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Last Chance to Take the Survey for the 2024 Annual Meeting Spine Section Symposium

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

Research Section Member Spotlight

Kieran Joyce, PhD, MB, BCh, BAO

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Who do you consider your mentors?
I consider Professor Abhay Pandit and Professor Aiden Devitt as my primary mentors since beginning my research journey. Professor Pandit has supported me from the outset, encouraging me to undertake a PhD with little research experience, and has pushed me to seize countless opportunities ever since. He has guided my doctoral and postdoctoral research at the SFI Research Centre for Medical Devices (CURAM). Prof Devitt has been instrumental in my clinical training and research in orthopaedic surgery, helping me to navigate a career as an academic clinician.
What is your specific area of interest in research?
My specific area of interest is intervertebral disc degeneration and biomaterials for regeneration, particularly focusing on the role of glycosylation in degeneration. Glycosylation is the addition of sugar molecules to peptides, lipids, and RNA that alter their function.

What are you currently working on?
Currently, I am working on projects involving the development of glyco-functionalized therapeutics for treating intervertebral disc degeneration. This involves characterizing human tissue in healthy and degenerated states to understand how the glycome and glycosylation are modulated in degeneration. We employ in vitro studies to investigate how these changes affect cell function. We have recently undertaken a preclinical study to specifically investigate how sialylation (a form of glycosylation) is modulated in degeneration and whether inhibition of sialylation can promote regeneration.

What has been the biggest challenge for you lately in your research?
My biggest challenge at the moment has been integrating both my research activities and clinical training. Balancing the demanding schedules of clinical training: theatre lists, clinics, and on-call hours with research. Experimental planning, wet lab activities, mentoring students and writing requires lots of planning. This has only been possible with the tremendous support of my mentors and colleagues who have given me the flexibility to pursue this career path.

What projects are you looking forward to?
I am particularly looking forward to advancing my work on biomaterials for cell therapies for intervertebral disc regeneration and exploring novel glyco-biomaterials to support cells to treat disc degeneration and its sequelae. I first gained experience in this area with Prof Daisuke Sakai at Tokai University, working with Tie2 positive progenitor cells and expanded on this work through the iPSpine consortium. I believe bioactive materials are one of the key pillars for successful cell expansion and delivery in disc regeneration.

What changes would you like to see in the future of the orthopaedic research community?
I would like to see greater integration of multidisciplinary teams in orthopaedic research in Ireland, involving more collaboration between basic scientists, bioengineers, and clinicians. I have seen a lot of positive changes since first starting my PhD and look forward to seeing further integration in research and clinical training pathways.

What do you like to do outside of your work?
Off the clock, I try to get to the gym whenever possible. I have been weightlifting since being first allowed to join a gym and have competed in many national and international competitions since. Nowadays, the challenge is keeping up with newbies!

What is the last book you read?
The only book I’ve read in the last year is "What I Talk About When I Talk About Running" by Haruki Murakami. It is a reflective memoir that intertwines the themes of running and writing. It was a very inspiring read for anyone struggling with writing and almost made me consider taking up running.

What is the most unusual/unexpected item sitting on your desk right now?
My suturing practice board.

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**Paper Review**

*Intervertebral Disc Microbiome in Modic Changes: Lack of Result Replication Underscores the Need for a Consensus in Low-Biomass Microbiome Analysis*

[https://doi.org/10.1002/jsp2.1330](https://doi.org/10.1002/jsp2.1330)
This paper describes an exciting exploration of the concept of the intervertebral disc (IVD) harbouring a microbiome, further challenging a previously traditional view of the disc's sterility, which has been under scrutiny in recent years. This study explores the relationship between Modic changes (MC), which are bone marrow lesions associated with disc degeneration, and the disc microbiome. The role of the microbiome and dysbiosis in IVD degeneration is poorly understood.

The study utilized 16S rRNA sequencing to analyze the microbiome of 70 intervertebral discs, categorized into non-Modic changes (nonMC), Modic type 1 (MC1), and Modic type 2 (MC2) discs. Discs were collected aseptically from patients undergoing lumbar spinal fusion surgery. Sequencing was performed under stringent aseptic conditions with buffer contamination controls in place. The analysis focused on variations in bioinformatic parameters and their impact on microbiome profiling, comparing different taxonomic assignments and filtering thresholds to assess their effects on the microbiome results.

The study’s findings emphasize the complexity and variability in disc microbiome profiles across different MC types. There was a notable lack of overlap with previous studies, indicating inconsistencies that may stem from methodological differences rather than biological variations. Importantly, the study found no universal bacterial signature associated with MC, underscoring the challenge of replicating microbiome results in low-biomass samples like the IVD.

The significant findings of this study highlight the urgent need for standardized methodologies in disc microbiome research to ensure reliable and reproducible results. Such standardization would enhance our understanding of the microbial influences on disc health and disease. This promising research focus has the potential to uncover novel diagnostic and therapeutic strategies for disc degeneration and associated conditions.

To view other paper reviews in the Spinal Column archives, please visit the link below.
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 the picturesque Pocono Mountains, Pennsylvania, from **November 10-14, 2024**.

Complete with [Symposium Speakers](#) and [Discussion Leaders](#), this exciting multiday meeting will provide a forum for discussion of the latest research, medical innovations, and the most advanced scholarship in Spine Research. This symposium will foster a greater understanding of the clinical problems associated with degenerative disc disease and will highlight cutting-edge scientific research in areas of basic biology, epidemiology, disease mechanisms, biomechanics, tissue engineering, and imaging of the intervertebral disc.

The meeting format will have plenty of networking time in the afternoon and post-dinner and the convenient location of Skytop provides great opportunities for outdoor and adventure activities that have made Pocono mountains a favorite tourist destination.

A draft of the scientific program will be available soon. **Abstract submission is now open** through the meeting website and will close on **July 15, 2024**.