

Investigates and analyzes biomechanical and biomedical injuries; injury causation; and medical equipment, devices, and implants.

Assesses Injuries: Applying physics, anatomy and physiology, assesses injuries involving:

- skull fractures
- neck, back and spinal cord injuries
- orthopedic and neurologic injuries
- vascular ruptures
- abdominal organs
- heart, lungs, skin (including burns) and other organs
- musculo-skeletal injuries including joints (i.e., shoulders, knees, ankles and elbows), soft tissues (i.e., rotator cuff, tendons and ligaments), and fracture patterns (torso, long bone, hand, foot or skull)

Determines Cause: Applying engineering principles, determines:

- the manner in which tissue failed: the type of loading, the direction of loading and magnitude or size of the load that caused the injury
- if injury patterns are causally related or consistent with the hazardous condition or circumstances claimed
- whether there was sufficient force in the right direction to cause an injury
- the presence of pre-existing conditions and how they affect the injury
- who and/or what action contributed to the injuries
- what could have been done to prevent the injuries

Typical Personal Injury Cases Involve:

- motor vehicle collisions
- slips, trips and falls
- medical malpractice or device failures
- occupational and work place injuries
- sports and recreational injuries

PROFESSIONAL EXPERIENCE

2017 to **Robson Forensic, Inc.**
present *Associate*

Provide technical investigations, analysis, reports, and testimony toward the resolution of commercial and personal injury litigation involving injury analysis and causation, medical equipment, medical devices, and procedures.

THE EXPERTS
Robson Forensic

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

- 2009 to present **Cedar-Sinai Medical Center**
Research Scientist II, *Assistant Professor* 2018-present
Director of the Orthopaedic Biomechanics Laboratory.
- Faculty Research Scientist* 2015-2018
Director of the Orthopaedic Biomechanics Laboratory.
- Project Scientist, Instructor* 2009-2015
Director of the Spine Biomechanics Laboratory.
- 2004 to 2009 **UCSF and UCB Joint Graduate Group**
Graduate Studies
Dissertation entitled: "Evaluation of Spinal Reconstructive Surgeries Using Multi-Body System Dynamics". Developed multi-scale models of the human spine to show the effects of total disc replacement on the mechanics and stability of the spine.
- 2003 to 2004 **Sierra Interventions, LLC**
President
Oversee administration, supervise and coordinate all projects, which include fabrication, device design, and experimental studies on an aneurysm treatment device.
- 2002 to 2003 **Lawrence Livermore National Laboratory**
Engineer, Medical Technology Program
Design, fabrication and experimental testing of several neuro-interventional shape memory polymer devices.
- Research Assistant, Medical Technology Program* Summer 2000
Functional testing of several neuron-interventional shape memory polymer devices.
- 2001 to 2002 **Sierra Internal Medicine**
Research Manager
Coordinate and manage a three-site NIH clinical study of the impact of nutritional supplements on chronic fatigue syndrome.
- Research Assistant* Summer 2009
Prepared blood and urine samples, proctored computerized cognitive performance tests, and organized paperwork for an NIH study as well as an open label and double blind study on an experimental drug for the treatment of Chronic Fatigue Syndrome.

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

TEACHING EXPERIENCE

- 2014 to present Didactic Lecture on Biomechanics and Biomaterials for Residents
- 2015 Dissertation committee for Cesar Lopez, "Composite Mechanics of Annulus Fibrosus of Intervertebral Disc", CSUN Mechanical Engineering
- 2010 to 2012 Didactic Lecture for Cedars-Sinai Spine Fellows
- 2006 Graduate Student Instructor, Bioengineering 10: Introduction to Biomedicine
- 2000 Organic Chemistry tutor, UC Berkeley

PROFESSIONAL CREDENTIALS

Management of Technology Certificate, Haas School of Business, University of California, Berkeley, California

EDUCATION

Ph.D., Bioengineering, University of California, San Francisco, California
B.S., Bioengineering, University of California, Berkeley, California

PROFESSIONAL MEMBERSHIPS

Orthopaedic Research Society, member, 2012-present

COMMITTEE APPOINTMENTS

- 2022-present Steering Committee, Cedars Sinai Medical Center's Center for Womens Research and Health Science (CREWHS)
- 2021-present Abstract Reviewer, Orthopaedic Research Society
- 2020-present Scientific Reviewer for The Journal of Shoulder and Elbow Surgery
- 2020-present Scientific Reviewer for The Journal of Biomechanics
- 2020-present Editorial Board member, Arthroscopy
- 2018-present Member, Board of Trustees, Ocean Charter School, Los Angeles, CA
- 2017-present Governor, All Community Group, Ocean Charter School, Los Angeles, CA
- 2016-2018 Grant Reviewer, UCLA Clinical and Translational Science Institute
- 2015-present Scientific Reviewer for Journal of Medical and Biological Engineering
- 2015-present Scientific Reviewer for Journal of Engineering in Medicine
- 2014-present Scientific Reviewer for American Journal of Sports Medicine

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

2014-present Fellow Research Committee, Kerlan-Jobe Institute
2011-present Resident Research Committee, Cedars-Sinai Medical Center
2011-present Resident Education Committee, Cedars-Sinai Medical Center
2009-2014 Scientific Reviewer, Spine Arthroplasty Society's Research Committee
2005-2008 UCSF Graduate Student Association, Bioengineering representative

PEER REVIEWED PUBLICATIONS

Block T, Kulber D, Nelson TJ, Sun M, An T, Yoshida R, **Metzger MF**. "Hand Ligament Reconstruction with Knee Collateral Ligament Allograft vs Tendon Autograft" *Journal of Hand Surgery*, in press.
<https://doi.org/10.1016/j.jhsa.2022.08.012>, (2022)

Metzger MF, Goel VK, Kulkarni N, Grauer JN. *Biomechanics, AAOS Comprehensive Orthopaedic Review, AAOS COR 4 Chapter 58*, in press, (2022).

Haruno L, Chen X, **Metzger MF**, Lin C, Little M, Kanim L, Poon S. "Racial and Sex Disparities in Resident Attrition Among Surgical Subspecialties" Accepted to *JAMA Surgery* June 2022.

Maldonado D, Banffy M, Huang D, Nelson TJ, Kanjiya S, Yalamanchili R, **Metzger MF**. "Comparable Torque to Failure Using the Simple Stich Versus the Figure of Eight Configuration for Hip Capsular Closure Following An Interportal Capsulotomy. A Cadaveric Study" *10.1016/j.arthro.2022.05.012* (2022)

Torres SJ, Limpisvasti O, Uffmann W, Nelson TJ, Pham N, **Metzger MF**., "Suture Tape Augmentation Increases the Immediate Post-Operative Stiffness and Strength of ACL Grafts" *Arthroscopy, Sports Medicine, and Rehabilitation* 4 (4): e1253-59 (2022)

Maldonado D, Banffy M, Huang D, Nelson TJ, Kanjiya S, **Metzger MF**. "An Increased Allograft Width for Circumferential Labral Reconstruction Better Restores Distractive Stability of the Hip" *Am J Sports Med.* 50(9):2462-2468 (2022).

Narvaez MV, Nelson TJ, Youssefzadeh K, Limpisvasti O, **Metzger MF**., "Biomechanical Comparison of Ulnar Collateral Ligament Reconstruction with and without Internal Bracing" *Am J Sports Med.* 50(9):2508-2514 (2022).

Mead N, Nelson TJ, Limpisvasti O, ElAttrache NS, **Metzger MF**. " Biomechanical Comparison of UCL Repair Using Suspensory Fixation Versus UCL Reconstruction" *O J Sports Med* 9 (9)
doi.org/10.1177/23259671211038992 (2021).

Wydra FB, Al'Khafaji I, Haruno L, Chahla J, Nelson TJ, Gerhardt MB, **Metzger MF**. "Hip Capsular Management with Pie-Crusting Technique: A Biomechanical Comparison to the T-Capsulotomy" *Arthroscopy* 37(9):2832-2833 doi.org/10.1016/j.arthro.2021.03.044. (2021)

Lazaro LE, Lim DP, Nelson TJ, Eberlein SA, Banffy MB, **Metzger MF**., "Proximal Over-resection During Femoral Osteochondroplasty Negatively Affects the Distractive Stability of the Hip Joint: A Cadaver Study" *Am J Sports Med.* 49(11):2977-2983 doi.org/10.1177/03635465211028979. (2021)

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Perrone MO, Noorzad A, Hamula M, **Metzger MF**, Banffy M, Gerhardt M. “Hip Adductor Longus Tendon Origin Anatomy is Consistent and may Inform Surgical Reattachment”, *Arthroscopy, Sports Medicine, and Rehabilitation (ASMAR)* 3(1): E227-E232, <https://doi.org/10.1016/j.asmr.2020.09.015> (2021).

Kremen TJ, Monifiston CH, Garlich J, Little M, **Metzger MF**. “Characterization of A Better Understanding of Infraspinal Tendon Characteristics Anatomy: The Soft-Tissue Portion of Remplissage” *Arthroscopy, Sports Medicine, and Rehabilitation (ASMAR)*; 3(3):741-748, <https://doi.org/10.1016/j.asmr.2021.01.013> (2021).

Uffmann W, ElAttrache N, Nelson TJ, Eberlein SA, Wang J, Howard DR, **Metzger MF**. “Posterior Lateral Meniscal Root Tears Increase Strain on the Reconstructed Anterior Cruciate Ligament: A Cadaveric Study”, in press, *Arthroscopy, Sports Medicine, and Rehabilitation* <https://doi.org/10.1016/j.asmr.2020.11.005> (2021).

Glaeser JD, Behrens P, Stefanovic T, Salehi K, Papalamprou A, Tawackoli W, **Metzger MF**, Eberlein S, Nelson TJ, Arabi Y, Kim K, Baloh R, Ben-David S, Cohn-Schwartz D, Ryu R, Bae HW, Gazit Z, Sheyn D. “Neural Crest-derived MSCs Enhance Cranial Allograft Integration” *STEM CELLS Transl Med.* 2020;1–13 <https://doi.org/10.1002/sctm.20-0364> (2020).

Glaeser JD, Ju D, Tawackoli W, Yang JH, Salehi K, Stefanovic T, Kanim LEA, Avalos P, Kaneda G, Stephan S, **Metzger MF**, Bae HW, and Dmitriy Sheyn D. “Advanced glycation end product inhibitor pyridoxamine attenuates IVD degeneration in type 2 diabetic rats” *Int J Mol Sci* 21(24):9709 (2020).

Kremen TJ, Haggerty E, Eberlein SA, Chahla J, Nelson TJ, Schroeder G, **Metzger MF**. “Comparative Analysis of Sagittal-Plane Radiographic Landmarks Used to Identify the Femoral Attachments of Lateral Knee Structures” *Arthroscopy* ;36(11):2888-2896, doi: 10.1016/j.arthro.2020.07.006 (2020).

Glaeser J, Salehi K, Kanim L, Ju D, Hyuk J, Behrens P, Eberlein S, **Metzger M**, Arabi Y, Stefanovic T, Sheyn D, Bae H. "Electrospun, synthetic bone void filler promotes human MSC function and BMP-2 mediated spinal fusion" *Journal of Biomaterials Applications*, doi: 10.1177/0885328220937999 (2020).

Garlich J, Little M, Nelson TJ, Eberlein SA, Monfiston CH, **Metzger MF**. “A Comparison of Three Fixation Strategies in the Treatment of Neer Type IIB Distal Clavicle Fractures”, *J Orthop Trauma* ;34(8):e266-e271. doi: 10.1097/BOT.0000000000001752 (2020)

Grotting JA, Nelson TJ, Banffy MB, Yalamanchili R, Eberlein SA, Chahla J, **Metzger MF**. “Biomechanical Evaluation of PCL Reconstruction Augmented with Internal Bracing” *Knee* Mar;27(2):375-383 (2020).

Pfeffer G, Michalski M, Nelson TJ, An T, **Metzger MF**. “Extensor Tendon Transfers for Treatment of Foot Drop in Charcot-Marie-Tooth Disease: A Biomechanical Evaluation”, *Foot Ankle Int.* Apr 1;41(4):449-456. doi: 10.1177/1071100719901119 (2020).

Chahla J, Nelson TJ, Dallo I, Yalamanchili R, Eberlein SA, Limpisvasti O, Mandelbaum B, **Metzger MF**. “Anterior cruciate ligament repair versus reconstruction: A kinematic analysis” *Knee* 27(2):334-340 DOI: 10.1016/j.knee.2019.10.020 (2019).

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Garlich J, Samuel K, Nelson TJ, Monfiston CH, Kremen TJ, **Metzger MF**, Little M. "Infraspinatus Tenotomy Improves Glenoid Visualization with The Modified Judet Approach", J Orthop Trauma. 2020 Mar;34(3):158-162 (2020).

Dutton P, Banffy M, Nelson TJ, **Metzger MF**. "Anatomic and Biomechanical Evaluation of Ulnar Tunnel Position in Medial Ulnar Collateral Ligament Reconstruction", Am J Sports Med., Am J Sports Med. Oct. 24: <https://doi.org/10.1177/0363546519880182>, (2019).

Thomas D, Thordarson D, Nelson TJ, Timothy CP, Eberlein S, **Metzger, MF**, "Biomechanical Impact of FHL Tendon Harvest on Forefoot and Great Toe Push-Off Strength and its Correlation to Knot of Henry Crossover Variation". Accepted to Foot & Ankle Int., July 2019.

Michalski MP, Gonzalez TA, **Metzger MF**, Nelson TJ, Eberlein SA, Pfeffer GB. "A Biomechanical Comparison of Achilles Tendon Pullout Strength Following Midline Tendon-Splitting and Endoscopic Approaches for Calcaneoplasty". Foot Ankle Int. Jun 17:1071100719856939. doi: 10.1177/1071100719856939 PMID: 31203670 (2019).

Bhamb N, Kanim LEA, Maldonado RC, Nelson TJ, Salehi K, Glaeser JD, **Metzger MF**. "The Impact of Type 2 Diabetes on Bone Metabolism and Growth after Spinal Fusion". Spine J, Jun;19(6):1085-1093 (2019).

Pfeffer GB, Gonzalez TA, Zapf M, Nelson TJ, **Metzger MF**. "Postoperative Achilles Pull-out Strength after Open Calcaneoplasty for Haglund's Syndrome". Foot Ankle Int. Aug;39(8):966-969. doi: 10.1177/1071100718770391. PMID: 29652192 (2018)

Alayan A, Maldonado RC, Polakof L, **Metzger MF**, Saini A, Lin C, Moon C. "Biomechanical Analysis of a Novel Buried Fixation Technique Using Headless Compression Screws". Am J Orthop. 47(7) (2018)

Bhamb N, Maldonado N, Kanim LEA, Svet MT, **Metzger MF**, "Interrelationships of Vitamin D Status, Bone Health and Fusion Consolidation", J Orthop Res. 2017 Dec 20. doi: 10.1002/jor.23832 (2017)

Trentacosta N, Pace JL, **Metzger MF** Michalski M, Nelson T, Polakof L, Mandelbaum B. "Biomechanical Evaluation of Pediatric Anterior Cruciate Ligament (ACL) Techniques with and without the Anterolateral Ligament (ALL)". J Pediatr Orthop, Oct 23 2017. DOI: 10.1097/BPO.0000000000001078 (2017)

Kremen TJ, Polakof LS, Rajee S, Nelson TJ, **Metzger MF**, "The effect of Hamstring Tendon Autograft Harvest on the Restoration of Knee Stability in the Setting of Anterior Cruciate Ligament Rupture and Concurrent Medial Collateral Ligament Injury", Am J Sports Med., Jan;46(1):163-170 (2018)

Welch T, Mohr K, Keller T, **Metzger MF**, Maldonado R, Kvitne R., "The Effect of a Dynamic PCL Brace on Patellofemoral Compartment Pressures in PCL- and PCL/PLC-Deficient Knees", Journal of Experimental Orthopaedics, J Exp Orthop., Dec;4(1):10. doi: 10.1186/s40634-017-0085-5. (2017)

Metzger MF, Robinson ST, Maldonado R, Rawlinson JJ, Liu JC, Acosta FL, "DLIF Direct Lateral Interbody Fusion (DLIF) Strategies for Adjacent Segment Degeneration in the Lumbar Spine: A Biomechanical Analysis". Spine J. 2017 Mar 18. pii: S1529-9430(17)30092-X. doi: 10.1016/j.spinee.2017.03.005. PubMed PMID: 28323239. (2017)

MELODIE METZGER, Ph.D.
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Arunakul R, **Metzger MF**, Kanim LEA, Bae H, Kropf M, Delamarter RD. "Radiographic Analysis of the Lumbosacral Juncture: Is There a Critical Sacral Angle for Total Disc Replacement?" *Asian Spine J*, (2):249-255. doi: 10.4184/asj.2017.11.2.249 (2017)

Tuchman A, Turner A, **Metzger MF**, Acosta FL. "An in Vitro Biomechanical Model of Differing Pedicle Screw Configurations for Long Construct Segmental Thoracic Fixation", *Operative Neurosurgery*, 0:1-6, doi: 10.1093/ons/opx051 (2017)

Metzger MF, Robinson ST, Svet MT, Liu JC, Acosta FL, "Biomechanical Analysis of the Proximal Adjacent Segment after Multi-Level Instrumentation of the Thoracic Spine: Do Hooks Ease the Transition?" *Global Spine Journal* 6(4): 335-343 (2016)

Metzger MF, Kanim LEA, Zhao L, Robinson ST, Delamarter RB. "The Relationship between Serum Vitamin D Levels and Spinal Fusion Success: A Quantitative Analysis", *Spine* 40(8): E458-68 (2015)

Robinson ST, Svet MT, Kanim LA, **Metzger MF**, "Four-Point Bending as a Method for Quantitatively Evaluating Spinal Arthrodesis in a Rat Model", *Journal of Comparative Medicine* 65(1):46-50 (2015)

Metzger MF, Kanim LEA, Zhao L, Robinson ST, Delamarter RB. "The Relationship between Vitamin D Status and Successful Spinal Fusion" *The Spine Journal* 13(9): S53 (2013)

Kennedy A, Coughlin DG, **Metzger MF**, Pearle AD, Lotz JC, Feeley BT, "Biomechanical Evaluation of Pediatric ACL Reconstruction Techniques", *The American Journal of Sports Medicine* 39(5):964-71 (2011)

Metzger MF, Faruk Senan NA, O'Reilly OM, Lotz JC, "Minimizing Errors Associated with Calculating the Helical Axis of Spinal Motion", *Journal of Biomechanics* 43(14): 2822-2829 (2010)

Metzger MF, Faruk Senan NA, O'Reilly OM, "On Cartesian Stiffness Matrices in Rigid Body Dynamics: An Energetic Perspective", *Journal of Multibody System Dynamics*, 24(4):441-472 (2010)

O'Reilly OM, **Metzger MF**, Buckley JP, Moody DA, Lotz JC, "On the Stiffness Matrix of the Intervertebral Joint: Application to Total Disc Replacement" *ASME Journal of Biomechanical Engineering*, 131(8):63-87 (2009)

Small W IV, **Metzger MF**, Wilson TS, Maitland DJ, "Laser-activated shape memory polymer microactuator for thrombus removal following ischemic stroke: preliminary in vitro analysis" *IEEE Journal of Selected Topics in Quantum Electronics* 11(4):892-901 (2005)

Suhadolnik RJ, Peterson DL, Reichenbach NL, Roen G, **Metzger MF**, McCahan J, O'Brien K, Welsch S, Gaughan JP, McGregor NR, "Clinical and Biochemical Characteristics Differentiating Chronic Fatigue Syndrome from Major Depression and Healthy Control Populations: Relation to Dysfunction of RNase L Pathway", *Journal of Chronic Fatigue Syndrome* (2004)

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Maitland DJ, **Metzger MF**, Schumann D, Wilson TS, Lee A, Matthews DL, “Photothermal Properties of Laser-Activated Shape Memory Polymer Microactuators for Treating Stroke,” *Lasers in Surgery and Medicine* 30:1-11 (2002)

Metzger MF, Schumann D, Wilson TS, Matthews DL, and Maitland DJ, “Mechanical Properties of a Mechanical Actuator for Treating Ischemic Stroke”, *Journal of Biomedical Microdevices* 4(2):89-96 (2002)

REFEREED CONFERENCE ABSTRACTS AND PRESENTATIONS

Ignacio GCT, Yoshida R, Huang DT, Sun M, Shin SS, **Metzger MF**. “Oblique Staple Orientation Decreases Risk of Impingement Without Compromising Strength of Capitulate Fusion” ePoster, ASSH (American Society for Surgery of the Hand) 77th Annual Meeting, Boston, MA, Sept 29 - Oct 1, 2022.

Chao LH, Stone MA, Huang DT, Sun M, Kulber DA, **Metzger MF**. “Replacing Like with Like: Reconstructing the Elbow mUCL with Knee MCL Allograft” ePoster, ASSH (American Society for Surgery of the Hand) 77th Annual Meeting, Boston, MA, Sept 29 - Oct 1, 2022.

Chen X, Haruno LS, **Metzger MF**, Lin CA, Little MTM, Kanim LEA, Poon S. Attrition in Female and Male Residents of Surgical Specialties. Abstract presented at Western Orthopaedic Association 86th Annual Meeting, Maui HI, August 4, 2022.

Chen X, Haruno LS, **Metzger MF**, Lin CA, Little MTM, Kanim LEA, Poon S. Female Resident Attrition in Orthopaedic Surgery. Abstract presented at Western Orthopaedic Association 86th Annual Meeting, Maui HI, August 4, 2022.

Chen X, Haruno L, **Metzger MF**, Lin CA, Little MTM, Kanim LE, Poon S. Female Resident Attrition in Orthopaedic Surgery. Poster presented at Medical Student Orthopaedic Symposium, April 2022.

Maldonado D, Banffy M, Huang D, Nelson TJ, **Metzger MF** “The Hip Suction Seal Restoration Using the Circumferential Labral Reconstruction. The Role of The Graft Width” AOSSM 2022 Annual Meeting Colorado Springs, CO, July 13th – 17th, 2022.

Haruno L, **Metzger MF**, Lin C, Little MT, Kanim LEA, Poon S. “Race and Gender Disparities in Resident Attrition in Orthopaedics and Surgical Subspecialties” American Orthopaedic Association 135th Annual Leadership Meeting Providence, RI, June 14-18, 2022.

Haruno L, **Metzger MF**, Lin C, Little MT, Kanim LEA, Poon S. “Race and Gender Disparities in Resident Attrition in Orthopaedics and Surgical Subspecialties” AAOS 2022 Annual Meeting, Chicago, IL, March 22nd – 26th, 2022.

Maldonado D, Banffy M, Huang D, Nelson TJ, **Metzger MF**. “Increased Allograft Width for Circumferential Labral Reconstruction Better Restores Hip Suction Seal”, Podium Presentation, Orthopaedic Research Society Annual Meeting, Tampa, FL, Feb 4th-8th 2022.

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Metzger MF, Huang D, Kaneda G, Pham N, Gonzalez AR, Lee S, Suzuki M, Nelson TJ, Glaeser JD, Millecamps M, Stone LS, Sheyn D. “Exercise Improves Load Bearing Bone Structural Properties in Female SPARC-/- Mice but not in Males” Poster Presentation, Orthopaedic Research Society Annual Meeting, Tampa, FL, Feb 4th-8th 2022.

Maldonado D, Banffy M, Huang D, Nelson TJ, **Metzger MF** “The Hip Suction Seal Restoration Using the Circumferential Labral Reconstruction. The Role of The Graft Width” AAOS 2022 Annual Meeting, Chicago, IL, March 22nd – 26th, 2022.

Maldonado D, Banffy M, Huang D, Nelson TJ, **Metzger MF** “Hip Capsular Closure Following An Interportal Capsulotomy. A Biomechanical Analysis of the Figure of Eight Versus Simple Stich Configuration Constructs” 2021 International Society for Hip Arthroscopy Annual Scientific Meeting Annual Scientific Meeting, Las Vegas, NV, December 11-14, 2021.

Block T, Kulber D, Nelson TJ, Sun M, An T, **Metzger MF**. “Hand Ligament Reconstruction with Knee Collateral Ligament Allograft vs Tendon Autograft” ePoster Presentation. 76th ASSH (American Society for Surgery of the Hand) Annual Meeting, September 30th – October 2nd, 2021, San Francisco, CA.

Narvaez M, Limpisvasti O, **Metzger MF**. “Biomechanical Comparison of Ulnar Collateral Ligament Reconstruction with and without Internal Bracing” Podium Presentation. American Orthopaedic Society for Sports Medicine (AOSSM) 2021 Annual Meeting, Nashville, TN, July 2021.

- Winner of the 2021 AOSSM Fellow Research Award in Basic Science

Metzger MF, Pham N, Gonzalez AR, Lee S, Miyako Suzuki M, Nelson TJ, Juliane D. Glaeser JD, Milescamp M, Stone LS, Sheyn D. “Sex Differences in Bone Mineralization in an Osteonectin-Deficient Mouse Model of Osteopenia” Specialized Centers of Research Excellence on Sex Differences (SCORE) Annual Meeting December 16-17th, 2020 (virtual).

Metzger MF, Schimmoeller N, Nelson TJ, Galloway J, Trentacosta N. “Do Oral Contraceptives Protect Against Anterior Cruciate Ligament Injuries in Female Athletes?” Specialized Centers of Research Excellence on Sex Differences (SCORE) Annual Meeting December 16-17th, 2020 (virtual).

Metzger MF, Pham N, Gonzalez AR, Lee S, Suzuki M, Nelson TJ, Glaeser JD, Milecamps M, Stone LS, Sheyn D. “Effects of Exercise and Sparc Knockout on Cranial Bone Structural and Biomechanical Properties”, Orthopaedic Research Society (ORS) Annual Meeting, February 2020, Phoenix, AZ.

Michalski M, Nelson TJ, An T, Pfeffer G, **Metzger MF**. “Biomechanical Evaluation of Extensor Tendon Transfers for Treatment of Foot Drop in Charcot-Marie-Tooth Disease”, Orthopaedic Research Society (ORS) Annual Meeting, February 2020, Phoenix, AZ.

- Winner of the New Investigator Recognition Award (NIRA)

Uffmann W, ElAttrache N, Nelson TJ, Eberlein SA, Wang J, Howard DR, **Metzger MF**. “Increased Anterior Cruciate Ligament Graft Strain with Lateral Meniscus Posterior Root Tears” Arthroscopy Association of North America (AANA) 2020 Annual Meeting, May 2020, Grapevine, TX.

MELODIE METZGER, Ph.D.
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Kremen T, Haggerty E, Chahla J, Eberlein S, Nelson T, Schroeder G, **Metzger MF**. “How Accurate Are Radiographic Landmarks at Predicting the Location of Lateral Knee Structures?” AAOS 2020 Annual Meeting, March 2020, Orlando, FL.

Lazaro LE, Lim DP, Nelson TJ, Eberlein SA, Banffy MB, **Metzger MF**., “Proximal Over-resection During Femoral Osteochondroplasty Negatively Affects the Distractive Stability of the Hip Joint” AOSSM/AANA 2020 Specialty Day, Orlando, FL, March 2020.

Ju DG, Glaeser JD, Salehi K, Kanim LE, Behrens PH, **Metzger MF**, Sheyn D, Bae HW. Electrospun synthetic bone scaffolds promote mesenchymal stem cell function and spinal fusion. 47th Annual Meeting of the Cervical Spine Research Society, New York, NY, November 2019.

Lim DP, Lazaro LE, Nelson TJ, Eberlein SA, Banffy MB, **Metzger MF**., “Abductor Muscles Increase Hip Stability Against Rotational and Distractive Forces: A Quantitative Study” International Society for Hip Arthroscopy Annual Scientific Meeting, Madrid Spain, October 2019

Lazaro LE, Lim DP, Nelson TJ, Eberlein SA, Banffy MB, **Metzger MF**., “Proximal Over-resection During Femoral Osteochondroplasty Negatively Affects the Distractive Stability of the Hip Joint” International Society for Hip Arthroscopy Annual Scientific Meeting, Madrid Spain, October 2019.

Ju DG, Glaeser JD, Salehi K, Kanim LE, Behrens PH, **Metzger MF**, Sheyn D, Bae HW. Electrospun synthetic bone scaffolds promote mesenchymal stem cell function and spinal fusion. 34th Annual Meeting of the North American Spine Society, Chicago, IL, September 2019.

Garlich JM, Nelson TJ, Katherine S, Monfiston CH, **Metzger MF**, Little MT., “Infraspinatus Tenotomy Increases Glenoid Exposure with the Modified Judet Approach to the Scapula”, Orthopaedic Trauma Association (OTA) Annual Meeting, Denver, CO, September 2019

Pham N, Gonzalez AR, Nelson TJ, Glaeser JD, Suzuki M, Milecamps M, Ohtori S, Stone L, Sheyn D, **Metzger MF** Exercise Attenuates Age-Related Bone Loss in a Transgenic Mouse Model. Cedars-Sinai Research Internship Program Poster Day, Los Angeles, CA, August 2nd, 2019

Ju DG, Glaeser JD, Salehi K, Kanim LE, Behrens PH, **Metzger MF**, Sheyn D, Bae HW. Electrospun synthetic bone scaffolds promote mesenchymal stem cell function and spinal fusion. 26th International Meeting on Advanced Spine Techniques (IMAST), Amsterdam, NL, July 2019

- Whitecloud Award Nominee

Garlich J, Little M, Nelson TJ, Eberlein SA, Monfiston CH, **Metzger MF**., “Evaluation of Multiplanar Stability in Neer Type IIB Clavicle Fractures”, Western Orthopaedic Association (WOA) Annual Meeting, Monterey, CA July 2019

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Garlich JM, Nelson TJ, Katherine S, Monfiston CH, **Metzger MF**, Little MT., “Infraspinatus Tenotomy Improves Glenoid Visualization with the Modified Judet Approach”, Western Orthopaedic Association (WOA) Annual Meeting, Monterey, CA July 2019

- Winner of the WOA’s David H. Chafey III, MD Donor Award

Papalamprou A, Chahla J, Chan V, Limpisvasti O, Mandelbaum BR, **Metzger MF** and Sheyn D. Revisiting the Vascularity and Resident Stem Cell Population of the Meniscal Avascular Zone, ICORS annual meeting, Podium Presentation, Montreal, Canada, June 2019

Papalamprou A, Chahla J, Khnkoyan Z, Arabi Y, Chan V, Salehi K, Nelson TJ, Limpisvasti O, Mandelbaum BR, **Metzger MF** and Sheyn D. Revisiting the Vascularity and Resident Stem Cell Population of the Human Meniscal White-White zone. International Society for Stem Cell Research (ISSCR) Annual Meeting, Los Angeles, CA, June 2019

Kremen TJ, Eberlein SA, Chahla J, Nelson TJ, Schroeder G, Haggerty E, **Metzger MF**. “How Accurate Are Radiographic Landmarks at Predicting the Location of Lateral Knee Structures?” Arthroscopy Association of North America (AANA) 2019 Annual Meeting, Orlando, FL, May 2019

Kremen TJ, Monfiston CH, Garlich J, Little MT, **Metzger MF**. “When is a Hill-Sachs Lesion Too Large for Remplissage? The Relationship Between Humeral Head Size and Infraspinatus Tendon Length” Arthroscopy Association of North America (AANA) 2019 Annual Meeting, Orlando, FL, May 2019

Chahla J, Nelson TJ, Dallo I, Yalamanchili R, Eberlein SA, Limpisvasti O, Mandelbaum B, **Metzger MF**. “Anterior Cruciate Ligament Repair versus Reconstruction: A Biomechanical Analysis” Arthroscopy Association of North America (AANA) 2019 Annual Meeting, Orlando, FL, May 2019.

Garlich J, Little M, Nelson TJ, Eberlein SA, Monfiston CH, **Metzger MF**. “Evaluation of Multiplanar Stability in Neer Type IIB Clavicle Fractures” Orthopaedic Research Society (ORS) Annual Meeting, Austin TX, February 2019

Papalamprou A, Chahla J, Arabi Y, Chan V, Salehi K, Nelson TJ, Limpisvasti O, Mandelbaum B, **Metzger MF**, Sheyn D. “Revisiting the Vascularity and Resident Stem Cell Population of the Meniscal Avascular Zone” Orthopaedic Research Society (ORS) Annual Meeting, Austin TX, February 2019

NaPier Z, Kanim LEA, Nelson TJ, Glaeser JD, Salehi K, Sheyn D, **Metzger MF**. “The Impact of Type I Diabetes on Bone Metabolism and Growth after Spinal Fusion”, Orthopaedic Research Society (ORS) Annual Meeting, Austin TX, February 2019

Garlich JM, Nelson TJ, Katherine S, Monfiston CH, **Metzger MF**, Little MT., “Infraspinatus Tenotomy Increases Glenoid Exposure with the Modified Judet Approach to the Scapula”, Orthopaedic Research Society (ORS) Annual Meeting, Austin TX, February 2019

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Monfiston CH, Garlich J, Mason BS, Little MT, **Metzger MF**, Kremen TJ. “When is a Hills-Sachs Lesion Too Large for Remplissage? The Relationship Between Humeral Head Size and Infrapinatus Tendon Length” Nth Dimension and AAOS Summer Internship Program’s Research presentations at the NMA Annual Convention, Orlando, FL, August 2018.

Katherine S, Garlich J, Nelson TJ, Monfiston CH, Little MT, **Metzger MF**. “Increased Glenoid Exposure After Infrapinatus Tenotomy: A Quantitative Analysis” Cedars-Sinai Research Internship Program Poster Day, Los Angeles, CA, August 3th, 2018

- Winner of the Minors in Research Poster Competition

Thomas D, Thordarson D, Nelson TJ, Timothy CP, Eberlein S, **Metzger, MF**. “Biomechanical Impact of FHL Tendon Harvest on Forefoot and Great Toe Push-Off Strength and its Correlation to Knot of Henry Crossover Variation”. American Orthopaedic Foot & Ankle Society (AOFAS) Annual Meeting, Boston, MA, July 2018

Bhamb N, Kanim LEA, Maldonado RC, Nelson TJ, Glaeser J, Salehi K, **Metzger MF**. “The Impact of Type 2 Diabetes on Bone Metabolism and Growth after Spinal Fusion”. North American Spine Society Annual Meeting, Orlando, FL, October 2017

Thomas D., Nelson T.J., Thordarson D., Nelson T.J., **Metzger M.F.** “Knot of Henry Variation and the Effect on Plantar Flexion Strength”. Orthopaedic Research Society Southern California Regional Symposium, September 25, 2017

Metzger M.F., Kanim L.E.A., Maldonado R.C., Nelson T.J., Glaeser J., Salehi K., Bhamb N., “The Impact of Type II Diabetes on Bone Metabolism and Growth after Spinal Fusion”. Orthopaedic Research Society Southern California Regional Symposium, September 25, 2017

Pfeffer, G.B., Zapf, M., Nelson T.J., **Metzger M.F.** “Postoperative Achilles Pull-out Strength after Calcaneoplasty for Haglund’s Syndrome”. Orthopaedic Research Society Southern California Regional Symposium, September 25, 2017

Polakof L.S., Alayan A., Maldonado R.C., Lin C., Moon C., **Metzger M.F.** “Biomechanical Analysis of a Novel Buried Fixation Technique Using Headless Compression Screws”. Orthopaedic Research Society Southern California Regional Symposium, September 25, 2017

Polakof L.S., Trentacosta N., Pace J.L., Michalski M., Nelson T.J., Mandelbaum B.R., **Metzger M.F.** “Biomechanical Evaluation of Pediatric Anterior Cruciate Ligament (ACL) Reconstruction Techniques with and without the Anterolateral Ligament (ALL)”. Orthopaedic Research Society Southern California Regional Symposium, September 25, 2017

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Kremen TJ, Polakof LS, Rajee S, Nelson TJ, **Metzger MF**. "The effect of Hamstring Tendon Autograft Harvest on the Restoration of Knee Stability in the Setting of Anterior Cruciate Ligament Rupture and Concurrent Medial Collateral Ligament Injury". Western Orthopaedic Association (WOA) 81st Annual Meeting, Koloa, Hawaii, August 2017

- Recipient of the Young Investigator Award

Pace JL, Trentacosta NE, **Metzger M**, Nelson T, Michalski M, Polakof LS, Mandelbaum BR. "Biomechanical Evaluation of Pediatric Anterior Cruciate Ligament Reconstruction Techniques with and without the Anterolateral Ligament" AOSSM Annual Meeting, Toronto, Canada, July 2017

Kremen TJ, Polakof L, Rajee S, Nelson T, **Metzger MF**. "The effect of Hamstring Tendon Autograft Harvest on the Restoration of Knee Stability in the Setting of Anterior Cruciate Ligament Rupture and Concurrent Medial Collateral Ligament Injury". AOSSM Annual Meeting, Toronto, Canada, July 2017

Trentacosta N, Pace JL, **Metzger MF**, Michalski M, Nelson T, Polakof L, Mandelbaum B. "Biomechanical Evaluation of Pediatric Anterior Cruciate Ligament (ACL) Techniques with and without the Anterolateral Ligament (ALL)". Pediatric Research in Sports Medicine Society 4th Annual Meeting, Dallas, TX, January 2017

Alayan A, Maldonado RC, Polakof L, **Metzger MF**, Saini A, Lin C, Moon C. "Biomechanical Analysis of a Novel Buried Fixation Technique Using Headless Compression Screws" Western Orthopaedic Association's 2016 Annual Meeting, Indian Wells, CA, September 2016

Xu, V, Nelson T, Maldonado RC, Bhamb N, Kanim, LEA, **Metzger, M.F.**, "The Impact of Type 2 Diabetes on Bone Metabolism and Growth after Spinal Fusion: Radiographic Analysis" Cedars- Sinai Research Internship Program Poster Day, Los Angeles, CA, August 5, 2016

- Placed as a Finalist in poster competition

Bhamb N, Maldonado R, Kanim LEA, Svet MT, **Metzger M.F.**, "Effect of Modulating Dietary Vitamin D on the General Bone Health of Rats During Posterolateral Spinal Fusion" California Orthopaedic Association's 2016 Annual Meeting, Dana Point, CA, May 2016

- Winner of the OREF Resident Award

Tuchman A., Turner AW, **Metzger M.F.**, Acosta F. "An In Vitro Biomechanical Model of Segmental Thoracic Fixation for Spinal Deformity Correction", Spine Summit 2016: The 32nd Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves, Orlando, FL, March 2016

- The Charlie Kuntz Scholars Award (awarded to top 10 residents)

Maldonado R, Kanim LEA, Svet MT, **Metzger M.F.**, "Interrelationships of Vitamin D Status, Bone Health and Fusion Consolidation", NASS 30th Annual Meeting, Chicago, IL, October 2015

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Welch T., Mohr K., Keller T., **Metzger M.F.**, Maldonado R., Kvitne R., "The Effect of Dynamic Bracing on Patellofemoral Joint Pressures in PCL- and PCL/PLC-Deficient Knees" The American Orthopaedic Society for Sports Medicine (AOSSM) Annual Meeting, Orlando, FL, July 2015

Metzger, M.F., Robinson, S.T., Maldonado R., Rawlinson, J.J., Liu, J., Acosta F.L., "Direct Lateral Interbody Fusion (DLIF) Strategies for Adjacent Segment Degeneration in the Lumbar Spine, a Biomechanical Analysis" The International Society for the Advancement of Spine Surgery (ISASS) Annual Meeting, San Diego, CA, April 2015

Metzger, M.F., Robinson, S.T., Maldonado R., Delamarter, R.B., Liu, J., Acosta F., "Biomechanical Analysis of Direct Lateral Interbody Fusion (DLIF): Strategies for Adjacent Segment Degeneration in the Lumbar Spine", Congress of Neurological Surgeons Annual Meeting, Boston, MA, October 2014

Metzger, M.F., Kanim, L.A., Zhao, L., Robinson, S.T., Delamarter, R.B. "The Relationship Between Vitamin D Status and Successful Spinal Fusion", NASS 28th Annual Meeting, New Orleans, LA, October 9-11th, 2013

- Best Papers Section
- Under consideration for Value Abstract Award

Metzger, M.F., Kanim, L.A., Zhao, L., Robinson, S.T., Delamarter, R.B. "The Relationship between Serum Vitamin D Levels, Successful Fusion and Fusion Strength: A Quantitative Analysis", SRS 48th Annual Meeting, Lyon, France, September 18-21, 2013

- Hibbs Basic Science Award Nominees

Metzger, M.F., Robinson, S.T., Drazin, D., Svet, M.T., Acosta, F.L. " Biomechanical Analysis of the Proximal Adjacent Segment after Scoliosis Correction: Do Hooks Ease the Transition?" 20th International Meeting on Advanced Spine Techniques (IMAST), Vancouver, British Columbia, Canada, July 10-13, 2013

Metzger, M.F., Kanim, L.A., Zhao, L., Robinson, S.T., Delamarter, R.B. "Suboptimal Vitamin D Increases Risk for Infection", ISSLS 40th Annual Meeting, Scottsdale, AZ, May 13-17, 2013

Metzger, M.F., Kanim, L.A., Zhao, L., Robinson, S.T., Delamarter, R.B. "The Relationship between Vitamin D Status and Successful Fusion", ISSLS 40th Annual Meeting, Scottsdale, AZ, May 13-17, 2013

S.T. Robinson, R.B. Delamarter, M.T. Svet, **M.F. Metzger**, "Does Sacral Geometry Affect Biomechanical Behavior and Facet Forces after Total Disc Replacement at the Lumbosacral Junction?" The International Society for the Advancement of Spine Surgery (ISASS) Annual Meeting, Vancouver BC, April 2013

M.F. Metzger, L.A. Kanim, L. Zhao, S.T. Robinson, Buser, Z., R.B., Delamarter. "The Relationship between Serum Vitamin D levels, Successful Fusion and Fusion Strength: A Quantitative Analysis" Orthopaedic Research Society 59th Annual Meeting, San Antonio, TX, January 2013

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

F.L. Acosta, Jr., Z. Buser, Y. Safai, **M.F. Metzger**, R.B. Delamarter. "Improving Bone Formation in Osteoporosis through Mechanical Signaling Pathways." SRS Annual Meeting, September 2012

Marshall, D.C., **Metzger, M.F.**, Bae, H.W., Zhao, L., Kanim, L.E.A, Wong, P., Delamarter, R.B., "Bone Marrow Aspirate with a Subeffective Dose of rhBMP-2 in Spinal Fusion: A Quantitative Analysis", Orthopaedic Research Society 58th Annual Meeting, San Francisco, CA, March 2012

Metzger, M.F., Faruk Senan, N.A., O'Reilly O.M., Lotz, J.C., "Minimizing Errors Associated with Calculating the Helical Axis of Spinal Motion", Orthopaedic Research Society 56th Annual Meeting, New Orleans, LA, March 2010

Metzger, M.F., Biomechanics of Cervical ADR, 9th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, February 2010

Metzger, M.F., Biomechanics of Posterior Non-Fusion Devices, 9th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, February 2010

Metzger, M.F., Biomechanics of Lumbar ADR, 9th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, February 2010

Metzger M.F., Bradford D.S., Lotz, J.C., "First Generation TDR Devices Do Not Adequately Resist Shear in the Lumbosacral Spine", Spine Arthroplasty Society 9th Annual Meeting, London, England, May 2009

Metzger M.F., Senan A.F., Lotz, J.C., O'Reilly, O.M., "Revisiting the Stiffness Matrix with an Application to Total Disc Replacement Systems", North American Spine Society 23rd Annual Meeting, Montreal, Ontario, October 2008

Metzger M.F., Buckley J.M., Acosta F.L., Lotz J.C., "A Simplified Method for Comparing 3D Quality of Motion in Vitro", Spine Arthroplasty Society 8th Annual Meeting, Miami, FL, May 2008

Metzger M.F., Buckley J.M., Acosta F.L., O'Reilly O.M., Lotz J.C., "Facet Force Sensitivity to Total Disc Replacement Device Position", Orthopaedic Research Society 54th Annual Meeting, San Francisco, CA, March 2008

Metzger M.F., Buckley J.M., O'Reilly O.M., Lotz J.C. "A Novel Method for Measuring In Situ Structural Rigidity of Total Disc Replacement Systems", Spine Arthroplasty Society 7th Annual Meeting, Berlin, Germany, May 2007

Buckley J.M., **Metzger M.F.**, Bradford, D.S., Lotz J.C., O'Reilly O.M., "How Accurately can we Measure the Instantaneous Axis of Rotation?" Spine Arthroplasty Society 7th Annual Meeting, Berlin, Germany, May 2007

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Metzger, M.F., D. Schumann, T.S. Wilson, D.L. Matthews, and D.J. Maitland, "Mechanical Properties of a Mechanical Actuator for Treating Ischemic Stroke", Annual American Society for Laser Medicine and Surgery Meeting, New Orleans, LA, April 2001

INVITED LECTURES

Metzger M.F., "Do Combined Oral Contraceptives Protect Against Anterior Cruciate Ligament Injuries in Female Athletes?" Cedars Sinai's CREWHS Monthly Meeting, August 18th, 2022

Metzger, M.F. "Sex Differences in How We Connect...To Our Bones" CREWHS (Center for Research in Women's Health and Sex Differences) Research Scientists Seminar Series, Cedars-Sinai Medical Center, April 17th, 2020.

Metzger, M.F. "Biomechanical Analysis Strategies Toward Improved Clinical Outcomes" Grand Rounds, Department of Orthopaedic Surgery, Cedars-Sinai Medical Center, January 8th, 2020.

Metzger, M.F. and Sheyn, D. "The Effect of Diabetes Mellitus on Musculoskeletal Tissues", EM-DORI (Endocrine Metabolism-Diabetes and Obesity Research Institute) Seminar Series, Cedars-Sinai Medical Center Los Angeles, CA, October 18th, 2019

Metzger, M.F. "The Biomechanics of Jumps and Landings", Lecture presentation to students in DANC105: Dance Science at USC Gloria Kaufman Dance Medicine Center, Los Angeles, CA, February 28th, 2019.

Metzger, M.F. "The Biomechanics of Dance: A Review", Cedars-Sinai/USC Gloria Kaufman Dance Medicine Center Symposium on The Hybrid Dancer: Care and Prevention of Dance Injuries, Cedars-Sinai Medical Center, Los Angeles, CA, April 7th, 2018.

Metzger, M.F. "The Effect of Type II Diabetes on Bone Growth and Metabolism after Spinal Fusion Surgery" Spine Center Grand Rounds, Cedars-Sinai Medical Center, Los Angeles, CA, March 13th, 2018

Metzger, M.F., "Head, Shoulders, Knees and Toes: An Overview of CSMC's Orthopaedic Biomechanics Lab", ORS Southern California Regional Symposium: Orthopaedic Research: From Mechanism to Mechanics, Cedars-Sinai Medical Center, Los Angeles, CA, September 25, 2017

Metzger, M.F., "Distinguished Women in Science", Association of Women in Science, Cedars-Sinai Medical Center, Los Angeles, CA, March 14, 2017

Metzger, M.F., "Research at Its Finest", Spine Center Grand Rounds, Cedars-Sinai Medical Center, Los Angeles, CA, January 14, 2015

Metzger, M.F., "The Relationship between Serum Vitamin D Status and Successful Spinal Fusion", 13th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, February 2014

THE EXPERTS Robson Forensic

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Metzger, M.F., "The Influence of Vitamin D on Spinal Surgery", Japanese Orthopaedic Association Traveling Fellows Conference, Orthopaedic Department at Cedars-Sinai Medical Center, Los Angeles, CA, June 20, 2013

Metzger, M.F., "Vitamin D and Spinal Fusion", Spine Division Neurosciences Department, University of Southern California, Los Angeles, CA, May 24, 2013

Metzger, M.F., "Biomechanical Challenges at Lumbosacral Junction: Motion Preservation vs. Fusion", 12th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, February 2013

Metzger, M.F., "Orthopaedic Biomechanics: Applying Principles of Mechanics to the Human Body", 2013 Engineer's Week, Department of Mechanical Engineering, Cal State University Northridge, CA, February 22, 2013

Metzger, M.F., "The Biomechanics Lab at Cedars-Sinai", Orthopaedic Surgery Grand Rounds, Cedars-Sinai Medical Center, Los Angeles, CA, September 19, 2012

Metzger, M.F., "Spine Center Research Core Lecture", Spine Center Grand Rounds, Cedars-Sinai Medical Center, Los Angeles, CA, May 9, 2012

Metzger, M.F. Biomechanics of Posterior Non-Fusion Devices, 9th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV February 2010

Metzger, M.F. Biomechanics of Lumbar ADR, 9th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV February 2010

AWARDS

Research Faculty of the Year Award, CSMC Dept. of Orthopaedic Surgery (2017)
Clinical and Translational Science Institute (CTSI) Research Core Award (2015)
Clinical and Translational Science Institute (CTSI) Research Core Award (2012)
Graduate Student Association Travel Award, UCSF (2009)
Earl C. Anthony Travel Award, UCSF (2008)
National Science Foundation Graduate Research Fellowship Recipient (2005-2009)
Nomination for UC Berkeley University Medal (2001)
American Society of Laser Medicine and Surgery Travel Grant Recipient (2001)
Kilpatrick Scholarship, Moulett, L. Scholarship, Hearst, Phoebe Scholarship, and Rodkey
Scholarship recipient (1998-1999)
Academic recognition for achievements in Mathematical Sciences, El Camino College (1998)

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

RESEARCH AWARDS AND FUNDING

AO Trauma North America Fellows Research Grant “Biomechanical Evaluation of a Central Collinear Entry Reconstruction Nail for Femoral Neck Fracture Prophylaxis” Co-Investigator, 10/2022-09/2023

AOFAS Ronald and Wendy Smith Clinical Research Grant “Polymethylmethacrylate (PMMA) Augmentation of Midfoot Beam Constructs for Treatment of Charcot Neuroarthropathy (CN): A Biomechanical Study” Co-Investigator, 10/2022-09/2023

Scoliosis Research Society (SRS) Resident Research Grant “Impact of Lumbosacral Anatomy and L5 Morphology on the Incidence of Pediatric Spondylolysis” Co-Investigator, 09/2022-08/2023

Arthrex Investigator Initiated Research Grant “Biomechanical Evaluation of Posterolateral Corner Reconstruction with Suture Augmentation”, Co-Principal Investigator, 08/2022-07/2023

Intuitive Foundation Training and Education Research Grant “Ergonomics Training in Robotic Surgery”, Co-Investigator 06/2022-05/2023

Medtronic Spine Investigator Initiated Research Grant “Biomechanical Evaluation of a Novel C2 Terminus for Occipitocervical Fusion”, Co-Investigator, 08/2021-07/2022

Cedars Sinai Center for Research in Women’s Health and Sex Differences Grant “Do Oral Contraceptives Protect Against Anterior Cruciate Ligament Injuries in Female Athletes?”, Principal Investigator, 09/2020-05/2023

Musculoskeletal Transplant Foundation (MTF) Junior Investigator Grant award “Elbow Ulnar Collateral Ligament Reconstruction with Knee Collateral Ligament Allograft: A Biomechanical Study”, Co-Principal, 01/2021-12/2021

Cedars Sinai Center for Research in Women’s Health and Sex Differences “The Impact of Faculty and Resident Diversity on Resident Attrition” Principal Investigator, 09/2020-08/2021

OREF / JRGOS Orthopaedic Disparities Resident Research Grant “The Impact of Faculty and Resident Diversity on Resident Attrition” Co-Investigator, 06/2020-05/2021

Arthrex Investigator Initiated Research Grant “Coronal Versus Sagittal Placement of Staple in Capitulum Fusion: A Biomechanical Study”, Co-Principal, 02/2020-01/2021

Musculoskeletal Transplant Foundation (MTF) Junior Investigator Grant award “Elbow Ulnar Collateral Ligament Reconstruction with Knee Collateral Ligament Allograft: A Biomechanical Study”, Co-Principal, 01/2021-12/2021

Cedars Sinai Center for Research in Women’s Health and Sex Differences “The Impact of Faculty and Resident Diversity on Resident Attrition” Principal Investigator, 09/2020-08/2021

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

OREF / JRGOS Orthopaedic Disparities Resident Research Grant “*The Impact of Faculty and Resident Diversity on Resident Attrition*” Co-Investigator, 06/2020-05/2021

Arthrex Investigator Initiated Research Grant “*Coronal Versus Sagittal Placement of Staple in Capitulum Fusion: A Biomechanical Study*”, Co-Principal, 02/2020-01/2021

Musculoskeletal Transplant Foundation (MTF) Research Grant “*A New Paradigm: Cadaveric Collateral Ligament for Hand Reconstruction*”, Co-Principal, 10/2019-04/2021

Arthrex Investigator Initiated Research Grant “*Biomechanical Comparison of Ulnar Collateral Ligament Reconstruction with and without Internal Bracing*”, Co-Principal, 12/2019-11/2020

Misonix Research Grant “*Effects of Temperature of Surrounding Issues with Use of Misonix Drill Compared to Midas Rex-8 Drill*”, Co-Investigator, 11/2019-10/2020

Arthrex Investigator Initiated Research Grant “*Comparison of Extensor Tendon Transfers for Ankle Dorsiflexion in Charcot-Marie-Tooth Disease*”, Co-Principal, 05/2019-04/2020

Arthrex Investigator Initiated Research Grant, “*Biomechanical Evaluation of Internal Brace Augmentation of Anterior Cruciate Ligament Reconstruction: Does Augmentation Protect ACL Grafts and Prevent Excess Graft Strain or Modify Failure*”, Co-Principal, 03/2019-02/2020

POSNA (Pediatric Orthopaedic Society of N. America) Directed Research Grant, “*Pedicle Screw Placement with a 3D Deformity Model*”, Co-Investigator, 03/2019-09/2020

Arthrex Investigator Initiated Research Grant, *Hip Capsular Management with the Pie Crusting Technique: A Biomechanical Analysis of Stability and Failure*,” Co-Principal, 02/2019-01/2020

Arthrex Investigator Initiated Research Grant, “*Biomechanical Evaluation of Internal Brace Augmentation of Anterior Cruciate Ligament Reconstruction: Does Augmentation Protect ACL Grafts and Prevent Excess Graft Strain or Modify Failure*”, Co-Principal, 05/2019-04/2020

POSNA (Pediatric Orthopaedic Society of N. America) Directed Research Grant, “*Pedicle Screw Placement with a 3D Deformity Model*”, Co-Investigator, 03/2019-09/2020

Arthrex Investigator Initiated Research Grant, *Hip Capsular Management with the Pie Crusting Technique: A Biomechanical Analysis of Stability and Failure*,” Co-Principal, 02/2019-01/2020

Arthrex Investigator Initiated Research Grant, *Biomechanical Evaluation of UCL Repair Using Suspensory Fixation*,” Co-Principal, 12/2018-11/2019

American Orthopaedic Society for Sports Medicine (AOSSM), Steven P. Arnoczky Young Investigator Grant, “*Revisiting the Vascularity and Stem Cell Population of the Meniscal Avascular Zone Using 3D Imaging Technique*”, Co-Investigator, 07/2018-06/2019

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Orthopaedic Research and Education Foundation (OREF), Resident Clinician Scientist Training Grant, *"Identifying and mitigating the effects of diabetes on intervertebral disc degeneration," Co-Investigator, 03/2018-06/2019*

Arthrex Investigator Initiated Research Grant, *Biomechanical Evaluation of Medial Ulnar Collateral Ligament Reconstruction with Ulnar Tunnels 1 cm from the Joint Line," Co-Principal, 11/2017-12/2018*

Arthrex Investigator Initiated Research Grant, *"Biomechanical Evaluation of PCL Reconstruction Augmented with Internal Bracing," Co-Principal, 11/2017-12/2018*

Arthrex Investigator Initiated Research Grant, *"A Biomechanical Comparison between Anterior Cruciate Ligament Repair Versus Reconstruction," Co-Principal, 11/2017-12/2018*

AOTrauma North America (AOTNA), Resident Research Grant, *"Evaluation of Multiplanar Stability in Near Type IIB Clavicle Fractures," Co-Investigator, 07/2017-06/2018*

Orthopaedic Research and Education Foundation (OREF) Resident Research Grant, *"Knot of Henry Variation and the Effect of Plantar Flexion Strength," Co-Investigator, 2/2017-01/2018*

Orthopaedic Research and Education Foundation (OREF) New Investigator Research Grant, *"The Effect of Hamstring Tendon Autograft Harvest on the Restoration of Knee Stability in the Setting of Anterior Cruciate Ligament Rupture and Concurrent Medial Collateral Ligament Injury," Co-Investigator, 07/2015-12/2016*

Ossur Research Grant, *"The Effect of Dynamic Bracing on Articular Contact Pressures in PCL Deficient Knees," Principal Investigator, 11/2014-10/2015*

Acumed, LLC Research Grant, *"Buried Fixation of Patella Fractures: A Biomechanical Investigation," Co-Investigator, 11/2014-10/2015*

Scoliosis Research Society, Research Grant, *"The Impact of Type I Diabetes on Bone Metabolism and Growth after Spinal Fusion," Principal Investigator, 08/2014-07/2018*

North American Spine Society, Young Investigator Basic Research Grant, *"The Impact of Type II Diabetes on Bone Metabolism and Growth after Spinal Fusion," Principal Investigator, 12/2014-12/2015*

AANS/CNS Haid Research Award, *"The Biomechanics of Sagittal Deformity: The Impact of Sacral Slope on Lumbosacral Interbody Fusion," Co-Author, Mentor, 07/2013-06/2014*

Medtronic, Research Grant, *"Biomechanical Analysis of Direct Lateral Interbody Fusion (DLIF) Strategies for Adjacent Segment Degeneration in the Lumbar Spine," Principal Investigator, 07/2012-12/2014*

Scoliosis Research Society, Research Grant, *"The Relationship between Serum Vitamin D levels, Successful Fusion and Fusion Strength: A Quantitative Analysis," Principal Investigator, 08/2011-10/2012*

MELODIE METZGER, Ph.D.
Biomedical Engineer / Biomechanics and Bioengineering

Stryker Spine, Research Grant, "*Biomechanical Analysis of the Effect of Different Instrumentation Techniques on Adjacent Level Stability After Long Segment Instrumentation of the Thoracic Spine,*" Principal Investigator, 07/2011-06/2014

Scoliosis Research Society, Research Grant, "*Improving Bone Formation in Osteoporosis Through Mechanical Signaling Pathways,*" Start-up grant to determine the responsiveness of MSCs and osteoblasts derived from osteoporotic human bone to both biochemical and mechanical signals, Co-Principal Investigator, 01/2011-10/2012

AOSpine, Hansjörg Wyss Start-up Grant, "*Does Sacral Geometry Affect Biomechanical Behavior and Facet Forces after Total Disc Replacement at the Lumbosacral Junction?*" Start-up grant to investigate whether the degree of sacral slope alters the efficacy of total disc replacements, Principal Investigator, 08/2010-05/2012

NIH/NHLBI SBIR, 1 R43 HL78528-01, "*Polymer Actuator for Peripheral Vessel Thrombectomy:*" Feasibility Phase I study produced a proof-of-concept device for the treatment of peripheral occlusive disease, Principal Investigator, 04/2004-09/2004

NIH/NINDS SBIR, 1 R43 NS044816-01A1, "*Interventional Applications of Shape Memory Polymer Foam:*" Phase I study resulted in the development of a shape memory polymer foam device for filling and sealing cerebral aneurysm/arteriovenous malformation volumes, Principal Investigator, 06/2003-12/2003