March 2024

From the Desk of the Section Chair

I hope this finds everyone enjoying the warming of Spring. We at the Spine Section are getting excited and finalizing programming for the year. We would be grateful for our spine membership to provide feedback via the [survey](#) for the past Annual Meeting Symposium and future research topics of interest. Two exciting events already in the works are the [ORS-ISSLS Joint Symposium in Milan, Italy](#) (May 28, 2024) and the [ORS PSRS 7th International Spine Research Symposium](#) (Nov 10-14, 2024), and we invite everyone to consider attending.

Simon Tang
PhD, MSCI

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2024 Spine Section Annual Meeting Symposium Survey

Please complete this three-minute survey regarding the annual meeting symposium. Your valuable input contributes to making future events more relevant, engaging, and beneficial for all participants. Thank you!

[Take the Survey](#)

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Call for Spine Section Interns

Want to get involved with the Spine Section? Apply to the ORS Spine Section Internship Program! (Must be an ORS trainee member in good standing and commit to attending monthly membership committee meeting calls, ORS Annual Meeting, and Section Symposium.) To apply, submit the following:

- Resume/CV
- A one paragraph (no more than 500 words) personal statement
Interns will assist with programming and outreach, will receive mentoring from ORS section officers, and will be more involved with the broader spine research community. Send the items detailed above to both Dr. Dmitriy Sheyn (dmitriy.sheyn@csmc.edu) and Dr. Jeannie Bailey (jeannie.bailey@ucsf.edu).

Application deadline is March 31, 2024!

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Member Spotlight

Giselle Kaneda, BS

**Current Title and Department:** PhD Graduate Student, Regenerative Medicine Institute

**Undergraduate Degree:** Kinesiology, Occidental College

**Who do you consider your mentors?**
Dr. Dmitriy Sheyn, Dr. Wafa Tawackoli, and Dr. Kerry Thompson are my mentors and have been pillars of support. Dr. Thompson sparked my love for research and gave me the opportunity to experience wet lab research during my time as an undergraduate. Later, when I joined the Sheyn Lab, Dr. Sheyn and Dr. Tawackoli gave me the freedom to get involved with multiple projects and guided me in figuring out what I wanted to do with my research career. All three of them continue to encourage me to strive toward my fullest potential, and I would not be where I am today without their support.

**What is your specific area of interest in research?**
I am interested in discogenic low back pain, specifically the mechanisms that cause it to develop in only some cases of IVD degeneration. Lower back pain is largely considered a symptom of IVD degeneration and thus has been mostly overshadowed in orthopedic research. Recently it has been coming into its own but there remains a lot we still don’t know about the exact mechanisms that cause LBP to occur.

**What are you currently working on?**
I am currently working on the development of a porcine IVD degeneration model to study lower back pain. There are a variety of animal models developed to study IVD degeneration; however, discogenic pain studies in animals are almost exclusively done in mice and rats. As our discoveries progress toward the clinical stage, we need larger animal models that can better recapitulate what we observe in humans.

**What has been the biggest challenge for you lately in your research?**
Recently, the biggest challenge with my research has been transferring back into the classroom. I am a newly minted PhD student, and after 3 years in the lab, it is difficult to be back in the classroom. Since I am now spending only part of my time in the lab, I miss the hustle and bustle of working and doing experiments.

**What are projects are you looking forward to?**
I am still in the brainstorming phase for my next projects, so I am not sure exactly where I am going yet. Of my established projects, I have some new bulk RNA-sequencing and proteomics data that is
What do you like to do outside of your work?
Outside of research I love playing with my 3-legged cat Tofu (I'm not a biomechanics person but I love observing her gait as she moves around my house), napping, and hanging out with friends and family.

What is the last book you read?
It's been a while since I've sat down and read a book, but one of the latest was Rebecca Skloot's The Immortal Life of Henrietta Lacks. As a researcher who regularly uses cell lines, many of which I don't know the origin of, it is an insightful read. It encourages me to not only take a closer look at some of the tools that have been so instrumental to our medical understanding but also acknowledge the injustices that allow us to move forward.

What is the most unusual/unexpected item sitting on your desk right now?
The most unusual thing at my desk right now is my potato lamp. Though it is a light, I don't use it as such, and it just lives on my desk shelf to give me (and my labmates) something cute to smile about.

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**Paper Review**

*Annulus Fibrosus Injury Induces Acute Neuroinflammation and Chronic Glial Response in Dorsal Root Ganglion and Spinal Cord—An In Vivo Rat Discogenic Pain Model*

*International Journal of Molecular Sciences.* 2024; 25(3), 1762

[https://doi.org/10.3390/ijms25031762](https://doi.org/10.3390/ijms25031762)

**Alon Lai, Denise Iliff,** Kashaf Zaheer, **Jennifer Gansau,** Damien M. Laudier, Venetia Zachariou, and **James C. Iatridis** (*Authors in bold indicate Spine Section Members)

Discogenic back pain, defined as back pain primarily caused by intervertebral disc (IVD) degeneration, is one of the most common musculoskeletal complaints seen in the clinic. The development of back pain has long been considered synonymous with IVD degeneration. However, not all patients with IVD degeneration exhibit discogenic back pain. A variety of factors have been implicated in its development, including vascularization, inflammation, and hyperinnervation, but the exact mechanism has yet to be elucidated.

Researchers from the Iatridis Lab at Mount Sinai investigated the immediate and long-term impacts of Annulus Fibrosus (AF) injury on discogenic pain and subsequent inflammation and sensitization of the spinal cord's dorsal horn and dorsal root ganglia (DRGs). This study utilized skeletally mature male Sprague Dawley rats that underwent annular puncture injury. At three days, one week, two weeks, and eight weeks, the lumbar spine, DRGs, and spinal cord were collected for IVD degeneration grading via histology and immunoreactivity quantification analysis through Immunohistochemistry (IHC).

Their findings indicated that AF injury results in moderate IVD degeneration, triggering acute and widespread spinal inflammation that leads to alterations in the DRGs and spinal cord within days to weeks. This damage initiated an increase in macrophages and microglia in the spine and DRGs, sparking glial responses. Specifically, the DRGs showed immediate neuroinflammation and pain indicators, with elevated CD68, substance P, and IBA1 levels and a prolonged increase in GFAP, hinting at neural remodeling related to neuroinflammation and sensitization. Similarly, the spinal cord...
exhibited long-term sensitization and astroglial responses through sustained high levels of substance P and GFAP, alongside a temporary surge in IBA1, indicating short-term microglia-mediated neuroinflammation.

These observations underscore the complex inflammatory crosstalk and glial reactions between the spine, DRGs, and spinal cord following AF injury, which contribute to chronic spinal cord sensitization and neural plasticity. The study emphasizes the necessity for therapeutic approaches targeting both the spinal and nervous systems to manage discogenic pain efficiently.

To look at previous newsletter examples and papers already reviewed recently in the Spinal Column archives, please visit the link below.

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Save the Date

ORS PSRS 7th International Spine Research Symposium

![Save the Date Image](image)

The ORS PSRS 7th International Spine Research Symposium, co-chaired by Dr. Lachlan J. Smith and Dr. Makarand V. Risbud, will be held at the Skytop Lodge located in picturesque Pocono Mountains, Pennsylvania, from **November 10-14, 2024**. The meeting website is now online and includes important deadlines for abstract submission and registration. Abstract submission will be open from **May 6th to July 15th, 2024**. More information on the speaker lineup and the scientific program will follow in the coming weeks.

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Meeting Announcement

**ISSLS-ORS Spine Section Joint Symposium**

The ORS Spine Section is happy to announce that we will co-organize a symposium with the **International Society for the Study of the Lumbar Spine (ISSLS) at their 50th Annual Meeting** in Milan, Italy, from **May 27-31, 2024**. The symposium is titled **ISSLS-ORS Low Back Pain Symposium – Understanding Mechanisms, Animal Models and Patient Management** and is co-chaired by Dr. Lisbet Haglund and Dr. Dino Samartzis. It will be held on **May 28, 2024**, from **11:30 AM-12:15 PM**.
ISSLS is the world’s oldest, international, and multidisciplinary spine society that shares a similar vision with the ORS and the ORS Spine Section. The co-branded symposium will provide an excellent opportunity to showcase ORS and the ORS Spine Section and motivate crosstalk to foster international research, collaborations, and partnerships. The symposia will present the latest development of accurate and specific markers to detect and follow disease, how pharmacological and non-pharmacological treatment methods can be evaluated in preclinical animal models, and current clinical phenotyping and treatment options.

**Invited Faculty**

Laura Stone, PhD  
Professor, Department of Anesthesiology, University of Minnesota. Dr. Stone will discuss how to measure pain behavior and response to treatment in animal models.

Lars Arendt-Nilsen, PhD  
Professor, Department of Health Science & Technology, School of Medicine, Aalborg University, Denmark. Dr. Arendt-Nilsen will discuss molecular, quantitative, & mechanistic pain biomarkers developed to measure pain in human patients.

Jaro Karppinen, PhD, MD  
Professor, Department of Physical and Rehabilitation Medicine, Oulu University in Finland. Dr. Karppinen will discuss clinical phenotyping, current treatment options, and how trends have changed.

The speakers will each give a 15-minute presentation, followed by a panel discussion.

Register Here

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