ORS Annual Meeting Highlights

The ISFR Section Meeting, in conjunction with the ORS 2024 Annual Meeting, was held on Saturday February 3, 2024 and featured invited talks by Allison Pettit, PhD (University of Queensland), Melanie Haffner-Luntzer, PhD (Ulm University, substituting for Hans-Christoph-Pape, MD), and Georg Duda, PhD (Berlin Institute of Health at Charite).

This meeting was moderated by both Katherine Hixon, PhD and Melanie Haffner-Luntzer, PhD. Spotlight talks were broken up into three distinct sections/topic areas including the basic science/engineering perspective, translational perspective, and clinical perspective. Despite historic rainfall in the Los Angeles Area, the section meeting was attended by over 140 people and was followed by a short business meeting and networking reception at the Yard House restaurant.

Dr. Pettit provided an extensive review of the work from their lab with ‘osteomacs’ - bone resident, IBA1+ macrophage-like cells that are part of the bone microenvironment. Osteomacs play an important role alongside osteoclasts in bone development, aging, and fracture repair.

Basic Science Considerations for Osteoimmunology
Allison Pettit, PhD
Mater Research & Mater Research Institute
University of Queensland
Georg Duda, PhD provided an overview of his lab’s work on the role of mechanobiological control of musculoskeletal healing, with a particular focus on the role of adaptive immune cells in bone repair. Work from his lab found that in humans, CD8+ T cells were enriched in fracture hematoma and that the peripheral levels of terminally differentiated CD8+ effector memory T (TEMRA) cells (CD3+CD8+CD11a++CD28−CD57+ T cells), which are reflective of a patient’s lifelong immune status and not injury, correlated highly with delayed healing events. In mice, the authors showed that these CD8+ cells were the major producers of interferon-γ/tumor necrosis factor–α, which inhibit osteogenic differentiation and survival of human mesenchymal stromal cells and that CD8+ effector memory T (TEMRA) cell depletion could enhance bone healing.

Melanie Haffner-Luntzer, PhD filled in for Hans-Christoph Pape, MD, University Hospital Zürich. Dr. Haffner-Luntzer provided an overview of her lab’s work on the role of MAST cells in bone health disorders. MAST cells secrete many immunomodulatory factors (histamine, heparin, cytokines, and growth factors) and play a large role in bone homeostasis and injury. For example, work from the Haffner-Luntzer Lab has demonstrated a pathogenic role of MAST cells in postmenopausal osteoporosis and fracture healing.

ISFR Rising Stars
The ISFR Rising Star series is designed to highlight up and coming Young Investigators in the field of fracture repair. Young Investigators who have previously received an ORS ISFR award are eligible to be selected as ISFR Rising Stars.

Augustine Mark Saiz, MD
Department of Orthopaedic Surgery
University of California Davis
Fracture Healing in Polytrauma

Assistant Professor Dr. Augustine Mark Saiz provided an overview of his lab’s investigations on how fracture healing is impaired in polytrauma. Using an in vivo preclinical mouse model with blunt chest trauma and blunt femur fracture stabilized with intramedullary pin, his work has focused on characterizing the altered systemic and local fracture immune response to fracture when systemic injury is present. Early finds demonstrate a hyperinflammatory, elevated innate immune response that is prolonged coupled with a concomitant prolonged, depressed adaptive immune response. This results in impaired
Fracture repair involves broad changes at the tissue, cellular and transcriptional level. In early stages of fracture repair, the periosteum responds by providing a pool of progenitor cells that contribute to callus formation. Madhura Nijsure provided an overview of her work in Dr. Joel Boerckel's lab at the University of Pennsylvania, where they study transcriptional changes in periosteal cells that trigger this proliferative response. Madhura specifically focused on Yes Associated Protein (YAP) - a transcription factor that is expressed in the expanding periosteum. Using orthogonal ATAC- and mRNA-Sequencing, this study identified several YAP target genes that are important in fracture repair. Of note, this study identified Bmp4 as a YAP target gene in periosteal cells, amongst several others, which could pave the way for therapeutic targets in the future.

**Madhura Nijsure, Doctoral Candidate**
Department of Orthopaedic Surgery
University of Pennsylvania
*Transcriptional Regulation in Fracture Healing*

Optogenetics is a technology that allows for the tunable control of “activatable” cells using specific wavelengths of light and is commonly used via transgenic and transfection approaches. Donahue Lab’s Postdoctoral Fellow Dr Evan Buettmann provided an overview of work completed during his first visit to the Killian-Abraham Lab, as part of the ORS 2024 Collaborative Exchange Program. Early results support the initial hypothesis that peak bone strains are reproducible with controllable optogenetic parameters (pulse width). Furthermore, we found that daily optogenetic stimulation of young (four to six weeks) but not adult (less than months) mice for three weeks altered tibial morphology, suggesting that this technology can alter bone morphogenesis when low stimuli are needed for skeletal adaptation. Future work will focus on use of optogenetics during skeletal disuse and regeneration.

**Evan Buettmann, PhD**
Department of Biomedical Engineering
Virginia Commonwealth University
*Optogenetics to Modulate Bone and Muscle During Disuse*
Congratulations, Peter Augat, PhD!

Director of the Institute of Biomechanics Trauma Center
Professor of Biomechanics, Paracelsus Medical University (Salzburg, Austria)

Peter Augat, PhD has served as a Past President of the International Society for Fracture Repair (ISFR), Past President of the German Society of Biomechanics (DGfB), and member of several societies in the area of musculoskeletal research including European Society of Biomechanics, ORS, and International Bone and Mineral Society. He is on the editorial board of several orthopaedic journals, including Biomedical Engineering, Archives of Orthopaedic and Trauma Surgery, Journal of Orthopaedic Trauma, European Journal of Orthopaedic Surgery and Traumatology and also a reviewer for most major musculoskeletal journals. Dr. Augat's research is focused on biomechanics of fracture repair and on the clinical translation of orthopaedic research. With a prolific output, he has published over 200 scientific articles and supervised more than 80 doctoral theses. He gave an inspiring speech highlighting his career, the serendipity of research, and how through collaboration, mentorship, and building of a network of similarly driven colleagues, impactful research could be achieved that improves the patient condition.

2024 Award Winners

Abstract Awards
Podium Award Winners

1st: Prism Schneider, MD, PhD
   (University of Calgary)
2nd: Xinyi Ma
    (Duke University)
3rd: Louis Gerstenfeld, PhD
    (Boston University)

Finalists

Ramkumar T. Annamalai
   (University of Buffalo)
Neashan Mathaven
   (ETH Zürich)
Jarrett Cain, MD
   (University of Pittsburgh
   School of Medicine)

Poster Award Winners

Mubashir Ahmad
   (Ulm University)
Peter Bertone
   (Dartmouth College)
Oliver Kueppers
   (Ulm University)

Finalists

Kavin Kathir
   (Dartmouth College)
Annika Nikhar
   (Dartmouth College)
Christopher Panebianco
   (University of Pennsylvania)
Kenneth Kozloff, PhD  
(University of Michigan)

Annemarie Lang, PhD  
(University of Pennsylvania)

Jarret Weinrich, PhD  
(University of California, San Francisco)

Maham Tanveer  
(Lehigh University)

Kylie Frew  
(Lehigh University)

Emma Kerimo  
(Dartmouth College)

Joanna Sadowska  
(Royal College of Surgeons in Ireland)

ISFR Members Recognized at the Annual Meeting

New Investigator Recognition Award  
Evan Buettmann, PhD

ORS/RJOS Young Female Investigator Award  
Annemarie Lang, DVM, PhD

OREF Clinical Research Award  
Christopher Evans, PhD, FAAOS

ORS/OREF Translational Science Travel Grant  
Joseph Patterson, MD

ON Education  
Justin King, BS

ISFR Lifetime Achievement Awards  
Peter Augat, PhD

ORS Early Career Outreach Travel Award (Open Door)  
Madhura Nijsure, Doctoral Candidate

Research and Education Committee Survey

Take a moment to complete our brief, five minute survey to help us schedule programming and events that interest you.

Complete the Survey

Save the Date

ORS/ISFR 18th Biennial Meeting  
October 21-23, 2024
The ORS International Section of Fracture Repair (ISFR) and the OTA Basic Science Focus Forum (BSFF) will collaborate for a joint session at the OTA (Orthopaedic Trauma Association) Annual Meeting, October 21 - 23 in Montréal, Canada. The call for abstracts is now open. All submissions must be received by May 20. The OTA is an international organization of orthopaedic surgeons and medical professionals dedicated to the care and treatment of patients with injuries to the musculoskeletal system, especially fractures and dislocations. Registration for the event will open in June.

**Call for Abstracts Closes May 20, 2024**

Abstracts submitted or presented at this meeting can also be submitted to the ORS 2025 Annual Meeting. There is no guarantee of acceptance if the abstract is resubmitted to the Annual Meeting.

**ISFR Section Student/Post-Graduate Trainee Awards**
*Eligibility: Must be an ISFR Section Member (Student or Post-Graduate Trainees ONLY)*

**Poster and Podium Awards**
Awards will be given to the authors of the top three Podium and Poster presentations, based on quality of submission and delivery.

- **Podium Awards**: $500.00 each
- **Poster Awards**: $250.00 each

**Important date to remember:**
Monday, July 1, 2024: Decision on Posters, Podiums and Late Breaking

**Learn More and Submit an Abstract**

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**ISFR Selected Publications For Q1 of 2024**

**Is Augmented Femoral Lateral Plating with Helically-shaped Medial Plates Biomechanically Advantageous Over Straight Medial Plates?**
*Torsten Pastor, Ivan Zderic, Ludmil Drenchev, Hristo K. Skulev, Till Berk, Frank J. P. Beeres, Björn-Christian Link, Boyko Gueorguiev, Karl Stoffel, Matthias Knobe*
*Journal of Orthopaedic Research® Early View*
First published: November 17, 2023

**The Critical Impact of Traumatic Muscle Loss on Fracture Healing: Basic Science and Clinical Aspects**
*Maryam Rahmati, Max Haffner, Mark A. Lee, Jonathan Kent Leach, Augustine M. Saiz*
*Journal of Orthopaedic Research® Volume 42, Issue 2*
First published: November 22, 2023

**Remission of Hypersensitivity By Simple Weight Load Stimuli in a Complex Regional Pain Syndrome Mouse Model**
*Kenta Kiyomoto, Makoto Emori, Megumi Hanaka, Atsushi Teramoto, Hikaru Hayakawa, Kenichi Takashima, Toshihiko Yamashita, Kousuke Iba*
*Journal of Orthopaedic Research® Early View*
First published: December 3, 2023

**Finite Element Modeling of Fracture Compression by Compression Plates**
*Hwabok Wee, John Spence Reid, Gregory S. Lewis*
**Embracing Ethical Research: Implementing the 3R Principles Into Fracture Healing Research for Sustainable Scientific Progress**

Amritha Anup, Sandra Dieterich, Richard O. C. Oreffo, Hannah L. Dailey, Annemarie Lang, Melanie Haffner-Luntzer, Katherine R. Hixon

Journal of Orthopaedic Research® Early View
First published: December 5, 2023

**Discretizing Low-intensity, Whole-body Vibration Into Bouts With Short Rest Intervals Promotes Bone Defect Repair in Osteoporotic Mice**

Takeshi Matsumoto, Keishi Hashimoto, Hyuga Okada

Journal of Orthopaedic Research® Early View
First published: December 20, 2023

**NSAID Use in Orthopedic Surgery: A Review of Current Evidence and Clinical Practice Guidelines**

Patrick M. Ryan, Haydn Scherry, Ryan Pierson, Charlie Dee Wilson, Robert A. Probe

Journal of Orthopaedic Research® Early View
First published: January 17, 2024

Interested in volunteering? ISFR anticipates the need for the following volunteer positions for a two-year duration (2024-2026).

**Membership Committee** (2 volunteers)

- Assist with section membership recruitment, engagement, and retention initiatives
- Promote the benefits of section membership
- Liaise with ORS staff to solicit member input focused on ISFR membership benefits and opportunities
- Collaborate with other ISFR committees to plan specific activities or projects

**Communications Committee** (2-3 volunteers)

- Increase visibility and awareness of the ORS and ISFR
- Develop content for the Section newsletter
- Develop content for social media posts/takeovers highlighting the ISFR community, membership benefits, meetings/events, and research related to ISFR
- Collaborate with the ISFR officers or other committees for member outreach
Education Committee (3 volunteers)

- Coordinate ISFR awards at the ORS Annual Meeting and ISFR Biennial Meeting
- Serve as award judges/reviewers, moderators, etc.
- Assist in planning the ISFR scientific meeting at ORS and the ISFR Biennial Meeting
- Oversee planning of education or career development activities such as webinars, the three-minute thesis competition, etc.
- Liaise with ORS staff to solicit member input focused on education, career development, or scientific topics.

Stay tuned for the upcoming ISFR call for volunteers via email and on the ORS ISFR handle @isfrfractures on X (formerly Twitter)!

Volunteer Form