The purpose of this conference is to bring scientists and clinicians together in a format of open verbal communication that permits the translation of basic science advances into clinical concepts. Physicians and scientists working in the field of bone and mineral metabolism are encouraged to participate.

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint providership of the Minnesota Medical Association and the Advances in Mineral Metabolism. The Minnesota Medical Association (MMA) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The Minnesota Medical Association designates this live activity for a maximum of 22.5 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

OBJECTIVES

- Learn about fundamental epigenetic changes as mesenchymal stem cells transition to differentiated cell states and the impact of epigenetic regulation on health and disease.
- Integrate new information on the mechanisms that drive bone cancer pain and how this knowledge is being translated into mechanism based therapies to better treat and control bone cancer pain.
- Examine recent insights in pathophysiology, diagnosis, and therapy of disorders of phosphate and magnesium metabolism.
- Gain new perspectives on the relative contributions of estrogen vs. testosterone towards regulating bone metabolism.
- Understand the geographical, environmental, ethnic, and genetic factors that influence varying risks of osteoporosis and fracture rates around the globe.
- Discuss recent advances in understanding the function and biology of the calcium-sensing receptor.
- To consider the inclusion of the human skeletal components in art across the ages, and the associated symbolism.
- Attendees will participate in discussion of clinical management of several skeletal diseases.
- Facilitate the development of collaborative ideas and research.
- Gain knowledge in a broad array of topics relevant to bone biology and disease.
- These talks will facilitate the development of collaborative ideas and research.
- Advance understanding of topics important to the science of mineral metabolism and the study of human disease.
- Recognize myriad approaches exist for pursuing an academic career path.
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AIMM Founders Lecture Fund

AIMM/ASBMR John Haddad Young Investigators

Amel Dudakovic, PhD  Mayo Clinic
Anyonya Guntur, PhD  Maine Medical Center Research Institute
Amira Hussein, PhD  Boston University
Zixue Jin, PhD  Baylor College of Medicine
Courtney Karner, PhD  Duke University
Chad Novince, DDS, PhD  Medical University of South Carolina
Kelly Roszko, MD, PhD  Massachusetts General Hospital
David Scott, PhD  Monash University
William Thompson, PhD  Indiana University
Mengrui Wu, MD, PhD  Harvard School of Dental Medicine
AIMM/ASBMR JOHN HADDAD YOUNG INVESTIGATORS MEETING
PROGRAM
April 4 – 8, 2017

TUESDAY, April 4

2:30 – 6:00pm  REGISTRATION

3:55 – 4:00pm  Introduction and Welcome
Christopher Kovacs, MD, AIMM President

Session 1  Basic and Applied Epigenetic Biology
Chairs: Steve Harris, PhD and Marc Wein, MD, PhD

4:00 – 4:45pm  Jonathan Gordon, PhD (University of Vermont)
“Regulation of mesenchymal cell fate by coordinated actions of epigenetic
regulators and transcriptional networks”

4:45 – 5:30pm  Andre Van Wijnen, PhD (Mayo Clinic)
“Epigenetic Control of Bone

5:30 – 5:45pm  break

5:45 – 6:30pm  Mark Meyer, PhD (University of Wisconsin)
“Epigenetic consequences and endocrine control points revealed by CRISPR
in vitamin D metabolism in vivo”

6:30 – 7:00pm  Young Investigator – Amel Dudakovic, PhD (Mayo Clinic)
“Control of skeletal development by the histone methyltransferase Ezh2”

7:45 – 10:00pm  WELCOME RECEPTION FOR REGISTRANTS AND GUESTS
**WEDNESDAY, APRIL 5**

**Session 2**  **Bone Pain and Disease**  
Chairs: David Roodman, MD, PhD, and Michaela Reagan, PhD

7:00 – 7:45am  Tamara King, PhD (University of New England)  
“The effects of treadmill exercise on bone remodeling and advanced osteoarthritis bone pain in rats”

7:45 – 8:30am  Patrick Mantyh, PhD, JD (University of Arizona)  
“The neurobiology of bone cancer pain”

8:30 – 8:45am  break

8:45 – 9:15am  Young Investigator – Chad Novince, DDS, MSD, PhD (Medical University of South Carolina College of Dental Medicine)  
“Commensal Flora, a Dynamic Osteoimmunoregulator of Skeletal Metabolism in Health”

9:15 – 9:30am  Discussion and Overview

9:30am  **GROUP PHOTO**

12:00 – 1:30pm  Mid-day consultations between Young and Established Investigators

3:00 – 4:15pm  **Special Session on the Skeleton in Art**  
Session Chair: Mary F. Barbe, PhD

Susan Fecho, MFA (Barton College)  
“Manifestations of the Undead: The Myth of Human Bones as Depicted in Art”

4:15 – 4:30 pm  break

**Session 3**  **Phosphate and Magnesium Metabolism**  
Chairs: Clemens Bergwitz, MD and Brya Matthews, PhD

4:30 – 5:15pm  Karl L. Insogna, MD (Yale)  
“Disorders of Phosphate Homeostasis”

5:15 – 6:00pm  Karl P. Schlingmann, MD (Universitätsklinikum Münster)  
“Magnesium in man: implications for health and disease”

6:00 – 6:15pm  break

6:15 – 6:45pm  Young Investigator – Mengrui Wu, PhD (Harvard School of Dental Medicine)  
“The mechanism underlying how Gα13 signaling inhibits osteoclast differentiation and attenuates osteoporosis”

6:45 – 7:00pm  Discussion and Overview

7:45 – 10:00pm  **WELCOME DINNER FOR REGISTRANTS AND GUESTS**
THURSDAY, APRIL 6

Session 4  Young Investigator Session  
Chair: Ivo Kalajzic, MD, PhD

7:00 – 7:30am Young Investigator – William Thompson, DPT, PhD (Indiana University)  
“Mechanical Regulation of MSC Differentiation through mTORC2/Cytoskeletal Signaling”

7:30 – 8:00am Young Investigator – Courtney Karner, PhD (Duke University School of Medicine)  
“The role of glutaminase during osteoblast specification and differentiation”

8:00 – 8:15am break

8:15 – 8:45am Young Investigator – Anyonya Guntur, PhD (Maine Medical Center Research Institute)  
“Differential glycolytic response by osteoblasts and adipocytes to meet ATP demand”

8:45 – 9:15am Young Investigator – Zixue Jin, PhD (Baylor College of Medicine)  
“Argininosuccinate Lyase Deficiency as a Model to Study Nitric Oxide Function in Bone”

9:15 – 9:30am Discussion and Overview  

10:30 – 12:00 Ski Race

12:00 – 1:30pm Mid-day consultations between Young and Established Investigators

3:00 – 4:00pm Meet the Professor Session 1  

1A: Sundeep Khosla, MD (Mayo Clinic) – The human as model organism  

1B: Andre Van Wijnen (Mayo Clinic) – How to get the most from your data mining

Session 5  Sex Steroids and Bone  
Chairs: Dana Gaddy, PhD and Jonathan Lowery, PhD

4:30 – 5:15pm Sundeep Khosla, MD (Mayo Clinic)  
“Estrogen vs Testosterone effects on bone: Mouse and human interventional studies”

5:15 – 6:00pm Robert Adler, MD (McGuire VA Medical Center)  
Testosterone Replacement in men: Safety, Effects on Bone and Muscle, Alternatives”

6:00 – 6:15pm break

6:15 – 6:45pm Young Investigator – David Scott, PhD (Monash University)  
“Obesity, muscle quality, falls and fractures in older adults”

6:45 – 7:00pm Discussion and Overview

7:45 – 10:00 pm Dinner Gathering for Invited Speakers and Young Investigators  
7:30 – 10:00 pm AIMM Board Meeting
FRIDAY, APRIL 7

Session 6  Late-Breaking Clinical Topics
Chair: Richard Bockman, MD, PhD

7:00 am  Marc Wein
Phosphoproteomic profiling reveals novel salt inducible kinase targets downstream of parathyroid hormone signaling in osteocytes

7:15 am  Karl Insogna
Efficacy and Safety of KRN23 in Adults with X-linked Hypophosphatemia (XLH): Data from a Phase 2 Extension Study

7:30 am  Suzanne Jan de Beur
Effects of KRN23, An anti-FGF23 antibody, in patients with tumor-induced osteomalacia or epiderman nevus syndrome-associated osteomalacia: interim results from a phase 2 study

7:45 am  Jackie Fretz
Elevations in FGF-23 precede disruptions in either phosphate or iron homeostasis in the Ebf-1-KO mouse model of renal insufficiency

8:00 am  Chris Kovacs
Absence of calcitriol causes greater cortical bone loss and lower milk calcium during lactation, but does not impair post-lactation recovery of bone mass or strength in Cyp27b1 null mice

8:15 am  Jad Sfeir
Clinical Features of Patients with Tumoral Calcinosis: The Mayo Clinic Experience

8:30 am  break

8:45 am  Robert Adler
Future of Osteoporosis Treatment

9:00 am  Robert Gensure
Lesion-seeking bone anabolic agents to enhance fracture repair in rodent models

9:15 am  Delores Shoback
TBA
**12:00 – 1:30pm**  Mid-day consultations between Young and Established Investigators

**3:00 – 4:00pm**  **Meet the Professor Session 2**

- **2A:** Clemens Bergwitz, MD (Yale) – *The kidney as master of phosphate metabolism*
- **2B:** Douglas P. Kiel, MD (Harvard) – *Working with big data sets*

**4:00 – 4:45pm**  Business Meeting

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**Session 7**  **Osteoporosis Genetics and Epidemiology**  
Chairs: Christopher Kovacs, MD and Matthew Greenblatt, MD, PhD

**4:45 – 5:30pm**  Jane A. Cauley, PhD (University of Pittsburgh)  
*“Geographic and secular changes in fractures: A global perspective”*

**5:30 – 5:45pm**  break

**5:45 – 6:30pm**  Douglas P. Kiel, MD, MPH (Harvard Medical School)  
*“The genetics of osteoporosis: Have we made progress?”*

**6:30 – 7:00pm**  Young Investigator – Amira Hussein Ali, PhD (Boston University School of Medicine)  
*“Serum Proteomic Assessment of the Progression of Fracture Healing”*

**7:45 – 10:00pm**  **AWARDS DINNER FOR REGISTRANTS AND GUESTS**
Session 8  Late breaking basic/translational topics  
Session Chair: Nan Hatch, DMD, PhD

7:00am  Clemens Bergwitz  
Reduced Exercise Capacity of Mice with skeletal muscle specific ablation of Pi

7:15am  Matthew Greenblatt  
Novel periosteal skeletal stem cells

7:30am  Murat Bastepe  
The extra-large G protein alpha-subunit (XLαs) mediates FGF23 production by maintaining FGFR1 expression and MAPK signaling in bone

7:45am  Nan Hatch  
TNAP Regulates Cranial Base Growth and Chondrocyte Maturation via Pi and MAPK

8:00am  Martin Pellicelli  
Lrp6 is a novel target of JunD and the PTH-activated αNAC transcriptional coregulator

8:15am  Dobrawa Napierala  
Phosphate stimulates secretion of mineralization-competent matrix vesicles and regulates their molecular composition

8:30am  Steve Harris  
Genomic Mapping of Enhancers, SuperEnhancers, and Enhancer RNAs Regulated by the Endogenous Bmp2 Gene in Periodontal and Bone Marrow Osteoprogenitors

8:45am  break

9:00am  Ebrahim Tahaei  
The reduced osteogenic differentiation potential of Nf1-deficient osteoprogenitors is TGFb and EGFR-independent

9:15am  Hans van Leeuwen  
In vitro models to study metastases to the bone: interaction of cancer cells with osteoblasts

12:00 – 1:30pm  Mid-day consultations between Young and Established Investigators

3:00 – 4:00pm  Meet the Professor Session 3

3A: Nan Hatch, DMD, PhD (U Michigan) – What bone(heads) can learn from teeth/the skull

3B: Ivo Kalajzic, MD, PhD (UConn Health) – Making the most of your in vivo model
Session 9  Calcium Sensing Receptor
Chairs: Bart Clarke, MD and Joy Tsai, MD

4:30 – 5:15pm  Jenny J. Yang, PhD (Georgia State University)
“Structural biology of receptor-mediated extracellular calcium signaling”

5:15 – 6:00pm  Dolores Shoback, MD (University of California San Francisco)
“Calcium- Sensing Receptor: Role in Endocrine Physiology and Pathophysiology”

6:00 – 6:15pm  break

6:15 – 6:45pm  Young Investigator – Kelly Lauter Roszko, MD PhD (Harvard Medical School)
“Knock-in mouse with mutant G11 mimics human autosomal dominant hypocalcemia and allows rescue by pharmacologic inhibitors”

6:45 – 7:00pm Discussion and Close

SEE YOU NEXT YEAR!!!