Accelerating the pace of discovery
ANNUAL MEETING SUPPORTERS

The Orthopaedic Research Society would like to thank the following corporate partners for their generous support.

THANK YOU TO OUR 2015 VIDEO OUTREACH COMPETITION SPONSORS

THANK YOU TO OUR 2015 NIRA (NEW INVESTIGATORS RECOGNITION AWARD) SUPPORTERS
# TABLE OF CONTENTS

Annual Meeting Corporate Supporters .................................................... Page ii
Meeting Information and Schedules ......................................................... Page v
New Investigator Meeting at a Glance ....................................................... Page 6
Future ORS Annual Meetings ................................................................. Page 9
Meeting Objectives / CME / FDA / Disclaimers / Safety Tips / Guest Badge Information Page ................................................................. Page 10
Membership Information ................................................................. Page 13
Friday, March 27 ............................................................................ Pages 15
Saturday, March 28 ........................................................................ Pages 16-25
Sunday, March 29 ........................................................................ Pages 26-36
Monday, March 30 ........................................................................ Pages 37-43
Tuesday, March 31 ........................................................................ Pages 44-49
Poster Sessions ........................................................................... Pages 50-149
Exhibitor Listing and Floor Plan .................................................. Pages 150-157
Dear Fellow ORS Members, Colleagues, and Guests,

On behalf of the Orthopaedic Research Society, we welcome you to the ORS 2015 Annual Meeting!

For more than 60 years, the ORS Annual Meeting has been a home for those in the field of musculoskeletal research from around the globe. Providing a forum that allows communication and collaboration among our multi-disciplinary attendees has always been one of the primary purposes of the society and the Annual Meeting.

We invite you to join us for the Welcome Session where we will introduce our international partners and honor Japan as our first Guest Nation. We will also invite Mellissa Marshall to the stage. Best known for her TEDtalk, “Talk Nerdy to Me,” Marshall will share how effective communication serves as the foundation to advance research. She will help attendees better communicate their science, a key challenge for the advancement of our field.

Once again, we are looking forward to offering the ORS/OREF Basic Science Course, ORS Clinical Research Forum, and the Translational Symposium, Cartilage Repair: Is it Possible? In addition to the workshops and spotlight sessions that will cover a broad spectrum of research activities, we will host a new workshop organized by The Journal of Orthopaedic Research (JOR) to help authors learn strategies for increasing their success of publishing their research. In addition to her keynote address, Melissa Marshall will give researchers a new skill set for communicating their science in her workshop: Present Your Science: Transforming Technical Talks.

Thank you to all of our many dedicated volunteers and to our members. The success of the society and the Annual Meeting would not be possible without your support!

At this year’s meeting, we hope that you find many opportunities to collaborate, communicate, and gain inspiration to accelerate the pace of discovery.

Enjoy your time in Las Vegas!

Sincerely,

Mary B. Goldring, PhD
ORS President
SCHEDULE

INNOVATION CENTRAL (POSTER AND EXHIBIT HALL)

*Marquee Ballroom* - Complimentary Wi-Fi, Innovation Theater, Charging Stations, seating, Refreshment Breaks, Food for Purchase

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SPEAKER READY ROOM

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CHECK-IN and REGISTRATION

*Grand Ballroom Pre-Function Area*

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DONATE TO THE ORS/OREF GRANTS CAMPAIGN TODAY!

By giving to the ORS/OREF Grants Campaign, you enable orthopaedic residents and post-doctoral ORS members to pursue important research that may one day translate into innovative new treatments and therapies that help patients recover their mobility and enjoy an improved quality of life.

All donors will also receive a special thank you from the ORS.

All donations over $25 – you will be entered into a raffle for free registration for the ORS 2016 Annual Meeting in Orlando, Florida.

Donate $25 – $49 a beverage voucher to be used during one of the two ORS Poster Receptions.

Donate over $50; an ORS fleece jacket.

GIVE TODAY! Please visit the ORS exhibit booth to make your donation and receive your gift.
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TOPIC CHAIRS

The ORS Board of Directors, Annual Meeting and Program Committees would like to acknowledge the Topic Chairs for their contribution to the 2015 Annual Meeting Program.

TISSUE BASED TOPICS

Biomaterials ................................................................. Fergal J. O’Brien, PhD
Cartilage, Synovium & Osteoarthritis ... Timothy Griffin, PhD, Anne-Marie Malfait, MD and Matthew Stewart, PhD
Meniscus ................................................................. Lutz Dürselen, PhD
Tendon/Ligament ........................................................ Helen Lu, PhD
Muscle ................................................................. Sameer B. Shah, PhD
Bone/Bone Biology .................................................. Edward Purdure, PhD
........................................................................ Vicki Rosen, PhD
Bone Fracture .......................................................... Elise F. Morgan, PhD

CTINAL/ANATOMICAL TOPICS

Hip and Knee Arthroplasty ....................... John DesJardins, PhD
................................................................. and Nico Verdonschot, PhD
Knee ................................................................. Guoan Li, PhD
Hip ................................................................. Lee E. Rubin, MD
Spine ................................................................. Makarand V Risbud, PhD,
........................................................................ Ashish D. Diwan, MD, Keita Ito, MD
Shoulder and Elbow ........................................ C. Benjamin Ma, MD
Hand and Wrist .................................................... Aaron Daluiski, MD
Foot and Ankle ................................................... Samuel B. Adams, MD
Infection ............................................................ Paul H. Wooley, PhD
Trauma ......................................................... David J. Hak, MD
Cancer, Tumors .............................................. Richard M. Terek, MD
Diagnostic Imaging ....................................... Hollis Potter, MD
Calculating fracture risk

Ara Nazarian, DrSc, co-principal investigator Brian Snyder, MD, PhD, and their colleagues are using the principles of beam theory—a calculation that factors in both geometric and material properties to determine rigidity—to design a computerized tomography (CT)-based rigidity analysis that can determine the risk of fractures in bones with metastasized lesions.

An OREF Prospective Clinical Research Grant gave Dr. Nazarian and his colleagues the funding they needed to conduct a multicenter study assessing the utility of the CT-based rigidity analysis. Read more at www.oref.org/AraNazarian.

Every gift makes a difference

Since 1955, ORS and OREF have worked together to expand funding for clinically relevant research and increase opportunities for new investigators. Now, the two organizations have collaborated to create the ORS/OREF Resident Research Grant and Post-Doctoral Fellowship Grant Fund.

Gifts to this fund:

• Enable post-doctoral ORS members to devote their time and resources to research that may one day translate into innovative new treatments and therapies.
• Assist ORS resident members who are exploring careers in research.
• Support ORS and OREF missions to advance orthopaedic research.

Make your gift today at www.oref.org/orsgrant.

For more information, please contact:

Ed Hoover, VP, Development
(847) 430-5105 | hoover@oref.org

Angela David, Development Specialist
(847) 430-5115 | david@oref.org
Collaborating in the Science of Patient Care

Friday, March 27 and Saturday, March 28
AAOS 2015 Annual Meeting
Venetian/Sands EXPO, Las Vegas, Nevada

Attend the AAOS 2015 Annual Meeting on Friday, March 27 and Specialty Day, Saturday, March 28 when we invite all ORS Annual Meeting registrants to take advantage of the opportunity for orthopaedic surgeons and scientists to collaborate in the science of patient care.

Complimentary Programs:
Friday, March 27, 7:00 AM – 6:00 PM
• Symposia
• Paper Presentations
• Posters
• Scientific Exhibits
• Orthopaedic Video Theater

Friday, March 27, 9:00 AM – 4:00 PM
• Technical Exhibits
  • Ask an Expert
  • Electronic Skills Pavilion

Friday, March 27, 10:30 AM – 12:30 PM
• AAOS/ORS Co-branded Symposium – Articulations in Total Joint Replacement: Have We Lost Our Bearings?
  William M. Mihalko, MD, PhD and
  Stuart Goodman, MD, PhD

Saturday, March 28, 7:00 AM – 3:00 PM
• Posters
• Scientific Exhibits
• Orthopaedic Video Theater

Registration Required
ORS attendees may purchase tickets, with no additional registration fee, for the following sessions:

Friday Instructional Courses
For details go to www.aaos.org/ameducation

Saturday Specialty Day
ORS attendees may purchase tickets; fees apply. For details go to www.aaos.org/amprograms
Programming is provided by:
• American Orthopaedic Foot & Ankle Society
• American Orthopaedic Society for Sports Medicine
• American Shoulder and Elbow Surgeons
• American Society for Surgery of the Hand/American Association for Hand Surgery
• Arthroscopy Association of North America
• Federation of Spine Associations
• The Hip Society/American Association of Hip and Knee Surgeons
• The Knee Society/American Association of Hip and Knee Surgeons
• Limb Lengthening and Reconstruction Society
• Musculoskeletal Tumor Society
• Orthopaedic Trauma Association
• Pediatric Orthopaedic Society of North America

HOW TO REGISTER:
A sticker on your badge is required to access the AAOS Annual Meeting on Friday, March 27 and Saturday March 28. For Specialty Day sessions on Saturday, March 28, attendees must register and pay the appropriate registration fee. To obtain a sticker or register for Specialty Day, please go to AAOS registration located at the Venetian/Sands Expo, Academy Hall G on Friday March 27 beginning at 7:00 AM. ORS attendees must have their ORS badge to receive a sticker.

For details about the AAOS 2015 Annual Meeting go to www.aaos.org/annual.
JOIN US | AUGUST 2–5, 2015
SUN VALLEY, IDAHO

45TH INTERNATIONAL
Sun Valley Workshop:
Musculoskeletal Biology

New Mechanisms for Old Problems

PROGRAM HIGHLIGHTS

- Cell Signaling and the Coupling of Bone Resorption and Formation
- Nerves, Bone, Joint Pain and Skeletal Homeostasis
- The Identification, Regulation and Importance of Cortical Porosity
- Using Bioimaging and 3D Printing to Regenerate Musculoskeletal Tissue
- Perilacunar Remodeling

Career Development Workshop for Young Investigators

Awards available to offset travel expenses for young and under-represented minority investigators

www.ors.org/sunvalley
NEW INVESTIGATOR MEETING AT A GLANCE

SATURDAY, MARCH 28

Mentor Connect
11:00 AM – 12:00 PM
Room 115

New Investigator Networking Session – Position Yourself for a Successful Career:
Strategic Lab and Time Management
11:00 AM – 12:00 PM
Room 117

PAS I: Career Advancement:
Winning the Uphill Battle for Research Funding
3:00 PM – 4:30 PM
Room 121 – 122

ORS PRESIDENT’S WELCOME RECEPTION
6:00 PM – 8:00 PM
Marquee Ballroom

SUNDAY, MARCH 29

New Investigator Networking Session – An Inside Look at Research Funding Opportunities
with the National Institutes of Health (NIH)
12:45 PM – 1:45 PM
Room 115

Poster Walking Tours
12:45 PM – 1:45 PM
Innovation Central/Marquee Ballroom

PAS II: Finding a Partner in Research
2:00 PM – 3:30 PM
Room 121 – 122

POSTER SESSION
4:45 PM – 6:00 PM
Innovation Central/Marquee Ballroom

MONDAY, MARCH 30

Industry Connect
12:30 PM – 1:30 PM
Room 116

New Investigator Networking Session – Position Yourself for a Successful Career:
Setting Foundational Early Career Goals
12:30 PM – 1:30 PM
Room 121 - 122

Poster Walking Tours
12:30 PM – 1:30 PM
Innovation Central/Marquee Ballroom

PAS III: Rising to the Top:
Leadership Success in Academics
1:45 PM – 3:15 PM
Room 121 – 122

POSTER RECEPTION
4:15 PM – 5:30 PM
Innovation Central/Marquee Ballroom

Women’s Leadership Forum Reception
7:30 PM – 10:00 PM
Vista Ballroom
(Registration and Fee required)

TUESDAY, MARCH 31

Poster Walking Tours
11:30 AM – 12:30 PM
Innovation Central/Marquee Ballroom
The ORS welcomes Japan, the inaugural Guest Nation to be honored at the ORS 2015 Annual Meeting. The Guest Nation Program honors our colleagues in Japan, recognizes their contribution to the field of musculoskeletal research, and celebrates our long-standing partnership with the Japanese Orthopaedic Association.

The Japanese Orthopaedic Association was founded in 1926 (Year 15 of the Taisho era) in order to promote studies of orthopaedics, presentation of study results, and to strengthen contact and cooperation among organizations and individuals specializing in this discipline. Our goal is to facilitate the maintenance and improvement of bone and joint function. To achieve this, it will be necessary to produce medical specialists who are adept at diagnosis and treatment, including conservative treatments such as therapeutic exercise, as well as pharma- cotherapeutics and surgery.

Connect with ORS for the latest #ORS2015 Annual Meeting information!

LIKE us on Facebook FOLLOW @ORSsociety on Twitter #ORS2014
JOIN the conversation on LinkedIn WATCH us on YouTube

DON’T FORGET TO DOWNLOAD THE ORS 2015 ANNUAL MEETING MOBILE APP!
HTTP://ORS.SHOWPRG.COM
BE A PART OF THE ORS SPINE SECTION COMMUNITY!

The Spine Section’s mission is to advance spine research and related sciences as to improve patient care through basic, translational and clinical research. The Spine Section is also committed to providing leadership by representing researchers in the Orthopaedic Research Society

ORS Spine Section dues are $50 for current ORS members*. ORS Spine Section dues are in addition to ORS annual membership dues.

**Stop by the ORS Booth to find out more information on how to join the ORS Spine Section and be a part of a community of spine researchers!**

*Not an ORS member? Interested in joining ORS? Ask us how to join today or visit ors.org for more information.

TRANSPORTATION INFORMATION

ORS will provide complimentary shuttle service between the MGM Grand Hotel and the Venetian/Sands EXPO (AAOS Annual Meeting) Friday, March 27 & Saturday, March 28.

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Please note, bus seating is on a first come first served basis.
FUTURE ORS ANNUAL MEETINGS!

ORS 2016 Annual Meeting
Disney’s © Coronado Springs Resort
Orlando, FL  March 5-8, 2016

ORS 2017 Annual Meeting
San Diego Convention Center
San Diego, CA  March 19-22, 2017
CONTINUING MEDICAL EDUCATION

This activity has been planned and implemented in accordance with the Essentials Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American Academy of Orthopaedic Surgeons and the Orthopaedic Research Society. The American Academy of Orthopaedic Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

The American Academy of Orthopaedic Surgeons designates this live activity for a maximum of 25.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Attendees will be able to claim CME from the ORS 2015 Annual Meeting by completing the CME form on the ORS website following the meeting in Las Vegas.

SAFETY TIPS

DO:

• Travel with only the credit card and ID cards you will use.
• Check that the lock works and that the door closes securely in your hotel room. Put the chain or deadbolt on the door after entering the room.
• Walk with another person. Single targets are the most likely victims of crime.

DON’T:

• Wear your badges or carry conference bags outside.
• Walk in dark, isolated areas, such as closed plazas

Children 16 years of age and under are not permitted to enter the exhibit and poster hall area or the session rooms at any time. No supervision is offered.

MEETING OBJECTIVES

• To present the best available research from all disciplines of musculoskeletal research.
• To promote the exchange of ideas and encourage collaborations in orthopaedic research.
• To encourage promising and emerging areas in musculoskeletal research including basic science education, and research strategies by use of forums, workshops, special sessions and special interest meetings.

FDA

All drugs and medical devices used in the United States are administered in accordance with Food and Drug Administration (FDA) regulations. These regulations vary depending on the risks associated with the drug or medical device, the similarity of the drug or medical device to products already on the market, and the quality and scope of clinical data available. Some drugs or medical devices demonstrated at this 2015 Annual Meeting of the Orthopaedic Research Society may have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice. Orthopaedic Research Society policy provides that “off label” uses of a drug or medical device may be described in the Orthopaedic Research Society’s CME activities so long as the “off label” use of the drug or medical device is also specifically disclosed (i.e., it must be disclosed that the FDA has not cleared the drug or device for the described purpose). Any drug or medical device is being used “off label” if the described use is not set forth on the product’s approved label.

DISCLAIMER

The materials presented at the 2015 Annual Meeting of the Orthopaedic Research Society have been made available by the Orthopaedic Research Society for educational purposes only. The material is not intended to represent the only, nor necessarily best, method or procedure appropriate for the medical situations discussed, but rather is intended to present an approach, view, statement or opinion of the faculty, which may be helpful to others who face similar situations. The Orthopaedic Research Society disclaims any and all liability for injury or other damages resulting to any individual attending the meeting and for all claims, which may arise out of the use of the techniques demonstrated therein by such individuals, whether these claims shall be asserted by physician or any other person. No reproduction of any kind, including audiotapes and videotape, may be used in any portion of the ORS Annual Meeting. The ORS reserves all of its rights to such material, and commercial reproduction is specifically prohibited.

Image Consent Policy

By attending the 2015 ORS Annual Meeting you give your consent, unless you notify us otherwise, to use your image captured during the conference through video, photographs, or digital imagery, to be used by the ORS in promotional materials, publications, and website and waive any and all rights to these images.

Filming/Recording Policy

The photography or recording of any kind (cell phone, camera, video recorder, etc) of a scientific presentation, educational program, workshop, posters, or meetings of the ORS is strictly forbidden without prior approval in writing by the ORS. This policy will be strictly enforced.
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THANK YOU TO THE ADJUNCT REVIEWERS

The ORS Board of Directors and Program Committee would like to thank all the volunteers for their time, effort, and dedication to the Society and the 2015 Annual Meeting.
BECOME A MEMBER OF THE ORTHOPAEDIC RESEARCH SOCIETY

The ORS Membership Committee will be available to discuss membership aspects and benefits as well as endorse applications during breaks and poster session in the ORS booth located in Innovation Central (Poster/Exhibit Hall).

<table>
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<tr>
<th>INFORMATION:</th>
<th>ACTIVE</th>
<th>ASSOCIATE (STUDENT)</th>
<th>AFFILIATE</th>
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<td>Active Members are elected to the Society based on previous scientific contributions and continued participation in the field of research. Active members pay annual dues of $240.</td>
<td></td>
<td>Associate (Student) Membership is available to trainees in the area of orthopaedic research, including individuals who are pursuing advanced degrees (e.g., MD, DDS, DO, MS, PhD, DVM) or in post-doctoral clinical and research training programs (Residency and Fellowship). Associate (Student) Members must verify their training status in the field of orthopaedic research for membership. Associate (Student) Members are expected to apply for Active membership when their training is completed. Associate (Student) Members pay annual dues of $50.</td>
<td>Affiliate Membership is available to lab technicians, lab and private practice administrators/managers, and industry representatives that make a significant scientific and/or non-scientific contribution to orthopaedic research and the ORS. Applicants must have two institutional sponsors; ORS members must write letters of recommendation including significant scientific and/or non-scientific contribution of the applicant. Letters must be on institutional letterhead. Affiliate members pay annual dues of $240.</td>
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| BENEFITS: | | |
| Prestige of membership | ✓ | ✓ | ✓ |
| Reduced registration fees at the ORS Annual Meeting | ✓ | ✓ | ✓ |
| Network of Skilled Professionals | ✓ | ✓ | ✓ |
| Free subscriptions to ORS Connect | ✓ | ✓ | ✓ |
| Online Membership Directory | ✓ | ✓ | ✓ |
| Discounted rate for ORS Career Center | ✓ | ✓ | ✓ |
| Eligibility for ORS Awards, Fellowships and Grants | ✓ | ✓ | ✓ |
| Online Subscription to Journal of Orthopaedic Research (12 issues) | ✓ | ✓ | ✓ |
| No fee to submit manuscripts to Journal of Orthopaedic Research | ✓ | ✓ | ✓ |
| Eligibility to serve on ORS Committees, as a reviewer and moderator | ✓ | | Corporate Affairs Committee only |
| Eligibility to serve on ORS Committees as an Ad Hoc | | ✓ | |

| REQUIREMENTS: | | |
| Presentation of a paper at an ORS Annual Meeting OR Publication of two peer-reviewed journals papers related to orthopaedic research. | A signature from your Advisor, Dean, Department or Program Chair verifying your training status is required. | Attendance at one or more prior ORS Annual Meetings. |
ORS WELCOMES OUR NEW MEMBERS
**Ancillary Event**
Research Interest Group: Bone Regeneration
6:00 PM – 8:00 PM
Room 106 - 107

Organizer:
Chelsea Bahney, PhD, Orthopaedic Trauma Institute

This is the 3rd annual Bone Regeneration RIG held at the ORS. Our mission is to provide new insights into important topics in bone repair by leading experts in field in a 1-hour panel seminar, followed by an opportunity for networking. The theme for this year’s RIG is *The Mechanics of Bone Regeneration*. Our panel will cover the basic science related to how cells receive and transduce mechanical signals, as well as translational applications for improving repair by optimizing the loading microenvironment and testing the efficacy of the bone regenerate.
SATURDAY | MEETING HIGHLIGHTS Saturday, March 28, 2015

8:00AM-10:30AM

ANCILLARY MEETINGS:

Research Interest Group: Growth Factors
Room 106 - 107

Research Interest Group: Mechanobiology
Room 115

Research Interest Group: Orthopaedic Evidence
Room 117

Research Interest Group: Tendon
Room 121 - 122

Research Interest Group: Spine Research Community
Room 116 (concludes at 10am)

ORS Advocacy Roundtable
Room 111 - 112

11:00AM-12:00PM

New Investigator Networking Session:
Strategic Lab and Time Management
Room 117

Mentor Connect
Room 115

12:00PM-8:00PM

Poster and Exhibit Hall Open
Marquee Ballroom

12:00PM-1:00PM

SESSIONS:

Bone Disease
Room 111 - 112

Knee Kinematics and Gait
Room 113-114

3:00PM-4:30PM

WORKSHOPS:

Hot Topics in Regulatory Challenges
within Orthopaedics
Room 111 - 112

ORS/The HIP Society - Biological Aspects
of Modular Implant Tribocorrosion
New Horizon Workshop
Room 113 - 114

Trials, Tribulations and Triumphs of
Conducting Prospective Clinical Research
Studies: The How and Why
Room 116

Quantitative MR Imaging: Research
Applications and Clinical Translation
Room 118 - 120

Professional Advancement Session-
Career Advancement: Winning the Uphill
Battle for Research Funding
Room 121 - 122

4:45PM-5:45PM

Welcome Session – Guest Nation, Patient
Story, Presidential Guest Speaker
Room 118 - 120

6:00PM-8:00PM

President’s Welcome Reception
Innovation Central/Marquee Ballroom

1:15PM-2:15PM

NIRA PRESENTATIONS:

Bone Biology & Repair
Room 111 – 112

Joint Physiology & Mechanics
Room 113 - 114

Cell Differentiation Fibrosis & Cancer
Room 116

OA & Cartilage
Room 118 – 120

Stem Cells & Tissue Repair
Room 121 – 122

2:00PM-6:00PM

ORS/OREF Basic Science Course: Part I
Room 117

2:30PM-3:00PM

Refreshment Break
Innovation Central/Marquee Ballroom

2:45PM-3:00PM

Innovation Theater Presentation:
THINK Surgical
TCAT™ as a Research Tool
Innovation Central/Marquee Ballroom
ANCILLARY EVENTS
8:00AM-10:30AM

Research Interest Group: Growth Factors and Musculoskeletal Repair
Room 106 – 107
Organizers:
Lawrence J. Bonassar, PhD, Cornell University
Johnny Huard, PhD, University of Pittsburgh
Objective:
Discuss current and future issues in growth factor research as they relate to orthopaedic problems.

Research Interest Group: Mechanobiology and Inflammation in Cartilage
Room 115
Organizers:
Christopher T. Chen, PhD, University of Texas Southwestern Medical Center
Alan J. Grodzinsky, ScD, Massachusetts Institute of Technology
Objectives:
1) To create a synergetic environment to present new findings in the emerging fields of mechanobiology and inflammation.
2) To discuss how mechanotransduction interacts with common signaling pathways (NF-kB, MAPK, STAT, P3k,CBP/p300 and other) and whether there are thresholds or windows (stress and strain) to activate the pro-inflammatory and anti-inflammatory signaling pathways in different connective tissues including cartilage, ligament, tendon, bone, and IVD.
3) To review our current understanding on the relationships between mechanobiology, inflammation, and tissue remodeling/healing.

Research Interest Group: Spine Research Community
Room 116 (Concludes at 10 AM)
Organizers:
Fackson Mwale, PhD, McGill University
Makarand V. Risbud, PhD, Thomas Jefferson University
Daisuke Sakai, MD, PhD, University of California, San Diego
James C. Iatridis, PhD, Icahn School of Medicine at Mount Sinai
Sibylle Grad, PhD, AO Research Institute
Rita Kandel, MD, Mount Sinai Hospital
Objectives:
1) To develop and strengthen collaborative research. To build international networks and foster interactions between research groups from different countries (and different continents). To avoid competition for national funding sources. To include more clinicians in the networks for identification of clinically relevant topics. To involve also industrial partners.
2) To identify underdeveloped areas.
3) To enlarge the spine research community. (a) How to recruit more people to the disc field. (b) How to improve publication efficiency of relevant journals. (c) To better involve the disc/spine research in the ORS committee and editorial board of orthopedic and other relevant journals.

Research Interest Group: Tendon
Room 121 - 122
Organizers:
Nelly Andarawis-Puri, PhD, Mount Sinai School of Medicine
Evan Flatow, MD, Mount Sinai School of Medicine
Louis Soslowsky, PhD, University of Pennsylvania
Objectives:
This will be the inaugural meeting of the Tendon Research Interest Group. Anyone with interest in tendon research (basic, tissue engineering, applied, etc) is welcome to attend. This session will begin by summarizing and reporting on the ORS- ISMMS New Frontiers in Tendon Research held in NYC last fall). We will then discuss the structure of this group going forward and initiatives of interest to grow and enhance the collaborative research efforts.

Research Interest Group: The Orthopaedic Evidence and Outcomes Education Organization
Room 117
Organizer:
Michael F. Dohm, MD, University of Arizona
Objectives:
To discuss the development of infrastructure required for outcomes projects in orthopaedics, discussion of patient reported outcome measures and functional measures, definition of data levels, promote and nurture an environment in which we can work on collaborative projects regarding applications of evidence in orthopaedic practice, promote and nurture collaborations within the discipline of orthopaedics between clinician scientists and researchers as well as in a multidisciplinary fashion with other organizations interested in the same.

ORS Advocacy Roundtable
Room 111 – 112
Organizer:
The ORS Advocacy Committee
We need more money for orthopaedic research! Yet, we often rely on others to advocate for us. It is more important than ever to have your voice heard. Come join us to learn how to become an advocate.
The members of the ORS Advocacy Committee invite you to join them for an open discussion on advocating for research funding. Attendees will have the opportunity to hear from people who have visited Capitol Hill on behalf of orthopaedic research. This informal roundtable will offer an open discussion on their experiences and lessons learned from their advocacy efforts. Discussion topic will include how to get involved in advocacy, what you need to do to be prepared and developing relationships with those that represent you.
NEW INVESTIGATOR NETWORKING SESSION

**Position Yourself for a Successful Career: Strategic Lab and Time Management**

11:00 AM - 12:00 PM

Room 106 - 107

Organizers:
The New Investigator Mentoring Committee

Moderators:
Nelly Andawaris-Puri, PhD
Devina Purmessur, PhD

The demands of an early career in academics can leave you feeling overwhelmed and unproductive. Developing techniques to manage your time to accomplish what matters is crucial for your success and well-being. Creating the team that will help enhance your vision will promote an inspiring and productive environment. How do you organize your time to accomplish what matters? How do you promote excellence and inspire your research personnel? From time management to lab management strategies, this networking session will provide guidance and advice based on ORS mentors’ own experiences and will focus on staffing (hiring, inspiring and firing), prioritizing and setting career goals, managing your time to maximize efficiency and knowing when to say yes and when to say no.

AGENDA

11:00 – 11:05AM
*Welcome & Introductions*
Nelly Andawaris-Puri, PhD and Devina Purmessur, PhD

11:05 – 11:20AM
*Managing Your Time for Success*
Larry Bonassar, PhD

11:20 – 11:35AM
*Staffing and Promoting an Inspired Environment*
Susannah Fritton, PhD

11:35 – 12:00PM
*Q&A* Moderators: Drs. Nelly Andarawis-Puri and Devina Purmessur

MENTOR CONNECT

**11:00 AM - 12:00 PM**

Room 115

Organizers:
The ORS New Investigator Mentoring Committee

This is an informal and interactive session between mentors and mentees. Mentees will be able to choose their mentor from a select group of ORS members who have demonstrated success in their career. The mentors and mentees will have the opportunity to discuss career establishment and how to balance competing demands in the academic and corporate environments. The discussions may also cover topics such as the importance of identifying mentors and describing the roles and functions of a mentor. This is an excellent opportunity to network with senior ORS members and ask questions of the mentors in an informal, small group environment. The Women’s Leadership Forum will host two tables for interaction and mentorship with female ORS leaders.

PAPER PRESENTATIONS

12:00 PM – 1:00 PM

See page 21

NIRA PRESENTATIONS

1:15 PM – 2:15 PM

See page 22-23
ORS/OREF BASIC SCIENCE COURSE

Part I: Saturday March 28, 2:00 PM – 6:00 PM
Part II: Sunday, March 29, 8:00 AM – 11:15 AM
Room 117

Organizers:
Richard L. Lieber, PhD, Rehabilitation Institute of Chicago
Marjolein C. van der Meulen, PhD, Cornell University
Theodore Miclau, MD, Orthopaedic Trauma Institute

The ORS/OREF Basic Science Course will provide attendees with the tools to explain the functions and limitations of the science behind the decisions, treatments, and procedures that are performed in practice every day. The course content has been derived from the Orthopaedic Basic Science: Foundations of Clinical Practice textbook developed in partnership with the AAOS and ORS. Covered topics will include principles of orthopaedic surgery basic science, musculoskeletal tissue biology, and musculoskeletal pathophysiology. Course attendees will also receive a copy of the textbook as part of the registration fee. The knowledge of the concepts learned in this course is evaluated through the Orthopaedic In-Training Examination and the American Board of Orthopaedic Surgery Part I and Recertification Examinations. The course will benefit anyone currently in the field or entering the field of orthopaedics including orthopaedic residents and fellows, practicing orthopaedic surgeons and musculoskeletal researchers.

Part I: Principles of Orthopaedic Surgery Basic Science

*Welcome and Introduction*
Richard L. Lieber, PhD, Rehabilitation Institute of Chicago

*Molecular and Cellular Biology*
Tamara Alliston, PhD, University of CA, San Francisco

*Musculoskeletal Development and Genetic Diseases*
Jennifer Westendorf, PhD, Mayo Clinic

*Principles of Biomechanics*
Marjolein C. van der Meulen, PhD, Cornell University

*Orthopaedic Biomaterials*
Kenneth A. Mann, PhD, SUNY Upstate Medical University

*Kinesiology*
Samuel R. Ward, PhD, University of CA, San Diego

Musculoskeletal Tissue Physiology and Function

*Bone*
Karl J. Jepsen, PhD, University of Michigan

*Skeletal Muscle and Nerve*
Richard L. Lieber, PhD, Rehabilitation Institute of Chicago

*Tendon and Ligament*
Louis J. Soslowsky, PhD, University of Pennsylvania

*Cartilage*
Suzanne A. Maher, PhD, Hospital for Special Surgery

*Meniscus and Intervertebral Disc*
Robert L. Mauck, PhD, University of Pennsylvania

Pre-registration required
Residents/Students/Associates: $145; ORS and/or AAOS registrants: $195; Non-Members: $295

All fees include Orthopaedic Basic Science: Foundations of Clinical Practice textbook

BREAK
2:30 PM – 3:00 PM
Innovation Central/Marquee Ballroom
Visit with exhibitors and view posters in Innovation Central. Refreshments will be served.

INNOVATION THEATER PRESENTATION: THINK Surgical

TCAT™ as a Research Tool
2:45 PM – 3:00 PM
Innovation Central/Marquee Ballroom

THINK Surgical, Inc. develops, manufactures, and markets an active computer-assisted surgical system for orthopedic surgery and is committed to the future of orthopedic surgery and to improving patient care through the development of leading-edge precision technology. Learn about the technology and potential research collaborations with THINK.
tribocorrosion, knowledge gaps that are fertile areas of future research and novel findings that challenge the current paradigms of metal implant biocompatibility.

**Bioreactivity of Tribocorrosion Debris: Known Unknowns**
Joshua J. Jacobs, MD, Midwest Orthopaedics at Rush

**Histological Correlates of Modular Implant Tribocorrosion**
Patricia A. Campbell, PhD, Orthopedic Hospital

**Novel Biological Observations in Modular Implant Tribocorrosion**
Jeremy L. Gilbert, PhD, Syracuse University

**Trials, Tribulations and Triumphs of Conducting Prospective Clinical Research Studies: The How and Why**

Room 116

Presented by:
The ORS Women’s Leadership Forum

Organizers:
Robin M. Queen, PhD, Duke University
Karen King, PhD, University of Colorado at Denver and Health Sciences Center Orthopaedics – Bioengineering

Moderators:
The logistical challenges of planning and implementing a large scale clinical research study can be daunting. There are many aspects of study design, study implementation, and the study team assembly and dynamics that must be considered prior to study initiation. This workshop will bring together three scientists who have been highly successful in the planning, funding, and implementation of large scale clinical studies to explore all aspects of these projects including the trials and triumphs.

**Moving from an Idea to a Clinical Trial**
Cecilia Rogmark, MD, PhD, Skane Hip Arthroplasty Register

**Engaging Your Subjects: The Johnston County Osteoarthritis Project**
Joanne Jordan, MD, MPH, University of North Carolina

**Regulatory Considerations When Planning a Clinical Trial**
Gloria L. Matthews, DVM, PhD, Genzyme Corporation

**Quantitative MR Imaging:**
Research Applications and Clinical Translation

Room 118 - 120

Organizer:
Hollis G. Potter, MD, Hospital for Special Surgery

Quantitative imaging of bone, articular cartilage, meniscus, and intervertebral disc and endplate provides noninvasive insight into tissue biochemistry and structure. Basic principles of MR research sequences will be discussed in this workshop, with correlates to more traditional imaging methodologies. The application of these techniques to translational clinical application will be discussed.
PROFESSIONAL ADVANCEMENT SESSION
Career Advancement: Winning the Uphill Battle for Research Funding
3:00 PM - 4:30 PM
Room 121-122
Organizer:
ORS New Investigator Mentoring Committee
Moderator:
Jinxi Wang, MD, PhD, University of Kansas Medical Center

Acquiring funding for research is more competitive than ever. Budget cuts have been a threat to individual researchers and research programs that affect musculoskeletal basic scientists and physician scientists at all stages. Whether you are a postdoctoral fellow, new investigator, mid-career investigator, or established investigator, this Professional Advancement Session will provide you with the tools to meet these challenges and to streamline career advancement strategies in today’s competitive funding environment.

This PAS includes brief presentations and ample discussions with the panel members who have experience with research grant policy, submission, review process, and post-award management. Topics include: What to do when you submit but don’t get funded; What to do when you submit and do get funded; What to do if you are stuck after completing a small grant project; What to do if your grant is not renewed as you expected; What to do if your tenure review is approaching but your NIH grant application is still pending.

Panel members:
Henry Donahue PhD, Penn State University College of Medicine, PA
James Iatridis PhD, Icahn School of Medicine at Mount Sinai, NY
Lynn Snyder-Mackler PT, ScD, FAPTA, STAR University of Delaware, DE
Mary Goldring PhD, Hospital for Special Surgery and Weill Cornell Medical College, NY
Gayle Lester PhD, NIH/NIAMS Program Director

Pamela Schroeder, Patient Advocate
I have been a dedicated advocate for Orthopaedic surgery and the advancement in musculoskeletal research. I have served on The American Academy of Orthopaedic Surgeons Patient Advisory Board for five years and I have advocated on Capitol Hill for musculoskeletal research funding. I spend free time talking to patients considering knee and ankle replacements. I am eternally grateful to have been given this opportunity to say thank you to The Orthopaedic Research Society, without all of you I would not be where I am today. Thank you for making a difference in my life and the lives of millions.

Melissa Marshall, ORS Presidential Guest Speaker
“Science Not Communicated is Science Not Done”

Important research often does not move forward because the significance of that research is not understood and appreciated by others. Melissa Marshall’s will motivate listeners on the importance of communication to the success and advancement of their research. She will explore how effective communication is the linchpin between research and those that are in a position to advance that research.
ORS PRESIDENT’S WELCOME RECEPTION
6:00 PM – 8:00 PM
Innovation Central/Marquee Ballroom
Don’t miss the excitement of the ORS Annual Meeting’s largest social event! Enjoy food and drinks while meeting new people and catching up with old friends and colleagues. All ORS Meeting Attendees are welcome to attend this kick-off reception.

Registered meeting attendees will receive 2 drink tickets for this event. Guests can register to attend the receptions. Please visit the Registration Desk for more information.
**SESSIONS 12:00PM–1:00PM** Saturday, March 28, 2015

**SESSION 1** Bone Disease

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper No.</th>
<th>Title</th>
<th>Moderators</th>
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</thead>
<tbody>
<tr>
<td>12:00 PM</td>
<td>0001</td>
<td>Paget’s Disease Of Bone-like Disorder Is Caused By Chmp5 Deletion And Reversed By The Treatment Of OPG-Fc</td>
<td>Edward M. Schwarz, PhD and Joseph Wallace, PhD</td>
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<td></td>
<td>0002</td>
<td>Moderate Chronic Kidney Disease Impairs Bone Quality In Skeletally Mature C57Bl/6 Mice</td>
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<td>0003</td>
<td>Increased Chip-1 Expression And Decreased Phosphorylated Smad1/5 Within Osteoblasts During Bone Formation Reduction In Glucocorticoid-induced Osteoporotic Rats</td>
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<td>12:10 PM</td>
<td>0004</td>
<td>Study Of Pain-related Behavior And Immunohistochemical Analysis In The Hindlimb-unloaded Mouse Model Of Bone Loss</td>
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<td>0005</td>
<td>Combination Squelcin Antibody And Zoledronic Acid Treatment Outperforms Either Treatment Alone In a Mouse Model Of Osteogenesis Imperfecta</td>
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<td>0006</td>
<td>Loss Of TIEG And Decreases In Wnt Signalling Are Substantially Abrogated By Sclerostin Antibody Therapy which Elicits A Robust Skeletal Response</td>
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**SESSION 2** Knee Kinematics and Gait

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<td>0007</td>
<td>Effect of Unstable Meniscal Injury on Three-dimensional Knee Kinematics in ACL-deficient Patients During Gait</td>
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<td>0008</td>
<td>The Effect of Cruciate Preservation on Walking Base of Support</td>
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<td>Influence of Anatomy on Dynamic Tracking in Patellar Instability</td>
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<td>0010</td>
<td>In-vivo Kinematics of the Knee 3 Years after ACL Reconstruction</td>
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<td></td>
<td>0011</td>
<td>Changes in Macrophage Decreased Dynamic Knee Joint Stiffness in Patients with Knee Osteoarthritis and Complaints of Instability</td>
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<tr>
<td>12:10 PM</td>
<td>0012</td>
<td>Relationship of Biomechanical and EMG Factors to Joint Contact Forces and Early Knee OA after ACL Reconstruction</td>
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<td></td>
<td>0013</td>
<td>Effects of Acetabular Rim Trimming on the Hip Joint Contact Pressure: How Much Is Too Much?</td>
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<td>0014</td>
<td>Three-dimensional Measurement Of The Muscle Volume And The Fatty Degeneration Of The Gluteus Medius In Patients With Hip Osteoarthritis</td>
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<td></td>
<td>0015</td>
<td>Statistical Shape Modelling to Quantify and Comparison of Proximal Femoral Cervical Bone Thickness between Patients with Femorocapsular Impingement and Normal Hips Analyzed by Statistical Shape Modeling</td>
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<td>0016</td>
<td>A Novel Model For the Induction Of Hip Dysplasia In The Developing Marine Hip</td>
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<td>0017</td>
<td>Relationships between Severity of Deformity and Impingement in Acute Slipped Capital Femoral Epiphysis</td>
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<td>0018</td>
<td>Hip Joint Stress in Individuals with an Asymptomatic Cam Deformation during Level-Walking</td>
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**SESSION 3** Hip Disease, Kinematics, FAI

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**SPOTLIGHT SESSION 4** Advanced Articular Cartilage Imaging Techniques

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<td>0007</td>
<td>Comparison Of Annual Changes In Knee Articular Cartilage Thickness Between The Osteoarthritis Side And The Contra-lateral Side Measured By B-mode Ultrasonography With Mechanical 3D Scanning In Osteoarthrits Patents</td>
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<td>0008</td>
<td>Deep Imaging of Collagen- and Proteoglycan-Rich Tissues using Optical Clearing</td>
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<td>0010</td>
<td>Response Of Intervertebral Disc Degeneration: Matrix Restoration or Pain Relief?</td>
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**SPOTLIGHT SESSION 5** Degeneration, Pain and Treatment

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**Saturday**
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<th>TIME</th>
<th>NIRA PRESENTATION 6</th>
<th>NIRA PRESENTATION 7</th>
<th>NIRA PRESENTATION 8</th>
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<tbody>
<tr>
<td></td>
<td>Bone Biology &amp; Repair</td>
<td>Joint Physiology &amp; Mechanics</td>
<td>Cell Differentiation Fibrosis &amp; Cancer</td>
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<td>Room # 111-112</td>
<td>Room # 113-114</td>
<td>Room # 116</td>
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<tr>
<td><strong>Moderators</strong></td>
<td>Andrea I. Alford, PhD and Edward Purdue, PhD</td>
<td>Nico Verdonschot, PhD and Kenneth A. Mann, PhD</td>
<td>Douglas D. Robertson, Jr., MD, PhD and Brian Snyder, MD, PhD</td>
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<td>1:15 PM</td>
<td>Paper No. 0025</td>
<td>SDF-1/CXCR4 Axis in Tie2-lineage Cells Including Endothelial Progenitor Cells Regulates Bone Fracture Healing</td>
<td>Yoshie Kawakami, Masaaki Ito, Tomoyuki Matsumoto, Tomoya Kunrada, Yukata Mimune, Taro Shoji, Tomoaki Fukuoka, Takayuki Akahara, Masahiro Kurnaka</td>
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<td>Paper No. 0033</td>
<td>Orthopaedic Grade Cobalt Chromium Alloy Particle Corrosion and Biological Evaluation</td>
<td>Danielle Willems, Agata Neya, Trent Trefley, Akramul Hoque, Alister Hart, Julia C. Shethon</td>
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<td>Paper No. 0011</td>
<td>Distinct Patterns Of Shmc Acquisition Mark Chondrogenic Differentiation</td>
<td>Sarah E. B. Taylor, Yu Henry Li, Pitera Smeriglia, Madhusukha Rath, Wing H. Wong, Nohi Bhatnani</td>
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<td>1:22 PM</td>
<td>Paper No. 0026</td>
<td>Collagen-Based Bone Sialoprotein Implants Promote Cranial Bone Repair by Stimulating Osteoblastic Differentiation of Dura-Derived Osteoprogenitor Cells</td>
<td>Paul C. Cowan, Yan Wang, Qingshua Li, John G. Yost, Yi Feng, Andrew H. Miller, Jina Wang</td>
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<td>Paper No. 0014</td>
<td>Early Phase of Wear Particle Induced Inflammation was inhibited by NF-κB Decay Oligodeoxynucleotide</td>
<td>Taishi Sato, Jukka Pajarinen, Tzu-hua Lin, Florence Loi, Kensuke Egashira, Zhenya Yao, Stuart B Goodman</td>
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<td>Paper No. 0042</td>
<td>Human Mesenchymal Stem Cell and Endothelial Cell Interaction through Endothelin-1</td>
<td>Tsung-Lin Tsai, Bowen Wang, Matthew Squire, Lian-Wang Guo, Wan-Du Li</td>
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<td>1:29 PM</td>
<td>Paper No. 0027</td>
<td>Identification of a Novel Regulatory Mechanism underlying PTH Anabolic Action on Bone Mass and Injury Repair via induction of Tob Required for RANKL Expression</td>
<td>Shuichi Moriya, Yoshihisa Ezura, Tadayoshi Hayata, Yayoi Izu, Kazuo Kaneko, Masaki Noda</td>
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<td>Paper No. 0035</td>
<td>Gender Differences in Knee Laxity and Stiffness: An In Vitro Study of Age Matched Specimens from a Younger Population</td>
<td>Daniel Boguszewski, Edward Chong, Nirav Joshi, Keith Markoff, David M. Allister</td>
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<td>Paper No. 0043</td>
<td>Ex-vivo Gene Therapy-induced Cartilage Regeneration: Comparison of Different Subpopulations of Primary Muscle-Derived Cells</td>
<td>Hongxiao Li, Aiping Lu, Ying Tang, MaCalus V Hogan, Johnny Huard</td>
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<td>1:36 PM</td>
<td>Paper No. 0028</td>
<td>Organ Culture Based Real-time Luminescence Imaging Revealed The Circadian Clock Exists In A Fracture Healing Site Of A Mouse Femur</td>
<td>Satsumi Kanimoto, Hiroyoshi Fujijara, Naoki Okubo, Yoshi Mirami, Yoshinori Hoshikawa, Ryo Oda, Toshikazu Kudo, Kazuhito Yagita</td>
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<td>Paper No. 0036</td>
<td>Molecular Characteristics Proving Femoroacetabular Impingement As The Precursor To Hip Osteoarthritis</td>
<td>Nobuaki Chinze, Shingo Hashimoto, Takaaki Fujishiro, Shinya Hayashi, Noriyuki Kanzaki, Masahisa Hatakeyama, Shihori Sakata, Shinpeku Kihara, Katsuhiko Kaneda, Soh Ouchida, Ryosuke Kaneda, Masahiro Kurnaka</td>
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<td>Paper No. 0044</td>
<td>Inhibitory Effect of Photodynamic Therapy with a Novel Indocyanine Green-labeled Nanoparticle and Near-infrared Light on the Growth of Bone Metastasis of a Human Breast Cancer in vivo</td>
<td>Tsoshinen Tsukishita, Masataka Sakane, Tetsuya Abe, Toru Funayama, Shizuo Onishi, Eiichi Ozeki, Isao Hara, Masashi Yamazaki</td>
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<td>Paper No. 0030</td>
<td>Aptamer-Functionalized Delivery System for Osteogenic stnAbs To Achieve Osteoblast-Specific RNA Interference for Bone Anabolic Therapy</td>
<td>Chao Liang, Baozheng Gao, Heng Wu, Liangqiang Zhang, Aiping Lu, Ge Zhang</td>
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<td>Paper No. 0038</td>
<td>Estimation Of Optimal Shoulder Orientation During The Acceleration Phase In Baseball Pitching From Minimal Shoulder Joint Load Viewpoint</td>
<td>Hiroshi Tamaka, Toshihiko Hayashi, Hiroki Imai, Yohi Takegi, Takanori Oi, Katsuyo Nobuhara</td>
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<td>Paper No. 0046</td>
<td>Oral Administration of Losartan Significantly Improves Muscle Healing after Compartment Syndrome-Like Muscle Injury</td>
<td>Makoto Kobayashi, Yoshie Kawakami, Takanobu Otsuka, Freddie H. Fu, Johnny Huard</td>
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<td>Paper No. 0031</td>
<td>Macrophage-associated Osteoactivin/gp100mb Mediates Mesenchymal Stem Cell Survival, Proliferation and Migration via a CD44-dependent Mechanism</td>
<td>Bing Yu, Gregory Songard, Christopher Malciott, Min-Ho Kim, Fayez F Safadi</td>
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<td>Paper No. 0039</td>
<td>Validation of MRI Quantification for Meniscus Volume Resection Following Partial Meniscectomy</td>
<td>Shirree Seger, Brian T Feely, Sharmila Majumdar, Richard B. Souza</td>
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<td>2:04 PM</td>
<td>Paper No. 0032</td>
<td>Therapeutic Inhibition Of Mir-214 By (asp-ser-ser)6-liposome Encapsulating Antagomir-214 in Osteogenic Cells For Promoting Bone Formation In Aged Osteoporotic Rats</td>
<td>Baozheng Gao, Aiping Lu, Baozheng Zhang, Ge Zhang</td>
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<td>Paper No. 0048</td>
<td>The Effect of Continuous and Local L-4 Delivery on Systemic Macrophage Trafficking and Polyethylene Particle Induced Bone Loss</td>
<td>Jukka Pajarinen, Tatsuki Sato, Tzu-hua Lin, Florence Loi, Ruth Zhang, Changchun Fan, Zhenya Yao, Stuart B Goodman</td>
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<td>Paper No. 0049</td>
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<td>Mechanotransduction in Articular Chondrocytes: High-Strain Activates Piezo1 and Piezo2 Channels</td>
<td>Wnts5a Treatment Of Embryonic Stem Cell Progenitors Promotes Cartilage Repair In A Rat Osteochondral Defect Model</td>
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<td>Paper No. 0050</td>
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<td>Protective Mechanism Adopted by Chondrocytes through Unfolding of Surface Ruffles during Mechanical Compression</td>
<td>TGFβ1 Signalling in Human Mesenchymal Stem Cells is regulated by the Primary Cilium</td>
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<td>Eng Kuan Moo, Walter Herzog</td>
<td>Marie-Noelle Labour, David Hore</td>
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<td>Paper No. 0051</td>
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<td>Feasibility and Reproducibility of a Displacement Controlled MRI-Compatible Loading Device for Assessing Knee Articular Cartilage Deformation in Human Knees</td>
<td>Intervertebral Disc Regeneration Using Mesenchymal Stem/Stromal Cells Transplanted Via The End-Plate Route in a Large Animal Model</td>
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<td>Hongsheng Wang, Matthew F Koff, Hollis Potter, Russell Warren, Scott Rude, Suzanne Maher</td>
<td>Gianluca Vadali, Fabrizio Russo, Maria Masumeci, Francesca De Strobel, Marco Bernardini, Giulia De Benedictis, Luca Delloro, Domenico D’Avella, Rosaria Giordano, Vincento Dennaro</td>
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<td>Paper No. 0052</td>
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<td>Legg-Calvé-Perthes Disease Produces Chronic Hip Synovitis and Elevation of Interleukin-6 in the Synovial Fluid</td>
<td>Synovial Mesenchymal Stem Cells Enhance Healing of Meniscal Repair In The Avascular Zone of Longitudinal Tear Using A Pig</td>
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<td>Ryuukyo Yamaguchi, Nobuhiro Kamiya, Naga Suresh Adapa, Elena Chen, David Neal, Hicham M Drissi, Harry Kim</td>
<td>Yosuke Nakagawa, Takeshi Muneta, Shupei Kondo, Masafumi Horie, Hideyuki Koga, Ichiro Sekiya</td>
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<td>Paper No. 0053</td>
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<td>Bone Marrow Stimulation Technique Augmented By Ultrapurified Alginate Gel Enhances Osteochondral Repair In A Rabbit Osteochondral Defect Model</td>
<td>Total Disc Replacement Using Tissue Engineered Intervertebral Discs In An In-vivo Beagle Model</td>
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<td>Rikiya Baba, Tomohiro Onodera, Daiki Momma, Masakazu Matsuoka, Kazutoshi Hontani, Norimasa Iwaiwa</td>
<td>Yo Moriguchi, Rodrigo Navarro, Peter Grament, Jorge Mojica, Katherine Hudson, Thamina Khair, Marjan Amini, Lawrence Bonassar, Roger Hartl</td>
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<td>Paper No. 0054</td>
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<td>Administrations Of Tenascin-c Delay Cartilage Degeneration In Murine Models Of Osteoarthritis</td>
<td>The Role of Prostanoid Receptor EP4 on Adhesion Formation in Flexor Tendon Healing - Differential Effects of Tendon-Specific Deletion Versus Systemic Antagonism</td>
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<td>Hironori Unno, Masahiro Hasegawa, Yanyo Matsui, Yoshiuki Suzuki, Takahiro Iino, Yoshimichi Yoshida, Akhiro Sudo</td>
<td>Michael B Gracy, Caitlin Orner, Fatima Bawany, Warren C Hammert, Regis J O’Keefe, Alayna E Losielle</td>
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<td>Paper No. 0055</td>
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<td>Endogenous Stores of Latent TGF-β Serve to Maintain the Integrity and Viability of Articular Cartilage Over Long Term Culture in Response to Physiologic and Excessive Dynamic Mechanical Loading</td>
<td>The Role of Hedgehog Signaling in Enthesis Healing</td>
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<td>Paper No. 0056</td>
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<td>The Synovial Lymphatic System Plays a Critical Role in the Pathogenesis of Osteoarthritis</td>
<td>Human, Muscle-derived Induced Pluripotent Stem Cells Loaded Onto Coral Scaffolds Are Osteoinductive In An Ectopic Mouse Model</td>
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<td>8:00AM-11:15AM</td>
<td>ORS/OREF Basic Science Course: Part II*</td>
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<td>8:00AM-9:00AM</td>
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<td>Biomaterials for Bone Repair</td>
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<td>Knee - Mechanics</td>
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<td>Bone Necrosis</td>
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<td>Pain Pathways and Therapies in Experimental OA</td>
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<td>Tendon/Ligament Cell Biology</td>
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<td>9:00AM-6:00PM</td>
<td>Poster and Exhibit Hall Open</td>
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<td>9:15AM-10:15AM</td>
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<td>Osteoblasts/Progenitor Cells</td>
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<td>Total Hip Replacement</td>
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<td>Metal Wear Reactions</td>
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<td>Imaging and Bone Healing</td>
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<td>Knee OA Repair</td>
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<td>Tendon/Ligament - Repair and Tissue Engineering</td>
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<td>10:30AM-11:00AM</td>
<td>Refreshment Break</td>
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<td>10:45AM-11:00AM</td>
<td>Innovation Theater Presentation: Micro Photonics</td>
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<td>Advancements in Nano-Computed Tomography for Orthopedic Applications</td>
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<td>1:30PM-1:45PM</td>
<td>Innovation Theater Presentation: AMTI</td>
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<td>Refining Simulation in a Bio-fedelic Testing Environment</td>
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<td>2:00PM-3:30PM</td>
<td>WORKSHOPS</td>
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<td>ORS/OTA - Systemic Inflammation and Organ Dysfunction in Multiply Injured Patients</td>
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<td>New Horizon Workshop</td>
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<td>ORS/SOMOS - How an Integrated Orthosis and Rehabilitation Initiative has Improved Outcomes for Lower Extremity Limb Salve Patients</td>
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<td>Improving the Translational Success of Cell-Based Therapies</td>
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<td>Professional Advancement Session: Finding a Partner in Research</td>
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<td>3:45PM-4:45PM</td>
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<td>Diagnostic Imaging: From Spine to Cartilage</td>
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<td>Total Hip &amp; Knee Replacement: Clinical Perspectives and Biomechanics</td>
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<td>PTOA: Studies in Preclinical Models</td>
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SUNDAY | MEETING HIGHLIGHTS CONT.  Sunday, March 29, 2015

4:45PM-6:00PM
Poster Reception I (authors present)
Innovation Central/Marquee Ballroom

7:00PM-10:00PM
ORS Awards Gala Reception and Dinner
Vista Ballroom

SUNDAY | PROGRAM DETAILS

PAPER PRESENTATIONS
8:00 AM – 9:00 AM
See page 32

ORS/OREF BASIC SCIENCE COURSE PART II*
8:00 AM – 11:15 AM (Continued from Saturday, See page 17)
Room 117

Part II: Musculoskeletal Pathophysiology
Tissue Engineering in Orthopaedics
Michael J Yaszemski, MD, PhD, Mayo Medical Center
Bone Injury, Regeneration and Repair
Ralph Marcucio, PhD, University of CA, San Francisco
Molecular Basis of Cancer
R Lor Randall, MD, University of Utah, Huntsman Cancer Institute
Orthopaedic Infections
Joseph C. Wenke, PhD, US Army Institute of Surgical Research
Inflammation in the Musculoskeletal System
Regis J O’Keefe, MD, Washington University, St. Louis
Osteoporosis/Metabolic Bone
Susan V Bukata, MD, University of CA, Los Angeles
Post-Traumatic Osteoarthritis
William Bugbee, MD, Scripps Clinic
Implant Wear and Inflammatory Response
Darryl D D’Lima, MD, PhD, Scripps Clinic
Thromboembolic Disease and Fat Embolism Syndrome
Vincent D. Pellegrini, Jr., MD, Medical University of South Carolina

Pre-registration required
Residents/Students/Associates: $145; ORS and/or AAOS registrants:
$195; Non-Members: $295
All fees include: Orthopaedic Basic Science: Foundations of Clinical
Practice textbook

PAPER PRESENTATIONS
9:15 AM – 10:15 AM
See page 33

BREAK
10:30 AM – 11:00 AM
Innovation Central/Marquee Ballroom
Visit with exhibitors and view posters in Innovation Central.
Refreshments will be served.

INNOVATION THEATER PRESENTATION:
Micro Photonics
Advancements in Nano-Computed Tomography
for Orthopedic Applications
10:45 AM - 11:00 AM
Innovation Central/Marquee Ballroom
Learn how you can achieve unprecedented levels of clarity in
bone-metal interfaces, obtain a high degree of accuracy in low
density polymer scaffold images, and resolve submicron features
in bone regeneration models. The new SkyScan 2211 brings you
cutting-edge technology by combining nano and macro scale
computer tomography in a single unit.
GENERAL SESSION
Kappa Delta, Orthopaedic Research & Education
Foundation, and CORR®/ORS Richard A. Brand Award
for Outstanding Orthopaedic Research Paper
Presentations
11:15 AM - 12:30 PM
Room 118 - 120

Robert L. Mauck, PhD, recipient of the
2015 Kappa Delta Young
Investigator Award
Engineering Dense Connective
Tissues: Mechanical, Material, and
Mechanobiologic Considerations

Steven A. Olson, MD, recipient of the 2015
Kappa Delta Ann Doner Vaughn Award
Early Inhibition of Proinflammatory
Cytokines Prevents Post-Traumatic
Arthritis: Insights from the Natural
History of Arthritis Developing after
Intra-Articular Fracture

William D. Bugbee, MD, recipient of the
2015 Kappa Delta Elizabeth Winston
Lanier Award
Osteochondral Allograft Transplantation
in Cartilage Repair: Graft Storage
Paradigm, Translational Models,
and Clinical Applications

Stuart Weinstein, MD, recipient of the
2015 OREF Clinical Research Award
The Evidence Base for the Prognosis
and Treatment of Adolescent
Idiopathic Scoliosis

Edward M. Schwarz, MD, recipient of the
CORR® ORS Richard A. Brand Award for
Outstanding Orthopaedic Research
A Multiplex Assay of Host
Immunity against S. aureus
for Osteomyelitis Patients

POSTER WALKING TOURS
12:45 PM – 1:45 PM
Innovation Central/Marquee Ballroom

Poster Walking Tours Poster Session I
Tours will feature posters in the following topics:
(Authors may be present.)
Biomaterials – Posters 0273, 0285 and 0286
Bone Biology – Posters 0537, 0572, 0574 and 0589
Bone Fracture – Posters 0633 and 0642
Cancer/Tumors – Posters 1060 and 1069
Cartilage, Synovium & Osteoarthritis – Poster 0435
Diagnostic Imaging – Posters 1114 and 1119
Hip and Knee Arthroplasty – Posters 0869 and 0970
Infection – Posters 1044 and 1045
Knee – Posters 0763, 0802 and 0811
Meniscus – Poster 0521, 0522 and 0523
Spine – Poster 0500
Tendon/Ligament – Poster 0500

Tours are subject to change. Check sign-up board in
Marquee Ballroom for confirmation of tours.

NEW INVESTIGATOR NETWORKING SESSION
An Inside Look at Research Funding Opportunities with the
National Institutes of Health (NIH)*
12:45 PM -1:45 PM
Room 115
Organizers:
The New Investigator Mentoring Committee
Moderators:
Jinxi Wang, MD, PhD
Diana Glaser, PhD

This NIH Networking Session will provide ORS meeting attendees
with an opportunity to better understand NIH funding policy
through one-on-one personal interactions with NIH staff. This
session will allow you to ask specific questions and participate in
small group discussions with NIH grant review administrators and
program officers. Get your questions answered and learn what
funding opportunities are available and which grant mechanisms
are right for you. The workshop will include representatives from
NIAMS, NIA, NIDCR and NIH-CSR.
ORS TRANSLATIONAL RESEARCH SYMPOSIUM
CARTILAGE REPAIR: IS IT POSSIBLE?
12:45 PM – 1:45 PM
Room 121-122
Organizer:
The ORS New Initiatives Committee
Moderator:
George R. Dodge, PhD

This innovative program brings together speakers to present different views on the topic while inspiring attendees to continue the discussion and apply new ideas to their own research. This year, the topic of cartilage repair will be discussed from the point of view of an orthopaedic surgeon and a bioengineer. Both presentations will focus on innovative approaches to this perplexing clinical problem.

A Physician-Scientist's Prospective:
25 Years of Clinical Effort
Kevin R. Stone, MD,
The Stone Clinic (Above)
Cracking the
Cartilage Conundrum:
A Bioengineer's View
Gordana Vunjak-Novakovic, PhD,
Columbia University (Below)

ORS CLINICAL RESEARCH FORUM:
The Basis for Clinical Decision Making in Orthopaedics
12:45 PM – 5:00 PM
Room 116
Organizer:
The ORS Clinical Research Committee
Kurt Spindler, MD, Chair

The ORS Clinical Research Forum will bring together key clinical research leaders to discuss the design, evaluation and reporting of clinical studies. Furthermore they will discuss comparative effectiveness research and explore the emerging field of economic analysis.

Session I: Design, Evaluation, and Reporting of Clinical Studies
Moderator: Roy K. Aaron, MD, The Warren Alpert Medical School of Brown University

Principals of Observational Studies
Kurt P. Spindler, MD, Cleveland Clinic Foundation

Design, Strengths, and Limitations of Observational Trials
Morgan H. Jones, MD, MPH Cleveland Clinic for Sports Health

Structure of Randomized, Controlled Studies
Marc F. Swiontkowski, MD, University of Minnesota Medical Center

Sources of Uncertainty in Randomized Controlled Studies
Roy K. Aaron, MD, Warren Alpert Medical School of Brown University

Changing Federal Regulations for Clinical Research
Jennifer Racine, MBA, Warren Alpert Medical School of Brown University

Session II: Comparative Effectiveness Research
Moderator: Kristy Weber, MD, University of Pennsylvania

What is Comparative Effectiveness Research?
James O. Sanders, MD, University of Rochester

A Practical Approach to Determining Effectiveness in Treating Hip and Knee Arthritis
David S. Jevsevar, MD, Intermountain Zion Orthopaedics & Sports Medicine

From Gaps in Knowledge to Translation of Effectiveness to Patients with ACL Injuries
Kevin G. Shea, MD, St. Luke’s Clinic

Session III: Economic Analysis
Moderators: Saam Morshed, MD, University of California and Kurt Spindler, MD, Cleveland Clinic Foundation

Defining Effectiveness Evaluation, Comparative Effectiveness and Economic Analysis of Clinical Literature and Practice
James Slover, MD, MS, NYU Hospital for Joint Diseases

Basic and Definitions
Amy M. Cizik, MPH, University of Washington

Putting it All Together – the MOON experience
Richard C. Mather, MD, Duke University

INNOVATION THEATER PRESENTATION:
National Disease Research Interchange (NDRI)
Project-driven Human Biospecimen Service for Biomedical Research
1:00 PM – 1:15 PM
Innovation Central/Marquee Ballroom

The National Disease Research Interchange (NDRI) is a 501(c)(3) not-for-profit, NIH-funded organization that provides project-driven human biospecimen service to academic and corporate scientists. NDRI has over 30 years of experience internationally distributing anatomical structures, organs, and tissues for biomedical research. Please by stop to discuss how our programs can help advance your research.
INNOVATION THEATER PRESENTATION:

AMTI
Refining Simulation in a Bio-fidelic Testing Environment
1:30 PM – 1:45 PM
Innovation Central/Marquee Ballroom

The past decade has seen a shift in the type of failure modes and thus an evolution of the functional evaluation of prosthetic designs. True simulation of the complexity of the surrounding joint tissues, kinematics and kinetics relevant to the patient, is the focus of this presentation. We will be highlighting the importance of testing joint implants in a more bio-fidelic environment and how this will set the testing benchmark for potential failure modes improving the implant’s function and durability.

WORKSHOPS
2:00 PM – 3:30 PM

New Horizon Workshop: ORS/OTA - Systemic Inflammation and Organ Dysfunction in Multiply Injured Patients
Room 113 - 114
Organizer:
Todd McKinley, MD, Indiana University Methodist

Multiply injured patients sustaining major orthopaedic injuries are at risk to develop sustained high magnitude inflammation and organ dysfunction. Evidence continues to accumulate demonstrating that endogenous inflammation secondary to tissue damage and ischemia plays a central pathoetiologic role in propagating inflammation leading to organ dysfunction. This workshop will highlight scientific progress in understanding the mechanisms causing systemic inflammation and to discuss the clinical significance of basic scientific progress.

Systemic Inflammation and Organ Dysfunction: Clinical Manifestations in Multiple Injured Patients Sustaining Major Fractures
H. Christopher Pape, MD, University of Aachen

Molecular Mechanisms of Systemic Inflammation in Multiply Injured Patients
Timothy R. Billiar, MD, University of Pittsburgh Medical Center

Therapeutic Interventions: Pre-Clinical Models to Treat Systemic Inflammation and Damaged Associated Molecular Patterns
Todd McKinley, MD, Indiana University Methodist

ORS/SOMOS - How an Integrated Orthosis and Rehabilitation Initiative has Improved Outcomes for Lower Extremity Limb Salvage Patients
Room 111 - 112
Organizers:
Daniel J. Stinner, MD, United States Army
Benjamin K. Potter, MD, Walter Reed National Military Medical Center

High-energy lower extremity trauma is common during military combat. Only recently have studies began to evaluate the outcomes of those service members who have chosen a limb salvage instead of an amputation. A custom energy-storing ankle-foot orthosis (Intrepid Dynamic Exoskeletal Orthosis, IDEO) was developed at our institution to be used in conjunction with a high-intensity rehabilitation program (Return to Run Clinical Pathway, RTR) designed to return injured service members to pre-injury, high-level physical activities. The purpose of this workshop is to highlight the outcomes, future research directives, and clinical applications of the IDEO and RTR. Multiple research studies have been conducted to evaluate the effectiveness of the IDEO and the RTR to evaluate the efficacy, utilization, and benefits of the IDEO and RTR. This workshop will help the audience understand the biomechanics behind the IDEO, physiology behind the RTR, the effective ways both have been used to improve the clinical outcomes of our severely wounded service members and the future applications of both innovations.

The Return to Run Pathway - The Physiology of a Successful Rehabilitation Program
Johnny Owens, CPT, Brooke Army Medical Center

The Clinical Effects of Return to Run Pathway and IDEO on Patient Outcomes
Daniel J. Skinner, MD, United States Army

The Biomechanics of the IDEO: How Does it Work?
Jason M. Wilken, PhD, United States Army
ORS Collaborative Exchange Grant

The ORS Collaborative Exchange Grants foster orthopaedic research by supporting interaction between research institutions. This grant, of up to $7,500, provides investigators at any stage of their career an opportunity to visit a research lab for the purpose of collaboration and knowledge exchange.

2015 Recipients:

- Dominik R. Haudenschild, PhD
- Virginia Ferguson, PhD

ORS/RJOS Young Female Investigator Travel Grant

The ORS/RJOS Young Female Investigator Travel Grant promotes and supports young female investigators in the field of orthopaedic research. This $1,000 grant represents the synergy of female leadership in the act of inspiring the younger generation of women in the field. The RJOS and WLF/ORS will present one travel award to a young female trainee whose abstract is accepted to an ORS annual Meeting.

2015 Recipient:

- Chantal M. de Bakker

For more information on ORS grants, eligibility and deadlines, please visit:

http://www.ors.org/early-careernew-investigators-awards/
Improving the Translational Success of Cell-Based Therapies
Room 118 - 120
Organizers:
Jennifer J. Bara, PhD, AO Research Institute
Marietta Herrmann, PhD, AO Research Institute
Geoff Richards, PhD, AO Research Institute
This workshop will address the clinical, scientific, and industrial requirements for the successful translation of cell-based therapies into both the clinic and market with an emphasis on educating investigators new to the translational process. By identifying current challenges and ascertaining the perceptions and needs of future investigators, we will make suggestions and encourage workshop participants to put forward innovative ideas on how to improve our rates of translational success in the future.

Clinical Considerations for Translational Success
Theodore Miclau, MD, University of California, San Francisco

Scientific Considerations for Translational Success
Christopher H. Evans, PhD, Mayo Clinic

Industrial Considerations for Translational Success
Anthony Ratcliffe, PhD, Synthasome, Inc.

PROFESSIONAL ADVANCEMENT SESSION
Finding a Partner in Research
2:00 PM - 3:30 PM
Room 121 - 122
Organizer:
The ORS Corporate Affairs Committee
Moderators:
Jeremy Rawlinson, PhD
Michael Ominsky, PhD
Collaboration is one hallmark of good research and research is strengthened when it is collaborative. Most challenging research problems are multi-disciplinary and multi-factorial. This requires researchers to reach outside their core expertise to make common connections. Why is it important to collaborate? What are the best ways to find a partner in research? These and other questions will be considered in this workshop. Participants will learn about modern tools that assist in the collaborative process, understand the impact of collaboration on advancing science and obtaining grant funding, and compare collaborative approaches from both academic and industrial perspectives.

Importance of Collaboration in Academia
Jeff Lotz, PhD, UCSF, CA

The ORS and its Role in Encouraging Collaboration
Tammy L. Haut Donahue, PhD, Colorado State University

Collaboration Between Industry and Academia: Guidelines for a Successful Relationship
Dick Tarr, MS, Kannapolis, NC

PAPER PRESENTATIONS
3:45 PM – 4:45 PM
See page 34

POSTER RECEPTION I
4:45 PM – 6:00 PM
Marquee Ballroom
Poster Session I presenters should be available at their posters during this reception to answer questions.

ORS AWARDS GALA
7:00 PM – 10:00 PM
Vista Ballroom
Join us for an elegant evening honoring these outstanding leaders in the Orthopaedic Research Community: The recipients of the William Harris Award, Marshall Urist Award, Alfred Shands Award, Kappa Delta Research Awards, OREF Clinical Research Award, CORR® ORS Richard A. Brand Award for Outstanding Research ORS/OREF Distinguished Investigator Award, ORS Women’s Leadership Award, the ORS New Investigator Recognition Awards (NIRA), the ORS Outstanding Achievement in Mentoring Award and the ORS Video Outreach Competition Awards.

New this year, The ORS New Initiatives Committee will be holding a Silent Auction during the Gala to benefit orthopaedic research and the ORS/OREF Grants Campaign.

Pre-registration required
$115 ORS Members/$125 Non-Members/
$1,000 for a table of 10
CONGRATULATIONS TO ALL OF THE 2015 AWARD RECIPIENTS

2015 Kappa Delta Young Investigator Award
Robert L. Mauck, PhD, University of Pennsylvania
Co-Authors: Dawn M. Elliott, PhD and Jason A. Burdick, PhD Engineering Dense Connective Tissues: Mechanical, Material, and Mechanobiologic Considerations
Bridgette Furman, BS, and Janet Huebner, MS

2015 Kappa Delta Ann Doner Vaughan Award
Steven A. Olson, MD, Duke University
Co-Authors: Farshid Guilak, PhD, Virginia Kraus, MD, PhD, M. Elliott, PhD and Jason A. Burdick, PhD Engineering Dense Connective Tissues: Mechanical, Material, and Mechanobiologic Considerations

2015 Kappa Delta Elizabeth Winston Lanier Award
William D. Bugbee, MD, Scripps Clinic
Co-Authors: Andrea L. Pallante-Kichura, PhD, Simon Görtz, MD, Robert Sah, MD, ScD, and David Amiel, PhD
Osteochondral Allograft Transplantation in Cartilage Repair: Graft Storage Paradigm, Translational Models, and Clinical Applications

2015 OREF Clinical Research Award
Stuart L. Weinstein, MD, University of Iowa
Co-Author: Lori A. Dolan, PhD
The Evidence Base for the Prognosis and Treatment of Adolescent Idiopathic Scoliosis

2015 CORR® ORS Richard A. Brand Award for Outstanding Orthopaedic Research
Edward M. Schwarz, PhD, University of Rochester
A Multiplex Assay of Host Immunity against S. aureus for Osteomyelitis Patients

Women’s Leadership Forum Award
Marjolein van der Meulen, PhD, Cornell University

Alfred R. Shands, Jr., MD Award
Linda Sandell, PhD, Washington University in St. Louis

ORS/OREF Distinguished Investigator Award
Adele Boskey, PhD, Hospital for Special Surgery

ORS William H. Harris, MD Award
Marco Caicedo, PhD, Orthopedic Analysis, LLC

ORS Marshall R. Urist, MD Award
Mauro Alini, PhD, AO Research Institute Davos

ORS Outstanding Achievement in Mentoring Award
Dawn Elliott, PhD, University of Delaware

ORS Outstanding Achievement in Mentoring Award
Steven A. Goldstein, PhD, Orthopedic Analysis, LLC

ORS Outstanding Achievement in Mentoring Award
Dawn Elliott, PhD, University of Delaware

ORS Outstanding Achievement in Mentoring Award
Steven A. Goldstein, PhD, Orthopedic Analysis, LLC

AAOS Women’s Health Issues Advisory Board Award
Douglas J. Adams, PhD, Connecticut Health
**SUNDAY | SESSIONS 8:00AM–9:00AM**

**Sunday, March 29, 2015**

<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION 11 Biomaterials for Bone Repair</th>
<th>SESSION 12 Knee Mechanics</th>
<th>SPOTLIGHT SESSION 13 Bone Necrosis</th>
<th>SPOTLIGHT SESSION 14 Pain Pathways &amp; Therapies in Experimental OA</th>
<th>SESSION 15 Tendon/Ligament Cell Biology</th>
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## Session 16: Progenitor Cells

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<tbody>
<tr>
<td>9:15 AM</td>
<td>Mechanical Loading Attenuates Radiation-Induced Bone Loss in Bone Marrow Transplanted Mice</td>
<td>One Third of 195 Failed MOM-THR Hips have Severely Corroded Taper Junc</td>
<td>Modification Of En Bloc Staining And Clearing Techniques For Improved 3D Imaging Of Musculoskeletal Cell Properties In Situ</td>
<td>Multi-modal Imaging For Structure-Function Characterization Of Periosteum’s Smart Properties</td>
<td>Fatigue Failure in Cancellous Bone is Primarily Due to Propagation of Microdamage from Pre-existing Microdamage Sites</td>
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<tr>
<td></td>
<td>Peter M Govey, Henry J Donahue</td>
<td>tions: An Elevated Blood Co/Cr Ratio is a Biomarker for this</td>
<td>and Clearing Techniques For Improved 3D Imaging Of Musculoskeletal Cell Properties In Situ</td>
<td>Renee Whan, Joanna L. Ng, Ulf Knothe, Simon Tang, PhD</td>
<td>Ashley M Torres, Jonathan B. Matheny, Marysol Luna, Clare M Rimmac, Christopher J Hernandez</td>
</tr>
<tr>
<td></td>
<td>Within Subject Changes To Tibial Articular Cartilage Thickness 4-5 Years Post Ac-injury</td>
<td>Whole Blood Stimulates ACL Repair in Pigs as Effectively as Mesenchymal Stem Cells</td>
<td>ACL Degeneration As An Early Marker Of Future Osteoarthritic Changes In The Knee</td>
<td>Surface Modification with Chemically Modified Synovial Fluid for Fixator Tendon Reconstruction in a Canine Model In Vivo</td>
<td>Hamesing Endogenous Stem/Progenitor Cells For Tendon Regeneration</td>
</tr>
<tr>
<td></td>
<td>Enhancement of Achilles Tendon Repair Viscoelasticity with Blockade of Matrix Metalloproteinase</td>
<td>Alteration In Neuronal Signaling During Diabetic Tendon Repair: A Study In Rat</td>
<td>The Effect of Sex on the Biomechanical Outcomes of Bio-enhanced Anterior Cruciate Ligament Repair: A Large Animal Pre-clinical Study</td>
<td>Elongation Of The Anteromedial And Posteroslateral Bundles Of The Ad During Hyper-extension Of The Knee: Implication To Double-bundle Act Reconstruction</td>
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</tbody>
</table>
### SESSION 21
**Diagnosis Imaging: From Spine to Cartilage**

**Room # 111-112**

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:45 PM</td>
<td>Paper No. 0113</td>
<td>qMRI T2 Texture Change To Articular Cartilage In Humans Over 6 Months Predicts Change To Knee Health And Cartilage Thickness Over 2 Years Following ACL Injury And Reconstruction</td>
<td>Ashley A Williams, Carl S Winalski, Constance R Chu</td>
</tr>
<tr>
<td>3:55 PM</td>
<td>Paper No. 0114</td>
<td>Changes in Tibiofemoral Gait Kinematics Are Associated with Regional Cartilage Morphological Changes</td>
<td>Eric Thoenhauer, Kimberly Sasi, Andrew Snappakasam, James J Jimpang, Freddie H. Fu, Scott Tashman</td>
</tr>
<tr>
<td>4:05 PM</td>
<td>Paper No. 0115</td>
<td>The Relationship Between Cartilage And Subchondral Bone And Their Effect On The Mechanical Properties Of Human Metacarpophalangeal Joint Cartilage</td>
<td>Daniel Ellis, Ben Lakin, Joshua Shlefsky, Mark Grinstaff, Brian Snyder</td>
</tr>
<tr>
<td>4:15 PM</td>
<td>Paper No. 0116</td>
<td>Digital Tomosynthesis and High Resolution Computed Tomography as Clinical Tools for Vertebral Endplate Topography Measurements: Comparison with Micromincomputed Tomography</td>
<td>Daniel Otterer, Abeer Quazi, Angela Xiao, Ellen Yang, Michael J Flynn, Yener N Yeni</td>
</tr>
<tr>
<td>4:35 PM</td>
<td>Paper No. 0118</td>
<td>Neutrophil-specific, Near-Infrared Fluorescence Imaging of Acute Intervertebral Disc Herniation</td>
<td>Li Xiao, Mengmeng Ding, Yi Zhang, Mahendra D Choudha, Tao Wang, Francis H Shen, Li Jin, Xiaoming Fu</td>
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### SESSION 22
**Total Hip & Knee Replacement: Clinical Perspectives and Biomechanic**

**Room # 113-114**

<table>
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<tr>
<th>Time</th>
<th>Paper No.</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>3:45 PM</td>
<td>Paper No. 0119</td>
<td>Total Joint Arthroplasty in Smokers: Should We Wait for Patients to Quit Before Operation?</td>
<td>Andrew James Pagely, Christopher Martin, Yubo Gao, Melissa Willenborg, Kyle Duchman, John Callaghan</td>
</tr>
<tr>
<td>4:05 PM</td>
<td>Paper No. 0120</td>
<td>Clinically Anchored Benchmarks for Gait Improvement after Total Hip Arthroplasty</td>
<td>Khrama C Foucher</td>
</tr>
<tr>
<td>3:45 PM</td>
<td>Paper No. 0124</td>
<td>The Effect of Stem Length on Strain and Micromotion in the Proximal Femur following Total Hip Arthroplasty</td>
<td>Scott R Small, Sarah E Hensley, Paige L Cook, Rebecca A Steven, Renee D Rogge, Michael E Berend</td>
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</table>

### SPOTLIGHT SESSION 23
**PTOA: Studies in Preclinical Models**

**Room # 118-120**

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:45 PM</td>
<td>Spotlight Speaker</td>
<td>Anti-Inflammatory Effect of Hepatocyte Growth Factor in Acute Phase of Spinal Cord Injury</td>
<td>Koichi Masuda, MD and Nadeen O. Chahine, PhD</td>
</tr>
<tr>
<td>4:05 PM</td>
<td>Paper No. 0125</td>
<td>Nanomechanical Symptoms in Cartilage Precede Histological Osteoarthritis Signs after the Destabilization of Medial Meniscus in Mice</td>
<td>Basak Doyran, Werl Tong, Qiang Li, Haerou Aa, Xianrong Zhang, Motomi Enomoto-Iwamoto, Ling Qiu, Lin Han</td>
</tr>
<tr>
<td>4:15 PM</td>
<td>Paper No. 0126</td>
<td>Cartilage-specific EHF Knockout Mice are Protected from Cartilage Degradation in a Surgically-induced Osteoarthritis Model.</td>
<td>Elisabeth Hondimus, Jun Chang, Kirby Colley, Cecilia Dragomir, Darren Plumb, Justin Quinn, Mary B Goldring, Miguel Otero</td>
</tr>
<tr>
<td>4:25 PM</td>
<td>Paper No. 0127</td>
<td>Effects of Single Local Injection of Local Anesthetic Agents on Intervertebral Disc Degeneration: Ex Vivo and Long-Term In Vivo Experimental Study</td>
<td>Koji Iwasaki, Hiroki Sudo, Katsuhisa Yamada, Takashi Ohnishi, Takero Takebayashi, Izaya Dyon, Toshikiko Yamashita</td>
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### SESSION 24
**Spine Therapeutics**

**Room # 121-122**

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:45 PM</td>
<td>Paper No. 0129</td>
<td>Low-energy Extracorporeal Shock Wave Therapy Promotes VEGF Expression and Angiogenesis and Improve Locomotor and Sensory Functions after spinal cord injury</td>
<td>Kenichiro Tahata, Hiroshi Ozawa, Hayao Kanno, Seji Yamaya, Satoshi Tate, Kenta Ita, Horiuki Shimokawa, Eiji Itou</td>
</tr>
<tr>
<td>4:05 PM</td>
<td>Paper No. 0130</td>
<td>Annuus Fibrous Cells And II-beta Independently Regulate 3d Axonal Outgrowth From The Cultured Dorsal Root Ganglions (DRG)</td>
<td>Hyunchul Kim, Sameer B. Shah, Adam H Hsieh</td>
</tr>
<tr>
<td>4:15 PM</td>
<td>Paper No. 0131</td>
<td>Changes In Synaptic Transmission Of Substantia Gelatinosa Neurons In A Rat Model Of Lumbar Radicular Pain</td>
<td>Yoshinori Terahama, Tsuyoshi Miyakawa, Toune Takebayashi, Izaya Dyon, Toshikiko Yamashita</td>
</tr>
</tbody>
</table>
## 6:30AM-7:45AM
Research Interest Group (RIG): Good and Bad Animal Models
Room 106 - 107

## 7:00AM-9:45AM
Present Your Science: Transforming Technical Talks with Melissa Marshall
Room 117

## 8:00AM-9:00AM
### SECTIONS
Mediators of Joint Repair
Room 118-120

Osteocytes and Mechanobiology
Room 111-112

Shoulder and Elbow Arthroplasty
Room 113-114

Tendon/Ligaments-Mechanics
Room 121-122

Biglycan in Bone Healing
Spotlight Session:
Room 116

## 9:00AM-5:30PM
Poster and Exhibit Hall Open
Innovation Central/Marquee Ballroom

## 9:15AM-9:45AM
Refreshment Break
Innovation Central/Marquee Ballroom

## 10:00AM-11:00AM
### General Session: Shands Lecture, Presidential Address, 1st Vice Presidential Address, and ORS Business Meeting
Room 118 - 120

### Animal Welfare in Orthopaedic Research: Focus on Refinement and Reduction
Room 116

### The Realities of Commercializing Orthopaedic Technologies: Business Strategies, Funding, Partnerships, and Juggling Academic & Corporate Roles
Room 111-112

### ORS/MSTS The Osteoclast and Bone Diseases
Room 118 - 120

### Publications Workshop: Improve Your Chances of Getting Published
Room 117

### Professional Advancement Session: Rising to the Top: Leadership Success in Academics
Room 121-122

## 11:15AM-12:15PM
### SESSIONS
Aging & OA
Room 118-120

Genetics: Bone Development, Bone Aging
Room 111-112

Shoulder and Elbow - Disease Process
Room 113-114

Spine Disc Biology and Repair
Room 121-122

Muscle/Tendon Biology and Repair
Room 116

## 12:30PM-1:30PM
### Poster Walking Tours
Marquee Ballroom

### New Investigator Networking Session: Position Yourself for a Successful Career: Setting Foundational Early Career Goals
Room 121-122

### Industry Connect
Room 116

## 1:45PM-3:15PM
### ORS/POSNA Key Concepts of Musculoskeletal Infection
Room 113 - 114

### Workshops

### Publications Workshop: Improve Your Chances of Getting Published
Room 117

### Professional Advancement Session: Rising to the Top: Leadership Success in Academics
Room 121-122

### Awards Session: Urist Lecture, NIRA Awards, Video Outreach Competition Awards, Harris Award, WLF Award, ORS/OREF Collaborative Exchange Award, Distinguished Investigator Award, ORS Outstanding Achievement in Mentoring Award
Room 118 - 120

### Poster Reception II (authors present)
Innovation Central/Marquee Ballroom

### Women's Leadership Forum Reception
Vista Ballroom
ANCILLARY EVENT

Good and Bad Animal Models for Orthopaedic Research: Scientific and Ethical Considerations
6:30 AM – 7:45 AM

Room 106 - 107
Organizer:
Stephan Zeiter, PhD, AO Research Institute

Objectives:
There is a scientific and ethical imperative that clinically most relevant models are used for orthopaedic research. Scientifically, the models should mimic as much as possible the (human) clinical situation. Ethically, according to the 3R principle, the number of animals used should be kept a minikum and potential pain, suffering, or distress should be minimized in all animals used in order to enhance animal welfare.

COMMUNICATIONS WORKSHOP

Present Your Science: Transforming Technical Talks with Melissa Marshall
(Formerly The Craft of Scientific Presentations Workshop)
7:00 AM – 9:45 AM

Room 117
Melissa Marshall, Penn State University

This workshop has three goals: (1) to teach participants effective strategies for structuring their research presentations; (2) to have participants completely rethink the design of presentation slides; and (3) to have participants analyze what would be their best delivery style. These goals are reached through lecture, discussion, analysis of filmed presentations, and exercises. In addition, workshop attendees will learn effective strategies for making an “elevator pitch” (a 1 – 2 minute summary) about their research. Video examples of effective elevator pitches will be shown and analyzed.

Pre-registration required
$20 ORS Members /$25 Non-Members

ORS 2015 ANNUAL BUSINESS MEETING AGENDA

Year in Review – Mary B. Goldring, PhD, ORS President
ORS Priorities – Mathias Bostrom, PhD, 1st Vice President
Collaborations – Farshid Guilak, PhD, 2nd Vice President
Finance Report – Gloria Matthews, PhD, Treasurer
ORS Newly Elected Officers, Committee Members
Welcome to New Members

PAPER PRESENTATIONS
8:00 AM – 9:00 AM
See page 40

BREAK
9:15 AM – 9:45 AM
Innovation Central/Marquee Ballroom
Visit with exhibitors and view posters in Innovation Central. Refreshments will be served.
POSTER WALKING TOURS
12:30 PM – 1:30 PM
Innovation Central/Marquee Ballroom

Poster Walking Tours Poster Session II
Tours will feature posters in the following topics:
(Authors may be present.)

- Biomaterials – Posters 1125, 1127, 1155 and 1182
- Bone Biology – Posters 1402, 1419, 1440, 1452 and 1476
- Bone Fracture – Poster 1506
- Cartilage, Synovium & Osteoarthritis – Posters 1199, 1204, 1274 and 1304
- Foot and Ankle – Posters 1899 and 1902
- Meniscus – Posters 1321 and 1372
- Spine – Posters 1578, 1593 and 1597
- Trauma – Posters 1915 and 1916

Tours are subject to change. Check sign-up board in Marquee Ballroom for confirmation of tours.

NEW INVESTIGATOR NETWORKING SESSION
Position Yourself for a Successful Career: Setting Foundational Early Career Goals
12:30 PM – 1:30 PM
Room 121-122
Organizer:
The New Investigator Mentoring Committee
Moderators:
Nelly Andawaris-Puri, PhD
Devina Purmessur, PhD

As a young investigator, establishing early career goals can be challenging as you juggle setting-up your own program and teaching/service commitments. What types of grants you should apply for as a junior PI and when you should apply are critical decisions faced in the early stages. In addition, establishing yourself for success and promotion is dependent on becoming a leading expert in your field at the national and international level. How can you become recognized across the globe? How do you maximize my chances of getting a funded grant? From deciding when to submit your first grant to establishing yourself in the national and international arena, this networking session will provide guidance and advice based on ORS mentors own experiences and will focus strategic grant submissions, maximizing your chances of getting funded, establishing effective collaborations and opportunities to network at home and overseas.

Pre-registration required

AGENDA
12:30 – 12:35PM
Welcome & Introductions
Nelly Andawaris-Puri, PhD and Devina Purmessur, PhD

12:35 – 12:50PM
Grant Submissions Strategies
Stavros Thomopoulos, PhD

12:50 – 1:05PM
Gaining National and International Reputation
Gordana Vunjak-Novakovic, PhD

1:05 – 1:30PM
Q&A
Moderators: Nelly Andawaris-Puri, PhD and Devina Purmessur, PhD

INDUSTRY CONNECT
12:30 PM – 1:30 PM
Room 116
Organizer:
The ORS Corporate Affairs Committee

The ORS Corporate Affairs Committee (CAC) believes that collaboration between industry and academic or medical research institutions plays a critical role in furthering research efforts and accelerating innovative patient care. Industry Connect is an excellent opportunity for ORS attendees currently affiliated with industry, directly through employment or indirectly through joint research programs, to network and discuss opportunities to advance the development of partnerships in orthopaedic research. In addition, attendees will have the opportunity to give the CAC feedback on how the ORS can better meet their needs as industry representatives.

Pre-registration required

WORKSHOPS
1:45 PM – 3:15 PM

ORS/POSNA Key Concepts of Musculoskeletal Infection
Room 113-114
Organizer: Jonathan G. Schoenecker, MD, PhD, Vanderbilt University

Musculoskeletal infection is an unremitting process which, if not rapidly identified and treated, results in substantial morbidity and mortality. Although the immune system has a great capacity to eradicate infection, for unknown reasons it is particularly inefficient at resolving infections of musculoskeletal tissue, especially in bone. Prior to the development of antibiotics and the capacity to perform surgical excision/drainage, the mortality rate of osteomyelitis was reported as high as 40%. Medical and surgical
advances during the 20th century dramatically improved outcomes of these patients. However, since infection of musculoskeletal tissue remains a significant global health care burden, there is a continued and substantial need for development of novel diagnostic, pharmaceutical, surgical, tissue regenerative and clinical practice guidelines to improve and potentially save the lives of patients inflicted with infection of musculoskeletal tissue. In this ORS/POSNA forum we will discuss key advances and unanswered questions in order to continue the advancement in clinical care of patients with musculoskeletal infection in the 21st century.

Improved Recognition and Treatment of Infection Induced Comorbidity and Mortality
Jonathan Schoenecker, MD, PhD, Vanderbilt University

Identifying and Targeting Bacterial Factors
Lawson Copley, MD, Children's Medical Center of Dallas

Repairing the Damage Caused by Infection
Brian Snyder, MD, PhD, Children's Hospital

Imaging Musculoskeletal Infection
Scott B. Rosenfeld, MD, Texas Children's Hospital

Animal Welfare in Orthopaedic Research: Focus on Refinement and Reduction
Room 116
Organizers:
Timothy E. Cooney, MS, UPMC Hamot Medical Center
Laurie R. Goodrich, DVM, PhD, Colorado State University

It remains a foregone conclusion that animals have helped to advance knowledge in the area of medical sciences. Ethically, the welfare of research animals should form the basis for conducting in vivo studies. The ‘3R’s; Replacement, Reduction, and Refinement, constitute the principal tenets to assure conformance to this ethical principal of animal welfare. This workshop will focus on, Refinement and Reduction. Specifically, we will focus our attention on institutional compliance with PHS guidelines for the reduction of pain and distress in animals, generalized approaches to refining animal-based protocols, and methods and unique opportunities to reduce animal use in experiments. Attendees will also be provided with a listing of references and resources to allow them to further their understanding of animal welfare issues and how to implement changes that will simultaneously benefit their animal study subjects and the quality of outcomes obtained from experimentation.

A Look at Complying with PHS Requirements for Managing Pain and Distress in Laboratory Animals
Patricia Brown, DVM, NIH, Office of Laboratory Animal Welfare

Refinement of Induced Animal Models
Jeremiah Easley, DVM, Colorado State University

The Team Approach to Implementing the 3R’s
Stephan Zeiter, DVM, PhD, DipECLAM, AO Research Institute Davos

Controlled Veterinary Clinical Trials: Is There a Role for Natural Models in Proving Efficacy of Therapeutics in Orthopaedics?
Alicia L. Bertone, DVM, PhD, Ohio State University

The Realities of Commercializing Orthopaedic Technologies: Business Strategies, Funding, Partnerships, and Juggling Academic & Corporate Roles
Room 111-112
Organizer: Suzanne A. Maher, PhD, Hospital for Special Surgery

Despite the wealth of innovation in the orthopaedic sciences, few technologies are translated to clinical use. This is in part caused by the philosophical divide that exists between orthopedic scientists and entrepreneurs, the fact that the path required to commercialize technology is opaque, and that funding mechanisms are complex. This workshop aims to de-myth the process of commercializing technology. Our goal is to highlight successful commercialization strategies, common challenges in the translation of orthopaedic science to industry, and new funding initiatives that are being launched at the local and federal levels.

The Realities of Commercializing Orthopaedic Technologies: Business Strategies, Funding, Partnerships, and Juggling Academic & Corporate Roles
Tom Cirrito, PhD, New York

Bedside to Bench and Back: Translation and Commercialization of Novel Treatments from the Perspective of an Academic Medical Center
Michael J. Yaszemski, MD, PhD, Mayo Medical Center

The Role of the National Institutes of Health in Translating Research from the Bench to the Bedside
Gayle Lester, PhD, Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health

ORS/MSTS The Osteoclast and Bone Diseases
Room 118-120
Organizers:
Richard K. Terek, MD, FACS, Brown University
Regis J. O’Keefe, MD, PhD, Washington University in St. Louis

Osteoclast related diseases span a wide spectrum of clinical problems including giant cell tumor of bone and periprosthetic osteolysis. The mechanisms of osteoclastogenesis are not fully understood, nor is the extent to which the mechanisms share similarities in these different scenarios. Treatment options for inhibiting osteoclast activity are only partially effective, highlighting the need for a better understanding of osteoclast biology and targeted therapy. This MSTS sponsored symposium will review the current understanding of osteoclastogenesis and the interaction of giant cells and stromal cells in giant cell tumor of bone and periprosthetic osteolysis. Potential new therapeutic targets will also be highlighted.

Osteoclast Biology and Clinical Challenges
Wentian Yang, MD, PhD

Osteoclast-like Cells in Giant Cell Tumor of Bone
Michelle Ghert, MD, FRCS
Role of Osteoprogenitor Cells and Inflammatory Signaling in Perioprosthetic Osteolysis
Francis Y. Lee, MD, PhD

Publications Workshop: Improve Your Chances of Getting Published

Room 117
Organizer: Linda Sandell, PhD, Washington University in St. Louis
Meet with JOR® Editor-in-Chief Linda Sandell, PhD at this year’s Publications Workshop. You’ll learn how to improve the quality of your journal manuscripts, what JOR® is looking for and how to increase your chances of getting published. Wiley staff will also update you on maximizing visibility for your paper, navigating the submission process and timeline, and taking advantage of the latest technology. Whether you’re a new author considering submitting a paper or a seasoned journal contributor, don’t miss this unique opportunity to hear directly from and interact with JOR®’s editor! Seating is limited

PROFESSIONAL ADVANCEMENT SESSION
Rising to the Top: Leadership Success in Academics
1:45 PM - 3:15 PM
Room 121-122
Organizer: ORS Women’s Leadership Forum
Moderator: Karen B. King, PhD, University of Colorado School of Medicine
Many individuals aspire to higher leadership roles within academics. The WLF Committee will engage ORS members who are in high-level academics positions to discuss how to navigate academic medicine and rise to leadership in the clinical, basic science and engineering arenas. The speakers will discuss how they balance academic leadership with their active research programs as well as provide practical advice for those who are interested in obtaining similar leadership roles. An open panel discussion will follow the presentations. Open to meeting attendees at any career stage, this session will explore the challenges and successes of academic leadership while illustrating the importance of career-long mentorship and sponsorship from a leadership position.

Making an Impact in the Dean’s Office
Clare M. Rimnac, Ph.D., Associate Dean of Research, Case Western Reserve University (ORS Past President)

Servant Leadership
Joshua Jacobs, MD, Chair, Department of Orthopedic Surgery, Rush University; Director, Section of Biomaterials; Chair, Scientific Leadership Council for the RTSC (ORS Past President, AAOS Past President)

It Takes a Village to Make a Dean
Barbara D. Boyan, Ph.D. Dean, School of Engineering, Virginia Commonwealth University

My American Dream: from Immigration to Leadership
Susan Chubinskaya, PhD, Associate Provost, Academic Affairs, Rush University; The Ciba-Geigy Professor of Biochemistry with conjoint appointments at the Departments of Orthopedic Surgery & Medicine (Section of Rheumatology)

ORS AWARDS SESSION
3:30 PM – 4:15 PM

Marshall R. Urist, MD
Award and Lecture
Mauro Alini, PhD

ORS Women’s Leadership Forum Award
Marjolein van der Meulen, PhD

William H. Harris, MD Award
Marco S. Caicedo, PhD

ORS/OREF Distinguished Investigator Award
Adele Boskey, PhD

ORS Outstanding Achievement in Mentoring Award
Dawn M. Elliott, PhD
Steven A. Goldstein, PhD

New Investigator Recognition Awards (NIRA)
TBD

Video Outreach Competition (VOC)
First Place: Emily Hargrave-Thomas
Second Place: Nico Verdonschot, PhD

POSTER RECEPTION II
4:15 PM – 5:30 PM
Innovation Central/Marquee Ballroom
Poster Session II presenters should be available at their posters during this reception to answer questions.

WOMEN’S LEADERSHIP FORUM RECEPTION*
7:30 PM – 10:00 PM
Vista Ballroom
Join us in celebrating women in science! Join the members of the Women’s Leadership Forum (WLF) at this event celebrating women in science. This reception is an excellent opportunity to discuss the challenges facing today’s female scientists. The 2015 Women’s Leadership Forum Award Winner, Marjolein C. van der Meulen, PhD, will be honored for her role as an outstanding mentor to fellow female scientists.

Pre-registration required
$60 ORS Members/$65 Non-Members
<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION 25 Osteocytes and Mechanobiology</th>
<th>SESSION 26 Shoulder and Elbow Arthroplasty</th>
<th>SPOTLIGHT SESSION 27 Biglycan in Bone Healing</th>
<th>SESSION 28 Mediators of Joint Repair</th>
<th>SESSION 29 Tendon/Ligament – Mechanics</th>
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<tbody>
<tr>
<td>TIME</td>
<td>SESSION 30 Genetics: Bone Development, Bone Aging</td>
<td>SESSION 31 Shoulder and Elbow - Disease Process</td>
<td>SESSION 32 Muscle/Tendon Biology and Repair</td>
<td>SESSION 33 Aging &amp; OA</td>
<td>SESSION 34 Spine Disc Biology and Repair</td>
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<td>Room # 111-112</td>
<td>Room # 113-114</td>
<td>Room # 116</td>
<td>Room # 118-120</td>
<td>Room # 121-122</td>
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<tr>
<td>Moderators</td>
<td>Jaimo Ahn, MD, PhD and D. Rick Summer, PhD</td>
<td>Samuel R. Ward, PhD and Louis J. Soslowsky, PhD</td>
<td>Xuhui (Philipp) Liu, MD and Megan Killian, PhD</td>
<td>Amy McNulty, PhD and Qian Chen, PhD</td>
<td>James C. Iatridis, PhD and Lisbet A. Haglund, PhD</td>
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<td></td>
<td>Daniel March, Clifford Voigt, Hongshuai Li, Xuemi Guo, Aiping Lu, Ting Yang, Bing Wang, Johnny Huard</td>
<td>Kevin A. Hildebrand, Andrew R. Buckley, Paul T. Salo, Min-A Zhang, A. Dean Befus, David A. Hart</td>
<td>Yohi Kawakami, Koji Takayama, Makoto Kuboyashi, Aiping Lu, Xiaoding Mu, Jessica Jetterson, James Cummins, Ryooyuki Kuroda, Masahiko Kurosaka, Freeck H.F. Fu, Johnny Huard</td>
<td>John Yang, Yun Gao, Wentian Yang, Qingshan Chen, Hugo Yoshiaki Itoigawa, John W. Sperling, Satoshi Suzuki, Tomohiro-Hikata, Kodai Watanabe, Ken Ishii, Takeshi Miyamoto, Yoshiaki Toyama, Morita Masutomo</td>
<td>Timothy Jacobson, Nadeen O. Chahine</td>
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<tr>
<td>11:45 AM</td>
<td>Paper No. 0164 Identification of New Models for Bone Research via High-Throughput Screening of Mice from the Knockout Mouse Project</td>
<td>Paper No. 0170 Minimally Important Differences In The WOMAC and ASES In Patients Treated Surgically Or Non-surgically For Full Thickness Rotator Cuff Tears</td>
<td>Paper No. 0176 Functional and Cellular Analysis Of Engineered Skeletal Muscle Units Following 28 Days In Vivo</td>
<td>Paper No. 0182 Reduced Epidural Growth Factor Receptor (EGFR) Signaling Enhances Cartilage Destruction in Mouse Osteoarthritis Model</td>
<td>Paper No. 0188 In Vitro Growth Trajectory and In Vivo Implantation of a Cell-Based Disc-like Alginate Pliy Scaffold for Total Disc Replacement</td>
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<td></td>
<td>Jacqueline McKensy, Courtney Sprouse, Heather Gordish-Dennis, Elizabeth Domini, Elizabeth Hedges, Zachary Kendrick, Michael Liu, Leticia Ryan, Eric Hoffman, Joseph M. Devarney, Laura L. Tou</td>
<td>Lisa Hackett, Neal L. Millar, Patrick H Lam, George AC Murrell</td>
<td>Xiangyu Gu, Richard Ma, Michael Schaer, Lily Yang, Jeffrey Nwosu, Xiang-Hua Deng, Scott Rodeo</td>
<td>Marjeleen MI. Caron, Pieter J. Emanis, Don A.M. Surtel, Peter M. van der Kraan, Lodewijk W van Rheijn, Tim J. Wolting</td>
<td>Puay Yong Neo, James CH Guh, Siew Lok Toh</td>
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<tr>
<td>12:05 PM</td>
<td>Paper No. 0166 Novel Med1-Cre;Cal1K2 Enhancer Mice Produce Heterotopic Ossification Localized To Joints Through Cartilage Intermediary Shalash Al Aghwal, Shawn Lader, Jonathan R. Peterson, Oluwatobi Eboho, Cameron Brownley, Satoria Nyamu, Shaik Li, Katalyn Setthiwich, Kathila Ranganathan, David Finn, Stewart Wang, Steven R. Buchanan, Paul Cedema, Topy Mshana, Benjamin Lew</td>
<td>Paper No. 0172 Prediction of Scapular Notching using 3D CT Simulation Software and Video-Based Motion Analysis</td>
<td>Paper No. 0178 Electrogropan Nanofibrous Scaffolds Enhanced with Decellularized Extracellular Matrix to Promote Tissue-Specific Biactivity for Tendon and Cartilage Repair</td>
<td>Paper No. 0184 Goelctin-1 Is A Novel Marker For Cartilage Degeneration In Osteoarthritis And Induces Pre-inflammatory And Catabolic Responses In Chondrocytes In Vitro</td>
<td>Paper No. 0190 Stem Cells Contribution to the Restoration of Degenerated Intervertebral Discs Depends on their Degenerative State</td>
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<td>Joel Koldmoe, Joseph Davidson, Dong-Jae Jun, Nupin Sudhi, NAVIN Sahlan, Thomas E. Patte, Dzung-Xin Li, Joseph P. Amatucci, Eric T. Ruchelli</td>
<td>Benjamin Rothrauff, Guang Yang, Rocky Yuan</td>
<td>Stefan Teegel, Daniela Bierder, Sabine Andre, Hans-Joachim Gabius, Sonja M. Walzer, Idries M. Branen-Bair, Martin Bilbain, Reinhard Windhaeger</td>
<td>Mariana Peppoloni, Stephanie Caprez, Lorin M. Benenreker, Mauro Alini, Sibylle Grad</td>
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</tbody>
</table>
**TUESDAY | MEETING HIGHLIGHTS**  Tuesday, March 31, 2015

### 6:00AM-3:30PM

**Poster Hall Open (no exhibits)**  
Marquee Ballroom

### 8:00AM-9:00AM

**SESSIONS**

- **Tendon/Ligament - Collagen Structure – Function**  
  *Spotlight Session*  
  Room 111-112

- **Bone Tissue Engineering**  
  Room 113-114

- **Biomolecular Approaches to Bone Fragility**  
  *Spotlight Session*  
  Room 116

- **Cartilage Matrix Biology**  
  *Spotlight Session*  
  Room 118-120

- **Spine Mechanics**  
  Room 121-122

### 9:15AM-9:45AM

- **Refreshment Break**  
  Marquee Ballroom

### 9:45AM-11:15AM

**WORKSHOPS**

- **The Intervertebral Disc From: Development to Regeneration**  
  Room 121 - 122

- **Functional Imaging of Articular Cartilage by MRI**  
  Room 113 - 114

- **Hip Evo Devo: Adaptation of the Hip in Phylogeny and Ontogeny**  
  Room 116

- **Acute Cartilage Injury: AO Foundation Collaborative Research Project**  
  Room 111 - 112

### 11:30AM-12:30PM

- **Poster Walking Tours**  
  Marquee Ballroom

### 12:45PM-1:45PM

**SESSIONS**

- **Ankle Arthritis, Arthroplasty, and Arthrodesis**  
  Room 111-112

- **Late Breaking Paper Presentations**  
  Room 113-114

### 2:00PM-2:30PM

**Posters**  
Marquee Ballroom

### 2:30PM-3:30PM

**SESSIONS**

- **Knee - Mechanics and Modeling**  
  Room 111-112

- **Bone Mechanics and Finite Element Analysis**  
  Room 113-114

- **Knee Ligaments and Meniscus**  
  Room 116

- **Cartilage Mechanobiology**  
  Room 118-120

- **Biomaterials for Cartilage Repair**  
  Room 121-122
BREAK
9:15 AM – 9:45 AM
Marquee Ballroom
Visit with exhibitors and view posters in Innovation Central. Refreshments will be served.

PAPER PRESENTATIONS
8:00 AM – 9:00 AM
See page 49

WORKSHOPS
9:45 AM – 11:15 AM

The Intervertebral Disc: From Development to Regeneration
Room 121-122
Organizers:
Rita Kandel, MD, Mount Sinai Hospital
Makarand V. Risbud, PhD, Thomas Jefferson University
The IVD is composed of three different tissues, each of different origins, that merge together to form a functional tissue anchored to bone. Intervertebral disc (IVD) degeneration has a lifetime prevalence of 80% and about 1 in 50 individuals become disabled by this disease resulting in annual direct and indirect costs in the United States alone of over $118 billion. Until recently little was known about the IVD but recent advances have increased our understanding of disc biology and how development can inform disc repair. This workshop will focus on the research related to maintaining a functional disc, specifically the advances and challenges related to understanding IVD development, regulation of disc degeneration, and biological repair or replacement of the degenerate disc.

Intervertebral Disc Development
Rosa Serra, PhD, University of Alabama at Birmingham

Synccan4: Regulation and Function in Intervertebral Disc Health and Disease
Makarand V. Risbud, PhD, Thomas Jefferson University

Biological Disc Repair: The Good, Bad and the Promising
Rita Kandel, MD, Mount Sinai Hospital

Functional Imaging of Articular Cartilage by MRI
Room 113-114
Organizers:
Yang Xia, PhD, Oakland University
Louis E. DeFrate, PhD, Duke University Medical Center
Magnetic resonance imaging (MRI) is one of the few imaging techniques that is highly sensitive to the molecular environment in soft tissues and is totally non-invasive. MRI of articular cartilage in response to loading allows for functional study of cartilage. Specifically, external loading becomes an adjustable tool to force the tissue to reach a new equilibrium with the environment so that the re-distribution of the tissue’s intrinsic properties and structural adaptability can be probed in a depth-dependent manner. Clearly, healthy and diseased tissue will respond to the loading differently. This workshop aims to review the new knowledge and latest results in the area, and to discuss possible applications based on the recent studies. Three presentations are included, ranging from the functional studies of cartilage-bone blocks by microscopic MRI, biomechanical measurement of knee cartilage deformation by MRI, to the in-vivo functional MRI in human subjects.

The Deformation of Cartilage by Microscopic MRI
Yang Xia, PhD, Oakland University

In Vivo Biomechanics of Knee Cartilage by MRI
Louis E. DeFrate, PhD, Duke University Medical Center

Towards In Vivo Weight-Bearing MRI for Knee OA
Xiaojuan Li, PhD, University of California, San Francisco

Hip Evo Devo: Adaptation of the Hip in Phylogeny and Ontogeny
Room 116
Organizer:
Sandra Shefelbine, PhD, Northeastern University
Understanding changes in hip morphology and what causes them is critical in evaluating etiology of hip osteoarthritis. This workshop will review current concepts of normal and abnormal hip joint structure including femoroacetabular impingement (FAI) and dysplasia. The topics will be discussed in the context of evolutionary changes (phylogeny) as well as changes within a person’s life time (ontogeny).

The Role of Mechanical Loading in the Prenatal Hip
Niamh C. Nowlan, PhD, Imperial College London

The Role of Mechanical Loading in the Postnatal Hip
Sandra Shefelbine, PhD, Northeastern University

Evolutionary Changes in Hip Structure
Jeremy M. DeSilva, PhD, Boston University

The Role of Neuromuscular Control in Joint Forces
Cara L. Lewis, PhD, Boston University
Acute Cartilage Injury: AO Foundation Collaborative Research Project
Room 111-112
Organizers:
Martin Stoddart, PhD, AO Research Institute
George R. Dodge, PhD, University of Pennsylvania

The repair of acute cartilage injuries is still a significant challenge in orthopedics. Current methods do not reproducibly result in hyaline like repair tissue, and the repair is often short lived. A more active, yet aging, population is increasing the frequency of injury and the longer term effect of osteoarthritis is becoming more prevalent. The economic burden due to the ever increasing need is enormous.

This workshop will highlight the influence of cell, materials and mechanical environment in the repair of cartilage defects. In addition, strategies for screening the large number of potential combinatorial devices will be emphasized. Interdisciplinary and international collaborations are needed to bring diverse ideas and technologies to bear. In this workshop we will describe the outcome of multidisciplinary, multinational consortium with complementary expertise as a collaborative research project of the AO Foundation.

Enhancing the Biology of Cartilage Regeneration
Magali Cucchiarini, PhD, Saarland University Medical Center

In Vitro and In Vivo Screening of Cartilage Repair Products
Robert Mauck, PhD, University of Pennsylvania

Hard and Soft Materials for Articular Cartilage Repair
David Elgin, PhD, AO Research Institute

POSTER WALKING TOURS
11:30 AM – 12:30 PM
Innovation Central/Marquee Ballroom

Poster Walking Tours Poster Session II
Tours will feature posters in the following topics:
(Authors may be present.)

Biomaterials – Posters 1125, 1127, 1155 and 1182
Bone Biology – Posters 1402, 1419, 1440, 1452 and 1476
Bone Fracture – Poster 1506
Cartilage, Synovium & Osteoarthritis – Posters 1199, 1204, 1274 and 1304
Foot and Ankle – Posters 1899 and 1902
Meniscus – Posters 1321 and 1372
Spine – Posters 1578, 1593 and 1597
Trauma – Posters 1915 and 1916

Tours are subject to change. Check sign-up board in Marquee Ballroom for confirmation of tours.

PAPER PRESENTATIONS
12:45 PM – 1:45 PM
See page 50

PAPER PRESENTATIONS
2:30 PM – 3:30 PM
See page 51
<table>
<thead>
<tr>
<th>TIME</th>
<th>SPOTLIGHT SESSION 35</th>
<th>SESSION 36</th>
<th>SPOTLIGHT SESSION 37</th>
<th>SPOTLIGHT SESSION 38</th>
<th>SESSION 39</th>
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<tbody>
<tr>
<td>8:00 AM</td>
<td>Spotlight Speaker</td>
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<td></td>
<td>David E. Birk, PhD</td>
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<td>Deepak Vashisth, PhD</td>
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<td></td>
<td></td>
<td>Paper No. 0194 In Vivo Re-vascularization And Osteogenesis Of Human Mesenchymal Stem Cells Mediated By Micro-Topography and Biochemical Cues</td>
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<td>8:10 AM</td>
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<td>Paper No. 0195 Effects Of Structural Polymer vs. Nano-structural Hydrogel Scaffolds on BMP-2- and Mechanical Loading-mediated Bone Regeneration</td>
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<td>8:20 AM</td>
<td></td>
<td>Paper No. 0196 Development of Heparin Microparticles for Enhanced Delivery of Bone Morphogenic Protein-2 (BMP-2)</td>
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<td>8:30 AM</td>
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<td>Paper No. 0197 Bone Morphogenic Protein-2 Non-viral Gene Therapy In A New Screening Model For Orthotopic Bone Formation In The Goat</td>
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<td>8:40 AM</td>
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<td>Paper No. 0198 SDF-1α Enhances Low Dose BMP-2 Mediated Bone Regeneration In Vivo</td>
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<td>8:50 AM</td>
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<td>Paper No. 0199 Immuno-modulation Of Encapsulated MSCs And Osteogenically Differentiating MSCs In Synthetic Hydrogels For Bone Tissue Engineering</td>
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<td>Paper No. 0200 Parathyroid Hormone Improves Fatigue Life But Not Whole Bone And Tissue Mechanics</td>
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<td>Paper No. 0201 Tissue Mineral Density And Cortical Porosity Predicts Bone Toughness And Frailty In Post Menopausal Women</td>
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<td>8:00 AM</td>
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<td>Paper No. 0202 Three Dimensional Micro-Computed Tomography Analysis For Spinal Instability After Lumbar Facetectomy in the Rat</td>
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<td>8:10 AM</td>
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<td>Paper No. 0203 Chondrocyte Expression Of SIRT-1, an Enzyme Vital to Cartilage Homeostasis, is Regulated by Osmolarity and Glucose Levels</td>
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<td>8:20 AM</td>
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<td>Paper No. 0204 Oxidative Stress-induced Apoptosis And Matrix Loss Of Chondrocytes Is Inhibited By Eicosapentaenoic Acid</td>
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<td>8:30 AM</td>
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<td>Paper No. 0205 Hif-1α fine-tune Sox9-dependent Extracellular Matrix Production In Chondrocytes</td>
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<td>8:50 AM</td>
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<td>Paper No. 0207 Spaceflight Decreases Bending Strength and Alters Failure Mode in Marine Spinal Segments</td>
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<td></td>
<td></td>
<td>Paper No. 0208 The Effect of Joint Angle Calculation Method on Intervertebral Range of Motion in the Lower Cervical Spine</td>
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<td></td>
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<td>Paper No. 0209 Adjacent Segment Range of Motion Does Not Increase 2 Years After Single-Level Cervical Arthrodesis</td>
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<td>Paper No. 0210 The In Vivo Effects of Exogenous Crosslinking on the Mechanical Function of Injured Rat Tail Discs under the Short-Term, Diurnal Compression Loading</td>
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<td>Paper No. 0211 The In Vivo Effects of Exogenous Crosslinking on the Mechanical Function of Injured Rat Tail Discs under the Short-Term, Diurnal Compression Loading</td>
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**Moderators**
- Evan L. Flatow, MD and Siddhesh R. Angle, PhD
- Mathias P. G. Bostrom, MD and Dominique P. Pioletti, PhD
- Pamela G. Robey, PhD and Chris Arts, PhD
- Anand Agarwal, MD and Timothy M. Griffin, PhD
- Alejandro A. Espinoza Orias, PhD and Brian D. Stemper, PhD

**Rooms**
- Room # 111-112
- Room # 113-114
- Room # 116
- Room # 118-120
- Room # 121-122

**Sessions**
- Session 39: Spine Mechanics
- Session 38: Cartilage Matrix Biology
- Session 37: Molecular Approaches to Bone Frailty
- Session 36: Bone Tissue Engineering
- Session 35: Tendon/Ligament - Collagen Structure - Function
<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION 40</th>
<th>LATE BREAKING 41</th>
<th>SPOTLIGHT SESSION 42</th>
<th>SESSION 43</th>
<th>SESSION 44</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accuracy and Feasibility of Dual Fluoroscopy to Quantify In-Vivo Kinematics of the Tibial and Subtalar Joints</td>
<td>Deterioration of Trabecular and Cortical Microarchitecture and Reduced Bone Stiffness at Distal Radius and Tibia in Postmenopausal Women with Vertebral Fractures</td>
<td>NSEADs and Healing: Different Effect in Different Situations</td>
<td>Paper No. 0222</td>
<td>Development of Pro-Resorptive Therapy for the Treatment of Heterotopic Ossification</td>
</tr>
<tr>
<td></td>
<td>Step-off Vs. Contact Stress Following Articular Cartilage Reduction: Which Measure is Better for Predicting PTDA?</td>
<td>Tendon Mineralization Is Progressive And Detrimental To Tendon Biomechanical Properties</td>
<td>Cells of the Intact AND Adaptive System Jointly Influence the Endochondral Ossification in Bone Regeneration</td>
<td>Stable And Efficient Differentiation of Human Induced Pluripotent Stem Cells Toward Articular Chondrocytes: By Defined Growth Factors</td>
<td>Cyclooxgenase 2 Deficient Muscle Derived Stem Cells Exhibit an Impaired Bone Regeneration Capacity via Cell Autonomous and Non-Autonomous Mechanisms</td>
</tr>
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<td></td>
<td>Post-traumatic Inflammatory Cytokine Profile in Synovial Fluid Following Intra-Articular Ankle Fracture</td>
<td>Exercise Protects Against TRPA1 Induced Joint Pain in Mice</td>
<td>Comparative Analysis of Fixed and Mobile Bearing Total Ankle Prostheses: Effect on Tibial Bone Strain and Tibial Component Fixation</td>
<td>Purinergic Signaling Regulates The Chondrogenic Response Of MSCs To Hydrostatic Pressure</td>
<td>Tissue Engineered Periosteum Modulates Allograft Healing Via Elaboration Of Angiogenic Growth Factors</td>
</tr>
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<td></td>
<td>Gait and Functional Outcomes 5 years After Total Ankle Replacement</td>
<td>Mechanically-induced Changes in Semaphorin Matrix Biomarkers Predict Regional Changes in Cartilage Thickness 5 Years Later In Human Subjects With Knee OA</td>
<td>Pathway Analysis to Identify Co-Culture-Generated Factors Involved in the Rejuvenation of Adult MSCs for Cartilage Tissue Engineering</td>
<td>Systemic Bone Loss Following Femoral Fracture in Mice: A Mechanism for Increased Fracture Risk</td>
<td>Autogenous Mesenchymal Stem/ Stromal Cells (MSCs) are Superior to Allogeneic MSC in Regulation of Large Bone Defects</td>
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<td>Systemic and Localized Inflammation Enhances Osteogenesis by Activating Progenitor Cells</td>
<td>Tissue Engineered Periosteum Modulates Allograft Healing Via Elaboration Of Angiogenic Growth Factors</td>
</tr>
<tr>
<td>TIME</td>
<td>SESSION 45 Knee – Mechanics &amp; Modeling</td>
<td>SESSION 46 Bone Mechanics and Finite Element Analysis</td>
<td>SESSION 47 Knee Ligaments &amp; Meniscus</td>
<td>SESSION 48 Cartilage Mechanobiology</td>
<td>SESSION 49 Biomaterials for Cartilage Repair</td>
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<tr>
<td>Room # 111-112</td>
<td>Kenneth M. Kozloff, PhD and Matthew T. Mathew, PhD</td>
<td>Jason Shearn, PhD and Matthew Fisher, PhD</td>
<td>Timothy E. Hewett, PhD and Alicia R. Jackson, PhD</td>
<td>Douglas J. Adams, PhD and Ferris M. Pfeiffer, PhD</td>
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<tr>
<td>3:00 PM</td>
<td>Paper No. 0242</td>
<td>Paper No. 0248</td>
<td>Paper No. 0254</td>
<td>Paper No. 0260</td>
<td>Paper No. 0261</td>
</tr>
<tr>
<td></td>
<td>Progression of Micro-motion, Micro-gaps, and Tubercular Strain Shielding in Cemented Knee Replacements Mark A Miller, Priyanka Sinhrasan, Dennis Janssen, Kenneth A Mann</td>
<td>Computer-based 3D Puzzle Solving For Pre-operative Planning Of Articular Fractures Reductions In The Ankle, Knee, And Hip Andrew M Kern, Donald Anderson</td>
<td>Articulation-Induced Responses of Superficial Zonal Chondrocytes in Human Knee Articular Cartilage: Effects of Shear and Sliding Felix H Hua, Alexander Y Hua, Albert C Cher, Martin K Lutz, Robert Sah</td>
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<td>-</td>
</tr>
</tbody>
</table>

TUESDAY | SESSIONS 2:30PM–3:30PM Tuesday, March 31, 2015
**POSTER SESSIONS**: The ORS will have two Poster Sessions in Las Vegas.

Posters are located in the Marquee Ballroom.

Poster Session 1 (PS1): Posters will be displayed on Saturday and Sunday.
Poster Session 2 (PS2): Posters will be displayed on Monday and Tuesday.

**Poster Presenter Hours:**
Authors will be available to answer questions during the following time.

<table>
<thead>
<tr>
<th>POSTER SESSION 1</th>
<th>POSTER SESSION 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, March 29</td>
<td>Monday, March 30</td>
</tr>
<tr>
<td><strong>EVEN</strong> numbered poster presenters</td>
<td><strong>EVEN</strong> numbered poster presenters</td>
</tr>
<tr>
<td>4:45PM–5:25PM</td>
<td>4:15PM–4:55PM</td>
</tr>
<tr>
<td><strong>ODD</strong> numbered poster presenters</td>
<td><strong>ODD</strong> numbered poster presenters</td>
</tr>
<tr>
<td>5:20PM–6:00PM</td>
<td>4:50PM–5:30PM</td>
</tr>
</tbody>
</table>

**POSTER CATEGORIES**

<table>
<thead>
<tr>
<th>Category</th>
<th>POSTER SESSION 1 #’S</th>
<th>POSTER SESSION 2 #’S</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Academy of Orthopaedic Surgeons (AAOS) Best Posters</td>
<td>AAOS1 - AAOS7</td>
<td>AAOS1 - AAOS7</td>
</tr>
<tr>
<td>Biomaterials - Other</td>
<td>263 - 319</td>
<td>1125 - 1186</td>
</tr>
<tr>
<td>Board of Specialty Society (BOS) Best Posters</td>
<td>BOS1 - BOS9</td>
<td>BOS1 - BOS9</td>
</tr>
<tr>
<td>Bone Fracture</td>
<td>628 - 671</td>
<td>1493 - 1538</td>
</tr>
<tr>
<td>Bone/Bone Biology</td>
<td>537 - 627</td>
<td>1402 - 1492</td>
</tr>
<tr>
<td>Cancer, Tumors</td>
<td>1060 - 1086</td>
<td>1923 - 1950</td>
</tr>
<tr>
<td>Cartilage, Synovium &amp; Osteoarthritis</td>
<td>320 - 452</td>
<td>1187 - 1320</td>
</tr>
<tr>
<td>Diagnostic Imaging</td>
<td>1087 - 1122</td>
<td>1951 - 1985</td>
</tr>
<tr>
<td>Foot and Ankle</td>
<td>1034 - 1043</td>
<td>1894 - 1905</td>
</tr>
<tr>
<td>Hand and Wrist</td>
<td>1022 - 1033</td>
<td>1880 - 1893</td>
</tr>
<tr>
<td>Hip</td>
<td>831 - 848</td>
<td>1699 - 1713</td>
</tr>
<tr>
<td>Hip and Knee Arthroplasty</td>
<td>849 - 980</td>
<td>1714 - 1840</td>
</tr>
<tr>
<td>Infection</td>
<td>1044 - 1052</td>
<td>1906 - 1914</td>
</tr>
<tr>
<td>Knee</td>
<td>762 - 830</td>
<td>1630 - 1698</td>
</tr>
<tr>
<td>Late Breaking Poster Session</td>
<td>1992 - 2031</td>
<td>1992 - 2031</td>
</tr>
<tr>
<td>Meniscus</td>
<td>453 - 466</td>
<td>1321 - 1335</td>
</tr>
<tr>
<td>Muscle</td>
<td>518 - 536</td>
<td>1384 - 1401</td>
</tr>
<tr>
<td>New Investigator Recognition Award Finalists</td>
<td>25 - 64</td>
<td>25 - 64</td>
</tr>
<tr>
<td>Policies/Guidelines/Leadership</td>
<td>1123 - 1124</td>
<td>Not in PS2</td>
</tr>
<tr>
<td>Shoulder and Elbow</td>
<td>981 - 1021</td>
<td>1841 - 1879</td>
</tr>
<tr>
<td>Spine</td>
<td>672 - 761</td>
<td>1539 - 1629</td>
</tr>
<tr>
<td>Tendon/Ligament</td>
<td>467 - 517</td>
<td>1336 - 1383</td>
</tr>
<tr>
<td>Trauma</td>
<td>1053 - 1059</td>
<td>1915 - 1922</td>
</tr>
<tr>
<td>Women’s Health Issues Board (WHIAB) Best Poster</td>
<td>WHIAB</td>
<td>WHIAB</td>
</tr>
</tbody>
</table>
INTERNATIONAL COMBINED ORTHOPAEDIC RESEARCH SOCIETY (ICORS) BEST POSTERS

ICORS1 Chinese Orthopaedic Research Society (CORS)
A novel bone targeting delivery system carrying bone-forming and anti-bone resorption phytomolecule icaritin for prevention of steroid-associated osteonecrosis in rat model
Shi Hui Chen, Xin Luan Wang, Li Zhen Zheng, Nan Wang, Jiayong Zhang, Zhijun Yang, Ling Qin

ICORS2 Chinese Orthopaedic Research Society (CORS)
TBX6 Variants: a Key Etiology for Congenital Scoliosis
Nan Wu, Zhihong Wu, Sen Liu, Jiaqi Liu, Zhenlei Liu, Yuzhi Zuo, Xuan Ming, Jianqiu Xiao, Xiaoli Chen, Feng Zhang and Guixing Qiu

ICORS3 International Chinese Musculoskeletal Research Society (ICMRS)
Chondrocytes Directly Form Osteocytes in the Calcified Articular Cartilage in vivo
Y. Jing, Y. Ren, J. Borrelli, Y. Xiao, Y. Liu, C. Liu, J. Feng

ICORS4 International Chinese Musculoskeletal Research Society (ICMRS)
Pregnancy, Lactation, and Weaning Induce Substantial Changes in Bone Microarchitecture and Remodeling in Rat Tibiae
Chantal de Bakker, Allison Altman, Connie Li, X. Sherry Liu

ICORS5 Japanese Orthopaedic Association (JOA)
Elimination of BMP7 from the developing limb mesenchyme leads to articular cartilage degeneration and synovial inflammation with increased age
Kahaer Abula, Takeshi Muneta, Kazumasa Miyatake, Jun Yamada, Yu Matsukura, Makiko Inoue, Ichiro Sekiya, Daniel Graf, Aris N. Economides, Vicki Rosen, and Kunikazu Tsuji

ICORS6 Japanese Orthopaedic Association (JOA)
Tumor Necrosis Factor-α Modulates Wnt Signaling in Nucleus Pulposus Cells by Activation of Cyclooxygenase 2 and Prostaglandin E2
Akihiko Hiyama, Daisuke Sakai, Joji Mochida

ICORS7 Korean Orthopaedic Research Society (KORS)
Activation of G protein-coupled receptor 84 with capric acid inhibits RANKL-induced osteoclast differentiation via the suppression of NF-κB signaling and blocks cytoskeletal organization and survival in mature osteoclasts
Hyun-Ju Kim, Hye-Jin Yoon, Shin-Yoon Kim

ICORS8 Taiwan Orthopaedic Research Society (TORS)
The use of demineralized bone matrix for anterior cruciate ligament reconstruction: a radiographic, histologic, and immunohistochemical study in rabbits
Shan-Ling Hsu, Ching-Jen Wang

ICORS9 Taiwan Orthopaedic Research Society (TORS)
A facile approach toward protein-resistant biointerfaces based on photo definable poly-p-xylylene coating
Chih-Hao Chang, Chiao-Tzu Su, Bing-Heng Lee, Pin-Chun Chou, Hsien-Yeh Chen

BOARD OF SPECIALTY SOCIETY (BOS) BEST POSTERS

BOS1 American Association for Hand Surgery (AAHS)
Does SLAC IV Exist? A Radiographic and Magnetic Resonance Imaging Analysis
Alexia Marie Hernandez-Soria, MD; Steve Lee, MD; Lauren E. Lamont, MD; Nadja Farshad-Amacker, MD, Hollis Potter, Scott W. Wolfe, MD

BOS2 Arthroscopy Association of North America (AANA)
Repeat Meniscus Repair: What Result Can We Expect
Paul Sousa, Benjamin Allen, Bruce Levy, Diane Dahm, Michael Stuart, Aaron Krych

BOS3 American Orthopaedic Foot & Ankle Society (AOFAS)
The Effect of a Calcaneal Osteotomy in a Novel Asymmetric Ankle Arthritis Model
Jack Anavian, MD; Todd A. Fellars, MD; Heather Gotha, MD; Sarah Koruprolu, MS; David Paller, MS; Ryan Rich, MS; and Christopher W. DiGiovanni, MD

BOS4 American Society for Surgery of the Hand (ASSH)
A Comparative Study of the Effects of Muscle-derived stem cell seeded Fibrin Gel and Collagen Gel Interposition in an in vitro Tendon Healing Model
Yasuhiro Ozasa, Anne Gingery, Chunfeng Zhao, Andrew Thoreson, Kai-Nan An, Peter C. Amadio

BOS5 Cervical Spine Research Society (CSRS)
Cervical Spine Research Society (CSRS)
(Basic Science Poster)
Effect of rhBMP-2 on Lung Cancer Spine Metastasis in Rodents
Abhishek Kannan, BS, Kevin Sonn, MD, Sharath S. Bellary, MD, Chawon Yun, PhD, Sohaib Hashmi, MD, John T. Nelson, MD, Amruta Ashtekar, MS, Anjan Ghosh, Nicholas Shawen, BS, Michael S. Nickoli, MD, Jason H. Ghodasra, MD, MSCI, Michael Okoli, Stuart Stock, PhD, Erin L. Hsu, PhD, and Wellington K. Hsu, MD

BOS6 Cervical Spine Research Society (CSRS)
(Clinical Poster)
Full Body Eos Analysis Of The Maintenance Of Functional Cbva And Horizontal Gaze Among Hypo-lordotic Verses Hyper-lordotic Patients
Vincent Challier, MD, Renaud Lafage, MS, Emmanuelle Ferrero, MD, Barthelemy Liabaud, MD, Bassel G. Diebo, MD, Shian Liu, BS, Justin S. Smith, MD, PhD, Christopher P. Ames, MD, Eric O. Klineberg, MD, Peter Passias, MD, Themistocles S. Protopsaltis, MD, Thomas J. Errico, MD, Frank J. Schwab, MD, and Virginie C. Lafage, PhD

BOS7 James Robert Gladden Orthopaedic Society (JRGOS)
Grafting Articular Defects in the Acetabulum: Is the Medial Tibial Plateau a Suitable Donor Site for Osteochondral Allografts?
Perry S. Bradford, BA, Hugh L. Jones, BS, Jesal N. Parekh, PhD, Melvyn A. Harrington, MD, Philip C. Noble, PhD
AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS (AAOS) BEST POSTERS

AAOS1  AAOS Best Hip Poster
Reliability of Modern Ceramic Femoral Heads in over 5.7 Million Hip Implants
Gwo-Chin Lee, MD, Raymond H. Kim, MD

AAOS2  AAOS Best Knee Poster
Routine Examination of Tissue from Total Knee Arthroplasty is Not Cost Efficient and does Not Affect Patient Care
David Liebelt, MD, PhD, Joseph Greene, MD, Theofanis Zois, PA-Cm Didi Omiyi, MD, Fred D. Cushner, MD, Giles R. Scuderi, MD

AAOS3  AAOS Best Foot & Ankle Poster
Advanced Glycation End Products Inhibitor Protects Against Diabetic Skeletal Muscle Atrophy
Rong-Sen Yang, MD, Shing-Hwa Liu, PhD

AAOS4  AAOS Best Hand and Wrist Poster
An Outcome Analysis of 75 Consecutive Cases of Revision Proximal Interphalangeal Arthroplasty
Robert Van Demark, MD

AAOS5  AAOS Best Shoulder and Elbow Poster
Quantification of the Position, Orientation, and Surface Area of Posterior Bone Loss in Type B2 Glenoids
Nikolas Knowles, Louis Ferreira, MSc, Jay D. Keener, MD, George S. Athwal, MD

AAOS6  AAOS Best Spine Poster
Do Upper Instrumented Vertebra Selection Recommendations Predict Shoulder Imbalance?
Benjamin Bjerke-Kroll, MD, Zoe B. Cheung, BS, MS, Grant Shifflett, MD, Sravisht Iyer, MD, Peter Derman, MD, Joseph Liu, MD, Matthew E. Cunningham, MD, PhD

AAOS7  AAOS Best Tumor Poster
Impact of Advanced Age and Comorbidity Burden on Morbidity and Mortality after Musculoskeletal Tumor Surgery
Koichi Ogura, MD, Hideo Yasunaga, MD, PhD, Yusuke Shinoda, MD, PhD, Hirotaka Kawano, MD, PhD, Saka Tanaka, MD, PhD

ORTHOPAEDIC RESEARCH SOCIETY BEST POSTERS

The following posters have been chosen as the “Best” of the ORS and were displayed at the American Academy of Orthopaedic Surgeons (AAOS) meeting, March 25-28 at the Venetian/Sands Expo.

Poster No. 0963  ORS Best Hip Poster
Modularity of Metal-on-Metal Hip Implants Increases Cobalt:Chromium Ratio
Kevin Ilo, Karim Aboelmagd, Harry Hothi, Robert Whittaker, Asaad Asaad, Gordon Blunn, John Skinner, Alistair Hart

Poster No. 0867  ORS Best Knee Poster
Factors Influencing TKR Joint Mechanics in the Varus Knee
Clare K Fitzpatrick, Sherrod Woods, Paul J Rullkoetter

Poster No. 1902  ORS Best Foot and Ankle Poster
Predicting Tibial Stress Fields Around Total Ankle Replacements
Matthew A Hamilton, Phong Diep, James Nunley, James DeOrio, Mark Easley, Victor Valderrabano

Poster No. 1117  ORS Best Hand and Wrist Poster
Multidimensional Ultrasound Imaging of the Wrist: Changes of Shape and Displacement of the Median Nerve and Tendons in Carpal Tunnel Syndrome
Anika Filius, Peter C. Amadio, Marjan Scheltens, Hans G. Bosch, Pieter A van Doorn, Henk J. Stam, Steven E.R. Hovius, Ruud W. Selles

Poster No. 1013  ORS Best Shoulder and Elbow Poster
Are The Brains Of Patients With Complex Shoulder Instability Wired Differently?
Anthony Howard, Joanne Powell, David Hawkes, Alison Kinghorn, Jo Gibson, Omid Alizadehkhajat, Graham Kemp, Simon Frostick

AAOS WOMEN’S HEALTH ISSUES

ADVISORY BOARD (WHIAB) BEST POSTER

This poster will be presented at the podium on Monday, March 30 in Session 30: Genetics: Bone Development, Bone Aging

WHIAB
Identification of New Models for Bone Research via High-Throughput Screening of Mice from the Knockout Mouse Project
Douglas J Adams, Renata Rydzik, Dana A Godfrey, Li Chen, Zhihua Wu, Caibin Zhang, Seung-Hyun Hong, Pujan Joshi, Xi Jiang, Dong Guk Shin, John P Sundberg, David W Rowe, Cheryl L Ackert-Bicknell
NEW INVESTIGATOR RECOGNITION AWARD (NIRA) POSTERS

The following posters will also be presented in the NIRA Presentations on Saturday, March 28 from 1:15 PM - 2:15 PM

NIRA 6 - BONE BIOLOGY & REPAIR

Poster No. 0025
SDF-1/CXCR4 Axis in Tie2-lineage Cells Including Endothelial Progenitor Cells Regulates Bone Fracture Healing
Yohei Kawakami, Masaaki Ik, Tomoyuki Matsumoto, Tomoya Kuroda, Yutaka Mizune, Taro Shoji, Tomoki Fukui, Takayuki Asahara, Masahiro Kurosaka

Poster No. 0026
Collagen-Based Bone Sialoprotein Implants Promote Cranial Bone Repair by Stimulating Osteoblastic Differentiation of Dura-Derived Osteoprogenitor Cells
Paul C. Cowan, Yan Wang, Qinghua Lu, John G. Yost, Yi Feng, Andrew H. Miller, Jinx Wang

Poster No. 0027
Identification of a Novel Regulatory Mechanism underlying PTH Anabolic Action on Bone Mass and Injury Repair via Induction of Tob Required for RANKL Expression
Shuichi Moriya, Yoichi Ezura, Tadayoshi Hayata, Yayoi Izu, Kazuo Kaneko, Masaki Noda

Poster No. 0028
Organ Culture Based Real-time Luminescence Imaging Revealed The Circadian Clock Exists In A Fracture Healing Site Of A Mouse Femur
Tatsuya Kunimoto, Hiroyoshi Fujiwara, Naoki Okubo, Yoichi Minami, Toshihiro Hosokawa, Ryo Oda, Toshikazu Kubo, Kazuhiro Yagita

Poster No. 0029
MT1-MMP Mediates Plasticity and Divergence of the Osteoblast and Adipocyte Lineages Through Cleavage of DLK1
Jason A Horton, Heba Degheidy, Teresa Yang, Nozomi Sakakibara, Steven R Bauer, Pamela G Robey, Kenn Holmbeck

Poster No. 0030
Aptamer-Functionalized Delivery System for Osteogenic siRNAs to Achieve Osteoblast-Specific RNA Interference for Bone Anabolic Therapy
Chao Liang, Baosheng Guo, Heng Wu, Lingqiang Zhang, Aiping Lu, Ge Zhang

Poster No. 0031
Macrophage-associated Osteoactivin/gpnmb Mediates Mesenchymal Stem Cell Survival, Proliferation and Migration via a CD44-dependent Mechanism
Bing Yu, Gregory Sondag, Christopher Malcuit, Min-Ho Kim, Fayez F Safadi

Poster No. 0032
Therapeutic Inhibition Of Mir-214 By (asp-ser-ser)6-liposome Encapsulating Antagomir-214 In Osteogenic Cells For Promoting Bone Formation In Aged Osteoporotic Rats
Baosheng Guo, Aiping Lu, Baoting Zhang, Ge Zhang

Poster No. 0033
Orthopaedic Grade Cobalt Chromium Alloy Particle Corrosion and Biological Evaluation
Danielle de Villiers, Agata Nyga, Terry Tetley, Akramul Hoque, Alister Hart, Julia C Shelton

Poster No. 0034
Early Phase of Wear Particle Induced Inflammation was inhibited by NF-kB Decoy Oligodeoxynucleotide
Taishi Sato, Jukka Pajarinen, Tzu-Hua Lin, Florence Loi, Kensuke Egashira, Zhenyu Yao, Stuart B Goodman

Poster No. 0035
Gender Differences in Knee Laxity and Stiffness: An In Vitro Study of Age Matched Specimens from a Younger Population
Daniel Boguszewski, Edward Cheung, Nirav Joshi, Keith Markolf, David McAllister

Poster No. 0036
Molecular Characteristics Proving Femoroacetabular Impingement As The Precursor To Hip Osteoarthritis
Nobuaki Chinei, Shingo Hashimoto, Takaaki Fujishiro, Shinya Hayashi, Noriyuki Kanzaki, Masahisa Hatakeyama, Shuhei Sakata, Shinsuke Kihara, Katsuhiko Haneda, Soshi Uchida, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 0037
Sex Differences in Knee Cartilage Pressure Distribution Under Functional Loading Conditions: Implications for Knee Osteoarthritis Risk
Aia M Kiapour, Carmen E Quatman, Samuel C Wordeman, Vijay K Goel, Timothy E Hewett, Constantine K Demetrropoulos

Poster No. 0038
Estimation Of Optimal Shoulder Orientation During The Acceleration Phase In Baseball Pitching From Minimal Shoulder Joint Load Viewpoint
Hirosi Tanaka, Toyohiko Hayashi, Hiroaki Inui, Yohei Takagi, Takanori Oi, Katsuya Nobuhara
Poster No. 0039
Validation of MRI Quantification for Meniscus Volume Resection Following Partial Meniscectomy
Shree Segev, Brian T Feeley, Sharmila Majumdar, Richard B. Souza

Poster No. 0040
Identification Of An Evolutionarily Conserved Host Response Against IsdA And IsdB As A Virulence Factor Associated With Death In Patients With Staphylococcus aureus Musculoskeletal Infections

Poster No. 0041
Distinct Patterns Of ShmC Acquisition Mark Chondrogenic Differentiation
Sarah E. B. Taylor, Ye Henry Li, Piera Smeriglio, Madhusikta Rath, Wing H Wong, Nidhi Bhutani

Poster No. 0042
Human Mesenchymal Stem Cell and Endothelial Cell Interaction through Endothelin-1
Tsung-Lin Tsai, Bowen Wang, Matthew Squire, Lian-Wang Guo, Wan-Ju Li

Poster No. 0043
Ex-vivo Gene Therapy-induced Cartilage Regeneration: Comparison of Different Subpopulations of Primary Muscle-Derived Cells
Hongshuai Li, Aiping Lu, Ying Tang, MaCalus V Hogan, Johnny Huard

Poster No. 0044
Inhibitory Effect of Photodynamic Therapy with a Novel Indocyanine Green-labeled Nanoparticle and Near-infrared Light on the Growth of Bone Metastasis of a Human Breast Cancer in vivo
Toshinori Tsukamichi, Masataka Sakane, Tetsuya Abe, Toru Funayama, Shinzo Onishi, Eiichi Ozeki, Isao Hara, Masashi Yamazaki

Poster No. 0045
RPN2 Gene Confers Osteosarcoma Lethal Phenotypes and Determines Clinical Prognosis
Tomohiro Fujitwara, Toshiyuki Kunisada, Ken Takeda, Yutaka Nezu, Aki Yoshida, Koji Uotani, Kazuhiya Sugiu, Toshiaki Omori, Takehiro Uehara, Yasuaki Yamakawa, Akira Kawai, Takahiro Ochiya, Toshifumi Ozaki

Poster No. 0046
Oral Administration of Losartan significantly Improves Muscle Healing after Compartment Syndrome-Like Muscle Injury
Makoto Kobayashi, Yohei Kawakami, Takanobu Otsuka, Freddie H. Fu, Johnny Huard

Poster No. 0047
$k$ Integrin Depletion Inhibits Profibrotic Cell Activation And Skeletal Muscle Fibrosis
Iain R Murray, Zaniah Gonzalez, John Iredale, Hamish Simpson, Bruno Peault, Neil Henderson

Poster No. 0048
The Effect of Continuous and Local IL-4 Delivery on Systemic Macrophage Trafficking and Polyethylene Particle Induced Bone Loss
Jukka Pajarinen, Taishi Sato, Tzu-hua Lin, Florence Loi, Ruth Zhang, Changchun Fan, Zhenyu Yao, Stuart B Goodman

NIRA 9 - CELL DIFFERENTIATION FIBROSIS & CANCER

Poster No. 0049
Mechanotransduction in Articular Chondrocytes: High-Strain Activates Piezo1 and Piezo2 Channels

Poster No. 0050
Protective Mechanism Adopted by Chondrocytes through Unfolding of Surface Ruffles during Mechanical Compression
Eng Kuan Moo, Walter Herzog

Poster No. 0051
Feasibility and Reproducibility of a Displacement Controlled MRI-Compatible Loading Device for Assessing Knee Articular Cartilage Deformation in Human Knees
Hongsheng Wang, Matthew F Koff, Hollis Potter, Russell Warren, Scott Rodeo, Suzanne Maher

Poster No. 0052
Legg-Calvé-Perthes Disease Produces Chronic Hip Synovitis and Elevation of Interleukin-6 in the Synovial Fluid
Ryosuke Yamaguchi, Nobuhiro Kamiya, Naga Suresh Adapala, Elena Chen, David Neal, Hicham M Drissi, Harry Kim

Poster No. 0053
Bone Marrow Stimulation Technique Augmented By Ultrapurified Alginate Gel Enhances Osteochondral Repair In A Rabbit Osteochondral Defect Model
Rikiya Baba, Tomohiro Onodera, Daisuke Momma, Masatake Matsuoka, Kazutoshi Hontani, Norimasa Iwasaki

Poster No. 0054
Administrations Of Tenascin-c Delay Cartilage Degeneration In Murine Models Of Osteoarthritis
Hironori Unno, Masahiro Hasegawa, Yuriro Matsui, Yoshiaki Suzuki, Takahiro Iino, Toshimichi Yoshida, Akihiro Sudo

Poster No. 0055
Endogenous Stores of Latent TGF-β Serve to Maintain the Integrity and Viability of Articular Cartilage Over Long Term Culture in Response to Physiologic and Excessive Dynamic Mechanical Loading
Michael B Albro, Krista M Durney, Jay J Shim, Akaljot Singh, Gerard A Ateshian, Molly M Stevens

Poster No. 0056
The Synovial Lymphatic System Plays a Critical Role in the Pathogenesis of Osteoarthritis
Hao Xu, Wensheng Wang, Echo Boua, Ronald Wood, Hengwei Zhang, Edward M. Schwarz, Micheal Zuscik, Yongjun Wang, Lianping Xing
POSTER SESSION 1

Posters Will Be Displayed Saturday And Sunday

PS1 BIOMATERIALS - OTHER

Poster No. 0263
Mechanical And Chemical Analyses In Highly Cross-linked Polyethylene By Raman Spectroscopy
Yoshihiro Miura, Masahiro Hasegawa, Leonardo Puppulin, Akiiro Sudo, Giuseppe Pezzotti

Poster No. 0264
Metallic Surface Modifications Reduce Immune Response to Orthopedic Implants
Kelly M Hotchkiss, Sharon L Hyzy, John J Ryan, Zvi Schwartz, Barbara D Boyan, Rene Olivares-Navarrete

Poster No. 0265
Investigation Of Fretting-corrosion Behavior Of Peek-metal Interfaces And Comparison With Fretting-Corrosion Of Metal-metal Interfaces
Sevi Kocagoz, Eric Ouellette, Sachin A Mali, Jeremy L Gilbert, Steven M Kurtz

Poster No. 0266
An Impact Testing Protocol for Evaluating the Fracture Resistance of Ceramic Femoral Components for Use in TKA
Marcel E Roy, Leo A Whiteside, Kasisin Klunklin, Christina M Schmidt, Paul Begeman

Poster No. 0267
Decellularized Pericardium as a Biologic Patch for Annulus Fibrosus Repair
Rachel McGuire, Sanjipal Gill, Dan Simionescu, Jeremy Mercuri

Poster No. 0268
Reduced Taper Fretting Corrosion Using a Zirconia-toughened Alumina Femoral Head in a Hip Joint Simulator Study
Masayuki Kyomoto, Yuichi Shoyama, Junji Ikeda, Mikio Iwamoto

Poster No. 0269
The Apatite-forming Ability of The New Ti-Nb-Sn Alloy With low Young’S Modulus Via Anodic Oxidation And Hot Water Treatment
Hidetatsu Tanaka, Yu Mori, Atsushi Noro, Norikazu Yamada, Shuji Hanada, Naoya Masahashi, Eiji Ito

Poster No. 0270
Mechanically Assisted Crevice Corrosion on CoCrMo Heads after Long-term Hip Simulator Wear Testing
Chenxi Li, Amit Parikh, Jeff Sprague, Vivek Pawar

Poster No. 0271
Metal Ion Release In Urine And Blood From Titanium Cups Cith Different Surface
Alessandro Bistolphi, Andrea Cimino, Davide Deledda, Alessandro Maselli, Filippo Castoldi, Giuseppe Massa

Poster No. 0057
Wnt5a Treatment Of Embryonic Stem Cell Progenitors Promotes Cartilage Repair In A Rat Chondral Defect Model
Jason D Gibson, Farhang Aalae, David N. Paglia, Ryu Yoshida, Thomas DeBerardino, Rosa Guzzo, Hicham Drissi

Poster No. 0058
TGFβ1 Signalling in Human Mesenchymal Stem Cells is regulated by the Primary Cilium
Marie-Noelle Labour, David Hoey

Poster No. 0059
Intervertebral Disc Regeneration Using Mesenchymal Stem/Stromal Cells Transplanted Via The End-Plate Route in A Large Animal Model
Gianluca Vadala, Fabrizio Russo, Maria Musumeci, Francesca De Strobel, Marco Bernardini, Giulia De Benedictis, Luca Denaro, Domenico D’Avella, Rosaria Giordano, Vincenzo Denaro

Poster No. 0060
Synovial Mesenchymal Stem Cells Enhance Healing of Meniscal Repair In The Avascular Zone of Longitudinal Tear Using A Pig
Yusuke Nakagawa, Takeshi Muneta, Shimpei Kondo, Masafumi Horie, Hideyuki Koga, Ichiro Sekiya

Poster No. 0061
Total Disc Replacement Using Tissue Engineered Intervertebral Discs In An In-vivo Beagle Model
Yu Moriguchi, Rodrigo Navarro, Peter Grunert, Jorge Mojica, Katherine Hudson, Thamina Khair, Marjan Alimi, Lawrence Bonassar, Roger Hartl

Poster No. 0062
The Role of Prostanoid Receptor EP4 on Adhesion Formation in Flexor Tendon Healing - Differential Effects of Tendon-Specific Deletion Versus Systemic Antagonism
Michael B Geary, Caitlin Orner, Fatima Bawany, Warren C Hammert, Regis J O’Keefe, Alayna E Loiselle

Poster No. 0063
The Role of Hedgehog Signaling in Enthesis Healing
Andrea G Schwartz, Leesa M Galatz, Stavros Thomopoulos

Poster No. 0064
Human, Muscle-derived Induced Pluripotent Stem Cells Loaded Onto Coral Scaffolds Are Osteoinductive In An Ectopic Mouse Model
Karim Oudina, Joseph Paquet, Emmanuelle Massourides, Morad Bensidhoum, Nathanael Larochette, Peter Upex, Mickael Deschepper, Delphine Logeat, Christian Pinset, Herve Petite
Poster No. 0272
Functionalizing Fibrin Hydrogels with Cartilage ECM Microparticles Enhances Chondrogenesis of Human Infrapatellar Fat Pad Stem Cells In Vitro and In Vivo
Henrique V Almeida, Rajalakshmanan Eswaramoorthy, Grainne Cunniffe, Fergal J O’Brien, Daniel J Kelly

Poster No. 0273
Ex Vivo Performance of an Injectable Zwitterionic Polymer Network to Supplement the Tribological Properties of Articular Cartilage
Benjamin G Cooper, Brian D Snyder, Mark W Grinstaff

Poster No. 0274
Real Time Assessment Of A New Hydrolytically Degradable And Photo-clickable Hydrogel For Cartilage Tissue Engineering
Alexander J Neumann, Timothy Quinn, Stephanie Bryant

Poster No. 0275
Superior Tribological Performance of Poly(vinyl alcohol) Hydrogels for Artificial Cartilage
Teruo Murakami, Seido Yarimitsu, Kazuhiro Nakashima, Tetsuo Yamaguchi, Yoshinori Sawae, Nobuo Sakai, Atsushi Suzuki

Poster No. 0276
3d-printed ABS And PLA Scaffolds For Cartilage And Intervertebral Disc Tissue Regeneration
Derek H Rosenzweig, Eric Carelli, Thomas Steffen, Peter Jarzem, Lisbet Haglund

Poster No. 0277
In Vitro Maturation and In Vivo Delivery of Cartilage Repair Composites composed of Minced Cartilage in a Photopolymerizable Hyaluronic Acid Hydrogel

Poster No. 0278
Development of a Cartilage-interpenetrating Hydrogel For Augmentation of Equilibrium and Time-dependent Mechanical Properties
Andrea M Simi, Shikha Sharma, Benjamin G Cooper, Rachel C Stewart, Mark W Grinstaff, Brian D Snyder

Poster No. 0279
Chondrogenic Differentiation Of Genetically Modified hMSC Via Controlled Release Of rAAV Vectors From Self-assembling Peptide Hydrogels
Ana Rey Rico, Jagadeesh Venkatessan, Janina Frisch, Gertrud Schmitt, Amália Monge-Marcet, Alvaro Mata, Carlos Semino, Henning Madry, Magali Cucchiarini

Poster No. 0280
Ibuprofen Impairs Capsulolabral Healing in a Rat Model of Anterior Glenohumeral Instability
Jonathan D Packer, Arya V Varthi, Frances Javier, David Zhu, Jennifer V. Garver, Steven M Tommasini, Theodore A Blaine

Poster No. 0281
A Simulated Long-Term Degradation Study of a Novel Artificial Medial Meniscus Implant
Jonathan J Elsner, Maoz Shemes, Adaya Shefy-Peleg, Eyal Zylberberg, Eran Linder-Ganz

Poster No. 0282
Synthetic PAMPS Gel Activates TGF-beta/BMP Signaling Pathway During The Chondrogenic Differentiation Of ATDC5 Cells
Keiko Goto, Nobuto Kitamura, Taichi Kimura, Shingo Semba, Takayuki Kurokawa, Jian P Gong, Shinya Tanaka, Kazunori Yasuda

Poster No. 0283
Controlled Release Of RaAV Vectors From Alginate-polyoxamer Complex Systems
Patricia Diaz-Rodriguez, Ana Rey Rico, Henning Madry, Marianda Mandin, Magali Cucchiarini

PS1 BIOMATERIALS - BONE

Poster No. 0284
Inflammatory Responses of Osteocytes to Mechanical Perturbation and Wear Particles
Heon Goo Lee, Lee Song, Jungho Back, Francis Y Lee

Poster No. 0285
Does Locally Delivered Zoledronate Influence Peri-implant Bone Formation? - Spatio-temporal Monitoring Of Bone Remodeling In Vivo
Ulrike Kettenberger, Julien Ston, Eric Thein, Philip Procter, Dominique Pioletti

Poster No. 0286
Enhanced Peri-implant Osteogenesis by Synthetic Peptide Conjugation
Jeong Joon Yoo, Ji-Hye Lee, Jinwoo Nam, Soong Joon Lee, Hee Joong Kim

Poster No. 0287
The Interactions Between BMP-2 and Hydrogel Stiffness in Stimulating Bone Formation
Shih Jye Tan, Josephine Fang, Zhi Yang, Marcel Nimni, Bo Han

Poster No. 0288
Intraosseous Injections of rhBMP-2 Induces Periosteal Bone Formation in a Mouse Model of Osteogenesis Imperfecta
Tegan L Cheng, Aaron Schindeler, Craig M Munns, David G Little

Poster No. 0289
Spinal Fusion With Bone Morphogenetic Protein-2 Delivered by hydroxyapatite/collagen in a Rabbit
Yasuda Hiroaki, Tomokazu Masaoka, Takashi Taniyama, Tsuyoshi Yamada, Wei Xuetao, Toshitaka Yoshii, Atsushi Okawa, Shinichi Sotome

Poster No. 0290
Enrichment of DBM with BMP-2: Burst Release Combined with Long Term Binding
Nicole Bormann, Philipp Schwabe, Britt Wildemann
Poster No. 0291
**Osseointductive, Osseoconductive And Antimicrobial Acrylate Hydrogel As Bone Graft Material**
Nathanael G Morris, Stefano Perni, Polina Prokopovich

Poster No. 0292
**Elution Characteristics of PMMA Bone Cement IM Spacers Impregnated with Vancomycin and Tobramycin**
Andrew G Patton, Brandon A. Perez, William L. Buford, Jr.

Poster No. 0293
**Surface Construction Of Zn Doped Hydroxyapatite/mgf2 Multilayer Coatings For The Biomedical Mg Materials By A Novel Conversion/sol-gel Method**
Heng Jui Liu, Da Jun Lin, Subhaini Jakfar, Fei Yi Hung, Ming-Long Yeh

Poster No. 0294
**Implant Coating Technology with New Bioadhesive Materials**
Yohei Kagawa, Kentaro Yamane, Kensuke Shinohara, Noriuyki Watanabe, Aki Yoshida, Akihiro Matsukawa, Toshifumi Ozaki

Poster No. 0295
**Implantation of an Osteoconductive Additive Manufactured Titanium Alloy Implant Leads to Osteointegration Outside the Bone Envelope in Rats and Rabbits**
David J Cohen, Alexander Whitehead, Sharon L Hyzy, Barbara D Boyan, Zvi Schwartz

Poster No. 0296
**Engineered Magnesium-based Resorbable Porous Scaffold For Bone Tissue Engineering**
Hoi Man Wong, Paul K Chu, Frankie KL Leung, Kenneth MC Cheung, Keith DK Luk, Kelvin Wai Kwok Yeung

Poster No. 0297
**Collagen Plasma Treatment Of Poly-(ether-ether)-ketone For Improved Outcomes Of Osseointegration**
Jessica S Hayes, Seán Gaynard, Declan M Devine, Mary Murphy

Poster No. 0298
**Mechanical Properties of Rough and Surface Porous Polyether-ether-ketone**
Nathan Evans, David Safranski, F Brennan Torstrick, Christopher S.D. Lee, Kenneth M Dupont, W. Chang, Annie Macedo, Jennifer Boothby, Angela Lin, Kenneth Gall

Poster No. 0299
**The Effects Of Hyaluronic Acid And Poly-d,l-lactic Acid Coatings On Titanium Implant Fixation In Sheep**
Christina M Andreasen, Susan S. Henriksen, Ming Ding, Thomas Levin Andersen, Soeren Overgaard

Poster No. 0300
**The Optimization of Porosity and Pore Patterning for Ti-6Al-4V Bone Constructs Using Additive Manufacturing**
Glenn Sanders, Matthew DiCaprio, Ronald Bucinell, Stephen A Paolicelli

Poster No. 0301
**Cell Behaviors on Grit-blasted Titanium Disc with or without Platelet-rich Plasma Pretreatment**
Ji-Hye Lee, Jinwoo Nam, Soong Joon Lee, Hee Joong Kim, Jeong Joon Yoo

Poster No. 0302
**The Effects Of Cobalt Chromium Molybdenum Surface Topography On Mesenchymal Stromal Cells In Vitro**
Niall Logan, Alison Traynor, Laurent Bozec, Peter Brett

Poster No. 0303
**Effect Of Calcination Temperature On phase transformation, Corrosion Resistance And Cytocompatibility Of CaP-coated Magnesium Materials For Orthopaedic Application**
Da-Jun Lin, Subhaini Jakfar, Fei-Yi Hung, Ming-Long Yeh

Poster No. 0304
**Intramedullary Boron Containing Nano-Hydroxyapatite Bioceramic Application Improves Bone Mineral Density, Volume and Surface of Ovariectomized Rabbit Femurs**
Edu Çiftçi, Feza Korkusuz, Petek Korkusuz, Hakan Hamdî Çelik, Alper Mehmet Çetinkaya

Poster No. 0305
**Mesenchymal Stem Cell Response To Uv-photofunctionalized Tio2 Coated Cobalt-chromium-molybdenum**
Niall Logan, Alison Cross, Alison Traynor, Laurent Bozec, Ivan Parkin, Peter Brett

Poster No. 0306
**Is Nano-Rough Topography A Solution For Enhanced And Stable Femoral Bone-Implant Interface In A Hip Implant?**
Sweetu B Patel, Farid Amirouche, Mathew Mathew, Tolou Shokufar

Poster No. 0307
**Allograft Bone Tissue Reconstitution Time and Associated Compressive Strength: A Biomechanical Analysis**
Mark D Barton, Amir H. Qureshi, Loren Latta, H. Thomas Temple

Poster No. 0308
**Development of a Novel Method for the Strengthening and Toughening of Irradiation-Sterilized Bone Allografts used in Orthopaedic Reconstructions**
Tarik Attia, Marc Grynpas, Thomas Willett

Poster No. 0309
**Intramedullary Wire Fixation of Bone Allograft for Reconstruction of Critically-Sized Radius Segmental Defect in a New Zealand White Rabbit Model**
Sam Si-Hyeong Park, Kate Banks, Peter Salat, Adeline H Ng, Christopher Kim, Marc Grynpas, Thomas Willett

Poster No. 0310
**Cortical Bone Mimetic Matrix for Regeneration of Segmental Bone Defects**
Danial Barati, Jeremiah T Easley, Ross H Palmer, Cecily Broomfield, Kirk McGilvray, EJ Ehrhart, Esmaiel Jabbari
Poster No. 0311

**Combined Use of Platelet-rich Plasma (PRP) and Autologous Bone Grafts for Regeneration of Long Bone Critical-size Defects**
Pascal Jungbluth, Johannes Schneppendahl, Simon Thelen, Mohssen Hakimi, Joachim Windolf, Jan Grassmann

Poster No. 0312

**Fluid Shifts And Microvascular Blood Flow In The Tibia Using Body Tilt And Lower Body Negative Pressure**
Jamila H Siamwala, Paul Lee, Brandon Macias, Alan Hargens

Poster No. 0313

**WITHDRAWN**

Poster No. 0314

**Faster Bone Healing Can Be Achieved By Using a Bone Marrow Stem Cells Concentrate Glass-Reinforced Hydroxyapatite Scaffold: An In Vivo Ovine Study**
Joao Torres, Manuel Gutierrez, Luis Atayde, Paulo Cortez, Maria Ascencio Lopes, Jose Domingo Santos, Abel Trigo Cabral, Carola F van Eck

PS1 BIOMATERIALS - TENDON AND LIGAMENT

Poster No. 0315

**Effect of Two Terminal Sterilization Techniques on the Functional Performance of Extracellular Matrix Scaffolds**
Gabriel S Perrone, Benedikt L. Proffen, Braden Fleming, Jakob Sieker, Joshua Kramer, Michael Hawes, Gary Badger, Martha Murray

Poster No. 0316

**ACL Replacement Using a Decellularised Xenograft Tendon**
Karin Hing, Gordon W Blunn

Poster No. 0317

**Human Fascia Lata ECM Scaffold Augmented with Immobilized Hyaluronan: Inflammatory Response and Remodeling in the Canine Body Wall and Shoulder Implantation Sites**
Diane Leigh, Myung-Sun Kim, David Kovacevic, Andrew Baker, Carmela Tan, Anthony Calabro, Kathleen Derwin

Poster No. 0318

**Biomechanical Properties of an Artificial Ligament Produced from Demineralized Bone for Anterior Cruciate Ligament Reconstruction**
Anita Vijapura, Ali Alhandi, David Kaimrajh, Edward Milne, Loren Latta, H. Thomas Temple

Poster No. 0319

**Effect of Electron Beam Sterilization on the In Vivo Function of Extracellular Matrix Scaffolds**
Gabriel S Perrone, Benedikt L. Proffen, Braden Fleming, Jakob Sieker, Joshua Kramer, Michael Hawes, Gary Badger, Martha Murray

PS1 CARTILAGE, SYNOVIM & OSTEOARTHRITIS - CELL AND MOLECULAR IMAGING

Poster No. 0320

**Applying Three-Dimensional Confocal Imaging to Study Articular Cartilage**
Minjie Zhang, S. Balaji Mani, Amber Hall, Lin Xu, Yefu Li, David Zurakowski, Gregory Jay, Matthew Warman

Poster No. 0321

**3-D Organization of Cells and Matrix in Human Articular Cartilage**
Neil Chang, Van Wong, Esther Cory, Felix Hsu, Robert Sah

Poster No. 0322

**Contrast-enhanced µCT Arthrography (CE-µCTA) Of Musculoskeletal Tissues In Mice**
Luis Cardoso, Daniel Leong, Hui Bin Sun

Poster No. 0323

**Raman Spectrographic Characterization of Cartilage Matrix Swelling via Lysyl Oxidase Inhibition in Immature Explants and Tissue Constructs**
Krista M. Durney, Robert J Nims, Michael Albro, Tingyi Gu, Lucie Karbowski, Akaljot Singh, Sinisa Vukelic, Clark Hung, Gerard Ateshian

Poster No. 0324

**Pathological and MR Imaging Evaluation of Articular Cartilage Degeneration in the Human Zygapophysial Joint**
Daisuke Yamabe, Hideki Murakami, Hirooki Endo, Koou Choukan, Itsuko Tsukimura, Minoru Doita

PS1 CARTILAGE, SYNOVIM & OSTEOARTHRITIS - POST TRAUMATIC OA

Poster No. 0325

**Serum Biomarkers In A Novel In Vivo Model Of Post-traumatic Osteoarthritis**
Carin E Ahner, Aaron Stoker, Ferris Pfeiffer, Farrah Monibi, Seth Sherman, Chantelle Bozynski, James L Cook

Poster No. 0326

**In vivo Evidence of a Shift in Tibiofemoral Contact In ACL-Reconstructed Knees During Dynamic Motion**
Jarred Kaiser, Richard Kijowski, Geoffrey Baer, Darryl Thelen

Poster No. 0327

**IL-10 Reduces Apoptosis And Extracellular Matrix Degeneration After Injurious Compression Of Bovine Articular Cartilage**
Peter Behrendt, Andre Preusse-Prange, Alan J Grodzinsky, Bodo Kurz

Poster No. 0328

**Analysis of the Metabolic Response of Cartilage Tissue to Injury and Inflammation in vitro**
Aaron Stoker, Kathleen James, Ferris Pfeiffer, Keiichi Kuroki, Chantelle Bozynski, James Cook
Poster No. 0329
P38 Mitogen-activated Protein Kinase Regulates HDAC4 Degradation In Growth Plate Chondrocytes Jingming Zhou, Pengcui Li, Qian Chen, Xiaochun Wei, Ting Zhao, Zhengke Wang, Lei Wei

Poster No. 0330

Poster No. 0331
The Correlation Of Cartilage Damage With Mechanical Properties In Early Stages Of Osteoarthritis Using A Mechanical Loaded Mouse Model Hongskik Cho, Yong-Hoon Jeong, Do-Gyoon Kim, Karen A Hasty

Poster No. 0332
Bone Morphological Changes Correlate with Reduction in PTA after Articular Fracture in the MRL/MpJ Mouse Kelly A Kimerling, Bridgette D Furman, Tyler J Vovos, Janet L Huebner, Virginia B Kraus, Farshid Gulik, Steven A Olson

Poster No. 0333
Abnormal Mechanical Loading Induces Cartilage Degeneration By Accelerating Meniscus Hypertrophy And Mineralization After Acl Injury In Vivo Guoqing Du, Hongsheng Zhan, Shaowei Wang, Fangyuan Wei, Jianzhong Zhang, Xiaochun Wei, Anthony M Reginato, Braden C Fleming, Bahar Bilgen, Lei Wei

Poster No. 0334
Conditional And Cartilage-specific Expression Of Mechanosensitive Microrna-365 Accelerates Meniscus Injury Induced Osteoarthritis In A Murine Model Rajiv J Iyengar, Kun Yang, Yun Gao, Zehong Yang, Wentian Yang, Qian Chen

Poster No. 0335
Characterization of Cartilage-specific IKKβ and IKKx Inducible Knockout Mice in a Surgical Model of Osteoarthritis Kirsty L Culley, Miguel Otero, Eleonora Olivotto, Jun Chang, Cecilia Dragomir, Kenneth B Marcu, Mary B Goldring

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - MATRIX PROTEINS, COLLAGEN AND PROTEOGLYCANS

Poster No. 0336
Galectin-3 Enhances Cartilage Lubrication via Lubrinc Binding Heidi L. Reesink, Edward D Bonniveje, Sherry Liu, Lawrence Bonassar, Alan J Nixon

Poster No. 0337
The Anabolic Effects Of Hif-1α-induced Hsp70 In Rabbit Articular Chondrocyte Under Hypoxic Conditions Shohei Ichimaru, Shinji Tsuchida, Yuji Araı, Shuji Nakagawa, Hiroaki Inoue, Tomohiro Matsuki, Kuniaki Honjo, Keiichiro Ueshima, Osam Mazda, Toshikazu Kubo

Poster No. 0338
Lubrinc/Proteoglycan 4 Binding to Cluster Determinant-44 (CD 44) Receptor and The Contribution of Central Mucin Domain Glycosylations Maha Jamal, Tannin Schmidt, Gregory Jay, Khaled A Elsaid

Poster No. 0339
Matrilin-3 Is An Inhibitor Of Angiogenesis In Vivo Linda H Chao, Samir K Trehan, Qian Chen

Poster No. 0340
Hyaluronidase Pre-treatment Inhibits Sox9 Expression Induced By Trpv4 Agonist Gsk1016790a In Chondrogenic Adsc5 Cell Yoshikazu Ogawa, Toshihisa Kojima, Nobunori Takahashi, Toki Takemoto, Naoki Ishiguro

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - FOCAL DEFECT REPAIR

Poster No. 0341
The Functional Assessment Of A Bi-layered Implant For The Repair Of Osteochondral Defects Tony Chen, Caroline Brial, Hongsheng Wang, Russell Warren, Suzanne Maher

Poster No. 0342
Platelet-rich Plasma Impregnated Porous PVA Scaffolds Improve Integration With Cartilage Explants In A Dose-dependent Manner Tony Chen, Supansa Yodmuang, Kyra Caldwell, Miguel Otero, Erik Attia, Russell Warren, Suzanne Maher

Poster No. 0343
Detection and Characterization of Local Interfacial Mechanics in a Cartilage Defect Repair Model Darwin Griffin, Amanda M Meppelink, Mark A Randolph, Itai Cohen, Lawrence Bonassar

Poster No. 0344
Design and Fabrication of Minced Engineered Cartilage Fragments for Joint Repair Andrea R Tan, Eben G Estell, Jack Farr, Christopher Ahmad, Gerard Ateshian, James L Cook, Clark Hung

Poster No. 0345
Chondroprotection of Tissue-Engineered Cartilage via Internal Delivery of Dexamethasone Brendan L Roach, Arta Kelmendi-Doko, Elaine C Balutis, Brian K Jones, Gerard A Ateshian, Kacey G. Marra, Clark T Hung

Poster No. 0346
Validation of Long-Term Preservation of Osteochondral Allografts at Room Temperature Aaron Stoker, Clark Hung, Eric G Lima, James P Stannard, James L Cook

Poster No. 0347
The Effect of Using Collagen Vitrigel Containing Transforming Growth Factor Beta 1 on Articular Cartilage Repair Hideyuki Maruki, Masato Sato, Toshiaki Takezawa, Yoshihiko Tani, Munetaka Yokoyama, Mikiyo Kobayashi, Mami Kokubo, Tomoko Kawake, Rie Okada, Joji Mochida, Yoshiharu Kato
Poster No. 0348
**Influence of Photosensitizer Concentration and Irradiance on Articular Cartilage Bond Strength**
Alberto L Arvayo, Chun Hua Zheng, Michelle Deng, Marc Levenston

PS1 CARTILAGE, SYNOVIIUM & OSTEOARTHRITIS - MECHANICS

Poster No. 0349
**Boundary Lubrication by Synovial Fluid in TMJ Disc and Condylar Cartilage**
Hunter Bachman, Brandon K Zimmerman, Eric J Granquist, David L Burris, X. Lucas Lu

Poster No. 0350
**Deleterious Effects of Blood on Cartilage Lubrication by Synovial Fluid: Friction and Wear are Impaired but not Correlated**
Michele M Temple-Wong, Ellie A Hofer, Haoran Qiu, Robert L Sah

Poster No. 0351
**Customized Osteochondral Grafts for Cartilage Resurfacing: Effects of Contour and Placement on Biomechanics of Femoro-Tibial Contact in the Goat**

Poster No. 0352
**Sprifermin (rhFGF18) Preserves Articular Cartilage Depth-Dependent Properties During In Vitro Culture**
Gregory R Meloni, Alexandra Farran, Bhavana Mohanraj, Anne Gigout, Robert L Mauck, George R Dodge

Poster No. 0353
**Cartilage Deformation in ACL-Deficient Knees: A Dynamic In Vitro Model**
Justin W Arner, James N. Irvine, Liying Zheng, Margaret Hankins, Robert E. Carey, Eric D Thorhauer, Scott Tashman, Christopher D Harner, Xudong Zhang

Poster No. 0354
**Mechanically Aided Transport of Antibodies through Articular Cartilage**
Chris DiDomenico, Zhen Xiang Wang, Lawrence Bonassar

Poster No. 0355
**Subject-Specific 3D T2 Relaxation Mapping Of The Tibiofemoral Cartilage Contact Regions During Walking: A Dual Fluoroscopy And Magnetic Resonance Imaging Approach**
Gulshan B Sharma, Gregor Kunzze, Jillian E Beveridge, Chris Bhatla, Richard Frayne, Janet L Ronsky

Poster No. 0356
**Fabella Size: A Marker for Specific Compartment Osteoarthritis and Mechanics**
Douglas D Robertson, Jr., Elie Harmouche, Jad Chamieh, Walter Carpenter, Michael Terk, Scott A Banks

Poster No. 0357
**Contrast Agent’s Transport Across Healthy Articular Cartilage Under Various Bath Conditions**
Behdad Pouran, Vahid Arbabi, Joaquin Villamar, Amir Abbas Zadpoor, Harrie Weinans

Poster No. 0358
**Impact Of The Synovial Fluid On Temperature Increase Due To Cartilage Viscoelastic Properties**
Mohamadreza Nassajian Moghadam, Philippe Abdel-Sayed, Valérie Malfroy Camine, Dominique P Pioletti

PS1 CARTILAGE, SYNOVIIUM & OSTEOARTHRITIS - GENE THERAPY

Poster No. 0359
**Relevance of the Spatial Distribution Pattern of Mechanical Properties of Articular Cartilage in Animal Studies**
Sotchead Sim, Insaf Hadjab, Martin Garon, Eric Quenneville, Michael D Buschmann

Poster No. 0360
**Improved Conditions To Enhance The Chondrogenic Differentiation Processes In Human Primary Bone Marrow Aspirates Via rAAV-mediated Gene Transfer**
Ana Rey Rico, Janina Frisch, Jagadeesh Venkatesan, Gertrud Schmitt, Henning Madry, Magali Cucchiarini

Poster No. 0361
**Enhanced Chondrogenic Differentiation Processes In Bone Marrow Aspirates From Minipigs Following rAAV-mediated Gene Transfer And Overexpression Of The Transcription Factor Sox9**
Janina Frisch, Ana Rey-Rico, Jagadeesh K Venkatesan, Gertrud Schmitt, Henning Madry, Magali Cucchiarini

Poster No. 0362
**Influence Of IGF-I Overexpression Via rAAV Gene Transfer Upon The Chondrogenic Differentiation Potential Of Human Bone Marrow Aspirates**
Janina Frisch, Ana Rey-Rico, Jagadeesh K Venkatesan, Gertrud Schmitt, Henning Madry, Magali Cucchiarini

Poster No. 0363
**Effect Of Inhibiting Mmp13 And Adamsst Small Interference Rna (sirna) By Intra-articular Injection In A Surgically Induced Osteoarthritis Model Of Mice**
Hiroko Hoshi, Takahisa Sasho, Ryuichiro Akagi, Yuta Muramatsu, Yorikazu Akatsu, Joe Katsuragi, Taisuke Fukawa

PS1 CARTILAGE, SYNOVIIUM & OSTEOARTHRITIS - MATRIX DEGRADATION

Poster No. 0364
**Detection of Elevated CTXII Levels within the Knee Joint of a Rat Monooiodoacetate OA Model using a Novel Magnetic Capture Technique**
Elena G Yarmola, Yash Shah, David P. Arnold, Jon Dobson, Kyle D Allen

Poster No. 0365
**Multi-scale Delineation of Articular Cartilage Deterioration in Aging and Osteoarthritis**
Neil Chang, Esther Cory, Albert C Chen, Martin K Lotz, Robert Sah

Poster No. 0366
**In vitro Degradation and In Vivo Deterioration Analysis of a Bioluminescent Cartilage Reporter Mouse Model**
Sarah Mailhiot, Garcia Allen, Donald Zignego, Ronald June
Poster No. 0367
**Intra-articular Injection Of Rebamipide Prevents Articular Cartilage Degeneration In Murine Models Of Osteoarthritis**
Yoshiaki Suzuki, Masahiro Hasegawa, Yurio Matsui, Hironori Unno, Takahiro Iino, Toshimichi Yoshida, Akihiro Sudo

Poster No. 0368
**Low Dosage Of Monoiodoacetic Acid Induces Arthritis Without Bone Defect In A Rat Model**
Mio Udo, Ichiro Sekiya, Kunikazu Tsuji, Nobutake Ozeki, Yusuke Nakagawa, Toshiyuki Ohara, Ryusuke Saito, Katsuaki Yanagisawa, Takeshi Muneta

PS1 CARTILAGE, SYNOVIOUM & OSTEOARTHRITIS - TISSUE ENGINEERING AND REPAIR

Poster No. 0369
**Active: Preliminary Results At 5 Years Of A Randomized Trial Of Autologous Chondrocyte Implantation In The Knee Where Previous Surgery Has Failed**
James B Richardson, Jan Herman Kuiper, Martyn Snow, Hamish Simpson

Poster No. 0370
**Identification Of Prognostic Biomarkers For Autologous Chondrocyte Implantation In Cartilage Repair**
Karina T Wright, James B Richardson, Heidi Fuller, Sally Roberts

Poster No. 0371
**Cartilage Regenerative Capacity of Amnion-derived ECM-coated PLGA Scaffold in a Cartilage Defect Model in Nonhuman Primates**
Makiko Nogami, Shoji Seki, Hiraku Motomura, Ryuichi Gejo, Hiroto Makino, Toshio Nikaido, Tomoatsu Kimura

Poster No. 0372
**Scaffold-free Cell-matrix Bead-type Autologous Chondrocyte Implantation, Cartilifetm For Cartilage Repair: Early Clinical Results**
Kee Yun Chung, Sahnhgoon Lee, Jungsun Lee, Jin-Yeon Lee, Byung-Chul Chae, Youngsook Son, Kyoung Ho Yoon, Myung Chul Lee

Poster No. 0373
**The Repair Of Articular Cartilage Defects Using A Transglutaminase 4 And Hydrogel Embedded With Synovium-derived Stem Cells In Rabbit Model**
Hyunjin Min, Sun Young Wang, Hee Jung Park, Yu Jung Kim, Kee Yun Chung, Hyuk Soo Han, Sahnhgoon Lee, Myung Chul Lee

Poster No. 0374
**Repair Of Chronic Osteochondral Defect Using Magnetically Labeled Mesenchymal Stem Cells**
Elhussein Elbadry Mahmoud, Goki Kamei, Yohei Harada, Naosuke Kamei, Nobuo Adachi, Mitsuo Ochi

Poster No. 0375
**Comparison and Characterization of In Vitro and In Vivo Treatments of Lubricin-Mimetics on Articular Cartilage**
Kirk J Samaroar, Mingchee Tan, Marco Demange, Ashley Titan, Camila Carballo, Marco Sisto, Scott Rodeo, David Putnam, Lawrence Bonassar

Poster No. 0376
**TGF-β induced Synergy Between Chondrocytes and Stem Cells for Articular Cartilage Repair In Vivo**
Janice H Lai, Lisa Su, R Lane Smith, William Maloney, Fan Yang

Poster No. 0377
**Enzymatically Treated Adult Cartilage Fragments for Cartilage Regeneration - Is Fibrin Glue Appropriate for Cartilage Repair?**
Alex J McNally, Jennifer Van Deven, Chris Chapman, Steve Lin, Kurt Sly

Poster No. 0378
**Hypoxia Enhances Colony Formation And Proliferation With Chondrogenic Potential In Passage 0 Human Synovial Mesenchymal Stem Cells**
Toshiyuki Ohara, Takeshi Muneta, Yu Matsukura, Kunikazu Tsuji, Ichiro Sekiya

Poster No. 0379
**Unraveling Chondrocyte and MSC Cocultures: Direct Cell-Cell Contact is Essential for Optimal Cartilage Regeneration**
Tommy S de Windt, Daniel B Saris, Ineke C Slaper-Cortenbach, Mattie H van Rijen, Wouter J Dhert, Lucienne A Vonk

Poster No. 0380
**Towards an Extracellular Matrix Based, In-situ Crosslinkable Scaffold for Cartilage Repair**
Emma Cavalli, Claudia Loebel, David Eglin, Marcy Zenobi-Wong

Poster No. 0381
**Optimization of a Novel Scaffold for Cartilage Repair**
Sarav Shah, Sandeep Pandit, Z Parikh, John A. Schwartz, Todd A Goldstein, L.P. Lavelle, Arindam Datta, Haixiang Liang, Daniel Grande

Poster No. 0382
**WITHDRAWN**

Poster No. 0383
**Treatment of Cartilage Defects With 3D Bio-Printed Scaffolding**
Todd A Goldstein, Benjamin Smith, John A. Schwartz, Jonathan Berkowitz, Daniel Grande

Poster No. 0384
**Enhanced Expression of Type II Collagen with a Micronized Cartilage Matrix and Platelet Derived Growth Factor**
James R Mullen, Kevin Myers, Zalak Parikh, Haixiang Liang, Daniel Grande
Poster No. 0385

**Magnetic Targeting of Chondrocyte Sheet for the Treatment of Osteoarthritis**
Seiju Hayashi, Yasunari Ikuta, Ryo Shimizu, Naosuke Kamei, Nobuo Adachi, Masataka Deie, Mitsuo Ochi

Poster No. 0386

**Age Independent Cartilage Generation for Synovium Based Autologous Chondrocyte Implantation**
Nahoko Shintani, Marius J.B. Keel, Kurt Lippuner, Ernst B Hunziker

Poster No. 0387

**Tissue Engineered Human Cartilage Sheets are Significantly Stiffer When Re-Differentiated at Low Oxygen Tension**
Thomas J Kean, G A Whitney, Geoff Traeger, Russell J Fernandes, James E Dennis

Poster No. 0388

**Physical Forces Modulate the Tissue Engineered Cartilage Ultrastructure**
Erica Kahn, Amy X Mei, Robert Stefani, Carol Ayala, Roy K Aaron, Bahar Bilgen

Poster No. 0389

**Chondrogenic Differentiation Of Bone Marrow-derived Mesenchymal Stem Cells Regulated By Wnt/beta-catenin Signaling Pathway**
Peng Cheng, Anmin Chen, Fengjing Guo, Hui Huang, Qing Yang, Weikai Zhang

Poster No. 0390

**Dynamic Axial Loading Disrupts Lateral Integration of Arthritic Human Articular Cartilage and Synthetic Tissue Engineered Scaffolds in an Ex Vivo Ring Model**
Benjamin R Mintz, Dean Papaliodis, Smelker Jordan, Garrett Leonard, Michael Mulligan, James A Cooper

Poster No. 0391

**Kartogenin Enhance Chondrogenic Differentiation of MSCs in 3-D Tri-copolymer Scaffold and Functional-Closed Perfusion System**
Chun-Ching Li, Ching-Yun Chen, Cherng-Jyh Ke, Feng-Hui Lin, Jui-Sheng Sun

Poster No. 0392

**MIAMI Cell hyaline cartilage formation is enhanced by TGF-β3-Releasing Pharmacologically Active Microcarriers And Human Cartilage Microparticles**
Gaetan J Delcroix, Gianluca D’ippolito, Teresita Reiner, Theodore Malinin, H. Thomas Temple, Claudia N Montero-Menei, Paul C Schiller

Poster No. 0393

**Development Of An Ex-vivo Organ Culture Model Of The Femoral-tibial Joint**
Natalie Fox, Martin Stanley, Daniel S Thomas, John Fisher, Eileen Ingham

Poster No. 0394

**Develop Surface Treated Biphasic Poly(lattice-co-glycolic) Acid (PLGA) Scaffold to Maintain Chondrocyte Phenotype and Interface Integration**
Meng-Chian Wu, Wen-Hui Cheng, Hsueh-Chun Wang, Tzu-Hsiang Lin, Jih-Jhan Lin, Horng-Chaung Hsu, Ming-Long Yeh

Poster No. 0395

**The Effect On Articular Cartilage Repair Using Collagen Vitrigel And Chondrocyte Sheets**
Yoshiki Tani, Masato Sato, Toshiaki Takezawa, Munetaka Yokoyama, Miyuki Kobayashi, Eriko Toyoda, Tomoko Kawake, Eri Okada, Joji Mochida

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - GENETICS/GENOMICS AND PROTEOMICS

Poster No. 0396

**Depletion Of GD3 Synthase Enhances Osteoarthritis Development In Mice**
Dausuke Momma, Tomohiro Onodera, Fumio Sasazawa, Masatake Matsuoka, Shinji Matsubara, Norimasa Iwasaki

Poster No. 0397

**A Transcriptomic and Proteomic Analysis of Acute Changes in a Pig Model of Post-Traumatic Osteoarthritis**
Ugur M Ayturk, Carla M Haslauer, Tue Bennike, Jakob T Sieker, Benedikt L. Proffen, Matthew L Warman, Braden C Fleming, Martha M Murray

Poster No. 0398

**Endoplasmic Reticulum Stress-induced Apoptosis Contributes To Articular Cartilage Degeneration Via C/EBP Homologous Protein**
 Yusuke Uehara, Jun Hirose, Hiroshi Mizuta

Poster No. 0399

**Genome-wide MicroRNA Expression Profiling And Pathway Analysis Reveal Progressive Changes In Epidermal Growth Factor Signaling In Experimental Osteoarthritis**
Paul J Fanning, Christopher Raskett, Yukiko Maeda, Nicholas Farina, Ellen Gravallese, Gary Stein, Janet Stein, David Ayers, Jane Lian

Poster No. 0400

**Deletion of the PH-domain and Leucine Rich Repeat Protein Phosphatase 1 (Phlp1p) Increases Fibroblast Growth Factor (Fgf) 18 Expression and Protects Against Surgically-Induced Osteoarthritis**
Elizabeth W. Bradley, Meghan E McGee-Lawrence, Lomeli R. Carpio, Derek F. Amanatullah, Sanjeev Kakar, Lauren E. Ta, Alexandra C. Newton, Jennifer J. Westendorf

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - GROWTH PLATE AND ENDOCHONDRAL OSSIFICATION

Poster No. 0401

**Meclozine, Motion Sickness Medicine, Has The Therapeutic Potential In Achondroplasia**
Masaki Matsushita, Hiroshi Kitoh, Kenichi Mishima, Yoshihiro Nishida, Naoki Ishiguro, Kinji Ohno

Poster No. 0402

**Loss Of Tet1 Impairs Endochondral Ossification In The Embryonic Growth Plate**
Piera Smeriglio, Sarah E. B. Taylor, Madhusikta Rath, Nidhi Bhutani
Poster No. 0403  
**Promoting Endogenous Repair in a Rat Growth Plate Injury Model by Enhancing Mesenchymal Stem Cell Recruitment and Chondrogenesis**  
Nichole Shaw, Michelle Sautque, Michael S Riederer, Nancy Hadley-Miller, Melissa D Krebs, Karin A Payne

Poster No. 0404  
**Zonal and Regional Variations in Growth Plate Chondrocyte Deformation under Compression as Predicted by 3D Multiscale Simulations**  
Jie Gao, Esra Roan, John L Williams

Poster No. 0405  
**Bone-Like Microenvironment Induces Hypertrophy in Phenotypically Stable Nasal Chondrocytes**  
Melika Sarem, Andrea Barbero, Neha Arya, Ivan Martin, V. Prasad Shastri

Poster No. 0406  
**Characterization Of A 3d Model Of Mineralization In Atdc5 Cells**  
Biming Wu, Rhima M Coleman

Poster No. 0407  
**Growth Plate Chondrocyte Biomechanics and Mechanobiology: A Multi-Scale Study**  
Jie Gao, Esra Roan, John L Williams

Poster No. 0408  
**A Novel Mechanism of Chondrocyte Death in Cartilage Subjected to Extreme Loads**  
Alexander Kotelsky, Andrea Lee, Mark Buckley

Poster No. 0409  
**Age Dependent Cartilage Repair and Subchondral Bone Remodeling in a Minipig Defect Model**  
Christian G Pfeifer, Matthew B Fisher, Vishal Saxena, Minwook Kim, Elizabeth A. Henning, George R Dodge, David R. Steinberg, Robert L. Mauck

Poster No. 0410  
**Flux Calculations Based on Metabolomic Data for Human Chondrocyte Central Energy Metabolism in Response to Applied Compression**  
Daniel Salinas, Cody Minor, Ross Carlson, Brendan Mumey, Ronald June

Poster No. 0411  
**Mechano-regulation Of NFATc In Articular Cartilage**  
Ayeshi Al-Sabah, Vic Duance, Emma Blain

Poster No. 0412  
**Oa Chondrons: A Biosynthetically Active Cell Population Capable Of Responding To Biomechanical Loads Within The Implant**  
Miriam Rothdiener, Tatiana Uynuk-Ool, Tino Felka, Bjoern Gunnar Ochs, Ulrich Stoeckle, Alan J Grodzinsky, Bernd Rolauffs

Poster No. 0413  
**The Role of Prenatal Movements in Promoting Postnatal Hip Joint Stability**  
Mario Giorgi, Alessandra Carriero, Niamh C. Nowlan, Sandra Shefelbine

Poster No. 0414  
**How Does The Actin Cytoskeleton Modulate The Local Elastic And Time-dependent Properties Of Chondrocytes During AFM Nanoindentation?**  
Cristina Florea, Milka E Mononen, James M Fick, Janne Ylarinne, Cheng J Qu, Mikko J Lammi, Rami K Korhonen

Poster No. 0415  
**Morphology Of Chondrocytes Within Articular Cartilage Affects The Solid But Not The Fluid Microenvironment Under Compression**  
Hongqiang Guo, Suzanne Maher, Peter Torzilli

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - MECHANOBIOLOGY

Poster No. 0416  
**A Smart Aptamer Facilitates The Conjugated-Triptolide Selectively Targeting Joint To Enhance Efficacy And Reduce Hepatotoxicity In Mice**  
Biao Liu, Junzhe Huang, Jun Lu, Defang Li, Xiaojuan He, Ge Zhang, Aiping Lu

Poster No. 0417  
**Bmp-2 Stimulation Works In A Cx2-2 Dependent Manner To Promote Chondrocyte Maturation**  
Jessica Cottrell, James O’Connor

Poster No. 0418  
**Synovial Macrophages Promote TGF-β Activation After Intra-Articular Injections of Oxidized LDL In Naïve Murine Knee Joints, Preventing Production of Pro-Inflammatory Factors S100A8/9, Chemokines and Aggrecanase-Induced Neo-Epitopes**  
Wouter de Munter, Arjen B Blom, Peter M van der Kraan, Johannes Roth, Thomas Vogl, Wim B van den Berg, Peter L van Lent

Poster No. 0419  
**Notch1 Negatively Mediates Mesenchymal Progenitor Cell Chondrogenic differentiation Mainly through Up-Regulation of Twist1**  
Bo Tian, Yongjun Wang, John Marymont, Yufeng Dong

Poster No. 0420  
**The Role Of The Tetraspanin CD9 In A Mouse Model Of Antigen-induced Arthritis**  
Norihiko Sumiyoshi, Shigeru Miyaki, Hiroyuki Ishitobi, Tomoyuki Nakasa, Kenji Miyado, Mitsuo Ochi

Poster No. 0421  
**Progranulin Protects Against Osteoarthritis Through Interacting With Tnf-κ And β-catenin Signaling Pathway**  
Jianlu Wei, Yunpeng Zhao, Qingyun Tian, Chuanju Liu

Poster No. 0422  
**Salubrinal Suppresses Cartilage Degeneration in a Murine Knee Osteoarthritis Model**  
Akinobu Nishimura, Kazunori Hamamura, Masahiro Hasegawa, Akihiro Sudo, Hiroki Yokota
Poster No. 0423
High Systemic LDL Cholesterol Levels during Experimental Osteoarthritis Lead to Increased Synovial Activation and Ectopic Bone Formation at End-Stage Osteoarthritis, While Excessive Levels Accelerate Development of Joint Pathology Already at Early-Stage Osteoarthritis
Wouter de Munter, Martijn H van den Bosch, Annet W Sloetjes, Peter M van der Kraan, Thomas Vogl, Johannes Roth, Wim B van den Berg, Peter L van Lent

Poster No. 0424
Interaction With Macrophages Attenuates Fibroblast-like Synoviocyte Adamts5 (aggrecanase-2) Gene Expression Following Inflammatory Stimulation
Rhiannon E Morgan, Peter D Clegg, John A Hunt, Simon R Tew

Poster No. 0425
Characterization of a Model System to Study Synovial Membrane Transport Properties
Robert Stefani, Andrea R Tan, Adam B Nover, J Chloe Bulinski, Gerard Ateshian, Clark Hung

Poster No. 0426
Cdk9 Inhibitors Preserve the Mechanical Properties of Osteochondral Explants After Prolonged Storage
Jasper Yik, Nina Liu, Kie Shidara, Derek Cissell, Kyriacos A Athanasiou, Dominik R Haudenschild

Poster No. 0427
Endocannabinoid Anandamide and Fatty Acid Amide Hydrolase Inhibitor URBS97 Prevent Interleukin-1β-Induced Cartilage Degradation While Enhancing Mesenchymal Stem Cell Chondrogenesis
Stephen D Thorpe, Aoife Gowran, Jung H Kim, David A Lee

Poster No. 0428
Low-Dose Preconditioning of Engineered Cartilage with Interleukin-1κ Provides Sustained Protection Against Subsequent Cytokine Exposure
Andrea R Tan, Mukundan Attur, Steven Abramson, Martin M Knight, J Chloe Bulinski, Gerard Ateshian, Clark T Hung

Poster No. 0429
Effects of Oxidized Low Density Lipoprotein on an in vitro Model of Canine Osteoarthritis
Keiichi Kuroki, Chris Kennedy, Aaron Stoker, James L Cook

Poster No. 0430
The Neuropeptide Substance P Suppresses Articular Chondrocyte Differentiated Activity
Yurong Ouyang, Juan Taboas

Poster No. 0431
Symptomatic Characterization Of Animal Model With Lumber Facet Joint Osteoarthritis Induced By Non-invasive Needle Puncture
Jae-Sung Kim, Jeffrey Kroin, Hong-Moon Sohn, Jae-Won You, Sang Soo Park, Dahye Oh, In-A Cho, Kyeong-Rok Kang, Sook-Young Lee, Do Kyung Kim, Chun Sung Kim, Su-Gwan Kim, Hee-Jeong Im

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - AGING
Poster No. 0432
Proteomic Analysis Of Mesenchymal Stem Cell Ageing And Their Musculoskeletal Differentiation
Mandy J Peffers, John Collins, Peter D Clegg

Poster No. 0433
Methylation Profiling Of Mesenchymal Stem Cells And Their Musculoskeletal Differentiation With Ageing
Mandy J Peffers, John Collins, Peter D Clegg

Poster No. 0434
Effect of Osmotic Stress on Intracellular Calcium Signaling of In Situ Juvenile and Mature Chondrocytes
Yilu Zhou, Michael A. David, Jie Ma, Liyun Wang, X. Lucas Lu

Poster No. 0435
Comprehensive Transcriptome Analysis of Aging-related Change in Early Phase of Post-traumatic Osteoarthritis
Tomoaki Fukui, Alesha B Castillo, Ashley Russell, Jasper HN Yik, Dominik R Haudenschild

PS1 CARTILAGE, SYNOVIUM & OSTEOARTHRITIS - THERAPIES
Poster No. 0436
Cannabinoid Receptor Expression in OA cartilage
Sara L Dunn, Aileen Crawford, J Mark Wilkinson, Rowena A.D Bunning, Christine L Le Maitre

Poster No. 0437
Thermally Responsive Pluronic-Chitosan-Small Molecular Drug Conjugated Nanocapsules with Controlled Dual Release for Combined Therapy of Osteoarthritis
Mi Lan Kang, Ji Eun Kim, Gun-II Im

Poster No. 0438
Intra-articular Injection Of Magnesium Chloride (MgCl2) Attenuates The Progression Of Osteoarthritis Through Suppressing The Expression Of Nucleostemin
Jerry Jiankun Xu, Yifeng Zhang, Jiali Wang, Kelvin Ho, Bruma Saichuen Fu, Kaiming Chan, Ling Qin

Poster No. 0439
Synergistic Regulation of Chondrocytes by Progranulin Growth Factor and Low Intensity Pulsed Ultrasound
Sardar Muhammad Zia Uddin, Chuanju Liu, Brendon Richbourg

Poster No. 0440
Flavopiridol Restores Global Metabolome in Mouse Post-Traumatic Osteoarthritis
Ronald June, Dominik R Haudenschild, Donald Zignego, Ziang Hu, Jasper Yik

Poster No. 0441
Green Tea Polyphenol Treatment Is Chondroprotective, Anti-inflammatory And Palliative In A Mouse Post-traumatic Osteoarthritis Model
Poster No. 0442

Intra-articular Delivery of Kartogenin Conjugated Chitosan Nano/microparticles for Cartilage Repair
Mi Lan Kang, Ji-Yun Ko, Ji Eun Kim, Gun-II Im

Poster No. 0443

Correlations between Patient Reported Outcome and Gait Alterations Pre- and Post- Anterior Cruciate Ligament Reconstruction
Asia R Azus, Hsiang-Ling Teng, Lauren Tufts, Benjamin Ma, Richard Souza, Xiaojuan Li

Poster No. 0444

Effect Of Obesity And Vitamin E On Mitochondrial Function In Human Chondrocytes
Saran Tantavisut, Mitchell C Coleman, James A Martin, John Callaghan

Poster No. 0445

Strenuous Running Enhances Degeneration Of Articular Cartilage In A Rat Mla-induced Arthritis Model
Ryusuke Saito, Ichiro Sekiya, Nobutake Ozeki, Yusuke Nakagawa, Mio Udo, Katsuaki Yanagisawa, Kunikazu Tsuji, Takeshi Muneta

Poster No. 0446

A Prospective Evaluation of Three Serum Biomarkers in Hip Arthroscopy Patients and Matched Controls
Austin V. Stone, Christopher Stem, Elizabeth A Howse, Allston J. Stubbbs

Poster No. 0447

After Repeated Division, Bone Marrow Stromal Cells Express Inhibitory Factors With Osteogenic Capabilities, And EphA5 Is A Primary Candidate.
Tsuyoshi Yamada, Shinichi Sotome, Toshitaka Yoshii, Atsushi Okawa

Poster No. 0448

In Vivo Kinetics of Mesenchymal Stromal Cell Transplanted into The Knee Joint in A Rat Model – In Vivo Fluorescence Imaging and 3D Computed Tomographic Evaluation
Yasunari Ikuta, Naosuke Kamei, Masakazu Ishikawa, Mitsuo Ochi

Poster No. 0449

Comparison Of The Immunosuppressive Properties Of Allogeneic And Autologous Equine Bone Marrow Derived Mesenchymal Stem Cells
Aimee C Colbath, Jennifer N Phillips, Frank Barry, C Wayne McIlwraith, Steven Dow, Laurie R Goodrich

Poster No. 0450

Inflammatory Suppression of Galectins Decreases Mesenchymal Stem Cell Adhesion and Motility
Heidi Reesink, Carolyn Shurer, Michael Davidson, Alan Nixon

Poster No. 0451

Induced Pluripotent Stem Cells Derived From Human Articular Chondrocytes Are A Source Of Chondrogenic Progenitor Cells
Rosa M. Guzzo, Hicham Drissi

Poster No. 0452

The Effects of Constant Hypoxia on the Expansion and Differentiation Of Human Mesenchymal Stem Cells
Marcel Betsch, Regina Wehrle, Brian Johnstone

Poster No. 0453

Alterations in Regional Loading Patterns on Articular Cartilage Following Meniscectomy and Meniscal Transplantation
Hongsheng Wang, Tony Chen, Albert O Gee, Ian D Hutchinson, Kirsten Stoner, Russell Warren, Scott Rodeo, Suzanne Maher

Poster No. 0454

Evaluation of Meniscal Extrusion with Posterior Root Disruption and Repair using Ultrasound
Grant M Rowland, Damon E Mar, Stephanie Nance, Terence E McIlff, Gary W Hinson, Joshua D Nelson

Poster No. 0455

An Anteriorized Posterior Root Position Does Not Alter Lateral Meniscal Transplant Kinematics When Compared To Anatomic Root Placement
Philip C Noble, Hugh Jones, Andrea Gale, Michael Hogen, Jason Alder, Patrick McCulloch

Poster No. 0456

Effect of Intramedullary Tibial Nailing on Attachment Area and Ultimate Strength of the Anterior Medial Meniscal Root: Is the Safe Zone Really Safe?
Matthew D LaPrade, Christopher M LaPrade, Mark G. Hamming, Michael B Ellman, Travis L Turnbull, Matthew T Rasmussen, Robert F LaPrade, Coen A Wijdicks

Poster No. 0457

3D Meniscal Kinematics and Deformation with Knee Flexion and Loading: A Novel In-Vivo MRI Study of the Knee
Daniel Watling, David Williams, Gemma M Whatling, Cathy A Holt

Poster No. 0458

Meniscal and Tibio-femoral Kinematics after Meniscal Transplantation
Philip C Noble, Donald Dulce, Hugh Jones, Andrea Gale, Michael Hogen, Jason Adler, Patrick McCulloch

Poster No. 0459

Biodegradable Tissue Glues For Meniscus Tears
Agnieszka I Bochynska, Tony G van Tienen, Gerjon Hannink, Pieter Buma, Dirk W Grijpma
Poster No. 0460
PLL Fiber-Reinforced Scaffold for Total Meniscus Replacement in an Ovine Model
Jay M Patel, Aaron R Merriam, Michael G Dunn, Charles J Gatt

Poster No. 0461
Effect Of Centralization For Extruded Meniscus Extrusion In A Rat Model
Kenichi Kawabata, Nobutake Ozeki, Hideyuki Koga, Yusuke Nakagawa, Mio Udo, Ryusuke Saito, Katsuaki Yanagisawa, Toshiyuki Ohara, Kunikazu Tsuji, Takeshi Muneta, Ichiro Sekiya

Poster No. 0462
The Effect Of Fibrin Clot Derived From Bone Marrow On Human Meniscal Healing In An Organ Culture Model
Takeshi Shoji, Tomoyuki Nakasa, Naosuke Kamei, Takuma Yamasaki, Yuji Yasunaga, Mitsuo Ochi

Poster No. 0463
A Novel Approach to Tissue Engineering Meniscus to Bone Interface
Mary Clare McCorry, Daniel Coppola, Jonathan Lee, Lawrence Bonassar

Poster No. 0464
Region-Specific Effect of Decellularized Meniscus Extracellular Matrix on Mesenchymal Stem Cell-Based 3D Meniscus Tissue Engineering
Kazunori Shimomura, Benjamin B Rothrauff, Rocky S. Tuan

Poster No. 0465
Matrix Microstructure and Micromechanics Influence the Repair Potential of the Knee Meniscus
Feini Qu, Michael P Pintauro, John L Esterhai, Matthew B Fisher, Robert L Mauck

Poster No. 0466
Concurrent Lateral Meniscal Repair and Anterior Cruciate Ligament Reconstruction Significantly Increases the Lateral Meniscal Width Percentage and Extrusion
Naoko Kashihara, Takayuki Furumatsu, Shinichi Miyazawa, Takaaki Tanaka, Masataka Fujii, Hiroto Inoue, Toshifumi Ozaki

PS1 TENDON/LIGAMENT - REPAIR AND TISSUE ENGINEERING

Poster No. 0467
Biceps Tendon Tenocytes from Patients Undergoing Rotator Cuff Repair Induce Adipose Derived Stem Cell Differentiation - Towards Tendon Engineering in the Operating Room
Sandra J Siatkowski, Taylor Pate, Richard J Hawkins, Michael Kissenerth, Stefan Tolan, Gregory P Colbath, Jeremy Mercuri

Poster No. 0468
Comparison of Human Mesenchymal Stem Cells Derived from Various Spinal Tissues: Superiority of Facet Joint and Interspinous Ligament
Baldur Kristjansson, Worawat Limthongkul, Sittisak Honsawek

Poster No. 0469
Anterior Cruciate Ligament (ACL) Derived Stem Cells Transduced Ex-vivo with BMP2 Accelerates Tendon-Bone Healing in ACL Reconstruction
Yohei Kawakami, Makoto Kobayashi, Ying Tang, Bing Wang, Koji Takayama, Yutaka Mifune, Tomoyuki Matsumoto, James Cummins, Ryosuke Kuroda, Masahiro Kurosaka, Freddie H Fu, Johnny Huard

Poster No. 0470
Biological Augmentation of Rotator Cuff Repair with Endothelial Progenitor Cells
Tony Lin, Erica Giles, Michael Glick, Charles Godbout, Sarah Ketcheson, Vladimir Iakovlev, Emil H Schemitsch, Aaron Nauth

Poster No. 0471
Cited2 Is A Principal Regulator Of Telomerase Expression, A Representative Feature Of A Functionally Active Tendon Stem Progenitor Cell Population
Fawzy Saad, Daniel Leong, Zhiyong He, Lin Xu, Robert J. Majeska, Tony S. Wanich, Konrad Gruson, Evan L Flatow, Hui Bin Sun

PS1 TENDON/LIGAMENT - PROGENITORS AND STEM CELLS

Poster No. 0472
Platelet Rich Plasma Protects Rat Achilles Tendon From The Deleterious Effects Of Steroid
Tomoyuki Muto, Takeshi Kokubu, Yutaka Mifune, Atsuyuki Inui, Yoshifumi Harada, Fumiaki Takase, Yassuhiro Ueda, Masahiro Kurosaka

Poster No. 0473
Exogenous Administration Of Fibroblast Growth Factor-2 Enhances The Expansion Of A Tenogenic Progenitor Cell Population In A Rat Rotator Cuff Repair Model
Takuya Tokunaga, Junji Ide, Hiroshi Mizuta

Poster No. 0474
A Canine Non-Weight-Bearing Model with Radial Neurectomy for Rotator Cuff Repair
Xiaoxi Ji, Nirong Bao, Kai-Nan An, Peter C Amadio, Scott P Steinmann, Chunjeng Zhao

Poster No. 0475
Rotator Cuff Repair Augmentation in a Rat Model with Use of a Combination of Multilayer Xenograft Tendon Scaffold and Bone Marrow Stromal Cells
Rei Omi, Anne Gingery, Scott P Steinmann, Peter C Amadio, Kai-Nan An, Chunjeng Zhao

Poster No. 0476
Improving Soft Tissue To Bone Healing: Intercellular Communication Between Tendon-Derived Cells And Cells Involved In The Early Development Of Tendons
Corina A Ghebes, Nathalie Groen, Hugo A M Fernandes, Daniel B F Saris
Poster No. 0477  
**Cell-free Biodegradable Synthetic Artificial Ligament for the Reconstruction of Anterior Cruciate Ligament (ACL) in a Rat Model**  
Yohei Kawakami, Kazuhiro Nonaka, Koji Takayama, Antonio A’More, Tomoyuki Matsumoto, Yutaka Mifune, James Cummins, Ryosuke Kuroda, Masahiro Kurosaka, William R Wagner, Freddie H Fu, Johnny Huard

Poster No. 0478  
**siRNA-mediated Gene Silencing of PAI-1 Rescues Flexor Tenocytes**  
Margaret A Thomas, Youssef M Farhat, John C Elfar, Hani A. Awad

Poster No. 0479  
**Tape Versus Suture - A Biomechanical Analysis In An Ovine Model And Post-operative Outcomes In Arthroscopic Rotator Cuff Repair**  
Patrick H Lam, RuiWen Liu, Henry Shepherd, George AC Murrell

Poster No. 0480  
**In Vivo Evaluation of Heparin Mediated Growth Factor Release from Tissue-Engineered Constructs for Anterior Cruciate Ligament Reconstruction**  
Natalie L Leong, Armin Arshi, Nima Kabir, Azadeh Nazemi, Frank A Petrigliano, Benjamin Wu, David R McAllister

Poster No. 0481  
**Platelet-rich Plasma (PRP) Accelerates Murine Patellar Tendon Healing Through Enhancement Of Angiogenesis And Collagen Synthesis**  
Yohei Kobayashi, Yoshitomo Saita, Masashi Nagao, Hiroshi Ikeda, Kazuo Kaneko

Poster No. 0482  
**Characterization of a Human MSC Population Utilized to Fabricate Scaffold-less Ligament Constructs for ACL Repair**  
Michael J Smietana, Pablo Moncada-Larrotiz, Ellen M Arruda, Lisa Larkin

Poster No. 0483  
**Sticky Sutures: Improved Suture Repair Mechanics Through the Use of Adhesives**  
Stephen W Linderman, Ioannis Kompakas, Richard H Gelberman, Victor Birman, Guy M Genin, Stavros Thomopoulos

Poster No. 0484  
**Differential Responses of Embryonic and Postnatal Tendon Cells to Mechanical and Biochemical Wound Healing Factors**  
Kaori L Graybeal, Catherine K Kuo

Poster No. 0485  
**WITHDRAWN**

Poster No. 0486  
**The Immunomodulatory Effect of Silver Nanoparticles is Critical for Promotion of Tendon Repair**  
Karen Kwan, Kelvin Yeung, Kenneth Cheung, Michael To

Poster No. 0487  
**Differential Regulation of Growth and Differentiation Factor-S-induced Tenogenic and Osteogenic Differentiation In Tendon-derived Stem Cells**  
Yuan-Hung Chao, Jui-Sheng Sun, Yang-Hwei Tsuang

**PS1 TENDON/LIGAMENT - MECHANICS**

Poster No. 0488  
**Investigating Extensibility And Plastic Deformation In Isolated Type-I Collagen Fibrils Using Atomic Force Microscopy**  
Andrew S Quigley, Laurent Kreplak, Samuel P Veres

Poster No. 0489  
**In situ Analysis of Anterior Cruciate Ligament Shape and Morphology**  
Eric Thorhauer, Yoshimasa Fujimaki, Ruben O’Hara-Plotnik, Scott Tashman, Freddie H. Fu

Poster No. 0490  
**Three-dimensional Anatomy And A Histological Study Of Equine Superficial Digital Flexor Tendon**  
Othman Ali, Peter Clegg, Eithne Comerford, Elizabeth Canty-Laird

Poster No. 0491  
**Evaluation of Work of Flexion in Flexor Tendon Graft with Different Junction Repair Techniques**  
Jingheng Wu, Andrew Thoreson, Kai-Nan An, Peter C. Amadio, Chunfeng Zhao

Poster No. 0492  
**The Biomechanical Role Of Fibre Twist In The Achilles Tendon**  
Vickie Shim, Justin Fernandez, Bruce Gardiner, David Smith, David Lloyd, Thor F Besier

Poster No. 0493  
**High-Load Preconditioning Protocols for Soft Tissue Grafts Minimize Graft Elongation and Confer Stiffness Equivalent to Native Anterior Cruciate Ligament under Simulated Early Rehabilitation Loading**  
Jeffrey R. Jaglowski, Brady T. Williams, Travis L Turnbull, Robert F LaPrade, Coen A Wijdicks

Poster No. 0494  
**Mechanical Properties of Semitendinosus Tendon Recover with Time Post Transection for ACL Reconstruction**  
Stephen M Suydam, Daniel H Cortes, Thomas S Buchanan

Poster No. 0495  
**Regional Mechanical Properties of the Long Head of the Biceps Tendon**  
Christopher W Kolz, Thomas Suter, Heath B Henninger

Poster No. 0496  
**The Effect of Fibrin Formulation on Initial Strength of Tendon Repair In Vitro**  
Kosuke Uehara, Chunfeng Zhao, Anne Gingery, Andrew Thoreson, Kai-Nan An, Peter C. Amadio
<table>
<thead>
<tr>
<th>Poster No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>0497</td>
<td><strong>Biomechanics And Micro-ct Scanning Of Normal Mouse Knee Ligaments</strong></td>
<td>Camila Carballo, Xiangyu Gu, Zoe Album, Scott Rodeo Jr, Michael Mosca, Arielle Hall, Hongsheng Wang, Lilly Ying, Xiang-Hua Deng, Scott Rodeo</td>
</tr>
<tr>
<td>0498</td>
<td><strong>Crimp Morphology In The Ovine ACL And How It Varies With Knee Position And In Relation To Its Double-bundle Structure</strong></td>
<td>Lei Zhao, Neil Broom, Ashvin Thambyah</td>
</tr>
<tr>
<td>0499</td>
<td><strong>Physical Activity and Bone Strength of Mice with an Acute Ankle Lateral Ankle Sprain</strong></td>
<td>Nigel Zheng, Tracia Hubbart-Turner, Hollis Owens, Jeffery Thousand, Erik Wikstrom, Mike Turner</td>
</tr>
<tr>
<td></td>
<td><strong>PS1 TENDON/LIGAMENT - CELL BIOLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>0500</td>
<td><strong>Antioxidant’s Cytoprotective Effects on Rotator Cuff Tenofibroblasts Exposed to Aminoamide Local Anesthetics</strong></td>
<td>Ra Jeong Kim, Young-Sool Hah, Jae-Ran Kang, Hyung Bin Park</td>
</tr>
<tr>
<td>0501</td>
<td><strong>Matrix-Specific Anchors: A Novel Concept for Targeted Delivery and Retention of Therapeutic Cells</strong></td>
<td>Mark L Wang, Pedro K Beredjikilian, Mualik D Shah, Ryan Hoffman, Andrzej Fertala</td>
</tr>
<tr>
<td>0502</td>
<td><strong>Apoptotic Bodies from Tenocytes Enhance the Proliferation and Migration of Tenocytes and Bone Marrow Mesenchymal Stem Cells In Vitro Canine Model</strong></td>
<td>Chenhui Dong, Anne Gingery, Ramona Reisdorf, Kai-Nan An, Peter C. Amadio, Chunfeng Zhao</td>
</tr>
<tr>
<td>0503</td>
<td><strong>Lipid Raft and Caveolin Polarization Guide Fibroblast Directional Migration in Electric Fields</strong></td>
<td>Shun-Hao Tsao, Bo-Jiang Lin, Pen-hsiu Grace Chao</td>
</tr>
<tr>
<td>0504</td>
<td><strong>PrP On Inflammation Of Tenocytes</strong></td>
<td>Seung Yeon Lee, Hyang Kim, Hyeyoun Kim, Ji Sun Shin, Won Kee Park, Kang Sup Yoon, Chris Hyunchul Jo</td>
</tr>
<tr>
<td>0505</td>
<td><strong>Prp And Corticosteroid In Tenocyte</strong></td>
<td>Seung Yeon Lee, Hyang Kim, Hyeyoun Kim, Ji Sun Shin, Won Kee Park, Kang Sup Yoon, Chris Hyunchul Jo</td>
</tr>
<tr>
<td>0506</td>
<td><strong>Effect Of Hyperglycemia On Degeneration And Inflammation Of Rat Tenocytes</strong></td>
<td>Yasuhiro Ueda, Atsuyuki Inui, Takeshi Kokubu, Yutaka Mifune, Tomoyuki Muto, Yoshifumi Harada, Fumiaki Takase, Masahiro Kurosaka</td>
</tr>
<tr>
<td>0507</td>
<td><strong>How Does BMP-7 Signal In Tenocytes?</strong></td>
<td>Franka Klatte-Schulz, Gerry Giese, Karen Ruschke, Regina Puts, Petra Knaus, Britt Wildemann</td>
</tr>
<tr>
<td>0508</td>
<td><strong>Differential Mechanical Regulation of Nuclear Morphology in Wavy Structures</strong></td>
<td>Chien An Chen, Pen-hsiu Grace Chao</td>
</tr>
<tr>
<td>0509</td>
<td><strong>Replicating In-vivo Behaviour Of Tenocytes Using A Cyclic Mechanical Strain Stimulator</strong></td>
<td>Jungjoo Kim, Jillian Cornish, David Musson, Iain Anderson, Vickie Shim</td>
</tr>
<tr>
<td>0510</td>
<td><strong>High CCN-1 Levels In Aging Tendons Promote Tendon Stem Cell Senescence And Tendon Degeneration</strong></td>
<td>Jianying Zhang, James Wang</td>
</tr>
<tr>
<td>0511</td>
<td><strong>Characterization of Novel Tendon Phenotype in CCN1 Conditional Knockout Mice</strong></td>
<td>Jie Jiang, Jaime V Tan, Tien Phan, Nancy Morones, Karen M Lyons</td>
</tr>
<tr>
<td>0512</td>
<td><strong>Changes In The Inflammatory Cell Population During Tendon Healing</strong></td>
<td>Parmis Sepanloo, Robert Blomgran, Jan Emenerudh, Per Aspenberg</td>
</tr>
<tr>
<td>0513</td>
<td><strong>Cell-Cell Junction Proteins and Embryonic Tendon Progenitor Cell Behavior Are Influenced by Substrate Elastic Modulus and Protein Composition</strong></td>
<td>Nathan Robert Schiele, Steven C Bench, Nicole A Danek, Ava M Sanayei, Catherine K Kuo</td>
</tr>
<tr>
<td>0514</td>
<td><strong>II-1β Inhibits Tenogenic Differentiation And Accelerates Glycolysis Activity In Injured Tendon-derived Progenitor Cells</strong></td>
<td>Kairui Zhang, Motomi Enomoto-Iwamoto</td>
</tr>
<tr>
<td>0515</td>
<td><strong>Bone Marrow Derived Mesenchymal Stem Cells Transduced With SOX-9 Improve Rotator Cuff Healing at an Early Time Point in a Rat Rotator Cuff Model</strong></td>
<td>Michael Schaer, Richard Ma, Will Gu, Marco Sisto, Ashley Titan, Xiang-Hua Deng, Scott Rodeo</td>
</tr>
<tr>
<td>0516</td>
<td><strong>MT3-MMP is Mediated by Elastic Modulus and Actin Cytoskeleton in Mouse Embryonic Tendon Progenitor Cells In Vitro</strong></td>
<td>Steven C Bench, Nathan R Schiele, Catherine K Kuo</td>
</tr>
<tr>
<td>0517</td>
<td><strong>Differential Effects of Growth Factors on Neonatal and Adult Achilles Tenocytes</strong></td>
<td>Julianne Huegel, Robert Mauck, Louis Soslowsky, Andrew F Kuntz</td>
</tr>
</tbody>
</table>
PS1 MUSCLE - MECHANICS

Poster No. 0518
**Measuring Hydraulic Permeability of Skeletal Muscles**
Lijian Peng, Michael Schenk, Xingyu Chen, Brandon K Zimmerman, Xin Lu, Liyun Wang

Poster No. 0519
**Changes in Muscle Thickness During Contraction on Return to Sports After a Hamstring Muscle Strain Injury**
Yasuhiro Nagano, Ayako Higashihara, Mutsuaki Edama

PS1 MUSCLE - BIOLOGY

Poster No. 0520
**Sclerostin Deficient Mice Display Sarcopenia But Also Resistance To Bone Loss During Hind Limb Suspension**
Andrew R Krause, Henry Donahue, Charles Lang, Jennifer Steiner, Toni Speacht, Yue Zhang, Peter M Govey

Poster No. 0521
**Prenatal and Pre-weaning Exposure to Low-dose of Benzo(a)pyrene, a Cigarette Smoke-Associated Hydrocarbon, Impairs Skeletal Muscle Development in F1 Generation Mice**
Rong S Yang, Chen Y Chiu, Shing H Liu

Poster No. 0522
**Losartan Improve The Muscle Regeneration Potential Of Muscle Derived Stem Cell**
Makoto Kobayashi, Yohei Kawakami, Satoshi Tateda, Shusuke Ota, Takanobu Otsuka, Freddie H Fu, Johnny Huard

Poster No. 0523
**Concomitant Musculoskeletal Injury Results in Delayed Fracture Healing and Heightened and Prolonged Immune Response**
Brady J. Hurtgen, Koyal Garg, Catherine L Ward, Joseph C. Wenke, Benjamin T Corona

Poster No. 0524
**Human Myogenic Reserve Cells: A Source of Quiescent Muscle Stem Cell That Improves Muscle Regeneration**
Thomas Laumonier, Flavien Bermont, Pierre Hoffmeyer, Jacques Menetrey

Poster No. 0525
**ErbB’s Palsy? A Molecular Link between Afferent Innervation, Muscle Spindles, and Contractures following Neonatal Brachial Plexus Injury**
Athanasia Nikolaou, Liangjun Hu, Roger Cornwall

Poster No. 0526
**VEGF Gene Transfer Enhances Human Myogenic Precursor Cell Survival After Transplantation in Injured Skeletal Muscles**
Thomas Laumonier, Flavien Bermont, Pierre Hoffmeyer, Jacques Menetrey

Poster No. 0527
**The Effect of Microgravity on Mouse Shoulder Muscle mRNA and Protein Expression**
Hua Shen, Chanteak Lim, Andrea G Schwartz, Stavros Thomopoulos

Poster No. 0528
**Fatty Infiltration Of Rotator Cuff Muscles After Tenotomy Is Associated With Desensitization Of Androgen Receptor Signalling**
Martin Flück, Severin Ruoss, Céline Ferrière, Christoph Möhl, Hans Hoppeler, Mario Benn, Brigitte von Rechenberg, Mazda T Farshad, Karl Wieser, Dominik C Meyer, Christian Gerber

Poster No. 0529
**Muscle Atrophy in Osteosarcoma-Induced Cancer Cachexia**
Xiaodong Mu, Adam Rothenberg, Clifford Voigt, Johnny Huard, Kurt Weiss

Poster No. 0530
**Collagen, Proteoglycan and SLRP Contribute to Stiffness in Human Skeletal Muscle Contractures**
Rajeswari Pichika, Rachel Meza, Lucas Smith, Samuel R Ward, Richard L Lieber

Poster No. 0531
**The Role of Muscle Satellite Cells in Contracture Pathophysiology following Neonatal Brachial Plexus Injury**
Athanasia Nikolaou, Liangjun Hu, Roger Cornwall

Poster No. 0532
**Volumetric Muscle Loss: Persistent Functional Deficits Beyond Frank Loss Of Tissue**
Koyal Garg, Catherine L Ward, Brady Hurtgen, Jason Wilken, Daniel J. Stinner, Joseph Wenke, Johnny G. Owens, Benjamin T Corona

Poster No. 0533
**Type 2 Diabetes Associated Beta-Adrenergic Receptor Polymorphisms Are Independently Associated with BMI and Physical Activity in College-Age Populations**
Zachary Kendrick, Courtney A Sprouse, Heather Gordish-Dressman, Michael Liu, Elizabeth Hedges, Elizabeth Dominic, Jackie McKesey, Dustin Hittel, Gina M Many, Whitney L Barfield, Eric Hoffman, Laura L. Tosi, Joseph M. Devaney

Poster No. 0534
**Progranulin Deficiency And Chronic Systemic Inflammation In Muscular Dystrophic Mice**
Xiaodong Mu, Ying Tang, Bing Wang, Kurt Weiss, Johnny Huard

Poster No. 0535
**Structural and Biological Response of Peripheral Nerves to Tensile Mechanical Loading**
Sameer B. Shah, Kenneth M Vaz, Ian Foran, James M Love, Ting-Hsien Chuang

Poster No. 0536
**Col5a1 Variant Is Associated With Body Composition And Physical Activity In Males**
Elizabeth Dominic, Courtney A Sprouse, Heather Gordish-Dressman, Zachary Kendrick, Michael Liu, Elizabeth Hedges, Jacqueline McKesey, Eric Hoffman, Laura L Tosi, Joseph M. Devaney
PS1 BONE/BONE BIOLOGY - SKELETAL DEVELOPMENT

Poster No. 0537  
**Development and Validation of a 3D Printed Chemical Screening System for Osteoactive Compound Discovery in the Regenerating Zebrafish Tail Fin**  
Adrian T Monstad-Rios, Ronald Y Kwon

Poster No. 0538  
**Prediction Of The Role Of Stenotic Sutures In The Pathological Growth Of Newborns Skulls**  
Florian Jalbert, Jérôme Briot, Frédéric Lauwers, Pascal Swider

Poster No. 0539  
**Pinpointing the Earliest Manifestations of Skeletal Disease in Mucopolysaccharidoses Disorders**  

Poster No. 0540  
**Methylphenidate Impairs Skeletal Development In Adolescent Female Rats**  
Evan Chernoff, Lisa S Robinson, Michalis P Michaelos, Jason Gandhi, Panayotis K Thanos, Michael Hadjigryrou, David E Komatsu

Poster No. 0541  
**Markers Of Bone Health In Pediatric Patients With Fractures Compared With Healthy Controls**  
Ashley Olson, Sara Merwin, Selina Poon, Jahn Avarello

Poster No. 0542  
**Greater Heritability in Bone Structural versus Bone Matrix Properties**  
Ryan D Ross, Meghan M Moran, Maleeha Mashiatulla, Lisa Miller, D. Rick Sumner

Poster No. 0543  
**Age-Dependent Recovery of Bone During Unloading Following a Period of Hindlimb Unloading in Rats**  
Hailey C Cunningham, Daniel WD West, Leslie M Baehr, Keith Baar, Sue C Bodine, Blaine A Christiansen

Poster No. 0544  
**Calcium- and Phosphorus-Supplemented Diet and Exercise Prevent Loss of Cortical and Trabecular Bone with Aging in Mice**  
Michael A Friedman, Robert Szczepankiewicz, David Kohn

Poster No. 0545  
**Muscle And Bone Regeneration Upon Castration And Treadmill Exercise**  
Ioannis Stratos, Konrad Schröpfer, Katharina Hink, Philipp Herlyn, Mario Bäumler, Tina Histing, Michael D. Menger, Sven Bruhn, Thomas Mittmeier, Brigitte Vollmar

Poster No. 0546  
**Cd44 Signaling Mediates Osteoactivin/gpnmb Effects On Bone Homeostasis**  
Gregory R Sondag, Thomas Mbimba, Fouad Moussa, Kimberly Novak, Bing Yu, Fayez Safadi

Poster No. 0547  
**Design and Proof of Concept for a Single Cell Electromagnetic Loading Device**  
Emily Noonan, Sarah Ferrell, Phillip Leopold, Antonio Valdevit

Poster No. 0548  
**Assessment of the Effect of Systemic Delivery of Sclerostin Antibodies on WNT Signaling in Distraction Osteogenesis Using Immunohistochemistry**  
Mohammad M Alzahrani, Asim M Makhdom, Dominique Lauzier, Maria Kotsioprits, Reggie C Hamdy

Poster No. 0549  
**Long Bones of Growing Thrombospondin-2 Null Mice Display Altered Collagen Fibril Morphology and a Brittle Phenotype**  
Andrea I Alford, Joseph E Perosky, Kenneth M Kozloff, Basma Khoury

PS1 BONE/BONE BIOLOGY - OSTEOBLASTS

Poster No. 0550  
**The Carboxy Terminus of Secreted Phosphoprotein 24 kD (spp24) Contains a Second BMP/TGF-β Binding Site and Can Independently Affect BMP-2 Activity**  
Haijun Tian, Chen-Shuang Li, Ke-Wei Zhao, Jeffrey C Wang, M. Eugenia L Duarte, Cynthia L David, Kevin Phan, Elisa Atti, Elsa J Brochmann, Samuel S Murray

Poster No. 0551  
**A Mechanism to Explain the Bone Loss in Metal-on-Metal Cobalt-containing Implants**  
Edward Puzas, Edward M. Schwarz, Tzong-Jen Sheu

Poster No. 0552  
**The Regulation of Bone Formation by the Met-5-enkephalin-Opioid Growth Factor Receptor Signaling Axis**  
Nikhil Thakur, Sean D DeBoyace, Bryan S Margulies

Poster No. 0553  
**The Regulation of Bone Formation and Bone Re-absorption by the Repulsive Guidance Molecules**  
Sean D DeBoyace, Adrienne M Parsons, Jessica SS Ee, Bryan S Margulies

Poster No. 0554  
**Evaluation of Bioburden on the Development of Heterotopic Ossification in an Established Rat Model**  
Gabriel J Pavey, Donald N. Hope, Dana M. Golden, Ammar T. Qureshi, Benjamin K Potter, Rebecca L. Paveley, Thomas A. Davis, Jonathan A. Forsberg

Poster No. 0555  
**Evaluation of the Effect of Vancomycin Powder on Bone Healing in a Rat Spinal Arthrodesis Model**  
Marco C Mendoza, Kevin Sonn, Sharath S Bellary, Abhishek Kannan, Gurmit Singh, Christian Park, Stuart R Stock, Erin L Hsu, Wellington Hsu
PS1 BONE/BONE BIOLOGY - OSTEOCLASTS

Poster No. 0556

*Poster No. 0556*

Tmem178 Is A Negative Regulator Of Bone Homeostasis And Osteoclast Activation In Mice And Humans Via A Novel Negative Feedback LoopTargeting Endoplasmic Reticulum Ca2+ Mobilization

Corinne Decker, Roberta Faccio

Poster No. 0557

Osteoclasts Are Significantly Affected By The Concentration Of Advanced Glycation End Products (AGEs) In Medium Released From Bone Resorption Process

Xiao Yang, Evan Verevege, Mark R Appleford, Xiaodu Wang

Poster No. 0558

Metabolic Regulation of Osteoclast Differentiation by Hif1α in Human Osteoclastogenesis

Koichi Murata, Kyung-Hyun Park-Min, Lionel B Ivashkiv

Poster No. 0559

Effect Of Repeated Oral Administration Of A Cathepsin K Inhibitor On Bone Turnover And Bone Quality In Healthy Adult Exercising Horses

Hayam Hussein, Jennifer Dulin, Lauren Smanik, Alicia L Bertone

Poster No. 0560

SubAB Prevent Joint Inflammation And Destruction Via Er Stress In Collagen Induced Arthritis

Kensuke Koyama, Tetsuro Ohba, Atsuhiko Nakao, Hirotaka Haro

Poster No. 0561

Siglec15 Mediates Periarticular Bone Loss But Not Joint Destruction In Murine Antigen induced Arthritis

Tomohiro Shimizu, Masahiko Takahata, Yusuke Kameda, Hiroki Hamano, Norimasa Iwasaki

PS1 BONE/BONE BIOLOGY - BONE OSTEOCYTES AND MECHANOBIOLOGY

Poster No. 0562

Development Of A Computational Model To Study Tissue Evolution In 3D Biodegradable Scaffolds

Chaochao Zhou, Ryan Willing

Poster No. 0563

Osteocyte-Mediated Remodeling of the Perilacunar Bone Matrix is Repressed by Glucocorticoids

Faith Hall-Glenn, Aaron J. Fields, Hrishikesh Bale, Jan Eieg, Robert Ritchie, Thomas Vail, Jeffrey Lotz, Tamara Alliston

Poster No. 0564

Osteocytes’ Response to Mechanical Loading Supports Breast and Prostate Cancer Cell Growth and Migration

Yu-Heng Ma, Shreyash Dalmia, Peter Gao, Chao Liu, Lidan You

Poster No. 0565

Dramatic Effects Of High And Low Glucose On Osteocytes: A Model For The Effects Of Glucose On Bone Loss

Donna Pacicca, Tammy Brown, Karen Kover, Lynda F Bonewald

Poster No. 0566

Microgravity during 30 Days Space Flight Induced Bone Morphological Changes and Bone Mineral Density Decrease in the Mouse Lumbar Spine

Kevin Cheng, Brandon R Macias, Alan R Hargens, Esther Cory, Keianne D Yamada, Jeffrey Lotz, Robert L Sah, Koichi Masuda

Poster No. 0567

Osteopenia Uncovered By Micro-mechanical Moduli In The Cortical Mid-diaphysis

Kartikey Grover, Minyi Hu, Liangjun Lin, Jesse Muir, Yi-Xian Qin

Poster No. 0568

Loading Induced Mechanobiological Modulation of In Situ Osteocytic Ca2+ Oscillations in an Intact Mouse Femur

Minyi Hu, Guowei Tian, Yi-Xian Qin

Poster No. 0569

Osteocyte Ca2+ Signaling in Response To Mechanical Loading in Vivo

Karl J Lewis, Dorra Benayed, David Spray, Mia Thi, Robert J. Majeska, Sheldon Weinbaum, Mitchell B. Schaffler

Poster No. 0570

Estrogen Loss Causes Mitochondrial Electron Transport Chain Dysfunction in Osteocytes in vivo

Dorra Frieka-Benayed, Jelena Basta-Pljakic, Robert J. Majeska, Mitchell Schaffler

Poster No. 0571

Assessment of MMP-2, MMP-3, And Osteocyte Apoptosis in The Lacunar-canalicular Network of Estrogen-deficient Rats

Divya Sharma, Andrew Moon, Damien M Laudier, Stephen B Doty, Mitchell B Schaffler, Susannah P Fritton

Poster No. 0572

Femoral Cortical Bone Quality And Osteocyte Network Characteristics In Young, Aged, Osteoporotic And Alendronate-treated Individuals

Petar Milovanovic, Elizabeth Zimmermann, Christoph Riedel, Annika vom Scheidt, Matthias Krause, Danijela Djonic, Michael Hahn, Maria Djuric, Michael Amling, Robert Ritchie, Klaus Pueschel, Björn Busse

Poster No. 0573

Exposure to Cobalt and Chromium Ions Reduces Osteocyte Response to Mechanical Loading

Peter Orton, Karan M Shah, J. Mark Wilkinson, Alison Gartland

PS1 BONE/BONE BIOLOGY - PROGENITORS AND STEM CELLS

Poster No. 0574

Do Mesenchymal Stromal Cells Abrogate The Host Immune Response In Massive Cortical Allograft Recipients?

Kaitlyn Mcnamara, John Coy, Amanda Guth, Steve Dow, Nicole Ehrhart
Poster No. 0575
NF-κB Decoy Oligodeoxynucleotide Enhanced Osteogenesis in Mesenchymal Stem Cells Exposed to Polyethylene Particle
Tzu-Hua Lin, Taishi Sato, Florence Loi, Ruth Zhang, Jukka Pajarinen, Zhenyu Yao, Stuart B Goodman

Poster No. 0576
Human Mesenchymal Stem Cell (hMSC) Spheroids Promote Large Bone Defect Repair
Ashley B Allen, Joshua A Zimmermann, Laura D Cox, Hazel Y Stevens, Todd C McDevitt, Robert E Guldberg

Poster No. 0577
Reduced Anabolic Response To Parathyroid Hormone In Periosteal Mesenchymal Stem Cells From Aged Mice
Li Yue, Alayna Loiselle, Jennifer Jonason, Regis O’Keefe

Poster No. 0578
Differential Signaling Through BMP Type 1 Receptors ALK2 and ALK3 in the Formation of Trauma-Induced Heterotopic Ossification
Jonathan R Peterson, Oluwatobi N Eboda, Agustin H Mohedas, Shawn Loder, Robert C Brownley, Shailesh Agarwal, Kavitha Ranganathan, Steven R Buchman, Paul S Cederna, Yuji Mishina, Stewart C Wang, Paul B Yu, Benjamin Levi

Poster No. 0579
Pericytes Support Bone Regeneration by Complementary Mechanisms - an in vitro Investigation into the Angiogenic and Osteogenic Properties of Pericytes Derived from Multiple Tissue Sources
Marietta Herrmann, Jennifer J Bara, Ursula Menzel, Jagoda M Jalowiec, Rik Osinga, Arnaud Scherberich, Mauro Alini, Sophie Verrier

Poster No. 0580
Ips Cells Can Be Efficiently Differentiated Back To Mscs Using A Short Exposure To Tgfβ
Dmitry Sheyn, Shiran Ben-David, Sandra Ann De Mel, Loren Ornelas, Anais Sahabian, Dhruv Sareen, Xiaoyu Da, Wafa Tawackoli, Dan Gazit, Zulma Gazit

Poster No. 0581
SIRT1-SOX2 Axis Is Important for Maintaining Self-renewal and Multipotency in Bone Marrow-derived Mesenchymal Stem Cells
Dong Suk Yoon, Yoorim Choi, Yeonsue Jang, Woo Jin Choi, Sung-Hwan Kim, Jaewan Suh, Moses Lee, Jin Woo Lee

Poster No. 0582
Bacterial Toxin-activated Leukocytes As A Model For Inflammation-induced Differentiation Of Mesenchymal Stem Cells
Manfred Koeller, Christina Sengstock, Dominik Sybold, Jan Gessmann, Thomas A Schildhauer

Poster No. 0583
L-WNT3a Enhances Bone Regeneration In A Murine Model Of Osteonecrosis
Jingtao Li, Chelsey A Johnson, Benjamin Salmon, Marie Ezran, Jill A Helms

Poster No. 0584
PS1 BONE/BONE BIOLOGY - OSTEOPOROSIS, METABOLIC BONE DISEASE, BIOMARKERS

Poster No. 0585
Does Long-term Bisphosphonate Therapy Cause Brittle Fractures?
Andi Jin, Jianmo Li, Ulrich Hansen, Rajarshi Bhattacharya, Justin Cobb, Richard Abel

Poster No. 0586
Novel Assessment Of Bone Using Raman Spectroscopy To Detect Changes Associated With Osteogenesis Imperfecta In Mice Bones

Poster No. 0587
Comparison Of Rankl Blockade And Bisphosphonate Therapies In A Growing Mouse Model Of Oi - Implications Of Prolonged Treatment On Bone Health
J Marino, N Pleshko, E Carter, K Jepsen, S Doty, A Boskey, C Raggio

Poster No. 0588
Sclerostin Antibody Dose-dependently Increases Bone Mass And Strength In Brlt/+/ Oi Mice
David K. Barton, Benjamin P. Sinder, Michael S. Ominskey, Terese Jenks, Joan C. Marini, Michelle S. Caird, Kenneth M Kozluff

Poster No. 0589
Brittleness in Osteoblast-derived BMP2 Knockout Bones is Due to Increased Porosity Cellularity
Zachary Toth, Sarah Howe McBride

Poster No. 0590
Increased Concentration Of Indian Hedgehog (Ihh) In Synovial Fluid (SF) Is Associated With Joint Injury And Early Cartilage Degradation In Human Knee Joint
Congming Zhang, Yunning Zhang, Renqi Jiang, Jun Wang, Qi Pei, Qian Chen, Lei Wei

Poster No. 0591
Type 1 Diabetes Impairs Long Bone Response to Exercise in Mice
Zeynep Seref-Ferlengez, Hui Bin Sun, Mitchell B. Schaffler, Sylvia O Suadicani, Mia M Th

Poster No. 0592
Sheep Model Reflecting Glucocorticoid-induced Osteoporosis In Postmenopausal Women
Christina M Andreasen, Ming Ding, Soeren Overgaard, Peter Bollen, Thomas Levin Andersen

Poster No. 0593
Inhibiting Mira-100 Is Associated With Increased Osteogenesis In Osteoblasts From Osteoporotic Patients
Sarah Kelch, Claudine Seeliger, Marina Unger, Martijn van Griensven

Poster No. 0594
The Axial Dependence of Bone Density and Ultrasound at the Radius
Jonathan J. Kaufman, Grant Nagaki, Gangming Luo, Alfred Rosenbaum, Robert S. Siffert
Poster No. 0594

Age-related Changes in the Microstructural Organization of the Femoral Neck Suggest Degradation in Bone Quality Independent of Cortical Thinning and Increased Porosity
Kendra E Keenan, Chad S Mears, Tanner D Langston, Colton M Phippen, Scott M Litton, S. Taylor Brady, Roy D Bloebaum, John G Skedros

Poster No. 0595

Susceptibility to Obesity and Bone Mineral Density in Young African American Populations
Michael Liu, Courtney A Sprouse, Heather Gordish-Dressman, Elizabeth Hedgess, Zachary Kendrick, Elizabeth Dominick, Jacqueline McKesey, Leticia Ryan, David Rowlands, Kevin Bell, Joseph M. Devaney, Laura L Tosi

PS1 BONE/BONE BIOLOGY - BONE MECHANICS AND FINITE ELEMENT ANALYSIS

Poster No. 0596

A Novel Anterior Transpedicular Screw Artificial Vertebral Body System For Lower Cervical Spine Fixation: A Finite Element Study
Jun Ouyang, Weidong Wu

Poster No. 0597

A Validated FE Model for Proximal Tibia Bone Grafting: The Study of the Effect of Window Size on Tibia Stability and Mechanics
David QK Ng, Chin Tat Lim, Wilson Wang, Ken Jin Tan, Desmond YR Chong

Poster No. 0598

A Cadaveric Study of Bone Tissue Temperature During Pin Site Drilling Utilizing Fluoroptic Thermography
Matthew T Muffly, Corbett Winegar, Gregory T Altman

Poster No. 0599

Biomechanical Comparison of the Human Cadaveric Pelvis with a 4th Generation Composite Model
Brandon L. Girardi, Tariq Attia, David Backstein, Oleg Safir, Thomas L. Willett, Paul R. T. Kuzyk

Poster No. 0600

Stress Analysis At The Boundary Of The Necrotic Lesion
Kazuyuki Karasuyama, Takuaki Yamamoto, Goro Motomura, Ryosuke Yamaguchi, Kazuhiko Sonoda, Yusuke Kubo, Yukihide Iwamoto

Poster No. 0601

Assessment Of Lumbar Vertebral Strength In Bone Metastasis Patients With Vertebral Lesions Before And After Anti-RANKL Antibody Administration; Pilot Study
Katsuhisa Kawanami

Poster No. 0602

Effects Of Fixation And Demineralization On Bone Collagen D-spacing As Analyzed By Atomic Force Microscopy
Joseph Michael Wallace

Poster No. 0603

In Vivo Mechanical Loading in Murine Tibiae as a Function of Applied Strain Results in Differential Changes in Microstructure and Fatigue Response
Creasy A Clauser, Alycia Berman, Caitlin Wunderlin, Joseph M Wallace

Poster No. 0604

Improvements in Bone’s Biomechanical Properties with Short-Term Whole Body Vibration are Independent of Amplitude and Confined to Cancellous Bone
William Runge, Laurence Dahners, Denis Marcellin-Little, Ola Harrysson, David Ruppert, Paul Weinhold

Poster No. 0605

Removing or Truncating Connexin 43 in Osteocytes Alters Nanoscale Composition and Microscale Mechanics
Max A Hammond, Rafael Pacheco-Costa, Hannah M Davis, Lilian I. Plotkin, Joseph M. Wallace

Poster No. 0606

Initiation and Propagation of Microdamage in Cancellous Bone Occurs Preferentially Distant from Resorption Cavities
Jonathan B Matheny, Ashley M Torres, Matthew G Goff, Clare M Rimnac, Christopher J Hernandez

Poster No. 0607

Intermittent PTH after Prolonged Bisphosphonate Treatment Improves Bone Structure by Inducing Substantial New Bone Formation with Decoupled, Inhibited Bone Resorption in Ovariectomized Rats
Allison R Altman, Carina Lott, Chantal M de Bakker, Wei-Ju Tseng, Ling Qin, X. Sherry Liu

PS1 BONE/BONE BIOLOGY - BONE TISSUE ENGINEERING AND REPAIR

Poster No. 0608

Pro-inflammatory T Cells Stimulate Osteoblast Maturation In Vitro
Michiel Croes, Cumhur F Öner, Moyo C Kruyt, Wouter JA Dhert, Jacqueline Alblas

Poster No. 0609

Porous Growth Plate Extracellular Matrix-derived Scaffolds Facilitate Osteogenesis of MSCs In Vitro and Accelerate Host-mediated Bone Healing In Vivo
Grainne M Cunniffe, Pedro J Diaz-Payo, Emmet Thompson, Fergal J O’Brien, Daniel J Kelly

Poster No. 0610

Development of a Novel Self-Organizing, Cell-Based Bone Graft Substitute: Control of Bone Dimension and Structure
Yijia Hong, Pooja Desai, Bernard Halloran, Alan B.C. Dang

Poster No. 0611

Wnt5a-BMP2 Crosstalk Regulates Spontaneous Stem Cell-Osteoblastic Differentiation on Micro-Nanostructured Titanium
Rene Olivares-Navarrete, David Haithcock, Christy Wasilewski, Caitlin A Cundiff, Sharon L Hyzy, Zvi Schwartz, Barbara D. Boyan
poster No. 0612
microRNA-activated Scaffolds for Enhancing Bone Formation by Mesenchymal Stem Cells through the Regulation of Osteogenic Genes
Irene Mencia Castaño, Caroline M Curtin, Georgina Shaw, Mary J Murphy, Garry P Duffy, Fergal J O’Brien

poster No. 0613
An Immediate Source Of Purified Autologous Mesenchymal Stem Cells For Musculoskeletal Regeneration
Iain R Murray, Christopher West, Winters Hardy, Mirko Corselli, Hamish Simpson, Xinli Zhang, Chia Soo, Bruno Peault

poster No. 0614
Comparative Analysis of Rat Mesenchymal Stem Cells Derived from Slow and Fast Skeletal Muscle in Vitro
Sang Yang Lee, Etsuko Okumachi, Takahiro Niikura, Takashi Iwakura, Yoshihiro Dogaki, Shunsuke Takahara, Takeshi Ueha, Yoshitada Sakai, Ryosuke Kuroda, Masahiro Kurosaka

poster No. 0615
Positive Effect Of Platelet-derived Growth Factor Bb On Adipose-derived But Not Marrow-derived Mesenchymal Stem Cells
Ben P Hung, Daphne L Hutton, Kristen L Koziecki, Corey J Bishop, Blal Naved, Jordan J Green, Arnold I Caplan, Jeffrey M Gimble, Amir H Dorafshar, Warren L Grayson

poster No. 0616
The Healing Of Tibial And Calvarial Defect Using Runx2-transfected Adipose Stem Cells
Jong-Min Lee, Eun-Ah Kim, Gun-II Im

poster No. 0617
A Predictive Model for Understanding Stem Cell Response on Allograft Bone through DLX5, RUNX2 and SP7 Production
Mary E Blackmore, Cody W Saylor, Shawn A Hunter

poster No. 0618
Mapping in situ Tissue Genesis by Stem Cells and Potential Implications of Intrinsic Implant Mechanical Stress
Celine Heu, Ulf Knothe, Stefan Milz, Melissa Knothe Tate

poster No. 0619
Platelet Rich Plasma Gel As An Autologous Delivery System Of Growth Factors And Cells
Jagoda M Jalowiec, Marietta Herrmann, Ursula Menzel, Matteo D’Este, Jennifer J Bara, Mauro Alini, Sophie Verrier

poster No. 0620
Fibromodulin Reprogrammed Cells for Bone Regeneration
Zhong Zheng, Pu Yang, Chen-Shuang Li, Elizabeth L Lord, Kambiz Khallinejad, Juyong Park, Caroline Chung, Tara Aghaloo, Xinli Zhang, Kang Ting, Chia Soo

poster No. 0621
Enhanced Formation of Mechanically Functional Engineered Bone by Hypertrophic Chondrocytes
Jonathan C Bernhard, Sarindr Bhumiratana, Ming Li, Gordana Vunjak-Novakovic

poster No. 0622
Heritable Differential Bone Regeneration is Present As Early As Seven Days after Marrow Ablation in the Mouse Model
Meghan M Moran, Amarjit Virdi, Steven Mazzone, D. Rick Sumner

PS1 Bone/Bone Biology - Computational Modeling

poster No. 0623
A Semi-automated Method For Defining Cortical Bone Breaks In Cadaveric Finger Joints Using High-resolution Peripheral Quantitative Ct And Microct
Michiel Peters, Andrea Scharma, Chris Arts, Astrid van Tubergen, Jeroen Williams, Joop Van den bergh, Bert Rietberg, Piet Geusens

poster No. 0624
Experimental And Computational Micro-mechanics At The Tibial Cement-bone Interface
Priyanka Srinivasan, Mark A Miller, Nico Verdonschot, Kenneth A. Mann, Dennis Janssen

poster No. 0625
Loading Induced 2nd Messenger and Transcriptional Interactions Mediate Multiple Measures of Bone Adaptation
Sundar Srinivasan, Edith Gardiner, Brandon J Ausk, Ronald Y Kwon, Ted Gross

poster No. 0626
Predicting Wrist Biomechanics During Scapholunate Ligament Dissociation Using a 3D Computational Model
Edward J Tremols, Jennifer S Wayne

poster No. 0627
Rat Cortical and Trabecular Bone: Hierarchical Analysis and Multi-Scale Modeling
Ramin Oftadeh, Vahid Entezari, Guy Spörri, Juan C Villa, Henry Krigbaum, Elsa Strawich, Lila Graham, Christian Rey, Hank Chiu, Ralph Müller, Hamid Nayeb Hashemi, Ashkan Vaziri, Ara Nazarian

PS1 Bone Fracture - Biology

poster No. 0628
Cannabidiol, a Major Non-Psychotrophic Cannabis Constituent Enhances Fracture Healing and Stimulates Lysyl Hydroxylase Activity in Osteoblasts
Poster No. 0629

(--)-epigallocatechin-3-gallate (egcg) Enhances Bone Defect Healing
Chung-Hwan Chen, Yi-Shan Lin, Yin-Chih Fu, Mei-Ling Ho, Je-Ken Chang, Chih-Kuang Wang, Lin Kang

Poster No. 0630

Systemically Administered Micelles Containing Simvastatin Improve Fracture Healing in Aged Mice
Alexia Hernandez-Soria, Yen Hsun Chen, Adam L. Johnson, Yi-jia Zhang, Dong Wang, Marjolein C.H. van der Meulen, Mathias P.G. Bostrom, Citlara L. Dahia, Ed Purduce, Steven Goldring, Aaron Daluiksi

Poster No. 0631

Age-related Emergence of Deleterious Buckling Ratio in the Femoral Neck Fails to Maintain the Coupling with Predominant Collagen Fiber Orientation and Osteon Morphotypes Seen in Younger Bones
Chad S Mears, Kendra E Keenan, Tanner D Langston, Colton M Phippen, Scott M Litton, S. Taylor Brady, Roy D Bloebaum, John G Skedros

Poster No. 0632

Heterogeneity and Fragility Fracture Risk: An FTIR Study
Adele L Boskey, Eve L. Donnelly, Zhen Xiang Wang, Lyudmilla Spevak, Yan Ma, Wei Zhang, Robert Recker

Poster No. 0633

Association Of Serum Vitamin D Levels With Risks For Surgical Pediatric Fracture
Barbara Minkowitz, Tim U. Leier, Joseph T Nguyen, Eileen Poletick, Nicole D Formoso, Barbara Cerame, Sherri L Luxenberg, Joseph M Lane

Poster No. 0634

Cartilage To Bone Transformation Through Reactivation Of Pluripotent Stem Cell Programs: A New Paradigm In Endochondral Fracture Repair
Diane P Hu, Federico Ferro, Aaron J Taylor, Frank Yang, Theodore Miclau, Wenhan Chang, Ralph S Marcucio, Chelsea S Bahney

Poster No. 0634A

Sosi Antibody Treatment Improves Fracture Healing in Type 1 Diabetes
Cristal Yee, Liqin Xie, Sarah Hatsell, Deepa Murugesh, Aris N Economides, Gabriela Loots, Nicole Collette

Poster No. 0635

Mini Fragment Fixation of Clavicle Fractures: A Biomechanical Study
Ali Alhandi, Jason Lowe, Edward Milne, David Kaimrajh, Jason Albert, Loren Latta

Poster No. 0636

Stability of the Glenohumeral Joint with Combined Humeral Head and Glenoid Defects: A Cadaveric Study
Lionel J Gottschalk, Piyush Walia, Ronak Patel, Matthew Kuklis, Morgan Jones, Stephen D Fening, Anthony Miniaci

Poster No. 0637

Loss of Anterior Stability of Shoulder Across a Range of Motion Due to Combined Bony Defects: A Cadaveric Study
Piyush Walia, Lionel Gottschalk, Ronak Patel, Matthew Kuklis, Morgan Jones, Stephen Fening, Anthony Miniaci

Poster No. 0638

The Effects of Latarjet Reconstruction on Glenohumeral Instability in the Presence of Combined Bony Defects
Piyush Walia, Ronak Patel, Lionel Gottschalk, Matthew Kuklis, Morgan Jones, Stephen Fening, Anthony Miniaci

Poster No. 0639

Trends in the Burden of Hip Fractures - What Does the Past Tell Us?
Kevin L Ong, Edmund Lau, Steven Kurtz

Poster No. 0640

Effects Of Preoperative Nutritional Status On 30-day Mortality In Elderly Patients Undergoing Operative Management Of Hip Fractures
Adam Graver, Bin Yang, Sara Merwin, Michael O’Connor, Ariel Goldman

Poster No. 0641

Biomechanics of Acute Total Hip Arthroplasty after Acetabular Fracture: Plate vs Cable Fixation
Mina Aziz, Omar Dessouki, Saeid Samiezadeh, Habiba Bougherara, Radovan Zdero, Emil H Schemitsch

Poster No. 0642

The Utility of Taper-wedged Stem for Bipolar Hemiarthroplasty in Patients with Displaced Femoral-neck Fractures: A Morphological and Clinical Study
Satoshi Ikemura, Taro Mawatari, Takahiro Iguchi, Gen Matsui, Hiroaki Mitsuyasu

Poster No. 0643

The Novel Method Of External Fixation In Unstable Pelvic Ring Fracture
Keisuke Oe, Kouki Nagamune, Takahiro Niikura, Ryosuke Kuroda, Masahiro Kuroskaka

Poster No. 0644

Experimental Investigations On Three Fixation Methods (CSs, DHS+DS, And PFLP) Of Femoral Neck Fractures In Young Adults
Shabnam Samsami, Sadegh Saberi, Nima Bagheri, Nazanin Daneshvar H, Mohammad J Ein-Afshar, Golamreza Rouhi

Poster No. 0645

A Biomechanical Comparison Of Four Methods Of Treatment For Periprosthetic Distal Femur Fractures
Tatu J Makinen, Gil Fichman, Herman Dhotar, Matthew Gunton, Mitchell Woodside, Oleg Safir, David Backstein, Thomas L Willett, Paul R Kuzyk

Poster No. 0646

Axial and Rotational Mal-Reduction (Golf Club Deformity) in Distal Femur Fractures
Ali Alhandi, Willard Moore, Jason Lowe, Edward Milne, David Kaimrajh, Loren Latta
PS1 BONE FRACTURE - REPAIR/ThERAPEUTICS

Poster No. 0647
**Local Application of a Proteasome Inhibitor Enhances Fracture Healing in Rats**
Toshitaka Yoshii, Jeffry S Nyman, Gloria Gutierrez

Poster No. 0648
**The Effects of the Duration of Transcutaneous CO₂ Application on the Facilitatory Effect in Rat Fracture Healing**
Takashi Iwakura, Takahiro Niikura, Sang Yang Lee, Etsuko Okumachi, Takahiro Waki, Shunsuke Takahara, Michio Arakura, Yoshitada Sakai, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 0649
**Histomorphometric Comparison of Graft Efficacy Using a Caprine Chronic Tibial Defect Model**
AlexAnne Weinzierl, Ferenc Toth, Grace Elizabeth Pluhr, George Muschler, Joan Bechtold, Viviane Luangphakdy, Cathy S Carlson

Poster No. 0650
**Characterization of Composition and Structure of Callus Tissue in Fractures Treated with BMP-7 and Zoledronate in an Osteoporotic Rat Model**
Neashan Mathavan, Mikael Turunen, Martin Bech, Florian Schaff, Ulf Olsson, Magnus Tagil, Hanna Isaksson

Poster No. 0651
**Osteogenic Potential of Teriparatide Adjuvant Therapy in Surgical Treatment of Femoral Fracture**
Hong Suk Kwak, Soong Joon Lee, Hee Joong Kim, Jeong Joon Yoo

Poster No. 0652
**Normobaric Oxygen Treatment Improves Fracture Healing After A Blunt Chest Trauma In Mice**
Julia Kemmler, Ronny Bindl, Florian Wagner, Oscar MacCook, Katja Wagner, Michael Gröger, Enrico Calzia, Peter Radermacher, Anita Ignatius

Poster No. 0653
**Inhibition Of Microrna-222 Expression Accelerates Bone Fracture Healing With Enhancement Of Angiogenesis And Osteogenesis In Atrophic Non-union Model In Rat**
Masaaki Yoshizuka, Tomoyuki Nakasa, Yoshitaka Kawanishi, Mitsuo Ochi

Poster No. 0654
**Effect of Plates in Proximity to Empty External Fixation Pin Sites on Long Bone Torsional Strength**
Fred L Speck, Randal P. Morris, Ronald W. Lindsey

Poster No. 0655
**Biomechanical Comparison of Conventional versus Cable Pin Fixation for Transverse Patellar Fractures**
Aaron D Schrayer, Randal P. Morris, Andrew G. Patton, William L. Buford, Ronald W. Lindsey

Poster No. 0656
**Cannulated Lag Screw Fixation of Displaced Lateral Humeral Condyle Fractures is Associated with Lower Rates of Open Reduction and Infection than Pin Fixation**
Benjamin E Stein, Alim F Ramji, Hamid Hassanzadeh, Jared M Wohlgemut, Michael C Ain, Paul D Sponseller

Poster No. 0657
**Human Psuedoarthrosis Tissue Contains Osteoprogenitor Cells In Vitro**
Shunsuke Takahara, Takahiro Niikura, Sang Yang Lee, Takashi Iwakura, Etsuko Okumachi, Takahiro Waki, Michio Arakura, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 0658
**Assessment of Methods for Rapid Intraoperative Concentration and Selection of Marrow-Derived Connective Tissue Progenitors for Bone Regeneration using the Canine Femoral Multi-Defect Model**
Viviane Luangphakdy, Cynthia Boehm, Hui Pan, Phil Zaveri, James Herrick, George Muschler

Poster No. 0659
**Reverse Dynamization Efficiently Heals Large Segmental Bone Defects Using a Reduced Dose of BMP-2**
Vaida Glatt, Nicole Loechel, Nicholas Quirk, Michael Schuetz, Chris Evans

Poster No. 0660
**Devitalized Cartilage Allografts Promote Improved Vascular Remodeling Compared to Bone Allograft in Murine Tibia Defects**
Aaron J Taylor, Yotvat Marmor, Diane P Hu, Jasselle Perry, Hayley M Britz, Avi D Stricker, Benedikt Hallgrimsson, Theodore Miclau, Ralph S Marcucio, Chelsea S Bahney

Poster No. 0661
**Local Transplantation Of CD31+ Cells From Peripheral Blood Improves Biologically Impaired Bone Healing By Modulation Of Early Inflammation And Angiogenesis**
Anke Dienelt, Andrea Sass, Katharina Schmidt-Bleek, Sebastian Filter, Agnes Ellinghaus, Georg Duda

Poster No. 0662
**Electronic Distraction Force Measurements to Optimize Segmental Transport in an Ilizarov Fixator**
Matthias Muench, Klaus DE Seide, Birgitt Kowald, Ulf J Gerlach

PS1 BONE FRACTURE - MECHANICS AND COMPUTATIONAL MODELING

Poster No. 0663
**The Relationship Between Elevated Contact Stress and Clinical Outcome Following Intra-Articular Calcaneal Fractures**
Kevin N Dibbern, Saran Tantavisut, Andrew M Kern, J. L. Marsh, Donald Anderson

Poster No. 0664
**Osteochondral Allograft Matching by Radius of Curvature**
Craig O’Neil, Jesal Parekh, Derick Bernstein, Hugh L Jones, Philip C Noble, Patrick McCulloch
Poster No. 0665
Would A Proximal Tibial Locked Plating System Or Cannulated Screws Allow Postoperative Weight Bearing On A Surgically Stabilized Schatzker I Tibial Plateau Fracture? An In Silico Pre-check
Gaetan Chary, Ion Carrera, Pablo E Gelber, Joan Carles Monllau, Jerome Noailly

Poster No. 0666
Use of Finite Element Analysis to Predict the Fatigue Strength of Cephalomedullary Nail Systems
Michael Bushelow, Stanley J. Kmiec, Brian Shultzabarger, Roderick McMillan, Dana J Coombs, Michael Blauth

Poster No. 0667
Comparison of Statically Locked Proximal Lag Screws in Cephalomedullary Nail Systems
Brian Shultzabarger, Michael Bushelow, Dana Pappalardo, Robert Harris

Poster No. 0668
Dynamic Hip Screw Hole Placement vs Bone Strain
Dana J Coombs, Michael Bushelow

Poster No. 0669
Comparison of Intra-operative Radiation Exposure during Intramedullary Nailing between Free-hand Technique and Electromagnetic Assisted Technique
Hiroki Kobayashi

Poster No. 0670
Time Course of Bone Screw Fixation Following a Local Delivery of Zoledronate in a Rat Femoral Model
Ulrike Kettenberger, Adeliya Latypova, Alexandre Terrier

Poster No. 0671
Development of a Novel Augmentation Pattern of Femoroplasty to Prevent Hip Fracture-Using Finite Element Methods
Qiang Luo, Frankie Leung

PS1 SPINE - COMPUTATIONAL MODELLING

Poster No. 0672
A Computational Model of Anulus Fiber Deformation in Cervical Discs During In Vivo Dynamic Flexion\ Extension, Rotation and Lateral Bending
William Anderst, Mara Palmer, Joon Lee, William Donaldson, James D Kang

Poster No. 0673
Severity of Adjacent Disc Disease Due to Lower Lumbar Fusion Depends on the Adjacent Segment’s Degenerative Grade
Raghu N Natarajan, Gunnar B Andersson

Poster No. 0674
Changes in Adjacent Segment Biomechanics After Laminecctomy and Laminotomy in Lumbar Spine
Shady Elmasry, Shihab Asfour, Joseph Gjolaj, Loren Latta, Francesco Travascio, Frank Eismont

Poster No. 0675
Pedicle Subtraction Osteotomy Rods: Surgical Skills Module
Robin Parrish, William Camisa, Jeremi Leasure

PS1 SPINE - SCOLIOSIS

Poster No. 0676
Clinical Sagittal Spinal Balance Reliably Quantified with Center of Mass in Surface Topography for Adolescent Idiopathic Scoliosis
Jessica Küpper, Gulshan Sharma, Chukwudi Chukwunyenwenwa, Adrienne Kline, Jason Howard, Ron El-Hawary, Ali Melia, Tyler Dubetz, Elaine Joughin, James Harder, Janet Ronsky

Poster No. 0677
Association of Vertebral Bone Marrow Edema with Low Back Pain in Degenerative Lumbar Scoliosis in the Elderly: A Cross-sectional Observational Study
Toshio Nakamae, Yoshinori Fujimoto, Kiyotaka Yamada, Osami Suzuki, Takashi Hashimoto, Masaki Matsuura, Taiki Morisako

Poster No. 0678
Wear Of Spinal Guided Growth Sliding Titanium Lsz-4d Implants For Early Onset Scoliosis Treatment
Elena Lukina, Mikhail Kollerov, Jay Meswasnia, Peter Mason, Paul Wagstaff, Aleksandr Laka, David Wertheim, Hilali Noordeen, Wai Yoon, Gordon Blunn

Poster No. 0679
Does Pedicle Fill Affect Pull-out Strength after Rod Reduction during Scoliosis Surgery?
Kevin Albanese, Nathaniel R Ordway, Brandon Clair, Stephen A Albanese, William F Lavelle

Poster No. 0680
Factors Affecting the Interface Strength of Pedicle Screws in the Thoracolumbar Spine
Nathaniel R Ordway, Kevin M. Albanese, Stephen A. Albanese, William F Lavelle

Poster No. 0681
Influence Of Back Extensor Strength On The Natural History Of Kyphosis Without Fresh Vertebral Fractures
Michio Hongo, Naohisa Miyakoshi, Yuji Kasukawa, Yoshinori Ishikawa, Daisuke Kudo, Yoichi Shimada

Poster No. 0682
Spine Growth Modulation Using Titanium Clip/Screw Device: Curvature, Vertebral and Disc Height Changes at 1 Year
Donita I Bylski-Austrow, Nana Enstuh, David L Gos, Joseph E Reynolds, Eric Wall

Poster No. 0683
Comparison of Uniplanar Versus Fixed Pedicle Screws in the Restoration of Thoracic Kyphosis in the Treatment of Adolescent Idiopathic Scoliosis (AIS)
Siddarth Badve, Ryan C Goodwin, David Gurd, Thomas Kuivila, William F Lavelle

PS1 SPINE - PERIPHERAL NERVE AND SPINAL CORD INJURY

Poster No. 0684
Amiloride Promotes Oligodendrocyte Survival And Remyelination After Spinal Cord Injury In Rats
Takeshi Imai
Poster No. 0685  
**Local Application Of The Sympathetic Nerve Blocker Around The Dorsal Root Ganglion Reduces Painful Behavior In A Lumbar Radiculopathy Model**  
Izaya Ogon, Tsumei Takebayashi, Katusmasa Tanimoto, Yoshinori Terashima, Tsuyoshi Miyakawa, Takehito Iwase, Takeshi Kobayashi, Noritsugu Tohse, Toshihiko Yamashita

Poster No. 0686  
**Circulating Microrna Expression As A Biomarker For Early Diagnosis Of Severity In Spinal Cord Injury**  
Susumu Hachisuka, Naosuke Kamei, Satoshi Ujigo, Shigeru Miyaki, Mitsuo Ochi

Poster No. 0687  
**Changes in Systemic Biomarkers are Correlated with Improvement in Pain in Patients Treated with Epidural Steroid Injection for Lumbar Disc Disorders**  
Shina Satoh, Shaheda Quraishi, KT Weber, Justin Vironjapa, Bruce Volpe, Ona Bloom, Nadeen Chahine

Poster No. 0688  
**Histological Comparison Between Pre- And Postganglionic Injuries Of The Brachial Plexus In A Rat Model**  
Takashi Noguchi, Souichi Ohta, Yukitoshi Kaizawa, Ryosuke Ikeguchi, Hirotoshi Oda, Ryosuke Kakinoki, Shuichi Matsuda

Poster No. 0689  
**Receptor-interacting Protein Kinases Mediate Necroptosis In Neural Tissue Damage After Spinal Cord Injury**  
Haruo Kanno, Hiroshi Ozawa, Satoshi Tateda, Kenichiro Yahata, Eiji Ito

**PS1 SPINE - DISC MECHANICS**

Poster No. 0690  
**Muscle Activity Costs of Cervical Sagittal Imbalance**  
Saeed Khayatzadeh, Robert M. Havey, Muturi Muriuki, Dale Schuit, Leonard I. Voronov, Alexander J. Ganayem, Avinash G. Patwardhan

Poster No. 0691  
**Differential Effects of Nucleolytic Insults on Intervertebral Disc and Function Assessed by 3-Dimensional Contrast-enhanced Micro-computed tomography**  
Kevin Lin, Simon Y Tang

Poster No. 0692  
**Population Average T2 MRI Maps Reveal Quantitative Regional Transformations in the Degenerating Rabbit Intervertebral Disc that Vary by Lumbar Level**  

Poster No. 0693  
**Effect of Glycation on the Biochemical and Biomechanical Properties of Intervertebral Disc**  
Li-Yu Lin, Yun-Chen Chiu, Yu-Chun Hsu, Pen-hsiu Grace Chao, Jaw-Lin Wang

Poster No. 0694  
**Quantifying the Spatial Distribution of Intradiscal Pressure and its Assessment via Non-Invasive Estimates of Intervertebral Disc Degeneration**  
Alexander M DelMonaco, Timothy M Jackman, Paul M Fein, Alexander M Adams, Kamil M Kakhnejeia, Elise F Morgan

Poster No. 0695  
**Influence of Trypsin Induced Protein Denaturation on Dynamic Mechanical Properties of Intervertebral Disc**  
Zong-Xing Chen, Yun-Chen Chiu, Yu-Chun Hsu, Pen-hsiu Grace Chao, Andy Chien, Jaw-Lin Wang

Poster No. 0696  
**Biomechanical Analysis of the Effect of Posterior Compared with Anterior Interbody Cage Positioning on Sacral Screw Strain in Long Posterior Spinal Fixation Constructs for Anterior Lumbar Interbody Fusion**  
Ryan Larsen, William Camisa, Jeremi Leasure

**PS1 SPINE - SPINE THERAPEUTICS (CLINICAL)**

Poster No. 0697  
**ORS Best Spine Poster**  
**Progressive Pattern of Vertebral Deformity in a Population-based Cohort Study of Vertebral Fracture: Association with Bone Mineral Density**  
Junichi Yamada, Koji Akeda, Norihiko Takegami, Toshihiro Kato, Koichiro Murata, Akinobu Nishimura, Ko Kato, Akihiro Sudo

Poster No. 0698  
**Changes Of Residual Disc Bulging After Successful Lumbar Microdiscectomy On Postoperative MR Imaging**  
Shigeru Kobayashi, Tsuyoshi Miyazaki, Riya Kosaka, Katsuhiko Hayakawa, Adam Meir

Poster No. 0699  
**Spinous Process Fractures after Placement of an Interspinous Process Spacer Device: Insight into the Mode of Action of an Interspinous Device**  
William F Lavelle, Fred H Geisler

Poster No. 0700  
**Anatomical Evaluation Of The Screw Placement With Sacral Plate Related To Nerve Injury In Lumbosacral Fixation - Comparison Of Clinical With Cadaver Study**  
Seiji Otsuka, Muneyoshi Fukuoka, Jun Mizutani, Nobuyuki Suzuki, Yoshishiro Matsumoto, Takanobu Otsuka

Poster No. 0701  
**Single Level Lumbar Fusion For Degenerative Disc Disease Is Associated With Worse Outcomes Compared To Fusion For Spondylolisthesis In A Workers’ Compensation Setting**  
Joshua T Anderson, Peter A. Surace, Uri M. Ahn, Nicholas U. Ahn

Poster No. 0702  
**The Difference of Regional Bony Quality in Cervical Vertebra to Find a Trajectory for Freehand Technique of Pedicle Screw Fixation**  
Dai-Soon Kwak, Moon-Kyu Kim
Poster No. 0703
Extreme Lateral Interbody Fusion For Unilateral Symptomatic Vertical Foraminal Stenosis
Marjan Alimi, Christoph Hofstetter, Apostolos J Tsiouris, Eric E Elowitz, Roger Härtl

Poster No. 0703A
Can Internet Information on Vertebroplasty be a Reliable Means of Patient Self-education?
T. Barrett Sullivan, Joshua T Anderson, Peter A. Surace, Uri M. Ahn, Nicholas U. Ahn

PS1 SPINE - SPINE THERAPEUTICS (IN VIVO PRECLINICAL)

Poster No. 0704
Acute Hyperglycemia Is A Treatable Risk Factor For Spinal Cord Injury: Animal Experiment And Human Cohort Study
Kazu Kobayakawa, Kensuke Kubota, Kazuya Yokota, Seiji Okada, Yukihide Iwamoto

Poster No. 0705
Inhibition of NF-κB Signaling in Annulus Fibrosus Cells Decreases Prostaglandin E2 Production in Response to Combined Mechanical Loading and Inflammatory Stimulation
Robert Fisherman, David Phillibert, Joao P Coelho, Nam Vo, Gwendolyn Sowa, James D Kang

Poster No. 0706
Rapamycin Suppresses Microglial Activation and Reduces inflammation after Spinal Cord Injury in Mice
Satoshi Tateda, Haruo Kanno, Hiroshi Ozawa, Akira Sekiguchi, Kenichiro Yahata, Seiji Yamaya, Eiji Itoi

Poster No. 0707
Clonal Human Embryonic Progenitor Cell Line Injections Facilitate Intervertebral Disc Repair and Reduce Nerve Root Pain in In Vivo Animal Models
Daisuke Sakai, Rajeswari Pichika, Tomonori Yamaguchi, Shintaro Shojo, Hitoshi Nemoto, Won Bae, Carol Muehleman, Joji Mochida, Hal Sternberg, Francois Binette, Koichi Masuda

Poster No. 0708
PDGF-BB Treatment for Mid-stage IVD Degeneration Inhibits Apoptosis and Preserves Disc Architecture In a Rabbit Model
David N. Paglia, Teja Karukonda, Hicham Drissi, Isaac L Moss

PS1 SPINE - DISC, TISSUE ENGINEERING AND REPAIR

Poster No. 0709
Human Mesenchymal Stem Cells Display Anti-inflammatory and Anti-catabolic Properties in Response to Degenerate Human Nucleus Pulposus Cells within a Degenerate Intervertebral Disc-Like Microenvironment
Stephen M Richardson, Pauline Baird, Judith A Hoyland

Poster No. 0710
The Influence of TGF-β3 on the Maturation of Tissue Engineered IVDs Containing Highly Contractile Human MSCs
Katherine Hudson, Priya Baraniak, Jon Rowley, Lawrence Bonassar

Poster No. 0711
GDF-6, Hypoxia and Load Act Synergistically to Promote Matrix Formation in Mesenchymal Stem Cell Tissue Engineered Nucleus Pulposus Constructs
Louise E Clarke, Stephen M Richardson, Judith A Hoyland

Poster No. 0712
Dynamic Loading, Matrix Maintenance And Cell Injection Therapy Of Intervertebral Disks Cultured In A Bioreactor.
Derek H Rosenzweig, Janet Moir, Rahul Gawri, David Eglin, Michael Weber, Jean Ouellet, Thomas Steffen, Lisbet Haglund

Poster No. 0713
Thermally Triggered Injectable Hydrogel Which Induces Mesenchymal Stem Cell Differentiation To Promote Regeneration Of The Intervertebral Disc
Abbey A Thorpe, Victoria Boyes, Chris Sammon, Christine L Le Maitre

Poster No. 0714
Effect of Priming and Structured Co-culture of Microencapsulated Bone Marrow and Adipose Tissue Derived Stem Cells for Disc Repair
Syeda Masooma Naqvi, Conor T Buckley

Poster No. 0715
Preconditioning Stem Cells to Maximize Regenerative Potential in the Challenging Microenvironment of the Intervertebral Disc

Poster No. 0716
Crosslinking Density Impacts Human Mesenchymal Stem Cell Differentiation and Associated Nucleus Pulposus-like Matrix Assembly in Carboxymethylcellulose Hydrogels
Huizi Anna Lin, Michelle S Gupta, Devika M Varma, Steven B Nicoll

Poster No. 0717
The Role of MHC Class Receptors on the Function of Tissue Engineered IVDs Made with Human MSCs
Katherine Hudson, Peter Grunert, Sara Towne, Roger Hartl, Lawrence Bonassar

Poster No. 0718
Pre-differentiation of Human Adipose Mesenchymal Stem Cells to a Discogenic Phenotype Protects Against the Catabolic Effects of IL-1
Louise E Clarke, Stephen M Richardson, Judith A Hoyland

Poster No. 0719
Synergic Effects of Hypoxic Isolation-Expansion and Lovastatin Pretreatment on Human Degenerative Nucleus Pulposus Cells Improves Properties of Regenerative Matrix
Shu-Hua Yang, Ming-Hsiao Hu, Yuan-Hui Sun
Poster No. 0720

Long-term Efficacy of Cell Therapy for Intervertebral Disc Repair: Quantitative Analysis
Qiaoqiao Zhu, Xin Gao, Thomas H Temple, Mark Brown, Weiyoung Gu

Poster No. 0721

Dynamic Tracking Of Il-6 Transcription In Nucleus Pulposus Cells In Vitro
Xinyan Tang, Dezba Coughlin, Erik Waldorff, James Ryaby, Tamara Alliston, Jeffrey Lotz

Poster No. 0722

Hepatocyte Growth Factor/c-Met Has Proliferation-promoting And Anti-apoptosis Effects On Rabbit Nucleus Pulposus Cells In Vitro
Hidenobu Ishibashi, Takumi Ikeda, Hitoshi Tomomura, Munehiro Sakata, Masateru Nage, Yasuo Mikami, Hiroyoshi Fujiiwa, Takashi Tanida, Ken-ichi Matsuda, Mitsuhiro Kawata, Toshikazu Kubo

Poster No. 0723

A Quantitative Analysis of Lumbar Discectomy Using Two Surgical Techniques During a Simulated TLIF Procedure
Nathaniel R Ordway, William F Lavelle, Ali Araghi, Rudolph Buckley, Amir H Fayyazi

Poster No. 0724

Accuracy of Fluoroscopy vs. Computer-Assisted Navigation for the Placement of Anterior Cervical Pedicle Screws
Andrew G Patton, Randal P Morris, Yong-Fang Kuo, Ronald W. Lindsey

PS1 SPINE - DISC BIOLOGY

Poster No. 0725

The Role of Class 3 Semaphorins in Innervation and Angiogenesis within the Degenerate Human Intervertebral Disc
Abbie L A Binch, Ashley A Cole, Lee M Breakwell, Antony LR Michael, Neil Chiverton, Alison K Cross, Christine L Le Maitre

Poster No. 0726

Large Cohort Investigation of Nerve and Blood Vessel Ingrowth into Human Intervertebral Discs
Abbie L A Binch, Ashley A Cole, Lee M Breakwell, Antony LR Michael, Neil Chiverton, Laura B Creemers, Alison K Cross, Christine L Le Maitre

Poster No. 0727

The Effects of Substance P Administration on the Intervertebral Disc in a Rat Organ Culture Model

Poster No. 0728

Matrix Metalloproteinase MMP12 is Associated with Intervertebral Disc Degeneration
Fengjuan Lv, Yan Peng, Foon Lian Lim, Yi Sun, Lixiong Zhou, Kenneth Cheung, Victor Leung

Poster No. 0729

Disc Gene Therapy: Development Of A Novel Inducible System To Regulate Expression Of The Therapeutic Transgene Timp1
Zhihua Ouyang, Wenjun Wang, Adam H Richman, Qing Dong, Wan Huang, Ying Tang, Bing Wang, Nam Vo, Gwendolyn Sowa, James D Kang

Poster No. 0730

Characterization Of Senescent Intervertebral Disc Cells: Secretion Of Catabolic Factors And Proteolysis Of Matrix Aggrecan
Kevin Ngo, Gwendolyn Sowa, James D Kang, Nam Vo

Poster No. 0731

Rapamycin, a mTORC1 Inhibitor, Protects the Intervertebral Disc Against Cellular Apoptosis, Senescence, and Extracellular Matrix Degradation Through Akt Activation Rather Than Autophagy Induction
Takashi Yurube, Thomas P Lozito, Robert A Hartman, Pedro H. I. Pohl, Zhongying Zhang, Kotaro Nishida, Masahiro Kurosaka, Nam V Vo, James D Kang, Gwendolyn A Sowa

Poster No. 0732

Chloroquine Increases Disc Cellular Apoptosis, Senescence, and Extracellular Matrix Degradation: Possible Adverse Effects of Inhibiting Autophagic Flux
Takashi Yurube, Thomas P Lozito, Kotaro Nishida, Masahiro Kurosaka, James D Kang, Gwendolyn A Sowa

Poster No. 0733

Gene Expression Profiling Identifies Interferon Signaling and IgFBP3 as Mediators in Human Intervertebral Disc Degeneration
Zepur Kazezian, Rahul Gawri, Lisbet Haglund, Jean Ouellet, Fackson Mwale, Peadar OGaora, Abhay Pandit, Mauro Alini, Sibylle Grad

Poster No. 0734

Proinflammatory Cytokines Regulate Mineralization in Bovine Nucleus Pulposus Cells
Robert J Frawley, Agata K Krzyzanowska, Sheela Damle, Matthew Cunningham

Poster No. 0735

Tnfrk Is Correlated With Trpv4 Expression In The Intervertebral Disc
Benjamin A Walter, Jessica Occhiogrosso, Devina Purmessur, Damien M Laudier, Andrew Moon, Andrew C Hecht, James C Iatridis

Poster No. 0736

Progranulin Deficiency Causes Intervertebral Disc Degeneration in Aging Mice
Jianlu Wei, Yunpeng Zhao, Qingyun Tian, Chuanju Liu

Poster No. 0737

The Effect of Omega-3 Fatty Acids on the Responses of Intervertebral Disc Cell to Inflammation
Zhongying Zhang, Carolyn Moore, Nam Vo, James D Kang, Gwendolyn A Sowa
Poster No. 0738
Proinflammatory Cytokines Modulate the Chemokine CCL2 (MCP-1) in Human Annulus Cells in Vitro: CCL2 Expression and Production
Helen Elizabeth Gruber, Gretchen Hoelscher, Synthia Bethea, Jane Ingram, Michael Cox, Edward Hanley

Poster No. 0739
High-Mobility Group Box-1 Gene, a Potent Proinflammatory Mediator, Is Upregulated in More Degenerated Human Discs in Vivo and Its Receptor Is Upregulated by TNF-α Exposure in Vitro
Helen Elizabeth Gruber, Gretchen Hoelscher, Synthia Bethea, Jane Ingram, Michael Cox, Edward Hanley

Poster No. 0740
Degenerating Discs Secrete Increased Concentrations of CHI3L1 and CHI3L2, Which Are Regulated by Inflammatory Cytokines and Toll-like Receptors
Emerson Krock, Joan B Currie, Michael H Weber, Peter Jarzem, Anneliese D Recklies, Jean A Ouellet, Lisbet Haglund

Poster No. 0741
Effects of Nicotine on Inflammation Activation in Human Nucleus Pulposus and Annulus Fibrosus Cells
Frank J. Brand III, Francesco Travascio, Juan Pablo de Rivero Vaccari

Poster No. 0742
Correlation of Outcomes and Intradiscal Cytokine Expression in Lumbar Fusion Patients
Christopher K Kepler, Dessislava Markova, John D Koerner, Joseph Mendelis, Gregory Schroeder, Alexander R Vaccaro, D. Greg Anderson

Poster No. 0743
Effects of Toll-Like Receptor 4 Activation on the Nucleus, Cytoskeleton and Mechanobiology of Intervertebral Disc Cells
Paula Hernandez, Timothy Jacobsen, Victoria Wei, Nadeen O. Chahine

Poster No. 0744
M1 and M2c Macrophage Phenotypes in Intervertebral Disc Degeneration
Kenneth R Nakazawa, Benjamin A Walter, Thomas P Naidich, Kara L Spiller, James C Iatridis

Poster No. 0744A
Role Of Circulating Signals In The Control Of Postnatal Intervertebral Disc Growth And Differentiation
Sarah Loh, Eric Mahoney, Christopher Wylie, Chitra L Dahia

Poster No. 0745
In-vivo Motion Characteristics Of The C5-C6 And C6-C7 Cervical Spine Segments During Dynamic Weight-bearing Flexion-Extension
Sean J. Driscoll, Shaobai Wang, Weiye Zhong, Guoan Li, Kirkham B Wood, Thomas D Cha

Poster No. 0746
Anterior Cervical Decompression and Fusion: Influence of Surgical Levels and Morphological Factors on the Range of Motion and Kinematical Changes

Poster No. 0747
Comparative Analysis of Cervical Kinematics, Pain and Functional Disability Between Single- and Two-level Anterior Cervical Discectomy and Fusion
Andy Chien, Dar-Ming Lai, Shwu-Fen Wang, Wei-Li Hsu, Chih-Hsiu Cheng, Jaw-Lin Wang

Poster No. 0748
Intervertebral Cervical Spine Kinematics During In Vivo Dynamic Loading: Continuous Motion Paths Defined Using Bootstrap Prediction Bands
William Anderst, Maya McKeown

Poster No. 0749
Variable Stiffness Cervical Plates Affect Load Sharing in the Interbody Space In Vitro
Joshua Peterson, Carolyn Chlebek, Karl Meier, Eric H Ledet

Poster No. 0750
Intervertebral Kinematics Correlate with T2 Relaxation Times in the Lower Human Cervical Spine
Sean J. Driscoll, Shaobai Wang, Weiye Zhong, Martin Torriani, Guoan Li, Kirkham B Wood, Thomas D Cha

Poster No. 0751
Loss of Cervical Deep Muscle Function Is Associated with An Increase in Cervical Kyphosis after Laminoplasty Surgery: In-Vitro Experimental Spine Model with Muscle Function Simulation
Wen-Kai Chou, Andy Chien, Zong-Xing Chen, Chia-Hao Hsieh, Li-Yu Lin, Jaw-Lin Wang

Poster No. 0752
Influence Of Stepwise Removal Of UHMWPE Sublaminar Wires On Segmental Stability In Long Segment Instrumentation For Early Onset Scoliosis Correction
Alex K Roth, Albert van der Veen, Rob Bogie, Paul Willems, Chris Arts, Lodewijk W van Rhijn

Poster No. 0753
Evaluation Of Trunk Kinematics Asymmetry Between Convex Side And Concave Side In Degenerative Lumber Scoliosis
Kaoruko Ito, Mitsuhiro Nishida, Kota Watanabe, Morio Matsumoto, Yoshiaki Toyama, Takeo Nagura

Poster No. 0754
Maintaining Lordosis Angle Is a Critical Factor for Safe Disc Decompression in Conservative Spine Traction Exercise for Treating Low Back Pain
Won Man Park, Dae Kyung Choi, Kyungsoo Kim, Yoon Hyuk Kim, Jae Lak Yang
Poster No. 0755
Thoracic Spine Motion as a Function of Disc Degeneration and Posterior Destabilization Procedures
Sean L Borkowski, Sophia N Sangiorgio, Patricia A Campbell, Timothy L Tan, Richard E Bowen, Anthony A Scaduto, Edward Ebramzadeh

Poster No. 0756
The Influence of Previous Low Back Pain and Sex on Trunk Flexor Endurance at Various Work Loads
Lauren C Thomas, Seth Oberst, Christopher Wall, Lindsey Russell, Kerry McFadden, David Russ, Brian Clark, James S Thomas

Poster No. 0757
Fretting Corrosion Response of Spinal Fixation Devices with CoCrMo Rods of Different Surface Roughness
Sachin A Mali, Aarti A Shenoy, Vaneet Singh, Jeremy L Gilbert

PS1 SPINE - BIOLOGY

Poster No. 0758
Axial Torsion Alters Load Distribution Among Spinal Components In Flexion/extension In Rabbit Lumbar Spinal Segments
Robert A Hartman, Robert T Tisherman, Kevin M Bell, Richard E Debski, James D Kang, Gwendolyn Sowa

Poster No. 0759
Making Connections In Spinal Mechanobiology: Mechanical Properties As Predictors Of Biological Responses

Poster No. 0760
Pathogenesis Of The Hypertrophied Ligamentum Flavum In LSCS
Yutaka Yabe, Yoshihiro Hagiwara, Akira Ando, Masahiro Tsuchiya, Takashi Minowa, Taro Takemura, Masahito Honda, Kazuaki Sonofuchi, Kenji Kanazawa, Masashi Koide, Takuya Sekiguchi, Nobuyuki Itaya, Eiji Itoi

Poster No. 0761
India Hedgehog is correlated to Human Endplate Cartilage Degeneration
Shaowei Wang, Yaqiong Chang, Lei Wei, Guoqing Du, Shunwu Fan

PS1 KNEE - KINEMATICS AND GAIT

Poster No. 0762
The Hip Internal Rotation is Negatively Correlated to Valgus Knee Motion and Internal Tibial Rotation in the Early Phase during a Landing Task in Drop Jumping
Tomoya Ishida, Masanori Yamanaka, Shohei Taniguchi, Ryo Ueno, Shikeyuki Minami, Yuta Koshino, Mina Samukawa, Hiroshi Saito, Takumi Kobayashi, Hisashi Matsumoto, Yoshimitsu Aoki, Harukazu Tohyama

Poster No. 0763
Gait Normalizes At Fast Walking Speeds In People With Knee Osteoarthritis
Victoria L Manning, Michela Zanotto, Adeel Aqil, Justin Cobb

Poster No. 0764
Sex-Specific Variations in Passive Knee Rotation under Unconstrained Axial Plane Torques
Ata M Kiapour, Samuel C Wordeman, Vijay K Goel, Carmen E Quatman, Timothy E Hewett, Constantine K Demetropoulos

Poster No. 0765
Can Medial Compartment Contact Forces in an ACL Deficient Knee Be Lower Despite Higher Muscle Co-contraction?
Ashutosh Khandha, Elizabeth Wellsandt, Kurt Manal, Adam Marmon, Lynn Snyder-Mackler, Thomas Buchanan

Poster No. 0766
The Joint Moment Distributions of the Lower Extremity during Gait in Patients after Open Reduction and Internal Fixation of Acetabular Fractures
William Tucker, Justin McCormick, Aaron Mates, Wei Liu, Jorge Alonso

Poster No. 0767
Alterations in Knee Contact Forces and Contact Centers During Gait in Normal, OA and Varus-Valgus Altered Subjects - A Detailed Lower Extremity Musculoskeletal Model Study
M Adouni, A Shirazi-Adl

Poster No. 0768
The Accuracy of Personal Activity Monitoring Devices
Andrew K. Battenberg, Donohoe Steven, Nicholas Robertson, Thomas P Schmalzried

Poster No. 0769
In-vivo Kinematics of Posterior-Stabilized Total Knee Prosthesis Designed For Japanese
Toshifumi Watanabe, Takeshi Muneta, Ichiro Sekiya, Hideyuki Koga, Masafumi Horie, Tomomasa Nakamura, Koji Otabe, Scott A Banks

Poster No. 0770
Sex Differences in Knee Valgus Rotation under Unconstrained Single- and Multi-Planar Loading: Implications for Valgus Collapse ACL Injury Mechanism
Ata M Kiapour, Carmen E Quatman, Samuel C Wordeman, Vijay K Goel, Constantine K Demetropoulos, Timothy E Hewett

Poster No. 0771
Knee Osteoarthritis Affects The Recovery Stepping Response Following A Large Postural Perturbation
Mackenzie L Pater, Noah J Rosenblatt, Mark D Grabiner

Poster No. 0772
Biomechanical Assessment of Three Patellar Advancement Procedures for the Treatment of Patella Alta in Children with Cerebral Palsy
Adam Seidl, Todd Baldini, Jason Rhodes, James Carollo

Poster No. 0773
Knee Function Classification: Is it Possible To Identify Factors That Contribute To Total Knee Replacement Outcome?
Daniel Watling, Paul Biggs, Andrew Metcalfe, Christopher Wilson, Gemma M Whatling, Cathy A HOLT
Poster No. 0774
The Effect of Contralateral Cane on the Knee and Thorax Biomechanics in Patients after Total Knee Arthroplasty
Hidenori Tanikawa, Tomonori Muto, Ryo Ogawa, Kengo Harato, Kazunari Okuma, Takeo Nagura

Poster No. 0775
Single Radius Versus Multi Radii CR TKA Kinematics
Trevor F. Grieco, Harold Cates, Adrija Sharma, William Hamel, Richard D Komistek

Poster No. 0776
Relationships Between Femoral Tunnel position and Dynamic Knee Function After ACL Reconstruction
Yuichiro Nishizawa, Eric Thorhauer, James J Irgang, Friede H Fu, Scott Tashman

Poster No. 0777
In Vivo Kinematics for Subjects Implanted With Either a Traditional or a Customized, Individually Made TKA

Poster No. 0778
Quantitative Assessment Of Cluster Methods Against Bi-plane Fluoroscopic Method In Measuring Knee Kinematics During Treadmill Walking
Young-jun Koo, Yoon Kwak, Seungbum Koo

Poster No. 0779
Condyle Motion Characteristics of the Knee during Dynamic Flexion-Extension
Yong Feng, Tsung-Yuan Tsai, Jing-Sheng Li, Shaobai Wang, Hai Hu, Changqing Zhang, Harry E Rubash, Guoan Li

Poster No. 0780
Preoperative Knee Kinematics Impacts Upon Postoperative Knee Kinematics in Total Knee Arthroplasty
Naoki Seito, Tomohiro Onodera, Yasuhiko Kasahara, Yusuke Nishio, Eiji Kondo, Norimasa Iwasaki, Tokifumi Majima

Poster No. 0781
Correlations Between Knee Anatomy and Joint Laxity Using Principle Component Analysis
Sam Shalhoub, Lowell M Smoger, Adam J Cyr, Paul J Rulkkoetter, Peter J Laz, Lorin P Maletsky

PS1 KNEE - MECHANICS

Poster No. 0782
Can the Entire Boundary of Knee Laxity be Determined by a Few Specific Laxity Measures?
Sam Shaloub, Adam J Cyr, Fallon Fitzwater, Lorin P Maletsky

Poster No. 0783
The Evaluation Of Intra- And Extra-articular Tension Of The graft During The graft Fixation In Anterior Cruciate Ligament Reconstruction
Kanto Nagai, Ryosuke Kuroda, Yuichi Hoshino, Yuichiro Nishizawa, Daisuke Araki, Shinya Oka, Naoki Nakano, Takehiko Matsushita, Tomoyuki Matsumoto, Koji Takayama, Kouki Nagamune, Masahiro Kurosaka

Poster No. 0784
Three-dimensional Lower Extremity Alignment In The Weight-bearing Standing Position In Osteoarthritis Subjects
Toshihide Fujii, Takashi Sato, Satoshi Watanabe, Naoto Endo

Poster No. 0785
Tibiofemoral Contact Mechanics following a Horizontal Cleavage Lesion in the Posterior Horn of the Medial Meniscus
Sally Arno, Christopher Bell, Carlos Uquillas, Ilya Borukhov, Peter S Walker

Poster No. 0786
Evaluation Of The Compositional And Functional Properties Of Articular Cartilage Using T1rho And T2 Relaxation Imaging
Amber T. Collins, Sophia Y Kim, Courtney E Cox, Sophia Ziemand, Charles E Spritzer, Farshid Gulak, Amy L McNulty, Louis E DeFrate

Poster No. 0787
The Porcine Knee as a Sex-Specific Model to Study Human Anterior Cruciate Ligament Pathology
Ata M. Kiapour, Matthew R. Shalvoy, Martha M. Murray, Braden C. Fleming

Poster No. 0788
Design and Validation of a Smart Knee Fixture for Measuring Knee Balancing
Christopher Bell, Patrick A. Meere, Peter S. Walker, Ilya Borukhov

Poster No. 0789
Does Venting Knee Joint Capsule Affect Laxity in TKA?
Erik L. Woodard, Casey T. Hebert, Wade C. Gobbell, William M. Mihalko

Poster No. 0790
Difference Of Graft Tension Pattern Between The Intra-And Extra-articular Graft Portion In Anatomic Anterior Cruciate Ligament Reconstruction
Kanto Nagai, Ryosuke Kuroda, Yuichi Hoshino, Yuichiro Nishizawa, Daisuke Araki, Shinya Oka, Naoki Nakano, Takehiko Matsushita, Tomoyuki Matsumoto, Koji Takayama, Kouki Nagamune, Masahiro Kurosaka

PS1 KNEE - COMPUTATIONAL MODELLING

Poster No. 0791
Fluid Flow Properties Of Articular Cartilage Change Most In Very Early Osteoarthritis
Janne TA Mäkelä, Sang Kuy Han, Walter Herzog, Rami Korhonen

Poster No. 0792
Importance of Patella, Quadriceps Forces and Depth-Wise Cartilage Structure on Knee Joint Motion and Cartilage Response During Patient-Specific Gait Cycle
Kimmo S Halonen, Mika E Mononen, Jukka S Jurvelin, Juha Töyräs, Adam Klokowski, Juha-Pekka Kulmala, Rami Korhonen
Poster No. 0793  
**Predicting Tibial rotation using Multiple Anatomic Landmarks**  
Philip C Noble, Kevin Hwang, Sabir Ismaily, Morteza Meftah, Stephen Incavo, Kenneth Mathis

Poster No. 0794  
**The Effect of Surgical Placement Parameters on Implant Micromotion with Heterogeneous Patient Specific Bone Properties: a Probabilistic FEA Study**  
Robert Davignon, Michael Ferko, Stuart Axelson

Poster No. 0795  
**Laxity Characteristics of the Medial and Lateral Compartment in Normal Female and Male Knees**  
Marc Bandi, Eik Siggelkow, Amit M Mane, Iris Bauerberg, Fred Wentorf

Poster No. 0796  
**WITHDRAWN**

Poster No. 0797  
**Validation of Patellofemoral Joint Contact Pressure Distribution Driven by Accurate Knee Joint Kinematics**  
Jonathan A Gustafson, Kyle A Berkow, Zhaochun Yang, Richard E Debski, Shawn Farrokh

Poster No. 0798  
**The Effect of Cartilage Thickness on Tibiofemoral Contact Pressure During Gait**  
Colin R Smith, Rachel Lenhart, Jarred Kaiser, Kwang Choi, Darryl Thelen

Poster No. 0799  
**Morphological Analysis of Proximal Tibia Using Statistical Shape Models**  
Yifei Dai, Jeffery Bischoff

Poster No. 0800  
**Knee Bone Shape Features Are Correlated With Abnormal Tibial Translation After ACL Injury And Reconstruction**  
Valentina Pdeoia, Keiko Amano, Drew Lansdown, Musa Zaid, Brian Lau, Richard Souza, C Benjamin Ma, Xiaojuan Li

**PS1 KNEE - SURGICAL REPAIR AND REHABILITATION**

Poster No. 0801  
**The Effect of Different Preconditioning Protocols on Anterior Knee Laxity After ACL Reconstruction with Four Commonly Used Grafts**  
Daniel Boguszewski, Nirav Joshi, Dean Wang, Keith Markolf, Frank Petriglano, David McAllister

Poster No. 0802  
**Does Mechanism of Injury Affect Gait Biomechanics in Athletes At Return to Activity after ACLR?**  
Mathew Failla, David Logerstedt, Lynn Snyder-Mackler

Poster No. 0803  
**Smart Patellar Implant for In Vivo Force Measurement Across the Patellofemoral Joint**  
Matthew K Dion, Colleen P Healey, Jared Roberts, Eric H Ledet

**POSTERS**

Poster No. 0804  
**Biomechanics and Mechanobiology of Osteochondral Graft Insertion: Cartilage Damage is Associated with Delivered Energy and Reduced by a Waisted Graft Geometry**  
Alvin W. Su, Dustin H Wailes, Yunchan Chen, Van Wong, Esther Cory, Albert C Chen, William D Bugbee, Robert Sah

Poster No. 0805  
**Factors Affecting Femoral Tunnel Morphology and Graft Bone Block Healing after Anterior Cruciate Ligament Reconstruction**  
Eric Thorhauer, Yuichiro Nishizawa, James J Irgang, Freddie H. Fu, Scott Tashman

Poster No. 0806  
**Can the Area and Distribution of the Bone Marrow Edema in Knee Osteoarthritis be Reduced by a Rotational Knee Exercise Program?**  
Kenji Hoshi, Tsukasa Kanda, Akira Nagao, Megumi Yamamoto, Yasuiko Ohkura, Kazuyoshi Gamada

Poster No. 0807  
**Fresh Meniscus with Hemi-Plateau Osteoarticular Allografts: Validation and Initial Clinical Results**  
Ferris M. Pfeiffer, James P. Stannard, James L Cook

Poster No. 0808  
**The Femorotibial Compressive Force in Total Knee Arthroplasty: A Novel Intraoperative Predictor of the Postoperative Flexion Angle**  
Go Iida, Tsuyoshi Jotoku, Mikio Nakajima, Yoshinori Okamoto, Shuhei Otsuki, Shyhei Oda, Yoshiaki Hoshiyama, Hidetsugu Ohara, Masashi Neo, Mutsumi Ohue, Hideki Matsuda, Yoshiaki Miyata

Poster No. 0809  
**Validation of a Portable System for Monitoring Knee Motion During Physical Rehabilitation**  
Daniel R Freer, Abhigyan Mukherjee, William D Anderton, Robert A Hartman, Shawn Farrokh, Kevin M Bell

Poster No. 0810  
**Relationships Between Clinical Laxity Measurement and Dynamic Knee Kinematics After ACL Reconstruction**  
Yuichiro Nishizawa, Eric Thorhauer, James J Irgang, Freddie H Fu, Scott Tashman

**PS1 KNEE - KNEE LIGAMENT**

Poster No. 0811  
**Preservation of Remnant Tissue Improves Knee Stability and Graft Healing after Anterior Cruciate Ligament Reconstruction in Sheep**  
Tsuneari Takahashi, Eiji Kondo, Yasuyuki Kawaguchi, Jun Onodera, Shin Miyatake, Norimasa Iwasaki, Kazunori Yasuda

Poster No. 0812  
**Reproduction of In-Vivo Gait Using a Novel Robotic Manipulator and Accuracy of the Tissue Forces Determined**  
Mohammad Atarod, Joshua M Rosvold, Cyril Frank, Nigel Shrive
Poster No. 0813

Age-dependent Healing Potential Of Anterior Cruciate Ligament Remnant-derived Cells
Naoki Nakano, Tomoyuki Matsumoto, Koji Takayama, Takehiko Matsushita, Daisuke Araki, Atsuo Uefuji, Kanto Nagai, Shurong Zhang, Takao Inokuchi, Kyohei Nishida, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 0814

Contribution from Collateral Ligaments to Overall Knee Joint Constraint
Adam J Cyr, Sami S Shalhoub, Fallon G Fitzwater, Lauren A Ferris, Lorin P Maletsky

Poster No. 0815

Histological Analyses of Early Onset of Fetal Double-Bundle Anterior Cruciate Ligament
Weifeng Yin, kostas Michail, Jian Li, Monica Linde-Rosen, Fengjin Guo, Ying Tang, Freddie Fu, Bing Wang

Poster No. 0816

Anterolateral Ligament Injury Increases Tibiofemoral Kinematic Changes Following ACL Injury: A Simulation Study
Nicholas A Early, Michael J Kelly, Alexis K Schlosser, Danielle E Filipkoswki, John J Elias

Poster No. 0817

Analysis of Adiopokine mRNAs in Canine Cranial Cruciate Ligament and Their Associations with Cartilage Matrix Markers
Wipawee Saengsoi, Simon R. Tew, Chen Bing, Brandan G. Wustefelds-Janssens, Eithne J. Comerford, Alexander J. German

Poster No. 0818

Bone Bridge Between Femoral Bone Tunnels Affects Bone Tunnel Enlargement After Anatomic Double-Bundle Anterior Cruciate Ligament Reconstruction
Daisuke Araki, Ryosuke Kuroda, Yosuke Uozumi, Kouki Nagamune, Takehiko Matsushita, Tomoyuki Matsumoto, Koji Takayama, Yuichi Hoshino, Masahiro Kurosaka

Poster No. 0819

Evaluation of Partial Transection Versus Synovial Debridement of the ACL as Novel Canine Models for Management of ACL Injuries
Chantelle Bozynski, Keichi Kuroki, James P Stannard, Patrick Smith, Aaron Stoker, Cristi Cook, James Cook

Poster No. 0820

Comparisons of Angular Velocities of Knee Abduction and Internal Rotation between Female and Male Subjects during a Landing Task
Ryo Ueno, Masanori Yamanaka, Tomoya Ishida, Shohei Taniguchi, Harukazu Tohyama

Poster No. 0821

Joint and Epiphyseal Progenitor Cells Revitalize Tendon Graft and Form Mineralized Insertion Sites in Murine ACL Reconstruction Model
Yusuke Hagiwara, Nathaniel A Dyment, Douglas J Adams, Shinro Takai, David W Rowe

Poster No. 0822

Utility of Instrumented Knee Laxity Testing in Diagnosis of Partial Anterior Cruciate Ligament Tears
Ata M Kiapour, Ali Kiapour, Timothy E Hewett, Vijay K Goel

Poster No. 0823

The Microscopic Anatomy of the Human ACL Entheses: A Quantitative Analysis
Melanie L. Beaulieu, Grace E. Carey, Stephen H. Schlecht, Edward M Wojtys, James A. Ashton-Miller

Poster No. 0824

Reliability of a 2D Simple Image Analysis Method to Predict 3D Bony Motion of the Lateral Knee Compartment During the Pivot Shift Test
Fabio V Arilla, Ata Azar, Benjamin Scott, Daniel Guenther, Carlos Yacuzzi, Ricahrd Debski, Volker Musahl

Poster No. 0825

WITHDRAWN

Poster No. 0826

Oral Contraceptive Use Predicts Fewer Cruciate Ligament Reconstructions in Young Females
Aaron M. Gray, Zbigniew Gugala, Jacques Baillargeon

Poster No. 0827

Changes in Cross-Sectional Area of The Human Posterior Cruciate Ligament during Knee Motion
Masataka Fuji, Yoshimasa Fujimaki, Yusuke Sasaki, Takayuki Furumatsu, Shinichi Miyazawa, Toshifumi Ozaki, Monica Linde-Rosen, Patrick Smolinski, Freddie H Fu

Poster No. 0828

Effect Of Graft Size And Insertion Site Area In Single Bundle And Double Bundle Anterior Cruciate Ligament Reconstruction: A Human Cadaver Study
Yusuke Sasaki, Fuji Masataka, Daisuke Araki, Monica Linde-Rosen, Patrick Smolinski, Freddie H Fu

Poster No. 0829

Factors Associated with Characteristics of Stem-like Cells Derived from Anterior Cruciate Ligament
Shurong Zhang, Tomoyuki Matsumoto, Atsuo Uefuji, Naoki Nakano, Takao Inokuchi, Takehiko Matsushita, Koji Takayama, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 0830

Gait Is a Poor Task Choice for Identifying Kinematic Deficits After ACL Reconstruction
Ruben OHara-Plotnik, Eric Thorhauser, Andrew Sivaprakasam, James Irgang, Freddie Fu, Scott Tashman

PS1 HIP - DISEASE PROCESS

Poster No. 0831

Bone Apatite Composition Of Osteonecrotic Trabecular Bone From The Femoral Head Of Immature Pigs
Olumide O Aruwajoye, Harry KW Kim, Pranesh B Aswath

Poster No. 0832

Femoral Perfusion After Electromagnetic Field Stimulation In A Steroid-induced Osteonecrosis Model
Akira Ikegami, Keiichiro Ueshima, Kazuya Ikoma, Mikihiro Fujioka, Masazumi Saito, Shigeki Hayashi, Masashi Ishida, Masaaki Kuribayashi, Osam Mazda, Toshikazu Kubo
Effect Of Corticosteroid In The Development Of Osteonecrosis Of The Femoral Head
Shunichiro Okazaki, Satoshi Nagoya, Junya Shimizu, Mikito Sasaki, Kenji Tateda, Hiromasa Inoue, Toshihiko Yamashita

Biomechanical Evaluation of Capsulotomy and Capsular Repair in the Hip: Restoring Stability
Sang H Song, Thomas H Wuerz, Jeffrey S Grzybowski, Mitchell J Greenberg, Alejandro A Espinoza-Orias, Shane J Nho

Radial Imaging Evaluation for Two Types of Cam-Type Femoroacetabular Impingement Hips
Kunihiro Muraoka, Masatoshi Naito, Koichi Kinoshita, Tomonobu Hagiwara, Tetsuya Sakamoto, Norihito Watanabe, So Minokawa, Tomohiko Minamikawa, Hajime Seo, Tetsuro Ishimatsu, Sodai Ishii

Biochemical and Histological Characterisation of the Porcine Acetabular Labrum and Labral-Cartilage Junction and its Relationship to Function
Rachel L Pallan, Joanne Tipper, John Fisher, Sophie Williams

Hip Joint Contact Force In Femoroacetabular Impingement Population During Walking: An Exploratory Study
Giulia Mantovani, Mario Lamontagne, Paul E Beaule

Side to Side Asymmetry of the Proximal Femoral Anatomy: 3D CT Analysis of 122 Hips
Dimitris Dimitriou, Tsung-Yuan Tsai, Kwan K Park, Kwang W Nam, Harry E Rubash, Young-Min Kwon, Guoan Li

Subchondral Bone Properties Of Cam-type Femoroacetabular Impingement Deformities
Ahmed Alnabelsya, Ifaz Haider, Andrew D Speirs, Paul E Beaule, Hanspeter Frei

Redefining the Acetabular Component Safe Zone for Posterior Approach Total Hip Arthroplasty
Jacob Bobman, Jonathan Danoff, Gregory Cunn, Katie Peyser, Calvin Zhu, Jeffrey Geller, William Macaulay

A Validated Robotic System for Native Hip Biomechanical Analysis
Mary T Goldsmith, Matthew T Rasmussen, Travis Lee Turbull, Cristiano A.C. Trindade, Robert F LaPrade, Marc J Philippon, Coen A Wijdicks

The Influence Of Cartilage Fibrillation On The Contact Mechanics Of A Biphasic Finite Element Hip Model
Junyan Li, Alison Jones, Sophie Williams, Zhongmin Jin, John Fisher, Ruth Wilcox

Finite Element Analysis Of Osteonecrosis Of The Femoral Head And Material-characteristics Measurement Of Osteonecrosis
Masamitsu Tomioka, Yutaka Inaba, Naomi Kobayashi, Hiroaki Ike, Haruka Suzuki, Tomoyuki Saito

In Vivo Kinematic Evaluation Of Cementless Total Hip Arthroplasty During Step-up Activity
Dimitris Dimitriou, Tsung-Yuan Tsai, Jing-Sheng Li, Kwan K Park, Kwang W Nam, Harry E Rubash, Guoan Li, Young-Min Kwon

Development of a Large Animal Model of Local Non-Weight-Bearing to Study Its Effects on Musculoskeletal Conditions
Olumide O Arowojoye, Matthew Phipps, Travis Wassell, Harry KW Kim

Analysis Of The Role Of Piriformis In Hip Joint Stability: Intraoperative Gap Measurement Using A Tensor
Isao Matsushita, Yoshiaki Ito, Hiraku Motomura, Tomoatsu Kimura

Effect of Capsulotomy on Hip Stability and Range of Motion: Should Capsules be Repaired after Hip Arthroscopy?
Suenghwan Jo, Alexander W Hooke, Kai-Nan An, Rafael J Sierra, Robert T Trousdale

Simultaneous Hip Head-Stem Taper Junction Measurements of Electrochemical Corrosion and Micromotion: A Comparison of Taper Geometry and Stem Material
Laura Scholl, Viswanathan Swaminathan, Reginald Lee, Lokesh K Raja, Ahmad Faizan, Mayur Thakore, Kevor TenHuisen

Anatomically Contoured Dual Mobility Insert Mitigates Soft-tissue Impingement and Insert Entrapment: A Cadaver Verification Study
Kartik Mangudi Varadarajan, Thomas Zumbrunn, Michael Duffy, Harry Rubash, Henrik Malchau, Andrew A Freiberg, Orhun Muratoglu

Gait Asymmetry in Patients with a Dual Mobility Total Hip Arthroplasty: a Randomized Clinical Trial
Danilo S Catelli, Sarah Reynolds, Mario Lamontagne, Paul E Beaule
Poster No. 0851
Can Simulated Activities Confirm the Need of Anatomical Articular Surface Together with ACL Preservation to Restore Normal Activity Dependent Knee Kinematics?
Thomas Zumbrunn, Kartik Mangudi Varadarajan, Harry E Rubash, Henrik Malchau, Guoan Li, Orhun Muratoglu

Poster No. 0852
Effect of Tibial Posterior Slope on the Kinematic and Patellofemoral Contact Force After Posterior-stabilized Total Knee Arthroplasty
Hideki Mizu-uichi, Ken Okazaki, Shigetoshi Okamoto, Satoshi Hamai, Umito Kuwashima, Koji Murakami, Yukihide Iwamoto

Poster No. 0853
Knee Extension Limitation At Heel Strike Will Lead To The Increase Of Toe Out Angle During Gait In The Early Postoperative Period After Total Knee Arthroplasty
Kengo Harato, Yasuo Niki, Takeo Nagura, Yoshiaki Toyama, Yasunori Suda

Poster No. 0854
MI Stability In Early Flexion May Be More Important Than Normal Kinematics After TKA
Philip C Noble, Shigeki Asada, Yafei Ouyang, Hugh Jones, Sabir Ismaily

Poster No. 0855
Kinematic and Wear Performance of a Novel Cruciate Retaining Biomimetic Implant Manufactured from Advanced Vitamin-E Stabilized Material
Kartik Mangudi Varadarajan, Thomas Zumbrunn, Harry E Rubash, Henrik Malchau, Guoan Li, Orhun Muratoglu

Poster No. 0856
Comparison of Robotic Assisted Gait Training versus Conventional Physical Therapy after Total Hip Replacement - a Prospective Clinical Study
Kohei Yabuno, Noriyoshi Sawada, Tadashi Kameyama, Shuichi Hamamoto, Motonori Kanazawa

Poster No. 0857
Dynamic Hip Kinematics During Golf Swing In Patients After Total Hip Arthroplasty
Daisuke Hara, Yasuharu Nakashima, Satoshi Hamai, Hidehiko Higaki, Satoru Iikebe, Takeshi Shimoto, Masanobu Hirata, Masayuki Kanazawa, Yusuhe Kohnho, Yukihide Iwamoto

Poster No. 0858
Rotational Alignment Of Femorotibial Joint Before And After Mobile-bearing TKA
Yoshikazu Tsuneizumi, Tae-Hyun Lee, Tadashi Tsukeoka

Poster No. 0859
Assessment Of The Mechanisms Of Rim Damage In Dual Mobility Polyethylene Inserts Using Retrievals And Cadaver Models
Audrey K Nebergall, Andrew A Freiberg, Meridith Greene, Jean Langlois, Henrik Malchau, Orhun Muratoglu, Shannon Rowell, Anders Troelsen, Thomas Zumbrunn, Kartik Mangudi Varadarajan

Poster No. 0860
Effects of Impaction Assembly Forces on Micromotion and Electrochemical Performance of Taper Junctions
David Pierre, Viswanathan Swaminathan, Laura Scholl, Philip Williams, Kever TenHuisen

Poster No. 0861
Design Features and Kinematic Behaviour of a Customized Surface-Guided Knee Implant
Shabnam Pejhan, Olivia Essex, Eric Bohn, Jan-Mels Brandt, Urs Wyss

PS1 HIP AND KNEE ARTHROPLASTY - INFECTION
Poster No. 0862
Epidemiology of Infecting Microorganism at First Time Revision of Primary Hip Arthroplasty for Infection
Richard J Holleyman, Paul N Baker, Andre Charlett, Kate Gould, David J Deehan

Poster No. 0863
Pathophysiologic Differences In TLR4 Vs. TLR2 Activation Associated With Co-alloy Implant Debris: Implications For Implant Associated Infections
Laurny Samelko, Kyron McAllister, Joshua Jacobs, Nadim Hallab

Poster No. 0864
Combined Local And Systemic Antibiotic Treatment Effective Against Peri-implant Biofilm Infection With Staphylococcus aureus
Anna S van der Horst, Ethan Ledbetter, Alexander Liu, Paul Weinhold, Daniel Del Gaizo, Laurence Dahners

Poster No. 0865
Obesity Increases Risk of Mixed vs. Single Organism Genus Infection in Primary Knee Arthroplasty Revised for Infection
Richard J Holleyman, Paul N Baker, Andre Charlett, Kate Gould, David J Deehan

Poster No. 0866
Bacterial Contamination Of Diathermy Tips Used During Orthopaedic Procedures
Ali Abdulkarim, Peter Coffey, Eoin Sheehan

PS1 HIP AND KNEE ARTHROPLASTY - COMPUTATIONAL MODELING
Poster No. 0867
ORS Best Knee Poster
Factors Influencing TKR Joint Mechanics in the Varus Knee
Clare K Fitzpatrick, Sherrod Woods, Paul J Rullkoetter

Poster No. 0868
Efficient Computational Framework for Population-Based Evaluation of TKR-Implanted Joint Mechanics
Azhar A Ali, Chadd W Clary, Lowell M Smoger, Clare K Fitzpatrick, Paul J Rullkoetter, Peter J Laz

Poster No. 0869
Thermoelastic Stress Analysis For Surface Stress Imaging Predicts Clinical Outcome Of The Total Hip Arthroplasty
Hiroshi Wada, Hajime Mishima, Hlsashi Sugaya, Tomofumi Nishino, Masashi Yamazaki, Koji Hyodo
Poster No. 0870  
**Digital Component Size Prediction for Total Knee Arthroplasty**  
Takayuki Murayama, Joseph Maratt, Tomoharu Mochizuki, Toshihide Fujii, John D Blaha

Poster No. 0871  
**Simulations Based on Various In Vivo Activities to Analyze Micro-Separation in Total Hip Implants**  
Thomas Zumbrunn, Kartik Mangudi Varadarajan, Michael Duffy, Harry E Rubash, Henrik Malchau, Andrew A Freiberg, Orhun Muratoglu

Poster No. 0872  
**How Does Acetabular Component Orientation Influence Iliopsoas impingement in THA? In-vivo 3D Modeling Study**  
Kwan Kyu Park, Tsung-Yuan Tsai, Dimitris Dimitriou, Harry E Rubash, Guoan Li, Young-Min Kwon

Poster No. 0873  
**Precision of Low Dose CT Localization of RSA Markers**  
Cyrus D Brodén, Henrik Olivecrona, Buster Sandgren, Gerald Q. Maguire Jr, Marilyn E. Noz, Michael P. Zeleznik, Lars Weidenhielm

Poster No. 0874  
**Validation of Three Dimensional Models of the Distal Femur Created from Surgical Navigation Data**  
Pia Bücher, David A Wilson, Carl Martin Grewe, Valentin Mocanu, Stefan Zachow, Carolyn Anglin, Michael Dunbar

Poster No. 0875  
**Morphometrical Measurement Of Resected Surface Of Anterior Femoral Condyle For Chinese Population**  
Chang-Hung Huang, Lin-I Hsu, Kun-Jhih Lin, Yung-Chang Lu, Wen-Haur Pu, Ting-Kuo Chang, Hung-Wen Wei

Poster No. 0876  
**The Effect of Unicondylar Knee Arthroplasty Alignment on Ligament Loads is Subject Specific**  
Mohammad Kia, Kevin Cassidy, Joseph Lipman, Geoffrey Westrich, Michael Cross, David J Mayman, Andrew D Pearle, Timothy Wright, Carl Imhauser

Poster No. 0877  
**A Lateraled Anterior Flange Improves Femoral Component Bone Coverage in Total Knee Arthroplasty**  
Shinya Kawahara, Ken Okazaki, Shigetoshi Okamoto, Umito Kuwashima, Koji Murakami, Yukihide Iwamoto, Scott A Banks

Poster No. 0878  
**Numerical Evaluation, Experimental Validation, and Model-Based Human Body Scaling of RF-Related Heating For Hip Replacement Devices Under 3-T MRI**  
Laura Scholl, Jianfeng Zheng, Mayur Thakore, Rob Ledger, Karen Ariemma, Margaret Klippel, Ji Chen

Poster No. 0879  
**The Distance From The Skin Surface To The Extramedullary Cutting Guide Is A Practical Useful Reference Guide For Tibial Slope In Total Knee Arthroplasty**  
Tadashi Tsukeoka, Yoshikazu Tsuneizumi, Tae-Hyun Lee

Poster No. 0880  
**PS1 HIP AND KNEE ARTHROPLASTY - IMPLANT WEAR**  

Poster No. 0881  
**Quantifying Material Loss in Dual Taper Hip Arthroplasty**  
Douglas Van Citters, Dylan Assael, John H Currier, Michael B Mayor, Stephen S. Tower

Poster No. 0882  
**Cell-Induced Corrosion on Titanium Alloys**  
Shiril Sivan, Kathleen G Pieri, Jeremy L Gilbert

Poster No. 0883  
**Corrosion of Modular Acetabular Liners**  
Harry Hothi, Kevin Ilo, Robert Whittaker, Antti Eskelinen, Jay Meswania, Shiraz Sabah, Johann Henckel, Gordon Blunn, John Skinner, Alister Hart

Poster No. 0884  
**Durability Of Ceramic Coatings On Metallic Implant Bearing Surfaces Characterized Via Quantitative Scratch Testing**  
Alex Stoller, Jeff Anderson

Poster No. 0885  
**The Degree of Periprosthetic Tissue Metallosis Does Not Correlate with the Degree of Tissue Necrosis**  
Patricia Campbell, Sean Borkowski, Edward Ebramzadeh, Scott D Nelson

Poster No. 0886  
**Assessment of Damage on a Dual Mobility Acetabular System**  
Chelsea Koch, Marcella Elpers, Christina Esposito, Geoffrey Westrich, Timothy Wright

Poster No. 0887  
**Metal Release in Ceramic and CoCr Heads at the Modular Junction: a Matched Cohort Retrieval Study**  
Sevi B Kocagöz, Richard Underwood, Daniel MacDonald, Jeremy L Gilbert, Clare M Rimnac, Steven M Kurtz

Poster No. 0888  
**Effect of Molybdate Ion on the Fretting Corrosion of a CoCrMo - Titanium Alloy Couple**  
Johnny Dufils, Dmitry Roykman, Mathew Mathew, Markus A Wimmer, Michel P Laurent

Poster No. 0889  
**In Vivo Metal Hypersensitivity is dependent on the NALP3 Inflammasome**  
Laurny Samelko, Marco Caicedo, Kyron McAllister, Joshua Jacobs, Nadim Hallab

Poster No. 0890  
**The Influence Of Patellofemoral Degenerative Changes On The Outcome Of The Unicompartmental Knee Replacement**  
Poster No. 0891

**Differences in Head Taper Corrosion between Two MOM-THR Designs from a Single Manufacturer using the Same Femoral Stem Design**
Harry Hotli, Robert Whittaker, Jay Meswania, Paul Bills, Liam Blunt, Radu Racasan, Gordon Blunn, John Skinner, Alistair Hart

Poster No. 0892

**Surface Cross-linked Ultra High Molecular Weight Polyethylene by Diffusion of Dicumyl Peroxide**
Sanem Kayandan, Brinda Doshi, Ebru Oral, Orhun Muratoglu

Poster No. 0893

**Wear of Crossed-Linked UHMWPE using Electromechanical and Pneumatic Hip Joint Simulators**
Murat Ali, Susan Partridge, Mazen Al-Hajjar, Sophie Williams, John Fisher, Louise M Jennings

Poster No. 0894

**Characterizing Large-scale Fretting-corrosion Damage At Modular Hip Junctions: A Parametric And Mechanistic Study**
Megha Patel, Dmitry Royhman, Maria Runa, Markus A Wimmer, Joshua Jacobs, Mathew Mathew, Nadim Hallab

Poster No. 0895

**Analysis Of The Interface Ti6Al4V/MG-63 Osteoblasts Under Different Applied Potentials: Simulating Hip Stem Environment**
Maria Runa, Eik-lang (Jenny) Lau, Luis Rocha, Tolou Shokuhfar, Mathew Mathew

Poster No. 0896

**Titanium Alloy Sleeves Do Not Prevent Fretting Corrosion in Modular THA**
Daniel W MacDonald, Galen Clarkin-Wright, Javad Parvizi, Gwo-Chin Lee, Gregg R Klein, Matthew Kraay, Clare M Rimnac, Jeremy L Gilbert, Steven M Kurtz

Poster No. 0897

**Vitamin E Grafted Highly Crosslinked Polyethylene Hip Acetabular Liners Exhibit Stable, Ultra Low Wear after 85 Million-Cycles of In Vitro Wear Testing**
Diego A Orozco Villasenor, Darcy Marshall, Alicia Rufner

Poster No. 0898

**Material Loss at the Head Taper Junction of Metal-on-Metal Pinnacle Total Hip Replacements**
Harry Hotli, Robert Whittaker, Jay Meswania, Reshid Berber, Antti Eskelinen, Gordon Blunn, John Skinner, Alistair Hart

Poster No. 0899

**Different levels of Rotational and Translational Surgical Mal-Positioning Affects the Occurrence and Severity of Edge Loading and Wear in Total Hip Replacements**
Mazen Al-Hajjar, Oscar O’Dwyer Lancaster-Jones, Sophie Williams, Louise M Jennings, Jonathan Thompson, Graham H Isaac, Eileen Ingham, John Fisher

Poster No. 0900

**Simulator Kinematic Inputs and Experimental Setup Influence the Wear of Knee Replacements**
Claire L Brockett, Abdellatif Abdelgaiied, Tony Haythornthwaite, Cath Hardaker, John Fisher, Louise M Jennings

Poster No. 0901

**Anatomical and Ultrastructural Aspects of Well-functioning Retrieved Total Knee Arthroplasty Specimens**
Erik L. Woodard, Casey T Hebert, Robert Skinner III, William Michael Mihalko

Poster No. 0902

**Evaluation of Electrochemically Treated Proteinaceous Film Formation on CoCrMo Alloy for Hip Prostheses**
Shelley Kerwell, David Baer, Elizabeth Martin, Markus A Wimmer, Kenneth Shull, Mathew Mathew

Poster No. 0903

**Performance of BioLox Delta Ceramic Bearings with Titanium Adapter Sleeves in Revision Hip Arthroplasty: A Retrieval Analysis**
Mark Figgie Jr., Marcella Elpers, Douglas Padgett

Poster No. 0904

**Development of a Clinically Grounded Protocol for Creating Standardized Femoral Head Damage for Use in Hip Simulator Wear Testing**

Poster No. 0905

**The Influence of Stem Taper Re-Use and Head/STEM Taper Mismatch on the Failure Load of Ceramic Heads**
Julian Göhrs, Florian Witt, Annika Krull, Mandy Körner, Michael M Morlock

Poster No. 0906

**Mechanistic Transitions in Fretting-corrosion Behavior of Various Metal Couples in Hip Implant Modular Junctions**
Dmitry Royhman, Megha Patel, Maria Runa, Robin Pourzal, Markus A Wimmer, Nadim Hallab, Joshua Jacobs, Mathew Mathew

Poster No. 0907

**Estimation of In Vivo Positioning of Femoral Head Dislocation Retrievals for Case-Specific Retrieval Wear Simulations**

Poster No. 0908

**Sequentially Irradiated And Annealed Polyethylene: Analysis Of 11 Years Of Wear Simulation Results**
LaQuawn Loving, Lizeth Herrera, Aaron Essner

Poster No. 0909

**Dynamic Mechanical Properties And Cyclic Creep Response Of Swine Cartilage In Comparison To Pva Hydrogels**
Orkun Kaymakci, Hatice Bodugoz-Senturk, David Bichara, Amy Moreira, Orhun Muratoglu
Poster No. 0910
Wear Rates Of Highly Cross-linked Versus Conventional Polyethylene Within The Same Knee Design: Retrieval Study Of 3 Implant Series
John H Currier, Xiaotian Wu, Daniel Santana, Joseph Cook, Barbara H. Currier, Douglas Van Citters

Poster No. 0911
What is the Impact of Manufacturer Component Mixing and Matching on Taper Material Loss in Total Hip Replacements?
Robert K Whittaker, Harry Hothi, Jay Meswania, Kevin Ilo, Shiraz Sabah, Johann Henkel, Gordon Blunn, John Skinner, Alister Hart

Poster No. 0912
The Use of Noninvasive Endothelial Dysfunction Test for Prediction of Deep Vein Thrombosis after Total Hip Arthroplasty
Kentaro Shinohara, Naoto Mitsugi, Naoya Taki, Masato Aratake, Hirohiotto Hita, Hiroyuki Suzuki, Kazuo Kimura, Tomoyuki Saito

Poster No. 0913
Short Stems Promote Positive Bone Remodeling; A DEXA And FEA Study
Ahmed Ercan, Alison Traynor, David Simpson, Jorg Jerosch

Poster No. 0914
Percutaneous Cryoneurolysis Nerve Block for Total Knee Arthroplasty to Reduce Postoperative Pain and Improve Patient Outcomes
Ryan Bliss, Gabe Lensing, Miles Parsons, Justin Harris, Vinod Dasa

Poster No. 0915
Cited Causes of TKR Failure in the United States and the Associated Financial Burden
Nicholas C Marais, Eric M. Lucas, Taylor Gambon, John D DesJardins

Poster No. 0916
Differences Between Observed and Patient-Reported Functional Status Following Primary Total Joint Arthroplasty
Robin M Queen, A Jordan Grier, Robert J Butler, Samuel S Wellman, Michael P Bolognesi, David E Attarian

Poster No. 0917
Short-Term Complications and Revision following Unicondylar Knee Arthroplasty
Kevin L Ong, Edmund Lau, Steven Kurtz, Erik Hansen, Jess Lonner

Poster No. 0918
5 Year Outcome of Randomised Trial Comparing Large Metal-metal to Standard Polyethylene Bearings In Hip Replacement
Richard J Holleyman, Jayasree Ramaskandhan, Michelle Bardgett, Russell Bowmann, Jim P Holland

Poster No. 0919
Does Component Alignment Affect Gait Symmetry in Unilateral Total Hip Arthroplasty Patients?
Tsung-Yuan Tsai, Dimitris Dimitriou, Jing-Sheng Li, Kwang-Woo Nam, Guoan Li, Young-Min Kwon

Poster No. 0920
Eliminating Blood Transfusion in Primary Total Hip and Knee Arthroplasty: An Achievable Goal?
Joshua Holt, Benjamin Miller, John Callaghan, Charles Clark, Melissa Willenborg, Nicolas Noiseux

Poster No. 0921
Mid-term Radiological Results Of Rotational Acetabular Osteotomy In 93 Hips With More Than 5 Years’ Follow-up
Masamitsu Tomioka, Yutaka Inaba, Naomi Kobayashi, Hiroyuki Ike, Tomoyuki Saito

Poster No. 0922
Does Unicompartmental Knee Arthroplasty Component Alignment Affect In Vivo Articular Contact at Standing Position?
Tsung-Yuan Tsai, Andrew A Freiberg, Guoan Li, Young-Min Kwon

Poster No. 0923
Positional And Chronological Change In Pelvic Tilt 5 Years After Total Hip Arthroplasty ~ A Three-dimensional Analysis
Haruka Suzuki, Yutaka Inaba, Naomi Kobayashi, Yohei Yukizawa, Takashi Ishida, Hiroyuki Ike, Masamitsu Tomioka, Tomoyuki Saito

Poster No. 0924
Intraoperative Lateral Gapping Associated with Improved Subjective Pain and Function Scores 2-5 Years after TKA
Cale Jacobs, Christian Christensen

Poster No. 0925
The Implications of Surgical Approach on the Location of Moderate and Severe Adverse Local Tissue Reactions Following Metal-on-Metal Hip Arthroplasty
Rami Madanat, Daniel K Hussey, Gabrielle S Donahue, Charles Bragdon, Orhun Muratoglu, Henrik Malchau

Poster No. 0926
Navigated Femur First Total Hip Arthroplasty leads to improved Biomechanical Outcome after surgery
Tim A Weber, Sebastian Dendorfer, Sjoerd K. Bulstra, Joachim Grifka, Gijsbertus J. Verkerke, Tobias Renkawitz

Poster No. 0927
Cementless Hip Arthroplasty In The Very Elderly: Does Stem Design Matter? A Radiological Study Of 607 Cases
Tim Boymans, Rachel Senden, Martijn Schotanus, Ide Heyligers, Bernd Grimm

Poster No. 0928
Multi-Component Rehabilitation Following Total Hip Arthroplasty: A Randomized Controlled Trial
Douglas A Dennis, Dana L Judd, Joshua Winter, Todd M Miner, Michael R. Dayton, Jennifer E. Stevens-Lapsley, Jason M Jennings, Bradley Davidson
PS1 HIP AND KNEE ARTHROPLASTY - POLYETHYLENE AND BIOMATERIALS

Poster No. 0940

Oxidation Mechanisms in Highly Cross-linked and Conventional Gamma-inert Sterilized UHMWPE Tibial Inserts
Barbara H Currier, John H Currier, Steven Reinitz, Douglas Van Citters

Poster No. 0941

White Band as an Indicator for Polyethylene Oxidation - Fact or Artifact
Jacob Blitz, Kim-Phuong Le, Carlos Aponte, Vorawut Ammatathongchai, Lin Song

Poster No. 0942

In Vivo Oxidation in Remelted Highly Cross-linked Bearings: A Clinical Concern?
Steven D Reinitz, Barbara H Currier, Rayna A Levine, John P Collier, Douglas W Van Citters

Poster No. 0943

Variation of Oxidation with Irradiation Dose and Source in Highly Crosslinked Remelted UHMWPE
Mitchell Fung, Rayna A Levine, Barbara H Currier, Steven D Reinitz, Douglas W Van Citters

Poster No. 0944

Surface Topography and Damage Grading of Modern Total Hip Arthroplasty Modular Head-Neck Junctions
Nguyen Q Ha, Robin Pourzal, Deborah J. Hall, Robert M Urban, Brett R. Levine, Hannah J Lundberg

Poster No. 0945

Peak Stress Dictates Fatigue Crack Growth in a Hindered Phenol Antioxidant UHMWPE
Krista Parran, Venkat Narayan, Clare M Rimnac

Poster No. 0946

Effect Of Impact Assembly On The Interface Deformation And Fretting Corrosion Of Modular Hip Tapers: An In Vitro Study
Anna Panagiotidou, Timothy E Cobb, Jay Meswania, John Skinner, Alister Hart, Fares Haddad, Gordon Blunn

Poster No. 0947

Notch Fatigue of Untreated and Crosslinked UHMWPE: A Linear Elastic Fracture Mechanics Approach
Farzana Ansari, Michael Ries, Lisa Pruitt

Poster No. 0948

Short Term and Long Term Chemical Effects of Micro-CT on UHMWPE
Steven D Reinitz, Megan N Mishra, Rayna A Levine, Barbara H Currier, Douglas W Van Citters

Poster No. 0949

Squeaking And Microcracks In A Delta-delta Ceramic Coupling: Pin-on-disc Study
Kiyokazu Fukui, Ayumi Kaneuji, Tadami Matsumoto, Kazuhiro Shintani
Poster No. 0950
Reasons for Revision, Surface Damage, and In Vivo Oxidation for Retrieved Sequentially Annealed HXLPE in Total Knee Arthroplasty
Daniel MacDonald, Michael A Mont, William Hozack, Peter Sharkey, Arthur Malkani, Steven Kurtz

Poster No. 0951
Fretting Corrosion of Silicon Nitride against Cobalt Chromium and Titanium Medical Alloys
Maria Pettersson, Abimbola Oladokun, Michael Bryant, Håkan Engqvist, Cecilia Persson, Anne Neville

Poster No. 0952
NF-KB Decoy Oligodeoxynucleotide Increases Bone Mineral Density in the Murine Femur during Continuous Infusion of Polyethylene Particles
Tzu-hua Lin, Taishi Sato, Jukka Pajarinen, Changchun Fan, Florence Loi, Ruth Zhang, Zhenyu Yao, Kensuke Egashira, Stuart B Goodman

PS1 HIP AND KNEE ARTHROPLASTY - POSTER SESSION 1

Poster No. 0953
Is There In-vivo Oxidation In Crosslinked UHMWPE?
Celia E Macias Gupta, Michelle A Ross, David B Warner, Venkat S Narayan

Poster No. 0954
Withdrawn

Poster No. 0955
Development of a Subject Specific Total Knee Replacement Contact Model using Finite Element Analysis and Marker-Based Gait Analysis
Steven P Mell, Markus A Wimmer, Hannah J Lundberg

Poster No. 0956
Finite Element Analysis of the Deformation Behavior and Fixation Stability of Newly Monolithic Ceramic Cups
Christian Schulze, Rainer Bader

Poster No. 0957
Cup Stability of Decreased Radius Metal on Metal Acetabular Cups: a Finite Element Analysis
Mark Gonzalez, Farid Amirouche, Giovanni F Solitro

Poster No. 0958
Contact Force Changes After Surgical Balancing Corrections In TKR
Patrick A Meere, Tom Y.T. Lin, Christopher Bell, Svenja Schneider, Peter S Walker

Poster No. 0959
Active Shape Modelling Accurately Characterizes Knee Cartilage Geometry in the Design of CT-based Patient-Specific Cutting Guides for Knee Arthroplasty
Richard P Courtis, Luke Aram, Corey Stauffer, Graham Vincent, Adam J Cyr, Michael Bowes, Lorin P Maletsky

Poster No. 0960
Surgeon Accuracy in Utilizing Anatomic Landmarks for Femoral Component Positioning in TKA
Philip C Noble, Fadi Saied, Rikin Patel, Sabir Ismaily, Melvyn A. Harrington, Glenn Landon, Brian Parsley

Poster No. 0961
Does Robot-Assisted Total Hip Arthroplasty Better Restore Native Hip Antversion?
Tsung-Yuan Tsai, Dimitris Dimitriou, Harry E Rubash, Guoan Li, Young-Min Kwon

Poster No. 0962
Assessment Of Accuracy In Acetabular Cup Placement Using A Smartphone -cadaveric Study
With Image Free Navigation System
Kenji Kurosaka, Shigeo Fukunishi, Shoji Nishio, Tomokazu Fukui, Yuki Fujihara, Shinichi Yoshiya

PS1 HIP AND KNEE ARTHROPLASTY - POSTER SESSION 2

Poster No. 0963
ORS Best Hip Poster
Modularity of Metal-on-Metal Hip Implants Increases Cobalt:Chromium Ratio
Kevin Ilo, Karim Aboelmagd, Harry Hothi, Robert Whittaker, Asaad Asaad, Gordon Blunn, John Skinner, Alister Hart

Poster No. 0964
Utility of Metal Ion Level in Patients with Corrosion of Dual Taper Modular THA: Sensitivity and Specificity for Predicting “Pseudotumours”
Young-Min Kwon, Tsung-Yuan Tsai, William Leone, Guoan Li, Andrew A Freiberg, Harry E Rubash

Poster No. 0965
The Infrapatellar Fat Pad Is A Key Focal Point For The Development Of Arthrofibrosis Following Total Knee Arthroplasty
Nicole G Abdul, David Dixon, Andrew Walker, David Weir, Nigel Brewster, David Deehan, Derek Mann, Lee Borthwick

Poster No. 0966
Macrophage Cytokine Release in Response to Gelsolin in the Presence of Titanium Particles
Charlie Xie, Paramjeet Cheema, Richard Smith, William M Mihalko

Poster No. 0967
Validating a Simplified Method for Assessing THA Taper Corrosion Susceptibility with a 15 year Retrieval Database
Patrick Aldinger, Bob Jones, Jacob L Cartner

Poster No. 0968
Automated Segmentation of Hip Abductor Muscles in Patients with Hip Arthroplasty to Aid Surgical Planning
Christian Klemt, Marc Modat, Johann Henckel, Manuel Jorge Cardoso, Alister Hart, Sebastien Ourselin
Poster No. 0969

**Biological Response to Highly Cross-linked and Vitamin E-doped Polyethylene - A Wear Particle-induced Osteolysis Animal Study**
Yung-Chang Lu, Chang-Hung Huang, Ting-Kuo Chang, Su-Ting Yeh, Yi-Ling Hsiao, Hsu-Wei Fang, Wen-Haur Pu, Chun-Hsiung Huang

PS1 HIP AND KNEE ARTHROPLASTY - IMPLANT FIXATION

Poster No. 0970

**Post-implantation Intermittent PTH Enhances Cancellous Osseointegration in a Physiologically-Loaded Murine Tibial Implant**
Xu Yang, Aleksey Dvorzhinskiy, Benjamin F. Ricciardi, Caroline Brial, Joseph Choi, Adam L. Johnson, Suhail Khokhar, Robert Chojnowski, F. Patrick Ross, Marjolein C.H. van der Meulen, Mathias P.G. Bostrom

Poster No. 0971

**Using 18f-fluoride Pet/ct-scans To Assess Longitudinal Bone Metabolism Activity Around Two Different Acetabular Components After Total Hip Arthroplasty**
Marloes Peters, Boudewijn Brans, Emiel Beijer, Roel Wierts, Rene ten Broeke, Chris Arts

Poster No. 0972

**Modification of Ti6Al4V Substrates with Well-defined Zwitterionic Polymer Brushes for Improved Surface Mineralization**
Pingsheng Liu, David C Ayers, Jie Song

Poster No. 0973

**Design Of A Novel Functional Hip Prosthesis Created Through Additive Manufacturing For Use In A Rodent Model Of Osseointegration**
Adam DM Paish, Hristo N Nikolov, Ian D Welch, David W Holdsworth

Poster No. 0974

**The Role Of Third-body Wear In Metal-on-polyethylene Thr On Tribo-corrosion Of The Head-neck Junction**
Philip C Noble, Xavier Pereira, Jerry Alexander, Sabir Ismaily, Ryan Kim

Poster No. 0975

**Comparison of Cruciate Retaining and Substituting Designs for Uncemented Application**
Michael T Lowry, Heather Rosenbaum, Peter S Walker

Poster No. 0976

**Constraint Evaluation of Constrained Posterior Stabilized and Constrained Condylar Knee Articular Surfaces During Gait**
James Wernle

Poster No. 0977

**What Implant Factors Affect Bone Ingrowth in Retrieved Porous Tantalum Hip Implants?**
Jos A Hanzlik, Judd Day, Gregg R Klein, Harlan M Levine, Mark A Hartzband, Javad Parvizi, Matthew Kraay, Clare M Rimnac, Steven M Kurtz

Poster No. 0978

**Bone Attachment in a Series of Explanted Cementless Monobloc Cups**
Michael S Kung, John Scudiero, Edward Ebrahimzadeh, Patricia Campbell

Poster No. 0979

**Torsional Strength and Tribocorrosion of Modular Hip Replacement Tapers**
Lauren Kark, Melissa Knothe Tate, Anne Simmons

Poster No. 0980

**Broaching of the Proximal Femur in Preparation for a Femoral Hip Prosthesis: Congruency between Broach and Resulting Cavity**
Dan Huff, Alex Maile, Niklas B Damm, Nicholas E Bishop, Michael Morlock

PS1 SHOULDER AND ELBOW - COMPUTATIONAL MODELING

Poster No. 0981

**The Contributions of Muscle Activity Imbalance and Impaired Muscle Growth to Postural and Osseous Shoulder Deformity following Brachial Plexus Birth Palsy: A Computational Simulation Analysis**
Wei Cheng, Roger Cornwell, Dustin L Crouch, Katherine R Saul

Poster No. 0982

**Finite Element Analysis of Effects of Surgical Variations on Joint Stability and Contact Pressures in Total Shoulder Arthroplasty with Severe Glenoid Retroversion**
William Conaway, H. Mike Kim, Hwa Bok Wee, Gregory S Lewis

Poster No. 0983

**Evaluation Of Humeral Head Cartilage Using Mri T1rho Mapping In Patients With Rotator Cuff Tears**
Hidehiko Yuge, Takamitsu Okada, Takuaki Yamamoto, Ken Okazaki, Yukihide Iwamoto

Poster No. 0984

**Tight Medial-Knot Tying May Increase the Risk of Re-tearing after Transosseous Equivalent Repair of Rotator Cuff Tendon**
Hirotaka Sano, Masako Tokunaga, Moriyuki Naguchi, Takashi Inawashiro, Taichi Irie, Hiroo Abe

Poster No. 0985

**The Effect Of The Humeral Tray Component Positioning for Onlay Reverse Shoulder Arthroplasty Designs**
Julien Berhouet, Lawrence Gulotta, Daniel Choi, Andreas Kontaxis

Poster No. 0986

**Reverse Total Shoulder Arthroplasty Can Significantly Change the Shoulder Center of Rotation**
David R Walker, Aimee Struk, Thomas Wright, Scott A Banks

Poster No. 0987

**The Effect of Shoulder Humeral Component Length on Bone Stresses: A Finite Element (FE) Analysis**
Najmeh Razfar, Jacob M Reeves, Dan Langohr, Ryan Willing, George S Athwal, James A Johnson
PS1 SHOULDER AND ELBOW - ARTHROPLASTY

Poster No. 0988
**The Effect Of Prosthetic Radial Head Geometry On Radiocapitellar Joint Contact Area And Pressure**
Daniel R. Bachman, Sutee Thaveepunsan, Sangeun Park, James S. Fitzsimmons, Kai-Nan An, Shawn W. O’Driscoll

Poster No. 0989
**Elbow Reaction Loads in a Sit-to-Stand Activity are Quite High and are Unaffected by Total Elbow Arthroplasty**
Daniel Choi, Mark Figgie, Joseph Lipman, Sherry Backus, Darrick Lo, Robert Hotchkiss, Timothy Wright

Poster No. 0990
**X-ray Based Quantification Of Implant Placement In Shoulder Arthroplasty**
Jeff Bischoff, Lara Vigneron, Danielle Beski

Poster No. 0991
**Analysis of Severely Fractured Glenoid Components: Clinical Consequences of Radiation Sterilization and Crosslinking in UHMWPE**
Farzana Ansari, Louis G. Malito, Taylor A. Lee, Stephen B. Gunther, Tom R. Norris, Michael Ries, Lisa Pruitt

Poster No. 0992
**Effects of Deltoid Lengthening on Functional Outcomes Following Reverse Shoulder Arthroplasty**
Vani Sabesan, Daniel J. Lombardo, Danya Josserand, Andrew Schrottenboer, J. Michael Wiater

Poster No. 0993
**Mechanical and Wear Characterization of Polycarbonate Urethane as a Viable Option for Total Shoulder Replacements**
Hannah Gramling, Amrita Srinivasan, Lisa Pruitt

Poster No. 0994
**Mechanically Assisted Crevice Corrosion Damage in Total Shoulder Arthroplasty is Comparable to Total Hip Arthroplasty**
Judd Day, Daniel MacDonald, Joseph Abboud, Gerald R. Williams, Clare M. Rimnac, Matthew Kraay, Reagan McCloskey, Steven M. Kurtz

Poster No. 0995
**Biomechanical Benefits of Anterior Offsetting of Humeral Head Component in Posteriorly Unstable Total Shoulder Arthroplasty: A Cadaveric Study**
Gregory S. Lewis, Alexander Chacon, Seth Andrews, Evan Roush, William Conaway, Edward Cho, H. Mike Kim

Poster No. 0996
**Migration of Stemless and Stemmed Humeral Components in Total Shoulder Arthroplasty - A Cadaveric Study**
Stephen Swope, Shouchen Dun, David Warlop

Poster No. 0997
**The Influence of Reverse Shoulder Arthroplasty Implant Variables on Muscle Activation and Joint Load**
Joshua William Giles, Dan Langohr, James A. Johnson, George Athwal

PS1 SHOULDER AND ELBOW - KINEMATICS AND MECHANICS

Poster No. 0998
**Effect of Arthroscopic Stabilization on In-Vivo Glenohumeral Joint Motion and Clinical Outcomes in Patients with Anterior Instability**
Cathryn Peltz, Tim Baumer, Renato Familara, Nima Mehran, Vasilios Moutzouros, Michael Bey

Poster No. 0999
**Relationship Between Throwing Plane And Shoulder Posture During The Early Cocking Phase In Baseball Pitching**
Yohei Takagi, Hiroshi Tanaka, Takenori Oi, Hiroaki Inui, Juichi Tanaka, Katsuya Nobuhara, Shinichi Yoshihiko

Poster No. 1000
**Effects Of Exercise Therapy For Treatment Of Symptomatic Full-thickness Tears Of The Supraspinatus Tendon On In Vivo Glenohumeral Kinematics**
R. Matthew Miller, Adam Popchak, Dharmesh Vyas, Scott Tashman, James J. Irrgang, Volker Musahl, Richard E. Debski

Poster No. 1001
**The Relationship between Critical Shoulder Angle and In-Vivo Glenohumeral Joint Motion in Healthy and Pathologic Shoulders**
Cathryn Peltz, Anne Drake, Vasilios Moutzouros, Michael Bey

Poster No. 1002
**Three-dimensional Kinematic Analysis Of The Throwing Motion Focusing On Trunk Bending, Pelvic Rotation, And Horizontal Abduction Of The Shoulder**
Takenori Oi, Yohei Takagi, Hiroshi Tanaka, Hiroaki Inui, Katsuya Nobuhara, Shinichi Yoshihiko

Poster No. 1003
**Relationship between Humeral Torsion and Career of Pitcher in Elementary and Junior-high Schools**
Yasuo Itami, Teruhisa Mihata, Masashi Neo

Poster No. 1004
**Study of Wrist Extensor-Flexor Torque Ratio in Isokinetic Contractions and Architecture Change of Common Extensor Tendon in the Lateral Elbow Tendinopathy**
Su-Ya Lee, Yi-Hsien Liu, Chien-Ju Lin, Hsiao-Feng Chieh, Li-Chieh Kuo, Fong-Chin Su

Poster No. 1005
**Effect of Radial Tuberosity Preservation on Supination and Flexion Strength following a Distal Biceps Repair**
Brandon T. Brown, Michael N. Nakashian, Benjamin Williams, James Rubright, Pat Schimoler, Daniel Schmidt, Andrew Pic, Patrick Smolinski, Christopher C. Schmidt, Mark Carl Miller

Poster No. 1006
**The Effect of Physical Therapy on Glenohumeral Joint Motion, Strength, and Clinical Outcome in Patients with Rotator Cuff Tears**
Tim Baumer, Cathryn Peltz, Veronica Mende, Vasilios Moutzouros, Michael Bey
Poster No. 1007  
**Effect of Scapular Dyskinesis on Supraspinatus Tendon Healing in a Rat Model**  

Poster No. 1008  
**Defining Loading and Moments on Joint with Crutch Ambulation: A Biomechanical Study**  
Ali Alhandi, Sarah Pastoriza, Francesco Travascio, Moataz Eltoukhy, Loren Latta, Shihab Asfour, Gregory Gregory

Poster No. 1009  
**Articular Contact Pressures During Prosthetic Radial Head Subluxation**  
Dipit C. Sahu, James S. Fitzsimmons, Andrew R. Thoreson, Daniel R. Bachman, Kai-Nan An, Shawn W O’Driscoll

Poster No. 1010  
**Re-attachment Site Anatomy and Supinator Muscle Fatty Infiltration Predict Supination Strength Following Distal Biceps Repair**  
Brandon T Brown, Carmen R Latona, Michael Nakashian, Rafal Z Stachowicz, Christopher C Schmidt, Mark Carl Miller

Poster No. 1011  
**Optimizing Deltoid Efficiency with Reverse Shoulder Arthroplasty Using a Novel Glenosphere Geometry**  
Christopher Patterson Roche, Matt Hamilton, Phong Diep, Thomas Wright, Pierre Henri Flurin, Joseph Zuckerman, Howard Routman

Poster No. 1012  
**A Biomechanical Analysis On The Effect Of Glenohumeral Abduction On Supraspinatus Repair Tension And Clinical Outcomes Of Abduction Pillow Usage On Cuff Integrity Following Arthroscopic Rotator Cuff Repair**  
Jacqueline R Hawthorne, Elise M Carpenter, Patrick H Lam, George AC Murrell

PS1 SHOULDER AND ELBOW - DISEASE PROCESS

Poster No. 1013  
**ORS Best Shoulder and Elbow Poster Are The Brains Of Patients With Complex Shoulder Instability Wired Differently?**  
Anthony Howard, Joanne Powell, David Hawkes, Alison Kinghorn, Jo Gibson, Omid Alizadehkhaiyat, Graham Kemp, Simon Frostick

Poster No. 1014  
**Regulation of Rotator Cuff Tear Regeneration by P38 MAPK Signaling**  
Jeffrey M Wilde, Jeremy A Grekin, Stuart M Roche, Jonathan Gumucio, Max E Davis, Asheesh Bedi, Christopher L Mendias

Poster No. 1015  
**Influence of Bone Loss on Stability of Base Plate Components in Reverse Shoulder Arthroplasty**  
Charles Penninger, Jeffrey Bischoff, Mehul A Dharia

Poster No. 1016  
**Effect of Tamoxifen on Fatty Degeneration of Rotator Cuff Muscles In Chronic Rotator Cuff Tear: An Animal Model Study**  
Edward Cho, Yue Zhang, Charles Lang, Anne Pruznak, Henry J Donahue, H. Mike Kim

Poster No. 1017  
**Primary Versus Revision Arthroscopic Rotator Cuff Repair – An Analysis In 350 Consecutive Patients**  
Aminudin Shamsudin, Karin Peters, Imants Rubenis, Patrick H Lam, George AC Murrell

Poster No. 1018  
**The Effect of Concomitant Glenohumeral Joint Capsule Release During Rotator Cuff Repair: A Comparative Study of 195 Arthroscopic Rotator Cuff Repairs**  
Jordan McGrath, Patrick H Lam, Martin TS Tan, George AC Murrell

Poster No. 1019  
**Collagen Scaffolds are a Safe Intra-articular Drug Delivery Vehicle in a Novel Rabbit Model of Arthrofibrosis**  
Justin A Walker, Timothy Ewald, Mark Morrey, Matthew Philip Abdel, Bernard Morrey, Joaquin Sanchez-Sotelo

Poster No. 1020  
**The Secreted Aggrecanases From Synovium In Rotator Cuff Tear Participate In Progression Of Cartilage Degradation In The Shoulder Joint**  
Takahiro Iino, Masaya Tsujii, Toru Wakabayashi, Naoki Kokubu, Hirokazu Yokoyama, Takuya Nakanishi, Masahiro Hasegawa, Akihiro Sudo

Poster No. 1021  
**Is the Neural Control Different in Complex Shoulder Instability Patients?**  
Anthony Howard, Joanne Powell, David Hawkes, Omid Alizadehkhaiyat, Jo Gibson, Graham Kemp, Simon Frostick

PS1 HAND AND WRIST - INFECTION AND TRUMA

Poster No. 1022  
**Are the New Generation of Dorsal Plates still a Greater Risk than Volar Fixed Angle Plating? Results of a Meta-Analysis**  
Mitchell S Fourman, Deidre L Bielicka, Robert J Goitz, John R Fowler

Poster No. 1023  
**Predictive Factors of Neurovascular and Tendon Injuries Following Dog Bites to the Upper Extremity**  
Ram K Alluri, William Pannell, Nathanael Heckmann, Michael Bauschard, Alidad Ghiassi

Poster No. 1024  
**Capitate-based Angles Can Better Characterize Carpometacarpal Fracture and Dislocation**  
Kaicheng Wu, Vishnu Potini, Virak Tan, Kang Li
PS1 HAND AND WRIST - MECHANICS

Poster No. 1025
Role of the Interosseous Membrane in Preventing Radial Head Displacement during Forearm Rotation
Frederick W Werner, Ashley Anderson, Brian J Harley

Poster No. 1026
In Vivo Thumb Carpometacarpal (CMC) Motion is Highly-Complex, with Coupled Rotations and Translations
Joseph J. Crisco, Eni Hallilaj, Tarpit Patel, Douglas Moore, Amy L Ladd, Arnold-Peter C Weiss

Poster No. 1027
A Biomechanical Comparison Of The Thumb-tip Trajectory With/Without Trapeziometacarpal Joint Fusion: A Cadaveric Study
Yusuke Kawano, Toshiyasu Nakamura, Mitsunori Tada, Yusaku Kamata, Shinjiro Sueda, Dinesh Pai, Takeo Nagura, Yoshiaki Toyama

Poster No. 1028
Compressive Loading across the Wrist Changes the Morphology and Position of the Carpal Arch and Median Nerve
Tamara L Marquardt, Joseph N. Gabra, Zong-Ming Li

Poster No. 1029
High Resolution Motion Analysis for Identification of Primary Trapeziometacarpal Joint Stabilizers During Grip Motion
Christina Salas, Deana Mercer

PS1 HAND AND WRIST - SOFT TISSUE AND NERVE

Poster No. 1030
MicroRNA Profiles Of Diseased Dupuytren’S Fascia Reveal Increased Extracellular Matrix Synthesis Via Downregulation Of Collagen Targeting MicroRNAs
Scott Riester, Emily Camilleri, Amel Dudakovic, Diren Arsoy, Eric Lewallen, Andre van Wijnen, Sanjeev Kakar

Poster No. 1031
Involvement Of Bmp7/smads Signale In De-differentiated Schwann Cells During Peripheral Nerve Regeneration After Injury
Naoki Kokubu, Masaya Tsujii, Takahiro Iino, Hirokazu Yokoyama, Akihiro Sudo

Poster No. 1032
Bridging A 20mm Rat Sciatic Nerve Gap Using An Undifferentiated Bone Marrow-derived Mesenchymal Stem Cell-laden Conduit Containing Vessels And Decellularized Allogenic Basal Lamina
Yukitoshi Kaizawa, Ryosuke Kinokiti, Ryosuke Ikeguchi, Souichir Ohita, Takashi Noguchi, Hiroki Oda, Shuichi Matsuda

Poster No. 1033
Unique Genetic Signature and Therapeutic Targets for Diabetic Carpal Tunnel Patients
Anne Gingery, Tai-Hua Yang, Sandra Passe, Kai-Nan An, Chunfeng Zhao, Peter C. Amadio

PS1 FOOT AND ANKLE - ADULT

Poster No. 1034
Model-Based Validation of a Graphics Processing Unit Algorithm to Track Foot Bone Kinematics Using Fluoroscopy
Matthew Kindig, Grant Marchelli, Joseph M Iaquinto, Duane Storti, David Haynor, Bruce J Sangeorzan, William R Ledoux

Poster No. 1035
The Effect of Normal Aging on the Biomechanical Properties of Rat Achilles Tendons
Emily C Vafek, Eric Friedman, Aaron T Scott, Sandeep Mannava, Kerry A Danelson

Poster No. 1036
Regeneration of Foot Fat Pad with Autologous Adipose Tissue Derived Mesenchymal Stem Cells
Zijun Zhang, Reed Mitchell, Jeremy Molligan, Lew Schon

Poster No. 1037
Biomechanical Evaluation of Mini-Open and Percutaneous Achilles Repair Techniques During Simulated Early Progressive Rehabilitation
Thomas O Clanton, C Thomas Haytmanek, Brady T Williams, David M Civitarese, Travis L Turnbull, Robert F LaPrade, Coen A Wijdicks

PS1 FOOT AND ANKLE - INFECTION AND TRAUMA

Poster No. 1038
Characterization of Syndesmotic Behavior During External Rotation Stress Test
Joshua T Bunch, Benjamin D. Westerhaus, Evan C Glidewell, Terence E McIff, Michael B Tilley

Poster No. 1039
Impact of Clamp Placement on Reduction of the Ankle Syndesmosis
Joshua T Bunch, Benjamin D Westerhaus, Evan C Glidewell, Terence E McIff, Michael B Tilley

PS1 FOOT AND ANKLE - MECHANICS

Poster No. 1040
Influence of Patient and Surgical Variability on Loading Across a Cuneiform Osteotomy
Mehul A Dharia, Jeffrey Bischoff, James Woodburn, Scott Tefler, Amir Al-Munajjed

Poster No. 1041
Cyclic Loading of Achilles Tendon Repairs Through Forces Simulating Early Functional Rehabilitation
Heather E. Gotho, Jack Anavian, Todd A Fellars, Sarath C. Koruprolu, Ryan R. Rich, Christopher W DiGiovanni

Poster No. 1042
Injuries Observed in a Prospective Transition from Traditional to Minimalist Footwear: A Protective Effect of High Impact Transient Forces?
Matthew J Salzler, Hollie J Kirwan, Donna M Scarborough, James T Walker, Anthony J Guarino, Eric Berkson
Poster No. 1043
Can Fixation Methods for First MTP Joint Arthrodesis Allow Full Weight-bearing?
Bradley C Campbell, Stephen F Conti, Mark Carl Miller, Adam Mandel, Sudhir C Belagaje, Pat Schimoler

PS1 INFECTION
Poster No. 1044
Elucidating The Natural History Of Staphylococcus aureus Biofilm Formation And Maturation During The Establishment Of Chronic Implant-associated Osteomyelitis In A Quantitative Murine Model

Poster No. 1045
CERAMENT Bone Void Filler Impregnated with Gentamicin Increases Bone Formation and Decreases the Rate of Detectable Infection After Debridement in a Rat Model of Osteomyelitis
Aleksey Dvorzhinskiy, Giorgio Perino, Robert Chojnowski, Marjolein C.H. van der Meulen, F. Patrick Ross, Mathias P.G. Bostrom, Xu Yang

Poster No. 1046
Altering Polymerization Temperature of Antibiotic-Laden Cement Can Increase Porosity and Subsequent Antibiotic Elution
Jeffrey Sundblad, Jeffrey C. Flynn, Christopher Bergum, Nancy Jackson, David C. Markel

Poster No. 1047
A Novel Murine Model of Established Staphylococcal Bone Infection in the Presence of a Fracture Fixation Plate to Study Therapies Utilizing Antibiotic-laden Spacers After Revision Surgery
Jason A Inzana, Edward M. Schwarz, Stephen L Kates, Hani A. Awad

Poster No. 1048
IL-12 Enhances Bacterial Killing Efficacy of Macrophages against Intracellular Bacteria
Bingyun Li, Therwa Hamza

Poster No. 1049
Electrical Stimulation as an Adjunct to Antibiotic Treatment During Periprosthetic Joint Infection

Poster No. 1050
Cytokine levels following surgical sepsis: Association with Tumor Necrosis Factor Gene Polymorphisms
Rajeshwar N Srivastava, Kavita Baghel, Abhijit Chandra, Jyotsna Agrawal, Aditya Bhusan Pant, Saloni Raj

Poster No. 1051
Dual Rifampin and Vancomycin Delivery from 3D Printed Calcium Phosphate Scaffolds Improves Outcomes of Implant-associated Osteomyelitis
Jason A. Inzana, Ryan P. Trombetta, Edward M. Schwarz, Stephen L Kates, Hani A. Awad

Poster No. 1052
A Persister Population of Biofilm Remains on the Surface of TKA Materials after Extended Antibiotic Treatment
Kenneth Urish, Peter Demuth, Brian Kwan, Hani Haider, David Craft, Thomas Wood, Charles Davis

PS1 TRAUMA - CLINICAL OUTCOMES METHODOLOGIES
Poster No. 1053
The Effect of Balanceshoes Training on the Knee Kinematics during Athletic Tasks Associated with Anterior Cruciate Ligament Injury
Satoshi Kubota, Kohei Koresawa, Kazuyoshi Gamada

Poster No. 1054
Distal Femoral Fracture Fixation: Locking Plates Vs. Retrograde Nails
Anthony Howard, Alexander Wibberley, Aafreen Rahman, Nick Kanakaris, Peter Giannoudis

Poster No. 1055
A Technique to Measure Intrarticular Displacement on CT After Fracture of the Calcaneus
Saran Tantavisut, John Lawrence Marsh, Matthew D Karam, Phinit Phisitkul, Kevin Dibbern, Yubo Gao, Brian O Westerling

Poster No. 1056
Radiographic Analysis of Korean Proximal Femur Fracture: PFNA vs PFNA II
Wonchul Shin, Sangmin Lee, Seunghun Woo, Kuentak Suh

PS1 TRAUMA - PATHOPHYSIOLOGY
Poster No. 1057
Degeneration of the Cervical Spine Influences the Risk of Sustaining Dens Fractures
Marcel Betsch, Sabina Blizzard, Jung U Yoo

Poster No. 1058
Testing the Utility of Engineered Anti-Collagen I Antibody to Limit the Formation of Collagen-Rich Fibrotic Deposits in a Rabbit Model of Posttraumatic Joint Stiffness
Andrzej Steplewski, Jolanta Fertala, Jonathan Barlow, Pedro Beredjiklian, Joseph Abboud, Mark Wang, Surenam Namdari, William Arnold, James Costas, Cheryl Hou, Andrzej Fertala

Poster No. 1059
The Amplitude of Pulse-Synchronous Oscillations correlates with the Level of Intramuscular Pressure
Andreas Nilsson, Quxia Zhang, Jorma Styf

PS1 CANCER, TUMORS
Poster No. 1060
ORS Best Tumors Poster
The Epigenetic Regulation Of SOX9 By MiR-145 In Human Chondrosarcoma
Isabella Mak, Shalini Singh, Robert Turcotte, Michelle Ghert
Poster No. 1061
RANKL Blockade Prevents And Treats Aggressive Osteosarcomas In Mice
Yan Chen, Rama Khokha

Poster No. 1062
Development of New Hybrid Treatment for Osteosarcoma Using Sustained-release Tearubicin Conjugated Endothelial Progenitor Cells
Yohei Kawakami, Masaaki li, Tomoyuki Matsumoto, Yasuhiko Tabata, Takayuki Asahara, Ryosuke Kuroda, Masahiro Kurokasa

Poster No. 1063
Netrin-, RGM- and Slit-Ligands Do Not Increase Proliferation in Ewing’s Sarcoma or Osteosarcoma Tumor Cells
Bryan S Margulies, Connor G Policastro, Benjamin Craxton, Adrienne M Parsons, Judith A Strauss, Timothy A Damron

Poster No. 1064
Apoptosis And Anti-tumor Effect Induced By Mtor Inhibitor And Autophagy Inhibitor In Human Osteosarcoma Cells
Ryosuke Horie

Poster No. 1065
AICAR Induces Apoptosis in Human Osteosarcoma Cells through AMPK-dependent PGC-1α/TFAM/Mitochondrial Pathway
Masayuki Morishita, Teruya Kawamoto, Hitomi Hara, Yasuo Onishi, Takeshi Ueha, Masaya Minoda, Etsuko Kamata, Masahiro Kurosaka, Toshihiro Akisue

Poster No. 1066
CD146 Identifies Tumor Propagating Cells In Soft Tissue and Bone Sarcoma
Yuning J Tang, Qingxia Wei, David Shih, Veronique Voisin, Makoto Hirata, Shingo Sato, Gary D Bader, Laurie Ailles, Jay Wunder, Benjamin Alman

Poster No. 1067
Expression of PIM1 Kinase in Osteosarcoma and the Clinical Significance
Yong Feng, Yan Gao, Jackson Shen, Gregory Cote, Edwin Choy, Henry Mankin, Francis Hornicek, Zhenfeng Duan

Poster No. 1068
Inhibition Of Gli2 And Smo By Clinical Agents Prevents Osteosarcoma Metastasis
Masahito Nagata, Takao Setoguchi, Hiroko Nagao-Kitamoto, Shunsuke Nakamura, Satoshi Nagano, Masahiro Yokouchi, Yasuhiro Ishidou, Setsuro Komiya

Poster No. 1069
Tumor-suppressive Microrna-let-7a Inhibits Cell Proliferation Via Targeting Of E2f2 In Osteosarcoma Cells
Masanori Kawano, Kazuhiro Tanaka, Ichiro Itonaga, Tetsuya Iwasaki, Hiroshi Tsumura

Poster No. 1070
Antagonistic Pleiotropy and its Effects on Angiogenic Capacity to Promote Osteosarcoma Tumor Progression
Stephanie N Moore, Tetsuro Oba, Heather Cole, Jonathan Schoenecker

Poster No. 1071
Identification of Circulating miRNA Signatures in Osteosarcoma Patients

Poster No. 1072
Combined Effect Of Zoledronic Acid And Telomerase-specific Oncolytic Adenovirus For Human Osteosarcoma Cells
Yasuaki Yamakawa, Joe Hasei, Hiroshi Tazawa, Shuhei Osaki, Toshinori Omori, Kazuhsia Sugiu, Tomohiro Fujiwara, Toshiyuki Kunisada, Aki Yoshida, Yasuo Urata, Toshiyoshi Fujiwara, Toshifumi Ozaki

Poster No. 1073
Parathyroid Hormone Confers Transient Protection Against Radiotherapy-Induced Bone Fragility and Trabecular Loss
Megan Elizabeth Oest, Kenneth A. Mann, Nicholas D Zimmerman, Nicholas Allen, Timothy Damron

Poster No. 1074
A Novel Mouse Model of Enchondromatosis by Cartilage Specific Expression of Mutant Idh1
Makoto Hirata, Masato Sasaki, Qingxia Wei, Shingo Sato, Yuning J Tang, Jay Wunder, Tak Mak, Benjamin Alman

Poster No. 1075
Tumor Infiltrating PD1-Positive Lymphocytes and the Expression of PD-L1 Predict Poor Prognosis of Soft Tissue Sarcomas
Jung Ryul Kim, Kyo Yun Jang

Poster No. 1076
Increased Insulin mRNA Binding Protein-3 Expression Correlates with Vascular Enhancement of Renal Cell Carcinoma by Dynamic Multidetector-CT and is Associated with Bone Metastasis
Chao Xie, Yaying Li, Qingqing Li, Yu Chen, Regis J O’Keefe, Edward M. Schwarz, Wakenda Tyler

Poster No. 1077
Clinicopathologic, Prognostic And In Vitro Evaluation To Assess The Rationale For Mtor Inhibition In Malignant Peripheral Nerve Sheath Tumors
Makoto Endo, Nokitaka Setsu, Kenichi Kohashi, Hitetaka Yamamoto, Michiuki Hakoizaki, Tomoya Matsunobu, Yoshihiro Matsumoto, Katsumi Harimaya, Yukihide Iwamoto, Yoshinao Oda

Poster No. 1078
Association Between The Micrornas Derived From Round Cell Component And Cancer Malignancy In Myxoid Liposarcoma
Yutaka Nezu, Kosuke Matsuo, Akira Kawai, Tomoyuki Saito, Takahiro Ochiya
Poster No. 1079

**Programmed Cell Death Ligand**

1 Expression in Chordoma

Yong Feng, Jackson K Shen, Yan Gao, Gregory Cote, Choy Edwin, Henry Mankin, Francis Hornicek, Zhenfeng Duan

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Poster No. 1080

**Stromal Cell Proliferation And Recurrence**

Of Giant Cell Tumor Of Bone Following Neoadjuvant Denosumab Treatment

Isabella Mak, Nathan Evaniew, Snezana Popovic, Michelle Ghert

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Poster No. 1081

**A Grooved Hydroxyapatite Coated Ingrowth Collar Reduces Aseptic Loosening of Cemented Distal Femoral Massive Bone Tumour Prostheses:**

A Radiographic Pair Matched Study


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Poster No. 1082

**Distinct Clinicopathologic Features Of Nab2-stat6 Fusion Gene Variants In Solitary Fibrous Tumor With Emphasis On The Acquisition Of Highly Malignant Potential**

Keisuke Akaite, Aiko Kurisaki-Arakawa, Kieko Hara, Yoshiyuki Suehara, Tatsuya Takagi, Kazuo Kaneko, Takashi Yao, Tsuyoshi Saito

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Poster No. 1083

**Does Simulating Activities of Daily Living Improve Fracture Prediction for Patients with Metastatic Femoral Lesions?**

Jacklyn Goodheart, Timothy Damron, Ara Nazarian, Brian Snyder, Kenneth A. Mann

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Poster No. 1084

**Targeting Skeletal Metastases Using HPMA Copolymer Nanoparticle Delivery and Retention**

Alexander B Christ, Chloe Horowitz, Yen H Chen, Dong Wang, Ed Purdie, Steven Goldring, John H Healey

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Poster No. 1085

**The Combined Effect Of Tumor-specific Oncolytic Adenovirus And Radiation On Bone And Soft Tissue Sarcoma Cells**

Toshinori Omori, Yasuaki Yamakawa, Joe Hasei, Hiroshi Tazawa, Shuhei Osaki, Tsuyoshi Sasaki, Kazuhisa Sugiu, Aki Yoshida, Toshiyuki Kunisada, Yasuo Urata, Toshiyoshi Fujiwara, Toshifumi Ozaki

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Poster No. 1086

**YM155, A Novel Small Molecule Survivin Suppressant, Reduces Tumor Progression of Human Musculoskeletal Malignancies**

Masaya Minoda, Teruya Kawamoto, Toshihiro Akisue, Hitomi Hara, Yasuo Onishi, Masayuki Morishita, Etsuko Kamata, Masahiro Kurosaka

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**PS1 DIAGNOSTIC IMAGING - TENDONS, LIGAMENTS**

Poster No. 1087

**Quantitative Evaluation of Elasticity in the Postero-inferior Shoulder Joint Capsules of Collegiate Baseball Players Using Shear-Wave Ultrasound Elastography**

Tetsuya Takenaga, Hideyuki Goto, Katsumasa Sugimoto, Masahiro Nozaki, Masahito Yoshida, Atsunori Murase, Hirotaka Iguchi, Takanobu Otsuka

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Poster No. 1088

**Ultrasound Based Tendon Micromorphology Predicts Mechanical Characteristics of Degenerated Tendons**

Yu-Jen Chang, Gregory R Bashford, Kornelia Kulig

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**PS1 DIAGNOSTIC IMAGING - BIOMARKERS**

Poster No. 1090

**18F-NaF Pet-CT Is A Good Early Clinical Marker For High Bone Stress In The Lower Lumbar Spine**

Justin Fernandez, Shasha Yeung, Andi Liu, Amanjeet Toor, Ju Zhang, Vickie Shim, Thor Besier, Jacob Munro, Peter Robertson, Gerard Deib

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Poster No. 1091

**Heterogeneity In the Mechanical Response of Differentiating Adipose-Derived Stem Cells**

Nicholas R Labriola, Eric M Darling

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Poster No. 1092

**Distribution Of Podoplanin In Synovial Tissues Of Rheumatoid Arthritis And Osteoarthritis**

Yuya Takakubo, Hiroharu Oki, Tomoyuki Hirayama, Yasunobu Tamaki, Yasushi Naganuma, Suran Yang, Akiko Sasaki, Kan Sasaki, Michiaki Takagi

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**PS1 DIAGNOSTIC IMAGING - BONE**

Poster No. 1093

**Mineral Density Of Subchondral Bone May Be Quantitatively Evaluated Using A Clinical Cone BeamComputed Tomography Scanner**

Mikael J Turunen, Juha Töyräs, Harri Kokkonen, Jukka S Jurvelin

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Poster No. 1094

**Increased Posterior Tibial Slope Is a Risk Factor for Anterior Cruciate Ligament Injuries: A Quantitative Three Dimensional Study**

Takayuki Murayama, Takashi Sato, Hiroshi Yamagiwa, Satoshi Watanabe, Osamu Tanifuji, Tomoharu Mochizuki, Go Omori, Yoshiro Koga, John D Blaha, Naoto Endo
Poster No. 1095

Evaluation of Bone Mineral Density of the Necrotic Area in Osteonecrosis of the Femoral Head Using Quantitative Computed Tomography
So Kubota, Yutaka Inaba, Naomi Kobayashi, Hiroyuki Ike, Taro Tezuka, Masaki Kawamura, Tomoyuki Saito

Poster No. 1096

Dual Ultrasound Can Measure Kinematic Motion and Intervertebral Disc Deformation of Cervical Spine
Mingxin Zheng, Aidin Masoudi, Sagar Umale, Daniel Buckland, Narayan Yoganandan, Brian Stemper, Thomas Szabo, Brian Snyder

Poster No. 1097

Visualization of Experimental Bone Defects by Computed Tomography at Reduced Radiation Doses
Jamie J Alexander, Zbigniew Gugala, Ronald Lindsey, John A. Hipp, Nathan K. Priddy, Jay S. Croley

Poster No. 1098

WITHDRAWN

Poster No. 1099

Quantitative Analysis of Bone Texture Using Digital Tomosynthesis in Spontaneous Osteonecrosis of the Knee (SONK)
Yener N Yeni, Omaima Bokhari, Daniel Oravec, Woong Kim, Michael J Flynn, Catherine Lumley, Fred Nelson

Poster No. 1100

Analysis Of Postoperative Intertrochanteric Fracture Based On 3d-mpr Images Of The Cortical Bone Contact Site In The Fractured Area
Tomohiro Yasuda

Poster No. 1101

Posterolateral Tibia Cartilage Condition, Age and Gender as Predictors of Patient-Reported Outcomes at 1 Year Following ACL Reconstruction
Brian C Lau, Favian Su, Richard Souza, Christina R Allen, Brian T Feeley, Xiaojuan Li, C Benjamin Ma

Poster No. 1102

Functional Imaging of Biomechanics and Relaxivity Following Articular Cartilage Injury In Vitro
Kateri Gilliland, Logan Worke, Nancy Emery, Corey Neu

Poster No. 1103

Contrast-Enhanced Computed Tomography Correlates with the Equilibrium Modulus of Tibial Plateau Cartilage in a Destabilized Medial Meniscus Mouse Model of Osteoarthritis
Benjamin Lakin, Joshua Shelofsky, Michele Sidler, Gisela Kuhn, Daniel Ellis, Brian Snyder, Kathryn S Stok, Mark Grinstaff

Poster No. 1104

Use of the Human Metacarpophalangeal Joint as an Ideal Model of a Discreet Synovial Joint that Develops OA and is Appropriate for High Resolution Imaging, Mechanical Testing and Biochemical Analysis
Benjamin Lakin, Joshua Shelofsky, Daniel Ellis, Mark Grinstaff, Brian Snyder

Poster No. 1105

Contrast-enhanced Computed Tomography Distinguishes Osteoarthritic Disease State in an Equine Patellofemoral Joint
Rachel C Stewart, Brad Nelson, Chris Kawcak, Brian Snyder, Laurie R Goodrich, Mark Grinstaff

Poster No. 1106

Evaluation of the Acetabular Labrum in Patients with Acetabular Dysplasia Using T2 Mapping with Arthroscopic Verification
Tomonobu Hagiyo, Masatoshi Naito, Yoshinori Nakamura, Koichi Kinoshita, Tetsuya Sakamoto, Kunihide Muraoka, Norihito Watanabe, So Minokawa, Tomohiko Minamikawa, Hajime Seo, Tetsuro Ishimatsu

Poster No. 1107

Predicting Early Osteoarthritis in the Human Knee: Pattern Recognition and Machine Learning Classification of Magnetic Resonance Images
Beth G. Ashinsky, Mustapha Bouhrara, Kenneth L. Urish, Christopher E. Coletta, Ilya G. Goldberg, Richard G. Spencer

Poster No. 1108

Determining the Composition of Human Meniscus using Near Infrared Spectroscopy
Isaac O Afara, Juuso T Honkanen, Elvis K Danso, Rami K. Korhonen, Jukka S Järvelin, Juha Töyräs

Poster No. 1109

Cartilage MR T1ρ And T2 Quantifications: Longitudinal Reproducibility And Variations Using Different Coils And Scanners At Single And Multi-sites
Xiaojuan Li, Valentina Pueda, Deepak Kumar, Drew Lansdown, Cory Wyatt, Julien Rivorie, Narihiro Okazaki, Dragana Savic, Matthew F Koff, Joel Felmlee, Steven Williams, Sharmila Majumdar

Poster No. 1110

Effects of Articular Cartilage Constituents on Phosphotungstic Acid Enhanced micro-CT Imaging
Sakari Karhula, Mikko Finnilä, Sami Kauppinen, Heikki J Nieminen, Simo Saarakkala

Poster No. 1111

Quantification of Glycosaminoglycans (GAG) Concentration in Articular Cartilage by micro Computed Tomography (μCT)
Daniel J Mittelstaedt, David J Kahn, Yang Xia

Poster No. 1112

True Four Dimensional Imaging Technology With Advanced Tissue Geometry Fusion Methods For Musculoskeletal Diagnosis
George Papaioannou, Christos Mitrogiannis

Poster No. 1113

MRI Detection of Early Lesions of Surgically-induced Osteochondrosis in Goats
Ferenc Toth, Mikloš J. Nissi, Luming Wang, Jutta M Ellermann, Cathy S Carlson
PS1 DIAGNOSTIC IMAGING - MUSCLE, NERVE, VASCULARATURE

Poster No. 1114  
**Automating the Diagnosis of Peripheral Nerve Injury via Second Harmonic Generation Imaging**  
Surabhi Vijayaraghavan, Nikki M Verberne, Asad Ashraf, Michael R Hausman

Poster No. 1115  
**Changes In Central Nervous System Activity After Peripheral Nerve Injury: A Functional MRI Study**  
Tetsuro Yamasaki, Kazuya Ikoma, Ryo Oda, Masateru Nagae, Takumi Ikeda, Yasuo Mikami, Hiroyoshi Fujiwara, Toshikazu Kubo

Poster No. 1116  
**Change In ADC and FA Values of the Normal Lumbar Spinal Root as a Function of Distance From the Junction of the Dura Mater**  
Ryo Miyagi, Toshinori Sakai, Eiko Yamabe, Hiroshi Yoshioka

PS1 DIAGNOSTIC IMAGING - NOVEL AND FUNCTIONAL IMAGING, ARTIFACTS

Poster No. 1117  
**ORS Best Hand and Wrist Poster**  
**Multidimensional Ultrasound Imaging of the Wrist: Changes of Shape and Displacement of the Median Nerve and Tendons in Carpal Tunnel Syndrome**  
Anika Filius, Peter C. Amadio, Marjan Schelten, Hans G. Bosch, Pieter A. van Doorn, Henk J. Stam, Steven E.R. Hovius, Ruud W. Selles

Poster No. 1118  
**Quantitating the Effect of Prosthesis Design on Femoral Remodeling Using High-Resolution Region-Free Densitometric Analysis (DXA-RFA)**  
Richard M Morris, Jeannette O Penny, Lang Yang, Miguel A Martin-Fernandez, Jose M Pozo, Soren Overgaard, Alejandro Frangi, J Mark Wilkinson

Poster No. 1119  
**A New MRI-Based 3D Bone-marrow Model for In Vivo Spine Kinematics**  
Sayuri Kitahara, Kresten Rickers, Alejandro A Espinoza Orias, Steffen Ringgaard, Gunnar BJ Andersson, Cody E Bünger, Jenna Peterson, Bruce Robie, Nozomu Inoue

Poster No. 1120  
**A Novel Approach to Determine Accuracy of Radiographic Measurements Utilizing Three-Dimensional Hip Implant Models**  
Chris Nocera, Paul Lichstein, Thies Wuestemann, Adam Bastian, Javad Parvizi, Richard Rothman

Poster No. 1121  
**Rapid Throughput, Seamless Imaging of Human Hip Joint Tissue Across Length Scales to Elucidate Emergent Structure-Function Relationships**  
Ulf Knothe, Dirk Zeidler, Anna-Lena Keller, Melissa Knothe Tate

Poster No. 1122  
**Measuring Internal Deformation of the In Vivo Rat Spinal Cord During Traumatic Spinal Cord Injury**  
Tim Bhatnagar, Jie Liu, Andrew Yung, Peter Cripton, Piotr Kozlowski, Wolfram Tetzlaff, Thomas Oxland

PS1 POLICIES/GUIDELINES/LEADERSHIP

Poster No. 1123  
**Revisions to Federal Guidelines for Human Experimentation and the Public Response**  
Jennifer Racine, Roy Aaron

Poster No. 1124  
**The Role of Chairman and Research Director in Influencing Scholarly Productivity and Research Funding in Academic Orthopaedic Surgery**  
Alexandra Stavraks, Ankur Patel, Zachary Burke, Amanda Loftin, Erik Dworsky, Mauricio Silva, Anthony Scaduto, Nicholas Bernthal

**POSTER SESSION 2**

*Posters Will Be Displayed Monday And Tuesday*

PS2 BIOMATERIALS - OTHER

Poster No. 1125  
**In Vivo Safety Testing Of A Fully Reacted, Injectable Platform Hydrogel For Use In Musculoskeletal Regeneration**  
Abbey A Thorpe, Christine Freeman, Paula Farthing, Paul Hatton, Ian Brook, Chris Sammon, Christine L Le Maitre

Poster No. 1126  
**Customized Platelet-Rich Plasma to Promote Skeletal Muscle Healing while Reducing Fibrosis**  
Hongshuai Li, Justin Hicks, Nick Oyster, MaCalus V Hogan, Johnny Huard

Poster No. 1127  
**Effects Of High Molecular Weight Hyaluronan For Joint Capsule In An Immobilized Rat Knee Model**  
Kenji Kanazawa, Yoshihiro Hagiwara, Masahiro Tsuchiya, Yutaka Yabe, Kazuaki Sonofuchi, Masashi Koide, Akira Ando, Yoshihumi Saijo, Eiji itoi

Poster No. 1128  
**Oxygen Delivery from Hyperbarically Loaded Biomaterials Enhances Cell Survival Under Anoxia**  
Colin A Cook, Kathryn Hahn, Garret Ma, Justin Morrissette-McAlmon, Joshua Temple, Warren L Grayson

Poster No. 1129  
**Epigenetic Reprogramming Through the Manipulation of Hydrogen Stiffness**  
Shih Jye Tan, Josephine Yen Fang, Zhi Yang, Marcel Nimni, Bo Han

Poster No. 1130  
**Where Are Our Stem Cells? Facts And Fate Of Autologous Stem Cells From Adipose Tissue Or Medullary Blood For Orthopaedic Use**  
Riccardo Ferracini, Raimondo Piana, Marco Busso, Alessandro Masse’
Poster No. 1131

Canine Infra-patellar and Subcutaneous Adipose Tissue Derived Multipotent Stromal Cells have Similar In Vitro Behavior Before and After Cryopreservation
Wei Duan, Nan Zhang, Mandi J Lopez

Poster No. 1132

Importance of Structural Alignment in Myogenic Cell Delivery for Regeneration of Skeletal Muscle
Michael J McClure, David J Cohen, Yen C Huang, MoonHae Sunwoo, Barbara D Boyan, Zvi Schwartz

Poster No. 1133

Continuous Expansion Culture Enhances The Phenotype Of Nucleus Pulposus Cells In Monolayer Culture
Julien Tremblay Gravel, Derek H Rosenzweig, Lisbet Haglund

Poster No. 1134

The Effect Of Modified Hyaluronan Hydrogel On The Prevention Of Epidural Fibrosis - In Vitro Cell Culture And Rat Laminectomy Model
Ming-Hsiao Hu, Shu-Hua Yang, Ching-Hsiao Yu, Yuan-Hui Sun, Feng-Huei Lin

Poster No. 1135

Non-Injected Illicit Drug Use and Infectious Disease Risk of Donor Tissue: A Single Institution Retrospective Review
Mark D Barton, Amir H. Qureshi, Anita Vijapura, Loren Latta, H. Thomas Temple

Poster No. 1136

Benefits Of Biomedical Versus Nonbiomedical Grade Alginites For The Durable And Safe Modification Of hMSC Via rAAV-mediated Gene Transfer
Christian Hunneshagen, Ana Rey Rico, Henning Madry, Magali Cucchiari

Poster No. 1137

Effects of Freezing on the Depth-dependent Stiffness of Articular Cartilage
David Kahn, Daniel Mittelstaedt, Clifford Les, Yang Xia

Poster No. 1138

Layered Alginate Constructs: Platform Development for Co-cultures of Heterogenous Cell Populations
Poonam Sharma, Michelle Patkin, Adam H Hsieh

Poster No. 1139

Characterization of Biodegradable Castor Oil Based Polyurethane of Different Chemical Compositions: Comparison of Solid and Porous Samples
Yasaman Ganji, Mehran Kasra

Poster No. 1140

Bioprinting De Novo Cartilage with ECM-based Bioink
Matti Kesti, Daniel Grande, Marcy Zenobi-Wong

Poster No. 1141

Chondrogenic Regeneration Using Bone Marrow Clots And A Porous Polycaprolactone-hydroxyapatite Scaffold By 3d Printing
Qingqiang yao, Chenshuang Li, Nancy Liu, Zorica Buser, Xinli Zhang, Liming Wang

Poster No. 1142

Proteoglycan and Cellularity Declined with Storage Time in Human Osteochondral Allograft Cartilage being Refrigerated for Over 25 Days But Proteoglycan Levels were Maintained in a Normal Range
Lei Ding, Keewoong Jang, Biagio Zampogna, Sebastiano Vasta, Francesca De Caro, Annunziato Amendola, James A Martin

Poster No. 1143

rAAV-based Genetic Modification Of Human Bone Marrow Aspirates Seeded In 3d Woven Poly(epsilon-caprolactone) (PCL) Scaffolds

Poster No. 1144

Effects of ECM Removal on Decellularization of Articular Cartilage
Catherine Bautista, Hee Jun Park, Matthew Akelman, Bahar Bilgen

Poster No. 1145

In Vivo Chondrogenesis Using Chondrogenic Induced Human Bone Marrow Stromal Cells (BMSCs) Mixed With a Novel Ultra-purified Alginate Gel; a Report Of Preliminary Study
Sameh Elmorsy, Tadanao Funakoshi, Norimasa Iwasaki

Poster No. 1146

Coupled Finite Element Model-artificial Neural Networks Can Predict Mechanical Properties Of Articular Cartilage
Vahid Arbabi, Behdad Pouran, Harrie Weinans, Amir Abbas Zadpoor

Poster No. 1147

The Combined Effects Of Cyclic Hydrostatic Pressure And Continuous Passive Motion On Osteochondral Regeneration Using Autologous Endothelial Progenitor Cells In Rabbit Model
Hsueh Chun Wang, Tzu-Hsiang Lin, Nai-Jen Chang, Meng-Chian Wu, Da Jun Lin, Shu Wei Wu, Horng-Chaung Hsu, Ming-Long Yen

Poster No. 1148

Keratin Hydrogel Delivery of rhBMP-2 Promotes Healing of a Critical-Size Femur Defect in an Osteopenic Rodent Model
Lindsey P Rau, Seth Tomblyn, Luke R Burnett
Poster No. 1149
**Effects Of Myo9b Knockout On Skeletal Growth And Quality**
Yonghoon Jeong, Brooke K McMichael, Seth Nye, Seung E Yu, Ryan Sedlar, Choongsu Shin, Martin Bähler, Beth Lee, Do-Gyoon Kim

Poster No. 1150
**Effects of Microporosity and Local rhBMP-2 Administration on Bioresorption of Beta-tricalcium Phosphate and New Bone Formation**
Atsuhiro Kakuta

Poster No. 1151
**A Novel Fixative Needle Carried Mg Can Promote Fracture Healing In Ovx Rats**
Zhang Yifeng

Poster No. 1152
**Covalently Immobilized Nacre Proteins Induce Osteogenesis in Mesenchymal Stem Cells and Osteoblasts**
Kristopher White, Ronke Olabisi

Poster No. 1153
**Critical Parameters For Drug Delivery Implant Materials In Bone Regeneration**
Patricia Diaz-Rodriguez, Mariana Landin

Poster No. 1154
**Distribution and Retention of Self-Assembling Peptide Hydrogel in the Femoral Head Epiphysis Following Local Intra-Osseous Infusion**
Matthew Phipps, Harry KW Kim

Poster No. 1155
**Additive Manufactured Prevascularized Tissue Engineering Constructs**
Yaser Shanjani, Yunqing Kang, Yunzhi Peter Yang

Poster No. 1156
**Using Tissue Engineering To Develop An In Vitro 3D Bone Model**
Gifty Tetteh, Ihtesham U. Rehman, Gwendolen C. Reilly

Poster No. 1157
**Novel Macroporous Calcium Phosphate Scaffold To Improve Cell Infiltration and Osseous Integration**
Siddhesh R Angle, Michael R Strunk

Poster No. 1158
**Developing Aligned 3D Fibrous Networks from Phenylalanine and Its Composite Nanofibers for Orthopaedic Applications**
Bingyun Li, Xianfeng Wang

Poster No. 1159
**Does Silicon Substitution Encourage Earlier Bone Formation By Hydroxyapatite Or TCP?**
Sorousheh Samizadeh, Melanie J Coathup, Karin Hing, Gordon Blunn

Poster No. 1160
**Capillary Formation Through The Bone Substitute Is A Key Factor Of Rapid New Bone Formation And Bone Remodeling in Unidirectional Porous Hydroxyapatite**
Takeshi Makihara, Masataka Sakane, Hiroshi Noguchi, Kenta Uemura, Toshinori Tsukamishi, Masashi Yamazaki

Poster No. 1161
**Nucleation and Growth of Bone-Like Hydroxyapatite via Controlled Conformational Changes in Highly Phosphorylated Proteins**
Melika Sarem, Steffen Lüdeke, Ralf Thomann, V. Prasad Shastri

Poster No. 1162
**A Carboxy-Methyl Cellulose Carrier Reduces Bone Formation within a Silicate-Substituted Calcium Phosphate Scaffold**
Melanie J Coathup, Charlie R Campion, Gordon W Blunn

Poster No. 1163
**Bioactive Glass Ionic Dissolution Products Increase Human Osteoblast and hMSC Proliferation and Osteogenic Expression in vitro**
Annie Reza, Stephen McIlhenny

Poster No. 1164
**Biodegradation Of Phosphopullulan-cement For Bone Regeneration In Vitro And In Vivo**
Aki Yoshida, Kentaro Yamane, Yohei Kagawa, Eri Sakaguchi, Mariko Nakamura, Yasuhiro Yoshida, Akihiro Matsukawa, Toshifumi Ozaki

Poster No. 1165
**Covalent Linking Of Growth Factors To Nanocomposite Scaffolds And Their Effect On Bone Formation**
Declan M Devine, Jessica S Hayes, Eilish Hctor, Sean Gaynard, Dimitra Kotsougiani, Clement L Higginbotham, Christopher H Evans

Poster No. 1166
**Development of a Composite PolyD,L-lactic acid / Calcium Phosphate Electrospun Fibrous Scaffold for Bone Tissue Regeneration**
Marie-Noelle Labour, Marie Cavaignac, Eamonn deBarra, David Hoey

Poster No. 1167
**Coaxial Polycaproactone/Polyvinyl Alcohol Electrospun Nanofibers Enhance Implant Osseointegration in a Rat Tibial Pin Model**
Praveen Kanneganti, Christopher Bergum, Weiping Ren, David Markel

Poster No. 1168
**Fabrication of 3d Printed β-tcp/pcl Scaffold For Bone Tissue Engineering**
Su A Park, Ji Sun Park, Jun Hee Lee, Jung Woog Shin, Wandoob Kim

Poster No. 1169
**Effect Of Salidroside On Healing Of A Critical Size Segmental Bone Defect**
Stefan Zwingenberger, Jennifer Frehe, Angela Jacobi, Corina Vater, Eik Niederlohmman, Robert Langanke, Stefan Rammelt, Michael Gelinsky, Klaus-Peter Günther, Stuart B Goodman, Maik Stiehler
Poster No. 1170
**Novel Multifunctional Ester Crosslinked Acrylate Based Hydrogel As Bone Graft Material**
Giacomo Tommasi, Stefano Perni, Polina Prokopenovich

Poster No. 1171
**Influence Of Chemistry On The In Vivo Resorption And Bone Formation Of Calcium Phosphate Ceramics.**
Marianne Koolen, Davide Barbieri, Cumhur Öner, Joost de Bruijn, Harrie Weinans, Huipin Yuan

Poster No. 1172
**Bioactive Glass Granules And Morselized Cancellous Bone Allograft In Load Bearing Defects; A Mechanical Study**
Dennis Hulslen, Jan Geurts, Bert Rietbergen, Chris Arts

Poster No. 1173
**A Novel Biologic Composite for Use in Orthopaedic Surgery: A Viable Alternative to Bone Cement**
Amir H. Qureshi, Mark D Barton, David Kaimrajh, Edward Milne, Loren Latta, H. Thomas Temple

Poster No. 1174
**Tissue Mineral Density Dependent Mechanical Properties of Individual Trabecular Plates and Rods Do Not Differ in Anatomic Directions but Individual Trabecular Directions**
Y. Eric Yu, Ji Wang, Bin Zhou, Zhendong Zhang, X. Edward Guo

Poster No. 1175
**Assessment of Cortical Mechanical Properties Under Physiological Strain Rates Reveals Favorable Collagen and Mineral Characteristics Following Bisphosphonate Treatment**
Elizabeth Zimmermann, Bernd Gludovatz, Eric Schaible, Michael Hahn, Klaus Pueschel, Michael Amling, Robert Ritchie, Björn Busse

Poster No. 1176
**Assessing Fatigue Resistance of Human Cortical Bone with 1H NMR Measurements**
Mathilde Granke, Kuniko Hunter, Sasidhar Uppuganti, Akhmal Hakim Zainal Ariffin, Mark D Does, Jeffrey S Nyman

Poster No. 1177
**The Effect of Overall Limb Alignment on Tibial Bone Properties at Mechanical and Anatomic Orientations**
Robert Davignon, Paul Rochette, Michael Ferko, Stuart Axelson

Poster No. 1178
**Characteristics of Human Mandibular Condyle Bone Tissue**
Yonghoon Jeong, Amanda Agnew, Robert Nichol, David W McComb, Heungsoo Shin, William M Johnston, Do-Gyoon Kim

Poster No. 1179
**The Effect of Frictional Conditions at the Bearing Surface on Relative Motion of the Head-Neck Taper Junction in THR**
Philip C Noble, Jesal Parekh, Jonathan E Gold

Poster No. 1180
**Time Course of Peri-Implant Bone Regeneration Around Loaded and Unloaded Implants in a Rat Model: A Pilot Study**
Shailly H Jariwala, Hwa Bok Wee, Evan Roush, Tiffany Whitcomb, Christopher Murter, April Armstrong, Gregory Lewis

Poster No. 1181
**Preserving Vascular Pathways while Structurally Augmenting Femoral Neck Fractures in Osteopenic Femurs**
Marc C Jacobsky, Timothy Browne, Jerry Chang, Colleen Hartwell, Siddhesh R Angle, Thomas A Russell

PS2 BIOMATERIALS - TENDON AND LIGAMENT

Poster No. 1182
**Development Of A New Animal Model Of Overuse Tendinopathy**
Ting Yuan, G Zhao, Jianying Zhang, James H-C. Wang

Poster No. 1183
**Chronic Tear and Rotator Cuff Repair in a Rat Model**
Christopher Chen, Fuxin Wei, Zachary Shirley, William Shelton, Michael Khazzam

Poster No. 1184
**Development of a Controlled Drug Delivery System in Anterior Cruciate Ligament Reconstruction with mPEG/PLGA Hydrogel Coating on Tendon Graft**
Wai Yin Vivien Chiu, Sai Chuen Fu, Shu Hang Yung, Wei Chuan Chen, Hsia Wei Liu, Chih Hwa Chen, Kai Ming Chan

Poster No. 1185
**Evaluation Of A PLLA Device In-vitro And In An Ovine Model Of Acute Rupture Of The Rotator Cuff**
William R Walsh, Nicky Bertollo, Phillip Heuberer, Chris Christou, Robert Stanton, Robert Poggie

Poster No. 1186
**Material Properties of the Ovine Stifle Cruciate and Collateral Ligaments**
Rajshree Mootanah, Nicolas Berchet, Franziska Reisse, Diagarajen Carpanen, Howard Hillstrom

PS2 CARTILAGE, SYNOVIVUM AND OSTEOARTHRITIS - CELL AND MOLECULAR IMAGING

Poster No. 1187
**Fourier Transform Infrared (FTIR) microspectroscopy of Human Articular Cartilage With Different Grades of Osteoarthritis**
Joonas Oinas, Mikko Finnilä, Sami Kauppinen, Maarit Valkelahti, Petri Lehenkari, Simo Saarakkala

Poster No. 1188
**Calcium Signaling Of In Situ Chondrocytes During The Stress-relaxation Of Cartilage Explant**
Mengxi Lv, Jie Ma, Michael Schenk, Lea Fang, Liyun Wang, X. Lucas Lu
Characterization Of Zinc And Calcium Spatial Distribution At The Fibrocartilage Of Rabbit Patellar-Tendon Complex: A Synchrotron Radiation Micro X-ray Fluorescence Study
Lu Hongbin, Chen Can, Hu Jianzhong, Zheng Yi

N-acetyl Cysteine Protect Cell from Chondrocyte Death Induced by Local Anesthetics
Hyung Bin Park, Ra Jeong Kim, Jae-Ran Kang, Young-Sool Hah

Serum Pentosidine Affects The Size Of Osteophyte In Knee Osteoarthritis: Ultrasonographic Evaluation In A Japanese Population
Daisuke Chiba, Eiichi Tsuda, Yuji Yamamoto, Shugo Maeda, Eiji Sasaki, Ippel Takahashi, Shigeyuki Nakaji, Yasuyuki Ishibashi

Poster No. 1191

PS2 CARTILAGE, SYNOVIUM AND OSTEOARTHRITIS - POST TRAUMATIC OA

Detailed Quantification of Early Articular Cartilage Structural Changes in the Murine Destabilized Medial Meniscus Model of Post-Traumatic Osteoarthritis
Michael A David, Melanie K Smith, Avery T White, Ryan T Locke, Christopher Price

Biomechanical Characterization of a New, Noninvasive Model of Anterior Cruciate Ligament Rupture in the Rat
Tristan Maerz, Michael Kurdzil, Abigail Davidson, Kevin Baker, Kyle Anderson, Howard Matthew

Chondro-protective Effects of Bisphosphonate for PTOA Could Attribute to the Inhibition of Chondrocyte Mevalonate Pathway
Yilu Zhou, Miki Park, Monideepa Chatterjee, Jie Ma, Lea Fang, Liyun Wang, X. Lucas Lu

Establishment Of Surgical Destabilization Model Of Mouse Ankle Osteoarthritis
Song Ho Chang, Tetsuro Yasui, Sakae Tanaka, Taku Saito

Impact-induced Fissuring at High Strain Rates in Adult Equine Hock Cartilage
Corinne R. Henak, Lena R. Bartell, Lisa A. Fortier, Itai Cohen, Lawrence J. Bonassar

Changes of Cartilage Composition and Surface Roughness One Week After MMT Surgery
David S Reece, Tanushree Thote, Angela Lin, Nick J Willett, Robert E Guldberg

Quantitative MRI-T2 Mapping of Articular Cartilage following Anatomic Anterior Cruciate Ligament Reconstruction: Relationship to Patient Reported Measures of Symptoms, Activity, and Participation
Rajan Manmohan, Nikhil Kurapati, Eric Thorhauer, Freddie H. Fu, Scott Tashman, James J Irrgang

The Effect of Inhibitors of Brd4 and CDK9 on Early Phase of Post Traumatic Osteoarthritis
Tomoko Fukui, Jasper Yik, Dominik R Haudenschild

Intraarticular Administration of N-Acetylcysteine and Glycyrrhizin Alleviates Acute Oxidative Stress Following Intraarticular Fracture
Mitchell C Coleman, James A Martin, Douglas C Fredericks, Mary S Bergh, Jessica E Goetz

The Role Of FoxA Factors In The Onset And Development Of Osteoarthritis
Andreia M Ionescu, Lin Xu, Elena Kozhemyakina, Yefu Li, Klaus Kaestner, Vicki Rosen, Andrew Lassar

NFAT1 Deficiency Promotes the Initiation and Progression of Post-traumatic Osteoarthritis Induced by Meniscal Destabilization
Yi Feng, Qinghua Lu, William C. Kramer, Nicholas C. Barnthouse, Jinxing Wang

Changes in Knee Joint Following Non-Invasive Tibial Compression in Genetic Mouse Strains
Xin Duan, Muhammad F Rai, Nilsson Holguin, Matthew J Silva, Linda J Sandell

Local intra-articular Injection of Rapamycin Delays Articular Cartilage Degeneration in a Murine Model of Osteoarthritis
Koji Takayama, Yohei Kawakami, Makoto Kobayashi, Takehiko Matsushita, Ryoukake Kuroda, Masahiro Kurosaka, Freddie H Fu, Johnny Huard

Rock Inhibitor Prevents Mmp-3 Expression And Maintains Aggrecan Production In Human Articular Chondrocytes
Hiroyuki Inoue, Takayuki Furumatsu, Shinichi Miyazawa, Takaaki Tanaka, Toshifumi Ozaki

Aggrecan Core Protein Length Is Reduced In Intervertebral Disc Compared With Articular Cartilage Derived Aggrecan
Russell James Craddock, Michael J Sherratt, Sarah H Cartmell, Judith A Hoyland
Posters:

**Poster No. 1207**
Topographical Investigation Of Changes In Depthwise Proteoglycan Distribution Of Rabbit Articular Cartilage 4 Weeks After Transection Of The Anterior Cruciate Ligament
James M Fick, Mikko E Arokoski, Jukka S Juvvelin, Rami Korhonen

**Poster No. 1208**
Adjunctive Intra-articular OPF Scaffolds Loaded with Either Celecoxib or DKK-1 (Wnt/β-Catenin Pathway Inhibitor) Do Not Improve The Results of Surgical Contracture Release in a Rabbit model of Arthrofibrosis
Suenghwan Jo, Luke B Morrey, Matthew Philip Abdel, Joaquin Sanchez-Sotelo, Bernard F Morrey, Mark E Morrey

**PS2 CARTILAGE, SYNOVIIUM AND OSTEOARTHRITIS - FOCAL DEFECT REPAIR**

**Poster No. 1209**
Small Subchondral Drill Holes Improve Marrow Stimulation of Articular Cartilage Defects
Mona Eldracher, Patrick Orth, Magali Cucchiariini, Dieter Michael Kohn, Dietrich Pape, Henning Madry

**Poster No. 1210**
Cartilage Repair With Mesenchymal Stem Cells Is Accelerated By Loading After Temporal Distraction Arthroplasty In Rabbits
Yohei Harada, Tomoyuki Nakasa, Elhussein Elbadry Mahmoud, Goki Kamei, Nobuo Adachi, Masataka Deie, Mitsuo Ochi

**Poster No. 1211**
Depletion Of Gangliosides Accelerated The Articular Cartilage Repair In Mice
Masatake Matsuoka, Tomohiro Onodera, Fumio Sasazawa, Daisuke Momma, Rikiya Baba, Kazutoshi Hontani, Norimasa Iwasaki

**Poster No. 1212**
Acetabular Labrum Blood Flow during Periacetabular Osteotomy: An Intraoperative In vivo Study using Laser Doppler Flowmetry
So Minokawa, Masatoshi Naito, Kouichi Kinoshita, Kunihide Muraoka, Tomonobu Hagio, Tetsuya Sakamoto, Tomoko Nagano, Norihito Watanabe, Hajime Seo, Tomohiko Minamikawa, Tetsuro Ishimatsu, Satohiro Ishii

**Poster No. 1213**
Pre-clinical Small Animal Model for Osteochondritis Dissecans of the Knee
Giuliana E. Salazar-Noratto, Nick Willett, Hazel Y Stevens, Angela Lin, Greg Gibson, Robert E Guldberg

**Poster No. 1214**
Articular Cartilage Progenitor Cells for the Repair of Articular Defects: A Long-Term Strenuous Exercise Model in Horses
David D Frisbie, Helen McCarthy, Charles Archer, Myra Barrett, C Wayne McIlwraith

**Poster No. 1215**
Topological Match of Medial and Lateral Femoral Condyle Donor Osteochondral Grafts to Medial Femoral Condyle Recipient Sites
Bradley C Hansen, Esther Cory, Matthew T Provencher, William D Bugbee, Timothy S. Mologne, Robert L Sah

**Poster No. 1216**
Intra-articular Injection of Synovium-Derived Mesenchymal Stem Cells with HA Can Repair Articular Cartilage Defects in a Canine Model
Shinya Miki, Masato Takao, Takashi Matsushita

**PS2 CARTILAGE, SYNOVIIUM AND OSTEOARTHRITIS - MECHANICS**

**Poster No. 1217**
Chondrocyte Mechanics in Intact and Meniscectomy Human Knee Joints During Walking
Petri K. Tanska, Mika E Mononen, Rami K Korhonen

**Poster No. 1218**
Kinematics of Ligament-Transected Mouse Knees using Controlled Tibial Compressive Loading
Olufunmilayo O Adebayo, Frank C Ko, Steven R Goldring, Mary B Goldring, Timothy M Wright, Marjolein C.H. van der Meulen

**Poster No. 1219**
Nanomechanical Properties of Murine Temporomandibular Joint Cartilaginous Tissues
Basak Doyan, Xingyu Chen, Qing Li, Elki Koyama, Hyun-Duck Nah, X. Lucas Lu, Lin Han

**Poster No. 1220**
A Confocal Microscope-Based Method for Mapping Compressive Strains in Murine Cartilage
Alexander Kotelsky, Michael Richards, Mark Buckley

**Poster No. 1221**
The Effect of Hemiarthroplasty Implant Shape on Early Cartilage Wear in Linear Reciprocal Sliding
Alana A Khayat, Dan Langohr, John B Medley, Graham King, James A Johnson

**Poster No. 1222**
Cartilage Surface Roughness is a Better Predictor of Coefficient of Friction than Traditional Measures of Cartilage Wear
Benjamin Lakin, Luai Zakaria, Daniel Grasso, Mark Grinstaff, Brian Snyder

**Poster No. 1223**
The Effect of Sliding Speed and Congruence on the 24 h Friction Response of Human Glenohumeral Joints
Brian Jones, Gerard Ateshian

**Poster No. 1224**
Relationship between Quantitative T1ρ and T2 Relaxation Times and the Biochemical and Biomechanical Properties of Osteoarthritic Cartilage
Courtney E Cox, Sophia Y Kim, Amber T. Collins, Sophia N Ziemian, Charles E Spritzer, Farshid Guilak, Louis E DeFrates, Amy L McNulty
Poster No. 1225  
Quantifying Diffusion of Fluorescent Solutes in Strained Porous, Viscoelastic Materials Using Correlation Spectroscopy  
Janty Shoga, Christopher Price

Poster No. 1226  
A Technique For Determining The Equilibrium Properties of Articular Cartilage From The Short-term Indentation  
Xingyu Chen, Brandon K Zimmerman, Michael Furr, X. Lucas Lu

Poster No. 1227  
Multi-scalar Mechanical Testing of the Calcified Cartilage and Subchondral Bone Comparing Healthy versus Early Degenerative states  
Emily Hargave-Thomas, Neil Broom, Ashvin Thambyah

Poster No. 1228  
Correlation of Non-destructive Electromechanical Probe (Arthro-BST) Assessment with Histological Scores and Mechanical Properties in Human Tibial Plateau  
Sotcheadt Sim, Anik Chevrier, Martin Garon, Eric Quenneville, Michael D Buschmann

PS2 CARTILAGE, SYNOVIIUM AND OSTEOARTHRITIS - GENE THERAPY

Poster No. 1229  
Effect of Binding Peptide Length and Concentration on Augmentation of IGF-I Gene Therapy for Chondrocytes  
Izath N Aguilar, Stephen B Trippel, Shuiliang Shi, Lawrence J Bonassar

Poster No. 1230  
Effects Of Static Versus Dynamic Culture Conditions Upon The Chondrogenic Differentiation Potential of Human Bone Marrow Aspirates Following rAAV-mediated Overexpression Of sox9  
Jagadeesh K Venkatesan, Ana Rey-Rico, Janina Frisch, Gertrud Schmitt, Henning Madry, Magali Cucchiarini

Poster No. 1231  
Effects Of rAAV Sox9 Gene Transfer Upon The Chondrogenic Differentiation Of HmScs Seeded In Polyurethane Scaffolds  
Jagadeesh K Venkatesan, Ana Rey-Rico, Oliver Gardner, Gertrud Schmitt, David Eglint, Mauto Alini, Martin Stoddart, Magali Cucchiarini, Henning Madry

Poster No. 1232  
Benefits Of Using PEO-PPO Copolymers For The Effective Delivery Of rAAV Vectors In Human Bone Marrow-derived Mesenchymal Stem Cells  
Ana Rey Rico, Alvarez-Lorenzo Carmen, Angel Concheiro, Henning Madry, Magali Cucchiarini

Poster No. 1233  
Early Changes in Synovial Protease Gene Expression after Surgical Induction of Post-Traumatic Osteoarthritis in a Porcine Large Animal Model  
Jakob T Sieker, Ugur M Ayturk, Benedikt L Proffen, Braden C Fleming, Martha M Murray

Poster No. 1234  
Magnetic Resonance-Guided Focused Ultrasound for Treatment of Arthritic Pain in a Sheep Model  
Adam Wilson, Xuejun Du, Chunxi Yang, Arik Hananel, Xinlin Yang, Jourdan Cancienne, Richard Price, Abhijit Dighe, Quanjun Cui

Poster No. 1235  
Wisp1 Aggravates Osteoarthritis By Modulation Of TGF-β Signaling And Positive Regulation Of Canonical Wnt Signaling  
Martijn H van den Bosch, Arjen B Blom, Azusa Maeda, Tina M Kilts, Esmeralda N Blaney Davidson, Wim B van den Berg, Floris P Lafeber, Peter L van Lent, Marian F Young, Peter M van der Kraan

Poster No. 1236  
Nrf2 Is A Novel Regulator Of Sox-9 In Chondrocytes  
Athanassios Fragoulis, Rainer Beckmann, Claudius Conrads, Mersedeh Tohidnezhad, Thomas Pufe, Christoph J Wruck, Mary B Goldring, Holger Jahr

Poster No. 1237  
Akt Activation by Type II Collagen Peptide Leading to Nuclear Factor-κB Up-regulation in Osteoarthritic Chondrocytes: Its Inhibition by Hyaluronan  
Tadashi Yasuda

PS2 CARTILAGE, SYNOVIIUM AND OSTEOARTHRITIS - TISSUE ENGINEERING AND REPAIR

Poster No. 1238  
Acute Injury induced Fibrosis Is Mediated By Lysophosphatidic Acid  
Ling Wu, Frank Petrigl iano 1, Syoung Lee 1, David McAllister, Denis E yseenko

Poster No. 1239  
Comparative Analysis of Human Amnion and Adipose Derived Stem Cells for Regenerating Orthopaedic Tissues  
Natasha Topoluk, Renae K eeley, Jeremy Mercuri

Poster No. 1240  
Delayed Mechanical Loading for The Rehabilitation of Microfracture Surgery  
Monideepa Chatterjee, Miri Park, Brandon K Zimmerman, X. Lucas Lu

Poster No. 1241  
Cell-Cell Interactions Enhance Cartilage Formation in Gradient Hydrogels that Mimic Tissue Zonal Organization  
Danqing Zhu, Pavin Trinh, Fan Yang
Poster No. 1242
Overexpression of hsa-miR-7 Enhances Cartilage Regeneration by Osteoarthritic Chondrocytes
Lucienne A Vonk, Margit W Bleijjs, Angela H Kragten, Wouter J Dhert, Daniel B Saris, Laura B Creemers

Poster No. 1243
Exploring the Chondrogenic Effects and Mechanisms of Suramin on Mesenchymal Stem Cells
Monica P McNerney, Andrew J Steward, Diane R Wagner

Poster No. 1244
The Effect Of Superimposed Vibrations On Chondrocytes Subjected To Dynamic Compressive Loading
Joanna Weber, Stephen Waldman

Poster No. 1245
Controlling The Formation Of Mechanically Strong Cartilage By Self-assembly Of hMSCs On Substrate Coated Membrane Inserts
Johnathan Ng, Sarindh Bhumiratana, Ming Li, Gordana Vunjak-Novakovic

Poster No. 1246
Heterogeneous Growth of Engineered Cartilage Results From Gradients of Media Supplemented Active TGF-β and is Ameliorated Through the Alternative Supplementation of Latent TGF-β

Poster No. 1247
Comparison of Insulin, ITS And ITS+ On The Development of Tissue-Engineered Cartilage

Poster No. 1248
Modulation of Hydrogel Crosslinking Density to Promote Development of Functional Mechanical Properties in Engineered Cartilage
Eben G Estell, Andrea Tan, Sonia Bansal, Gerard Ateshian, Clark T Hung

Poster No. 1249
Characterization of a Human Chondrocyte-Agarose System for Engineering Cartilage: The Importance of Cell Seeding Density
Alexander D Cigan, Robert J Nims, Michael B Albro, Brian K Jones, Hadley J Feingold, Gordana Vunjak-Novakovic, Clark T Hung, Gerard A Ateshian

Poster No. 1250
Long-Term Storage and Preservation of Tissue Engineered Articular Cartilage
Adam B Nover, Stephanie L Lee, William T Yu, Robert M Stefani, Gerard A Ateshian, Aaron M Stoker, James L Cook, Clark T Hung

Poster No. 1251
Glucose- and TGF-β-Dependent Matrix Synthesis Models Explain Heterogeneous Matrix Deposition in Large Engineered Tissues
Robert J Nims, Alexander D. Cigan, Michael B Albro, Clark T. Hung, Gerard A. Ateshian

Poster No. 1252
Cartilage Mechanobiology: Is It Governed By Solid- Or Fluid-dependent Phenomena?
Philippe Abdel-Sayed, Stefania Rissone, Dominique Pioletti

Poster No. 1253
Genome Engineering Using CRISPR/Cas9 To Generate IL-1-resistant Induced Pluripotent Stem Cells For Cartilage Tissue Engineering
Jonathan M Brunger, Ananya Zutshi, Vincent P. Willard, Charles A. Gersbach, Farshid Guilak

Poster No. 1254
Evaluation of Micro and Nano-scale Scaffold Architectures For Osteochondral Tissue Engineering
Liliana F. Mello, Saahil Mehandale, Mahsa Mohiti-Asli, Michael A. Taylor, Christian Pedersen, Rohan A. Shirwaiker, Elizabeth G. Loboa

Poster No. 1255
Scaling Media to Construct Surface Area Improves Functional Maturation of Mesenchymal Stem-Based Engineered Cartilage
Elizabeth A Henning, Megan J Farrell, David R Steinberg, Robert L Mauck

Poster No. 1256
Biphasic Finite Element Modeling Reconciles Mechanical Properties of Engineered Cartilage Constructs Derived from Different Testing Modalities
Gregory R Meloni, Brendan D Stoeckl, Matthew B Fisher, George R Dodge, Robert L Mauck

Poster No. 1257
Anatomic Mesenchymal Stem Cell-Seeded Engineered Cartilage Constructs for Biologic Joint Replacement
Vishal Saxena, Minwook Kim, Robert L. Mauck

Poster No. 1258
Human Amniotic Fluid-derived Stem Cells As A Novel Cell Type To Enhance Cartilage Repair In Combination With Hypoxia And A Collagen-hyaluronic Acid Scaffold
Cai Lloyd-Griffith, Amos Matsiko, Garry P Duffy, Fergal J O’Brien

Poster No. 1259
The Bioengineering Chondrocyte Sheets Serves As Cell Source For Cartilage Repair
Ryo Shimizu, Naosuke Kamei, Nobuo Adachi, Mitsuo Ochi

Poster No. 1260
Improved Collagen Type II Expression In Chondrocytes Under Physiological Osmolarity Upon Tgfβ2 Knockdown
Ufuk Tan Timur, Anna van der Windt, Esther Haak, Harrie Weinans, Jenny Visser, Tim J Welting, Marjolein Caron, Pieter J Emans, Holger Jahr
<table>
<thead>
<tr>
<th>Poster No. 1261</th>
<th>Novel Infrared Parameters for Assessment of Full-depth Matrix Changes in Engineered Cartilage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uday P Palukuru, Cushiha McGoverin, Ramya Ailavajhala, Farzad Yousefi, Nicholas Cacesse, Padraig Glenn, Nancy Pleshko</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1262</th>
<th>Friction-Based Detection of Damage Resulting From the Application of Frictional-Shear Stress on Engineered Cartilage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G. Adam Whitney, Joseph Mansour, James E Dennis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1263</th>
<th>Hybrid 3-Dimensional Nanofiber Scaffold For Articular Cartilage Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Philip Tatman, William Gerull, Jeffrey Davis, Sean Sweeney-Easter, Albert O Gee, Deok-Ho Kim</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1264</th>
<th>Effect of Molecular Weight Of Hyaluronan on Chondrogenic Effect in Adipose Derived Stem Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shun Cheng Wu, Je Ken Chang, Mei Ling Ho</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1265</th>
<th>Measurement Of Residual Enzyme And Enzyme Penetration Depth In Partially Digested Cartilage Tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Powei Lee, Chunan Chen, Alex McNally, Kurt Sly, Chris Chapman, Steve Lin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1266</th>
<th>Nell-1 Restores Delayed Chondrocyte Maturation Caused by Runx2 Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chen-Shuang Li, Caroline Chung, Jie Jiang, Xinli Zhang, Kang Ting, Chia Soo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1267</th>
<th>Contrast Enhanced Micro-Computed Tomography of Growth Plate Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lauren M Mangano, Louis Gerstenfeld, Elise F Morgan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1268</th>
<th>3T MRI, Histologic and Second Harmonic Generation Microscopic Evaluation of Femoral Trochlear Epiphyseal Growth Cartilage Matrix and Vascularization of Foals Predisposed To Osteochondrosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gabrielle Martel, Sabrina Kiss, Charles-André Couture, Guillaume Gilbert, Hélène Richard, Thomas Moser, François Légaré, Sheila Laverty</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1269</th>
<th>Histological Characterization of Joint Lesions in a Feline Model of Sandhoff Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cathy S Carlson, Elizabeth R. Nussbaum, Patricia Beadlescomb, Miguel Sena-Estoves, Ashley N. Randle, Aime K Johnson, D. Ray Willhite, Douglas R. Martin, Margaret McNulty</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1270</th>
<th>Ligand Dependent RARy Signaling Regulates Chondrocyte Maturation in Growth Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kenta Uchibe, Agnese Di Rocco, Rebecca Berger, Sayantani Sinha, Colleen Larmour, Motomi Enomoto-Iwamoto, Masahiro Iwamoto</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1271</th>
<th>Hypoxia-Inducible Factor 3-alpha Expression is Associated with the Stable Chondrocyte Phenotype in Human Chondrogenic Cells and Tissues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brandon D Markway, Holly Cho, Jevgenia Zilberman-Rudenko, Paul Holden, Audrey McAlinden, Brian Johnstone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1272</th>
<th>Early Detection Of Growth Plate Change Using MR Images After Growth Plate Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Masashi Nakase, Wook-Cheol Kim, Kazuya Ikoma, Motoo Hosokawa, Takashi Yoshida, Yoshinobu Oka, Naotake Yamada, Yoshihiro Kotoura, Atsushi Nishida, Kouichi Yokozeki, Mitsuhiro Kawata, Toshikazu Kubo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1273</th>
<th>Role of Apoptosis in Development of Early Osteochondrosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stacy Semevolos, Katja Dueisterdieck-Zellmer, Maureen Larson</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1274</th>
<th>Seamless Multiscale Imaging and Computational Modeling of Molecular Communication in the Osteoarthritic Knee Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lauren Kark, Lucy Armitage, Dan Hagerman, Roy K Aaron, Melissa L. Knothe Tate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1275</th>
<th>Osteoarthritis-like Phenotype Induced By Advanced Glycation Endproducts Alters Chondrocyte Cytoskeleton Organization, Mechanical Properties, And Metabolic Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jenny Liu, Alisa Moyer, Kaixi Wang, Simon Tang</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1276</th>
<th>Effect of Counterface on Cartilage Boundary Lubricating Ability by Proteoglycan 4 and Hyaluronan: Cartilage-Glass vs Cartilage-Cartilage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Saleem Abubacker, Allison E McPeak, Sam G Dorosz, Philip Egberts, Tannin A Schmidt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1277</th>
<th>Metabolic Activities in Mevalonate Pathway could affect the Intracellular Calcium Signaling of In Situ Chondrocytes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jie Ma, Yilu Zhou, Liyun Wang, X. Lucas Lu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster No. 1278</th>
<th>Mechanical Activation of the Mammalian Target of Rapamycin Complex 2 Signaling is Required for Stimulation of the Hypertrophic Marker Type X Collagen in Chondrocytes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yingjie Guan, Xu Yang, Qian Chen</td>
</tr>
</tbody>
</table>
Poster No. 1279  
**Confined Compression of Chondrocyte-Hydrogel Construct Leads to Highly Inhomogeneous Strain Distribution Within**  
Sophia Leung, Susan McGlashan, Jillian Cornish, David Musson, Iain Anderson, Vickie Shim

Poster No. 1280  
**A Stoichiometric Matrix Model of the Biochemical Network of Central Energy Metabolism in Human Cells for Understanding Chondrocyte Mechanotransduction**  
Cody Minor, Daniel Salinas, Ross P Carlson, Brendan Mumey, Ronald June

Poster No. 1281  
**Whole Body Vibration Increases Cartilage Thickness Without Histopathologic Changes**  
William Runge, Laurence Dahners, Denis Marcellin-Little, Stephen Kallianos, Paul S Weinhold

Poster No. 1282  
**Proliferation And Metabolic Function Regulated With Hydrostatic And Compressive Distortional Stresses In Human Articular Chondrocytes In Vitro**  
Takahiro Ogura, Akihiro Tsuchiya, Andreas Gomoll, Tom Minas, Thomas S Thornhill, Shuichi Mizuno

**PS2 CARTILAGE, SYNOVUM AND OSTEOARTHRITIS - CYTOKINES, INFLAMMATION**

Poster No. 1283  
**Responses of Infrapatellar Fat Pad to Cytokine Stimulation In Vitro**  
Aaron Stoker, Catherine Jones, James L Cook

Poster No. 1284  
**Effects of PRP on Subacromial Bursal Synoviocytes**  
Hyang Kim, Seung-Yeon Lee, Hye-Youn Kim, Ji-Sun Shin, Won-Kee Park, Kang Sup Yoon, Chris Hyunchul Jo

Poster No. 1285  
**Synovium-Derived Mesenchymal Stem Cells Inhibit Inflammatory Processes of Chondrocytes From Osteoarthritis Patients in Noncontact Coculture Systems**  
EH Lee, Kee Yun Chung, HJ Min, SY Wang, HJ Park, Hyuksoo Han, Sahnghoon Lee, Myung Chul Lee

Poster No. 1286  
**Indication of IRE1 Endonuclease Specific Inhibitor for Rheumatoid Synovitis**  
Soutarou Izumi, Tomoyuki Nakasa, Shigeru Miyaki, Mitsuo Ochi

Poster No. 1287  
**Centrosomal Protein 70kda Is Down-regulated By Decoy Receptor 3 In Specifically Rheumatoid Synovial Fibroblasts**  
Koji Fukuda, Yasushi Miura, Toshihisa Maeda, Shinya Hayashi, Masahiro Kurosaka

Poster No. 1288  
**Lubricin/Proteoglycan-4 Inhibits Pro-inflammatory Cytokine Induced Synoviocyte Proliferation via CD44-Interaction**  
Afnan Al-Sharif, Tannin Schmidt, Gregory Jay, Khaled A Elsaid

Poster No. 1289  
**Increased Synovial-Based Inflammation in Glenohumeral Rotator Cuff Tears and Osteoarthritis**  
Geoffrey D Abrams, Ayala Luria, Rebecca A Carr, Christopher Rhodes, William H Robinson, Jeremy Sokolove

Poster No. 1290  
**Cyclic Compressive Load To Three-dimensional Cultured Tissue Derived From Human Synovial Cells Up-regulates Prostaglandin E2 Production Through lL6 Signaling**  
Yuzuru Ueda, Yasukazu Yonetani, Shinya Yatani, Tomoko Okamoto, Fuminori Kawano, Naoya Nakai, Tatsuo Mae, Hideki Yoshikawa, Ken Nakata

Poster No. 1291  
**IL-15 induces Increased Matrix Metalloproteinase-1 and -3 release from Human Articular Cartilage**  
Anjali Nair, Arnazav Hakimiyan, Lev Rappaport, Arkady Margulis, Susanna G Chubinskaya, Carla R Scanzello

Poster No. 1292  
**Reduced Expression of Circadian Rhythm Genes in Human Osteoarthritis Cartilage: Suppression of NR1D1 and BMAL1 Alters TGF-β Signaling in Chondrocytes**  
Ryuichiro Akagi, Kathleen M Fisch, Oscar Alvarez-Garcia, Takeshi Teramura, Yuta Muramatsu, Masahiko Saito, Takahisa Sasho, Andrew I Su, Martin Lotz

Poster No. 1293  
**Hyperglycemia-induced Inflammatory Responses and Collagen Degradation in Human Chondrocytes and Diabetic Mouse Cartilages via a PPARγ Signaling Pathway**  
Shing H Liu, Ying-Ju Chen, Chen Y Chiu, Rong S Yang

Poster No. 1294  
**Effects Of PRP And Dexamethasone On Synoviocytes**  
Hyang Kim, Seung-Yeon Lee, Hye-Youn Kim, Ji-Sun Shin, Won-Kee Park, Kang Sup Yoon, Chris Hyunchul Jo

Poster No. 1295  
**Hyaluronan Inhibits Tlr-4 Dependent Rankl And Cathepsin K Expression In Human Rheumatoid Arthritis Synovial Fibroblasts**  
Tatsuo Watanabe, Toshihisa Kojima, Nobunori Takahashi, Naoki Ishiguro

Poster No. 1296  
**Biological Effect of Regulatory T Cells by Tocilizumab and Its Predictive Therapeutic Gain Factor in Rheumatoid Arthritis Patients**  
Tomoka Yoshikawa, Toru Yamakawa, Kunikazu Ogawa, Mamoru Matsumoto, Satoshi Hosoi, Akihiro Sudo

Poster No. 1297  
**B Induced Smad1/5 And Smad2/3 Phosphorylation Is Both Alk5 And Takt1 Dependent in Chondrocytes**  
Arjan van Caam, Wojciech Madej, Esmeralda Blaney Davidson, Peter van der Kraan

Poster No. 1298  
**Vitamin D Analogue For The Inhibition Of Matrix Metalloproteinases (mmps) In Treatment Of Osteoarthritis**  
Hongsik Cho, Alexander Hicks, Keith Nord, Margaret Powell, Andrzej Slominski, Karen A Hasty
Poster No. 1309

**Link N Suppresses Interleukin-1β Induced Human Osteoarthritic Cartilage Degradation Through Down-regulation of NF-κB Signalling**

Omar Salem, Motaz Ala'qeel, Michael P Grant, Laura Mery Epure, Olga L Huk, John Antoniou, Jackson Mwale

Poster No. 1310

**Restoration of Chondroprotection by rhPRG4 in IL-1α Stimulated Cartilage Explants**

Katherine Larson, Gregory Jay, Braden Fleming, Tannin Schmidt, Khaled A Elsaid

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Poster No. 1301

**Tristetraprolin Is A Negative Regulator Of SOX9 mRNA And Binds To Sequences Within Its 3’UTR**

Ben T McDermott, Peter D Clegg, Simon R Tew

---

Poster No. 1302

**Endoplasmic Reticulum (er) Stress Induces Mitochondrial Dysfunction In Chondrocytes**

Raghunatha Yammanni

---

Poster No. 1303

**Decreased Hdac4 Plays A Critical Role In Human Oa Cartilage Degeneration By Releasing Hdac4 Inhibition Of Runx2 And Increasing Oa-related Genes**

Kun Cao, Xiaochun Wei, Li Guo, Shaowei Wang, Pengcui Li, Changqi Sun, Lei Wei

---

Poster No. 1304

**Potent Role Of Sirt6 In The Crosstalk Between Metabolic Syndrome And Osteoarthritis**

Allikiding Maierhaba, Aibibula Zulipiya, Iwata Munetaka, Jinying Piao, Guangwen Jin, Daisuke Koga, Atsushi Okawa, Sadao Morita, Yoshinori Asou

---

Poster No. 1305

**NBQX, An AMPA-Kainate Glutamate Receptor Antagonist, Alleviates Inflammation And Pain Related Behaviour In Two Models Of Osteoarthritis**

Cleo S Bonnet, Sophie J Gilbert, Anwen S Williams, David A Walsh, Deborah J Mason

---

Poster No. 1306

**Effect of Preparation Technique on Anti-inflammatory Properties of Autologous Therapies**

William King, Kathleen Steckbeck, Krista O’Shaughnessey Toler, Jennifer Woodell-May

---

Poster No. 1307

**Thermal Therapy with a Resonant Cavity Applicator for Osteoarthritis**

Akiko Sato, Kenji Takahashi, Yasuhiro Shindo, Kazuo Kato, Hiroshi Nakamura, Shinoh Takai

---

Poster No. 1308

**Gro-αalpha Induces IL-6 Production In Human Synovial Fibroblasts Through Fak, Mapk And Ap-1 Pathways**

Ju-Fang Liu, Sheng Mou Hou, Chun Han Hou

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Poster No. 1309

**Comparison of Synovial and Infrapatellar Fat Pad Tissue Response to Cytokine Stimulation Using an In Vitro Co-culture Model**

Nicole Walden, Aaron Stoker, Nikki Werner, James L Cook

---

Poster No. 1310

**Synovial Stimulation of Sensory Neurons by Nerve Growth Factor Augments Osteoarthritic Pain**

Xin Li

---

Poster No. 1311

**PS2 CARTILAGE, SYNOVIM AND OSTEOARTHRITIS - AGING**

**scAAVIL-1ra Dosing Trial in a Large Animal Model and Validation of Long-Term Expression with Repeat Administration for Osteoarthritis Therapy**

Laurie R Goodrich, Joshua Grieger, Jennifer Phillips, Nadia Khan, Steven Gray, C Wayne McIlwraith, R. Jude Samulski

---

Poster No. 1312

**Hypercoagulability and Arterial Pathology in Human Osteoarthrosis**

Roy K Aaron, Manuel Garcia Toca, Anne Voisinet, Jennifer Racine

---

Poster No. 1313

**Bone Turnover Markers In The Synovial Fluid are Correlated With The Articular Cartilage Loss In The Patients With Knee Osteoarthrosis**

Kenichi Kurata, Yoshitomo Saita, Taisuke Satou, Ryo Sadatsuki, Yohei Kobayashi, Syunya Kamano, Susumu Fukasaku, Kazuo Kaneko, Masayuki Nemoto

---

Poster No. 1314

**Chondrotoxic Effects of Local Analgesics: Effect of Lidocaine on chondrocytes under Low Osmotic Conditions As Seen in Osteoarthrosis**

Shigeru Kobayashi, Tsuyoshi Miyazaki, Kenichi Takeno

---

Poster No. 1315

**Effect Of Parathyroid Hormone On Early Chondrogenic Differentiation From Mesenchymal Stem Cells**

Ken Kumagai, Yun Zhang, Tomoyuki Saito

---

Poster No. 1316

**Chondrogenesis Of Human Embryonic Stem-derived Progenitor Cells In A High-throughput Three-dimensional Culture System: Application To A Metabolic Study**

Shintaro Shoju, Mary Lenz, Hal Sternberg, Francois Binette, Koichi Masuda

---

Poster No. 1317

**Characterizing the Cellular Response of the Articular Cartilage at the Ankle to Injury by Cyclical Compression in a Mouse**

Tarik S Onur, Ruobin Wu, Stacey T. Chu, Cole Sitron, Wenhan Chang, Alexis B.C. Dang

---
Poster No. 1318
Clinical Reaction After Repeated Intra-articular Injection Of Allogeneic Mscs Compared To Autologous In Normal Joints
Ashlee Watts, Amanda-Jo Joswig, Roger Smith, Chad Marsh, Kevin Cummings

Poster No. 1319
Reconstruction Of Osteochondral Defects Using A Microenvironment Created From Autologous Endothelial Progenitor Cells And Porous Piga Scaffolds In A Rabbit Model
Tzu-Hsiang Lin, Nai-Jen Chang, Horng-Chaung Hsu, Ming-Long Yeh

Poster No. 1320
Mesenchymal Stem Cell Differentiation in Agarose Scaffolds is Superior to Differentiation in Collagen Scaffolds for Cartilage Tissue Engineering Applications
Jose L Ramirez-GarciaLuna, Antonio A Gordillo-Moscoso, Juan M Shiguemoti-Medina, America S Mares-Garcia, Jorge F Toro-Vazquez, Mauricio Pierdant-Perez

Poster No. 1321
A Statistically-Augmented Computational Platform For Designing And Optimizing Meniscal Replacements
Hongqiang Guo, Thomas J Santner, Tony Chen, Hongsheng Wang, Caroline Brial, Susannah Gilbert, Matthew F Koff, Amy L Lerner, Suzanne A Maher

Poster No. 1322
Micromechanical Heterogeneity and Anisotropy of the Meniscus Extracellular Matrix
Qing Li, Feini Qu, Biao Han, Robert Mauck, Lin Han

Poster No. 1323
Meniscal Material Properties Obtained From In Vitro MRI Data
Maren Freutel, Fabio Galbusera, Anita Ignatius, Lutz Dürselen

Poster No. 1324
Strain-Dependent and Anisotropic Diffusion of Glucose in Meniscus Fibrocartilage
Kelsey L Kleinhans, Lukas M Jaworski, Alicia R Jackson

Poster No. 1325
Comparing the Transient Osmotic Swelling of Articular Cartilage and Meniscal Fibrocartilage in Confined Compression
Eva G Baylon, Marc E Levenston

Poster No. 1326
Biomechanics of the Transitional Zone between the Meniscus and Its Ligamentous Attachments
Lutz Dürselen, Natalie B Scholz, Andreas M Seitz, Anita Ignatius, Maren Freutel

PS2 MENISCUS - BIOLOGY AND REPAIR
Poster No. 1327
Intra-articular Injection Of Synthetic Microrna-210 Accelerates Avascular Meniscal Healing In Rat Medial Meniscal Injured Model
Yoshitaka Kawanishi, Tomoyuki Nakasa, Takeshi Shoji, Michio Hamanishi, Ryo Shimizu, Naosuke Kamei, Muhammad Andry Usman, Mitsuo Ochi

Poster No. 1328
Seamless Healing of Inner Meniscus Tears by Temporal Control of Stem Cells Recruitment and Step-Wise Fibrocartilaginous Differentiation
Chang H Lee, Kristy Kao, Yena Jun, David Joo

Poster No. 1329
Meniscal Regeneration using a Bovine Dermal Collagen Matrix
Mark A Randolph, Sanford C Edwards, Amanda M Meppelink, Thomas J Gill

Poster No. 1330
Photochemical Tissue Bonding of Fibrocartilage: A Potential Tool for Enhancing Meniscus Repair
Joy A Franco, Alberto L Arvayo, Marc E Levenston

Poster No. 1331
Mesenchymal Stem Cell Phenotype Changes in 3D Co-Culture with Meniscus Fibrochondrocytes
Mary Clare McCorry, Lawrence Bonassar

Poster No. 1332
Hyaluronan Modulates Gene Expression And Proliferative Activity In Human Meniscus Cells
Takaaki Tanaka, Takayuki Furumatsu, Shinichi Miyazawa, Masataka Fujii, Hiroto Inoue, Naoko Kashihara, Toshifumi Ozaki

Poster No. 1333
The Role of the Hypoxia-inducible Factor (HIF) Pathway in Normal and Osteoarthritic Meniscus
Austin V Stone, Richard F Loeser, Michael Callahan, Kadie S Vanderman, David L Long, Margaret A McNulty, Raghu Yammani, Cristin M Ferguson

Poster No. 1334
Histopathologic Analysis of Degenerative Meniscal Root Tears; Emphasis on Fibrocartilage Formation and Calcification
Do Young Park, Byoung-Hyun Min

Poster No. 1335
Analysis of the Metabolic Response of Meniscal Tissue to Injury and Inflammation in vitro
Alex Cook, Aaron Stoker, Ferris Pfeiffer, James L Cook
Poster No. 1336

**Hypoxic Culture Conditions Induce Increased Metabolic Rate and Collagen Expression in ACL-derived Cells**

Tomasz J Kowalski, Natalie Leong, Ling Wu, Nima Kabori, Adam Khan, Andrew Pedron, Ashant Karayant, Siyoung Siyoung, Benjamin Wu, Denis Evseenko, David R McAllister, Frank A Petrigliano

Poster No. 1337

**Effects Of High Glucose On Cell Apoptosis, Cell Proliferation And Tenogenic Marker Expression Of Tendon-derived Stem Cells In Vitro**

Yu-Cheng Lin, Chen Wang, Xin Zhang, Liu Shi, Yun-Feng Rui

Poster No. 1338

**The Effects of Fibrin Gel on Viability of Bone Marrow Stem Cells**

Kosuke Uehara, Chunfeng Zhao, Anne Gingery, Andrew Thoreson, Kai-Nan An, Peter C. Amadio

Poster No. 1339

**An Irradiation-And-Injection Approach to Study TSC Differentiation in a Mouse Treadmill Running Model**

Jianying Zhang, James H-C. Wang

PS2 TENDON/LIGAMENT - REPAIR AND TISSUE ENGINEERING

Poster No. 1340

**Multidisciplinary Evaluation of Treatments for Achilles Tendon Ruptures During Early Healing in an Animal Model**


Poster No. 1341

**Modulation of Rat Ligament Healing using Primed Mesenchymal Stem Cells**

Erin Saether, Connie Chamberlain, Stacey Brickson, Erdem Aktas, Ray Vanderby

Poster No. 1342

**In Vivo Evaluation of Tissue-Engineered Constructs for Anterior Cruciate Ligament Reconstruction**

Natalie L Leong, Nima Kabori, Armin Arshi, Azadeh Nazemi, Frank A Petrigliano, Benjamin Wu, David R McAllister

Poster No. 1343

**Silk/Hydroxyapatite Composite Scaffold for Soft-to-Hard Tissue Interface Regeneration in Anterior Cruciate Ligament Reconstruction**

Thomas K.H. Teh, Pujiang Shi, Kelei Chen, Xiafei Ren, Siew Lok Toh, James H Hui, Jun Li, James CH Goh

Poster No. 1344

**What Are The Proteomic Differences Between Tendon, Ligament And 3D Tissue Engineered Tendon And Ligament Constructs?**

Yalda Ashraf Kharaz

Poster No. 1345

**Fibrin Glue Does Not Improve Rotator Cuff Healing in a Rat Model**

Michael Schae, Richard Ma, Marco Sisto, Will Gu, Ashley Titan, Xiang-Hua Deng, Scott Rodeo

Poster No. 1346

**Comparison Of Cellular Composition and Cytokine-release Kinetics according to the Platelet-rich Plasmas (PRPs) Preparation**

Joo Han Oh, Young Hak Roh, Woo Kim

Poster No. 1347

**The Effect of PRP with Gelatin Hydrogel Sheets on Rotator Cuff Repair**


Poster No. 1348

**Flat and 3D Electrospun Scaffolds for Ligament Tissue Engineering: Mechanical Properties and Cellular Response**

Hannah Pauly, Ketul Popat, Daniel Kelly, Tammy Donahue

Poster No. 1349

**Evaluation of Bioadhesive Mesh Construct to Augment Achilles Tendon Repair in a Rabbit Model**

Yan Lu, Brett Nemke, Jackie Kondratko, Vicki kalscheur, Gino Bradica, Ray Vanderby, Mark D. Markel

Poster No. 1350

**Characterization And In Vivo Response Of A Mechanically-active Shape-Memory Fabric For Soft-tissue Repair**

David L. Safranski, Kenneth M Dupont, Cambre Kelly, Jennifer Boothby, Angela Lin, Hazel Y Stevens, Robert E Guldberg

Poster No. 1351

**Synergistic Effects of Mechanical Stimulation and PDGF Nanoparticles on Tenocyte Differentiation of Adipose-Derived Stem Cells on Aligned Collagen Scaffolds**

Douglas A. Cornet, Larry D. Swain, David D Dean, Xingguo Cheng, Daniel P Nicoletta, Ramesh C. Srinivasan, Victor Louis Sylvia

Poster No. 1352

**BMP13 Up-regulates Genes Critical To Early Tendon Healing In Immortalized Tenocytes**

Sahitya K Denduluri, Bryan Scott, Joseph Daniel Lamplot, Tong-Chuan He

Poster No. 1353

**3D Microarchitecture Quantification Of Bone Regeneration During Bone-tendon Junction Healing By SR-μCT**

Daqi Xu, Cheng Zheng, Zhanwen Wang, Can Chen, Huabin Chen, Jianzhong Hu, Hongbin Lu
Poster No. 1354
**Rotator Cuff Repair with a Tendon-Fibrocartilage-Bone Composite Bridging Patch**
Xiaoji Ji, Qingshan Chen, Andrew R Thoreson, Jin Qu, Kai-Nan An, Peter C. Amadio, Scott P Steinmann, Chunfeng Zhao

**PS2 TENDON/LIGAMENT - CELL BIOLOGY**

Poster No. 1355
**Epigenetic Changes In A Murine Model Of Tendinopathy**
Katie J Trella, Jun Li, Jonathan Frank, Katalin Mikecz, Jorge Galante, John Sandy, Vincent M Wang, Anna Plaa, Robert Wysocki

Poster No. 1356
**Probing Potential Mechanisms of Collagen Crimp Formation During Embryonic Tendon Development**
Zachary L Tochka, Nathan R Schiele, Catherine K Kuo

Poster No. 1357
**Cathepsin Activity in Supraspinatus Tendinopathy: Identification in Human Chronic Tears and Temporal Induction in a Rat Overuse Model**
Akia N Parks, Song Seto, Jennifer McFatine-Figueroa, Louis J. Soslowsky, Spero Karas, Timothy Ghattas, Harris Slone, Gregory Tayrose, Manu O. Platt, Johnna Temenoff

Poster No. 1358
**Biologic Environment of MRL/MpJ Tendon Healing Correlates With Extent of Ear Punch Regeneration**
David Shiovitz, Harmandeep Singh, Meagan Robles-Harris, Rebecca Bell, Arun Fricker, Damien Laudier, Nelly Andarawis-Puri

Poster No. 1359
**Ablation Of Hyaluronan Synthase 1 Or 3 Primarily Affects The Phenotype Of The Achilles Rather Than The Flexor Digitorum Longus Tendon In Skeletally Mature Mice**
Katie J Trella, Jun Li, Carol DeLa Motte, John Sandy, Anna Plaa, Vincent M Wang

Poster No. 1360
**Influence Of Lidocaine On Torn Rotator Cuff Tendon**
Hirokazu Honda, Masafumi Gotoh, Tomonoshin Kanazawa, Hidehiro Nakamura, Hiroki Ohzono, Hisao Shimokobe, Naoto Shiba

Poster No. 1361
**The Proteome and Turnover rate of the Tendon Interfascicular Matrix Alters with Ageing**
Chavaunne T Thorpe, Mandy J Peffers, Deborah Simpson, Elizabeth Halliwell, Hazel RC Screen, Peter Clegg

Poster No. 1362
**Age-related Changes in Mouse Intrasynovial Tendons**
Masanori Hayashi, Kazutaka Uemura, Shigeharu Uchiyama, Masatoshi Komatsu, Hiroyuki Kato

Poster No. 1363
**Overload Damage Results In Early Inflammation In Tendon**
Ewa M Spiesz, Chavaunne T Thorpe, Saira Chaudhry, Graham P Riley, Helen L Birch, Peter Clegg, Hazel RC Screen

Poster No. 1364
**WITHDRAWN**

Poster No. 1365
**Effect of Short and Long Durations of Systemic Apoptotic Inhibition on Apoptotic Activity of Fatigue Damaged Patellar Tendons**
Meagan Robles-Harris, Alison Pruzan, Damien Laudier, Evan L Flatow, Nelly Andarawis-Puri

Poster No. 1366
**Accumulation Of Pentosidine And Receptors For Advanced Glycation End Products (RAGE) In The Native Tendon Of Type 2 Diabetes Rat**
Atsushi Yokota, Hiroshi Katoh, Naomune Yamamoto

Poster No. 1367
**Three Dimensional Ultrastructural Analysis Of The Postnatal Development At The Supraspinatus Insertion With FIB/SEM Tomography**
Tomonoshin Kanazawa, Masafumi Gotoh, Kei-ihiro Nakamura, Naoto Shiba

Poster No. 1368
**Angiopoietin-like Protein 2 Contributes To The Degeneration And Hypertrophy Of Ligamentum Flavum In Lumbar Spinal Canal Stenosis**
Takayuki Nakamura, Toru Fujimoto, Takafumi Nakamura, Hiroshi Mizuta

Poster No. 1369
**Genome-wide DNA Methylation Analysis Of Ligamentum Flavum In Patients With Lumber Spine Stenosis**
Sadayuki Ito, Ken Watanabe, Taiki Mori, Eri Ara, Yae Kanai, Atsushi Harada, Shumpei Niida, Yoshihito Sakai

Poster No. 1370
**Differences in Elements Between Intact and Disrupted Human Ligamenta Capitum Femorum**
Yasushi Shinozara, Tsukasa Kumai, Ichiro Higashiyama, Yasuhiro Tanaka

Poster No. 1371
**A Comparison of the Effects of Using Radiofrequency Energy Compared to Sharp Transection for Tenoscopic Desmotomy of the Superior Check Ligament in Horses**
Brad B Nelson, Chris E. Kawcak, E. J. Ehrhart, Laurie R Goodrich

**PS2 TENDON/LIGAMENT - MECHANICS**

Poster No. 1372
**P2 Porous Titanium Implants Improve Early Tendon Healing in a Rat Supraspinatus Repair Model**

Poster No. 1373
**Tendon Healing in a Supraspinatus Tear and Repair Rat Model is not Altered by Overuse-induced Tendinopathy**
Jennica J Tucker, Brianne K Connizzo, Corinne N Riggin, Robert L Mauck, David R Steinberg, Andrew F Kuntz, Louis J Soslowsky, Joseph Bernstein
Poster No. 1374
What Is The Best Candidate Allograft For Acl Reconstruction? An In Vitro Gliding Characteristics And Histological Study In A Canine Model
Jin Qu, Andrew Thoreson, Kai-Nan An, Peter C. Amadio, Thomas M. Schmid, Chunfeng Zhao

Poster No. 1375
Mechanical Over-loading Induced Non-tenocyte Differentiation Of TsCs Is Not Reversible By Rest
Jianying Zhang, James H-C. Wang

Poster No. 1376
Elastin Governs the Extracellular Mechanical Response of Ligament
Heath B Henninger, William R Valdez, Sara A Scottt, Jeffrey A Weiss

Poster No. 1377
Functionally Distinct Tendons have Dissimilar Collagen Fibril Architectures and Crosslinking, Leading to Differing Nanoscale Fatigue Damage Susceptibility
Tyler W Herod, Neil C Chambers, Samuel P Veres

Poster No. 1378
The Effect of Recombinant Human Parathyroid Hormone (rhPTH) on Tendon-to-Bone Healing in a Rat Rotator Cuff Model
Kyle R Duchman, Jessica Goetz, Bastian Uribe, Andrew Amendola, Joshua Barber, Allison Malandra, Carolyn Hettrich

Poster No. 1379
Comparison of EDC and Genipin Crosslinking to Stabilize Tendon Allografts after Sterilization
Justin W Rice, Aaron U. Seto, Christopher Mino, David Macknet, Charles J Gatt, Michael G Dunn

Poster No. 1380
Anisotropic Nonlinear Material Characterization Of The Human Anterior Longitudinal Ligament
Mitchell Hortin, Sarah Graham, Kara Boatwright, Peter Hyoung, Anton E Bowden

Poster No. 1381
Tendon Rupture At The Nanoscale: Damage To Collagen Fibrils Varies Substantially With Both Rupture Speed And Tendon Type
Neil C Chambers, Tyler W Herod, Samuel P Veres

Poster No. 1382
A Novel Study by Confocal Raman Micro-spectroscopy in the Rabbit Bone-tendon Junction of the Patella-patellar Tendon
Hongbin Lu, Wang Zhanwen, Jianzhong Hu

Poster No. 1383
Effect of High Fat Diet and Forced Exercise on Male C57BL/6 Achilles Tendon Biomechanical Properties
Gregory P Boivin, Ryan Roberts, Shawn A Hunter

Poster No. 1384
Expression Of Intracellular MMP-2 After Muscle Injury Does Not Increase With Aging
Lawrence Lee, Xuhui Liu, David H Lovett, Hubert Kim

Poster No. 1385
Intrinsic Transcriptional Regulation of Intracellular Matrix Metalloproteinase-2 in Skeletal Muscle Ischemia-Reperfusion Injury
Sunil Kumar Joshi, Lawrence Lee, Heejae Kang, David Lovett, Christopher Owens, Hubert Kim, Xuhui Liu

Poster No. 1386
Muscle Atrophy and Fatty Infiltration After an Acute Rotator Cuff Repair in a Sheep Model
Tammey Luan, Xuhui Liu, Jeremiah T Easley, Bharat Ravishankar, Christian Puttlitz, Brian Feeley

Poster No. 1387
P21 Deficiency Impaired The Regeneration Of Skeletal Muscle
Nobuaki Chinezi, Shinya Hayashi, Takeshi Ueha, Takaaki Fujishiro, Noriyuki Kanzaki, Shingo Hashimoto, Shuhei Sakata, Shinsuke Kihara, Katsuhiiko Haneda, Yoshitada Sakai, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 1388
A Screening To Identify A Clinically Applicable Drug Enhancing Muscle Growth For Sarcopenia And Other Muscle Wasting Diseases
Tetsuro Hida, Bisei Ohkawara, Masaki Matsushita, Mikito Tsushima, Shiro Imagama, Naoki Ishiguro

Poster No. 1389
Resveratrol Regulates RhoA GTPase And Decreases ROS Induced Apoptosis In Muscle Stem Cells Isolated From A Mouse Model Of Accelerated Aging
Xiaodong Mu, Aiping Lu, Mitra Lavasani, Seth David Thompson, Kurt Weiss, Johnny Huard

Poster No. 1390
The Role Of Non-myogenic Mesenchymal Stem Cells (nmMscs) In The Skeletal Muscle Pathology Of Muscular Dystrophy
Jihee Sohn, Ying Tang, Anthony M Ascoli, Aiping Lu, Bing Wang, Johnny Huard

Poster No. 1391
Use Of Pulsed Electromagnetic Fields (PEMF) To Improve Tenocyte Production Of Fibrotic-related Genes In An In Vitro Model
Dominique Laron, Xuhui Liu, Erik Waldorff, James Ryaby, Jeffrey C Lotz, Brian Feeley

Poster No. 1392
Effect Of Platelet Rich Plasma On Fatty Degeneration Of Rotator Cuff Muscles In Vitro And In Vivo.
Fumiki Takase, Atsuyuki Inui, Yutaka Mifune, Tomoyuki Muto, Yoshifumi Harada, Yasuhiro Ueda, Takeshi Kokubu, Masahiro Kurosaka
Poster No. 1393
Anabolic Steroids Reduce Muscle Degeneration Caused by Rotator Cuff Tendon Release in Sheep
Christian Gerber, Dominik C Meyer, Martin Flück, Brigitte von Rechenberg, Mario Benn, Karl Wieser

Poster No. 1394
Interaction between Myogenic and Non-myogenic Progenitor Cells during Muscle Regeneration
Aiping Lu, Jihee Sohn, Berkcan Akpinar, Johnny Huard

Poster No. 1395
Effects of Platelet-Rich Plasma on Musculotendinous Structure and Limb Function After Induced Tibialis Anterior Strain in Rats
Nasr A Abdel-Kader, Aliaa Rehan Youssef, Dina Sabry, Lubna O Abdel-Salam, Soheir M Mahfouz, Alaadeen A Balbaa

Poster No. 1396
Fatty Degeneration and vnt10b Expression in Supraspinatus Muscle after Surgical Repair of Torn Rotator Cuff Tendon.
Yoshiyuki Kuwahara, Koshi N Kishimoto, Yoshiaki Itoigawa, Eiji Itoi

Poster No. 1397
ASC Myogenesis Within A 3D Fibrin-Nanofiber Construct
Jordan E. Gilbert, Brian Ginn, Pinar Yilgor Huri, Colin A. Cook, Joshua P. Temple, Tracy Y. Zhang, Jeffrey M. Gimble, Kathryn Wagner, Hai-Quan Mao, Warren L. Grayson

Poster No. 1398
Reduced Muscle Stem Cells In Situ In Contractures From Children With Cerebral Palsy
Sudarshan Dayanidhi, Peter B Dykstra, Vera Lyubasyuk, Bryon R McKay, Henry Chambers, Richard L Lieber

Poster No. 1399
Transcutaneous Application Of CO2 Accelerates Muscle Injury Repair In Rat Models
Shiho Akahane, Yoshitada Sakai, Takeshi Ueha, Hanako Nishimoto, Keisuke Oe, Takahiro Niikura, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 1400
Spinal Muscle Quality Changes in Physically Active Individuals with Disc Degeneration
Ana E Rodriguez Soto, Jessica R Stambaugh, Jeannie Su, David B Berry, Sara P Gombatto, Laura Palomno, Karen R Kelly, Samuel R Ward

Poster No. 1401
Myokines Augment Wnt Signaling By Repressing Sost Expression
William Foster, Damian Genetos

PS2 BONE/BONE BIOLOGY - SKELETAL DEVELOPMENT

Poster No. 1402
Mechanosensitive MicroRNA-365 Regulates Orofacial Development and Targets Satb2, a Determinant of Craniofacial Patterning and Bone Formation, in Chondro-Lineage Cells
Yun Gao, Kun Yang, Qian Chen

Poster No. 1403
Hbm Mice Have Altered Bone Composition
Ryan D Ross, Maleeha Mashiatulla, Randy Smith, Lisa Miller, Mark L Johnson, D. Rick Sumner

Poster No. 1404
The Anabolic Effects of Electrical Stimulation on Endochondral Bone
Suzanne Lababidi, Ryan Fitzgerald, Kimberly Novak, Fouad Moussa, Cale Crowder, Melanie Morsch, Rebecca Kuntz Willits, Dennis Weiner, Fayez Safadi

PS2 BONE/BONE BIOLOGY - GENETICS, GENOMICS AND PROTEOMICS

Poster No. 1405
Periosteal Primary Cilia Are Necessary for Postnatal Longitudinal Growth in the Appendicular Skeleton
Emily Moore, Julia Chen, Christopher Jacobs

Poster No. 1406
Modulation Of Bone Homeostasis And Suppression Of Adipogenic Differentiation By Sulforaphane, A Naturally Occurring Isothiocyanate
Roman Thaler, Scott Riester, Markus Schreiner, Klaus Klaushofer, Franz Varga, Andre van Wijnen

Poster No. 1407
Viperin Expression in Chondrocytes is Linked to Expression of Col2a1
Mandy M.F. Steinbusch, Marjolein M.J. Caron, Franziska Eckmann, Ekkehart Lausch, Lodewijk W. van Rhijn, Bernhard Zabel, Tim J.M. Welting

Poster No. 1408
A Bayesian Approach to Assess the Transcriptome of Bone Aging and the Role of the Brd2 Gene in the Regulation of Sex Linked Bone Loss
Amira I Hussein, Joseph Wu, Mayetri Gupta, Louis Gerstenfeld

Poster No. 1409
Increased CKIP-1 within Osteoblast Suppress BMP Signaling to Inhibit Bone Formation During Aging
Jin Liu, Baosheng Guo, Defang Li, Chao Liang, Lei Dang, Xiaojuan He, Baoting Zhang, Xiaohua Pan, Lingqiang Zhang, Aiping Lu, Ge Zhang

Poster No. 1410
Age Diminishes the Upregulation of Wnt Ligands and the Anabolic Response of Bone to Single and Multiple Loading Bouts
Nilsson Holguin, Michelle Sanchez, Michael D Brodt, Matthew J Silva

Poster No. 1411
An Interleukin-15 Gene Polymorphism Is A Genetic Risk For Radiographic Progression Of Joint Destruction In Anti-citrullinated Peptide Antibody-negative Rheumatoid Arthritis
Shinji Yoshida, Katsunori Ikari, Koichiro Yano, Yoshiaki Toyama, Atsuo Taniguchi, Hisashi Yamanaka, Shigeki Momohara
Poster No. 1412

Early histological and molecular characterization of the local tissue microenvironment following blast-related post-traumatic injury in a rat model of heterotopic ossification
Ammar T Qureshi, Erica Crump, Donald Hope, Gabriel J Pavéy, Elizabeth C Martin, Jeffrey Gimble, Jonathan A Forsberg, Thomas A Davis

Poster No. 1413

Genetic variation in neuromedin U influences lean body mass and bone morphometry in males
Elizabeth A Hedges, Courtney Sprouse, Heather Gordish-Dressman, Michael Liu, Zachary Kendrick, Elizabeth Dominic, Jacqueline McKesey, Leticia M Ryan, Eric Hoffman, Joseph M Devaney, Laura L Tosi

PS2 BONE/BONE BIOLOGY - OSTEOBLASTS

Poster No. 1414

Inhibition of TGF-β signaling in osteoblasts leads to activation of Sost and Axin, Sclerosis-like pathologiical defects in mice
Hsin-Chiu Ho, Shanshan Shi, Tzong-Jen Sheu

Poster No. 1415

Pulsed electromagnetic fields stimulate osteogenic differentiation of MG63 cells by modulating notch pathway
Alessia Ongaro, Agnese Pellati, Leila Bagheri, Giorgio Aquila, Paola Rizzo, Stefania Setti, Ruggero Cadossi, Monica De Mattei

Poster No. 1416

A Novel role of mir-150 in Bone Homeostasis
Fouad M. Moussa, Gregory R. Sundag, Kimberly Novak, Thomas S. Mbimba, Bing Yu, Faye F. Safadi

Poster No. 1417

(-)-epigallocatechin gallate attenuates the induction of Hsp27 stimulated by sphingosine 1-phosphate via suppression of phosphatidylinositol 3-kinase/akt pathway in osteoblasts
Jun Mizutani, Takanobu Otsuka, Osamu Kozawa

Poster No. 1418

Pulsed electromagnetic field regulation of TGF-beta pathway and microRNA21 in differentiating human bone marrow stromal cells towards osteoblasts
Zhiming He, Nagarajan Selvamurugan, Jawed A Siddiqui, Erik I. Waldorff, James T. Ryaby, Nicola C Partridge

PS2 BONE/BONE BIOLOGY - OSTEOCLASTS

Poster No. 1419

Bisphosphonates inhibit osteosarcoma-mediated osteolysis via attenuation of tumor expression of MCP1 and RANKL
Tetsuro Oba, Hirotaka Haro

Poster No. 1420

A delivery system to approach bone resorption surfaces for specifically targeting osteoclasts in vivo
Lei Dang, Baosheng Guo, Defang Li, Jin Liu, Chao Liang, Xiaojuan He, Heng Wu, Zhijun Yang, Zicai Liang, Aiping Lu, Ge Zhang

Poster No. 1421

Exosome-encapsulated miR-214 Secreted from Osteoclast to Inhibit Osteoblastic Activity
Defang Li, Jin Liu, Baosheng Guo, Chao Liang, Lei Dang, Xiaojuan He, Zicai Liang, Aiping Lu, Ge Zhang

Poster No. 1422

PI3K Signaling Regulates SDF-1-Mediated Recruitment of Osteoclast Precursors in Homeostasis and During Fracture
Vanessa M Scanlon, Do Yu Soung, Naga Suresh Adapala, Mark Hansen, Hicham M Drissi, Archana Sanjaya

Poster No. 1423

Effects of Megavoltage Irradiation on the Formation and Resorptive Activity of Osteoclasts In Vitro
Elizabeth R. Heffrich, Meagan R. Williams, Eric R. Green, Matthew J. Allen

Poster No. 1424

Notch Signaling is Required for Osteoclast Differentiation and Function
Jason W Ashley, Jaimo Ahn, Kurt D Hankenson

Poster No. 1425

RING Finger Protein RNF114 Inhibits RANKL-induced Osteoclast Maturation
Boren Lin, Qi Ke, Douglas Leaman, Vijay Goel, Anand Agarwal

PS2 BONE/BONE BIOLOGY - BONE OSTEOCYTES AND MECHANOBIOLOGY

Poster No. 1426

OB-Cadherin and N-Cadherin Adhesion Junctions Differentially Influence the Mechanical Properties of 3D Osteogenic Mesenchymal Stem Cell Spheroids
Fiona E Griffin, Patrick McGarry, Todd C. McDevitt, Laoise M McNamara

Poster No. 1427

Thermally Induced Osteocyte Apoptosis Initiates Pro-osteoclastic And Pro-osteoblastic Signaling Responses
Eimear B Dolan, Muriel C Voisin, Matthew G Haugh, David Tallon, Laoise M McNamara

Poster No. 1428

Osteocyte-driven Responses to Thermal Elevations In Vivo
Eimear B Dolan, David Tallon, Wing-yee Cheung, Mitchell B Schaffler, Oran D Kennedy, Laoise M McNamara

Poster No. 1429

LMNA Gene Expression Serves As A Novel Biomarker For Characterizing Mechanical Phenotype
Rafael D Gonzalez Cruz, Vera Fonseca, Manisha Kanthilal, Jessica S Sadick, Eric M Darling

Poster No. 1430

Intracellular and Endoplasmic Reticulum Calcium Dynamics in Osteocyte Mechanobiology
Genevieve Brown, Prajesh Desai, X. Edward Guo
Poster No. 1431

**Bone Cells with Primary Cilia Exhibit High Localized Strains Near the Cilium Base when Subjected to Dynamic Fluid Flow**

Kenneth A. Mann, Megan Elizabeth Oest, Astrid Bakker, Anna Fahlgren

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Poster No. 1432

**Analyzing the Effect of the Reynolds Number of Flow on Osteocytes**

Avinash Kondiboyma, Kevin Middleton, Michael Borrett, Xueting Mei, Lidan You

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Poster No. 1433

**Mechanical Loading System to Apply Concurrent Physiological Pressure and Shear to Osteocytes**

Chao Liu, Frank X Sun, Lidan You

---

Poster No. 1434

**Oscillatory Fluid Flow Represses Sost Expression Through The ECRS Enhancer**

William H. Foster, Gabriela Loots, Damian Genetos

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Poster No. 1435

**Effect Of Two Different Mechanical Stimuli, Shear Stress And Hydrostatic Pressure, On Early Humscs Response**

Pierre Becquart, Magali Cruel, Herve Petite, Thierry Hoc, Rena Bizios, Delphine Logeart-Avramoglou, Morad Bensidhoum

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Poster No. 1436

**A Microfluidic System to Study Cross-Talk between Osteocytes and Osteoclasts**

Kevin Middleton, Xueting Mei, Lidan You

---

Poster No. 1437

**Comparison Of Micro-CT Sampling Methods For The Analysis Of Trabecular Bone Density In A Rat ACL-transsection Model**

Kaitlyn E Chin, Tarpit K Patel, Douglas C Moore, Matthew R Akelman, Benedikt L. Proffen, Martha M Murray, Braden C Fleming

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Poster No. 1438

**The Role of Subchondral Bone Microdamage in PTOA Following ACL Rupture**

Matin Lendhey, Bryan Beutel, Oran D Kennedy

---

Poster No. 1439

**Microdamage and Mechanical Loading Have an Interactive Effect on Remodeling Signals Produced by Osteocyte**

Chao Liu, Xiaoqing Zhang, Michael Wu, Lidan You

---

Poster No. 1440

**Inhibiting BMP 2/4 Signaling Increases Cancellous Bone Mass and Reduces Bone’s Response to Mechanical Loading in Female Mice**

Katherine M Melville, Gina Surita, Natalie H. Kelly, R. Scott Pearsall, John C Schimenti, F. Patrick Ross, Marjolein C.H. van der Meulen

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Poster No. 1441

**Pigment Epithelium Derived Factor Suppresses Expression Of Sost/sclerostin By Human Osteocytes: A Possible Mechanism By Which It Regulates Matrix Mineralization**

Feng Li, Na Song, Joyce Tombran-Tink, Christopher Niyibizi

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Poster No. 1442

**Calcium signalling in Response to Fluid Flow within the Primary Cilium Microdomain of Mesenchymal Stem Cells**

Michele A Corrigan, Kristen L Lee, Marie-Noelle Labour, Christopher R. Jacobs, David A. Hoey

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Poster No. 1443

**Identifying the Role of CD146 in Bone Marrow Stroma in Mice**

Andrew J Maul, Luis F. de Castro, Brian J. Sworder, Paolo Bianco, Pamela G. Robey, Kenn Holmbeck

---

Poster No. 1444

**Mesenchymal Progenitor Cells Demonstrate Increased Osteogenic Differentiation And Enhanced Isolation On Collagen Nanofiber**

Ronald Goodlett, Patrick E Jones, Husain Bhamal, Youngmi Ji, Gregory Christopherson, Leon J Nesti

---

Poster No. 1445

**Perlecanc/HSPG2 Deficiency Enhances the Differentiation and Mineralization of Mesenchymal Stromal Cells but Reduces Their Intracellular Calcium Signaling Responses to Fluid Flow Stimulation**

Xiaohan Lai, Mengxi Lv, Catherine Kim-Safran, X. Lucas Lu, Liyun Wang

---

Poster No. 1446

**A Simple In-Vitro Fluid Flow Stimulation Platform To Enhance Osteogenesis Of Human Mesenchymal Stem Cells**

Elena Stavenschi, Marie-Noelle Labour, David Hoey

---

Poster No. 1447

**G protein-Coupled Estrogen Receptor-1 (GPER-1) Positively Regulates cell proliferation via cAMP/PKA pathway In Murine Bone Marrow Mesenchymal Stem Cells**

Shu-Chun Chuang, Po-Lun Hsiao, Mei-Ling Ho, Je-Ken Chang

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Poster No. 1448

**Transient Receptor Potential Melastatin 7 Is Mechansensitive To Shear Flow And Modulates Osteogenic Differentiation Of Murine Mesenchymal Stem Cells Through Osterix Pathway**

Yi-Shiuan Liu, Yu-An Liu, Chin-Ching Huang, Meng-Hua Yen, Shu Chien, Oscar K. Lee

---

Poster No. 1449

**Bone Marrow-Derived MSC Osteogenesis Requires Endogenous BMP Activity**

Melody Martychenko, Sushmitha Durgam, Matthew Stewart
Poster No. 1450
**Macrophages Co-Cultured with MC3T3 Cells Enhanced Osteogenic Differentiation**
Florence Loi, Ruth Zhang, Katherine Barcay, Heather Rogan, Tzu-hua Lin, Jukka Pajarinne, Changchun Fan, Taishi Sato, Jordan Raphel, Zhenyu Yao, Stuart B Goodman

Poster No. 1451
**Dexamethasone Inhibits Production Of Angiogenic Factors Associated With Bone Formation By Microencapsulated Adipose Stem Cells Cultured In Osteogenic Media**
Shiraie K Leslie, Barbara D Boyan, Zvi Schwartz

PS2 BONE/BONE BIOLOGY - OSTEOPOROSIS, METABOLIC BONE DISEASE, BIOMARKERS

Poster No. 1452
**Parathyroid Hormone, But Not Melatonin, Resets The Bone Circadian Clock**
Naoki Okubo, Yoichi Minami, Hiroyoshi Fujiwara, Tatsuya Kunimoto, Toshihiro Hosokawa, Ryo Oda, Toshikazu Kubo, Kazuhiro Yagita

Poster No. 1453
**Keratin Biomaterial for Delivery of rhBMP-2 Promotes Healing of Nonunion Bone Defect in Osteoporotic Model**
Omnusa Chalayon, Theresa Pham, Seth Tomblyn, Lindsey Pattison, Luke Burnett

Poster No. 1454
**A Non-Weight Bearing Model of Osteoporosis for Histomorphometric and Mechanical Evaluation of Bone Repair Using Bone Graft Substitutes**
Deborah J. Hall, Thomas M Turner, Stephanie M McCarthy, Steven Gitelis, Robert M Urban

Poster No. 1455
**Adipose Stem Cell Mediated Calvarial Defect Repair In An Osteoporotic Rat Model**
Ming Pei, Jingting Li, David McConda, Nina Clovis, Suzanne Danley

Poster No. 1456
**Quantal Energy Alters the Rate of Maturation and Enhances the Proliferation and Mineralization of Osteoblasts**
Josh M Kolz, Patrick J Hughes, Janine Struve, Scott Marshall, Richard Davidson, Dorothee Weihrauch, James T Ninomiya

Poster No. 1457
**Fucoidan Inhibits Osteoclast Differentiation And Function By Modulating RANKL Signaling**
Seung-Hoon Baek, Young Woo Kim, Tae-Ho Kim, Shin-Yoon Kim

Poster No. 1458
**Absence of Complement Component 3 Protects Against Bone Loss in a Murine Model of Postmenopausal Osteoporosis**
Danielle L MacKay, Thomas J Kean, Kristina G Bernardi, Feng Lin, James E Dennis

Poster No. 1459
**The Potential of Reference Point Microindentation for Fracture Risk Assessment**
Thomas Jenkins, Louise V. Coutts, Douglas G. Dunlop, Richard O.C. Oreffo, Cyrus Cooper, Nicholas C Harvey, Philipp J Thurner

Poster No. 1460
**Direct and Indirect Raman Signatures of Advanced Glycation End Products in Bone**
Bo Gong, Erin M McNerny, David H Kohn, Michael D Morris

Poster No. 1461
**A Novel Image Transformation Scheme Minimizes Interpolation Artifact and Allows Reproducible Measurement of Trabecular Bone Remodeling through µCT-Based In Vivo Dynamic Bone Histomorphometry**
Chantal M de Bakker, Allison Altman, Connie Li, Mary Beth Tribble, Wei-Ju Tseng, X. Sherry Liu

Poster No. 1462
**Analysis Of Signal-to-noise Ratio On Cortical Bone Of The Ovariectomized Rats At Primary Stage By Using Mri With Swift Technique**
Tsuyoshi Sukenari, Motoyuki Horii, Kazuya Ikoma, Masamitsu Kido, Shigeki Hayashi, Yusuke Hara, Tetsuro Yamasaki, Ken-ichi Matsuda, Mitsuhiro Kawata, Toshikazu Kubo

Poster No. 1463
**45CaCalcium Used as a Marker of Bone Formation and Metabolism**
Nicole Collette, Nicholas Hum, Deepa Murugesh, Michael Malfatti, Sarah Hatsell, Aris N Economides, Gabriela Loots

Poster No. 1464
**Females and Males Achieve Equivalent Cortical Bone Mechanical Properties through Different Combinations of Bone Traits**
Daniel P Nicoletta, Arthur E. Nicholls, Donald Moravits, Jennifer A.K. Harris, Shanya M Levine, Matthew R Allen, Jeffry S Nyman, Todd L Bredbenner, Lorena Havill

PS2 BONE/BONE BIOLOGY - BONE MECHANICS AND FINITE ELEMENT ANALYSIS

Poster No. 1465
**Biomechanical Numerical Research of Disc Displacements**
Zhan Liu, Ying-Li Qian, Yu-Bo Fan

Poster No. 1466
**DTS Derived Fractal, LFD and MIL Parameters Contribute to Prediction of Whole Vertebral Strength and Energy to Fracture Independent From Bone Mass**
Woong Kim, Daniel Oravec, Angela Xiao, Ellen Yang, George Divine, Michael J Flynn, Yener N Yeni

Poster No. 1467
**Application and Validation of Multiscale Modeling to the Distal Radius**
Joshua E. Johnson, Karen L. Troy
POSTERS

Poster No. 1468
Finite Element Analysis of Different Repair Methods of Greater Tuberosity Fractures Under Different Bone Mineral Densities
Heng-Jui Liu, Yu-Chih Wang, Wei-Ren Su, Ming-Long Yeh

Poster No. 1469
In-vivo Range Of Motion Of The Tibiotaral And Subtalar Joints During Treadmill Walking And Toe-rise
Koren E Roach, Bibo Wang, Ashley Lynn Kapron, Niccolo Fiorentino, Andrew Anderson

Poster No. 1470
Optical Mechanical And Biochemical Characterization Of Trabecular Bone
Grazia Spatafora, Ilaria Bargigia, Markus Malo, Federico Tortelli, Mohamad Shahgothi, Marco Agnoletto, Marco Domenicucci, Giuseppe M Peretti, Jeffrey A Hubbell, Jukka S Jurvelin, Antonio Pifferi, Paola Taroni, Federica Boschetti

Poster No. 1471
The Changing Microarchitecture of Trabecular Bone During Compression
Robert J Wallace, Krishna Manda, Erika Sales, Pankaj Pankaj, Hamish Simpson

Poster No. 1472
Spatial Correlations Between Microdamage and Finite Element Derived Local Tissue Strain in Cancellous Bone
Matthew G Goff, Floor M Lambers, Rachel M Sorna, Tony M Keaveny, Christopher J Hernandez

Poster No. 1473
Fracture Response of Human Cortical Bone with Reduced Compositional Heterogeneity
Alexandra Abel, Ani Ural

Poster No. 1474
Viscoelastic Creep Properties of Bone at Various Degrees of Mineralization
Gavriel Feuer, Subrata Saha

Poster No. 1475
Association between Reference Point Indentation Measures, Bone Composition, and Mechanical Properties in Human Cortical Bone
Lamya Karim, Daniel J Brooks, Rachel Adams, Gregory Dadourian, Garrett Easson, Mary L Bouxsein

Poster No. 1476
A Multi-level Finite Element Analysis of Fluid/Solute Flow in Mechanically Loaded Bone
Lixia Fan, Xiaohan Lai, Shaopeng Pei, Liyun Wang

Poster No. 1477
Influence of Vascular Porosity Morphology on Loading-Induced Interstitial Fluid Flow in the Lacunar-Canalicular Porosity of Estrogen-Deficient Rats
Vittorio Gatti, Evan M. Azoulay, Luis Cardoso, Susannah P. Fritton

Poster No. 1478
Investigation of Vitreous Carbon Foam as a Bone Graft Substitute in Critical Defects
Nora Strong, Stephen Miller, Joel White, Prashanta Shrestha, Kim Reuter, Andrea Meyer, Paul Wooley

Poster No. 1479
Vitreous Carbon Foams for Orthopedic Surgeries
Stephen Miller, Nora Strong, Joel White, Prashanta Shrestha, Andrea Meyer, Kim Reuter, Paul Wooley, Michael Heggeness

Poster No. 1480
Co-delivery of Amniotic Membrane and BMP-2 for Regeneration of Segmental Bone Defects
Lauren B Priddy, Nikhil Gupte, Lacminarayan Krishnan, Marian Hettiaratchi, Robert E Guldberg

Poster No. 1481
Characterization of Gene Expression in BMP-2 Mediated Bone Regeneration
Lauren B Priddy, Lacminarayan Krishnan, Hazel Y Stevens, Robert E Guldberg

Poster No. 1482
Age-related Differences in BMP-2-mediated Bone Repair
Albert Cheng, Lacminarayan Krishnan, Lisa Tran, Robert E Guldberg

Poster No. 1483
Combinatorial Gene Therapy Accelerates Bone Regeneration: Non-viral Dual Delivery Of VEGF And BMP2 In A Collagen-nanohydroxyapatite Scaffold
Erica Grace Tierney, Caroline M Curtin, Kevin McSorley, Sally Ann Cryan, Garry P Duffy, Fergal J O’Brien

Poster No. 1484
BMP-2 Gene & Cell-functionalized 3D Scaffolds for the Repair of Cranial Bone Defect
Hang Lin, Ying Tang, Jingwen Xue, Weifeng Yin, Bing Wang, Rocky S Tuan

Poster No. 1485
Oligochitosan-pDNA Activated Collagen Scaffolds as a Platform For Bone and Cartilage Tissue Regeneration
Rosanne M Raftery, Caroline M Curtin, Sally Ann Cryan, Fergal J O’Brien

Poster No. 1486
An Injectable Complex Of Beta-Tricalcium Phosphate Granules, Hyaluronate, And RhFGF-2 On Repair Of Long-Bone Fractures With Large Fragments
Takaaki Tanaka, Yoshio Kumagae, Masaaki Chazono, Hirokazu Komaki, Seiichiro Kitasato, Atsuhito Kakuta, Keishi Marumo

Poster No. 1487
Extracellular Matrix Modification by Microsecond-Pulsed Dielectric Barrier Discharge Plasma Treatment Enhances Bone Formation
Peter Eisenhauer, Qian-shi Zhang, Natalie Chernets, Theresa A Freeman
Poster No. 1488

**Bone Tissue Regeneration: Effect of Low Intensity Pulse Ultrasound on MC3T3 Cells in Bovine Trabecular Bone Scaffold under Dynamic Flow Bioreactor**

Surinder S Moonga, Yi-Xian Qin

Poster No. 1489

**Does Femoral Osteochondroplasty Restore Adequate Motion for All Athletes to Perform Their Sports without Bony Impingement**

Philip C Noble, Joshua Harris, Sabir Ismaily, Jonathan E Gold

Poster No. 1490

**Vitamin D Status Interrelationship Of Bone Health And Fusion Consolidation**

Ruben Maldonado, Mark T Svet, Linda E A Kanim, David Schultz, Melodie F Metzger

Poster No. 1491

**In Vivo Heat-stimulus Triggered Osteogenesis**

Kunihiro Ikuta, Hiroshi Urakawa, Eiji Kozawa, Shunsuke Hamada, Naoki Ishiguro, Yoshihiro Nishida

Poster No. 1492

**Test The Clinical Viability Of Chondrogenically Primed Pre-vascularised Cellular Aggregates Using An Subcutaneous In Vivo Rat Model**

Fiona E Freeman, Ashley B Allen, Hazel Y Stevens, Robert E Goldberg, Laoise McNamara

PS2 BONE FRACTURE - BIOLOGY

Poster No. 1493

**ESET Histone Methyltransferase Plays An Essential Role In Fracture Healing**

Liu Yang, Jacques Hacquebord, Sean Haloman, Andrew Ghatan, Ning Li, Howard A Chansky

Poster No. 1494

**Impaired Fracture Healing Caused By Deficiency Of The Immunoreceptor Adaptor Protein DAP12**

Masayuki Kamimura

Poster No. 1495

**Conditional Deletion of Runx3 in Prx-positive Cells Resulted in Accelerated Fracture Healing**

David N. Paglia, Do Yu Song, Jayne Gavirty, Vanessa Scanlon, Archana Sanjay, Hani Awad, Hicham Drissi

Poster No. 1496

**The Complement Receptor C5aR On Osteoblasts Has An Immune Modulatory Function In Fracture Healing**

Stephanie Baur, Anna Kottun, Thorsten Schinke, Michael Amling, Markus Huber-Lang, Anita Ignatius

Poster No. 1497

**Interruption Of Glycosphingolipid Synthesis Decelerates Endochondral Ossification In Fracture Healing**

Dausuke Momma, Masahiko Takahata, Yusuke Kameda, Tomohiro Shimizu, Norimasa Iwasaki

Poster No. 1498

**Mesenchymal Stem Cells-derived Exosomes Promote Bone Repair In Mouse Model**

Taisuke Furuta, Shigeru Miyaki, Hiroyuki Ishitobi, Naosuke Kamei, Mitsuo Ochi

Poster No. 1499

**Scleraxis Modulates Cortical Morphology And Fracture Healing**

Megan Leigh Killian, Adam C Abraham, Jennifer A McKenzie, Evan G Buettmann, Michael J Gardner, Matthew J Silva

Poster No. 1500

**Study of Phalangeal Fracture Threshold and Design of a Surrogate for Human Finger**

Ming Shen, Ariana Mostafa, Paul C Begeman, Tal Saif, King H Yang

Poster No. 1501

**Development Of A Novel Model System To Study Compressive Immature Rib Fractures**

Nicola Beadle, Michael J Sherratt, Timothy L Burnett, Judith A Hoyland, Anthony J Freemont

Poster No. 1502

**Are 3.5mm Plates and Screws Ideal Forearm Fixation? Biomechanical Analysis of Diaphyseal Forearm Refracture**

Jeffrey Shub, Charles M Lawrie, Stephen M Quinnan, Shahroze Hussain, Loren Latta, Edward Milne

Poster No. 1503

**Are Left and Right the Same? Contralateral Microstructural and Biomechanical Differences in Radius and Tibia**

Bin Zhou, Y. Eric Yu, Ji Wang, Zhengdong Zhang, Fernando Rosete, Kyle Nishiyama, Elizabeth Shane, X. Edward Guo

Poster No. 1504

**Comprehensive Validations of HR-pQCT Based Morphological and Biomechanical Measures of Human Distal Radius and Tibia**


Poster No. 1505

**The Transmission Of Whole Body Sinusoidal And Stochastic Vibration Signals To Bone**

Daniel L Miranda, Ruby Kandah, Adam Roy, Eugene Goldfield, David Paydarfar, Brian Snyder, Melissa Putman

Poster No. 1506

**Three-dimensional Analyses of Proximal Humeral Fractures using Computed Tomography with Multiplanar Reconstruction: The Relationship between Preoperative Bone Quality and Results of Osteosynthesis**

Satoshi Ikemura, Koki Ueda, Taro Mawatari
Poster No. 1507
Comparison of Stochastic Predictors and Trabecular Bone Score (TBS) in Predicting the Risk of Hip Fracture for Postmenopausal Women
Rajeshwar Pinninti, Patricia Cussen, Timothy Lowe, Joyce E Ballard, David Di Paolo, Mukul Shirvaikar, Xuanliang Neil Dong

Poster No. 1508
Mechanism of Extremity Pathologic Fracture is Different from Osteoporotic Fracture
Heli K. Shah, Kenneth A. Mann, Timothy A. Damron

Poster No. 1509
Multidirectional Poroelastic Ultrasound (PeUS) and Fabric-Anisotropy Predict Elastic and Yield Mechanical Properties of Trabecular Bone
Paolo E Palacio-Manchano, Sankha Ghatak, Mohammad F Souzanchi, Stephen C Cowin, Luis Cardoso

Poster No. 1510
Structural Strength of Bovine Cancellous Cubic Specimens Under Cyclic Compression
Kaori Endo, Satoshi Yamada, Masahiro Todoh, Shigeru Tadano, Masahiko Takahata, Norimasa Iwasaki

Poster No. 1511
Optimizing Bone Grafting Procedures in Proximal Tibial Bone Grafting: A Biomechanical Study
Chin Tat Lim, David QK Ng, Wilson Wang, Ken Jin Tan, Desmond YR Chong

Poster No. 1512
Mini Plate Can Influence the Primary Healing of a Long Bone Fracture Fixed with a Compression Plate
Jihui Li, Cary Schwartzbach, Ilia A Iliev, Ryan Westbrook, Mark Theiss

Poster No. 1513
Osthol, an Anabolic Small Molecule, Enhances Bone Regeneration in Fracture Healing
Zhongrong Zhang, Ho Yee Cheung, Wing Nang Leung, Gang Li, Chun Wai Chan

Poster No. 1514
Stimulation of Osteoblast Differentiation and Increased Rate of Bone Defect Repair by a Novel Potent Lactam Acetylene EP4 Receptor Agonists
Stephen Barrett, Jim O’Malley, Gregory Endres, Adam Uzieblo, Bradley Germain, Andrei Kornilov, Joseph Colombo, James Kramer, Liuye Huang, Jeffrey Johnson, Ross Sanfilippo, Thomas A Owen

Poster No. 1515
Delayed Fracture Healing in a Mouse Model of Saethre-Chotzen Syndrome
Sharon L Hyzy, Gireesh B. Reddy, Rene Olivares-Navarrete, Barbara D. Boyan, Zvi Schwartz

Poster No. 1516
Profiling MicroRNA Expression in Fracture Healing in Diabetic Rat
Shunsuke Takahara, Sang Yang Lee, Takahiro Niikura, Takashi Iwakura, Etsuko Okumachi, Takahiro Waki, Michio Arakura, Ryosuke Kuroda, Masahiro Kurosaka

Poster No. 1517
WITHDRAWN

Poster No. 1518
Anti-RANKL Treatment Improves Screw Fixation In Cancellous Bone In Rats
Magnus Bernhardsson, Olof Sandberg, Per Aspernberg

Poster No. 1519
Doxycycline Inducible Adenoviral Delivery Of Bmp-2 With Mesenchymal Stem Cells And A Calcium Phosphate Ceramic For The Repair Of Critically-sized Bone Defects In A Rat Model
Jennifer Bara, Dirk Nehrbass, David Eglin, Martina Anton, Guy Duculsi, Mauro Alini, Martin Stoddart

Poster No. 1520
Promoting in vivo Osteogenesis using Lansoprazole
Kenichi Mishima, Hiroshi Sugiyura, Masaki Matsushita, Hiroshi Kitoh, Naoki Ishiguro, Kinji Ohno

Poster No. 1521
The Masquelet Induced Membrane Technique with BMP and a Synthetic Scaffold Can Heal a Rat Femoral Critical Size Defect
Magnus Tagil, Per Bosemark, Christina Perdikouri, Mea Pelkonen, Hanna Isaksson

Poster No. 1522
Large Autologous Bone Graft Augmented By Mesenchymal Stromal Cell Or Fibroblast Growth Factor-2 Accelerates Bone Union In Rat Model
Hiroaki Murakami, Tomoyuki Nakasa, Mitsuo Ochi

Poster No. 1523
N-acetyl Cysteine (NAC) Restores Normal Onset of Osteogenesis in a Fracture Model of Chronic Ethanol-Fed Rats
Dennis A Chakkalakal, Geoffrey M Thiele, Anand Dusat, Michael J Duryee, Joseph D Bruenjes, Karen C Easterling, Justin C Siebler

Poster No. 1524
Local Administration of Non-diabetic hMSCs to Diabetic Murine Femoral Fractures Enhances Callus Remodeling and Deposition of Reparative Bone

Poster No. 1525
Fibrin Gel And β-tcp Granules Loaded With Bmp-2 Messenger Rna Lipoplexes For Local Gene Delivery
Elizabeth Rosado Balmayor, Johannes-Peter Geiger, Manish Kumar Anje, Christian Koch, Carsten Rudolph, Christian Plank

Poster No. 1526
Pre-Clinical Evaluation of the Local Delivery of Rifamycins Against Staphylococcus aureus Biofilms
Sharanda K Hardy, Kevin S Akers, Joseph C Wenke, Carlos J Sanchez

Poster No. 1527
Delivery of Osteoporosis Drugs From Mesoporous Coatings and Bone Remodelling in Rat Models
Necati Harmankaya, Johan Karlsson, Anders Palmquist, Mats Halvarsson, Martin Andersson, Pentti Tengvall
Poster No. 1528
Effect Of Dedifferentiated Fat Cell Transplantation Combined With Parathyroid Hormone Administration On Bone Formation In A Rat Nonunion Model
Gouki Kinoshita, Shinsuke Kikuta, Tomohiko Kazama, Taro Matsumoto

Poster No. 1529
The Effect of Teriparatide on Femoral Neck Fracture Healing in Men and Postmenopausal Women
Mohit Bhandari, Marc Swiontkowski, Ling Jin, Kyoungah See, Russel T Burge, Kelly D Krohn, Margaret R Warner, Qasim I Ahmad, Bruce Mitlak

PS2 BONE FRACTURE - MECHANICS AND COMPUTATIONAL MODELING

Poster No. 1530
Finite Element Modeling of the Ovine Hindlimb for the Investigation of Microgravity-Related Mechanobiological Alterations
Benjamin C Gadomski, Zachary F Lerner, Raymond C Browning, Christian M Puttlitz

Poster No. 1531
QCT-Based Finite Element Models Do Not Accurately Predict Vertebral Failure Under Anterior Flexion
Timothy M Jackman, Elise F Morgan

Poster No. 1532
Development of a Reference Database for Proximal Femoral Fracture in Men and Women Age 27 to 96
Joyce H Keyak, Tadashi S Kaneko, Sundee Khosla, Shreyasee Amin

Poster No. 1533
Finite Element Representation of Bone-Screw Pull-Out
Sean Hu, Dana J Coombs, Michael Bushelow, Andy Freeman, P J Laz, Paul J Rullkoetter

Poster No. 1534
Damage Mechanisms in Cortical Bone During RPI Testing
Bryan Beutel, Matin Lendhey, Oran D Kennedy

Poster No. 1535
How Much Trabecular Bone Damage Is Induced By Screw Insertion?
Juri A Steiner, Harry G van Lenthe, Stephen J Ferguson

Poster No. 1536
Bone Fracture under Wedge Indentation in Bovine Cortical Bone with Finite Element Analysis
Kevin Hoffseth, Connor Randall, Srinivasan Chandrasekar, Paul Hansma, Henry T Yang

Poster No. 1537
Trabecular Microarchitecture Predicts Fabric Tensor and Anisotropic Mechanical Behavior of Trabecular Bone in Compression and Shear
Annalisa De Paolis, Stephen Cowin, Luis Cardoso

Poster No. 1538
Fabric-Microarchitecture Predicts Anisotropic Elastic and Anisotropic Yield Shear Behavior of Trabecular Bone
Paolo E Palacio-Manchena, Christina Moawad, Melvin Mejia, Mohammad F Souzanchi, Stephen C Cowin, Luis Cardoso

PS2 SPINE - COMPUTATIONAL MODELING

Poster No. 1539
Comparative Analysis on the Implications of Anterior Lumbar Interbody Fusion and Posterior Lumbar Interbody Fusion on Adjacent Segment Biomechanics: A Finite Element Study
Shihab Asfour, Shady Elmasry, Loren Latta, Joseph Gjolaj, Francesco Travascio, Frank Eismont

Poster No. 1540
Virtual Stress Testing of Pedicle Screws in a Large Sample of Women Using Patient-Specific Finite Element Analysis
Tony Keaveny, Kwang Lee

Poster No. 1540A
Variation in Lumbar Anatomy for Healthy and Disc Degenerated Populations
Justin F.M. Hollenbeck, Christopher M Cain, Jill Fattor, Clare K Fitzpatrick, Paul J Rullkoetter, Peter J Laz

Poster No. 1541
Effect Of Varying Geometrical And Material Properties And Fixation Techniques In Posterior Lumbar Spinal Instrumentation On Spine Biomechanics: A Finite Element Study
Raghu N Natarajan, Kazuhiro Hasegawa

Poster No. 1541A
Validation of an Automated Method for Generating Subject-Specific Finite Element Models of the Lumbar Spine
Julius Q Campbell, Paul J Rullkoetter, Anthony Petrella

Poster No. 1542
Kirsten E Stoner, Kingsley Abode-Iyamah, Stephanus Viljoen, Douglas C Fredericks, Matthew Howard, Nicole Grosland

Poster No. 1542A
Lordotic Endplate Balancing Cages May Provide Greater Stability than Non-balanced Cages in Posterior Lumbar Interbody Fusion: A Finite Element Study
Amanda Zakeri, Aakash Agarwal, Anand Agarwal, Vijay Goel

PS2 SPINE - SCOLIOSIS

Poster No. 1543
Kinematic Comparison of the Osteo-ligamentous Adolescent Idiopathic Scoliosis Spine with the Normative: A Finite Element Modeling Study
Prasannaah Hadagali, Aditya Belwadi, John P Dougherty, Sriram Balasubramanian
Poster No. 1544

**HSPG2 Variant Associated with Familial Idiopathic Scoliosis**


Poster No. 1545

**Stability Analysis of A Self-Adaptive Growing Rods System for Early Onset Scoliosis**

Frank Li, Po-Liang Lai, Andy Chien, Wen-Kai Chou, Jaw-Lin Wang

Poster No. 1546

**Bone Metabolism And Trabecular Bone Micro-architecture In Adolescent Idiopathic Scoliosis**

Hironori Tanabe, Yoichi Aota, Naoyuki Nakamura, Masafumi Machida, Tomoyuki Saito

Poster No. 1547

**Analytical Method to Reduce Pedicle Screw Complications**

Giovanni F Solitro, Farid Amirouche

Poster No. 1548

**A Mouse Model of Scoliosis**

Xing-Ming Shi, Jun Zheng, Jay Cao, Nianlan Yang, Kehong Ding, Mark Hamrick, Carlos Isales

Poster No. 1549

**An Endplate-Based Joint Coordinate System for Measuring Kinematics in Normal and Abnormally Shaped Lumbar Vertebrae**

David B Berry, Ana E Rodriguez-Soto, Jana R Tokunaga, Sara P Gombatto, Samuel R Ward

Poster No. 1550

**A Novel Surface Reconstruction Method for the Deformed Thoracic Cage Using Biplanar Projections and 3D Statistical Priors**

James R Peters, Srijan Balasubramanian

PS2 SPINE - DISC MECHANICS

Poster No. 1551

**Effect of Bone Fragment Impact Velocity by Burst Fracture on Biomechanical Parameters Associated to Spinal Cord Injury**

Battayar Khuyagbaatar, Kyungsoo Kim, Yoon Hyuk Kim

Poster No. 1552

**Dislocation Spinal Cord Injury in a Rodent Model - Identifying Variability using High-Speed X-Ray Imaging**

Thomas Oxland

Poster No. 1553

**Transcription Factor Decay NFκB Inhibits the Expression of Cytokines and Pain Markers in Rat Dorsal Root Ganglion Organ Cultures**

Shintaro Shoji, Mary Lenz, Sameer B. Shah, Mitsuru Naiki, Koichi Masuda

Poster No. 1554

**3D Angioarchitecture of Spinal Cord in a Rat Model Detected by Synchrotron Radiation Micro-computed Tomography (SR-MicroCT)**

Hongbin Lu, Yong Cao, Tianding Wu, Jianzhong Hu

Poster No. 1555

**Role Of Fgf18 In Motor Neurons Of The Spinal Cord**

Kenyu Ito, Bisei Ohkawara, Shiro Imagama, Kinji Ohno, Naoki Ishiguro

Poster No. 1556

**Validation of a Novel Animal Model of Thoracolumbar Burst Fracture-Induced Spinal Cord Injury - The Impactor Study Phase**

Rory Petroeys, Steven Spitz, Rachel Sarabia-Estrada, Hasan Syed, Robert Rice, Daniel Sciubba, Brett Freedman

Poster No. 1557

**Synergistic Neurogenic and Angiogenic Effects of Combined Biologic (PTH, EGF & bFGF) and Exogenous Mesenchymal Stem Cell Therapy During Spinal Cord Hemisection Healing in a Murine Model**

Qingqing Li, Hai Liu, Yu Chen, Longze Zhang, Guoyong Yin, Regis J O'Keefe, Edward M. Schwarz, Chao Xie

PS2 SPINE - PERIPHERAL NERVE AND SPINAL CORD INJURY

Poster No. 1558

**Net Transport Into the Degenerated Intervertebral Disc Is Enhanced via Low Rate Loading Induced Convection In Vivo**

Sarah Gullbrand, Jenna Aihlborn, Timothy Roberts, Joseph Glennon, Mostafa Absousayed, James P Lawrence, Eric H Ledet

Poster No. 1559

**Spectroscopic Analysis of Human Endplate Cartilage: Comparison to Articular Cartilage and Correlation with Biomechanical Properties**

Aaron J Fields, Harsh Goel, Deanna Necula, Jeffrey C. Lotz, Galateia J. Kazakia

Poster No. 1560

**Is Cervical Sagittal Imbalance an Independent Risk Factor for Adjacent Segment Disease After Multilevel Fusion?**


Poster No. 1561

**In Vivo Deformation Of L4-5 And L5-1 Discs During A Weight-lifting Extension**

Zhan Liu, Minfei Wu, Sean Driscoll, Shaobai Wang, Tsung-Yuan Tsai, Thomas D Cha, Kirkham B Wood, Guoan Li

Poster No. 1562

**Mr Diffusion Is Sensitive To Mechanical Loading In Human Intervertebral Discs**

Ron N Alkalay, Carl-Fredrik Westin, David Hackney
Poster No. 1563  
**Time-dependent Biomechanical Behaviour of a Hydrogel-based Disc Arthroplasty**  
Weng-Pin Chen, Chien-Yu Lin, Shih-Youeng Chuang, Yang-Hwei Tsuang, Chang-Jung Chiang

Poster No. 1564  
**Diffusion Tensor Imaging Detects The Spatial Variation In Fiber Angle and Lamellar Number In Intact Human Disc Joint**  
Ron N Alkalay, Carl-Fredrik Westin, Dominik Meier, David B Hackney

PS2 SPINE - SPINE THERAPEUTICS (CLINICAL)

Poster No. 1565  
**Anatomical Analysis of Artery Variations for the Lower Lumbar Spine**  
Toshinori Sakai, Fumitake Tezuka, Toshihiko Nishisho, Yoichiro Takata, Kosaku Higashino, Shoichiro Takao, Masafumi Harada, Koichi Sairyo

Poster No. 1566  
**Severity of Stenosis Correlation Using MRI, Dural Cross Sectional Area and Oswetry Disability Index**  
Satyajit Marawar, Mark Palumbo, Richard A Tallarico, Ian Madom, Dongliang Wang, Nathaniel R Ordway, William F Lavelle

Poster No. 1567  
**Three-dimensional Analysis of the Occipital Condyle Considering the Internal Hypoglossal Canal Structure**  
Jinsong Zhou, Alejandro A Espinoza Orías, Howard S An, Nozomu Inoue

Poster No. 1568  
**Targeted Therapy of Low Back Pain Associated with de novo Degenerative Lumbar Scoliosis in the Elderly: Observation Cohort Study**  
Toshio Nakamae, Yosinori Fujimoto, Kiyotaka Yamada, Osami Suzuki, Takashi Hashimoto, Masaki Matsuura, Taiki Morisako

Poster No. 1569  
**Characteristics of Postural Control Dynamics in Patients with Cervical Spondylotic Myelopathy after Surgery and Post-Surgery Exercise Training**  

Poster No. 1570  
**The Relationship Between Transversus Abdominis and Lumbar Multifidus During the Lifting Task**  
Takuya Miura, Masanori Yamanaka, Yasuhiro Morii, Hiroshi Saito, Mina Samukawa, Takumi Kobayashi, Takumi Ino, Harukazu Tohyama

Poster No. 1571  
**WITHDRAWN**

Poster No. 1572  
**Anterior Cervical Discectomy And Fusion (ACDF): Comparison Between Zero Profile Implants And Anterior Cervical Plate And Spacer**  
Marjan Alimi, Innocent Njoku, Christoph Hofstetter, Kartik Kesavabhotla, Apostolos J Tsiouris, John Boockvar, Roger Hartl

PS2 SPINE - SPINE THERAPEUTICS (IN VIVO PRECLINICAL)

Poster No. 1573  
**A Novel AAV Vector-based Combinatorial Gene Therapy Ameliorates Spine Abnormalities in a Severe DMD Murine Model**  
Robert Kang, Ying Tang, Qing Dong, Kara Imbrogno, Qing Yang, James Kang, Bing Wang

Poster No. 1574  
**Pre-operative Lumbar Axial Rotation in Disc Herniation Patients Predicts Post-operative Low Back Pain**  
Kresten Rickers, Sayuri Kitahata, Alejandro A Espinoza Orías, Steffen Ringgaard, Finn B Christensen, Gunnar BJ Andersson, Cody E. Bünger, Jenna Peterson, Haisheng Li, Nozomu Inoue, Bruce Robie

Poster No. 1575  
**Teriparatide Improves Trabecular Osteoporosis but Simultaneously Promotes Spinal Ankylosis in the twy Mice Model for Diffuse Idiopathic Skeletal Hyperostosis**  
Hiromi Hamano, Masahiko Takahata, Masahiro Ota, Shigeto Hiratsuka, Tomohiro Shimizu, Yusuke Kameda, Norimasa Iwasaki

Poster No. 1576  
**Comparison Of A Novel Porous Titanium-Nickel Intervertebral Fusion Device And A Poly-ether-ether-ketone Intervertebral Fusion Device In A Sheep Lumbar Fusion Study**  
Carl Laursyyen, Gary S Fanton, EJ Ehrhart, Dana Ruehlman, Howard Seim, Jeremiah T Easley

Poster No. 1577  
**Nell-1 Promotes Spinal Fusion In Non-human Primates**  
Jia Shen, Aaron W James, Kevork Khadarian, Weiming Li, Jinny Kwak, Min Lee, Benjamin Wu, Kang Ting, Chia Soo, Xinli Zhang

PS2 SPINE - DISC, TISSUE ENGINEERING AND REPAIR

Poster No. 1578  
**A Novel in Vitro Model of the Annulus Fibrosus-Cartilage Endplate Interface**  
Elisabeth Rok, Marc Grynpas, J Paul Santerre, Rita Kandel

Poster No. 1579  
**Visualization of Collagen Crimp in Multilayer Annulus Fibrosus using Ultra-High Field 9.4T MRI**  
Scott Moorman, Jeff Dunn, John Matyas, Neil Duncan

Poster No. 1580  
**Effects of Depth of Annular Injury and Tumor Necrosis Factor-alpha on Disc Degeneration and Pain**  
Alon Lai, Andrew Moon, Devina Purtmessur, Branko Skovrlj, Beth Winkelstein, Samuel Cho, Andrew C Hecht, James C Iatridis
Poster No. 1581
Fibrin-Genipin Annulus Fibrosus Sealant as a Delivery System for Anti-TNFα Drug
Morakot Likhitpanichkul, Yusul Kim, Eugene See, Olivia M Torre, Zepur Kazezian, Abhay Pandit, Andrew C Hecht, James C Iatridis

Poster No. 1582
Structural, Chemical and Cellular Enhancements to Improve Adhesive and Bulk properties of Fibrin-Genipin in Sealing the Annulus Fibrosus
Michelle A Cruz, Svenja Illien-Junger, David Eglin, Andrew C Hecht, James C Iatridis

Poster No. 1583
Fibrin Based Annular Sealant Has Low Risk of Herniation in Bending in Bovine IVD Injury Model
Rose G Long, Diana C Litsas, David Eglin, Sebastien B Blanquar, Dirk W Grijpma, Andrew C Hecht, James C Iatridis

Poster No. 1584
Effect Of A Selective Inhibitor Of c-Fos/activator Protein-1 On Intervertebral Disc Degeneration Induced By Needle Puncture In Rats
Hiroti Makino, Shoji Seki, Hiraku Motomura, Yasuhiro Yahara, Makiko Nogami, Shunichi Shiozawa, Tomoatsu Kimura

Poster No. 1585
Dynamic Loading Improves Intervertebral Disc Metabolic Activity And Nutrient Exchange Under Low Glucose Conditions
Derek Rosenzweig, Janet Moir, Thomas Steffen, Lisbet Haglund

Poster No. 1586
Small-moleculeSuppressors of Proteoglycan Catabolism in Degenerative Disc Cells
Yi Sun, Koichi Masuda, Danny Chan, Kenneth Cheung, Victor Leung

Poster No. 1587
Developing a Minimally Invasive Nucleus Replacement Procedure Using High Intensity Focussed Ultrasound (HIFU): Effect of Hyperthermia on Collagen Integrity and Cell Viability in the Intervertebral Disc
Olga A Boubriak, Jill P.G. Urban, Delphine Elbes, Shan Qiao, Robin O. Cleveland, Constantin Coussios

Poster No. 1588
Effect of Scaffold Density and Crosslinking on Alginate and Collagen Tissue-Engineered Intervertebral Discs
Jorge A Mojica-Santiago, Yu Moriguchi, Peter Grunert, Roger Hartl, Lawrence J Bonassar

Poster No. 1589
WITHDRAWN

Poster No. 1590
Methacrylated Gelatin Hydrogel in Intervertebral Disc Tissue Engineering
Karl Henrikson, Pedro Pohl, Hang Lin, Gwendolyn Sowa, Rocky Tuan, James D Kang

Poster No. 1591
Genipin-Crosslinked Gelatin Hydrogel Injection Recovers the Functional Integrity of Intervertebral Disc Secondary to a Needle Puncture: An in vitro Porcine Model Using Quantitative Discomanometry Examination
Jui-Jung Yang, Wen-Kai Chou, Andy Chien, Jaw-Lin Wang

Poster No. 1592
Sustained Cellular, Structural, and Mechanical Integrity of Murine Functional Spine Units in Controlled Culture
Adam C Abraham, Jennifer W Liu, Simon Tang

PS2 SPINE - DISC BIOLOGY

Poster No. 1593
Follistatin-like Protein 1 Attenuates Catabolic Effects Of Tumor Necrosis Factor-κ (TNF-κ) Through Nuclear Factor κB (NF-KB) Signaling In Notochordal Cells
Ryuichi Watanabe, Nobuyuki Fujita, Satoshi Suzuki, Tomohiro Hikata, Kota Watanabe, Ken Ishii, Keisuke Horiuchi, Takeshi Miyamoto, Yoshiaki Toyama, Morio Matsumoto

Poster No. 1594
Cadherin 2 Is Essential To Tie2+ Notochordal Cell Maintenance In Nucleus Pulposus
Foonlian Lim, Wai-Kit Tam, Changli Zhang, Tiffany YL Au, Danny Chan, Kathryn S Cheah, Rocky Tuan, Kenneth M Cheung, Victor YL Leung

Poster No. 1595
Glucose Consumption Rate of Notochordal Nucleus Pulposus Cells Following Prolonged Exposure to Various Nutrient Concentrations
Lukas M Jaworski, Kelsey L Kleinhans, Alicia Jackson

Poster No. 1596
Assessing The Effect of Notochord-specific Deletion of Ccn2 on Intervertebral Disc Degeneration and Behavior Associated with Back Pain
Jake Bedore, Sunny Jang, Matthew Veras, Amanda Sauvé, Andrew Leask, Cheryle Séguin

Poster No. 1597
Is There A True Nucleus Pulposus Marker Which Can Be Used To Determine Stem Cell Differentiation Towards A Nucleus Pulposus Phenotype Rather Than Chondrocytes?
Abby A Thorpe, Laura Creemers, Ashley A Cole, Lee M Breakwell, Antony L R Michael, Neil Chiverton, Chris Sammon, Christine L Le Maitre

Poster No. 1598
Role of Collagen Substrate Configuration and Stiffness on Nucleus Pulposus Cell Morphology
Lauren Resutek, Hyunchul Kim, Adam H Hsieh

Poster No. 1599
Effects of Adenosine Treatment on Extracellular Matrix Biosynthesis and Intracellular ATP Production in Intervertebral Disc Cells
Silvia D Gonzales, Chong Wang, Carlos Barrera, Brittany Rodriguez, Chun-Yuh Huang
Poster No. 1600

Advanced Glycation Endproducts induce Hypertrophy and Osteogenic Differentiation in Nucleus Pulposus Cells
Svenja Illien-Junger, Alexander Real, Olivia Torre, William Kindschuh, Sheeraz A Qureshi, Andrew C Hecht, James C latridis

Poster No. 1601

RANK/RANKL/OPG System in the Rat Intervertebral Disc
Norihiko Takegami, Koji Akeda, Koichiro Murata, Junichi Yamada, Akihiro Sudo

Poster No. 1602

The Contribution Of ANKH, ENPP1 And TNAP On The Mineralization Of Nucleus Pulposus
Agata K Krzyzanowska, Robert Frawley, Sheela Damle, Tony Chen, Miguel Otero, Matthew Cunningham

Poster No. 1603

The Expression of Adiponectin Receptor 1 and 2 of Rat Intervertebral Disc Cells
Yoshiki Terashima, Kenichiro Kakutani, Koichiro Maeno, Toru Takada, Takashi Yurube, Takuto Kurakawa, Shingo Miyazaki, Masaaki Ito, Masahiro Kurosaka, Kotaro Nishida

Poster No. 1604

The Effect Of Recombinant Human Sirt1 On Apoptosis And Autophagy Of Human Nucleus Pulposus Cell With Low Nutritional Condition
Shingo Miyazaki, Kenichiro Kakutani, Koichiro Maeno, Toru Takada, Zhongying Zhang, Takashi Yurube, Takuto Kurakawa, Yoshiki Terashima, Masaaki Ito, Koki Uno, Tepppei Suzuki, Masahiro Kurosaka, Kotaro Nishida

Poster No. 1605

Gene Expression of Notochordal Nucleus Pulposus Cells Following Prolonged Culture at Varied Nutrient Levels
Lukas M Jaworski, Kelsey L Kleinhans, Alicia Jackson

Poster No. 1606

Is Acidic pH The Initiator For The Aberrant Nucleus Pulposus Cell Function Observed In Intervertebral Disc Degeneration?
Hamish T Gilbert, Nathan Hodson, Stephen M Richardson, Judith A Hoyland

Poster No. 1607

Alterations in Intervertebral Disc Matrix Homeostasis in the UCD-T2DM Rat Model of Type 2 Diabetes
Aaron J. Fields, Stephanie Miller, Lionel N Metz, James L Graham, Peter J Havel, Jeffrey C Lotz

Poster No. 1608

WITHDRAWN

Poster No. 1609

Effects of Static Loading on Intervertebral Disc using a Whole Organ In vitro Culture Model
James T Stannard, Aaron Stoker, Alexis Zallas, Ferris Pfeiffer, Theodore Choma, James L Cook

Poster No. 1610

Effects of Diurnal Loading on Intervertebral Disc using a Whole Organ In vitro Culture Model
James T Stannard, Aaron Stoker, Ferris Pfeiffer, Theodore Choma, James L Cook

Poster No. 1611

Intervertebral Disc Degeneration following Impact Injury - A Rat Ex Vivo Model
Fuxin Wei, Christopher T. Chen

Poster No. 1612

A Biomechanical Model Simulating Vertebral Compression Fracture and Proximal Junctional Kyphosis
Robin Parrish, William Camisa, Jeremi Leasure, Jon Park, Christopher Ames

PS2 SPINE - MECHANICS

Poster No. 1613

Biomechanical Stability of the Metastatic Spine Post-treatment with Bone-targeted Radiofrequency Ablation (RFA) Alone and in Combination with Percutaneous Vertebroplasty (PVP)
Padina S Pezeshki, Sean RH Davidson, Margarete Akens, Claire C McCann, Kieran Murphy, Michael Sherar, Albert J Yee, Cari Whyne

Poster No. 1614

Vertebral Body Response to Elevated Frequency Fatigue Loading
Rebecca Chung, Kaitlynn Pugliese, Gabrielle Vandergaag, Arthur Ritter, Antonio Valdevit

Poster No. 1615

Analysis of Failures after Three Column Osteotomies of the Spine
Niranjan Kavadi, Richard A Tallarico, Mike Sun, William F Lavelle

Poster No. 1616

Relationship Between Material and Mechanical Properties of Osteophytes and Non-osteophytic Cortical Bone: A Preliminary Study
Fred Xavier, Rozan winter, Martin pendola, Gabriel Feuer, Westley Hayes, Subrata Saha

Poster No. 1617

The Effect of Vertebral Body Geometry on Pedicle Screw Fixation Biomechanics in Human Lumbar Spine
Ata M Kiapour, Laura E Buckenmeyer, Kristophe J Karami, Vijay K Goel, Teck M Soo, Constantine K Demetropoulos

Poster No. 1618

WITHDRAWN

Poster No. 1619

The Degenerative State Of The Intervertebral Disc Independently Predicts The Failure Of Osteoporotic Human Lumbar Spines Under High Rate Loading Simulating A Backward Fall Event
Ron N Alkalay, David Hackney
Poster No. 1620

**Improvement in Physical Performance in Patients with Degenerative Facet Osteoarthropathy Lumbosacral Spine following Paravertebral Facet Injection**

Tzu-Chuan Yen, Nina Toosizadeh, Michael Dohm, Cindy Fastje, Bijan Najafi

Poster No. 1621

**In-vivo Dynamic Changes of Dimensions in the Lumbar Intervertebral Foramen**

Weiye Zhong, Sean Driscoll, Tsung-Yuan Tsai, Shaobai Wang, Jing-Sheng Li, Zhan Liu, Thomas D Cha, Kirkham B Wood, Guoan Li

Poster No. 1622

**Biomechanical Analysis of the Intact Sacroiliac Joint Following Posterior Ligament Injury Combined with Rigid Instrumentation and the Influence of Unilateral and Bilateral SIJ Screws**

Bruce E. Dall, Noel Goldthwaite, Sonia Eden, Mark Moldavsky, Soumya Yandamuri, Brandon Bucklen

Poster No. 1623

**Regional Biomechanical Variations within the Vertebral Body Under Fatigue Loading in Sagittal Plane**

Constance Maglaras, Emily Noonan, Arthur Ritter, Antonio Valdevit

Poster No. 1624

**Interpedicular Kinematics in an In Vitro Biomechanical Assessment of a Bilateral Lumbar Spondylolytic Defect**

Uphar Chamoli, Alan S Chen, Ashish D Diwan

Poster No. 1625

**Increase in Stability by Design Parameter Change in Stand-alone Cage for Direct Lateral Interbody Fusion**

Yong Woo Kim, Won Man Park, Dae Kyung Choi, Kyungsoo Kim, Yoon Hyuk Kim

Poster No. 1626

**Facet Stabilization for Lumbar Posterior Stability- Facet screw Versus Facet Spacer**

Ching-Lung Tai, Wen-Huang Liang, Po-Liang Lai

**PS2 SPINE - BIOLOGY**

Poster No. 1627

**Enrichment Of Committed, Chondroitin Sulfate-expressing Human Nucleus Pulposus Cells Over Progenitors Under Alginate Encapsulation**

Yi Sun, Minmin Lv, Zhaomin Zheng, Danny Chan, Kenneth Cheung, Victor Leung

Poster No. 1628

**Neuropeptide Y And Fear Avoidance Beliefs Are Associated With Self-Reported Disability In Acute Low Back Pain Patients**

Gwendolyn Sowa, Wan Huang, Alhaji Buhari, Michael Schneider

Poster No. 1629

**Laminar Thickness: Correlation Against Symptoms of Spinal Stenosis and Changes with Age**

Hamed Shalikar, Sean L Borkowski, Juan Pablo Villalblanca, Sophia N Sangiorgio, Edward Ebromzadeh, Arya N Shamie

**PS2 KNEE - KINEMATICS AND GAIT**

Poster No. 1630

**A Low-Cost Multi-Sensor Device for Unsupervised Large Animal Activity Monitoring**

Feini Qu, Peter M Gebhard, Christian G Pfeifer, Emily L Miedel, Robert L Mauck

Poster No. 1631

**The Influence of Bony Landmark Identification on Knee Kinematics Using Point Cluster Technique: An In Vivo 3D-CT Study**

Takumi Ino, Harukazu Tohyama, Kensaku Kawakami, Toshinori Yoshida, Yuhei Ohsumi, Satoshi Kotake, Sho’ji Suzuki, Tatsunori Maeda, Kou Suzuki, Yasumitsu Ohkoshi

Poster No. 1632

**The Center of Axial Rotation of the Femorotibial Joint in Osteoarthritic Knees - Medial Pivot vs Lateral Pivot -**

Takumi Ino, Kensaku Kawakami, Satoshi Kotake, Yuuhei Ohsumi, Toshinori Yoshida, Sho’ji Suzuki, Tatsunori Maeda, Kou Suzuki, Yasumitsu Ohkoshi

Poster No. 1633

**A Novel Volumetric-Data Based 2D to 3D Image Registration Method Using MRI Scan Data and Radiography**

Koichi Kobayashi, Makoto Sakamoto, Yuji Tanabe, Takashi Sato, Go Omori, Yoshio Koga

Poster No. 1634

**The Center of Axial Rotation during Walking in the Anterior Cruciate Ligament-Deficient Knees**

Yuhei Ohsumi, Yasumitsu Ohkoshi, Kensaku Kawakami, Takumi Ino, Tatsunori Maeda, Ko Suzuki, Satoshi Kotake, Kengo Ukishiro, Toshinori Yoshida, Sho’ji Suzuki, Harukazu Tohyama

Poster No. 1635

**High Accuracy of Joint Kinetics Prediction in Lower Extremity with Wearable Sensor System during Walking Consistent to Optical Motion Capture System with Force Plates**

Tsolmonbaatar Khurelbaatar, Ariunzaya Dorj, Kyungsoo Kim, Yoon Hyuk Kim, Moonkee E Kim

Poster No. 1636

**Kinematic Accuracy of CT-Based and MRI-Based Bone Models for Model-Based Tracking When Using Biplanar Videoradiography to Measure Knee Joint Kinematics**

Emily R Robbins, Tarpit K Patel, Michael J Rainbow, Braden C Fleming

Poster No. 1637

**Kinematics of Varus Thrust during Stepping Activity: a Pilot Study using a 3D-to-2D Registration Technique**

Kenji Hoshi, Goro Watanabe, Chikane Fujihira, Ryuji Tanaka, Yasuo Kurose, Jiro Fujii, Kazuyoshi Gamada
Poster No. 1638

**Three-dimensional In Vivo Motion Analysis of Anterior Cruciate Ligament Deficient Knees Using Single-plane Fluoroscopy: Comparison to Contralateral Uninjured Knees and Normal Control Knees**
Takayuki Murayama, Takashi Sato, Satoshi Watanabe, Osamu Tanifuji, Koichi Kobayashi, Tomoharu Mochizuki, Hiroshi Yamagiwa, Yoshio Koga, Go Omori, Naoto Endo

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Poster No. 1640

**The Effects of Foot Orthoses on Sagittal Plane Energetics in Lower Extremity during Single-leg Landing**
Yu Ito, Masanori Yamanaka, Hisashi Matsumoto, Tomoya Ishida, Yoshimitsu Aoki

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Poster No. 1641

**Comparison Of Gait Biomechanics Between Kinematically Aligned And Neutrally Aligned Total Knee Arthroplasty**
Takeo Nagura, Yasuo Niki, Kengo Harato, Yoshiaki Toyama, Yasunori Suda

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Poster No. 1642

**Low-Cost Motion Capture: A Comparison to Vicon**
Julia K Nichols, Mark P Sena, Oliver M. O’Reilly, Brian T Feeley, Jeffrey C Lotz

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Poster No. 1643

**Quantification of Rolling and Sliding in the Knee during Passive Flexion Motion using Bi-Plane Fluoroscopic System**
Cong-Bo Phan, Ho-Jung Jung, Seungbum Koo

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Poster No. 1644

**Reduction in Muscle Co-contraction during Walking after Opening Wedge High Tibial Osteotomy for Medial Compartment Knee Osteoarthritis**
Ariunzaya Dorj, Kyungsoo Kim, Kyung Wook Nha, Yoon Hyuk Kim, Moonkee Eric Kim

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Poster No. 1645

**Impact of Tibia Bearing Surface and Femoral Component Design on Flexion Kinematics during Lunge**
Eik Siggelkow, Nick Drury, Iris Sauerberg, Marc Bandi

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Poster No. 1646

**A Gait Analysis and Proprioception Assessment of Patients with Knee-sparing Massive Bone Tumour Implants**
R Poursaeidi, M Coathup, M Thornton, I McCarthy, K Shah, J Bhamra, P Unwin, G Blunn

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Poster No. 1647

**Differences In Knee Mechanics Between Customized, Individually Made BKR And Off-the-shelf TKR Patients During Walking**
Henry Wang, Jonathan Foster, Natasha Francksen, Jill Estes, Lindsey Roilston

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Poster No. 1648

**Comparison Between Parameterisation And Principle Component Analysis In The Classification Of Osteoarthritic Gait**
Paul R Biggs, David Williams, Catherine A Holt, Gemma M Whatling

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Poster No. 1649

**Three-Dimensional Knee Joint Kinematics in Obese Individuals with Knee Pain during Treadmill Gait**
Jing-Sheng Li, Tsung-Yuan Tsai, Katie Brentzel, Yoo Jin Ahn, David T Felson, Guoan Li, Cara L Lewis

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PS2 KNEE - MECHANICS

Poster No. 1650

**Preliminary Evidence Supporting Shared Mechanical Abnormalities In ACL-Deficient Human And Ovine Knees**
Jillian E Beveridge, Christopher Bhatla, Gulshan Sharma, Gregor Kuntze, Nigel G Shrive, Cyril B Frank, Janet L Ronsky

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Poster No. 1651

**Accuracy And Efficacy Of Patient-specific Instrumentations For Total Knee Arthroplasty: Analyses Of Three Different Systems**
Claudio Belvedere, Michele d’Amato, Paolo Barbadoro, Alessandro Feliciangeli, Alberto Leardini, Sandro Giannini, Andrea Ensini

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Poster No. 1652

**Sex Differences in Knee Flexion Angle During a Rapid Change of Direction While Running**
Christopher L Sheu, David Brown, Aaron M. Gray, Brian A. Smith

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Poster No. 1653

**The Effect of Malrotation of the Tibial Component of Total Knee Arthroplasty on the Tibial Insert Comparing Different Prosthesis: A Finite Element Analysis**
Kei Osano, Ryuji Nagamine, Mitsugu Todo, Makoto Kawasaki

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Poster No. 1654

**An Investigation of the Relationship between Plantar Weight Distribution and the Condition of Osteoarthritic Knees During Quiet Standing**
Brian Sutterer, Eric Reyes, Michael E Berend, Scott Small, Renee D Rogge

---

Poster No. 1655

**Contralateral Knee Joint Contact Pressure after Unicondylar Knee Arthroplasty**
Roy Rusly, Julia Lee, Michael Stokes, Xin Xie, Kyle Walker, Brandon Broome, Stephanie Tanner, John D DesJardins

---

Poster No. 1656

**Where Is The Appropriate Proximal Reference Point Of The Tibia In Total Knee Arthroplasty?**
Kenichiro Takahiba, Gen Uehara, Ryuji Nagamine
Poster No. 1657
Integrated Modeling and Sensitivity Analysis Identify Critical Parameters Associated with Subject-specific Knee Function: Applications in ACL Injury and Reconstruction
Mohammad Kia, Kevin Schafer, Kyle Stone, Joseph Lipman, Anil Ranawat, Daniel Green, Michael Cross, David J Mayman, Andrew D Pearle, Thomas Wickiewicz, Timothy Wright, Thomas Santner, Carl W Imhauser

Poster No. 1658
Variation in Knee Shape Predicts the Future Onset of Radiographic Knee Osteoarthritis (RKOA) and this Variation is Different in Males Compared to Females
Daniel P Nicoletta, Todd L Bredbenner, Lorena Havill, Jose Tamez-Pena, Patricia Gonzalez, Ed Schreyer, Saara Totterman, C. Kent Kwoh

Poster No. 1659
Knee Bone Shape Features Predict The Progression Of Cartilage T1 Tip 1 Year After ACL Reconstruction
Valentina Pedoia, Favian Su, Drew Landsown, Musa Zaid, Richard Souza, C Benjamin Ma, Xiaojuan Li

Poster No. 1660
Specimen-Specific Validation of Patellofemoral Joint Mechanics in a Finite Element Model of the Knee
Azhar Ali, Adam J Cyr, Michael Harris, Sami Shalhoub, Clare K Fitzpatrick, Paul J Rullkoetter, Kevin B Shelburne

Poster No. 1661
Quantitative Assessment of Asymmetric and Symmetric Tibial Baseplate Design with the Virtual Surgery Technique
Jae Won Kim, Oui Sik Yoo, Jung Sung Kim, Doo Hun Sun, Yong Sik Kim

Poster No. 1662
Ligament Resting Length: A Method for Patient Specific Determination
Antonis Stylianou, Swithin Razu, Hamidreza Jahandar, Katherine H Bloemker, Akin Cil, Trent Guess

Poster No. 1663
The Effect of Patellar Height on Patellofemoral Contact Pressure and Area after Medial Patellofemoral Ligament Reconstruction: A Finite Element Analysis
Nicole A DeVries Watson, Matthew J Bollier, Nicole M Grosland

Poster No. 1664
Trochlear Groove Geometry Prior To And After Total Knee Arthroplasty - Are The Preoperative Conditions Restorable?
Enrico Mick, Joerg Luetzner, Stephan Kirschner, Richard Bieck, Robert Souffrant, Rainer Bader

Poster No. 1665
Importance of Inhomogeneous Elastic Properties of Bone on Mechanical Responses of Articular Cartilage in Human Knee Joint - Combination of CT Imaging and Computational Modeling
Mikko S Venäläinen, Mika E Mononen, Jukka S Jurvelin, Juha Töyräs, Tuomas Viren, Rami K Korhonen

Poster No. 1666
Poplites Tendon and Popliteofibular Ligament Are Indispensable for More Reliable Computational Knee Joint Models
Tserenchimed Purevsuren, Kyungsoo Kim, Yoon Hyuk Kim

Poster No. 1667
Effect Of Partial Meniscectomy On Cartilage Shear Stress: Walking Versus Running
Diagarajen Carpanen, Robert Walker, Howard Hillstrom, Franziska Reisse, Matthew F Koff, Mark Lenhoff, Rajshree Mootanah

PS2 KNEE - COMPUTATIONAL MODELING

PS2 KNEE - SURGICAL REPAIR AND REHABILITATION

Poster No. 1668
Femoral Bowing is Main Determinant of the Proper Alignment to Restore Mechanical Axis in Total Knee Arthroplasty
Philip C Noble, Sabir Ismaily, Gregory Stocks, Romy Megahed

Poster No. 1669
Rigid vs. Flexible Screwdriver for Femoral Interference Screw Placement: Comparison of Divergence and Fixation Strength
Mark E Steiner, Kempland C. Walley, Aidin Masoudi, Ohan S. Manoukian, Miguel E Perez-Viloria, Stephen Okajima, Jeffrey Spalazzi, Araz Chiloyan, Maria Drazek, David W Wing, Ara Nazarian

Poster No. 1670
Virtual Bone Analysis Determines Metaphyseal Augment Fit
Evan leibowitz, Daniel Lipschutz, Mohamed Soliman, R. Michael Meneghini

Poster No. 1671
Load To Failure At The Femoral Cortex Using Transtibial Versus Anteromedial Based ACL Tunnel Positions In Human Cadaveric Specimens
Michael J Feldstein, Thomas E Stephens, Alexis B.C. Dang

Poster No. 1672
Biomechanical Comparison of Screw and Spiked Washer versus Suture-Post for Tibial Sided Fixation in ACL Reconstruction
Dean Wang, Daniel V Boguszewski, Nirav B Joshi, Keith L Markolf, Frank A Petrigiano, David R McAllister

Poster No. 1673
Fabrication and Function of a Passive, Wireless Force Sensor for Orthopedic Implants
John F Drazan, Aleksandra A. Gunko, Omar T Abdoun, Reena Dahle, Nathaniel C Cady, Kenneth A Connor, Eric H Ledet

Poster No. 1674
Relationship of the Posterior Femoral Axis of the “Kinematically Aligned” Total Knee Arthroplasty to the Posterior Condylar, Transsept condylar, and Anteroposterior Femoral Axes
Denis Nam, Andrew Park, Stephen Duncan, Ryan Nunley, James Keeney, Robert L Barrack
Poster No. 1675
3D Analysis of Uniplanar and Biplanar Opening-Wedge High Tibial Osteotomies
Gareth G Jones, Martin Jaere, Anthony Leong, Rory McMillan, Justin Cobb

Poster No. 1676
Measurement Of Soft Tissue Balance In Tka With Preoperative Flexion Contracture
Masato Aratake, Naoto Mitsugi, Naoya Taki, Hirohiko Ota, Kentaro Shinohara

Poster No. 1687
Effect Of Graft Inclination Angle In Single Bundle Anterior Cruciate Ligament Reconstruction On Knee Kinematics
Paulo H Araujo, Shigeihiro Asai, Mauricio Pinto, Thiago Prota, Kellie K Middleton, James J Irgang, Monica Linde-Rosen, Patrick Smolinski, Freddie H. Fu

Poster No. 1685
Influences Of Knee Flexion Angle And Portal Position On The Location Of Femoral Tunnel Outlet In Anterior Cruciate Ligament Reconstruction
Kanji Osaki, Ken Okazaki, Hideki Mizu-uchi, Satoshi Hamai, Umito Kuwashima, Koji Murakami, Yukihide Iwamoto

Poster No. 1686
Does Pre-surgical Treatment Affect Joint Loading and Motion Five years after ACL-Reconstruction?
Zakariya H Nawasreh, Adam Marmon, David Logerstedt, Lynn Snyder-Mackler

Poster No. 1688
Commonly Used Acl Autografts Size Are Not Correlated With The Size Of Acl Footprint And Femoral Condyle
Takanori Iriuchishima, Keinosuke Ryu, Shin Aizawa, Freddie H Fu

Poster No. 1689
The Most Important Fibers In The Femoral Attachment Of The Anterior Cruciate Ligament For Resisting Tibial Displacements
Yasuyuki Kawaguchi, Eiji Kondo, Ryo Takeda, Camilla Halewood, Keiichi Akita, Kazunori Yasuda, Andrew A Amis

Poster No. 1690
Graft Shift In The Femoral Tunnel In Anterior Cruciate Ligament Reconstruction; An Experimental Study
Masataka Fujii, Yusuke Sasaki, Daisuke Araki, Takayuki Furumatsu, Shinichi Miyazawa, Toshifumi Ozaki, Monica Linde-Rosen, Patrick Smolinski, Freddie H Fu

Poster No. 1691
Development of a Novel “Hybrid” Double-bundle ACL Reconstruction Technique in a Translational Large Animal Model
Farrah A Monibi, Patrick Smith, James P Stannard, Keichi Kuroki, Chantelle Bozynski, Ferris Pfeiffer, Cristi Cook, James Cook

Poster No. 1692
ACL Graft Movement Relative to a Bone Tunnel Differs with Tunnel Orientation
Alexander Kharlamov, Thomas W Jordan, Sam Akhavan, Mark C Miller

Poster No. 1693
Macrosopic Anatomic, Histologic, and Magnetic Resonance Imaging Correlation of the Lateral Capsule of the Knee
Malcolm Dombrowski, Joanna Costello, Bruno Ohashi, Christopher D Murawski, Nicole Friel, Fabio Arilla, Ben Rothrauff, Freddie H. Fu, Volker Musahl

Poster No. 1680
Quantitative Assessment Of The Pivot-shift Test For Anterior Cruciate Ligament Injuries Using A Gyroscope
Atsunori Murase, Masahiro Nozaki, Masaaki Kobayashi, Hideyuki Goto, Tetsuya Takenaga, Yoko Nagaya, Hiroto Mitsui, Hideki Okamoto, Hirotaka Igeuchi, Takanobu Otsuka

Poster No. 1677
A Cortical Suspension Technique for Distal Pole Patella Tendon Repair: Biomechanical Evaluation Versus Transosseous Tunnel Suture Repair and Suture Anchor Repair Techniques
Gabriella Ode, Dana Piasecki, Nahir Habet, Richard Peindl

Poster No. 1678
Investigating the Transverse Cross-section of the Lateral Hinge in Medial Opening Wedge High Tibial Osteotomy
James Liston, Martin Jaere, Gareth Jones, Anthony Leong, Justin Cobb

PS2 KNEE - KNEE LIGAMENT

Poster No. 1679
Neuromuscular Training Following ACLR Affects Kinematics and Kinetics at 1 year
Ryan Zarzycki, David Logerstedt, Lynn Snyder-Mackler

Poster No. 1681
Steeper Tibial Posterior Slope is a Risk Factor in ACL Injury - Gait Simulation by a Lower Extremity Model
H Marouane, A. Shirazi-Adl, M Adouni, J. Hashemi

Poster No. 1683
Intra-articular Graft Length In Double Bundle Posterior Cruciate Ligament Reconstruction
Masahiro Nozaki, Masaaki Kobayashi, Hideyuki Goto, Atsunori Murase, Tetsuya Takenaga, Yoko Nagaya, Hiroto Mitsui, Hirotaka Igeuchi, Takanobu Otsuka

Poster No. 1682
Reconstruction of the Anterior Cruciate Ligament: Characterization in a New Murine Model
Brian M Grawe, Xiangyu Gu, Camila Carballo, Boyce Collins, Jeffrey Willey, Liang Ying, Ian D Hutchinson, Xiang-Hua Deng, Scott Rodeo

Poster No. 1674
Three-Dimensional CT Analysis of Posterolateral Femoral Tunnel in Double Bundle ACL Reconstruction. Comparison of Ourside-in and Transportal drilling Techniques
Shunichiro Kambara, Hiroshi Nakayama, Motoi Yamaguchi, Akio Matsumoto, Ken Sasaki, Kaori Kashiwa, Tomoya Iseki, Shinichi Yoshiya

Poster No. 1684
Microscopic Anatomic, Histologic, and Magnetic Resonance Imaging Correlation of the Lateral Capsule of the Knee
Malcolm Dombrowski, Joanna Costello, Bruno Ohashi, Christopher D Murawski, Nicole Friel, Fabio Arilla, Ben Rothrauff, Freddie H. Fu, Volker Musahl
Poster No. 1694
**Evaluation of a Multivariate Risk Model for ACL Injury**
Johanna Kelley, Erin C Argentieri, Daniel Robert Sturnick, Pamela M Vacek, Robert J Johnson, James Slauterbeck, Timothy W Tourville, Bruce Beynnon

Poster No. 1695
**Respective In-Situ Length Change of Two Functional Bundles of the Anterior Cruciate Ligament Under Various Knee State**
Yoshimasa Fujimaki, Eric D Thorhauer, Christopher D Murawski, Yusuke Sasaki, Scott Tashman, Patrick Smolinski, Freddie H Fu

Poster No. 1696
**Radiographic Landmarks for Identifying the Anterolateral Ligament**
Lakshmanan Sivasundaram, Nathanael D Heckmann, Diego Villacis, Matthew Kleiner, Anthony Yi, Eric White, George F Hatch

Poster No. 1697
**Biomechanical And Histological Evaluation Of Normal Rat Knee Ligaments And Patellar Tendon**
Xiangyu Gu, Zoe M Album, Scott Rodeo Jr, Michael Mosca, Arielle J Hall, Hongsheng Wang, Lilly Ying, Xiang-Hua Deng, Scott Rodeo

Poster No. 1698
**Effects of Anterolateral Capsular Injury and Extra-Articular Tenodesis on Knee Kinematics During Physical Examination**
Fabio V Arilla, Ata Azar, Benjamin Scott, Carlos Yacuzzi, Daniel Guenther, Freddie Fu, Richard Debkski, Volker Musahl

**PS2 HIP - DISEASE PROCESS**

Poster No. 1699
**Effects of Erythropoietin and GCSF on Traumatic Osteonecrosis of the Femoral Head in Rabbits**
AliSina Shahi, Timothy Tan, Mohammad Ghorashian, Peter Park, Hamid Reza Seyyed Hosseinzadeh

Poster No. 1700
**Volumetric Assessment of Muscle Atrophy After Hip Arthroplasty**
Christian Klemt, Johann Henckel, Marc Modat, Shiraz Sabah, Reshid Berber, Keshthra Satchithananda, Sebastien Ourselin, Alister Hart

Poster No. 1701
**Nerve Growth Factor Affects Characteristics Of Sensory Innervation And Synovia Of The Hip In Rat**
Takanori Omae, Junichi Nakamura, Shigeo Hagiwara, Shuichi Miyamoto, Shunji Kishida

Poster No. 1702
**Native Combined Anteverision Influenced Onset of Pain in Patients with Hip Dysplasia**
Yusuke Kohno, Yasuharu Nakashima, Mio Akiyama, Masanori Fujii, Yukihide Iwamoto

**PS2 HIP - FAI AND MORPHOLOGY**

Poster No. 1703
**Evaluation of Bone Turnover in Femoroacetabular Impingement by 18F-Fluoride Positron Emission Tomography**
Naomi Kobayashi, Yutaka Inaba, Taro Tezuka, Hiroyuki Ike, So Kubota, Masaki Kawamura, Tomoyuki Saito

Poster No. 1704
**Does Acetabular Morphometry Differ Between Symptomatic And Asymptomatic Cam-type Femoroacetabular impingement?**
Kathryn Culliton, Paul E Beaule, Andrew D Speirs

Poster No. 1705
**Effect of Cam Femoroacetabular Impingement on Hip Translation**
Laura E Callan, Michael Gilbart, David R Wilson

Poster No. 1706
**Diagnostic Effectiveness of Ultrasound Examination in Patients with Risk Factors for Developmental Dysplasia of the Hip**
Thu-Ba Leba, Kelly D. Carmichael, Leonard E. Swischuk

Poster No. 1707
**Vibratory Sense Deficits in Subjects with Symptomatic Femoroacetabular Impingement**
Gary J Farkas, Najia Shakoor, Renee Kawecki, Simon Lee, Kharma Foucher, Alejandro Espinoza-Orias, Shane J Nho

**PS2 HIP - MECHANICS - KINEMATICS**

Poster No. 1708
**Evaluation of Variability in Head Impaction Forces Among Multiple Orthopaedic Surgeons**
Gregg Schmidig, Laura Scholl, Mayur Thakore, Ahmad Faizan

Poster No. 1709
**Joint Angle and Minimum Bone-to-Bone Distance Changes in the Hip Joint during Inclined Walking**
Niccolo Fiorentino, Michael Kutschke, Penny Atkins, Justine Goebel, Ashley Lynn Kapron, Kenneth B Foreman, Andrew E Anderson

Poster No. 1710
**Does Ligamentum Teres Contribute to Hip Stability?**
Suenghwan Jo, Alexander W Hooke, Kai-Nan An, Rafael J Sierra, Robert T Trousdale

Poster No. 1711
**Effect of Various Surgical Approaches on the Patterns and Magnitudes of Hip Separation**
Michael LaCour, Bradley A Meccia, Adrija Sharma, Richard D Komistek

Poster No. 1712
**Comparison of Different Test Models to Measure Frictional Torque Generated on the Articulating Surfaces of THR**
Laura Scholl, Lokesh K Raja, Jim Nevelos, Jason Longaray, Lizeth Herrera, Gregg Schmidig, Mayur Thakore
Poster No. 1713

Differences in Hip and Knee Mechanics during Three Variations of the Single Leg Squat in Healthy Females
Anne Khuu, Eric Foch, Cara L Lewis

PS2 HIP AND KNEE ARTHROPLASTY - KINEMATICS

Poster No. 1714

Navigation-based In Vivo Knee Kinematics Of The New Gradually Reducing Radii Design Total Knee Arthroplasty
Hiroshi Takagi, Atsushi Sato, Soshi Asai, Takashi Atsumi

Poster No. 1715

Kinematic Analysis Of Stair-climbing In Cruciate-retaining And Posterior-stabilized Total Knee Arthroplasties
Satoshi Hamai, Ken Okazaki, Hideki Mizu-uchi, Hiroyuki Nakahara, Takeshi Shimoto, Hidehiko Higaki, Yukihide Iwamoto

Poster No. 1716

Mobile-bearing Tka Reduced The Postoperative Anteroposterior Laxity Comparing To Fixed-bearing TKA In The Same Patients
Yukihide Minoda, Shegekazu Mizokawa, Yoichi Ohta, Mitsuhiro Ikebuchi, Maki Itokazu, Kazumasa Yamamura, Suguru Nakamura, Hiroaki Nakamura

Poster No. 1717

Three Dimensional Assessment of Medial-lateral Stability after TKA with A Femoral Single-radius Design
Hayato Mine, Ryuichi Gejo, Makiko Nogami, Kazuhito Sugimori, Hiraku Motomura, Tomoatsu Kimura

Poster No. 1718

Tibiofemoral Articular Contact Kinematics Of The Knee After A Posterior Cruciate Substitute Total Knee Arthroplasty - A Comparison Between Caucasian And Asian Patients
Ji Hoon Bae, Ali Hosseini, Kyung Wook Nha, Sang Eun Park, Andrew A Freiberg, Harry E Rubash, Guoan Li

Poster No. 1719

Does Knee Osteoarthritis Affect The Femoral Component Position During Total Hip Arthroplasty? 3D Model Analysis
Kwang Woo Nam, Dimitris C Dimitriou, Tsung-Yuan Tsai, Jing-Sheng Li, Kwan-Kyu Park, Harry E Rubash, Guoan Li, Young-Min Kwon

Poster No. 1720

Recovery of Gait and Changes of Pelvic Motion After Total Hip Arthroplasty
Masaya Ueno, Riki Tanaka, Shuichi Eto, Masatsugu Tsukamoto, Shunsuke Kawano, Masaru Kitajima, Motoki Sonohata, Masaaki Mawatari

Poster No. 1721

Gap Changes of Medial Osteoarthritic Knees before and after a Cr TKA: In-vivo Geometric Condylar Axis Analyses
Kwan Kyu Park, Ali Hosseini, Tsung-Yuan Tsai, Young-Min Kwon, Andrew A Freiberg, Harry E Rubash, Guoan Li

Poster No. 1722

Asymmetrical Hip Kinematics during Gait in Unilateral Total Hip Arthroplasty Patients
Tsung-Yuan Tsai, Jing-Sheng Li, Dimitris Dimitriou, Harry E Rubash, Guoan Li, Young-Min Kwon

Poster No. 1723

Does Implant Orientation Influence Functional Pelvic Stability In Female Patients With Unilateral Total Hip Arthroplasty?
Donna Moxley Scarborough, Tova L Kosowsky, Tsung-Yuan Tsai, Young-Min Kwon

Poster No. 1724

A Surgical Concept to Restore the Natural Flexion Coronal Alignment of the Lower Extremity with Well-Balanced Flexion Gap in Posterior-stabilized Total Knee Arthroplasties
Hitoshi Nochi, Satomi Abe, Takuya Ruike, Yusuke Sasaki, Hiroshi Ito

PS2 HIP AND KNEE ARTHROPLASTY - INFECTION

Poster No. 1725

The Incidence Of Bacterial Contamination Inside The Leg Bag, During The Hip Surgery With Lateral Approach In Lateral Decubitus Position
Tomokazu Fukui, Shigeo Fukunishi, Konan Tsuchiyama, Yu

Poster No. 1726

The Usefulness of New Multiplex real-time PCR in Diagnosing Periprosthetic Joint Infection
Masaki Kawamura, Yutaka Inaba, Naomi Kobayashi, Yushi Miyamae, Hiroyuki Ike, Taro Tezuka, So Kubota, Tomoyuki Saito

Poster No. 1727

Revision Total Hip and Knee Arthroplasty Following Documented Deep Infection: The Utility of Frozen Sections
Grayson A Moore, Malone V. Hill, Ronald W. Lindsey, Kelly Stephenson

Poster No. 1728

Demographic Characteristics Of Patients With Infected Knee Arthroplasty By Organism Genus
Richard J Holleyman, Paul N Baker, Andre Charlett, Kate Gould, David J Deehan

Poster No. 1729

The Utility of MRI with Metal Artifact Reduction Sequencing in Diagnosing Periprosthetic Joint Infection after Total Hip Arthroplasty
Kaitlin M Carroll, Erik Schnaser, Hollis Potter, Michael B Cross

PS2 -HIP AND KNEE ARTHROPLASTY - COMPUTATIONAL MODELING

Poster No. 1730

A Preliminary Colloidal Boundary Lubrication Model for Wear Prediction in Total Joint Replacements
Sean T O’Brien, Yunhua Luo, Jan-M. Brandt
Poster No. 1731
A Comparison Of Femoral Bone-cut Angles Determined By Kinematic Alignment-based Planning And Cylindrical Axis-based Planning
Tomoki Sassa, Yasuo Niki, Kengo Harato, Takeo Nagura, Yoshiaki Toyama, Yasunori Suda

Poster No. 1732
Predicting the 3D Hip Centre of Rotation Using Contralateral Pelvic Anatomy
Matthieu Durand-Hill, Johann Henckel, Keshthra Satchithananda, Jia Hua, John Skinner, Alister Hart

Poster No. 1733
Population-Based Evaluation of Patellar Component Design on Size, Coverage and Median Ridge Position
Charlie C Yang, Raymond H Kim, Patrick G. Davenport, Todd M. Miner, Douglas A Dennis, Derek R Johnson, Peter J Laz

Poster No. 1734
No Lift-off Motion Occurs with Proper Coronal Alignment Regardless of Excessive Collateral Ligament Laxity in Total Knee Arthroplasty
Shinichi Kuriyama, Masahiro Ishikawa, Moritoshi Furu, Hiromu Ito, Shuichi Matsuda

Poster No. 1735
Incidence of Undesired Collateral Ligament Imbalance and Instability between Extension and Flexion in Neutrally Aligned Total Knee Arthroplasty for Japanese Patients
Yasuo Niki, Kengo Harato, Tomoki Sassa, Takeo Nagura, Shu Kobayashi, Yoshiaki Toyama, Yasunori Suda

Poster No. 1736
Design and Placement of Unicompartmental Tibial Components Based on Morphological Analysis
Miriam Chaudhary, Hao Yang Chan, Sally Arno, Aaron Lerner, Christopher Bell, Ravinder Regatte, Peter S Walker

Poster No. 1737
Evaluation Of Femoral Neck Anteverision Based on Clinical Epicondylar Axis Using The Three-dimensional Preoperative Planning Software “Athena”
Ryugi Ichimura, Makoto Kondo, Yasuo Higuma, Takahiro Noguchi, Kazuhide Tomari

Poster No. 1738
Evaluation of the Position of the Cup Center and the Flexion Range of Motion after Total Hip Arthroplasty
Naoya Taki, Naoto Mitsugi, Yuichi Mochida, Masato Aratake, Hirohiko Ota, Kentaro Shinohara, Tomoyuki Saito

Poster No. 1739
Three Dimensional Assessments Of Distal Femur Geometry With Resection Level For Total Knee Arthroplasty With Asian Peoples
Tetsuya Tomita, Yasuo Kunugiza, Yu-Shu Lai, Kazuma Futai, Hideki Yoshikawa, Kazuomi Sugamoto

PS2 HIP AND KNEE ARTHROPLASTY - IMPLANT WEAR

Poster No. 1740
Manufacturing Inventory Problems: Implant Adjustability Comes at a Cost, Recall of the R3 Acetabular System
Kevin Ilo, Emma Derby, Harry Krishnan, Harry Hothi, Robert Whittaker, Gordon Blunn, John Skinner, Alister Hart

Poster No. 1741
What Effect Does the Stength of the Taper Connection Have on Taper Damage in Retrieved Total Hip Devices?
Genymphas Higgs, Ryan Siskey, Jeremy L Gilbert, William Michael Mihalko, Clare M Rimnac, Steven M Kurtz

Poster No. 1742
Profiling 3rd-body Abrasion In A 10-cycle MOM Simulator Study - Alumina And Hydroxyapatite Ceramic Particles Compared To PMMA And CoCr As Control Debris
Thomas Halim, Ian C Clarke, Michelle Burgett, Thomas K Donaldson, Jean Yves Lazennec, Christina Savisaar, John G Bowsher

Poster No. 1743
Influence of Stem Type on Material Loss at the Metal-on-Metal Pinnacle Taper Junction
Harry Hothi, Robert Whittaker, Jay Meswania, Kevin Ilo, Reshid Berber, Antti Eskelinen, Gordon Blunn, John Skinner, Alister Hart

Poster No. 1744
Frictional Torque In Highly Cross-liked Acetabular Liners After In Vivo Service
Shannon Rowell, Michael Duffy, Thomas Zumbrunn, Kartik Mangudi Varadarajan, Orhun Muratoglu

Poster No. 1745
Development Of A Wear Model For Lubricated Metal-on-Metal Hip Joints
Leiming Gao, Rob W Hewson

Poster No. 1746
A Proposed Classification System for Taper Surface Morphology: Smooth Vs. Micro-grooved
Christina M Arnholt, Richard Underwood, Steven M Kurtz

Poster No. 1747
The Effect Of High Bending Moment On Fretting Corrosion And Wear At The Modular Head-Stem Junction of Metal On Metal Total Hip Replacements
Anna Panagiotidou, Konstantinos Tsitskarias, Jay Meswania, John Skinner, Alister Hart, Fares Haddad, Gordon Blunn

Poster No. 1748
Is Linear Penetration an Accurate Surrogate Measure for Volumetric Wear in TKR Tibial Liners?
Elmira Moslemi Rad, Christopher B Knowlton, Robin Pourzal, Hannah J Lundberg, Markus A Wimmer

Poster No. 1749
Corrosion and Damage Mechanisms in Retrieved Long-Term TKA Femoral Components
Christina M Arnholt, Sebi V Kocagoz, Daniel MacDonald, Jeremy L Gilbert, Arthur Malkani, Gregg R Klein, Clare M Rimnac, Steven M Kurtz
Poster No. 1750  
**Relationship Between TKR Polyethylene Liner Volumetric Wear Rate And Periprosthetic Osteolysis**  
Robin Pourzal, Johannes Cip, Christopher B Knowlton, Elmira Moslemi Rad, Markus A Wimmer

Poster No. 1751  
**Uhmwpe Particle Delivery And Analgesia Induce Walking Track Alterations In A Murine Tibial Particle-induced Osteolysis Model**  
Jean Langlois, David Bichara, Daniel Copeland, Moussa Hamadouche, Orhun Muratoglu

Poster No. 1752  
**Tribocorrosion in Hard-on-Hard Total Hip Replacement Bearing Couples**  
Andrew R Beadling, Michael G Bryant, Duncan Dowson, Anne Neville

Poster No. 1753  
**Knee Wear Measurement Using CMM Scanning: A Novel Method Shows Promise**  
Byoungwook Jang, John H Currier, John Collier, Douglas Van Citters

Poster No. 1754  
**Corrosion of Cemented Femoral Stems may Contribute to Implant Failure**  
Harry Hothi, Andreas Panagiotopoulos, Reshit Berber, Robert Whittaker, Shiraz Sabah, Johann Henckel, Gordon Blunn, John Skinner, Alister Hart

Poster No. 1755  
**Tibial Backside Wear Predicted By Cross-shear Model; A Retrieval Study**  
Kathleen Lewicki, Rayna A Levine, John H Currier, Douglas Van Citters

Poster No. 1756  
**Is There A Difference In Wear Performance Between Scratched Coc And Ceramic Femoral Heads?**  
Kimberly Mimnaugh, Diego A Orozco Villasenor, Alicia Rufner

Poster No. 1757  
**How Do Positive and Negative Taper Mismatches Affect the Interface Mechanics of Modular Head-Neck Junctions?**  
Philip C Noble, Jesal Parekh, Newton Chan

Poster No. 1758  
**The Role of Femoral Head Size and Offset on Corrosion in the Bore**  
Bridget E Shaia, John H Currier, John Collier, Douglas Van Citters

Poster No. 1759  
**Increased Torque in Hip Replacement Bearings due to Translational Surgical Mal-Positioning**  
Mazen Al-Hajjar, Philippa Clarkson, Sophie Williams, Louise M Jennings, Jonathan Thompson, Graham H Isaac, Eileen Ingham, John Fisher

Poster No. 1760  
**Metal Transfer on Ceramic and Metal Heads: a Retrieval Study**  
Eliza K Fredette, Daniel MacDonald, Richard Underwood, Steven M Kurtz

Poster No. 1761  
**Effects of CoCrMo Surface Finishing on UHMWPE Wear In A Pin-On-Disk Test**  
Elizabeth Hippensteel, Jason Langhorn

Poster No. 1762  
**Medial versus Lateral Thinning in Retrieved Knee Bearings: Fixed-Bearings and Mobile Bearings Wear Differently**  
John H Currier, Xiaotian Wu, Daniel Santana, Joseph Cook, Douglas Van Citters

Poster No. 1763  
**Characterizing Head-Neck Junction Wear Helps Understand the Mechanism of Failure of Metal on Metal Total Hip Replacements**  
Andreas C Panagiotopoulos, Harry Hothi, Robert Whittaker, Jay Meswania, Paul Bills, Radu Racasan, Gordon Blunn, John Skinner, Alister Hart

Poster No. 1764  
**Patient-specific Wear Testing For TKR: The Influence Of Gait And Implant Alignment On Wear Scar Size And Location**  
Ryan Freed, Robin Pourzal, Hannah Lundberg, Markus A Wimmer

Poster No. 1765  
**Vitamin E Grafted UHMWPE Knee Inserts Exhibit Significant Wear and Delamination Resistance under Activities of Daily Living**  
Diego A Orozco Villasenor, Jerry Parcell, Alicia Rufner

Poster No. 1766  
**Modifications to Wear Particle Analysis Procedure to Improve Percent Yield for Third Body Particles**  
Anneliese Heiner, Ikakis Papageorgiou, Kruger Karen, Eileen Ingham, Joanne Tipper, Thomas D Brown

Poster No. 1767  
**Modular Junctions in Knee Arthroplasty Devices Show Notable Corrosion and Fretting**  
John H Currier, Scott Mitchell, John Collier, Michael B Mayor, Rayna A Levine, Douglas Van Citters

Poster No. 1768  
**Is Particle-induced Osteolysis Age Related?**  
Jean LANGLOIS, Amine Zaoui, David Bichara, Morad Bensidhoum, Hervé Petite, Orhun Muratoglu, Moussa Hamadouche

Poster No. 1769  
**Three THAs Paired With Highly Cross-linked UHMWPE Liners Revised For Taper Junction Corrosion**  
Shannon Rowell, Christopher Reyes, William Tomford, Young-Min Kwon, Dennis Burke, Henrik Malchau, Orhun Muratoglu
Poster No. 1770
A Novel Material “Carbide-Derived-Carbon (CDC)” to Improve Tribological Properties of MoM Hip Implants
Eik-lang Lau, Maria Runa, Michael McNallan, Mathew Mathew

Poster No. 1771
Validation Study for a Quantitative Method to Measure the Volumetric Material Loss from Taper Surfaces
Sevi B Kocagoz, Richard Underwood, Daniel MacDonald, Doruk Baykal, Judd Day, Steven M Kurtz

PS2 HIP AND KNEE ARTHROPLASTY - CLINICAL OUTCOMES RESEARCH

Poster No. 1772
Comparison of Patient Function Six Weeks after Surgery Between Balanced and Unbalanced Total Knee Arthroplasties
Cale Jacobs, Christian Christensen

Poster No. 1773
Rotational Alignment Of Tibial Prosthesis Using Medial Border Of Tibial Tubercle In Mobile-bearing TKA
Yoshinori Ishii, Junko Sato, Hideo Noguchi

Poster No. 1774
Intra-operative Procedures for Factors Influencing Flexion Angle Before and After PS-TKA
Ryuji Nagamine, Makoto Kawasaki, Mitsugu Todo, Weijia Chen

Poster No. 1775
Retention Of The Posterior Cruciate Ligament Does Not Affect Femoral Rotational Alignment In TKA Using A Gap-balance Technique
Yoshinori Ishii, Hideo Noguchi, Junko Sato

Poster No. 1776
Orthopedic Surgeons Rank Low in Total Medicare Payments: Evaluation of the Medicare Provider Utilization and Payment Database
Daniel A Belatti, Andrew James Pugely, Phinit Phisitkul, Annunziato Amendola, John Callaghan

Poster No. 1777
Total Joint Arthroplasty in Patients with Chronic Renal Disease: Is It Worth the Risk?
Lucian Warth, Andrew James Pugely, Christopher Martin, Yubo Gao, Nicolas Noisexe, Melissa Willenborg, John Callaghan

Poster No. 1778
What Can Be Learned From Minimum 20 Year Follow-Up Studies of Hip Replacement?
Christopher Martin, John Callaghan, Lucian Warth, Steve Liu, Devon Goetz, Andrew James Pugely, Nicolas Noisexe, Melissa Willenborg, Yubo Gao, Richard Johnston

Poster No. 1779
Ossous Response Of Four Different Types Of Cementless Stems In Primary Total Hip Arthroplasty
Taro Tezuka, Yutaka Inaba, Naomi Kobayashi, Hiroyuki Ike, So Kubota, Masaki Kawamura, Tomoyuki Saito

Poster No. 1780
Defining High Activity in Arthroplasty Patients
Nicholas B Robertson, Andrew Battenberg, Michael Kertzner, Thomas P Schmalzried

Poster No. 1781
Correlation Between a Dedicated Orthopedic Complication Grading System and Early Adverse Outcomes in Joint Arthroplasty
Dorothy Y Harris, Jillian McAngus, Yong-Fang Kuo, Ronald W. Lindsey

Poster No. 1782
Unicondylar Knee Arthroplasty in the U.S. Patient Population: Prevalence and Epidemiology
Kevin L Ong, Edmund Lau, Steven Kurtz, Erik Hansen, Jess Lonner

Poster No. 1783
Assessing And Quantifying Instability In Revision Total Knee Arthroplasty
David F Hamilton, Richard Burnett, James T Patton, Colin R Howie, Hamish Simpson

Poster No. 1784
Comparative Survival Analysis of Two Porous Metal Acetabular Components in Total Hip Arthroplasty
Peter Hsiue, Emil Vutescu, Wayne Paprosky, Sumon Nandi

Poster No. 1785
To Brace Or Not To Brace: Association Between Pre-And Post-Tka Brace Use And Short-term Outcomes
Kevin L Ong, Edmund Lau, Michael A Mont, Michael Manley, Steven Kurtz

Poster No. 1786
Peri-prosthetic Bone Mineral Density after Bilateral TKA: Mobile vs. Fixed Bearing prostheses
Suguru Nakamura, Yukihide Minoda, Shigekazu Mizokawa, Yoichi Ohta, Maki Itokazu, Kazumasa Yamamura, Hiroaki Nakamura

Poster No. 1787
Functional Outcomes of Direct Anterior Approach and Mini-Posterior Approach for Total Hip Arthroplasty
Kenton Kaufman, Michael Taunton, Melissa Morrow, Rafael J Sierra, Robert Trousdale, Mark Pagnano

Poster No. 1788
THA Functional Outcomes Are Independent of Acetabular Component Orientation When a Polyethylene Liner is Employed
Jacob Bobman, Jonathan Danoff, Oladapo Babatunde, Katie Peyser, Calvin Zhu, Jeffrey Geller, William Macaulay

Poster No. 1789
Are There Any Good Patient Reported Outcome Questionnaires For Patients Undergo Total Hip Arthroplasty? Systematic Reviews On Psychometric Property Evaluations And Methodological Quality Assessments
Hsiaomin Huang, Megan Mullins, Heather Stone, Anna Ghambarian, Kevin Troyer, Nilsa Loyo-Berrios, Benjamin Eloff, Manuel Bayona, Danica Marinac-Dabic, Faisal Mirza, Joel Gagnier
Poster No. 1790

The Relationship Between Alignment, Function And Loading In Total Knee Replacement: In-Vivo Analysis Of A Unique Patient Population
David E Williams, Andrew Metcalfe, June Madet, Gemma Whatling, Paul Biggs, Alexis Roux, Peter J Kempshall, Kathleen Lyons, Mark Forster, Catherine A Holt

Poster No. 1791

Differences in Total Hip Replacement Outcomes based on Age
Leslie Harrold, David Ayers, Wenjun Li, Courtland Lewis, Philip C Noble, Regis J O’Keefe, Jeroan Allison, Patricia Franklin

Poster No. 1792

What Are Important Surgical Factors Affecting Wound Healing after Primary Total Knee Arthroplasty?
Kengo Harato, Yasuo Niki, Takeo Nagura, Yoshiro Otani, Yoshiaki Toyama, Yasunori Suda

Poster No. 1793

Post-Recall Retrieval Analysis of Metal-on-Metal Total Hips
Patricia Campbell, Sang-Hyun Park, Zhen Lu

Poster No. 1794

Patient Reported Outcome Questionnaires For Total Knee Arthroplasty: A Systematic Review Of Psychometric Property Evaluations And Methodological Quality Assessments
Megan Mullins, Hsiaoamin Huang, Faisal Mirza, Manuel Bayona, Heather Stone, Kevin L Troyer, Anna Ghambaryan, Nilza Loyo-Berrios, Benjamin Ellof, Danica Marinac-Dabic, Joel J Gagnier

Poster No. 1795

Gender Role in Perioperative Outcomes in Total Knee Arthroplasty
Sapan Shah, David Mossad, Olivia Wang, Mark H Gonzalez

Poster No. 1796

Use of a Computerized Arthroplasty Registry to Generate Operative Notes Decreases Transcription Errors
Todd M Miner, Raymond H Kim, Charlie C Yang, Douglas A Dennis, David N Conrad, Justin Duke

Poster No. 1797

Impact of Intravenous Ketorolac on Complications after Total Knee Arthroplasty
Clifford K. Boese, Leslie Centeno, Ryan Walters, Brian Cooley, Bridget Scherrer

Poster No. 1798

Asymmetric Tibial Component Reduced The Risk Of Malrotation In TKA
Yukihide Minoda, Shegekazu Mizokawa, Yoichi Ohta, Maki Itokazu, Kazumasa Yamamura, Suguru Nakamura, Hiroaki Nakamura

Poster No. 1799

Differences in Total Knee Replacement Outcomes based on Age
Leslie Harrold, David Ayers, Wenjun Li, Vincent Pellegrini, John Grady-Benson, Jeroan Allison, Patricia Franklin

PS2 HIP AND KNEE ARTHROPLASTY - POLYETHYLENE AND BIOMATERIALS

Poster No. 1800

Silver Chromium Nitride Coatings for the Generation of Particulate Silver
Danielle de Villiers, Agata Nyga, Terry Tetley, Sarah Banfield, Jonathan Housden, Alister Hart, Alison Traynor, Julia C Shelton

Poster No. 1801

Hip Simulator Study on the effect of Acetabular Bearing Design on Frictional Torque
Jason A Longaray, Reginald Lee, Lizeth Herrera, Amber Schweitzer, Aaron Essner

Poster No. 1802

Corrosion Behavior of Medical-Grade Ti-6Al-4V Exposed to Tensile Loads
Pooja Panigrahi, Amir Poursaeae, Melinda Harman

Poster No. 1803

Retrieval Analysis of Short - Term Anti-Oxidant Stabilized Highly Crosslinked UHMWPE Used in Knee and Hip Arthroplasty
Komal Mehta, Daniel MacDonald, Gregg R Klein, Mark A Hartzband, Harlan M Levine, Michael A Mont, Steven M Kurtz

Poster No. 1804

Quantification of Antioxidant Concentration in UHMWPE
Michelle A Ross, David B Warner, Celia E Macias Gupta, Venkat S Narayan

Poster No. 1805

Assessment of Methods for Quantification of Antioxidant Stabilized UHMWPEs
Michelle A Ross, David B Warner, Celia E Macias Gupta, Venkat S Narayan

Poster No. 1806

Variation of Mechanical Properties with Oxidation in Highly Crosslinked Remelted UHMWPE
Mitchell Fung, Steven D Reinitz, Douglas W Van Citters

Poster No. 1807

Reduction of In Vivo Oxidation induced by Lipid Absorption by Phospholipid Polymer Grafting on Orthopedic Bearings
Masayuki Kyomoto, Toru Moro, Shihori Yamane, Kenichi Watanabe, Sakae Tanaka, Kazuhiro Ishihara

Poster No. 1808

Tibial Insert Retrievals Allow Comparison of Wear and Oxidation in Conventional and Highly Cross-linked UHMWPE
Barbara H Currier, John H Currier, Xiaotian Wu, Rayna A Levine, Douglas Van Citters

Poster No. 1809

Dynamic Mechanical Analysis As A Tool For Understanding Entanglements And Cross-links In UHMWPE
Steven D Reinitz, Anna M Gottardi, Kathleen A Lewicki, Douglas W Van Citters
Poster No. 1810  
**A Comparison of Wear and Wear Particles Generated by Injection Molded PEEK-based Materials with Cross Linked Polyethylene Sliding Against Metal and Ceramic Counterface in a Simple Configuration Wear Simulation**  
Salah Hammouche, Joanne L. Tipper, John Fisher, Sophie Williams

Poster No. 1811  
**PEEK And CFR-PEEK As An Alternative To UHMWPE In Total Knee Replacement**  
Claire L Brockett, Silvia Carbone, John Fisher, Louise Jennings

Poster No. 1812  
**Effects Of Absorbed Lipids On Fatigue Crack Growth Rates Of Ultra-high Molecular Weight Polyethylene.**  
Hideyuki Sakoda, Shingo Niimi

Poster No. 1813  
**Molecular Weight Characterization To Assess Aging In Ultra High Molecular Weight Polyethylene**  
Norma Turner, Stephen H Spiegelberg, Kim-Phuong Le, Jacob Blitz, Lin Song

**PS2 HIP AND KNEE ARTHROPLASTY - FINITE ELEMENT ANALYSIS**

Poster No. 1814  
**Do Modeling Choices Have a Large Influence on the Prediction of “Fretting Wear” at the Cone-Head Interface?**  
Thom Bitter, Dennis Janssen, Berend W. Schreurs, Gjeron Hannink, Timothy E Marriott, Imran Khan, Nico Verdonschot

Poster No. 1815  
**Prediction of the Long-term Course of the Cementless Femoral Stem Based on Finite Element Analysis and Mid-term Radiological Evaluation**  
Kanehiro Matsuayama, Yasuhiro Ishidou, Yong-Ming Guo, Hironori Kakoi, Naohiro Shinohara, Yuhei Yahiro, Ichiro Kawamura, Takao Setoguchi, Shingo Maeda, Setsuro Komiya

Poster No. 1816  
**Bone Grafting With An Acetabular Reinforcement Ring: Effects Of The Graft Location According To 3-dimensional Finite Element Analysis**  
Koji Totoribe, Etsuo Chosa, Go Yamako, Xin Zhao, Shinji Watanabe, Hiroaki Hamada, Gang Deng

Poster No. 1817  
**Investigation of Novel Unicompartmental Knee Component Designs for Medial Osteoarthritis**  
Miriam E Chaudhary, Joseph Bosco, Chih-Shing Wei, Peter S Walker

**PS2 HIP AND KNEE ARTHROPLASTY - SURGICAL NAVIGATION OUTCOMES AND ROBOTICS**

Poster No. 1818  
**Bone Preservation in a Customized, Individually Made Total Knee Replacement**  
John E Slamin, William B Kurtz, Scott Doody

Poster No. 1819  
Laurent Angibaud, Ralph Liebelt, Bo Gao, Xeve Silver

Poster No. 1820  
**Evaluation Of Knee Deformity On Alignment Discrepancies During Total Knee Arthroplasty Using A Computer-assisted Guidance System**  
Laurent Angibaud, Ralph Liebelt, Bo Gao, Xeve Silver

Poster No. 1821  
**Patient Factors Influencing Mediolateral Compartment Force Imbalances During Total Knee Arthroplasty**  
Cale Jacobs, Christian Christensen

Poster No. 1822  
**Accuracy Of Component Orientation And Leg Length Adjustments Using A Revised Version Image-free Navigation In Total Hip Arthroplasty**  
Yu Takeda, Shigeo Fukunishi, Shoji Nishio, Yuki Fujihara, Tomokazu Fukui, Shinichi Yoshiya

**PS2 HIP AND KNEE ARTHROPLASTY - OSTEOLYSIS AND ADVERSE SOFT TISSUE REACTION**

Poster No. 1823  
**Murine Model Of Particle-induced Osteolysis Using A Titanium Tibial Implant To Test The Influence Of Aging On Bone Turnover**  
Jean Langlois, David Bichara, Bertrand David, Herve Petite, Keith Wannomae, Moussa Hamadouche, Orhun Muratoglu

Poster No. 1824  
**Teriparatide vs. Alendronate For The Preservation Of BMD Around Femoral Implant And In The Lumbar Spine After Total Hip Arthroplasty**  
Makoto Uchiyama, Yutaka Inaba, Naomi Kobayashi, Hiroyuki Ike, Taro Tezuka, Satoshi Kubota, Masaki Kawamura, Tomoyuki Saito

Poster No. 1825  
**Immunophenotypic Analysis of Peripheral Blood Lymphocytes in Patients with Hip Implant-Related Metal Hypersensitivity**  
Eric A Lehoux, Ian Hurda, Stephen J Baskey, Paul E Beaulé, Isabelle Catelas

Poster No. 1826  
**Do Metal Ion Levels Normalize Following Revision Surgery for ‘Pseudotumours’ in Patients with Corrosion of Dual Taper Modular THA?**  
Young-Min Kwon, Tsung-Yuan Tsai, William Leone, Guoan Li, Harry E Rubash, Andrew A Freiberg

Poster No. 1827  
**Histopathology of Pseudotumours in Corrosion of Dual Taper Modular Femoral Stem: Hypersensitivity or Dose-Dependent Reaction?**  
Young-Min Kwon, Kenneth Urish, Tsung-Yuan Tsai, Guoan Li, Andrew A Freiberg, Harry E Rubash
Poster No. 1828
The Effect of Wear Particles from Hard-on-Hard Total Hip Replacements on the Cell Plasma Membrane
Ruth Craven, Lars Jeuken, Sophie Williams, Joanne Tipper

Poster No. 1829
Immunohistochemical Localization And Cellular Reaction Of Tlr2 And Nlrp3 Cascades In Aseptic Loosening Of Totally Replaced Hip Joints
Yasushi Naganuma, Tomoyuki Hirayama, Hiroharu Oki, Suran Yang, Yasunobu Tamaki, Yuya Takakubo, Kan Sasaki, Michiaki Takagi

Poster No. 1830
Practical Method to Dynamically Measure 3-D Implant Motion In Cadaveric Specimens
Nicholas J Stroud, Cameron Staunach

Poster No. 1831
Is The Anterior Approach Associated With A Higher Risk Of Femoral Component Migration?
Paul E Beaule, Alex Page, Ashley Drodge, Peter Breithaupt

Poster No. 1832
Acid Etch To Increase Debonding Strength At PMMA Cement And CoCrMo Interface
Weidong Tong, Steve Leisinger

Poster No. 1833
Rim Defect Repair in Healthy and Osteoporotic Patients Using Cement Augmentation
Farid Amirouche, Giovanni F Solitro, Mark Gonzalez, Wayne M Goldstein

Poster No. 1834
Broaching of the Proximal Femur in Preparation for a Femoral Hip Prosthesis: Density of Cancellous Bone in Region Immediately Around Broach Canal
Dan Huff, Alex Maile, Niklas B Damm, Nicholas E Bishop, Michael Morlock

Poster No. 1835
Migration Of Trident Tritanium Ingrowth Actebular Components Assessed With RSA
Rene ten Broeke, Jan Geurts, Elisabeth Jutten, Boudewijn Brans, Lennard Koster, Marloes Peters, Bart Kaptein, Chris Arts

Poster No. 1836
Can the Pre-operative Femoral Neck Geometry Be Used to Predict Post-operative Femoral Stem Antversion in THA Patients?
Kwan Kye Park, Tsung-Yuan Tsai, Dmitris Dimitriou, Harry E Rubash, Guoan Li, Young-Min Kwon

Poster No. 1837
Initial Stability of Cementless Femoral Stems: An In Vitro Technique to Measure Micromotion and Gap Around the Loaded Stem
Valérie Malfroy Camine, Hannes A Rüdiger, Dominique P Pioletti, Alexandre Terrier

Poster No. 1838
How Does Ambient Temperature and Time to Implantation Affect Intrusion Depth? A Comparative Bone Cement Study
Andrew Pytiak, Nathaniel Jove, Laryssa A Korduba-Rodriguez, Shulin He, Frank Sagato, Marc Esformes, David C Markel

Poster No. 1839
Mediolateral Subsidence Assessment of a Novel Unicondylar Porous Baseplate Keel Design
Gokce Yildirim, Robert Davignon, Laura Scholl, Gregg Schmidig

Poster No. 1840
The Position of Components using the Modified Gap-Balancing Technique after Posterior Stabilized Type Total Knee Arthroplasty
Makoto Kawasaki, Ryuji Nagamine, Kei Osano, Koichiro Tanaka, Mitsugu Todo, Akinori Sakai

Poster No. 1841
A Finite Element Analysis of Mechanical Trade-Offs Encountered In Changing Centers of Rotation In Reverse Shoulder Arthroplasty
Vijay N Permeswaran, Donald D Anderson, Jessica E Goetz, Carolyn M Hettrich

Poster No. 1842
Glenohumeral Anatomy Study: A Comparison Of Male And Female Shoulders With Similar Average Age And Bmi
Amanda Jacobson, Matt Hamilton, Alex Greene, Pierre Henri Flurin, Thomas Wright, Joseph Zuckerman, Christopher Patterson Roche

Poster No. 1843
Shoulder Instability Computer Model Replicates Patient Range of Motion When Simulating Capsular Plication
Charlie Yongpravat, Eugene W Brabston, Daniel Briggi, Charles A Popkin, Charles M Jobin, William N Levine, Thomas R Gardner, Christopher S Ahmad

Poster No. 1844
WITHDRAWN

Poster No. 1845
WITHDRAWN

Poster No. 1846
WITHDRAWN

Poster No. 1847
The Effect of Cement Morphology on Surrounding Stress of Implanted Cadaveric Glenoids: Micro-Finite Element Analysis
Hwa Bok Wee, April Armstrong, Wesley Flint, Gregory S Lewis

Poster No. 1848
Influence Of Length On The Biomechanical Performance Of Humeral Stems In Shoulder Arthroplasty
Jeff Bischoff, Charles L Penninger
PS2 SHOULDER AND ELBOW - ARTHROPLASTY

Poster No. 1849
Biomechanical Effectiveness Of Glenohumeral Tendon Transfers Performed With Reverse Shoulder Arthroplasty To Restore External Rotation
Jean-David Werthel, Alexander Hooke, Taku Hatta, Eric Wagner, Kai-Nan An, John Sperling, Bassem Elhassan

Poster No. 1850
Changes in Glenohumeral Muscle Moment Arms Following Reverse Shoulder Arthroplasty: A Biomechanical Study
Jean-David Werthel, Alexander Hooke, Taku Hatta, Eric Wagner, Kai-Nan An, Bassem Elhassan, John Sperling

Poster No. 1851
Factors Related to Improved Quality of Life in Operative and Non-operative Patients
Joel J Gagnier, Bruce S Miller, James E Carpenter, Asheesh Bedi, Christopher B Robbins

Poster No. 1852
The Effect of Material Selection and Implant Positioning on Cartilage Stresses Following Partial Joint Resurfacing: A Finite Element Study
Jacob M Reeves, Najmeh Razfar, Dan Langoth, George S Athwal, Graham J King, James A Johnson

Poster No. 1853
Reliability Of Assessment Of Component Position With Three-dimensional Computed Tomography Imaging Following Total Shoulder Arthroplasty: Comparison Of Analysis Techniques
Eric T Ricchetti, Bong Jae Jun, Richard A Cain, Eric J Rodriguez, David Kusin, Naveen Subhas, Thomas E Patterson, Joseph P Iannotti

Poster No. 1854
Sequential Three-dimensional Computed Tomography Analysis Of Implant Position Following Total Shoulder Arthroplasty
Eric T Ricchetti, Richard A Cain, Bong Jae Jun, Ari Youserian, Eric J Rodriguez, David Kusin, Naveen Subhas, Thomas E Patterson, Joseph P Iannotti

Poster No. 1855
Factors Associated with Rotator Cuff Tears in Total Shoulder Arthroplasty (TSA) Explored
Matthew T Binkley, Scott Nodzo, Philip Stegemann, Thomas Duquin

Poster No. 1856
Accuracy Of Pre-operative Glenoid Correction In Reverse Shoulder Arthroplasty: Comparison Of 3d-interactive And Traditional Methods
Julien Berhouet, Lawrence Gulotta, Xiang Chen, Daniel Choi, Andreas Kontaxis

Poster No. 1857
The Effect of Bone Density on Migration of Stemless and Stemmed Humeral Components - A Cadaveric Study
David M Warlop, Shouchen Dun, Steve Swope, Amit Vasanji

PS2 SHOULDER AND ELBOW - KINEMATICS AND MECHANICS

Poster No. 1858
Association Between Shoulder Subluxation And Rotator Cuff Muscles Degeneration In Osteoarthritic Shoulders
Alexandre Terrier, Julien Ston, Alain Farron

Poster No. 1859
What Shoulder Motions Are Safe After Rotator Cuff Repair? - A Biomechanical Study For Safe Rehabilitation Protocols
Satoshi Oki, Noboru Matsumura, Yoshimori Kiriyama, Yoshiaki Toyama, Takeo Nagura

Poster No. 1860
Joint Motion Remains Altered Following Remobilization in an Animal Model of Post-Traumatic Elbow Contracture
Ryan M Castile, Leesa Galatz, Spencer Park Lake

Poster No. 1861
Biomechanical Comparison of Traditional Anchors to All-Suture Anchors in a Double-Row Rotator Cuff Repair Cadaver Model
Todd Baldini, Andrew Goschka, Jason Hafer, Monica Hawkins, Kirk Reynolds, Nicholas Aberle, Eric McCarty

Poster No. 1862
Strain of the Tendon After Transosseous Equivalent Repair: A Cadaveric Study
Hideaki Nagamoto, Nobuyuki Yamamoto, Yuki Shioita, Jun Kawakami, Takayuki Muraki, Eiji Itoi

Poster No. 1863
Impact of Humeral Offset on Muscle Length with Reverse Shoulder Arthroplasty
Christopher Patterson Roche, Phong Diep, Matt Hamilton, Thomas Wright, Pierre Henri Flurin, Joseph Zuckerman, Howard Routman

Poster No. 1864
Tracking Shoulder Implant Motion Using Biplanar Videoradiography: An Accuracy Study
Tarpit Patel, Alexia Stylianou, Joel Schwartz, Andrew Green, Joseph Trey Crisco

Poster No. 1865
Minimal Effect of Compressive Loading on the Glenohumeral Joint Stability Ratio
Piyush Walia, Ronak Patel, Lionel Gottschalk, Matthew Kuklis, Morgan Jones, Stephen Fening, Anthony Miniaci

Poster No. 1866
Biceps Detachment Alters Rotator Cuff Tendon Properties and Joint Function in a Supraspinatus Tendon Tear Rat Model

Poster No. 1867
Contact Analysis Of The Glenohumeral Joint During Simulated Throwing Motion
Hiroaki Inui, Hiroshi Tanaka, Katsuya Nobuhara
Poster No. 1868
Effects of Margin Convergence on Gleno-Humeral Joint Contact Area and Contact Pressures
Anand Murthi, Vikram Sathyendra, Daniel Acevedo, Joseph Abboud

Poster No. 1869
Alteration Of Stress Distribution Patterns In The Elbow Medial Collateral Ligament Injury
Tadanao Funakoshi, Kozo Furushima, Naomi Oizumi, Yuichiro Abe, Norimasa Iwasaki

Poster No. 1870
Kinematic and Mechanical Analysis of Reverse Shoulder Arthroplasty
Glenn Sanders, Mark S Caruso, George Zanaros

Poster No. 1871
Measuring Three-Dimensional Thorax Motion Using Biplane X-Ray Imaging: Technique and Accuracy Assessment
Tim Baumer, Joshua William Giles, Anne Drake, Megan VanLuven, Michael Bey

PS2 SHOULDER AND ELBOW - DISEASE PROCESS
Poster No. 1872
Tryptase as a Biomarker of Post-Traumatic Joint Contracture in a Rabbit Model
Michaela Kopka, Mei Zhang, Michaela J Monument, Marvin J Fritzler, David A Hart, A. Dean Befus, Paul T Salo, Kevin A Hildebrand

Poster No. 1873
The Ability Of Ultrasound To Determine Rotator Cuff Tear Repearability
Andrew KH Tse, Patrick H Lam, Lisa Hackett, George AC Murrell

Poster No. 1874
Can Rotator Cuff Repair Prevent The Progression Of The Osteoarthritis?
Tsuyoshi Sasaki, Atsushi Yamamoto, Hitoshi Shitara, Tsuyoshi Ichinose, Daisuke Shimoyama, Tsutomu Kobayashi, Toshihisa Osawa, Kenji Takagishi

Poster No. 1875
Bone Morphogenetic Proteins Signaling in Rotator Cuff Muscles Following Massive Tendon Tears
Xuhui Liu, Bharat Ravishankar, Dominique Laron, Sunil Kumar Joshi, Tammy Luan, Hubert Kim, Brian T Feeley

Poster No. 1876
Side-specific Differences In The Supraspinatus Muscle And Tendon Morphological Properties In Collegiate Baseball Players With And Without Shoulder Injuries
Tomonobu Ishigaki, Masanori Yamanaka, Motoki Hirokawa, Yuya Ezawa, Mina Samukawa, Hiroshi Saito, Makoto Sugawara

Poster No. 1877
Muscular Fatty Infiltration Is Mediated By Mmp-13 In A Mouse Model Of Rotator Cuff Tears
Bharat Ravishankar, Tammy Luan, Dominique Laron, Hubert Kim, Brian T Feeley, Xuhui Liu

Poster No. 1878
Mast Cell Tryptase Modifies The Contraction Of Human Joint Capsule Cells In Vitro
Kevin A Hildebrand, Lindsey M Logan, Mei Zhang, David A Hart, Paul T Salo, A. Dean Befus

Poster No. 1879
A Prospective, Quantitative MRI-Based Assessment on the Progression of Fatty Infiltration after Rotator Cuff Repair
Drew Lansdown, Sonia Lee, Craig Sam, Roland Krug, Brian T Feeley, C Benjamin Ma

PS2 HAND AND WRIST - MECHANICS
Poster No. 1880
Side-to-side Versus Pulvertaft Extensor Tendon Repair - Biomechanical Study
Michael Rivlin, Ali Hosseini, Amir Reza Kachooei, Kyle Eberlin, Nikola Zivaljevic, Guoan Li, Chaitanya S Mudgal

Poster No. 1881
Looped versus Single Stranded Flexor Tendon Repairs: A Cadaveric Mechanical Study
Ryan P Calfee, Sean Boone, Jeffrey G Stepan, Daniel A Osei, Stavros Thomopoulos, Martin I Boyer

Poster No. 1882
Reducing Radiation Exposure in CT Image-Based Kinematic Analysis: Influence on Segmentation and Automated Kinematic Analysis
Tarpit Patel, Eni Halilaj, Michael Rainbow, Scott McAllister, Joseph J Crisco, Douglas C Moore

Poster No. 1883
Stepwise Releases of the Flexor Retinaculum Affect Carpal Tunnel Structural Properties
Kaihua Xiu, Xin Guo, Peter J. Evans, William H Seitz Jr., Zong-Ming Li

Poster No. 1884
Characterization of the Hyperelastic Material Properties of Subsynovial Connective Tissue
Yusuke Matsuura, Andrew Thoreson, Chunfeng Zhao, Peter C. Amadio, Kai-Nan An

Poster No. 1885
Biomechanical Evaluation of Isolated Scapholunate Ligament Disruption on Dynamic Scapholunate Instability
Matthew E. Hiro, Muturi Muriuki, Corey J. Schiffman, Julia Graham, Robert M Havey, Leonard I. Voronov, Avinash G. Patwardhan, Randipsingh Bindra

PS2 HAND AND WRIST - RECONSTRUCTION
Poster No. 1886
Proximal Tendon-Prosthesis Junction for Active Tendon Implants of the Hand: A Biomechanical Comparison of Two Techniques
Matthew J Thompson, John R Owen, Jennifer S Wayne, Charles M McDowell
Poster No. 1887

Biomechanical Analysis of Internal Fixation Methods for Distal Interphalangeal Joint Arthrodesis
Stephanie Rigot, Rafael Diaz-Garcia, Richard E Debski, John Fowler

Poster No. 1888

Force in the Scapholunate Interosseous Ligament during Physiological Wrist Loading
Frederick W Werner, Craig Dimitris, Donald A Joyce, Brian J Harley

Poster No. 1889

Secondary And Tertiary Axial Stabilization Of The Forearm, A Biomechanical Study Of The Interosseous Membrane And Triangular Fibrocartilage Complex
Daniel R Bachman, Kai-Nan An, Shawn W O’Driscoll

Poster No. 1890

Fixation for Metacarpal Neck Fracture: A Biomechanical Study
Pramote Malasit, John R Owen, Marc A Tremblay, Jennifer S Wayne, Jonathan E Isaacs

Poster No. 1891

Electrophysiological Changes of Median Nerve Induced by An Intraoperative Phalen’s Test on Carpal Tunnel Syndrome
Shigeru Kobayashi, Takafuli Yawama, Kousuke Awaru, Adam Meir, Katsuhiko Hayakawa

Poster No. 1892

Cell-Seeded Contraction Gel Model to Assess TGF-β and Fibroblast Biomechanics in an Established Rabbit Model of Carpal Tunnel Syndrome
Tai-Hua Yang, Andrew Thoreson, Anne Gingery, Dirk Larson, Sandra Passe, Kai-Nan An, Chunfeng Zhao, Peter C. Amadio

Poster No. 1893

Light Activated Sealing of Nerve Graft Coaptation Sites Improves Outcome Following Large Gap Nerve Injury

Poster No. 1894

Examinations In Relation To Intra-articular Pressure Force Of Talocrural Joint By The Use Of Miniature Pressure Sensor: Comparison Of Three Types Of Screws On Arthroscopic Ankle Arthrodesis
Satoshi Kamijo, Tsukasa Kumai, Shogo Tanaka, Tuyoshi Mano, Yasuhiro Tanaka

Poster No. 1895

Posterior Tibial Dysfunction: Imaging Diagnosis When No MRI Detectable Tendon Pathology Is Present
Elie Hamrouche, Douglas D Robertson, Jr., Apama Kakarala, Seth Means, Minzhi Xing, Michael Terk

Poster No. 1896

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Cambridge Polymer Group, Inc. is a contract research laboratory specializing in materials and products. Our services range from routine analytical testing to new product research and development. We provide a high-quality rapid turnaround resource with our multi-disciplined experienced team in all sizes of projects.

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http://mds.clevelandclinic.org/services/biorobotics.aspx

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The Japanese Orthopaedic Association
2-40-8 Hongo, Bunkyo-ku
Tokyo 113-8418
Japan
Phone +81-3-3816-3671
Fax +81-3-3818-2337
www.joa.or.jp

The Japanese Orthopaedic Association was founded in 1926 (Year 15 of the Taisho era) in order to promote studies of orthopaedics, presentation of study results, and to strengthen contact and cooperation among organizations and individuals specializing in this discipline. Our goal is to facilitate the maintenance and improvement of bone and joint function. To achieve this, it will be necessary to produce medical specialists who are adept at diagnosis and treatment, including conservative treatments such as therapeutic exercise, as well as pharmacotherapeutics and surgery.

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www.ndri.org

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www.niams.nih.gov

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Fax +86-21-61002270
www.pharmalegacy.com

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www.preclinicalresearch.com

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Preclinical Surgical Research Laboratory (PSRL)
Colorado State University
300 W. Drake Road
Fort Collins, CO 80523
Phone (970)682-0079
http://csu-cvmbs.colostate.edu/academics/clinsci/surgical-research-laboratory/Pages/default.aspx

The Preclinical Surgical Research Laboratory (PSRL) at Colorado State University conducts pilot and pre-clinical research studies with sheep, goats, rodents, and rabbits as validated animal models. The laboratory collaborates with industry and academic institutional partners to evaluate a wide variety of medical devices for treatment of spinal, orthopaedic, sports medicine and soft tissue conditions. Metabolic disorders such as osteoporosis are also commonly studied at the PSRL.

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Fax +49-89-321459-16
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Presented by William L. Bargar, MD
Saturday, March 28, 2015 at 2:45-3:00pm
Located in the Exhibit Hall of the Marquee Ballroom

or

Visit us at booth# 225
SUNDAY, MARCH 29, 2015 CONT.

Professional Advancement Session: Finding a Partner in Research
Room 121 - 122

3:45PM-4:45PM
Diagnostic Imaging:
From Spine to Cartilage
Room 111 - 112

4:45PM-6:00PM
Poster Reception I
(authors present)
Innovation Central/ Marquee Ballroom

7:00PM-10:00PM
ORS Awards Gala Reception and Dinner*
Vista Ballroom

MONDAY, MARCH 30, 2015

6:30AM-7:45AM
Research Interest Group (RIG):
Good and Bad Animal Models
Room 106 - 107

7:00AM-9:45AM
Present Your Science:
Transforming Technical Talks with Melissa Marshall
Room 117

8:00AM-9:00AM
Mediators of Joint Repair
Room 118-120

9:00AM-5:30PM
Poster and Exhibit Hall Open
Innovation Central/ Marquee Ballroom

10:00AM-11:00AM
General Session: Shands Lecture, Presidential Address, 1st Vice Presidential Address, and ORS Business Meeting
Room 118 - 120

11:15AM-12:45AM
Aging & OA
Room 118-120

12:30PM-1:30PM
Poster Walking Tours
Innovation Central/ Marquee Ballroom

JOR Workshop
Room 117

Professional Advancement Session: Rising to the Top:
Leadership Success in Academics
Room 121-122

3:30PM-4:15PM
General Session: Urist Lecture, NIRA Awards, Video Outreach Competition Awards, Harris Award, WLF Award, ORS/OREF Collaborative Exchange Award, Distinguished Investigator Award, ORS Outstanding Achievement in Mentoring Award
Room 118 - 120

4:15PM-5:30PM
Poster Reception II
(authors present)
Innovation Central/ Marquee Ballroom

7:30PM-10:00PM
Women's Leadership Forum Reception
Vista Ballroom

TUESDAY, MARCH 31, 2015

6:00AM-3:30PM
Poster Hall Open (no exhibits)
Innovation Central/ Marquee Ballroom

8:00AM-9:00AM
Tendon/Ligament - Collagen Structure – Function
Spotlight Session
Room 111-112

Bone Tissue Engineering
Room 113-114

Biomolecular Approaches to Bone Fragility
Spotlight Session
Room 116

Cartilage Matrix Biology
Spotlight Session
Room 118-120

Spine Mechanics
Room 121-122

9:45AM-11:15AM
The Intervertebral Disc: From Development to Regeneration
Room 121 - 122

Functional Imaging of Articular Cartilage by MRI
Room 113 - 114

Hip Evo Devo: Adaptation of the Hip in Phylogeny and Ontogeny
Room 116

Acute Cartilage Injury: AO Foundation Collaborative Research Project
Room 111 - 112

12:45PM-1:45PM
Ankle Arthritis, Arthroplasty, and Arthrodesis
Room 111-112

Title To Be Determined
Late Breaking Session
Room 113-114

2:00PM-3:30PM
Knee - Mechanics and Modeling
Room 111-112

Bone Mechanics and Finite Element Analysis
Room 113-114

Knee Ligaments and Meniscus
Room 116

Cartilage Mechanobiology
Room 118-120

Biomaterials for Cartilage Repair
Room 121-122

2:00PM-3:30PM
Knee - Mechanics and Modeling
Room 111-112

Bone Mechanics and Finite Element Analysis
Room 113-114

Knee Ligaments and Meniscus
Room 116

Cartilage Mechanobiology
Room 118-120

Biomaterials for Cartilage Repair
Room 121-122
## DAILY MEETING HIGHLIGHTS

### SATURDAY, MARCH 28, 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>8:00AM-10:30AM</td>
<td><strong>Research Interest Group: Growth Factors</strong>&lt;br&gt;Room 106 - 107</td>
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<td><strong>Research Interest Group: Mechanobiology</strong>&lt;br&gt;Room 115</td>
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<td><strong>Research Interest Group: Orthopaedic Evidence</strong>&lt;br&gt;Room 117</td>
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<td><strong>Research Interest Group: Tendon</strong>&lt;br&gt;Room 121 - 122</td>
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<td></td>
<td><strong>Research Interest Group: Spine Research Community</strong>&lt;br&gt;Room 116 (concludes at 10am)</td>
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<td><strong>ORS Advocacy Roundtable</strong>&lt;br&gt;Room 111 - 112</td>
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<tr>
<td>11:00AM-12:00PM</td>
<td><strong>New Investigator Networking Session: Strategic Lab and Time Management</strong>&lt;br&gt;Room 117</td>
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<td><strong>Mentor Connect</strong>&lt;br&gt;Room 115</td>
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<tr>
<td>12:00PM-8:00PM</td>
<td><strong>Poster and Exhibit Hall Open</strong>&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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<tr>
<td>12:00PM-1:00PM</td>
<td><strong>Bone Disease</strong>&lt;br&gt;Room 111 - 112</td>
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<td><strong>Hip Disease, Kinematics, FAI</strong>&lt;br&gt;Room 116</td>
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<td></td>
<td><strong>Advanced Articular Cartilage Imaging Techniques</strong>&lt;br&gt;Spotlight Session&lt;br&gt;Room 118 - 120</td>
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<tr>
<td></td>
<td><strong>Intervertebral Disc: Degeneration, Pain and Treatment</strong>&lt;br&gt;Spotlight Session&lt;br&gt;Room 121 - 122</td>
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<tr>
<td>1:15PM-2:15PM</td>
<td><strong>NIRA PRESENTATIONS:</strong>&lt;br&gt;<strong>Bone Biology &amp; Repair</strong>&lt;br&gt;Room 111 - 112</td>
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<td></td>
<td><strong>Joint Physiology &amp; Mechanics</strong>&lt;br&gt;Room 113 - 114</td>
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<tr>
<td>3:00PM-4:30PM</td>
<td><strong>Hot Topics in Regulatory Challenges within Orthopaedics</strong>&lt;br&gt;Room 111 - 112</td>
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### SUNDAY, MARCH 29, 2015

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<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>8:00AM-11:15AM</td>
<td><strong>ORS/OREF Basic Science Course: Part II</strong>&lt;br&gt;Room 117</td>
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<tr>
<td>8:00AM-9:00AM</td>
<td><strong>Biomaterials for Bone Repair</strong>&lt;br&gt;Room 111-112</td>
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<td><strong>Knee - Mechanics</strong>&lt;br&gt;Room 113-114</td>
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<td><strong>Bone Necrosis Spotlight Session</strong>&lt;br&gt;Room 116</td>
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<td><strong>Pain Pathways and Therapies in Experimental OA Spotlight Session</strong>&lt;br&gt;Room 118 - 120</td>
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<td><strong>Tendon/Ligament Cell Biology</strong>&lt;br&gt;Room 121-122</td>
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<td>9:00AM-6:00PM</td>
<td><strong>Poster and Exhibit Hall Open</strong>&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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<td>9:15AM-10:15PM</td>
<td><strong>Osteoblasts/Progenitor Cells</strong>&lt;br&gt;Room 111 - 112</td>
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<td><strong>Total Hip Replacement Metal Wear Reactions</strong>&lt;br&gt;Room 113 - 114</td>
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<td><strong>Imaging and Bone Healing Spotlight Session</strong>&lt;br&gt;Room 116</td>
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<td><strong>Knee OA Repair Spotlight Session</strong>&lt;br&gt;Room 118-120</td>
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<td><strong>Tendon/Ligament - Repair and Tissue Engineering</strong>&lt;br&gt;Room 121 - 122</td>
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<td>10:30AM-11:00AM</td>
<td><strong>Refreshment Break</strong>&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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<tr>
<td>11:15AM-12:30PM</td>
<td><strong>Kappa Delta, OREF, CORR</strong>&lt;br&gt;ORS Award Paper Presentations&lt;br&gt;Room 118 - 120</td>
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<td><strong>Poster Walking Tours</strong>&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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<tr>
<td>12:45PM-1:45PM</td>
<td><strong>New Investigator Networking Session: An Inside Look at Research Funding Opportunities with the National Institutes of Health (NIH)</strong>&lt;br&gt;Room 115</td>
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<td><strong>ORS Translational Research Symposium: Cartilage Repair: Is it Possible?</strong>&lt;br&gt;Room 121-122</td>
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<td>1:30PM-1:45PM</td>
<td><strong>Innovation Theater Presentation:</strong>&lt;br&gt;AMTI Refining Simulation in a Bio-fedelic Testing Environment&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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<td>12:45PM-5:00PM</td>
<td><strong>Clinical Research Forum: The Basis for Clinical Decision Making in Orthopaedics</strong>&lt;br&gt;Room 116</td>
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<td>2:00PM-3:30PM</td>
<td><strong>ORS/OTA - Systemic Inflammation and Organ Dysfunction in Multiply Injured Patients</strong>&lt;br&gt;New Horizon Workshop&lt;br&gt;Room 113 - 114</td>
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<td><strong>ORS/SOMOS - How an Integrated Orthosis and Rehabilitation Initiative has Improved Outcomes for Lower Extremity Limb Salvage Patients</strong>&lt;br&gt;Room 111 - 112</td>
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<td><strong>Improving the Translational Success of Cell-Based Therapies</strong>&lt;br&gt;Room 118 - 120</td>
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**FRIDAY, MARCH 27, 2015**

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<tr>
<th>Time</th>
<th>Event Description</th>
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<tr>
<td>7:00AM-6:00PM</td>
<td><strong>AAOS 2015 Annual Meeting</strong>&lt;br&gt;Venetian/Sands EXPO</td>
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<td>6:00PM-8:00PM</td>
<td><strong>Research Interest Group: Bone Regeneration</strong>&lt;br&gt;Room 106 - 107</td>
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<td><strong>ORS/The Hip Society - Biological Aspects of Modular Implant</strong>&lt;br&gt;Triboresistant&lt;br&gt;New Horizon Workshop&lt;br&gt;Room 113 - 114</td>
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<td><strong>Trials, Tribulations and Triumphs of Conducting Prospective Clinical Research Studies: The How and Why</strong>&lt;br&gt;Room 116</td>
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<td><strong>Quantitative MR Imaging: Research Applications and Clinical Translation</strong>&lt;br&gt;Room 118 - 120</td>
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<td><strong>Professional Advancement Session-Career Advancement: Winning the Uphill Battle for Research Funding</strong>&lt;br&gt;Room 121 - 122</td>
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<td>4:45PM-5:45PM</td>
<td><strong>Welcome Session – Guest Nation, Patient Story, Presidential Guest Speaker</strong>&lt;br&gt;Room 118 – 120</td>
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<tr>
<td>6:00PM-8:00PM</td>
<td><strong>President’s Welcome Reception</strong>&lt;br&gt;Innovation Central/ Marquee Ballroom</td>
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