneic canine stem cells for treatment of chronic osteoarthritis and cruciate ligament injuries IND012-003
- **Conduct:** Wyomissing Animal Hospital, Reading, PA
- **Methodology:** 8 dogs with chronic osteoarthritis were injected intravenously. In 12 dogs, the cells were injected directly into the joints.
- **Time frame:** January 2011
- **Status:** Study on hold
- **Results:**
  - In 3 dogs, after intravenous injection, a mild to moderate transient anaphylactic reaction was observed.
  - No tumor formation or infection has been detected.
  - Direct injection chosen as preferred route
  - Showed safety and promise of efficacy

Case Study of CVM Compassionate Use Treatment for Repair of Canine Tissue Wounds from Burns

- **Purpose:** To repair tissue damage to canine burn victim. Bernie was an abused pit bull whose owner left him on the metal roof of a row home in Reading, PA for several scorching hot summer days, with temperatures reaching 110°F. He developed severe third-degree burns to all four paws with no skin remaining, as well as burns to his back and legs. The local director of the Animal Rescue League came to Celavet because of our pilots with stem cells and asked us to help this animal. The CVM approved compassionate use treatment.
- **Conduct:** Wyomissing Animal Hospital, Reading, PA
- **Methodology:** Dr. Oleg Kopyov of Celavet and Dr. Boyd Wagner of Wyomissing Animal Hospital injected of the cells in a circular pattern around the rim of each pad, and then protection with a scaffolding to hold the cells in place and give them a surface for attachment. The paws were then wrapped and bandaged.
- **Time frame:** 2011
- **Status:** Plans pending for preclinical study and submitting an Investigational New Animal Drug for chronic wounds and burns.
- **Results:**
  - Almost total restoration, with no scar tissue in 5 weeks