



# Orthopaedic Research Society 2012 Annual Meeting



U·P·O·J Paper and Poster Presentations from the University of Pennsylvania

February 4-7, 2012

San Francisco, California

## Presentation #0006

**Activation of Notch Signaling by Jagged1 Adsorption to a Poly( $\beta$ amino ester) Enhances Human MSC Osteogenesis**  
*Dishowitz, MI; Sundararaghavan, HG; Burdick, JA; Hankenson, KD*

## Presentation #0010

**Tendon Mechanical, Compositional and Structural Changes in Decorin and Biglycan Null and Heterozygous Mice**  
*Dourte, LM; Pathmanathan, L; Buckley, MR; Jawad, AF; Iozzo, RV; Birk, DE; Soslowsky, LJ*

## Presentation #0042

**Rat Rotator Cuff Tendon-to-Bone Healing Properties are Adversely Affected by Hypercholesterolemia**  
*Beason, DP; Tucker, JJ; Edelstein, L; Lee, CS; Abboud, JA; Soslowsky, LJ*

## Presentation #0046

**Dynamic Tensile Stretch Promotes Lamin A/C Reorganization and Chromatin Condensation in Adult Stem Cells**  
*Heo, SJ; Driscoll, TP; Nerurkar, NL; Mauck, RL*

## Presentation #0061

**Mechanical and Biochemical Consequences of Needle Puncture Injury in the Mouse Caudal Disc**  
*Martin, JT; Beattie, EE; Gorth, DJ; Smith, LJ; Elliott, DM*

## Presentation #0106

**Increased Porosity and Early Cellularization Improves Integration of Nanofibrous Scaffolds to Native Meniscus**  
*Ionescu, LC; Mauck, RL*

## Presentation #0109

**Differential Nesprin Expression with Mesenchymal Stem Cell Fibrochondrogenesis and Altered Contractility**  
*Driscoll, TP; Yang, MT; Heo, SJ; Nakasone, RH; Chen, CS; Mauck, RL*

## Presentation #0110

**The Critical Role of the Epidermal Growth Factor Receptor in Endochondral Ossification**  
*Qin, L; Zhang, X; Siclari, VA; Lan, S; Zhu, J; Koyama, E; Dupuis, HL; Beier, F*

## Presentation #0119

**Notch Signaling Activity in MSC Harvested from Geriatric Mice**  
*Mutyaba, PL; Sbtaye, H; Gray, CF; Belkin, NS; Dopkin, D; Abn, J; Hankenson, KD*

## Presentation #0123

**Sensitivity of *In Vivo* Micro-MRI-based Biomechanics in Detecting Trabecular Bone Loss**  
*Sun, W; Rajapakse, CS; Webrli, FW*

## Presentation #0130

**Regional Material Properties of the Infraspinal Tendon Differ from Those of the Supraspinal Tendon**  
*Szczesny, SE; Liu, SS; Peloquin, J; Elliott, DM; Soslowsky, LJ*

## Presentation #0158

**Tendon Repair Response to Injury is Affected by the Absence of Biglycan and Decorin**  
*Kumar, A; Dunkman, AA; Buckley, MR; Pathmanathan, L; Mienaltowski, MJ; Beason, DP; Iozzo, RV; Birk, DE; Soslowsky, LJ*

## Presentation #0170

**Dynamic Compressive Loading Enhances Cartilage Matrix Synthesis and Distribution and Suppresses Hypertrophy in hMSC-Laden Hyaluronic Acid Hydrogels**  
*Bian, L; Zhang, EC; Mauck, RL; Burdick, JA*

## Presentation #0173

**Altered Mechanosensitivity of Fibrochondrogenic Mesenchymal Stem Cells with Modulation of Nuclear Mechanics**  
*Heo, SJ; Driscoll, TP; Zhong, Z; Mauck, RL*

## Presentation #0187

**Computationally-Optimized Mechanical Modeling of Trabecular Bone**  
*Zhang, N; Magland, JF; Rajapakse, CS; Wright, A; Webrli, FW*

## Presentation #0238

**Nanorod-Mediated Assembly of Nanofibrous Laminates through Focused Near-Infrared Exposure**  
*Silverstein, AM; Hribar, KC; Burdick, JA; Mauck, RL*

## Presentation #0250

**The Role of the Notch Signaling Ligand Jagged1 in Bone**  
*Dishowitz, MI; Bales, C; Loomes, K; Hankenson, KD*

## Presentation #0272

**Development of a Contaminated Musculoskeletal Wound Model Using a Bioluminescent *Staphylococcus aureus* Strain**  
*Schenker, ML; Baldwin, K; Rankin, S; Hankenson, KD; Esterhai, JL; Abn, J; Mehta, S*

**Presentation #0286****A Novel High-Throughput System for the Mechanical Analysis of Engineered Cartilage Constructs**

*Cosgrove, BD; Lewis, G; Winarto, B; Wong, J; Dodge, GR; Mauck, RL*

**Presentation #0293****Effect of Immobilization on a New, Two-Tendon Rat Rotator Cuff Repair Model**

*Ilkhan-Pour, S; Satchell, LN; Sarver, JJ; Tucker, JJ; Gray, CF; Edelstein, L; Lee, CS; Williams, GR; Soslowsky, LJ*

**Presentation #0437****Augmentation of Trauma Hardware in a Proximal Femoral Osteotomy Model – Pilot Study and Proof of Concept**

*Fawns, N; Stewart, S; Schaer, TP*

**Presentation #0449****Intra-articular Viscosupplementation Improves Proteoglycan Content in Superficial Knee Cartilage by T1 Rho MRI**

*Shah, RP; Stambough, J; Fenty, M; Mauck, RL; Kelly, JD; Reddy, R; Tjournakaris, FP*

**Presentation #0553****Significant Distal Phalangeal Bone Loss in Equine Laminitis**

*Engiles, JB; Galantino-Homer, HL; Dishowitz, MI; McDonald, D; Boston, R; Hankenson, KD*

**Presentation #0606****Scaffold Mechanical Properties Influence the Hypertrophic Differentiation of Chondrogenically-induced Human Mesenchymal Stem Cells**

*Bian, L; Zhang, EC; Mauck, RL; Burdick, JA*

**Presentation #0619****Nanofibrous Synthetic/Biologic Composites as Multifunctional and Dynamic Growth Factor Delivery Systems**

*Kluge, JA; Pampati, RA; Zhou, DJ; Schenker, ML; Qu, F; Esterhai, J; Kaplan, DL; Mauck RL*

**Presentation #0634****VEGF Delivery from Electrospun Composites Increases Vascular Density *In Vivo***

*Ionescu, LC; Fisher, MB; Schenker, ML; Esterhai, JL; Mauck, RL*

**Presentation #0654****Dynamic Nanofibrous Scaffolds Improve *In Vivo* Colonization and Implant Fixation in a Meniscus Defect Model**

*Schenker, ML; Huang, KL; Bonilla, A; Fisher, MB; Shah, RP; Ionescu, LC; Qu, F; Esterhai, JL; Schaer, TP; Mauck, RL*

**Presentation #0657****A Model for Testing the Effects of Injury and Repair Using Engineered Cartilage Tissue Analogs: The Effects of Impact Loading on Chondrocyte Gene Expression**

*Strutz, WC; Mohanraj, B; Mauck, RL; Dodge, GR*

**Presentation #0673****Multi-Scale Analysis of Heterogeneity in Mesenchymal Stem Cell Chondrogenesis**

*Farrell, MJ; Cosgrove, BD; de Vries, S; Raj, A; Mauck, RL*

**Presentation #0751****Removal from Defined Media Reduces Properties of MSC-Laden HA Hydrogels after Transient TGF- $\beta$ 3 Exposure**

*Kim, M; Garrity, S; Erickson, IE; Choudhury, M; Mauck, RL*

**Presentation #0776****Modulation of the Meniscus Repair Interface via Collagenase Delivery from Nanofibrous Composites**

*Qu, F; Esterhai, JL; Mauck, RL*

**Presentation #0815****Glenoid Cartilage Mechanical Properties Decrease after Rotator Cuff Tendon Tears in a Rat Model**

*Reuther, KE; Sarver, JJ; Gray, CF; Lee, CS; Dourte, LM; Schultz, SM; Sebgal, CM; Glaser, DL; Soslowsky, LJ*

**Presentation #0916****Polycationic Coating on Orthopaedic Implants Inhibit Biofilm Formation in an Infected Ovine Tibial Osteotomy Model**

*Schaer, TP; Stewart, S*

**Presentation #0917****Prevention of Pin Tract Infection in External Fixation Using Bactericidal Sol-Gel Thin Films *In Vivo***

*Qu, H; Knabe, C; Radin, S; Garino, J; Ducheyne, P*

**Presentation #0917****Accuracy of *In Vivo*  $\mu$ MRI-Based Biomechanics of the Proximal Femur: A Simulation Study**

*Aznarez-Sanado, M; Rajapakse, CS; Zhang, N; Sun, W; Magland, JF; Wright, AC; Wehrli, FW*

**Presentation #1193****Comparison of the Response of Nucleus Pulposus Cells and Articular Chondrocytes to Treatment with Hyaluronan Oligosaccharides**

*Chiario, JA; Dodge, GR; Hebela, NM; Mauck, RL; Elliott, DM; Smith, LJ*

**Presentation #1199****Sustained Delivery of IL-1ra from PLGA Microspheres Attenuates IL-1 $\beta$  Mediated Degradation of Engineered Nucleus Pulposus**

*Gorth, DJ; Chiario, JA; Dodge, GR; Hebela, NM; Mauck, RL; Elliott, DM; Smith, LJ*

**Presentation #1224**

**Effect of Return to Overuse Activity Following an Isolated Supraspinatus Tendon Tear On Adjacent Intact Tendons and Glenoid Cartilage in a Rat Model**

*Reuther, KE; Sarver, JJ; Thomas, SJ; Lee, CS; Gray, CF; Tucker, JJ; Glaser, DL; Soslowsky, LJ*

**Presentation #1225**

**High Cholesterol Increases Supraspinatus Tendon Mechanical Properties Across Multiple Species**

*Beason, DP; Hsu, JE; Edelstein, L; Lee, CS; Lee, BC; Marshall, SM; McDaniel, AL; Temel, RE; Abboud, JA; Soslowsky, LJ*

**Presentation #1240**

**Restoration of Anterior-Posterior Rotator Cuff Force Balance Alters Glenoid Properties in a Chronic Cuff Tear Rat Model**

*Gray, CF; Reuther, KE; Hsu, JE; Lee, CS; Sarver, JJ; Schultz, SM; Sebgal, CM; Glaser, DL; Soslowsky, LJ*

**Presentation #1289**

**Collagen Fiber Re-Alignment in a Neonatal Developmental Mouse Supraspinatus Tendon Model**

*Miller, KS; Connizzo, BK; Tucker, JJ; Soslowsky, LJ*

**Presentation #1290**

**Local Differences in Collagen Fiber Crimp Throughout Mechanical Testing in a Mouse Supraspinatus Tendon Model**

*Miller, KS; Connizzo, BK; Tucker, JJ; Feeney, E; Trasolini, NR; Soslowsky, LJ*

**Presentation #1308**

**Age-Related Changes in Tendon Mechanical Properties are Not Enhanced by the Absence of Biglycan and Decorin**

*Buckley, MR; Pathmanathan, L; Mienaltowski, MJ; Dunkman, AA; Kumar, A; Beason, DP; Iozzo, RV; Birk, DE; Soslowsky, LJ*

**Presentation #1398**

**Toward the Characterization of Altered Signaling Pathways in an Aged Mouse Model of Fracture Healing**

*Belkin, NS; Gray, CF; Karp, MR; Dopkin, D; Dishowitz, MI; Hankenson, KD; Abn, J*

**Presentation #1532**

**BMD T-Score as a Predictor for Vertebral Fracture Severity in Postmenopausal Women**

*Phillips, EA; Rajapakse, CS; Wald, MJ; Webrli, FW*

**Presentation #1655**

**Biaxial Mechanics and Inter-lamellar Shearing of Electrospun Bilayers for Annulus Fibrosus Tissue Engineering**

*Driscoll, TP; Nakasone, RH; Szczesny, SE; Elliott, DM; Mauck, RL*

**Presentation #1664**

**Fiber-Aligned Polymer Scaffolds for Rotator Cuff Repair in a Rat Model**

*Beason, DP; Connizzo, BK; Dourte, LM; Edelstein, L; Tucker, JJ; Liu, SS; Mauck, RL; Soslowsky, LJ; Steinberg, DR; Bernstein, J*

**Presentation #1666**

**Novel Design of Organized Nanofibrous Scaffolds to Mimic the Macroscopic Curvature of Native Meniscus**

*Fisher, MB; Henning, E; Mauck, RL*

**Presentation #1753**

**Durable *In Vitro* Cartilage Repair and Functional Load Transmission with MSC-Seeded Hyaluronic Acid Hydrogels**

*Erickson, IE; Zellars, KH; Cosgrove, BD; Burdick, JA; Mauck, RL*

**Presentation #2226**

**Locked Plating for Proximal Humerus Fractures: Do Long Subchondral Screws Provide a Significant Biomechanical Advantage Over Shorter Screws?**

*Hsu, JE; Ricchetti, ET; Svach, DJ; Guan, Z; Abboud, JA; Huffman, GR*