



August 2023



(Pictured: 2020 ORS Spine Section Award Recipients)

The 2024 ORS Spine Section Travel Fellowship

The [ORS Spine Section](#) leadership has continued to develop ideas for initiatives that bring value to its Section members, particularly junior investigators. The Spine Section Travel Fellowship is designed to advance an ongoing study or establish new collaborations in the spine field by providing a mechanism to promote the exchange of research methodologies and/or development of pilot data to support larger scale funding.

Expand your expertise and research network with a travel fellowship that complements or extends your professional skills. The fellowship will recognize an applicant and a host PI and provide \$1,500 to support the travel of the applicant for research exchange with the host PI.

Deadline for submission is October 2, 2023.

[Learn More](#)

2024 Dr. Peter Roughley Award



Dr. Peter Roughley was particularly gifted in teaching and mentoring individuals, and always willing to instruct and advise his fellow scientists.

Now accepting applications!

The **Dr. Peter Roughley Award** will recognize a team (mentor and trainee) and provide \$2,000 to support the travel of the student or trainee.

Eligibility

Mentor:

- The Mentor should be a well-established researcher who has demonstrated an outstanding and sustained commitment to mentorship.
- The Mentor can be at any career stage beyond their PhD, MD, or DVM with a well-documented and sustained track record of mentorship, with particular emphasis given to diversity and inclusion.
- The Mentor must also have clearly demonstrated impactful research relevant to the Trainees research project; this may be viewed in its broadest sense.

Trainee:

- The Trainee must be an ORS and ORS Spine Section member in good standing.
- The Trainee should be a doctoral candidate or a post-doctoral fellow (PhD, MD or DVM).

Deadline for submissions is October 16, 2023.

[Apply for the Dr. Peter Roughley Award](#)



The 2024 Annual Meeting: Abstract and Award Submissions, and Open Door

Be a part of history when ORS celebrates **70 Years of Advancing Research to Keep the World Moving**, February 2-6 in Long Beach, CA. Mark your calendars and start preparing your abstract submissions and award applications. Some of these will be due within the coming weeks. You can find more information in the following links.

Abstract submissions are open for the 2024 ORS Annual Meeting. This is your opportunity to be a part of history when ORS celebrates 70 Years of musculoskeletal research, February 2-6 in Long Beach, CA. For more information, guidelines on submission, and a list of topics, click the link below. Abstract submissions will be open until Monday, August 28.

[Submit Your Abstracts](#)



Open Door 2024 will take place February 2, 2024 as part of the Annual Meeting. The goal of Open Door is to get students excited about the possibility of future careers in the musculoskeletal sciences, introducing them to a wide variety of professional pathways and work performed by ORS members. If you are interested in supporting or assisting with ORS Open Door 2024, please contact Meghan McGee-Lawrence at mmcgeelawrence@augusta.edu by August 31.

[Get Involved with Open Door](#)

Awards and grant submissions are now being accepted for the 2024 Annual Meeting. [CLICK HERE](#) for a full list of awards, with descriptions and application submission information.

Research Section Member Spotlight



Name and Degree:

Daniele Zuncheddu, MSc

Current Title and Department:

PhD candidate at AO Research Institute Davos

Undergraduate Degree:

BSc in Toxicology, University of Cagliari (Italy)

Graduate Degree:

MSc in Nutrition and Health, University of Sassari (Italy)

Who do you consider your mentors?

I've been lucky to have several mentors throughout my journey, including people from different fields. In my current role, Dr. Sibylle Grad, my direct supervisor, has been a significant mentor. She's always there for discussions, and I can easily knock on her office door, which is conveniently located near mine. Prof. Martin Stoddart has also been influential, coming up with good ideas and suggestions in our meetings. I've also had the chance to visit other labs and work with different supervisors through my research project. It's been a valuable experience to learn from their expertise. I've learned a lot from younger scientists too, who have given me useful advice and fresh perspectives, especially in the labs.

What is your specific area of interest in research?

My research primarily focuses on non-viral gene therapy for intervertebral disc degeneration and low back pain. I'm particularly interested in identifying effective delivery methods for nucleic acids in this context. To investigate this, I conduct experiments using *ex vivo* organ models. Therefore, I am also keen about refining these models of intervertebral discs to enhance their reliability in addressing fundamental research questions.

What are you currently working on?

Currently, I'm conducting research on a potential target within the inflammatory pathways to suppress it and reduce inflammation. In addition, I'm developing a standardized procedure for injecting and visualizing the delivery system of interest in our *ex-vivo* intervertebral disc model. This standardization is important to enhance the accuracy and reproducibility of our experiments.

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

Every day brings its own set of individual challenges, but in general, I find the translational aspects of my research to be particularly challenging. *Ex vivo* models serve as valuable tools for addressing fundamental questions and offer certain advantages. However, their simplified characteristics deviate from the complexity of the human body, which can impact the interpretation and translation of our research outcomes.

What projects are you looking forward to?

I'm excited about interdisciplinary projects that bring together different fields, especially those that integrate emerging methods and new technologies. I would love the opportunity to work on projects that allow me to expand my knowledge and expertise across different areas.

What do you like to do outside of your work?

Outside of work, I like to relax, reading books or listening to music, and I also like playing the guitar. I'm also interested in sports, particularly basketball and soccer, even if I'm not particularly skilled in them.

What is the last book you read?

The last book I read was "Breathless: The Scientific Race to Defeat a Deadly Virus" by David Quammen. This book is about how scientists from around the world raced to understand and track the SARS-CoV-2 coronavirus and develop a vaccine. The author interviewed many scientists and shares their experiences, highlighting the important moments of the pandemic. His writing style, which I loved in his masterpiece 'Spillover,' is just as captivating in this book.

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

I don't know if it can be considered unusual, but I have a miniature Colosseum on my desk that a friend from Rome gave to me.

Paper Review

GLUT1 is Redundant in Hypoxic and Glycolytic Nucleus Pulposus Cells of the Intervertebral Disc

Johnston, S. N., Silagi, E. S., Madhu, V., Nguyen, D. H., Shapiro, I. M., & Risbud, M. V. (2023). Jci Insight, 8(8). doi:ARTN e164883.

The intervertebral disc is an avascular tissue that relies on glycolysis for energy production. It is well-established that maintaining an appropriate glycolytic flux and nutrient-metabolite balance is critical for the survival of cells within the intervertebral disc. However, research on the relationship between glucose consumption and disc health *in vivo* remains limited. Glucose transporter 1 (GLUT1) is considered fundamental in the functional maintenance of other skeletal tissues, such as bone and cartilage. Previous research indicates that GLUT1 is highly expressed in human nucleus

pulposus (NP) cells, while other transporters (GLUT3 and 9) have lower expression levels. These findings suggest that glucose transporter redundancy might be essential for maintaining disc health and optimal function. Based on this, the authors hypothesized that the loss of GLUT1 expression in the NP could significantly impact both disc development and the age-related structural changes of the disc.

To investigate the importance of GLUT1, two specific GLUT1 inhibitors and a GLUT1/3 inhibitor were used in NP cells *in vitro*. Using Seahorse XF analysis, Johnston, Silagi et al. evaluated the potential metabolic changes due to the loss of GLUT1. In this study, the authors also generated two NP-specific knockout mice to investigate the redundancy of GLUT1 in skeletally mature mice and in the embryonic and perinatal development of NP. Microarray analysis was used to verify transcriptomic alterations.

Surprisingly, the authors found that NP cells can maintain normal rates of glycolysis and ATP production even when GLUT1 is blocked, indicating intrinsic compensatory mechanisms. The study also showed that NP cells can mitigate GLUT1 loss by rewiring glucose import through GLUT3. This suggests that changes in flux through alternative glucose transporters may be sufficient to maintain the glycolytic capacity in the NP. Moreover, the dual inhibition of GLUT1 and 3 did not result in any shift in metabolism, but it compromised cell viability.

In the two NP-specific knockout mice, there were no apparent defects in postnatal disc health or development and maturation. Microarray analysis verified that GLUT1 loss did not cause transcriptomic alterations in the NP, supporting the notion that cells are refractory to GLUT1 loss. These observations provide evidence of functional redundancy in GLUT transporters in the physiologically hypoxic intervertebral disc and underscore the importance of glucose as the indispensable substrate for NP cells.

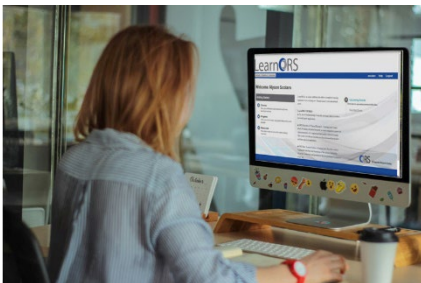
**Find or Post Spine Events on the
Orthopaedic Events Calendar**



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.

[Find or Post Events](#)

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