

**October 2023**

## **Get to the Annual Meeting Early for the Spine Section Research Symposium**



To kickstart the [ORS 2024 Annual Meeting](#), mark your calendars for the Spine Section Research Symposium on February 2, 2024, from 2:00 pm to 7:00 pm. Make your Annual Meeting experience even more exciting by arriving a day in advance to catch this spine-tingling event. Click the link below to view the program agenda.

[2024 Spine Section Research Symposium](#)

## Section Newsletter Survey

Your feedback is crucial in helping us tailor the ORS Spinal Column to better meet your preferences and needs. We value your input and want to ensure that the newsletter's frequency aligns with your expectations. Please take a moment to fill out our survey and cast your vote on how often you would like to receive this newsletter by answering this survey, which will take 30 seconds or less.



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## Member Spotlight



### Ryan Potter, MSc

#### Current Title and Department:

PhD candidate in Mechanical Engineering at Washington University in St Louis

#### Graduate Degree:

MSc in Biomedical Engineering, University of Texas San Antonio/University of Texas Health San Antonio

#### Undergraduate Degree:

BSc in Biomedical Engineering, LeTourneau University

#### Who do you consider your mentors?

I have had wonderful mentors to work under, from Daniel Nicolellam, PhD who helped open my eyes to the exciting opportunities in biomedical research, to Stavros Thomopoulos, PhD, Richard Gelberman, MD, and Matthew Silva, PhD who all played key roles in inspiring me to pursue excellence in my work and encouraged me to think deeply about solutions to complex issues. Currently, I have the privilege to be mentored by Simon Tang, PhD who has supported me and believed in me to explore and develop new areas in pain behavior assessment and vascular and neural imaging for our lab. Many thanks also go out to my lab-mates, who have openly shared their expertise with me in a wonderful collaborative environment.

### **What is your specific area of interest in research?**

My interest is in understanding the pathoanatomy of injured IVD with a focus on growth factor therapies, which can potentially mitigate lower back pain. Specifically, my work uses a temporally controllable conditional knockout to study the impact of VEGFA on vascular and neuronal features in a murine lumbar injury model while using behavioral assays to assess performance and painful-like behaviors. I hope my work will provide the pre-clinical motivation to use VEGFA as a therapy for injury-induced lower back pain and elucidate the mechanisms behind this pain.

### **What are you currently working on?**

I am working to graduate in 2024, so I hope to form two manuscripts and my PhD thesis over the coming year while I wrap up some ongoing studies examining vessel and neuronal development at acute and chronic time points following injury.

### **What has been the biggest challenge for you lately in your research?**

Trying to measure pain in a mouse has been my biggest challenge. The transition from objective mechanics of materials to the more subjective nature of behavioral pain assays in mice has proved challenging as our lab seeks to focus on the clinical outcome arguably the most important to patients.

### **What projects are you looking forward to?**

I look forward to the potential of my work to make it into the treatment of lower back pain and the potential elucidation of the mechanisms leading to chronic lower back pain.

### **What do you like to do outside of your work?**

I enjoy camping, hiking, soccer, basketball, euro-style board games, volunteering with my wife in our community and on short-term trips to African hospitals and schools, and raising my 3 kids.

### **What is the last book you read?**

The last book I read was *Hitchhikers Guide to the Galaxy*, and I am in the middle of a fascinating book called *The Covenant of Water*.

### **What is the most unusual/unexpected item sitting on your desk right now?**

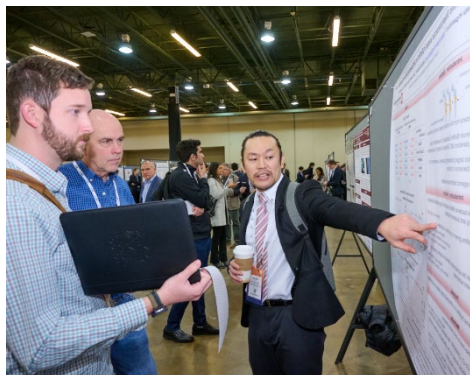
A rather crudely made glass chalice and a glass blown paperweight that I made when I took a glass art class.

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## The Call for Late Breaking Abstracts is Open

Be a part of history when ORS celebrates *70 Years of Advancing Research to Keep the World Moving* at the 2024 ORS Annual Meeting, February 2-6 in Long Beach, CA. The meeting brings the orthopaedic community together for five days of workshops, learning sessions, networking, and advocacy. Attendees from many disciplines and career levels will network and learn about the latest innovations in orthopaedics. **Registration for the 2024 Annual Meeting is open.**



You still have an opportunity to share your valuable research with key players in the orthopaedic community. The call for late breaking abstract submissions is now open. These submissions allow for truly late-breaking scientific research for which no preliminary data were available at the time of the original abstract submission deadline. Submissions must be received by November 13.

[Submit Your Late Breaking Abstract](#)

## Paper Summary

### The Influence of Intervertebral Disc Overloading on Nociceptor Calcium Flickering *JOR Spine*

What is the role of mechanical loading on chronic lower back pain (LBP), and more specifically, what is the communicating mechanism between IVD and the sensory nervous system in chronic LBP? These questions seek to address the costly and prevalent condition of chronic LBP. One of the commonly discussed potential risk factors of chronic LBP is spinal overloading. This overloading may correlate



with pain-associated neural activation, but this remains unknown. Nerve fibers from nociceptors, the damage-sensing neuronal subtype in the dorsal root ganglion (DRG), are found in deeper regions of the IVD in chronic LBP patients, potentially acting as the source of this pain, particularly when evidence shows that ectopic discharges correlate with spontaneous and ongoing pain and calcium flickering released pain-related neurotransmitters. The authors hypothesized that the conditioned media of overloaded IVD can elevate the calcium flickering of nociceptors.

Gewiess, et al. used organ culture of IVDs from bovine tails with a static “long-term sitting and standing” loading and dynamic “wear and tear” loading at mild and overloading conditions simulating various physiological loading. Conditioned media (CM) from each loading condition was used on bovine primary DRG cell culture. Calcitonin gene-related peptide (CGRP) immunofluorescent labeling and calcium imaging with Fluo-4 were jointly used on the DRG cultures to measure the calcium flickering of CGRP(+) nociceptors exclusively.

Overloading in static and dynamic groups led to elevated calcium frequency flickering in the CGRP(+) nociceptors compared to their mildly loaded controls. This finding links IVD mechanical loading with the ectopic discharge of nociceptors. While the authors recognize the inability of the in vitro system to fully recapitulate chronic discogenic pain, they assert the regional and temporal IVD-nociceptor communication mechanism elucidated may help in the discovery of therapeutics for discogenic pain. However, further understanding of molecular mechanisms of IVD-nociceptor communication is likely needed.

*Gewiess, J. Eglauf, J., Soubrier, A., Grad, S., Alini, M., Peroglio, M., Ma J. (2023).*

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## Find or Post Spine Events on the Orthopaedic Events Calendar



An orthopaedic events calendar has been added to the ORS website. The events listed are of potential interest to those in the orthopaedic community. ORS Members are welcome to submit applicable events at no charge through the Submit Event button at the top of the calendar on the site. Institutions or sponsors interested in posting an event are welcome to do so in exchange for a donation to ORS. For information, please email [ors@ors.org](mailto:ors@ors.org).

[Find or Post Events](#)



## Growing Our Network

The [ORS Spine Section](#) was the first research section formed within the ORS. Over the past several years, the membership community has grown to over 300 Section members.

If you have a colleague interested in joining the Spine Section, please send them [HERE](#). Your personal endorsement and enthusiasm can inspire potential members to be part of the advancement of spine research within our diverse community.



### Orthopaedic Research Society

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