

Murine Muscle Mechanics Workshop

An immersive, hands-on workshop on measuring skeletal muscle function in murine models.



Effectively measure and interpret muscle mechanics

Hosted by Dr. Christopher Perry and Dr. Arthur Cheng in the Muscle Health Research Centre at York University, and produced in partnership with Aurora Scientific, our Murine Muscle Mechanics Workshop integrates fundamentals of muscle physiology and mechanics as well as hands-on laboratory training in multiple functional assays. This program is designed to impart preclinical researchers with the necessary knowledge and techniques to effectively measure and interpret muscle mechanics and functional outcomes in murine models.

Topics include:

- Muscle architecture, principles of function, typical muscles assessed and benefits of in-vivo function
- Fundamental surgical approaches for in-situ and in-vitro methods, including dissection and suturing techniques
- Correct handling of animals, tissues, and test instrumentation
- Tissue viability and animal optimization before, during and after the procedure
- Animal monitoring and analysis of anesthesia options
- Recommendations and optimizations for experimental design
- Performing end-to-end isolated muscle (in-vitro) mechanics of the Extensor Digitorum Longus (EDL), Soleus (SOL) and Diaphragm (DIA)
- Performing end-to-end dissection and mechanics testing (in-situ) of Tibialis Anterior (TA) and Quadriceps (Quad)
- Performing end-to-end whole animal (in-vivo) mechanics testing of the Dorsiflexor and Plantarflexor groups
- Common experimental output and data analysis measurements (twitch, tetanus, fatigue, force-frequency, eccentric, force-velocity, etc.)

This program is recognized by the American Physiological Society and supported through technology sponsorship from Aurora Scientific and Kent Scientific.

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Instructors

Christopher Perry, PhD

Professor, School of Kinesiology & Health Science
Director, Muscle Health Research Centre
Faculty of Health, York University



Dr. Christopher Perry's research focuses on the regulation of skeletal muscle metabolism, particularly how disruptions in metabolic control contribute to muscle weakness in disorders such as Duchenne muscular dystrophy, cancer cachexia, and chemotherapy-induced muscle weakness. A central aim of his work is to develop novel therapies to enhance muscle fitness and restore metabolic control in these conditions.

Using an integrative approach, Dr. Perry's laboratory employs preclinical rodent models, human muscle biopsies, and cell cultures to directly assess muscle fitness and mitochondrial bioenergetics. His research emphasizes mitochondrial regulation as a key determinant of muscle function, exploring its role in energy provision, oxidative stress, and calcium homeostasis. This work informs therapeutic strategies in collaboration with international pharmaceutical partners and helps refine exercise therapy regimens for specific disorders.

Arthur Cheng, PhD

Assistant Professor,
School of Kinesiology & Health Science
Faculty of Health, York University



Dr. Arthur Cheng's research centers on understanding the cellular mechanisms of skeletal muscle weakness, fatigue, and post-exercise recovery. His laboratory employs translational research approaches, spanning from single muscle fiber studies to whole-animal and human models, with a unique focus on delineating how excitation-contraction coupling in intact muscle fibers influences contractile force generation in both healthy and diseased states.

An overarching aim of Dr. Cheng's work is knowledge translation: applying research findings to develop pharmacological, nutritional, and exercise-based interventions that enhance muscle strength and fatigue resistance across various populations, including aging and disease-affected groups. His expertise in muscle fiber mechanics, combined with his innovative research methodologies, positions him as a key contributor to advancing therapeutic strategies for improving muscle performance and recovery.

Location

York University

Muscle Health Research Centre

Petrie Science and Engineering,
4700 Keele St., Toronto, Ontario
M3J 1P3, Canada



Agenda

Day 1

Morning Session:

- Fundamentals of Muscle Mechanics
- Introduction to in-vitro, in-situ and in-vivo techniques, and Experimental Design

Afternoon Session:

- Basic Dissection and Suturing Techniques
- Tissue Viability and Animal Optimization
- Instrumentation and Tissue/Animal Handling

Day 2

Day 2

Morning Session:

- Demonstration of EDL and SOL Surgery and *in-vitro* Testing
- Demonstration of TA and GA Surgery and *in-situ* Testing
- Demonstration of animal anesthesia, animal preparation and *in-vivo* testing of plantarflexors and dorsiflexors

Afternoon Session:

- Hands-on Practice of *in-vitro*, *in-situ*, and *in-vivo* Assays

Day 3

Morning Session:

- Continued Hands-on Practice, Participant Choice
- Analysis of common muscle mechanics experiments, important parameters and presenting data in the literature
- Open Discussion and Q&A with Instructors followed by Closing Remarks



Technology

Through generous sponsorship from our program partners, attendees benefit from learning how to measure muscle mechanics in rodent models using industry leading technologies.

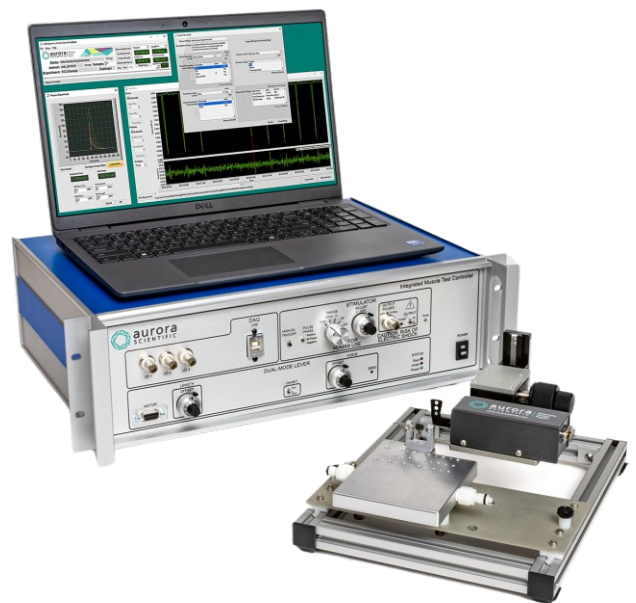


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Kent Scientific is a leading global provider of digital anesthesia systems, non-invasive blood pressure instruments, and physiological monitoring solutions for small animal research. Our products are designed to deliver fast, consistent, and accurate results while offering the most value at industry leading prices.

At the workshop, students will gain experience using the **Aurora Scientific 3-in-1 Integrated Whole Animal System for Mice**. Demonstrations combined with hands-on practice in all three techniques means students gain the necessary skills to repeat these measurements with confidence in their lab. Additionally, students are exposed to an extensive list of standard muscle experiments such as twitch, tetanus, fatigue, and force-frequency.



Cost

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Academic Rate: Single – \$3,800, or Pair – \$7,200

Industry Rate: Single – \$4,600, or Pair – \$8,700

Pricing is USD. Pair rate is for two colleagues that wish to share a surgical station.

About APS

Founded in 1887, the American Physiological Society is a global leader in expanding knowledge related to biological function. They connect a multidisciplinary community of nearly 10,000 scientists and educators from around the world, driving collaboration and spotlighting scientific discoveries in physiology and related disciplines. Their members are advancing treatments and cures for everything from cancer and heart disease, to obesity and addiction.

Together with Endpoint Preclinical, the APS helps create and support training programs, enabling professionals to expand their skills, advance their careers, and foster the future of basic and translational research.



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About Endpoint Preclinical

Endpoint Preclinical is a specialized consulting network serving CROs, pharmaceutical companies, biotech firms, medical device manufacturers, and academic research labs. Our team of experienced professionals streamlines preclinical research by reducing administrative complexity, minimizing overhead, and eliminating delays in sourcing specialized expertise.

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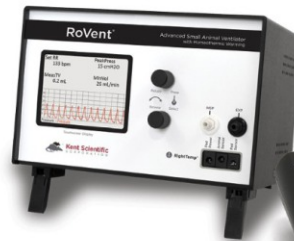
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