

ORS International Section of Fracture Repair History

In 2016, the Orthopaedic Research Society (ORS) and former International Society for Fracture Repair (ISFR) announced their new partnership and the establishment of the **ORS International Section of Fracture Repair (ORS ISFR)**. This collaboration allowed both organizations to combine their collective resources and move forward together to ensure the growth in the field of Fracture Repair and Bone Regeneration.

The ORS ISFR is committed to providing education, networking opportunities, consensus building and the development of best practices in the field of fracture repair.

The ORS ISFR serves as the primary global research community within the larger parent organization ORS as the organization dedicated to the advancement and interchange of the science of fracture repair and its application to the improvement of patient care. It is the home of experts in the field of fracture repair and will thereby serve an important role within the ORS in the areas of scientific program developments, identification of research priorities, and the dissemination of research in the field.

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Join the ORS and ORS ISFR

Stop by the ORS Member Center in the Exhibit and Poster Hall (Elite Hall) to learn more about ORS and ORS ISFR. Please also visit <http://www.ors.org/ors-isfr>.

- Not a member of the ORS ISFR? [Join the Section Today!](#)
- Not a member of ORS? [Join the ORS & ORS ISFR Today!](#)

Upcoming ORS ISFR Workshops/Symposia

[ORS ISFR Workshop at EORS 2018](#)

26th European Orthopaedic Research Society Annual Meeting
September 25-28, 2018, Galway, Ireland
Registration Deadline: July 2018

[ORS ISFR Biennial Workshop](#)

November 27-30, 2018, Kyoto, Japan
Abstract Deadline: May 30, 2018

[ORS ISFR Workshop at the 7th Fracture Fragility Network Congress](#)

July 5-7, 2018, Dublin, Ireland

[ORS ISFR Consensus Workshop](#)

Proximal Humerus Fractures: Identifying Issues & Finding Solutions
Information coming soon!

Check out *ORS ISFR Breakthroughs* E-Newsletter!

The *ORS ISFR Breakthroughs* e-newsletter is part of the ORS ISFR membership. The newsletter features ORS ISFR member interviews, the latest developments in the field, and more! [View the first issue.](#)

ORS ISFR Scientific Meeting and Reception Agenda

Hyatt Regency New Orleans Imperial 5, 3:30 PM – 6:00 PM

3:30 PM – 4:15 PM	ORS Preclinical Models Section & ORS ISFR Joint Workshop: <i>Fracture Non-Union Models</i> Jaimo Ahn, MD, PhD, University of Pennsylvania; Ted Miclau, MD, University of California San Francisco; Brigitte von Rechenberg, DVM, University of Zurich; Vicki Rosen, PhD, Harvard School of Dental Medicine
4:15 PM – 4:40 PM	ORS ISFR Keynote: <i>Stem Cell Populations and Molecular Signaling Pathways Involved in Fracture Repair</i> Ivo Kalajzic, MD, PhD, University of Connecticut Health Center
4:40 PM – 4:50 PM	Leading to Believing: IMPACT Research Featured Video: <i>Using Sex and Gender to Shape Policy, Programs, and Patient Care for the Prevention of Fracture</i> Lorraine Lipscombe, MD, PhD; Sandra Kim, MD, MSc; Paula Rochon, MD, MPH, University of Toronto
4:55 PM – 5:20 PM	ORS ISFR Keynote: <i>Bioinspired Materials for Orthopaedic Tissue Regeneration</i> William L. Murphy, MS, PhD, University of Wisconsin-Madison
5:20 PM - 6:00 PM	Junior Investigator 3-Minute Thesis Competition
6:15 PM - 8:15 PM	Section Reception at The Little Gem Saloon 445 S. Rampart St., New Orleans, LA 70112

ORS ISFR Awards

The ORS ISFR Junior Investigator 3-Minute Thesis Competition, Section member podium and poster presentations are all eligible for and ORS ISFR awards. ORS ISFR awards will be recognized at the ORS Achievement Awards & 2018 Inauguration Ceremony on Tuesday, March 13 from 3:00 PM – 4:00 PM in Hyatt Regency New Orleans Celestin DE.



**ORS Preclinical Models Section & ORS ISFR Joint Workshop:
*Fracture Non-Union Models***

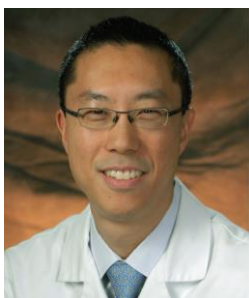
Panel Moderator



Kurt D Hankenson, DVM, MS, PhD, received his DVM from the University of Illinois (1992), his MS from Purdue University (1997) and his PhD from the University of Washington, Department of Biochemistry (2001). A former equine veterinarian, he began his research career at the University of Michigan in 2002 as a faculty member in the Orthopaedic Research Laboratories (ORL) before moving to the University of Pennsylvania, School of Veterinary Medicine, where he was the inaugural holder of the Dean W. Richardson Chair for Equine Disease Research. He returned to the ORL at the University of Michigan in 2017 as a Professor of Orthopaedic Surgery. He is a member of the NIH Skeletal Biology Structure and Regeneration (SBSR) study section and an Associate Editor for *Connective Tissue Research* and an Editorial Board member for multiple orthopedic peer-reviewed journals.

Panel Participants

Jaimo Ahn MD, PhD, FACS, is an Associate Professor of Orthopedic Surgery and an Advisory Dean at the Hospital of the University of Pennsylvania. As an orthopaedic surgeon-scientist-educator, Dr. Ahn strives to improve the health of our society through evidence and humanism-based clinical care of orthopaedic trauma patients. He achieves this through a four-part mission of hands-on surgical/clinical treatment, patient-oriented and laboratory-based investigation, active contribution within local and international societies, and medical/scientific education. One area of his research focuses on traumatic fracture healing (with collaborator, Kurt Hankenson) and the pathways related to thrombospondins, Wnt and Notch. Dr. Ahn is also interested in geriatric fractures and bone loss. His clinical expertise is in fracture, reconstruction, limb lengthening, malunion, non-union, and trauma.



Theodore Miclau, MD, is a Professor of Orthopaedic Surgery at University of California, San Francisco. His research focuses on problematic fracture healing and post-traumatic skeletal repair and regeneration, which have direct relevance to his clinical practice at the Zuckerberg San Francisco General Hospital (ZSFG). The UCSF/ZSFG Orthopaedic Trauma Institute (OTI) houses 4 laboratories: Laboratory for Skeletal Regeneration (cellular and molecular biology), Biomechanical Testing Facility, Clinical Research Center, and the Surgical Training Facility. Dr. Miclau's collaborations include partners from non-orthopaedic disciplines studying a wide range of innovative medical research directions. The OTI research facilities have the ability to study problems from bench to bedside, and the vast majority of research has a direct translational component.



Brigitte von Rechenberg, Prof. Dr.med.vet., Dipl. ECVS, is the head of the Musculoskeletal Research Unit (MSR) and the Competence Center for Applied Biotechnology and Molecular Medicine (CABMM) at the University of Zurich. She is also the current Dean of the Vetsuisse Faculty, University of Zurich. Her main research interests are the mechanisms of cartilage remodeling and resurfacing and substitutes for cartilage and bone. She has studied and published on the use of osteochondral plugs in cartilage replacement. As for bone and cartilage substitutes, she has studied the use of various biomaterials in conjunction with bone enhancing factors as well as basic mechanisms of cell signaling and interaction between bone resorption/formation. She is engaged in several projects related to the spine, such as vertebroplasty, disc degeneration and posterolateral fusion. In her basic research, she has focused on the importance of subchondral bone on cartilage remodeling and inflammatory processes within bone leading to pathological bone resorption.





Vicki Rosen, PhD, is a Professor of Developmental Biology and Chair of the Department of Developmental Biology at Harvard School of Dental Medicine. Dr. Rosen arrived at HSDM by way of industry, having spent the early part of her career as a scientist at Genetics Institute, a biotechnology company, where she was a member of the research team that identified the bone morphogenetic protein (BMP) genes in 1988. She became a professor in the Faculty of Medicine in 2001, and chair of the Department of Developmental Biology at HSDM in 2005. Dr. Rosen's lab studies the physiological roles that bone morphogenetic proteins (BMPs) play in the development, maintenance, and repair of musculoskeletal tissues (bone, cartilage, tendon, ligament, meniscus, muscle) with the goal of developing novel strategies for their repair and regeneration.

ORS ISFR Keynote Speakers

Invited Keynote: *Stem Cell Populations and Molecular Signaling Pathways Involved in Fracture Repair*



Ivo Kalajzic MD, PhD, is an Associate Professor of Reconstructive Sciences with the Center for Regenerative Medicine and Skeletal Development and an Associate Professor with the Department of Genetics and Genome Sciences at the University of Connecticut Health Center. His major research focus is identifying and isolating cells within the skeletal progenitor pathway. He has characterized transgenic animals that define cells at different stages of osteoblast lineage differentiation. His lab has developed a lineage tracing model using alpha-smooth muscle actin inducible Cre that identifies an osteoprogenitor population *in vivo* in bone marrow, periosteum, and periodontal tissue, and demonstrates their contribution to injury healing. They have expanded their research to incorporate the understanding of molecular mechanisms that regulate bone healing, including regulation of Notch signaling and role of the growth factors in the healing process.

Invited Keynote: *Bioinspired Materials for Orthopaedic Tissue Regeneration*



William L. Murphy MS, PhD, is the Harvey D. Spangler Professor of Biomedical Engineering, Professor of Orthopedics & Rehabilitation, Co-Director of the Stem Cell and Regenerative Medicine Center, and Director of the Human MAPs Center at the University of Wisconsin- Madison. His research interests focus on creating new biomaterials inspired by the materials found in nature. Dr. Murphy's research group is using new biomaterials to understand stem cell behavior and to induce tissue regeneration. He has published more than 170 scientific manuscripts, filed 45 patents, co-founded multiple start-up companies, and received awards that include the National Science Foundation Career Award, the Wisconsin Vilas Associate Award, the H.I. Romnes Fellowship, and induction as a Fellow in the American Institute for Medical and Biological Engineering.

Leading to Believing: IMPACT Research Featured Video:

Using Sex and Gender to Shape Policy, Programs, and Patient Care for the Prevention of Fracture

A discussion of the impacts of sex and gender bias on treatment options and patient outcomes, and changes at the institutional and programming levels to improve access and care for patients. Musculoskeletal diseases are an enduring burden for aging men and women. A disproportionate number of women are diagnosed with both osteoporosis and diabetes, leading, by default, to treatment options that are often targeted primarily or solely at women.



Sandra Kim MD, MSc, is an Assistant Professor of Medicine in the Division of Endocrinology and Clinician Teacher at the University of Toronto, ON, Canada. Currently, she serves as the Director of the Osteoporosis Program at Women's College Hospital, and Vice-Chair of the Scientific Advisory Council for Osteoporosis Canada. She is involved with the Ministry of Health Ontario Osteoporosis Strategy in leading osteoporosis care outreach and inter-professional education delivered through the Ontario Telemedicine Network. Dr. Kim is the recipient of several education awards and her research interest is in quality improvement and patient safety strategies. In particular, she is dedicated to advancing the quality and appropriateness of bone density testing in Ontario.



Lorraine Lipscombe, MD, PhD, is an endocrinologist and Director of Endocrinology at Women's College Hospital, as well as a scientist at the Women's College Research Institute and an Associate Professor of Medicine at University of Toronto. She completed her MD at McGill University in 1998, followed by Internal Medicine and Endocrinology training and an MSc in Clinical Epidemiology from University of Toronto. Dr. Lipscombe's research program focuses on the epidemiology, care and prevention of diabetes, with a specific focus on diabetes in women.



Paula Rochon MD, MPH, is a Senior Scientist at the Women's College Research Institute and Vice President of Research at Women's College Hospital, Toronto. Dr. Rochon is also a Professor in the Department of Medicine and Institute of Health Policy, Management & Evaluation at the University of Toronto, a Senior Scientist at the Institute for Clinical Evaluative Sciences and the Retired Teachers of Ontario Chair in Geriatric Medicine at the University of Toronto. Her research focuses on understanding the unique needs of older adults, most of whom are women. Much of her clinical work as a geriatrician in conjunction with her extensive research has laid the foundation of her expertise on older adults. She is one of the leading Canadian health-services researchers in geriatric medicine.

ORS ISFR Junior Investigator 3-Minute Thesis Competition

Invited participants will have 3 minutes to pitch the significance of their research.

Beyond Angiogenesis: Osteoblast Lineage VEGFA's Nontraditional Roles in Bone Repair
Evan Buettmann, Washington University St Louis

Out of the Chondrocyte into the Osteoblast: Transforming Fracture Healing
Jiun Chiun Chang, PhD, University of California, San Francisco

Gene-Diet Interactions in Fracture Healing
Amira Hussein, PhD, Boston University

Peering into the Black Box of Cellular Mechanobiology during Fracture Healing
Jarred Kaiser, PhD, Boston University

One Cytokine, Two Faces - The Role of IL-6 in Bone Healing
Kathrin Kaiser, University of Ulm

"Osteoprogenitor" Imperfecta: What are these Mice YAP-ping about?
Chris Kegelman, University of Pennsylvania

Straining for Faster Rehabilitation - A Sensor to Non-Invasively Monitor Functional Loads after Fracture
Brett Klosterhoff, Georgia Institute of Technology

Super-Healer Mice Exhibit Superior Bone Quality in Bone Fracture Healing via Modulation Osteoblastogenesis and Osteoclastogenesis
Xuying Sun, PhD, University of Texas- Health

Epigenetics Regulates Bone Regeneration
Cuicui Wang, PhD, Washington University St Louis

What Do We Want? Fracture Healing! When Do We Want It? We Don't Know...
Rob Zondervan, University of Michigan

The following are highlighted podium and poster presentations that will be presented **during the ORS 2018 Annual Meeting**.

Junior Investigator Podium Presentations

Gender Differences in Tibial Fracture in Normal and Muscular Dystrophic Mouse Models
Zhenhan Deng, University of Texas- Health

Pharmacologically Targeting Beta-catenin to Rejuvenate Fracture Healing in Mice
Yoon Hae, PhD, Duke University

Knockdown Indian Hedgehog (Ihh) Does Not Delay Fibular Fracture Healing in Genetic Deleted Ihh Mice and Pharmaceutical Inhibited Ihh Mice
Shengchun Li, PhD, Brown University

Absence of the Terminal Complement Complex Manifests in Low Bone Mass and Impaired Fracture Healing
Yvonne Mödinger, University of Ulm

Development of Bone-Targeted Polymer Conjugates of Wnt/ β -Catenin Agonists to Stimulate Fracture Healing
Maureen R. Newman, University of Rochester

Conditional Deletion of Runx1 in Myeloid Precursor Cells Delays Fracture Healing Due to Differential Resorption of Mineralized Bone and Cartilage Matrix at the Fracture Callus
David N. Paglia, PhD, University of Connecticut Health Center

Wnt/ β -Catenin Signaling Regulates Chondrocyte-to-Osteoblast Transformation during Endochondral Repair
Sarah Wong, University of California San Francisco

Faculty or >10 Years of Experience Podium Presentations

Low-Density Lipoprotein Receptor-related Protein 1 (Lrp1) is Important for Fracture Repair
Gurpreet Baht, PhD, Duke University

Morbidity, Mortality and Cost of Osteoporotic Fractures - Should Proximal Humerus Fractures be taken as seriously as Hip Fractures?
Carola F. van Eck, PhD, University of Pittsburgh

hPTH(1-34) Promotes Bone Fracture Healing in Multiple Diabetic Murine Models
Francis Lee, PhD, Yale University

Altering Spacer Material and Micro-Topography in the Masquelet Technique: Effects on Factor Expression & Bone Regeneration
Sarah McBride-Gagyi, PhD, St. Louis University

Activation of Hedgehog (Hh) Signaling Pathway Enhances the Bone Regeneration Mediated by the Delivery of VEGF and BMP-6 Tethered to a Novel Polysaccharide Scaffold in a Critical-sized Rat Mandibular Defect
Matthew Miller, PhD, University of Virginia

Layer-by-Layer Enabled Nanofibrous Biomimetic Periosteum for Allograft Repair and Reconstruction
Xinping Zang, PhD, University of Rochester

Dental Pulp Derived Stem Cells are More Effective for Critical Bone Defect Treatment Compared to Bone Marrow Derived MSC
Stefan Zwillingenberger, PhD, University Medicine Carl Gustav Carus Dresden

Poster Presentations

TREM2/DAP12 Activity in Macrophages Regulates Fracture Healing
Daniel Clark, University of California San Francisco

ORS ISFR Scientific Meeting & Reception
Friday, March 9, 2018, New Orleans, Louisiana



Transcriptional Profiling of Endochondral and Intramembranous Bone Fracture Repair
Brandon A. Coates, Washington University St. Louis

Mechano-Regulation Models of Fracture Healing Predict Differences in Healing Rate Due to Morphology
Hannah Dailey, PhD, Lehigh University

Estrogen Receptor α - (ER α), but Not ER β -signaling, is Crucial for Mechanostimulation of Bone Fracture Healing
Melanie Haffner-Luntzer, PhD, University of Ulm

Bone Formation was promoted in Mouse Model of Distraction Osteogenesis with Gain-of-function Mutation in Fgfr3
Yusuke Osawa, Nagoya University

Male Cadherin11 Deficient Mice Show Improved Fracture Healing
Kaitlyn M. Tracy, University of California, San Francisco

Real Time Monitoring of Frame Forces during Bone Transport: The Smart Frame
Scott M. Tucker, Penn State Health

Myeloid Cells Residing in the Periosteum Display an Enhanced Response to Fracture in Cathepsin K Null Mice
Bhavita Walia, PhD, Mount Sinai

Plasminogen is Critical for Bone Fracture Repair by Promoting the Functions of Mesenchymal Progenitors
Luqiang Wang, University of Pennsylvania

Intraoperative Delivery of Jagged-1 Drives Craniofacial Bone Regeneration in Rodents
Dan Youngstrom, PhD, University of Michigan

Rigidity of Fixation affects Vascularization in Fracture Healing in the Murine Model
Masato Yuasa, PhD, Tokyo Medical & Dental University

Early Prediction of Healing Outcome in a Large Bone Defect Rodent Model via MicroCT
Stephan Zeiter, PhD, AO Research Institute

Potential Factors Involved in Delayed Osteoporotic Fracture Healing in the Presence of Sarcopenia: Interventional Study of the Efficacy of Low-Magnitude High-Frequency Vibration
Ning Zhang, Chinese University of Hong Kong

The ORS ISFR would like to thank the following supporters for their contributions.

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