ORS Spine Section/ Preclinical Models Section 2021 Scientific Meeting
Sunday, February 14, 2021
8:15 AM – 11:15 AM (Pacific Time)
during the ORS 2021 Annual Meeting

ORS | **ORS**
PRECLINICAL**MODELS** | Spine Section
Orthopaedic Research Society | Orthopaedic Research Society

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Preclinical Models: The Backbone of Translational Spine Research

8:15 AM – 8:30 AM	**ORS Preclinical Models Section and ORS Spine Section Business Meetings**

- *Please join Preclinical Models in the breakout room for their business meeting.*
- *Please remain in the main room the ORS Spine Section for their business meeting.*

8:30 AM – 9:00 AM	**Poster Pitch Session**

Pre-recorded session featuring 8 poster pitch presentations with live panel discussion/Q&A with participants.

Moderators:
Sade Williams Clayton, **BS^**, University of Alabama at Birmingham
Kevin Haussler, DVM, PhD, Colorado State University

Activation Of TRPV4 Mediates Calcium Signaling And Increases Glycosaminoglycan Production In Intervertebral Disc Organ Culture
Garrett Easson^, Washington University in St. Louis

Hydrogel Nucleoplasty Improves Disc Height And Condition In A Goat Model Of Moderate-severity Disc Degeneration
Alessandra Fusco, DVM^, DVM, University of Pennsylvania

MSC Secretome Treatment Of Loaded Annulus Fibrosus Organ Cultures Decreases the Inflammatory Response
Graciosa Teixeira, PhD^, Institute of Orthopaedic Research and Biomechanics, Ulm University

Phlpp1 Deficiency Decelerates Inflammation And Spontaneous Intervertebral Disc Degeneration In Aged Mice
Changli Zhang^, PhD, Emory University

3-Minute Panel Discussion/Question & Answer

A Proof Of Concept Study For Pre-clinically Testing Osseointegration Of Metallic Implants
Nupur Kohli, Imperial College London

First Steps Towards The Establishment Of An In Vitro Trabecular Human Bone Model
Annemarie Lang, DVM, PhD*, Charite-Universitaetsmedizin Berlin

A Murine Model Of Post-radiotherapy Bone Fragility Fractures
Megan Oest, PhD*, SUNY Upstate Medical University

3-Minute Panel Discussion/Question & Answer

9:00 AM – 9:10 AM	**Meeting Break**

This program will be held LIVE via ZOOM (Pacific Time).
*Names with a * are ORS Preclinical Models Section members. Names with a ^ are ORS Spine Section members.*
Learn more about the ORS Preclinical Models Section and ORS Spine Section.

Follow us on Twitter (@ORSSociety) and share why you are attending, post key takeaways, interesting or new information, ask questions about session content, and much more!   Hashtag: #ORS2021 #ORSPreclinical #ORSSpine

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Scientific Presentations

(Pre-recorded Scientific Presentations with live Q&A.)

Moderators:
Laurie Goodrich*, DVM, PhD, Colorado State University
Christine Le Maitre^, PhD, Sheffield Hallam University

9:10 AM – 9:25 AM	*Selecting the Right Preclinical Model for Your Research Question* **Annette McCoy*, DVM, MS, PhD, DACVS**, University of Illinois College of Veterinary Medicine
9:25 AM – 9:40 AM	*Preclinical Spinal Models: From Canine to Caprine and Everything in Between* **Jeremiah Easley*^, DVM**, Colorado State University
9:40 AM – 9:55 AM	*Preclinical Spinal Models: Start Small and Think Big* **Victor Leung, PhD***, The University of Hong Kong
9:55 AM – 10:10 AM	*Advancements and Future Perspectives* **Sibylle Grad*, PhD**, AO Research Institute Davos
10:10 AM – 10:25 AM	*The Translational Utility of Mouse Models for Spinal Diseases: From Organ Culture and Beyond* **Simon Tang, PhD***, Washington University in St Louis
10:25 AM – 10:40 AM	**Panel Discussion**
10:40 AM – 10:55 AM	**Breakout Room Discussions**
10:55 AM – 11:15 AM	**Concluding Discussion**

The ORS Preclinical Models Section would like to thank you to the following for their support:

charles river

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Breakout Room Discussions		
Breakout Room #	**Topic**	**Section Moderators**
1	Outcomes	**Annette McCoy, DVM, MS, PhD, DACVS***, University of Illinois College of Veterinary Medicine **Zhirui Jiang, PhD^**, University of Pennsylvania
2	Outcomes	**Stephan Zeiter, DVM, PhD, Dipl. ECLAM*^**, AO Research Institute **Holly Stewart**, **VMD, DACVS-LA***, Colorado State University
3	Large in vivo	**Jeremiah Easley, DVM*^,** Colorado State University Kevin Haussler, DVM, PhD, Colorado State University
4	Large in vivo	**D. Josh Cohen, MD*,** Virginia Commonwealth University Evan Buettmann, PhD, Virginia Commonwealth University
5	Small in vivo	**Victor Leung, PhD^,** The University of Hong Kong Wai-Kit Tam, PhD, The University of Hong Kong
6	Small in vivo	**David Nuckley, PhD^,** Stryker Spine Joseph Fredericks, Stryker Spine
7	Small organ culture	**Nadeen Chahine, PhD^,** Columbia University **Kevin Burt^,** Columbia University
8	Small organ culture	**Simon Tang, PhD^**, Washington University in St. Louis **Garrett Easson^**, Washington University in St. Louis
9	Large organ culture	**Christine Le Maitre, PhD^**, Sheffield Hallam University **Kaitlyn Broz^**, Washington University in St. Louis
10	Large organ culture	**Sibylle Grad, PhD^,** AO Research Institute Davos **Nina Tang^,** The Ohio State University

Join the Discussion! How it will work:

The goal of the breakout rooms and subsequent group discussion will be to reflect on the unique advantages and limitations of different preclinical spinal models, including their application to specific research questions. The ultimate goal is to gene rate guidelines for model section that will benefit the spine research community as a whole.

- Each break out room will be moderated by a senior investigator and student/trainee with expertise in preclinical spinal models.

- Attendees should place their questions and ideas in the chat box, and the moderators will relay these to the group for discussion.

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Suggested discussion topics:

- How important are systemic factors (i.e., adaptive immune system, blood supply, central nervous system) in disc research, and should this be a factor in selecting *in vivo* vs organ culture models?
- How can large animal models be used effectively for mechanistic studies of disc biology and pathophysiology?
- How can small animal models be used effectively for translational studies of disc therapeutics?
- Is cost the major limiting factor when deciding whether to use large *in vivo* animal models?
- How important are disc size and geometry when selecting an appropriate animal model?
- How important is the presence or absence of notochordal cells in the disc when selecting an appropriate animal model?
- How can different models be best applied sequentially or synergistically to maximize research impact?
- How important is six-degree of freedom loading in assessing disc therapeutics?
- How different is the animal loading condition from human daily activity, and how can this effect study outcomes?
- Is access to sophisticated bioreactors an impediment to using disc organ culture models, and how can this be addressed?
- When would pain as an outcome measure influence model selection?
- How can we assess pain using organ culture models?
- What are the best practices for assessing pain in animal models? What are the limitations of these approaches?
- An advantage of organ culture is the ability to study primary human tissue, but how can we access appropriate tissue for studying disc therapeutics?
- How should desired study outcomes influence model selection?

Breakout Room Discussion Notes/Takeaways

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