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

Poster Presentations

**Topic: Development and Homeostasis**

1. **Effect of Microenvironmental Conditions on the Glycosaminoglycan Synthesis Rates of Nucleus Pulposus Cells**
   Presenting Author: Niamh Wilson, *Trinity College Dublin, Ireland*

2. **Investigating the role of steroid hormones in the intervertebral disc**
   Presenting Author: Jeffrey Hutchinson, *University of Western Ontario, Canada*

3. **Does increasing sulfation boost primary intervertebral disc cell cultures**
   Presenting Author: Paola Bermudez-Lekerika, *University of Bern, Switzerland*

   Presenting Author: Levon Rodriguez, *Icahn School of Medicine at Mount Sinai, USA*

5. **A role of biglycan C-terminal peptide in regulating intervertebral disc homeostasis**
   Presenting Author: Manyu Zhu, *The University of Hong Kong, Hong Kong*

6. **CD-9 as a Novel Marker of Healthy Late-Stage Nucleus Pulposus Cells**
   Presenting Author: Lachlan Smith, *University of Pennsylvania, USA*

7. **Effects of Organ Culture and Mesenchymal Stem Cell Delivery on Nucleus Pulposus Cell Extracellular Matrix Gene Expression and Cell Cycle Progression**
   Presenting Author: Lachlan Smith, *University of Pennsylvania, USA*

8. **Mitochondrial fusion protein OPA1 is necessary for maintaining integrity of NP cell organelles and tissue homeostasis**
   Presenting Author: Vedavathi Madhu, *Thomas Jefferson University, USA*

9. **Understanding the physiological behaviour of disc cells in an in vitro imitation of the healthy and degenerated niche**
   Presenting Author: Shaghayegh Basatvat, *Sheffield Hallam University, UK*

10. **Investigating the Role of TRPV4 as a Mechanoreceptor in the Intervertebral Disc**
    Presenting Author: Taylor Shelton, *The University of Western Ontario, Canada*
11. Effects of Lactate and Histone Lactylation on Aggrecan Expression in Rat Nucleus Pulposus Cells
   Presenting Author: Trudy Zou, University of Pittsburgh, USA

12. Understanding the Role of the Notochord in Spinal Development
   Presenting Author: Vaneka Hoskie, Harvard Medical School, USA

13. The Role of Ellis-Van Creveld Syndrome Proteins during Intervertebral Disc Development and Degeneration
   Presenting Author: Zihan Wu, University of Manchester, UK

14. Regulation of CREB provides a feedback loop for the homeostasis and mechanics of connective tissues vital for spine alignment
   Presenting Author: Ryan Gray, University of Texas at Austin, USA

15. Spatial and temporal N-glycome characterisation of the human healthy and diseased intervertebral disc
   Presenting Author: Aert Scheper, CURAM SFI Research Centre for Medical Devices, Ireland

16. Bioprinting Whole Intervertebral Discs to Understand Development and Inform Regenerative Therapies
   Presenting Author: Matthew Kibble, University of Manchester, UK

17. Native Tie2+ Progenitor Cells - The ultimate Rejuvenation Source for the Degenerated Intervertebral Disc?
   Presenting Author: Benjamin Gantenbein, University of Bern, Switzerland

18. From pluripotent stem cells to intervertebral disc progenitor cells: a transcriptomic study at the single-cell resolution
   Presenting Author: Julie Warin, Nantes University, France

19. High Osmolality with Supplemented Chondroitin Sulfate not only Stimulates Anabolism but also Suppresses Catabolism in Bovine Nucleus Pulposus Explants
   Presenting Author: Yutaro Kanda, The Brigham and Women’s Hospital, USA

20. Effects of High Osmotic Pressure with Supplemented Chondroitin Sulfate under Cyclic Hydrostatic Pressure on Metabolism in Bovine Nucleus Pulposus Explants
   Presenting Author: Yutaro Kanda, The Brigham and Women’s Hospital, USA

21. Regenerative Healing in neonatal mouse intervertebral discs only occurs before postnatal day 28
   Presenting Author: Danielle D’Erminio, Icahn School of Medicine at Mt Sinai, USA

22. Sirtuin 6 is critical for maintaining intervertebral disc homeostasis during spine aging
   Presenting Author: Pranay Ramteke, Thomas Jefferson University, USA

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**Topic: Pain, Pathobiology and Crosstalk**

23. Evidence of Histone Lactylation and its Role in MMP-13 Epigenetic Regulation in Intervertebral Discs
    Presenting Author: Dong Wang, University of Pittsburgh, USA

24. Network medicine-based gene prioritization in Intervertebral Disc Degeneration
    Presenting Author: Francesco Gualdi, Universitat Pompeu Fabra, Spain
25. Smoking and tetramer tryptase+ Mast Cells accelerate intervertebral disc degeneration by inducing METTL14-mediated DIXDC1 m6 modification
   Presenting Author: Ji Tu, University of New South Wales, Australia

26. HMGB1 mediates macrophage recruitment and regional intervertebral disc properties following injury
   Presenting Author: Kevin Burt, Columbia University, USA

27. Characterization and Modulation of the Pro-Inflammatory Effects of Immune Cells in the Canine Intervertebral Disc
   Presenting Author: Mary Heimann, The Ohio State University, USA

28. Free calcium and the Extracellular Calcium-Sensing Receptor Regulate Intervertebral Disc Degeneration and Calcification
   Presenting Author: Michael Grant, McGill University, Canada

29. Revisiting the catabolic response of intervertebral disc cells in 3D to TNF-α and IL-1β
   Presenting Author: Paola Bermudez-Lekerika, University of Bern, Switzerland

30. TLR-2 Activation Dysregulates miR-100-5p and miR-155-5p Leading to the Downregulation of c-Fos
    Presenting Author: Petra Cazzanelli, Rochester Institute of Technology, USA

31. Females Activate More Inflammatory Pathways than Males and Wnt Signaling-Deficiency in Aging Attenuates Inflammatory Pathways in Response to Disc Injury
    Presenting Author: Tori Kroon, Icahn School of Medicine at Mount Sinai, USA

32. Slow twitch paraspinal muscle dysregulation in adolescent idiopathic scoliosis exhibiting HIF-2α misexpression
    Presenting Author: Wai Kit Tam, The University of Hong Kong, Hong Kong

33. Environmentally Stressed Nucleus Pulposus Cells Trigger the Onset of Discogenic Low Back Pain
    Presenting Author: Wensen Jiang, Cedars-Sinai Medical Center, USA

34. Novel dissection method for isolating the dorsal root ganglion, dorsal horn of the spinal cord, along with the nucleus pulposus, and annulus fibrosus from the intervertebral discs of the same mouse
    Presenting Author: Alison Shur, Hospital for Special Surgery, USA

35. Chronic Type 2 Diabetes Impairs Tissue Remodeling and Stimulates Pro-inflammatory and Immune-Cell Recruiting Chemokines in the Murine Intervertebral Disc
    Presenting Author: Christian Gonzalez, Washington University in St. Louis, USA

36. Effects of Vertebral Endplate Injury on Spinal Cord Using an in Vivo Rat Model
    Presenting Author: Denise Iliff, Icahn School of Medicine at Mount Sinai, USA

37. ADAM8 Inactivation Retards Intervertebral Disc Degeneration in Mice
    Presenting Author: Yejia Zhang, University of Pennsylvania, USA

38. Roles of TNFAIP8 family in intervertebral disc degeneration
    Presenting Author: Yejia Zhang, University of Pennsylvania, USA

39. Characterization of the Temporal Regulation of Acute Immune Cell Infiltration in a Mouse Model of Intervertebral Disc Injury
40. Circulating microRNAs May be Predictive of Degenerative Cervical Myelopathy  
Presenting Author: Nicholas D’Antonio, Rothman Institute, USA

41. Differential expression of TNFR1 and TNFR2 receptors with TNF-alpha challenge in a rat IVDs cells in vitro  
Presenting Author: Olga Yiantsos, Icahn School of Medicine at Mt Sinai, USA

42. Identification of sub-populations of Chronic Low Back Pain patients by cluster analysis of gut microbiota: a preliminary analysis  
Presenting Author: Valerio Tonelli Enrico, University of Pittsburgh, USA

43. Link N Regulates DRG Hypersensitivity through Regulation of IL-1beta  
Presenting Author: Muskan Alad, McGill University, Canada

44. Lumbar intervertebral disc injury in mice increases neuronal and vascular annulus fibrosis infiltration  
Presenting Author: Ryan Potter, Washington University in St Louis, USA

45. Are current machine learning applications analogous to radiologist classification of degenerate discs? A systematic review and meta-analysis  
Presenting Author: Roger Compte, King's College London, UK

46. Investigating autoimmune contribution to Modic change in TwinsUK  
Presenting Author: Francesco Gualdi, Universitat Pompeu Fabra, Spain

47. Sdc4 plays an important role in the homeostasis of lumbar spine  
Presenting Author: Kimheak Sao, Thomas Jefferson University, USA

48. Intradiscal Inflammatory Stimulation Induces Spinal Pain Behavior and Intervertebral Disc Degeneration In Vivo  
Presenting Author: Lauren Lisiewski, Columbia University, USA

49. Intervertebral Disc Activation of NFKB leads to Systemic Inflammation and Disc Macrophage Infiltration  
Presenting Author: Mark Kim, Columbia University, USA

50. A Novel Mouse Model for the Study of Spinal Cord Injury-Associated Neurogenic Heterotopic Ossification  
Presenting Author: Rachad Aita, McGill University, Canada

51. A Prospective Evaluation of the Clinical Outcomes of Culture Positive Patients who Underwent Primary Lumbar Fusion  
Presenting Author: Philip Paschal, Hospital for Special Surgery, USA

52. Bilateral needle puncture of caudal intervertebral discs in mice results in compromised structure, elevated IL-6, and de novo intradiscal innervation and vascularization  
Presenting Author: Remy Walk, Washington University in St. Louis, USA

53. Diffuse idiopathic skeletal hyperostosis (DISH) in humans: Prevalence and the continuum of imaging features in a Northern US population  
Presenting Author: Dale Fournier, University of Western Ontario, Canada

55. Mechanical compression in an ovine model of Degenerative disc disease  
   Presenting Author: Andres Bonilla, Colorado State University, USA

56. Synergy of the Autoimmune response in a model of Degenerative Disc Disease  
   Presenting Author: Andres Bonilla, Colorado State University, USA

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**Topic: Biomechanics and Imaging**

57. In Vivo Differences in Disc Mechanical Function Between Young and Elderly Populations During Diurnal Loading and Postural Changes Evaluated with MRI  
   Presenting Author: Harrah Newman, University of Delaware, USA

58. Inhibition of TRPV4 Blunts IL-6 Production and Protects Against Degeneration in the Nucleus Pulposus Due to Dynamic Loading of the Intervertebral Disc  
   Presenting Author: Garrett Easson, Washington University in St. Louis, USA

59. Intervertebral Disc and Facet Crosstalk in a Rabbit Puncture Model of Disc Degeneration  
   Presenting Author: Brianna Orozco, University of Pennsylvania, USA

60. Molecular Augmentation of the Microniche of Human Osteoarthritic Chondrocytes by Biomimetic Proteoglycans  
   Presenting Author: Elizabeth Kahle, Drexel University, USA

61. A finite element comparison between Total Disc Replacement and Anterior Cervical Discectomy & Fusion in lordotic, kyphotic, and straight cervical spine  
   Presenting Author: Deepanshu Singh, University of Toledo, USA

62. A Method to Characterize Crack Initiation in Intervertebral Discs Using a Multiaxial Anisotropic Approach  
   Presenting Author: Jill Middendorf, University of Minnesota, USA

63. An Evaluation of the Comparators Used to Establish Credibility and Validation of Spine Computational Models  
   Presenting Author: Brittany Stott, McGill University, Canada

64. Automated Vertebral Segmentation using a Convolutional Neural Network  
   Presenting Author: Girish Viraraghavan, Drexel University, USA

65. Delamination Strength and Stiffness in the Annulus Fibrosus from Adult Spinal Deformity Patients  
   Presenting Author: Manmeet Dhiman, University of Calgary, Canada

66. Determination of Stress-Growth Relationship in Immature Porcine Vertebrae using Finite Element Modeling  
   Presenting Author: Christian D'Andrea, Drexel University, USA

67. Development and Validation of DNA Origami Sensors to Assess the Microenvironment of the Intervertebral Disc  
   Presenting Author: Jordin Marshall, The Ohio State University, USA

68. Does Intervertebral Disc Stiffness Differ in Adolescent Idiopathic Scoliosis (AIS) and Degenerative Scoliosis?  
   Presenting Author: Taylor Bader, University of Calgary, Canada
69. Does Spinal Deformity Result from Loss of Mechanical Integrity of the Annulus Fibrosus in Degenerated Intervertebral Discs?  
   Presenting Author: Taylor Bader, University of Calgary, Canada

70. Effect of Anterior Vertebral Body Tether Breakage on Curve Correction in Adolescent Idiopathic Scoliosis Patients  
   Presenting Author: Ausilah Alfraihat, Drexel University, USA

71. Multi-modal Evaluation of Vertebral Strength in Individuals with Impaired Bone Density  
   Presenting Author: Rachana Vaidya, Washington University in St. Louis, USA

72. Patient-Specific Finite Element Modeling of Scoliotic Curve Progression using Region-Specific Stress-Modulated Vertebral Growth  
   Presenting Author: Christian D’Andrea, Drexel University, USA

73. Prediction of Curve Correction in Adolescent Idiopathic Scoliosis Patients After Anterior Vertebral Body Tethering Surgery Using Machine Learning  
   Presenting Author: Ausilah Alfraihat, Drexel University, USA

74. Step time and trunk acceleration magnitude asymmetries do not contribute to overall gait asymmetry in chronic low back pain  
   Presenting Author: Anna Bailes, University of Pittsburgh, USA

75. Use of Finite Element Modeling to Design 3D-Printed Bioabsorbable Cage to Support Tissue-Engineered Intervertebral Disc Implants  
   Presenting Author: Byumsu Kim, Cornell University, USA

76. In Vitro and In Silico Investigation of Dynamic Compression on Cartilage Endplate Cells in Agarose  
   Presenting Author: Katherine Crump, University of Bern, Switzerland

77. Cellular Responses to Physiologically Relevant Hydrostatic Pressure in Isolated Bovine Annulus Fibrosus Cells in vitro  
   Presenting Author: Ryo Taiji, Brigham and Women’s Hospital, USA

78. Effects of Hydrostatic Pressure on Metabolic Turnover in Inner and Outer Annulus Fibrosus Explants  
   Presenting Author: Ryo Taiji, Brigham and Women’s Hospital, USA

79. Effects of collagen cross-linking on solute transport in the human cartilage endplate  
   Presenting Author: Jae-Young Jung, University of California San Francisco, USA

80. Restoration of Physiologic Loading Improves Outcomes in Engineered Disc Implanted-Spinal Motion Segments  
   Presenting Author: Sarah Gullbrand, University of Pennsylvania, USA

81. A 3D Bioprinted Model of the Intervertebral Disc for Disease Modelling Applications  
   Presenting Author: Samuel Moxon, University of Manchester, UK

82. Characterization of Quantitative MRI Measures to Assess Spontaneous Canine Intervertebral Disc Degeneration  
   Presenting Author: Casey Johnson, University of Minnesota, USA
83. Effects of Hydration of Nucleus Pulposus Tissue on T1rho and T2 Relaxation Times and Mechanical Properties
Presenting Author: Megan Co, The Ohio State University, USA

84. Validating a Novel VR/AR Spinal Surgical Training Device with Focus on Physics-Based Force Feedback
Presenting Author: Sami Alkadri, McGill University, Canada

85. Cyclic traction loading facilitates water uptake in a healthy bovine disc culture: preliminary study
Presenting Author: Astrid Soubrier, AO Research Institute, Switzerland

**Topic: Next Generation Treatments**

86. 3D Printed Scaffolds for Stabilization and Local Delivery in Bone Metastases
Presenting Author: Audrey Pitaru, McGill University, Canada

87. Nanoparticle-functionalized Bone Cement for the Local Therapeutic Delivery to Spine Metastases
Presenting Author: Ateeque Siddique, McGill University, Canada

88. Dasatinib and Quercetin treatment reduces the incidence and severity of disc degeneration with evidence of Junb and Zfp3611 as regulators of cell fate
Presenting Author: Olivia Ottone, Thomas Jefferson University, USA

89. Targeting Senescent Cancer Cells Using Senolytic Drugs to Prevent Breast-To-Bone Metastasis
Presenting Author: Eleane Hamburger, McGill University, USA

90. A cell-free therapeutic strategy: the role of Wharton's Jelly MSCs derived extracellular vesicles in intervertebral disc regeneration
Presenting Author: Gianluca Vadala, Campus Bio-Medico University Hospital Foundation of Rome, Italy

91. EV-enriched secretome fraction of interleukin-1β-primed mesenchymal stem/stromal cells modulates the phenotype of human annulus fibrosus cells
Presenting Author: Graciosa Teixeira, Ulm University, Germany

92. 3D Printed Titanium Surface Optimization for Mesenchymal Stem Cell Growth and Attachment
Presenting Author: Gregory Paschal, Hospital for Special Surgery, USA

93. Regenerative potential of an injectable hydrogel system in human degenerate discs
Presenting Author: Hosni Cherif, McGill University, Canada

94. Novel-Unidentified Targets for Driving Osteogenesis in ASCs Using a Genome-Wide CRISPRa Screen
Presenting Author: Hunter Levis, University of Utah, USA

95. Increased Extracellular Matrix Deposition using Synergistic Multiplex CRISPR-activation of a Novel Gene in ACAN/Col2 Upregulated Adipose-Derived Stem Cells
Presenting Author: Hunter Levis, University of Utah, USA

96. Synergistic Multiplex CRISPR-activation of RNF14 Improves Extracellular Matrix Deposition in Low-pH Media in dCas9-VPR-ACAN/Col2 Upregulated Adipose-Derived Stem Cells
Presenting Author: Hunter Levis, University of Utah, USA
97. **PCRX-201, a novel gene therapy treatment approach for intervertebral disc degeneration**
   Presenting Author: Joseph Snuggs, *Sheffield Hallam University, UK*

98. **Phenotypic maturation of hiPS-derived notochord-like cells using covalent hydrogel and micromasses culture**
   Presenting Author: Julie Warin, *Nantes University, France*

99. **o-Vanillin Enhanced Extracellular Vesicle Modulation of Human Mesenchymal Stem Cell Differentiation and Disc Cell Phenotype**
   Presenting Author: Li Li, *McGill University, Canada*

100. **Non-viral Cell Penetrating Peptides for microRNA Delivery and Regulation of NP Cell Phenotype**
    Presenting Author: Marcos Barcellona, *Trinity College Dublin, Ireland*

101. **Notochordal cells as a potential cell source for disc degeneration-associated low back pain**
    Presenting Author: Shaghayegh Basatvat, *Sheffield Hallam University, UK*

102. **Treatment of intervertebral disc cells with CRISPR modified MSC derived EVs**
    Presenting Author: Iker Martinez Zalbidea, *Rochester Institute of Technology, USA*

103. **Dual Peptide Functionalized Alginate Hydrogels to Control MSC Therapeutic Potency for Cell-mediated Intervertebral Disc Repair**
    Presenting Author: Xiaohong Tan, *Washington University in St. Louis, USA*

104. **TNFR1 blocking improves degenerative human annulus fibrosus cell genotype**
    Presenting Author: Jennifer Gansau, *Icahn School of Medicine at Mount Sinai, USA*

105. **A Novel, Shelf-Stable Complete Autograft Substitute Based on Innovative Allograft Preservation Technology**
    Presenting Author: Subha Bhattacharyya, *MTF Biologics, USA*

106. **Fetal-inspired scaffolds for Intervertebral Disc Regeneration**
    Presenting Author: Joana Caldeira, *Universidade do Porto, Portugal*

107. **Mechanical Characterization of Flexible and Resorbable Support Materials for Tissue Engineered Intervertebral Discs**
    Presenting Author: Alikhan Fidai, *Cornell University, USA*

108. **Nanofiber-Reinforced Sulfated Alginate for 3D Bioprinting of Intervertebral Discs**
    Presenting Author: Gabriella Wagner, *Rochester Institute of Technology, USA*

109. **Notochordal cell matrix-based hydrogel serves as a delivery vehicle and protective niche of notochordal phenotype for IVD regeneration**
    Presenting Author: Georgina Targa Fabra, *CURAM SFI Research Centre for Medical Devices, Ireland*

110. **Repairing Annulus Fibrosus Fissures to Prevent Intervertebral Disc Herniation using Methacrylated Gellan Gum in combination with Novel Silk**
    Presenting Author: Andreas Croft, *University of Bern, Switzerland*

111. **Using Mesendoderm Progenitor Cells Seeded in Hydrogel Biomaterial to Regenerate the Intervertebral disc**
    Presenting Author: Rebecca Williams, *Sheffield Hallam University, UK*
112. **Adhesive and Non-Adhesive Hydrogels for Intervertebral Disc Repair in an Ovine Discectomy Model**  
Presenting Author: Christopher Panebianco, *Icahn School of Medicine at Mount Sinai, USA*

113. **Driving Osteogenesis in Composite Biomaterials Using Tunable Hydroxyapatite Surface Modifications**  
Presenting Author: Matthew Fainor, *University of Pennsylvania, USA*

114. **From Preclinical to Clinical Translation of Intervertebral Disc Cell-based Regeneration - Effects of Species-Specific Scale, Metabolism and Matrix Synthesis Rates**  
Presenting Author: Emily McDonnell, *Trinity College Dublin, Ireland*

115. **Repair of Intervertebral Disc Herniations with Surgical-Fiberlock Technology**  
Presenting Author: Brianna Orozco, *University of Pennsylvania, USA*

116. **Injectable Radiopaque Hyaluronic Acid Granular Hydrogels for Intervertebral Disc Repair**  
Presenting Author: Sarah Gullbrand, *University of Pennsylvania, USA*

117. **Interlaminar Fusion Stabilization versus Pedicle Screw Instrumentation, a Retrospective Study of Lumbar Circumferential Fusion**  
Presenting Author: Philip Paschal, *Hospital for Special Surgery, USA*

118. **An Analysis of a Decade of Lumbar Interbody Cage Malfunctions in the United States: A MAUDE Database Study**  
Presenting Author: Amit Piple, *The Taylor Collaboration, USA*

119. **Are All Cervical Cages Created Equal? An Analysis of a Decade of Adverse Event Reports in the United States**  
Presenting Author: Oluwatodimu Raji, *The Taylor Collaboration, USA*

120. **Intravenous vs Oral Acetaminophen Perioperative to Instrumented Lumbar Fusion: A Comparative Effectiveness Study**  
Presenting Author: Gregory Paschal, *Hospital for Special Surgery, USA*

121. **Poly-Ether-Ketone-Ketone versus Titanium Interbody Cages in Patients Undergoing ACDF Procedures, a Prospective Evaluation**  
Presenting Author: Philip Paschal, *Hospital for Special Surgery, USA*

122. **Rapamycin Ameliorates Age-Associated Intervertebral Disc Degeneration in Marmosets with Gender Specific Effects**  
Presenting Author: Yunting Tang, *University of Pittsburgh, USA*

123. **FOXF1 Delivery via Engineered Extracellular Vesicles in a Mouse Lumbar Intervertebral Disc Puncture Model**  
Presenting Author: Shirley Tang, *The Ohio State University, USA*

124. **Bariatric Surgery Before Spinal Fusion is Associated with Shorter Postoperative Length of Stay**  
Presenting Author: Kevin Bondar, *University of Miami, USA*

125. **Synergistic Effect of RG-7112 & o-Vanillin Combination Treatment for Intervertebral Disc Degeneration**  
Presenting Author: Matthew Mannarino, *McGill University, USA*

126. **Title TBD**  
Presenting Author: Kathryn Cheah, *University of Hong Kong, Hong Kong*