



ORS PSRS 6th International Spine Research Symposium
 Skytop Lodge, Pennsylvania
 Sunday, November 6 – Thursday, November 10, 2022
Preliminary Agenda

Sunday, November 6, 2022		
2:00 PM – 9:00 PM	Arrival and Check-in	Evergreen Ballroom
5:30 PM – 7:00 PM	Dinner	West Windsor Dining Room
7:00 PM – 7:10 PM	Welcome & Introductory Comments by Chair Makarand Risbud, <i>Thomas Jefferson University, USA</i>	Evergreen Ballroom
7:10 PM – 9:00 PM	Topic: Development and Homeostasis 1 Discussion Leaders: Christine Le Maitre, <i>Sheffield Hallam University, UK</i> and Devina Purmessur, <i>Ohio State University, USA</i>	Evergreen Ballroom
7:10 PM – 7:20 PM	Discussion Leader Lightning Talk by: Christine Le Maitre and Devina Purmessur	
7:20 PM – 7:50 PM	Invited Speaker: Anne Camus, <i>Université de Nantes, France</i> In depth transcriptomic characterization of human induced pluripotent stem cells-derived notochordal cells for intervertebral disc regeneration	
7:50 PM – 8:20 PM	Invited Speaker: Chitra Dahia, <i>Hospital for Special Surgery, USA</i> Role of developmental signaling pathways in intervertebral disc development and aging	
8:20 PM – 9:00 PM	Short Talk Podium Presentations (10 minutes each) Embryonic Notochord Proliferation Increases in the Intervertebral Expansion and Decreases in the Vertebral Fragment Rose Long, <i>Harvard University, USA</i> TGF-β Signaling is Required for Sclerotome Resegmentation During Development of the Axial Skeleton Rosa Serra, <i>University of Alabama at Birmingham, USA</i> Characterising Notochordal and Progenitor Cell Sub-Populations within the Human Nucleus Pulposus Andra-Maria Ionescu, <i>University of Manchester, UK</i> GLUT1 is Redundant in Hypoxic and Glycolytic Nucleus Pulposus Cells of the Intervertebral Disc Shira Johnston, <i>Thomas Jefferson University, USA</i>	
9:00 PM – 10:00 PM	Organizing Committee Welcome Reception	Hemlock Ballroom

Monday, November 7, 2022		
7:30 AM – 8:30 AM	Breakfast	West Windsor Dining Room
8:30 AM – 10:00 AM	Topic: Development and Homeostasis 2 Discussion Leaders: <i>Rosa Serra, University of Alabama at Birmingham, USA</i> and <i>Fackson Mwale, McGill University, Canada</i>	Evergreen Ballroom
8:30 AM – 8:40 AM	Discussion Leader Lightning Talk by: Rosa Serra and Fackson Mwale	
8:40 AM – 9:10 AM	Invited Speaker: Ryan Gray, <i>University of Texas at Austin, USA</i> Regulation of CREB Provides a Feedback Loop for the Homeostasis and Mechanics of Connective Tissues Vital for Spine Alignment	
9:10 AM – 9:40 AM	Invited Speaker: Makarand Risbud, <i>Thomas Jefferson University, USA</i> Role of Mitochondria in Intervertebral Disc Health and Disease	
9:40 AM – 10:00 AM	Short Talk Podium Presentations (10 minutes each) A Role of Biglycan C-terminal Peptide in Regulating Intervertebral Disc Homeostasis <i>Manyu Zhu, The University of Hong Kong, Hong Kong</i> Single-cell RNA-Seq of Human Cartilage Endplate Cells Identifies Clusters that Drive Healthy and Diseased Phenotypes <i>Kyle Kuchynsky, Ohio State University, USA</i>	
10:00 AM – 10:30 AM	Break	
10:30 AM – 12:00 PM	Topic: Pain, Pathobiology and Crosstalk 1 Discussion Leaders: <i>Dino Samartzis, Rush University, USA</i> and <i>Robby Bowles, University of Utah, USA</i>	Evergreen Ballroom
10:30 AM – 10:40 AM	Discussion Leader Lightning Talk by: Dino Samartzis and Robby Bowles	
10:40 AM – 11:10 AM	Invited Speaker: Frances Williams, <i>King's College London, UK</i> Using 'omics to understand back pain: studies from TwinsUK	
11:10 AM – 11:40 AM	Invited Speaker: Danny Chan, <i>University of Hong Kong, Hong Kong</i> Spatiotemporal proteomics atlas of human intervertebral discs	
11:40 AM – 12:00 PM	Short Talk Podium Presentations (10 minutes each) Cartilage Endplate Composition and Intervertebral Disc Height: Associations with Disc Degeneration in Patients with Chronic Low Back Pain <i>Noah Bonnheim, University of California San Francisco, USA</i> Gram Positive Bacteria within the Disc and their Potential Influence on Nucleus Pulposus cells <i>Andrea Nuesch, Sheffield Hallam University, UK</i>	
12:00 PM – 1:00 PM	Lunch	West Windsor Dining Room
4:00 PM – 5:30 PM	Odd Number Viewing	
5:30 PM – 6:30 PM	Dinner	West Windsor Dining Room
6:30 PM – 7:00 PM	PSRS Lifetime Achievement Awardee Lecture TBD	Evergreen Ballroom
7:00 PM – 9:00 PM	Topic: Pain, Pathobiology and Crosstalk 2 Discussion Leaders: <i>Robert Mauck, University of Pennsylvania, USA</i> and <i>Conor Buckley, Trinity College Dublin, Ireland</i>	Evergreen Ballroom
7:00 PM – 7:10 PM	Discussion Leader Lightning Talk by: Robert Mauck and Conor Buckley	

7:10 PM – 7:40 PM	Invited Speaker: Laura Stone, <i>University of Minnesota, USA</i> Epigenetics and Low Back Pain: What is it and why should I care?	
7:40 PM – 8:10 PM	Invited Speaker: Nam Vo, <i>University of Pittsburgh, USA</i> Roles of Lactate in Disc Metabolism and Epigenetic Regulation	
8:10 PM – 9:00 PM	Short Talk Podium Presentations (10 minutes each) New Insights into a Cross-Talk between the Muscle and the Intervertebral Disc: the Role of Irisin in Human Nucleopulocytes In Vitro Gianluca Vadala, <i>Campus Bio-Medico University Hospital Foundation of Rome, Italy</i> Single Cell RNA-Sequence Analyses Reveal Uniquely Expressed Genes and Heterogeneous Immune Cell Involvement in the Rat Model of Intervertebral Disc Degeneration Sade Clayton, <i>Washington University in St. Louis, USA</i> Spontaneous Intervertebral Disc Herniation Mouse Model Uncovers the Molecular Profiles within the Disc, Dorsal Root Ganglia, and Spinal Cord in Discogenic Pain Emanuel Novais, <i>Thomas Jefferson University, USA</i> Global Deletion of SerpinA1a-e Impairs Macrophage Recruitment to the Site of Disc Injury by Enhancing Osteoclast Differentiation Neharika Bhadouria, <i>Icahn School of Medicine at Mount Sinai, USA</i> Cell Senescence and Facet Joint Osteoarthritis in Adolescent Idiopathic Scoliosis Kai Sheng, <i>McGill University, Canada</i>	
9:00 PM – 10:00 PM	Networking Reception	Hemlock Ballroom

Tuesday, November 8, 2022		
7:30 AM – 8:30 AM	Breakfast	West Windsor Dining Room
8:30 AM – 10:10 AM	Topic: Pain, Pathobiology and Crosstalk 3 Discussion Leaders: Ashish Diwan, <i>University of New South Wales, Australia</i> , and Jeffrey Lotz, <i>University of California San Francisco, USA</i>	Evergreen Ballroom
8:30 AM – 8:40 AM	Discussion Leader Lightning Talk by: Ashish Diwan and Jeffrey Lotz	
8:40 AM – 9:10 AM	Invited Speaker: Cheryle Seguin, <i>University of Western Ontario, Canada</i> Nuclear Receptors as Potential Mediators of Disc Degeneration	
9:10 AM – 9:40 AM	Invited Speaker: Lachlan Smith, <i>University of Pennsylvania, USA</i> Cellular Heterogeneity of the Nucleus Pulposus: Impact of Species, Microenvironment and Treatment	
9:40 AM – 10:10 AM	Short Talk Podium Presentations (10 minutes each) Targeting TRPC6 for Chronic Discogenic Back Pain Janitri Babu, <i>Rochester Institute of Technology, USA</i> Increased Glucose Uptake in the Lumbar Discs with Age and the Impact of Spinal Level: a Retrospective 18F-FDG PET Imaging Study Christine Park, <i>Duke University, USA</i> Use of Shock Waves in a Large Animal Model of Degenerative Disc Disease Andres Bonilla, <i>Colorado State University, USA</i>	

10:10 AM – 10:30 AM	Break	
10:30 AM – 12:10 PM	Topic: Pathobiology, Imaging and Biomechanics Discussion Leaders: Aaron Fields, <i>University of California San Francisco, USA</i> and Larry Bonassar, <i>Cornell University, USA</i>	Evergreen Ballroom
10:30 AM – 10:40 AM	Discussion Leader Lightning Talk by: Aaron Fields and Larry Bonassar	
10:40 AM – 11:10 AM	Invited Speaker: Simon Tang, <i>Washington University in St Louis, USA</i> Intervertebral Disc Inflammation: Befriending a Foe	
11:10 AM – 11:40 AM	Invited Speaker: Nadeen Chahine, <i>Columbia University, USA</i> Intervertebral Disc Inflammatory Activation Induces Severe Degeneration In Vivo	
11:40 AM – 12:10 PM	Short Talk Podium Presentations (10 minutes each) Diffusion Tensor Imaging visualizes the Effect of Aging on the Spatial Variation in Annulus Fiber and Lamellar Structure In Intact Human Discs Ron Alkalay, <i>Beth Israel Deaconess Medical Center, USA</i> Cartilage Endplate Permeability: From In Vitro to In Silico Ahmad Alminnawi, <i>University of Liege, Belgium</i> In Vitro Coupled Motions of the Human Thoracic and Lumbar Spine with Rib Cage Mattan Orbach, <i>Drexel University, USA</i>	
12:10 PM – 1:00 PM	Lunch	West Windsor Dining Room
1:00 PM – 3:30 PM	Optional Scientific Program BACPAC Workshop (Organized by Jeffrey Lotz and Jeannie Bailey, University of California San Francisco in collaboration with the ORS-Spine Section) <i>Knowledge Organizing Technologies to Advance Transdisciplinary Back Pain Research</i>	Evergreen Ballroom
4:00 PM – 4:45 PM	Odd Number Poster Viewing	Hemlock Ballroom
4:45 PM – 5:30 PM	Even Number Poster Viewing	
5:30 PM – 6:45 PM	Dinner	West Windsor Dining Room
7:00 PM – 9:00 PM	Topic: Biomechanics Discussion Leaders: Elise Morgan, <i>Boston University, USA</i> and Sriram Balasubramaniam, <i>Drexel University, USA</i>	Evergreen Ballroom
7:00 PM – 7:10 PM	Discussion Leader Lightning Talk by: Elise Morgan and Sriram Balasubramaniam	
7:10 PM – 7:40 PM	Invited Speaker: Dawn Elliott, <i>University of Delaware, USA</i> In Vivo Mechanics of the Intervertebral Disc	
7:40 PM – 8:10 PM	Invited Speaker: Theo Smit, <i>Amsterdam University Medical Center, Netherlands</i> On Growth and Scoliosis	
8:10 PM – 8:40 PM	Invited Speaker: Jerome Noailly, <i>Universitat Pompeu Fabra, Spain</i> Systems mechanobiology in intervertebral disc modelling: multifactorial cell regulation in an organ context	
8:40 PM – 9:10 PM	Short Talk Podium Presentations (10 minutes each) Geometric Determinants of the Mechanical Behavior of Intervertebral Disc Models Ingmar Fleps, <i>Boston University, USA</i> Modeling the Effects of Hydration on Viscoelastic Properties of Nucleus Pulposus Tissue in Shear and Compression using the Fractional Zener Model Megan Co, <i>The Ohio State University, USA</i>	

	The Development of Complex Physiological Loading Profiles for the Study of the Intervertebral Disc Daniela Lazaro-Pacheco, <i>University of Exeter, UK</i>	
9:10 PM – 10:00 PM	Networking Reception	Hemlock Ballroom

Wednesday, November 9, 2022		
7:30 AM – 8:30 AM	Breakfast	West Windsor Dining Room
8:30 AM – 12:00 PM	Topic: Next Generation Treatments 1 Discussion Leaders: Gianluca Vadala, <i>Campus Bio-Medico University Hospital, Italy</i> and Sibylle Grad, <i>AO Foundation, Switzerland</i>	Evergreen Ballroom
8:30 AM – 8:40 AM	Discussion Leader Lightning Talk by: Gianluca Vadala	
8:40 AM – 9:10 AM	Invited Speaker: Abhay Pandit, <i>University of Galway, Ireland</i> Understanding the Regenerative Response Induced by Biomaterial Systems: Insights into the Role of Glycosylation	
9:10 AM – 9:40 AM	Invited Speaker: James Iatridis, <i>Icahn School of Medicine at Mount Sinai</i> What needs repairing following annulus fibrosus injury, and can we repair it?	
9:40 AM – 10:00 AM	Short Talk Podium Presentations (10 minutes each) Mitochondrial Transfer from Mesenchymal stromal cells to intervertebral disc cells Megan Fahey, <i>Cornell University, USA</i> Secretome of Mechanically Loaded Intervertebral Discs Influences Stem Cell Immunomodulatory Response Hagar Kenawy, <i>Columbia University, USA</i>	
10:00 AM – 10:30 AM	Break	
10:30 AM – 10:40 AM	Discussion Leader Lightning Talk by: Sibylle Grad, <i>AO Research Institute Davos, Switzerland</i>	
10:40 AM – 11:10 PM	Invited Speaker: Svenja Illien-Junger, <i>Emory University, USA</i> PHLPP Inhibition to Promote IVD Health	
12:00 PM – 1:00 PM	Lunch	West Windsor Dining Room
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	Topic: Next Generation Treatments 2 Discussion Leaders: Benjamin Gantenbein, <i>University of Bern, Switzerland</i> , and Catherine LeVisage, <i>Nantes Université, France</i>	Evergreen Ballroom
7:00 PM – 7:10 PM	Discussion Leader Lightning Talk by: Benjamin Gantenbein and Catherine LeVisage	
7:10 PM – 7:40 PM	Invited Speaker: Raquel Goncalves, <i>Universidade do Porto, Portugal</i> Is there a future for MSC-based IVD therapies?	
7:40 PM – 8:10 PM	Invited Speaker: Stephen Richardson, <i>University of Manchester, UK</i> Understanding human intervertebral disc development: from multi-omic characterisation to bioprinted tissue analogues	
8:10 PM – 8:30 PM	ORS PSRS Awards Ceremony and Closing Remarks	Evergreen Ballroom

Thursday, November 10, 2022		
8:00 AM – 10:00 AM	Breakfast	West Windsor Dining Room
11:00 AM	Check-out	

