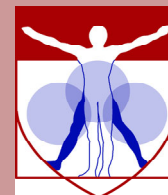


# Musculoskeletal Messenger



**Inside this issue:**

Research Updates PMCD Members	2
In the News Histology Core Update Pilot Grants Awarded PCMD Funds Available	3
Upcoming events	4

*University of Pennsylvania Penn Center for Musculoskeletal Disorders*

## Looking Forward to the 2022 PCMD Annual Scientific Symposium November 16, 2022

Preparations are underway for the 18th Annual Penn Center for Musculoskeletal Disorders Scientific Symposium in the Smilow Rubinstein Auditorium and Commons to be held on November 16, 2022.

The day will begin that morning with registration and poster set-up followed by scientific presentations from new Center Full and Affiliate members and PCMD Pilot Grant recipients.

The keynote speaker will be Lori A. Setton, Ph.D., Lucy and Stanley Lopata Distinguished Professor and Chair of Biomedical Engineering; Professor of Mechanical Engineering & Materials Science and Orthopedic Surgery from Washington University in St. Louis.



The symposium will also include lunch and a judged poster session with prizes awarded in four categories

The day will conclude with a reception in the commons area of Smilow.

We are excited to return to an in person symposium and look forward to seeing you.

Registration is free but is required. Registration information to follow.

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If you have any news or information that you would like included in the next issue of this newsletter, please email us at:

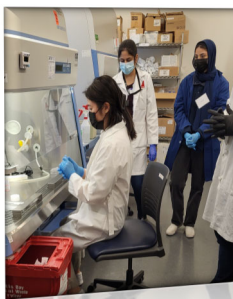
[pcmd@pennteam.upenn.edu](mailto:pcmd@pennteam.upenn.edu)

Remember to include reference to support from the Center in your abstracts and publications.

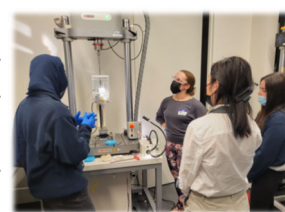
Cite Grant NIH/NIAMS P30AR069619 from the National Institute Of Arthritis And Musculoskeletal And Skin Diseases of the NIH.

## PCMD Learning on a Limb! Event

On March 30, 2022 15 high school students representing six Philadelphia area high schools, attended a half-day workshop exploring research at Penn's Center for Musculoskeletal Disorders (PCMD). This "Learning on a Limb" program was a hands-on science and technology experience designed by PCMD and the McKay Diversity, Equity and Inclusion Committee to foster interest in the field of musculoskeletal re-



search. Small groups of students participated in hands-on research modules in the areas of histology, biomechanics, microCT and cell culture. Students also had the opportunity to network with PCMD trainees and faculty, and become familiar with laboratories hosting summer researchers. A special thank you to Jamie Shuda, EdD, Director of Outreach, Education, & Research for the PSOM for arranging and participating in the event.

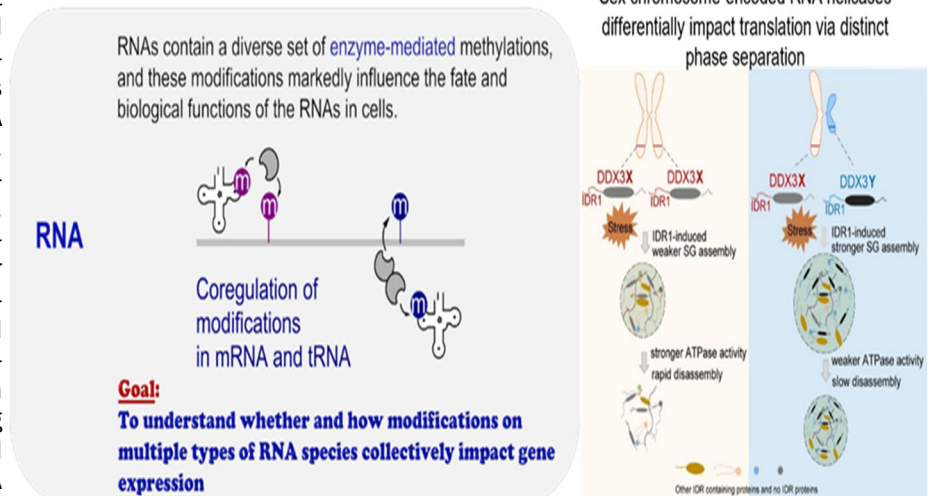


## Research Update from PCMD Members

**Fange Kathy Liu, Ph.D.**

### RNA modifying enzymes and sex chromosome-encoded RNA binding proteins in human physiology and disease.

The Liu Lab investigates the function of RNA modifying enzymes and sex chromosome-encoded homolog proteins in sex bias of neuromuscular disorders and cancers. It has been demonstrated recently that a diverse set of enzyme-mediated modifications are found internally within RNAs, which markedly influence the fate of RNAs in cells. Many enzymes responsible for regulating protein and DNA modifications are targets of current therapies. RNA epitranscriptomics, the study of RNA modifications, is the new frontier in this arena. However, there are many unknown but fundamentally important questions, such as whether RNA modifications are dynamically and reversibly regulated in physiology and disease and whether RNA modifications synergistically impact gene regulation. Furthermore, based on our observation of sex-specific RNA binding proteins, we ask the question of how sex and gender influence gene regulation at the RNA level. Our lab uses a combination of biochemical, RNA biology, high throughput sequencing, mass spectrometry, and smFRET approaches (through close collaboration with Dr. Yale. E. Goldman's lab). Our work aims to make a paradigm shift toward a more systematic and comprehensive understanding of RNA modifying enzymes in human disease and reveal an entirely new universe of sex-specific diagnostic and therapeutic targets.



**Jason Syrcle, DVM, DACVS-SA**

### Longitudinal evaluation of Synovetin OA treatment in dogs with hip osteoarthritis: An open-label clinical trial

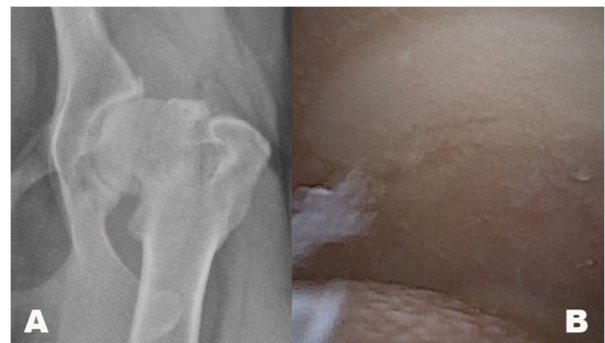
Canine hip dysplasia is a common problem leading to debilitating arthritis, joint pain, and quality of life issues. Management routinely includes non-steroidal anti-inflammatory drugs, weight loss, nutraceuticals, and activity modification. Some patients are treated surgically with total hip replacement or femoral head and neck ostectomy. When surgery is not an option and the dog cannot be managed with standard medical therapy, further treatment options are limited.

Synovetin OA is a homogeneous Tin ( $^{117m}\text{Sn}$ ) colloid for intra-articular injection. The colloid contains microparticles that remain in the joint space and are absorbed by macrophages and synovocytes, causing cell death and decreased inflammation. The injected colloid emits discrete, safe, effective, low-energy conversion electrons and gamma irradiation. Synovetin OA was shown to improve lameness associated with elbow arthritis in dogs in three separate year-long clinical trials, with positive effects lasting up to 12 months following a single intra-articular injection.<sup>1-3</sup>

Dr. Syrcle and the surgical staff at PennVet are currently enrolling patients in a clinical trial to evaluate the efficacy of a single intra-articular injection of Synovetin OA for the treatment of dogs with bilateral hip osteoarthritis. Injections are performed under general anesthesia, guided by a needle arthroscope. The primary outcome measure is change in peak vertical force from baseline over the 12-month study period. Other outcome measures include activity counts and data from clinical instruments including the Canine Brief Pain Inventory and Canine Orthopedic Index.

#### References:

- Aulakh, KS, Lopez MJ, Hudson C, Gaschen L, Fabiani M, Beale B, et al. Prospective clinical evaluation of intra-articular injection of tin-117m ( $^{117m}\text{Sn}$ ) radiosynoviothrosis agent for management of naturally occurring elbow osteoarthritis in dogs: A pilot study. *Vet Med (Auckl)*. 2021 Jun 4;12:117-128.
- Donecker J, Fabiani M, Gaschen L, Singh Aulakh K. Treatment response in dogs with naturally occurring grade 3 elbow osteoarthritis following intra-articular injection of  $^{117m}\text{Sn}$  (tin) colloid. *PLoS One*. 2021 Jul 19;16(7):e0254613.
- Donecker J, Lattimer JC, Gaschen L, Aulakh KS Safety and Clinical Response Following a Repeat Intraarticular Injection of Tin-117m ( $^{117m}\text{Sn}$ ) Colloid in Dogs with Elbow Osteoarthritis. *Vet Med (Auckl)*. 2021 Dec 17;12:325-335.



**Fig 1:** A. Anterior-posterior hip radiograph from a study patient exhibiting severe osteophytosis and femoral head and neck remodeling. B. Arthroscopic image of the same hip acquired at the time of Synovetin OA injection showing full thickness cartilage loss of the femoral head (bottom left) and acetabulum

## In the News!

### CORES UPDATES

#### Histology Core Updates

The Histology Core continues to provide an expansive range of musculoskeletal histology services to members of the Penn community and those from nearby institutions. We are pleased to report that all core services have returned to their pre-pandemic levels, with capacity restrictions on self-service users lifted. Visitors to the core must continue to follow University guidelines for covid-safe work practices, as outlined on the core website. We would like to remind current and prospective users to take advantage of our popular protocol development service, where we will work with you at no charge to optimize techniques for new tissue types and applications.

We are pleased to announce the Histology Core is hosting a hybrid (in person & Zoom) learning lunch on Thursday, July 14, 2022. The topic of this Learning Lunch is “Advanced histology for spatial omics” and will be presented by Dr. Mei Zhang. Dr. Zhang is the Technical Director at the Center for Single Cell Biology at CHOP.

### 2022 PCMD Pilot and Feasibility Grant Recipients Announced

The Penn Center for Musculoskeletal Disorders Pilot and Feasibility Grant Program has awarded three investigators with one year of funding for their pilot grant projects with a start date of July 1, 2022

**Carla Scanzello, MD, PhD** will receive funding for her grant titled “Biophysical Regulation of Macrophage Fate and Function in OA”

**Chider Chen, PhD** will receive funding for his grant titled “mTOR Mediated Ribosome Biogenesis Regulates CD4+ T Cell Activation in Osteoporotic Mice”

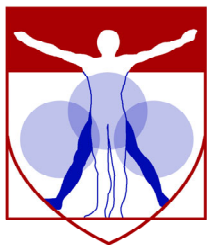
**Eiki Koyama, DDS, PhD** will receive funding for his grant titled “The molecular mechanisms underlying osteophyte onset and growth and its pharmacologic intervention”

### PCMD FUNDS AVAILABLE: Summary Statement Driven Funding Request

If you have a recent summary statement from an NIH grant (eligible NIH mechanisms include all “R” grants such as R03, R21 and R01 and “K” grants such as K01, K08 on their first submission—please inquire regarding eligibility of other proposal mechanisms) which requires you to run additional experiments, gather additional data, provide feasibility for an approach, or similar, we can provide small funds (\$1,000-\$15,000) with a very short turn-around time in order to allow you to complete these experiments and resubmit your proposal with the best chance of success. Requests for funding will be evaluated on a rolling basis and priority will be given to Assistant Professors with encouraging initial review priority scores better than ~30-35%. The format of the “Summary Statement Driven Funding Request”, which is limited to **one page**, is as follows:

- ◆ Name of PI (must be a PCMD full member)
- ◆ Title of Project Request
- ◆ Specific Purpose of Request with Stated Outcome/Goal Referring Explicitly to the Summary Statement for Justification
- ◆ Research Design and Methods
- ◆ Budget with Brief Justification

Funding through this mechanism is available by submitting the one page proposal to [pcmd@pennterms.upenn.edu](mailto:pcmd@pennterms.upenn.edu)



**PENN**  
CENTER for  
MUSCULOSKELETAL  
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Supported by the

**National  
Institutes  
of Health**



U.S. Department of Health  
and Human Services



**NIAMS**  
National Institute of Arthritis and  
Musculoskeletal and Skin Diseases

**Remember to include reference to support from the Center** in your abstracts and publications. Cite Grant NIH/NIAMS P30AR069619 from the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the NIH. Support has also been provided by the Perelman School of Medicine at the University of Pennsylvania.

## PCMD Visiting Professorship Series Fall/Winter 2022-2023

**Tuesday, September 20, 2022 1:30-2:30pm/CRB Austrian Auditorium**  
*Building Tissues Engineering Complexity Through Biomaterial Design*  
**Brendan A. Harley, Ph.D.**, Robert W. Schaefer Professor, Dept. of Chemical & Biomolecular Engineering Cancer Center at Illinois (CCIL) Carl R. Woese Institute for Genomic Biology University of Illinois

**Tuesday, October 25, 2022 1:30-2:30pm/CRB Austrian Auditorium**  
*Deciphering TNF Receptor 2 Signaling in Autoimmune and Musculoskeletal Disorders*  
**Chuanju Liu, Ph.D.**, Professor & Director, Translational Orthopaedic Research Laboratory, Dept. of Orthopaedic Surgery & Dept. of Cell Biology NYU Grossman School of Medicine

**Wednesday, November 16, 2022, Annual Scientific Symposium Smilow Rubinstein Auditorium 8:30am-5:30pm**  
*Navigating a Path to Understanding Drug Delivery in the Treatment of Arthritis*  
**Keynote Speaker:**  
**Lori A. Setton, Ph.D.**, Lucy and Stanley Lopata Distinguished Professor & Chair of Biomedical Engineering Washington University in St. Louis Stay tuned for more information

**Tuesday, December 13, 2022, 1:30-2:30pm/CRB Austrian Auditorium**  
*The Physiology and Pathophysiology of FGF23 in Skeletal and Mineral Biology*  
**Michael T. Collins, MD, FASBMR** Senior Investigator, Chief Skeletal Disorders and Mineral Homeostasis Section, National Institute of Dental and Craniofacial Research, National Institutes of Health

**Tuesday, January 24, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
*Life, Death and Transformation in the Transition Zone, Implications for Bone Healing*  
**Ralph Marcucio, Ph.D.**, Professor of Orthopaedic Surgery and Director, Laboratory for Skeletal Regeneration Orthopaedic Trauma Institute and Co-Director, Oral and Craniofacial Science Graduate Program, University of California San Francisco

**Tuesday, February 21, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
*Immunoengineering in the Musculoskeletal System*  
**Jennifer Elisseff, Ph.D.** Morton Goldberg Professor Wilmer Eye Institute and Biomedical Engineering Translational Tissue Engineering Cen-

ter, Board of Maryland's Technology Development Corporation (TEDCO) Johns Hopkins University

**Tuesday, March, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
TBD

**Tuesday, April, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
TBD

**Tuesday, May, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
TBD

**Tuesday, June, 2023, 1:30-2:30pm/CRB Austrian Auditorium**  
TBD