Using rAAV-TIMP3 Vectors for the Improvement of Osteoarthritis in an Ovine Model

Presented By
Crystal Collier
Outline

- What is osteoarthritis?
- Current Treatments
- Pilot Study
- Treatment Approach
- Methods
- Summary
Osteoarthritis

Causes

- Age and Genetics
- Injury and Excessive Use
- Obesity
- Menopause

http://www.humanillnesses.com
Osteoarthritis

- Pain and Inflammation
- Swelling and Stiffness
- Reduced Range of Motion
- Deformed Joints

http://www.firstaidforfree.com
Current Treatments

- Lifestyle Changes
- Topical Pain Relievers
- NSAIDS
- Corticosteroid Injections
- Physical Therapy
- Surgery
Pilot Study  
(Hill et al. 2017)

- Developed a female ovine model for osteoarthritis
- CCLD (ACLT)/ovariectomy surgeries
- Oblique-angle forced exercise
- Foundational protocols and procedures for my project
**Treatment Approach**

- **Decreases the effects of aggrecanase-**
  - preserves aggrecan

- **Viral DNA is modified to prevent replication**

- **Cells in joint transduced to rebalance cartilage homeostasis**

- **rAAV-TIMP3**

- **Predicted to slow the progression of disease**
Study Design

- Sheep underwent CCLD or Ovariectomy surgery – December 2017
- 6 of 15 were injected with the virus
- Collecting serum and urine every 3 weeks to measure biomarkers
Study Design

- Began treadmill running in March 2018
- Taking 4 sets of radiographs on each sheep every 6 weeks
- Tracking gait in collaboration with Kinesiology department
- Sheep are to be collected in July 2018
Summary

The most common joint disease on earth.

23 Million Americans

630 Million People Worldwide

23 Million

Americans

630 Million

People

Worldwide

https://www.healthyfamiliesbc.ca
Questions?

Acknowledgments

**Mason Lab**
- Dr. Jeff Mason
- Kate Parkinson
- Tracy Habermehl
- Anisa Samhouri
- Dr. Holly Mason
- Dr. Rusty Stott
- Dr. Aaron Olsen
- Dr. Alexis Sweat

**Surgery Team**
- McKenna Walters
- Madelin Session
- Peter Welsh
- Kyleigh Tyler
- Dr. Sierra Salopec
- Adam Ustach
- Sarah Ward-Pierce

**Bressel Lab**
- Dr. Eadric Bressel
- Michael Valuka
- Youngwook Kim

**PPRL**
- Rex Probst
- Dr. Daniel Cook
- Dr. Ben Green