WINTER 2025/2026

STEADMAN PHILIPPON RESEARCH INSTITUTE

SPRI NEWS

MAJOR MILESTONES INSPIRE FORWARD VISION

A MULTI-YEAR CLINICAL TRIAL CONCLUDES AND NEW SCIENCE TAKES SHAPE

In the winter edition of *SPRI News*, Steadman Philippon Research Institute (SPRI) would like to share some key updates from 2025 and share some exciting scientific directions in 2026. From regenerative medicine to education, from biomechanics to outcomes research, SPRI's teams are making an impact in orthopaedic research and beyond.

MESSAGE OF THE CHAIRMAN AND CEO

As we reflect on the past year at **Steadman Philippon Research Institute (SPRI)** and welcome 2026, we'd like to thank the entire SPRI network for their support of our scientific research. The SPRI community extends far beyond the reaches of our laboratories in Vail and Basalt—it includes grateful patients of The Steadman Clinic, community members, collaborators and partners, and generous donors.

In this edition of SPRI News, we're excited to share some key highlights from 2025, including the completion of SPRI's five-year clinical trial funded by the National Institutes of Health (NIH)—the Regenerative Medicine Innovation Project (RMIP)—and SPRI's new fellowship program with the International Olympic Committee (IOC). We'll also share some exciting new research areas that SPRI is embarking on in 2026.

SPRI's team is comprised of dedicated scientists, researchers, clinician partners and administrators who are passionate about advancing the field of orthopaedic research and improving patient care on a global level. We'd like to thank the SPRI team for their efforts in 2025 and their continued pursuit of excellence as we begin a new year at the institute.

With sincere thanks,

MARC J. PHILIPPON, MD
CHAIRMAN, STEADMAN PHILIPPON RESEARCH INSTITUTE

DAN DRAWBAUGH
CEO, STEADMAN PHILIPPON RESEARCH INSTITUTE

THE REGENERATIVE MEDICINE INNOVATION PROJECT AND FUTURE DIRECTIONS

SPRI'S FIVE-YEAR, FEDERALLY FUNDED CLINICAL TRIAL IS A MAJOR MILESTONE FOR SPRI

In 2019, SPRI was awarded the prestigious Regenerative Medicine Innovation Project (RMIP) from the National Institutes of Health (NIH) and began enrolling patients into the trial in fall 2020. This award, administered by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) was one of the most significant awards in SPRI's history—in both size and recognition. The RMIP was designed to accelerate the field of regenerative medicine by supporting clinical research on adult stem cells, and SPRI's receipt of this award was an honor and milestone for the institute.

AWARD COMBINED FEDERAL FUNDS AND PHILANTHROPY

The RMIP was not only a great fit for SPRI from a scientific perspective, but also because the award utilized a 1:1 philanthropic match. As an organization powered by philanthropy, this award—$2.8 million from the NIH and $2.8 million from philanthropic donors—was a tremendous opportunity for SPRI. Together, $5.6 million was awarded to SPRI to conduct this five-year clinical trial.

CLINICAL TRIAL MADE POSSIBLE BY SCIENTIFIC AND MEDICAL PARTNERSHIP

Entitled "The Use of Senolytic and Anti-Fibrotic Agents to Improve the Beneficial Effect of Bone Marrow Stem Cells for Osteoarthritis," the clinical trial was focused on delaying osteoarthritis (OA) in the knee, helping to delay the need for a total knee replacement. The study investigated whether anti-fibrotic and/or senolytic agents improved the beneficial effect of bone marrow stem cells in patients with diagnosed knee OA.

The success of this trial was not only due to SPRI's scientific teams—including the Linda & Mitch Hart Center for Regenerative and Personalized Medicine (CRPM), Department of Biomedical Engineering (BME) and the Center for Outcomes-Based Orthopaedic Research (COOR)—but also due to the collaboration of world-class physicians from The Steadman Clinic. The combination of team science and medicine, in a co-located space, provided an ideal ecosystem for conducting this major clinical trial.

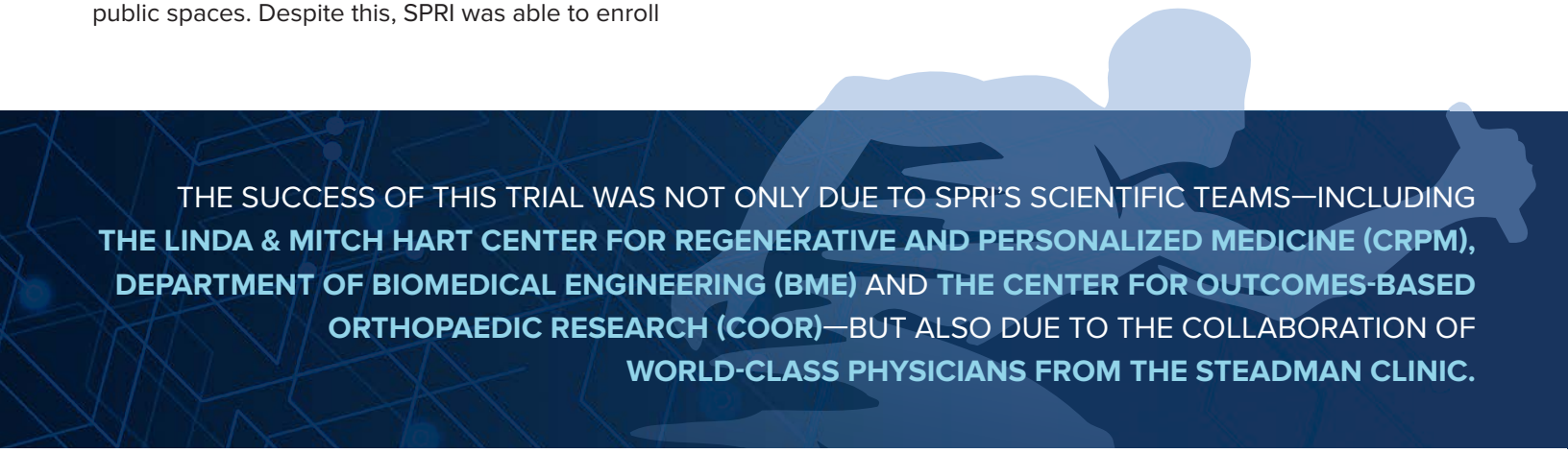
ENROLLMENT SUCCESS THROUGH COVID

With the RMIP beginning enrollment in the fall of 2020, the team at SPRI considered if the COVID-19 pandemic would adversely affect the trial—vaccines were not yet available, and many people were wary of entering public spaces. Despite this, SPRI was able to enroll patients throughout the pandemic, and were even ahead of schedule on enrollment milestones. Enrolling and completing its first five-year, federally funded clinical trial—including during a global pandemic—was a significant achievement for the organization.

KEY FINDINGS AND CONTINUATIONS

One of the most important aspects of any clinical trial is ensuring that the therapeutic approaches are safe for patients. The RMIP concluded that both the anti-fibrotic medication and senolytic supplement were safe for participants of the clinical trial. Additionally, patient-reported outcomes (PROs) indicated that participants experienced improvement in pain, stiffness and function across treatment arms. Through conducting this trial, SPRI learned that forward directions for treatment need to include a patient-specific, personalized regenerative medicine approach, rather than uniform dosing.

During the course of conducting the clinical trial, science continued to advance at SPRI's CRPM, including more investigations into extracellular vesicles (EVs), including exosomes. To continue the important orthobiologics research being conducted with the RMIP, the team submitted a renewal application to continue its investigation, this time looking at the existing samples with the clinical lens of EVs. SPRI anticipates learning more about their potential scientific research renewal in 2026.



THE SUCCESS OF THIS TRIAL WAS NOT ONLY DUE TO SPRI'S SCIENTIFIC TEAMS—INCLUDING **THE LINDA & MITCH HART CENTER FOR REGENERATIVE AND PERSONALIZED MEDICINE (CRPM), DEPARTMENT OF BIOMEDICAL ENGINEERING (BME)** AND **THE CENTER FOR OUTCOMES-BASED ORTHOPAEDIC RESEARCH (COOR)**—BUT ALSO DUE TO THE COLLABORATION OF **WORLD-CLASS PHYSICIANS FROM THE STEADMAN CLINIC.**

Olympic House IOC Headquarters

IOC RESEARCH CENTRE TRAINING AND CAREER DEVELOPMENT PROGRAM CONTINUES

SPRI SECURES FUNDING FOR INTERNATIONAL RESEARCH TRAINING

In December 2025, SPRI secured a significant gift from longtime supporter Bjorn Erik Borgen to sustain a critical training and career development program within the International Olympic Committee's (IOC) Research Centre network. Alongside partners the U.S. Olympic & Paralympic Committee (USOPC) and the University of Utah, SPRI represents the United States in the U.S. Coalition for the Prevention of Illness and Injury in Sport, one of only 11 IOC Research Centres out of more than 200 Olympic competing nations.

Mr. Borgen's gift funds the 2026 SPRI-Borgen IOC Research Centre Training and Career Development Travel Award, which will support Ph.D. students, postdoctoral scholars and research fellows who are dedicated to injury prevention research.

FELLOWSHIP BROADENS EXPERIENCE

The Fellowship is open to members of the 11 IOC Research Centres who can apply for an award to complete a four-to-six week visiting fellowship at any of the 11 centres. Applications were due Dec. 15 and a committee will review and select awardees in early 2026. It is anticipated that the fellowships will occur in Summer 2026.

The SPRI-Borgen IOC Research Centre Visiting Trainee Fellowship will help participants broaden their geographical and research perspectives, develop new skills and build mentorship and collaboration networks. Visiting fellows will have the opportunity to conduct training activities at the IOC Research Centres, including collaborating on new projects, peer-to-peer learning, research team and mentorship meetings, skill development and networking opportunities.

OLYMPIC SPIRIT DEFINES RESEARCH EFFORTS

A prominent goal of the IOC Research Centres is to understand the impact of elite sport on athlete's bodies and develop protocols to protect these athletes from injury, reinjury and illness. The Olympic Agenda 2020, which was adopted in 2014, aimed to place athletes and their well-being at the heart of the Olympic Movement. The IOC Research Centres of Excellence connect on this mission, working collaboratively to protect all athletes, independent of nationality.

MUSCLE HEALTH DEFINES FORWARD DIRECTIONS FOR SPRI'S RESEARCH

REGENERATIVE MEDICINE AND BIOMECHANICS PROGRAMS INVESTIGATE NOVEL APPROACHES TO MUSCLE HEALTH

As an orthopaedic and sports medicine research organization with over 35 years of conducting patient-focused research, SPRI has been on the forefront of science related to musculoskeletal injuries and diseases, including conditions like osteoarthritis, femoroacetabular impingement (FAI), rotator cuff tears and anterior cruciate ligament (ACL) injuries. With a collaborative focus in its scientific departments—regenerative medicine, biomechanics and outcomes—SPRI also takes a comprehensive approach to orthopaedic research, investigating the complete system to determine the best ways to prevent injury and disease, as well as improve patient outcomes following treatment.

Measuring the vascularity of muscle tissue with ultrasound establishes SPRI as a pioneer in this advanced imaging technique

SKELETAL MUSCLE AS A CORNERSTONE OF THE MUSCULOSKELETAL SYSTEM

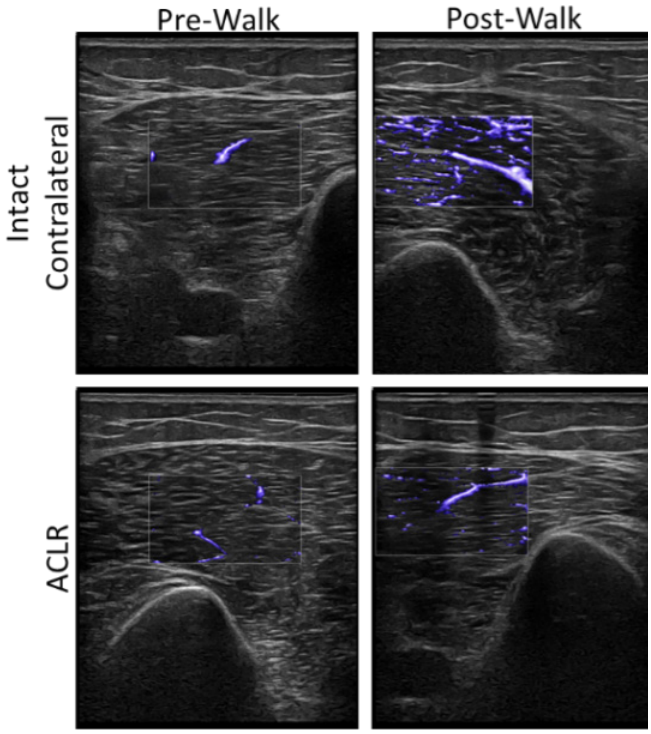
Building upon decades of science, SPRI is continuing its research into muscle health across the institute, including using novel tools to investigate muscle tissue and the vascular system, as well as therapeutic approaches to build and maintain healthy muscle tissue as people age.

REGENERATIVE MEDICINE TEAM EXPLORES MUSCLE THROUGHOUT A PATIENT'S JOURNEY

Skeletal muscle plays a vital role before, during and after surgery. Patients who enter surgery with strong, healthy muscle tissue have better outcomes, fewer complications and quicker recoveries. By optimizing muscle health across the entire surgical journey, SPRI is committed to improve patient outcomes, especially in our aging population.

In partnership with surgeons at The Steadman Clinic and SPRI's outcomes team, regenerative medicine scientists and researchers have modeled a skeletal muscle health program across patients' surgical journeys:

- **Before surgery,** SPRI will investigate how exercise protocols, nutrition and supplements can prepare patients for optimal outcomes by strengthening skeletal muscle tissue.
- **During surgery,** SPRI will study how regenerative medicine approaches, including biologics and therapeutics, can protect and preserve muscle tissue, much in the way SPRI has explored its impact on other tissues like bone and cartilage.
- **After surgery,** SPRI will explore strategies to accelerate recovery—helping patients rebuild strength, minimize complications and return to their lives with confidence.



SPRI's Superb Microvascular Imaging ultrasound measurements revealed reduced microvascular blood flow after 5 minutes of walking 6 months after ACL reconstruction when compared to the non-operated leg

BIOMOTION TEAM PIONEERS NOVEL USE OF ULTRASOUND

Clinicians and scientists know that the human body regulates blood flow to muscles to conserve energy at rest and maximize oxygen delivery when people exercise. But when muscles aren't used as often due to injury or aging, the muscle's vascular network (blood supply) is reduced, impairing performance. Once this vascular regression occurs, it becomes exponentially more difficult to regrow muscle tissue. Without targeted research into muscle vascularity and its role in aging and recovery, scientists and physicians do not yet have a complete picture of this developing medical science.

In collaboration with the other scientific teams at SPRI, the Biomotion and Advanced Imaging teams within the Department of Biomedical Engineering have launched a multi-phase research program investigating muscle vascularity, called "Muscle Blood Flow: A Novel Approach to Optimize Surgical Rehabilitation and Aging Mobility."

While measuring muscle blood flow non-invasively has previously been impossible, SPRI will adapt Superb Microvascular Imaging—a state-of-the-art ultrasound technology developed to measure blood vessel growth in tumors—to measure the increase in blood flow in muscle response to exercise. This innovative muscle evaluation tool will be developed by SPRI to provide key insights linking muscle vascularity with strength. And, once these connections are made, SPRI is positioned to broaden its clinical research into muscle vascularity—an emerging field.

TEAM SCIENCE ESSENTIAL TO FORWARD GOALS

As all of SPRI's scientific teams and physician partners move forward in exploring distinct aspects of muscle health in orthopaedics, the organization is united by the concept of team science—research and science across the organizations help to paint a cohesive picture of muscle health to help improve patient outcomes and longevity.

To learn more about SPRI and how you can support its research and education initiatives, please contact Kristin Morgan, Vice President of Development at kmorgan@sprivail.org.