



ORS PSRS 5th International Spine Research Symposium

New Horizons in Intervertebral Disc Research

Sunday, November 3 – Thursday, November 7, 2019

Skytop Lodge, Skytop, Pennsylvania

POSTER SCHEDULE

Name of Presenter is in Bold Font

Diagnosis, Biomarkers & Clinical Treatment

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Regenerative Markers are Differentially Induced with TGF β -1 in Human Annulus Fibrosus Cells from Degenerative and Healthy Intervertebral Discs

Büşra Günay, Abhay Pandit

CÚRAM, Centre for Research in Medical Devices, National University of Ireland Galway

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Mechanobiological Dysfunction of Disease: Cell Stiffness Decreases with Severity of Disc Degeneration and Inflammatory Stimulation

Timothy Jacobsen, Hayley Jacobsen, Eric Leung, Venkat Boddapati, Christopher Filippi, Mitchell Levine, Ronald Lehman, Nadeen Chahine

Columbia University

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Disc Degeneration – More Than an Aging Process

Amir Jamaludin, Timor Kadir, Andrew Zisserman, Claudio Pereira, Frances Williams, **Jill Urban**, Jeremy Fairbank

Department of Engineering Science, University of Oxford

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Does Anticoagulant Thromboprophylaxis Increase Bleeding Complications in Spinal Surgery and Spinal Cord Injury? A Systematic Review and Meta-Analysis

Anh Nguyen, Sonia Tran, Robin Turner, Ahmed-Ramadan Sadek, Alexander Montgomery

Queen Mary University of London

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Patient Specific Computation of Glucose, Oxygen, Lactic Acid and pH Profile in Degenerated Intervertebral Discs

Ward Shalash, Sonia Ahrens, Vadim Byvaltsev, Morgan Giers

Oregon State University

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T2* mapping of the human cartilage endplate: spatial differences and association with adjacent disc degeneration

Linshanshan Wang, Misung Han, Jason Wong, Sara Sampson, Patricia Zheng, Roland Krug, Aaron Fields, University of California, San Francisco

Next Generation Treatments & Imaging

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Comparison of MRI Real T1, T2 and T2* Relaxation Time Measurement in the Assessment of Lumbar Disc Degeneration in Sheep

Nora Bouhsina, Jean-Baptiste Hardel, Cyrille Decante, Stephane Madec, Jerome Abadie, Julie Lesoeur, **Jerome Guicheux**, Johann Clouet, Marion Fusellier
INSERM, UMR

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Vertebral Endplates in and Aged Diabetic Mouse Model Show Decreased Tissue Mineral Density

Kaitlyn Broz, Remy Walk, Simon Tang
Washington University in St Louis

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Validation of a 3D Spin-Echo Echo-Planar Imaging Sequence for MR Elastography of the Intervertebral Disc

Megan Co, Huiming Dong, Prateek Karla, Brian Raterman, Arunark Kolipaka, Benjamin Walter
The Ohio State University

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Multiplex CRISPRa-Driven Collagen II & Aggrecan Deposition Drives Disc-Cell Phenotypes Without Exogenous Growth Factors

Niloofer Farhang, Bryton Davis, Jacob Weston, Alison Thompson, **Robert Bowles**
University of Utah

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Altering the Local Acidic Microenvironment of the Degenerated Intervertebral Disc using Injectable Antacid Microcapsules

Jennifer Gnsau, Emily McDonnell, Conor Buckley
Trinity College Dublin

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Controlled Release of Biological Factors for Progenitor Cell-Mediated Endogenous Repair of Intervertebral Discs

Catherine Le Visage, Leslie Frapin, Marion Fusellier, Claire Chedeville, Constantin Moraru, Edouard Samarut, Johann Clouet, Jérôme Guicheux
Inserm U1229, Regenerative Medicine and Skeleton

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Inhibiting TGF- β Mediated Myofibroblast Differentiation of Nucleus Pulposus Cells by Silver Nanoparticles

Yi Sun, Ellen Zhang, Michael To, **Victor LEUNG**

The University of Hong Kong

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3D Printed Microheater Sensor-Integrated, Drug-Encapsulated Microneedle System for Pain Management

Joshua Xudong Li, Mengtian Yin, Li Xiao, Sng-yun Kwon, Li Jin, Baoxing Xu

University of Virginia

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Decellularized Nucleus Pulposus Tissue Transitions Macrophages Towards a Regenerative Phenotype

David Lillyman, Logan Piening, Rebecca Wachs

University of Nebraska - Lincoln

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Senolytics as a Potential Treatment Option in Painful Degenerating Intervertebral Discs

Matthew Mannarino, Kai Sheng, Lisbet Haglund

McGill University

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In Vivo Glucose Uptake by Intervertebral Disc Cells as Measured by Positron Emission Tomography

John Martin, Satish Chitneni

Duke University

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Dual-Network Hydrogels with Complex Mechanical Properties for Nucleus Pulposus Replacement

Samantha Marshall, Nadeen Chahine

Columbia University

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Elucidating and Optimizing the Distribution of Metabolites within Ex Vivo Disc Organ Culture Systems

Emily McDonnell, Brooke Tornifoglio, Jennifer Gansau, Conor Buckley

Trinity College Dublin

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Improving Spinal Fusion with Injectable Hydrogels

David Owen, Simon Partridge, Joseph Snuggs, Antony Michael, Ashley Cole, Neil Chiverton, Mark Wilkinson, Christopher Sammon, **Christine Le Maitre**

Sheffield Hallam University

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Microencapsulation of Annulus Fibrosus Cells in Oxidized Alginate Microbeads for Intervertebral Disc Cell Delivery

Christopher Panebianco, Tiffany Lim, Michael Weir, James Iatridis

Icahn School of Medicine at Mount Sinai

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Optimal Stem Cell Source for Intervertebral Disc Regeneration

Joseph Snuggs, Abbey Thorpe, Antony Michael, Ashley Cole, Neil Chiverton, Mark Wilkinson, Chris Sammon, Christine Le Maitre
Sheffield Hallam University

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Reproducing Homeostasis in Nucleus Pulposus Mimicking Diurnal Spinal Motion in vitro

Fabio Vieira, **Shuichi Mizuno**, James Kang
Brigham and Women's Hospital and Harvard Medical School

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Driving Osteogenesis in ASCs by Targeting BMP Antagonists with CRISPR Epigenome Editing

Jacob Weston, Hunter Levis, Bryton Davis, Brandon Lawrence, Robby Bowles
The University of Utah

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Spatial Mapping of Collagen Content and Structure in Human Intervertebral Disc Degeneration

Lawrence Zeldin, Grace Mosley, Damien Laudier, Robert Hoy, James Iatridis
Icahn School of Medicine

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Percutaneous Lumbar Annulotomy: A Novel Technique to Establish a Rat Model of Intervertebral Disc Degeneration

Brandon Couch, Richard Wawrose, Joseph Chen, Malcolm Dombrowski, Bryan Rynearson, Dong Wang, Joon Lee, Gwendolyn Sowa, Nam Vo
University of Pittsburgh

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Nilsson Holguin, Neharika Bhadouria, Tori Kroon, Marina Zieger, Christian Mueller, Uma Sankar
Indiana University - Purdue University Indianapolis

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Inflammatory Response of Rat Caudal Intervertebral Discs to Ex Vivo Dynamic Loading

Hagar Kenawy, Samantha Marshall, Andy Lee, Quynhhoa Nguyen, Clark Hung, Nadeen Chahine
Columbia University

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Investigating the Relationship Between Diet-Induced Obesity, Intervertebral Disc Degeneration and Back Pain

Geoffrey Kerr, Ian White, Magali Millecamps, Laura Stone, Cheryle Seguin
The University of Western Ontario

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Design and Evaluation Of Electrospun Structured Polycaprolactone Biomaterials for Annulus Fibrosus Repair

Catherine Le Visage, Maude Gluais, Johann Clouet, Marion Fusellier, Sing Yian Chew, Jerome Guicheux
Inserm, RMeS, Regenerative Medicine and Skeleton

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Pre-clinical Testing of Anti-Inflammatory and Regenerative Drug Therapy in a Bioreactor-Guided Intervertebral Disc Organ Culture Model

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AO Research Institute Davos

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Intervertebral Disc Degeneration, a Loose Definition for a More Complex Pathology? Insights From Aging Inbred Mouse Strains

Emanuel Novais
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John Parant
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Deepani Poramba-Liyanage, Annelinde Voordijk, Frances Bach, Marianna Tryfonidou
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Jordy Schol, Daisuke Sakai, Warita Takayuki, Marianna Peroglio, Zhen Li, Stephan Zeiter, Sibylle Grad, Mauro Alini
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Cedars-Sinai Medical Center

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University of Pennsylvania

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A Caprine Model of Intervertebral Disc Degeneration: A Testing Platform for an Injectable Hydrogel

Joseph Snuggs, Christine Rustenberg, Kaj Emanuel, Simon Partridge, Chis Sammon, Theo Smit, Christine Le Maitre

Sheffield Hallam University

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Thomas Jefferson University

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Remy Walk, Tracy Xu, Simon Tang

Washington University in St. Louis

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Junxuan Ma, Surya Häne, Sibylle Grad, Mauro Alini, Marianna Peroglio

AO Research Institute

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Joshua Stover, Brandon Lawrence, Jared Zitnay, Jeffrey Weiss, Robby Bowles,
University of Utah

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Harsh Alluri, Vikrant Piprode, Sohrab Virik, Kathleen Vincent, Robert Pinelli, Todd Albert, Chitra Dahia
Hospital for Special Surgery

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Beth Ashinsky, Chao Wang, Sai Mandalapu, Edward Bonnevie, Stephen Pickup, Lin Han, Robert Mauck, Harvey Smith, Sarah Gullbrand
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Christian D'Andrea, Sriram Balasubramanian
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Danielle D'Erminio, Divya Krishnamoorthy, Robert Hoy, Devorah Natelson, Damien Laudier, Svenja Illien-Junger, James Iatridis
Icahn School of Medicine at Mount Sinai

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Timothy Jacobsen, Nadeen Chahine
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Li Li, Rayan Fairag, Lisbet Haglund
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Yuan Xing, Li Xiao, Li Jin, **Joshua Li**, Yong Wang
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Marianne Lintz, Lawrence Bonassar
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Girish Viraraghavan, Christian D'Andrea, Sriram Balasubramanian
Drexel University

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Benjamin Werbner, Mohamed Habib, Aaron Fields, **Grace O'Connell**
University of California, Berkeley

Biomechanics & Tissue Cross-talk

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In vivo Deletion of HMGB1 Protects Against Inflammatory Induced Disc Degeneration

Kevin Burt, Adam Abraham, Nadeen Chahine
Columbia University

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Ionizing Radiation Exposure Contributes to Intervertebral Disc Degeneration In-Vitro and in Mouse Model

Joseph Chen, Jiongbiao Zhang, Michael Epperly, Joel Greenberger, Gwendolyn Sowa, **Nam Vo**
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Senolytics Reduce Inflammation and Enhance Matrix of Human Discs Ex-vivo

Hosni CHERIF, Daniel Bisson, Kai Sheng, Lisbet Haglund
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A Novel Developmental Role for TGF β Signaling in the Spatial Organization of the Spinal Column via Resegmentation

Sade Clayton, Ga Ban, Rosa Serra
University of Alabama at Birmingham

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Chitra Dahia, Rajakumar Anbazhagan
Weill Cornell Medicine, Hospital for Special Surgery

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Theodor Di Pauli von Treuheim, Olivia Torre, Angelica Abbondandolo, Manuel Delgado Caceres, Denitsa Docheva, James Iatridis
Icahn Mount Sinai School of Medicine

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David Hudson, Audrey McAlinden, Aysel Fernandes, **Russell Fernandes**
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Selective Silencing of p38 MAPK Isoforms Differentially Regulate Transcription Profile of Genes Controlling Matrix Homeostasis in Human Nucleus Pulposus Cells Under Inflammatory Stress

Ayesha Firdous, James Kang, Rebecca Studer, Nam Vo, Gwendolyn Sowa
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Michael Grant, Laura Epure, John Antoniou, Fackson Mwale
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Sonja Haeckel, Mona Zolfaghar, Jie Du, Sven Hoppe, Lorin Benneker, Marianna Peroglio, Mauro Alini, Sibylle Grad, Avner Yayon, Zhen Li
AO Research Institute, Inselspital, University

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Yu-Ching Hsu, Changli Zhang, **Wai-Kit Tam**, Vincent Lam, Barbara Chan, Victor Leung
University of Hong Kong

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Mark Kim, Rithwik Ramachandran, Cheryle Seguin
The University of Western Ontario

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Role of MMP12 in Mediating TGF β -induced Myofibroblastic Activity in Nucleus Pulposus Cells

Yi Sun, Ellen Zhang, Yan Peng, Fengjuan Lyu, Kenneth Cheung, **Victor Leung**
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Zhen Li, Jie Du, Rose Long, Daisuke Sakai, Lorin Benneker, James Iatridis, Mauro Alini, Sibylle Grad,
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Vedavathi Madhu, Paige Boneski, Elizabeth Silagi, Yunping Qiu, Irwin Kurland, Anyonya Guntur, Irving Shapiro, Makarand Risbud
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Devorah Mincha Natelson, **Alon Lai**, Divya Krishnamoorthy, Rob Hoy, James Iatridis, Svenja Illien-Jünger
Icahn School of Medicine at Mount Sinai

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Olivia Ottone, Irving Shapiro, Makarand Risbud

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Chandreshkumar Patel, Anas Khanshour, Yared Kidane, Jimin Pei, Nick Grishin, Jonathan Rios, Carol Wise

University of Texas Southwestern Medical Center

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Vikrant Piprode, Raffaella Bonavita, Robert Pinelli, Chitra Dahia,
Hospital for Special Surgery

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Annie Reza, Marissa Conrad

Stryker Spine

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Aleksandra Sadowska, Wolfgang Hitzl, Agnieszka Karol, Phillip Jaszczuk, Hosni Cherif, Lisbet Haglund,
Oliver Nic Hausmann, Karin Wuertz-Kozak

Institute for Biomechanics, ETH Zurich

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Aleksandra Sadowska, Birsen Altinay, Wolfgang Hitzl, Karin Wuertz-Kozak

Institute for Biomechanics, ETH Zurich

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Regulation of Osmotically-driven Cell Volume and Water Permeability Changes in Nucleus Pulposus Cells

Joseph Snuggs, Rowena Bunning, Christine Le Maitre
Sheffield Hallam University

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Laminin Presenting Biomaterial Regulates Nucleus Pulposus Cells Through Integrin Mediated Mechanisms

Julie Speer, Marcos Barcellona, Benjamin Liu, Bailey Fearing, Era Jain, Liufang Jing, Michael Kelly, Jacob Buchowski, Lukas Zebala, Munish Gupta, Lori Setton
Washington University in St. Louis

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Yoshiki Takeoka, Shuichi Mizuno, James Kang
Brigham and Women's Hospital

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Olivia Torre, Victoria Mroz, Robert Hoy, Alice Huang, James Iatridis
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Steven Tessier, Victoria Tran, Olivia Ottone, Emanuel Novais, Michael DiMuzio, Irving Shapiro, Makarand Risbud
Thomas Jefferson University

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Sox9 is a Critical Regulator of Intervertebral Disc Function

Maria Tsingas, Olivia Ottone, Abdul Haseeb, Ranjan Kc, Veronique Lefebvre, Irving Shapiro, Makarand Risbud
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Food, not Feces: Evidence for Lactate-Dependent Metabolic Symbiosis in Intervertebral Discs

Dong Wang, Robert Hartman, Chao Han, Michael Jurczak, Stacy Wendell, Steven James, James Kang, Joon Lee, Gwendolyn Sowa, **Nam Vo**
University of Pittsburgh

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Frankie Wignall, Leo Zeef, Stephen Richardson, Judith Hoyland
University of Manchester

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Frances Williams, Maxim Freidin, Yakov Tsepilov, Pradeep Suri, Yurii Aulchenko, Lennart Karssen
King's College London

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Changli Zhang, Madeline Smith, George Zhou, Alon Lai, Robert Hoy, Victoria Mroz, Olivia Torre, Damien Laudier, Elizabeth Bradley, Jennifer Westendorf, James Iatridis, Svenja Illien-Jünger

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The Proteomic Landscape of the Young and Aged Lumbar Intervertebral Disc

Vivian Tam, Peikai Chen, Anita Yee, Mateusz Kudelko, Wilson Chan, Lisbet Haglund, **Danny Chan**
The University of Hong Kong