



## ORS PSRS 5th International Spine Research Symposium

### *New Horizons in Intervertebral Disc Research*

Sunday, November 3 – Thursday, November 7, 2019

#### Schedule-At-A-Glance

#### Sunday, November 3, 2019

2:00 PM – 9:00 PM	Arrival and Check-in	Evergreen Ballroom
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5:30 PM – 7:00 PM	Dinner	West Windsor Dining Room
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7:00 PM – 7:10 PM	<b>Welcome &amp; Introductory Comments by Chair</b> James Iatridis, PhD, <i>Icahn School of Medicine at Mount Sinai</i>	Evergreen Ballroom
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7:10 PM – 9:00 PM	<b>Diagnosis, Biomarkers &amp; Clinical Treatment</b> Discussion Leaders: Harvey Smith, MD, <i>University of Pennsylvania</i> and James Iatridis, PhD, <i>Icahn School of Medicine at Mount Sinai</i>	Evergreen Ballroom
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7:10 PM – 7:20 PM	<b>Discussion Leader Lightning Talk by Harvey Smith, MD</b>
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7:20 PM – 7:50 PM	<b>GWAS in Low Back Pain: Phenotyping Matters</b> Frances Williams, MBBS, PhD, <i>King's College London</i>
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7:50 PM – 8:20 PM	<b>Clinical Pain Diagnosis</b> Gwen Sowa, MD, PhD, <i>University of Pittsburgh</i>
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8:20 PM – 9:00 PM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>  <b>Comparison of MRI Techniques as Tools to Evaluate Spinal Pathology</b> Morgan Giers PhD, <i>Oregon State University</i>  <b>The Lasting Effects from Prolonged Microgravity on Multifidus Muscle Quality and Implications for Rehabilitation of Multifidus for Low Back Pain</b> Jeannie F. Bailey, PhD, <i>University of California, San Francisco</i>  <b>Downregulation of Circulating miR-155 Predicts Progression of Disc Degeneration and also Correlates with Increased Leg Pain</b> Srikanth N. Divi, MD, Rothman Institute, <i>Thomas Jefferson University Hospital</i>  <b>Exclusion Criteria in Clinical Evaluation of a Disc Cell Therapy: How Do We Ensure a Robust Answer?</b> Lara Ionescu Silverman, PhD, <i>DiscGenics</i>
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9:00 PM – 10:00 PM	NYC Organizing Committee Welcome Reception	Hemlock Ballroom
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10:00 PM	Campfire
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Monday, November 4, 2019

7:30 AM – 8:30 AM	Breakfast	West Windsor Dining Room
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8:30 AM – 10:00 AM	<b>Diagnosis, Biomarkers &amp; Clinical Treatment</b> Discussion Leaders: Nadeen Chahine, PhD, <i>Columbia University</i> and Yejia Zhang, MD, PhD, <i>University of Pennsylvania</i>	Evergreen Ballroom
8:30 AM – 8:40 AM	<b>Discussion Leader Lightning Talk by Nadeen Chahine, PhD</b>	
8:40 AM – 9:10 AM	<b>Biomarkers to Advance Clinical Phenotypes of Low Back Pain</b> Adam Goode, Pt, DPT, PhD, <i>Duke University</i>	
9:10 AM – 9:40 AM	<b>Phenotyping/Phenomics of Spine Imaging and Pain</b> Dino Samartzis, DSc, <i>Rush University</i>	
9:40 AM – 10:00 AM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>  <b>In vivo fluid Transport in Human Intervertebral Discs Varies by Spinal Level, Disc Region, and Degeneration Grade</b> John Martin, PhD, <i>Duke University</i>  <b>Associations Between Disc Degeneration and the Mechanical and Microstructural Properties of the Vertebral Endplate (VEP)</b> Yuanqiao Wu, MS, <i>Boston University</i>	

10:00 AM – 10:30 AM	Break	
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10:30 AM – 12:00 PM	<b>Pain Mechanisms</b> Discussion Leaders: Devina Purmessur, PhD, <i>Ohio State University</i> and Laura Stone, PhD, <i>McGill University</i>	Evergreen Ballroom
10:30 AM – 10:40 AM	<b>Discussion Leader Lightning Talk by Devina Purmessur, PhD and/or Laura Stone, PhD</b>	
10:40 AM – 11:10 AM	<b>Mechanomodulation &amp; Pain Mechanisms</b> Beth Winkelstein, PhD, <i>University of Pennsylvania</i>	
11:10 AM – 11:40 AM	<b>Steroids and Steroid Receptors in Pain</b> Jun-Ming Zhang, MD, MSc, <i>University of Cincinnati</i>	
11:40 AM – 12:00 PM	<b>Short Talk Podium Presentations (7 minutes each followed by discussion)</b>  <b>Peripheral Nervous System Gene Expression in Two Pain Transduction Pathways After Intervertebral Disc Injury</b> Grace Mosley, BS, <i>Icahn School of Medicine at Mount Sinai</i>  <b>Molecular Correlates of Pain with Disc Degeneration in Aging Mice</b> Kathleen Vincent, PhD, <i>Hospital for Special Surgery</i>	

12:00 PM – 1:00 PM	Lunch	West Windsor Dining Room
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1:00 PM – 4:00 PM	<b>Free Time</b>
	<b>Hikes - 3.3 Miles</b> Organized by the ORS Spine Section Membership Committee  Begin with <b>Lake Trail</b> (beginner 2.1 miles) and lead into <b>Leavitt Falls Trail</b> (advanced 1.2 miles)

4:00 PM – 5:30 PM	<b>Odd Number Viewing</b>
	Ice Breaker Bingo Game Organized by the ORS Spine Section Membership Committee

5:30 PM – 6:30 PM	Dinner	West Windsor Dining Room
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6:30 PM – 7:00 PM	<b>PSRS Lifetime Achievement Awardee Lecture</b>	Evergreen Ballroom
	Introduction of Michele Crites Battié, PhD, <i>University of Western Ontario</i> “A Brief Look Back and Ahead”	

7:00 PM – 9:00 PM	<b>Next Generation Treatments</b> Discussion Leaders: Christine LeMaitre, BSc, PGCert HE, PhD, FHEA, <i>Sheffield Hallam University</i> and Lori Setton, PhD, <i>Washington University in St. Louis</i>	Evergreen Ballroom
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7:00 PM – 7:10 PM	<b>Discussion Leader Lightning Talk by Christine LeMaitre, PhD, and/or Lori Setton, PhD</b>
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7:10 PM – 7:40 PM	<b>Differentiation of Human iPSCs to Notochordal Cell Phenotype</b> Zulma Gazit, PhD, <i>Cedars-Sinai Medical Center</i>
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7:40 PM – 8:10 PM	<b>Disc Degeneration and Regeneration: Role of Cartilage Endplate Transport Properties</b> Aaron Fields, PhD, <i>University of California San Francisco</i>
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8:10 PM – 9:00 PM	<b>Short Talk Podium Presentations</b> (7 minutes each followed by group discussion)
	<b>Harmonization and Standardization of Intervertebral Disc Cell Culture Methods</b> Abbie Binch, PhD, <i>Sheffield Hallam University</i>
	<b>Non-Viral Transfection of Human Nucleus Pulposus Cells with FOXF1 Induces Reprogramming to a Healthy Pro-anabolic Phenotype</b> Nina Tang, BS, <i>The Ohio State University</i>
	<b>Optimized Strategy for the Differentiation of Human Induced Pluripotent Stem Cells into Notochordal-Like Cells: Application to Intervertebral Disc Regenerative Medicine</b> Nicolas Vedrenne, PhD, <i>Inserm</i>
	<b>Role of Cell Shape in Regulating NP Cell Phenotype</b> Bailey Fearing, PhD, <i>Washington University in St. Louis</i>

9:00 PM – 10:00 PM	Networking Reception	Hemlock Ballroom
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**Tuesday, November 5, 2019**

<b>7:30 AM – 8:30 AM</b>	<b>Breakfast</b>	<b>West Windsor Dining Room</b>
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<b>8:30 AM – 10:10 AM</b>	<b>Next Generation Treatments</b> Discussion Leaders: Lachlan Smith, PhD, <i>University of Pennsylvania</i> and Benjamin Walter, PhD, <i>The Ohio State University</i>	<b>Evergreen Ballroom</b>
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8:30 AM – 8:40 AM	<b>Discussion Leader Lightning Talk by Lachlan Smith, PhD and/or Benjamin Walter, PhD</b>	
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8:40 AM – 9:10 AM	<b>Engineering Biomaterial and Cell-based Strategies for Disc Regeneration- Layers of Complexity</b> Conor Buckley, PhD, <i>Trinity College Dublin</i>	
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9:10 AM – 9:40 AM	<b>Next Generation Treatments for Disc Degeneration</b> Xudong Li, MD, PhD, <i>University of Virginia</i>	
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9:40 AM – 10:10 AM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>	
	<b>Recapitulating the Complex Biomechanical Properties of the Intervertebral Disc Using Tunable 3D Printing</b> Samantha Marshall, PhD, <i>Columbia University</i>	
	<b>Annulus Fibrosus Differentiation of Human Bone Marrow Stem Cells on Polycaprolactone Scaffolds with 3D Printed Oriented Ply Structure</b> Andrea Vernengo, PhD, <i>AO Research Institute Davos</i>	
	<b>Bioadhesive Optimization and Cytocompatibility Assessment of a Novel Two-Part Strategy for Annular Repair</b> Tyler DiStefano, BEng, <i>Icahn School of Medicine at Mount Sinai</i>	

<b>10:10 AM – 10:30 AM</b>	<b>Break</b>	
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<b>10:30 AM – 12:10 PM</b>	<b>Animal Models &amp; Preclinical Studies</b> Discussion Leaders: Sibylle Grad, PhD, <i>AO Research Institute</i> and Danny Chan, PhD, <i>The University of Hong Kong</i>	<b>Evergreen Ballroom</b>
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10:30 AM – 10:40 AM	<b>Discussion Leader Lightning Talk by Sibylle Grad, PhD and/or Danny Chan, PhD</b>	
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10:40 AM – 11:10 AM	<b>(Advanced) Therapies from Bench to Back: What is Here and What Has Yet to Come</b> Marianna Tryfonidou, DVM, PhD, <i>Utrecht University</i>	
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11:10 AM – 11:40 AM	<b>Dogs Get Low Back Pain from Degenerative Disc Disease?</b> James Cook, DVM, PhD, <i>University of Missouri</i>	
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11:40 AM – 12:10 PM	<b>Mouse Models for Disc Research: Why Bother?</b> Victor Leung, PhD, <i>University of Hong Kong</i>	
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<b>12:10 PM – 1:00 PM</b>	<b>Lunch</b>	<b>West Windsor Dining Room</b>
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<b>1:00 PM – 4:00 PM</b>	<b>Free Time</b>	
	<b>Volleyball and Lawn games</b> (corn hole/bags, ladder ball, and Kan jam)	

	<b>Optional Scientific Program</b>	<b>Evergreen Ballroom</b>
	<b>ORS Spine Section / JOR Spine Histopathology and Animal Model Workshop</b>  <u>1:00 PM – 2:00 PM</u> ORS Spine Section / <i>JOR Spine</i> – Histopathology Initiative 10-minute introductions with 5-minute discussion for each topic <ul style="list-style-type: none"> <li>• Rat/Rabbit</li> <li>• Mouse</li> <li>• Large Animal</li> <li>• Human</li> </ul> <u>2:00 PM – 3:30 PM</u> <b>Breakout Discussions</b> Rat/Rabbit: Evergreen Ballroom (right side) Mouse: Evergreen Ballroom (left side) Large Animal: Laurel Room East Human: Laurel Room West	

<b>4:00 PM – 4:45 PM</b>	<b>Odd Number Poster Viewing</b>	<b>Hemlock Ballroom</b>
<b>4:45 PM – 5:30 PM</b>	<b>Even Number Poster Viewing</b>	

<b>5:30 PM – 6:45 PM</b>	<b>Dinner</b>	<b>West Windsor Dining Room</b>
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<b>7:00 PM – 9:00 PM</b>	<b>Animal Models Working Group Recap and Tissue Cross-Talk</b> Discussion Leaders: Sibylle Grad, PhD, <i>AO Research Institute</i> and Danny Chan, PhD, <i>The University of Hong Kong</i> <i>JOR Spine</i> Editors-in-Chief: Mauro Alini, PhD, <i>AO Research</i> <i>Institution</i> and Robert Mauck, PhD, <i>University of Pennsylvania</i>	<b>Evergreen Ballroom</b>
7:00 PM – 7:10 PM	<b>JOR Spine Update</b>	
7:10 PM – 7:20 PM	<b>Working Group Recap Report</b>	
7:20 PM – 7:50 PM	<b>Phlpp1 in Intervertebral Disc Degeneration</b> Svenja Illien-Junger, PhD, <i>Emory University School of Medicine</i>	
7:50 PM – 8:20 PM	<b>Human Ex Vivo Disease Models for Functional Drug Testing and Response to Therapy</b> Lisbet Haglund, PhD, <i>McGill University</i>	
8:20 PM – 9:00 PM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>  <b>Development of a Translational Canine Model of Human Intervertebral Disc Degeneration</b> Naomi Lee, DVM, <i>University of Missouri</i>  <b>Structure-Function Alterations to the Vertebral Endplate during Degeneration Reduce Small Molecule Transport into the Intervertebral Disc</b> Beth Ashinsky, BA, <i>University of Pennsylvania</i>  <b>Voluntary Running Attenuates Behavioral Low Back Pain in SPARC-Null Mice: Different Inflammatory Regulation Between Male and Female</b> Seunghwan Lee, PhD, <i>McGill University</i>  <b>Reduced Inflammation in Injured Tail Intervertebral Disc of TIPE and TIPE2-deficient Mice</b> Yejia Zhang, MD, PhD, <i>University of Pennsylvania</i>	

9:00 PM – 10:00 PM	Networking Reception	Hemlock Ballroom
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Wednesday, November 6, 2019

7:30 AM – 8:30 AM	Breakfast	West Windsor Dining Room
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8:30 AM – 12:00 PM	<b>Biology, Development and Pathophysiology &amp; Tissue Cross-Talk</b> Discussion Leaders: Cheryle Seguin, PhD, <i>The University of Western Ontario</i> and Chitra Dahia, PhD, <i>Hospital for Special Surgery</i>	Evergreen Ballroom
8:30 AM – 8:40 AM	<b>Discussion Leader Lightning Talk by Cheryle Seguin, PhD</b>	
8:40 AM – 9:10 AM	<b>HIF-1 is the Central Regulator of NP Cell Metabolism</b> Makarand Risbud, PhD, <i>Thomas Jefferson University</i>	
9:10 AM – 9:40 AM	<b>IVD Development</b> Rosa Serra, PhD, <i>University of Alabama at Birmingham</i>	
9:40 AM – 10:00 AM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>  <b>Diffuse Idiopathic Skeletal Hyperostosis (DISH): Quantitative Micro-CT and Histological Analyses in Humans</b> Dale Fournier, MSc, <i>The University of Western Ontario</i>  <b>Global Deletion of SOST Increases Osterix/Sp7 in Mildly Degenerated Intervertebral Discs</b> Tori Kroon, BS, <i>IUPUI</i>	

10:00 AM – 10:30 AM	Break	
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10:30 AM – 10:40 AM	<b>Discussion Leader Lightning Talk Chitra by Dahia, PhD</b>	
10:40 AM – 11:30 AM	<b>Short Talk Podium Presentations (7 minutes each followed by group discussion)</b>  <b>Pregnancy-associated Plasma Protein A (PappA) Knockout Mice: In Vivo Disc Study</b> Rebecca Kritschil, BS, <i>University of Pittsburgh</i>  <b>Identification of Glycomic-Based Therapeutics: Complete Characterization of the N-Glycan Profile of the Intervertebral Disc in IVD Degeneration</b> Kieran Joyce, <i>National University of Ireland, Galway</i>  <b>Enrichment of Nucleus Pulposus Progenitor is Coupled with MEK Kinase Activity</b> Wai Kit Tam, PhD, <i>The University of Hong Kong</i>  <b>Inflammatory Cytokines Induced by Sustained Loading of the Lumbar Disc is Attenuated by TRPV4 Inhibition</b> Garrett Easson, Masters, <i>Washington University in St. Louis</i>  <b>Imaging the Local Biochemical Content of the Intervertebral Disc using Fourier Transform Infrared Microscopy</b> Stephen Sloan, MS, <i>Cornell University</i>	
11:30 AM – 12:00 PM	<b>Immunomodulatory Natural Biomaterials for the Treatment of Disc Degeneration</b> Rebecca Wachs, PhD, <i>University of Nebraska</i>	

12:00 PM – 1:00 PM	Lunch	West Windsor Dining Room
1:00 PM – 4:00 PM	Free Time Kickball/soccer and lawn games (corn hole/bags, ladder ball, and Kan jam)	
4:00 PM – 5:30 PM	Even Number Poster Viewing	Hemlock Ballroom
5:30 PM – 6:45 PM	Dinner	West Windsor Dining Room
7:00 PM – 8:20 PM	<b>Biomechanics &amp; Tissue Cross-Talk</b> Discussion Leaders: Elise Morgan, PhD, <i>Boston University</i> and Simon Tang, PhD, <i>Washington University at St Louis</i>	Evergreen Ballroom
7:00 PM – 7:10 PM	<b>Discussion Leader Lightning Talk by Elise Morgan, PhD</b>	
7:10 PM – 7:40 PM	<b>Biomechanical Interaction of Disc Substructures</b> Grace O'Connell, PhD, <i>University of California Berkeley</i>	
7:40 PM – 7:50 PM	<b>Discussion Leader Lightning Talk by Simon Tang, PhD</b>	
7:50 PM – 8:20 PM	<b>Multiplex CRISPR Gene Regulation for the Treatment of Back Pain</b> Robby Bowles, PhD, <i>University of Utah</i>	
8:20 PM – 8:40 PM	ORS PSRS Awards Ceremony and Closing Remarks	Evergreen Ballroom
8:40 PM – 10:10 PM	<b>Trivia Night</b> Organized by the ORS Spine Section Membership Committee	Evergreen Ballroom
<b>Thursday, November 7, 2019</b>		
8:00 AM – 10:00 AM	Breakfast	West Windsor Dining Room
11:00 AM	Check-out	