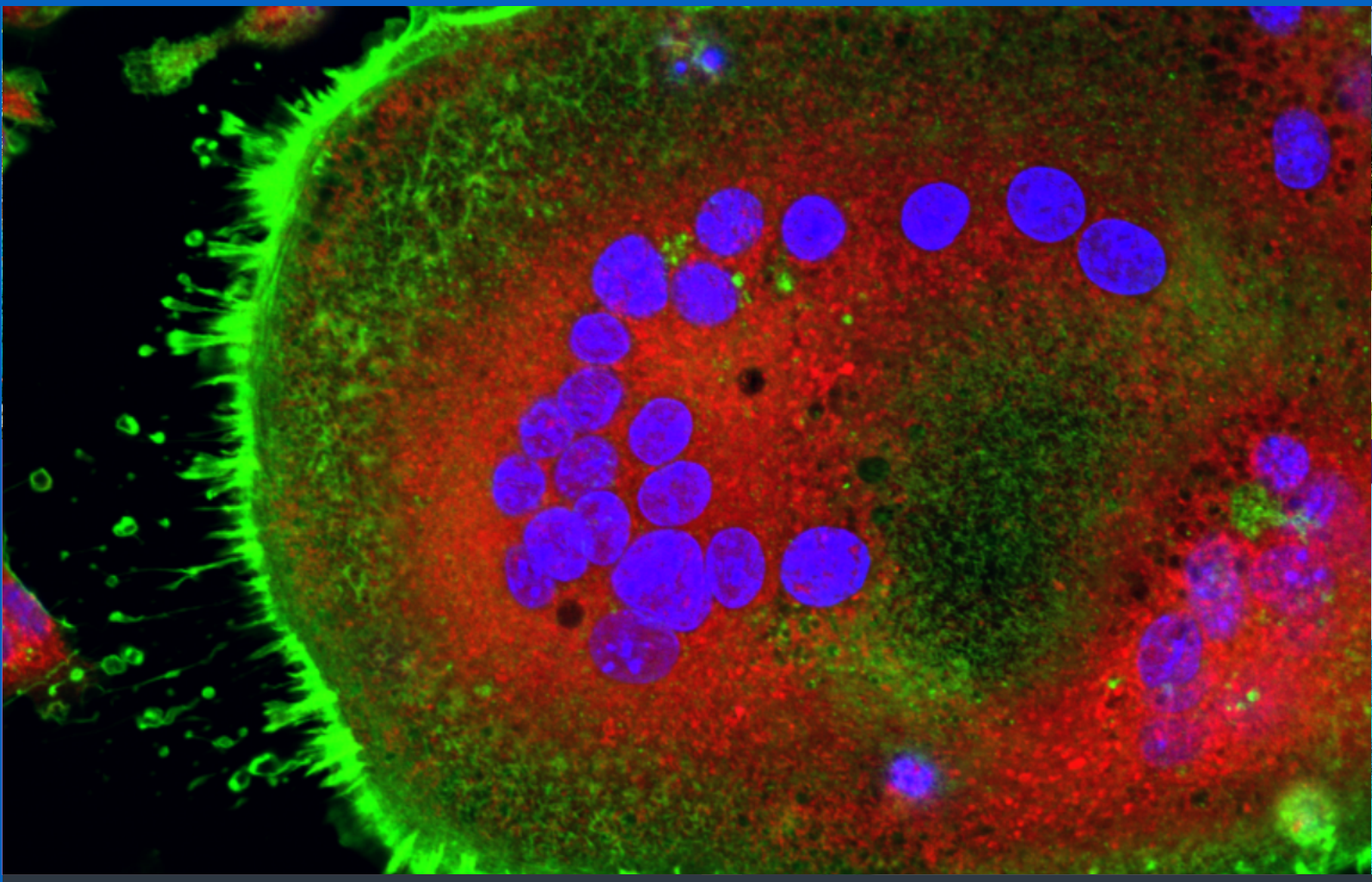
Issue 3, September 2025

ANZBMS Newsletter



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Cover image from work by Professor Jiake Xu, whose recent publication is featured in this issue, showing a confocal image of one osteoclast cell. Image provided by Shengnan Qin, a member of the lab.

Welcome to the ANZBMS Newsletter

Welcome to the third ANZBMS Newsletter of 2025!

This issue reflects the momentum and achievements of our community as we head into the final months of the year. President Mark Cooper shares important updates on the Annual Scientific Meeting (ASM) program, international collaborations through the B.O.N.E Program, new support initiatives for mid-career researchers, and the Society's clinical advocacy efforts.

You will also find program highlights from the Program Organising Committee, along with a feature of the first Asia Pacific IFMRS Herbert Fleisch Workshop. We also have ECIC reports on the success of the "ECR Connect" workshop, the launch of the 2025 ANZBMS/RACP Webinar Series, and an exciting line-up of ECIC sessions and networking events planned for November.

This issue's Special Report spotlights Dr Melissa Cantley's experience at the 43rd JSBMR Annual Meeting in Japan, made possible through the B.O.N.E Program. The Member Publications section showcases cutting-edge research from our community, including: a systematic review on muscle loss during paediatric cancer treatment (Anna Maria Markarian), the first high-resolution Micro-C genome topology map in human osteoclasts (Scott Wilson), and a biphasic, growth factor-free scaffold for cartilage repair (Shengnan "Iris" Qin) - highlighting the depth and breadth of ANZBMS research.

As always, we'd love to hear your news for future issues. We can't wait to see many of you in Cairns this November for a fantastic ASM and Herbert Fleisch Workshop. If you'd like to get involved or share something to celebrate, just drop us a line at newsletter@anzbms.org.au

Happy reading!

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Next Issue: September 2025

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ANZBMS Newsletter Editorial Board

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Dr Chelsea Tan

Cecily Chen

From the President

As I write this report a range of ANZBMS committees are busy putting the final elements together for the Annual Scientific Meeting (ASM). Most importantly, this involved scoring of abstracts and determining what goes where in the scientific program. This year we have the extra responsibility of doing this for both the ASM and the Herbert Fleisch-style meeting that follows on shortly afterwards. My thanks go out to all of the members involved with these activities. What I can say is that we have had terrific submissions of work across the range of basic science to clinical research and look forward to two great meetings.

In addition, the other work done by our Society continues. I am grateful to the efforts of our ECIC and ex officio members of that Committee for beefing up our agreements which underpin the Bridging Overseas Networking and Exchange (B.O.N.E) Program that we have with JSBMR and ASBMR. We are similarly looking at updating our arrangements with ECTS. These initiatives are world leading in trying to build international collaborative networks in our field. Demonstrating similar leadership in the research space, our ECIC committee recently joined together with young investigator colleagues from the Endocrine Society of Australia (ESA) and the Australian Diabetes Society (ADS) to host an online meeting addressing needs for early career researchers. Our ECIC and its activities demonstrate how our society can have a national and international impact to enhance bone and mineral research.

At the last Council meeting we again discussed the results from the members survey we undertook last year. The results of this were discussed at the AGM last year in Adelaide but one of the themes that we will be focussing on going forward is support for mid-career researchers (MCRs). Even though the research environment is difficult for everyone currently, we have heard from the membership that it is particularly tough for researchers sitting mid-career. Whilst continuing to support early and senior researchers we will be developing initiatives to try to address some of the issues faced by MCRs. If you have ideas to support these colleagues please discuss these with me or any of the other Council members. We want to make a difference.

Lastly, there is plenty of activity going on in the clinical advocacy space. Through our Clinical Imaging Committee and the leadership of Nick Pocock, ANZBMS has made a submission to the Department of Health relating to the current suitability of Medicare support for bone densitometry testing. Our suggestions are wide-ranging and aim to enhance the quality of diagnostic testing and correct some of the current 'gaps' in the availability/public funding of bone density measurement. We have also had input into applications for PBS funding of new (to Australia) treatments for bone disease. It was encouraging to hear recently that abaloparatide (an anabolic agent based on PTH-related peptide) has been recommended for approval, partly based on the support given to the application by our society.

From the President

Please keep your ideas coming and look forward to meeting up in a few months' time in Cairns.

Mark Cooper

BMBCh PhD FRCP
(London) FRACP, GAICD

ANZBMS President
Head of Clinical School,
Concord Clinical School
Faculty of Medicine and Health
Patyegarang Precinct

Welcome to our new members...

Tony Huang

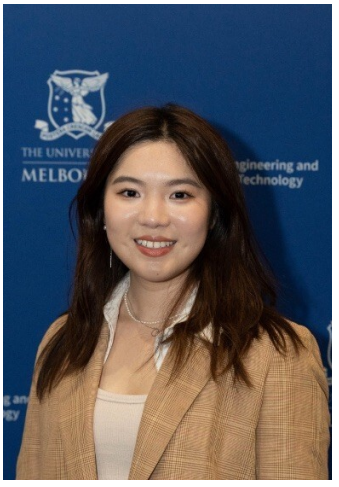
MD-PhD Candidate, the University of Melbourne.
Department of Biomedical Engineering.

I'm really excited to be joining the ANZBMS Newsletter Committee! My research focuses on cartilage injury, repair, and regeneration, with a particular interest in how insights from basic cartilage biology can be translated into better clinical outcomes for sporting injuries and osteoarthritis. Beyond the lab, I have a strong interest in science communication and student-driven research initiatives, and I'm looking forward to contributing to the newsletter as a way of helping share impactful work with our community.

I'm grateful for the opportunity to be part of the committee and to work alongside you all in continuing to highlight the breadth and excellence of ANZBMS research.

Cecily Chen

PhD Student, the University of Melbourne.
Department of Biomedical Engineering.



It's my pleasure to join the editorial board. I'm a PhD student at the University of Melbourne, supervised by Professor Kathryn Stok. My research focuses on the cartilage microenvironment, with particular interest in how mechanical factors influence tissue behavior and integration with tissue-engineered cartilage. I look forward to contributing to sharing our community's achievements and to connecting with you all in future.

Program Organising Committee

We are looking forward to the ANZBMS ASM in Cairns, 9th–12th November 2025. We are grateful to all Program Organsing Committee (POC) members for their support and guidance.

The POC hopes to create a stimulating and engaging program with confirmed themes and speakers listed below:

International speakers:

- A/Prof John Schousboe (USA): Imaging and bone health
- A/Prof Morten Frost Nielsen (Denmark): Diabetes and bone health
- A/Prof Marc Wein (USA): Osteocyte mechanoresponses. Marc will be a faculty speaker at the Herbert Fleisch Workshop, to be held 12th - 14th November 2025, following the ANZBMS ASM.
- Prof Geert Carmeliet (Belgium): Metabolic regulation of bone

National speakers:

- A/Prof Dawn Coates: Dental tissue regeneration
- Dr Lieke Scheepers: Gut microbiome and bone health in children
- Dr Cassandra Smith: Exercise and bone health
- Dr John Kemp: OMICS
- Prof Bronwyn Stuckey: Menopausal hormone therapy
- Prof Rachel Davey: Transgender and bone health
- Dr Ayse Zengin: Indigenous health

We are in the process of allocating abstracts and assigning chairs for sessions. The debate topic will be: "Nutritional therapy is better than pharmacotherapy as first line to prevent bone loss in the older adult". Excitingly, the debate speakers have recently confirmed: Prof Emma Duncan, Dr Sandra Iuliano, Dr Marc Sim and Prof Robert Blank.

We look forward to an exciting 2025 meeting in tropical North Queensland.

IFMRS Program Organising Committee

The IFMRS Herbert Fleisch Workshop: Asia Pacific is a 3-day residential workshop designed to bring together international investigators, early- and mid-career researchers and students in the later stages of their PhD working in musculoskeletal research for a few days of learning, discussion and networking, with hands-on participation and ongoing interactions with selected top scientists.

This event will be held in the Asia Pacific region for the first time, offering investigators from the region easier access to this globally renowned workshop. In the spirit of the late Herbert Fleisch, the workshop offers an informal and relaxed atmosphere which encourages engagement, curiosity and collegiality, fostering the development of scientific ideas and career growth for EMCRs.

The IFMRS Herbert Fleisch Workshop will be held following the ANZBMS Annual Scientific Meeting from 12th - 14th November in Cairns.

The exciting program is now available and will feature some amazing international and national speakers along with 6 sessions of selected oral presentations and an engaging poster session. Talks will be delivered by presenters from multiple different countries and societies including ANZBMS, JSBMR and KSBMR and we can't wait to hear all the amazing research that will be presented. Make sure to check out the program on the website.

On the first evening there will be a career development session focussed on promoting networking and engagement for our EMCR attendees with our invited speaker guests leading small group roundtable chats. This will be a fun, engaging and insightful session and will hopefully set you up with the skills to make the most of the remainder of the workshop to meet others and build your profile.

It's not too late to register for the meeting and join us in Cairns!

We can't wait to see you in Cairns in November.

The IFMRS Herbert Fleisch Workshop Program Organising Committee

ECIC Co-Chairs Report

The second half of the year is racing by, and the ANZBMS ECIC has been busy delivering on exciting initiatives for the year, as well as planning for another great Annual Scientific Meeting in November!

Our **Events subcommittee** held "**ECR Connect**" on Saturday 2nd August. This event was an online career development workshop delivered in collaboration with the early career committees of the Endocrine Society of Australia and the Australian Diabetes Society. This marks the start of exciting new collaborations between the societies at an early career level. Topics included artificial intelligence, hacking conference presentations, designing a mouse model study, running investigator-initiated clinical trials, effective grant writing for competitive funding opportunities and a Q&A panel. Thank you to our ANZBMS speakers, Prof Natalie Sims, A/Prof Michelle McDonald and Dr Albert Kim for their time and excellent presentations. The workshop attracted more than 60 attendees across science and clinical backgrounds and was very well received in our feedback survey. We plan to deliver this again next year!

Our **Clinical subcommittee** launched the **2025 ANZBMS/RACP Webinar Series** on 23rd June featuring a presentation on Nutrition and Bone by Dr. Sandra Iuliano. The program will run until mid-November and includes six clinically focused webinars. A big thank you to the speakers who have agreed to present. To register for this webinar, please use this link.

Our **Career Development subcommittee** has been busy facilitating another great year of international speakers under our **B.O.N.E program**. Be sure to keep a close eye on the annual meeting program schedule so that you can attend our awardee presentations, including presentations from outstanding researchers from ASBMR (American) and JSBMR (Japanese).

On that note, the ANZBMS ECIC have been busy planning ECIC events at the upcoming annual meeting in Cairns. We highly encourage all ECIs to register for these events. They are a fantastic opportunity to meet your peers, as well as network with more senior researchers and clinicians. It is sure to be a fun meeting, and we can't wait to see you all in Cairns for both the ANZBMS meeting (9th – 12th November) and the 1st Asia Pacific Herbert Fleisch workshop (12th – 14th November).

The ANZBMS ECIC is run by ECIs, for ECIs! We would love to hear from you if you have any suggestions for how we can better support you. We would also love to share your news and successes through our various communication channels; feel free to share through our LinkedIn page, Facebook group or contact us at ecic@anzbms.org.au.

Yours Sincerely,
Dr Shejil Kumar
ANZBMS ECIC Co-Chair 2025

Yours Sincerely,
Dr Eugenie Macfarlane
ANZBMS ECIC Co-Chairs 2025

ANZBMS ECIC Events

Upcoming ECIC Sessions and Networking Events at the Annual Scientific Meeting

Sunday 9th November	Monday 10th November	Tuesday 11th November	Wednesday 12th November
2:00pm Science at Speed Networking	**6:00pm** ECIC Clinical Cases in Metabolic Bone Diseases Seminar	**1:30 pm** ECIC Lunchtime symposium	**9:00am** B.O.N.E Awardee symposium
6:00pm Welcome Reception		**5:00pm** B.O.N.E Awardee symposium	**4:00pm** 1st Asia Pacific Herbert Fleisch Workshop begins 12th to 14th November
7:30pm Bones and Brews		**7:30pm** Conference Dinner	

Science at Speed - Networking Session This event aims to foster collaboration and networking across different disciplines and career levels. Each pair will be given 5 minutes to pitch their research interests. Over the hour, each attendee will network with 10 people.

Welcome Function - A fantastic opportunity for delegates to catch up with old friends from past conferences, make new connections and interact with the trade sponsors over drinks and canapes.

Bones & Brews at Hemingway's Brewery Cairns Wharf - This is a fun, casual drinks and dinner social event which will bring like-minded friends and colleagues together with an evening of trivia.

Clinical Cases in Metabolic Disease Seminar - This event provides an opportunity for physician trainees to present their clinical case to a national scientific audience. Presentations will be judged , and a winner will be selected. Dinner and drinks are included with your ticket.

ECIC Career Development Lunch - A panel of researchers spanning basic science, clinical and public health fields will share their interdisciplinary research experiences and knowledge, as well as tips on how to bridge the gaps between bone and mineral research disciplines at various career stages.

B.O.N.E Symposium - The Bridging Overseas Networking and Exchange (B.O.N.E) Program is a collaborative initiative to provide ECIs the opportunity to present their research abroad to facilitate international networking and collaboration. This year ANZBMS has invited two early-career speakers from ASBMR and JSBMR.

Conference Dinner at Rainforestation Nature Park - A social highlight of the conference. The dinner will include a Bush Tucker BBQ Buffet & Beverages. Get together with friends old and new, to celebrate the achievements over the last year at this fantastic location! There is sure to be dancing and an afterparty, for those wanting to extend the festivities.

There is still time to register for **1st Asia Pacific Herbert Fleisch Workshop**. The workshop offers an informal and relaxed atmosphere to encourage curiosity, collegiality, and the fostering of scientific ideas and career growth for EMCRS in the MSK field. This is an event not to miss!

RACP Specialists. Together
EDUCATE ADVOCATE INNOVATE

ANZBMS

2025 RACP/ANZBMS Webinar Series

Speaker	Topic	Time/date
Dr Sandra Iuliano	Nutrition and bone: a clinician's guide	Monday 23rd June 6:00pm (AEST)
Prof Craig Munns	Paediatric and Adult OI	Tuesday 29th July 6:00pm (AEST)
A/Prof Christian Girgis	Management of rare bone diseases – giant cell granuloma and fibrous dysplasia	Tuesday 12th August 6:00pm (AEST)
Prof Peter Ebeling	Osteoanabolic therapy – transition/sequence/combination	Monday 25th August 6:00pm (AEST)
Dr Albert Kim	Insights into denosumab discontinuation: from bench to bedside	Monday 22nd September 6:00pm (AEST)
Dr Hanh Nguyen	Hypophosphataemia following iron infusions	Monday 17th November 6:00pm (AEST)

Register in advance for this webinar:

https://event.racpevents.edu.au/specialty-society-webinar-series-2025/anzbms

After registering, you will receive a confirmation email containing information about joining the webinar.

This webinar is part of the Specialty Society Webinar Service that is being undertaken by the Royal Australasian College of Physicians in partnership with its affiliated Specialty Societies.

ecic@anzbms.org.au anzbms.org.au

Funding Opportunities

Grant/Scheme	Important Dates
MRFF 2025 Research Data Infrastructure Grant Opportunity	Closing 11th of December 2025
MRFF – Clinical Trials Activity Initiative – 2025 International Clinical Trial Collaborations Grant Opportunity	Closing 4th of February 2026
Clinical Trial Cohort Studies Grants	Minimum data due 8th of October 2025, applications close 5th of November 2025
ARC Discovery Projects - DP 2027	Expression of interest due 12th of December 2025

B.O.N.E program

Attending the 43rd Japanese Society for Bone and Mineral Research Annual Meeting.

24th-26th July 2025, Kumamoto, Japan.

As part of the B.O.N.E program I was invited to attend and present my research at the 43rd Japanese Society for Bone and Mineral Research Annual Meeting in Kumamoto, Japan. I presented as part of the JSBMR/International Federation of Musculoskeletal Research Society (IFMRS) joint symposium on Thursday 24th July focussed on recent topics in musculoskeletal disease. This session included speakers from JSBMR, the American Society for Bone and Mineral Research (ASBMR) and the European Calcified Tissue Society (ECTS). It was a fantastic opportunity to present alongside some outstanding researchers from around the world. It was a fantastic session with lots of engagement, questions and discussions. All these talks were presented in English with AI translation to Japanese available. I thoroughly enjoyed meeting and getting to know the other speakers from the international symposium.

On the Thursday evening, we attended the President's dinner at the Kumamoto Hotel Castle. A highlight of this dinner was a Samurai sword display. I also provided a greeting on behalf of the IFMRS symposium presenters. It was a fantastic opportunity to meet and network with members from both JSBMR and the Korean Society for Bone and Mineral Research (KSBMR). The social event held on the Friday night was fantastic and included cheerleaders and the Kumamoto mascot who danced and posed for photos with guests. There was a buffet dinner and a great opportunity for networking.

The meeting was held in Kumamoto with the hotel and conference venue all located in the same complex. I had the opportunity to explore Kumamoto on the day of my arrival. Everyone was so lovely, approachable and helpful. I also visited the Kumamoto Castle with Colleen Wu from ASBMR.

I attended as many sessions at the conference as possible and was impressed by the exceptional level of science presented throughout. While many of the talks were delivered in Japanese, having slides in English was extremely helpful and made it easier to follow along and engage with the content.

Overall, this was a fantastic opportunity and an incredibly valuable experience. I'm very grateful to both ANZBMS and JSBMR for supporting my attendance and making it possible. I am looking forward to seeing many of the JSBMR and KSBMR members that I met in Kumamoto at the IFMRS Herbert Fleisch Workshop in Cairns in November.

Yours Sincerely,

Dr Melissa Cantley
2025 B.O.N.E Program Recipient

Cancer Council Research Fellow
Myeloma Research Laboratory
The University of Adelaide

B.O.N.E program

Attending the 43rd Japanese Society for Bone and Mineral Research Annual Meeting.

24th-26th July 2025, Kumamoto, Japan.

Presenting in the JSBMR/IFMRS Joint Symposium.

Presenters and Chairs for JSBMR/IFMRS Joint Symposium: Prof Yuuki Imai, Dr Kazuo Okamoto (JSBMR), Dr Melissa Cantley (ANZBMS), Dr Colleen Wu (ASBMR), Dr Biagio Palmisano (ECTS), Dr Ritsuko Masuyamam (Chair) & Dr Kenji Hata (Chair).

President's dinner: Dr Melissa Cantley (ANZBMS), Prof Takeshi Miyamoto (President for the 43rd Annual Meeting of JSBMR, 2025), Dr Colleen Wu (ASBMR) & Dr Biagio Palmisano (ECTS).

President's dinner: Samurai sword display.

B.O.N.E program

Attending the 43rd Japanese Society for Bone and Mineral Research Annual Meeting.

24th-26th July 2025, Kumamoto, Japan.

Kumamoto mascot at the social event.

At the social event with Kumamoto mascot.

Kumamoto Castle

Prof Roland Baron, Prof Yuuki Imai, and Dr Melissa Cantley at the social event.

Anna Maria Markarian

Exercise Medicine Research Institute, Edith Cowan University.
Research category: Clinical

Research interests: Muscle–bone interactions, musculoskeletal health in childhood cancer survivors, exercise interventions, paediatric bone imaging, and advocating that muscle is just as exciting as bone.

What I hope to gain from joining ANZBMS: I'm looking forward to connecting with researchers and clinicians, exchanging ideas, and staying up to date with developments in musculoskeletal science

Dr. Farahnaz Salehi Nia

Endocrinologist, FRACP
Cornerstone Health, Our Medical Dee Why, and Our Medical Crows Nest clinics, Sydney, Australia
Research Category: Clinical

Research Interests: PCOS, obesity, and Osteoporosis

What I hope to gain from joining ANZBMS: I hope to connect with fellow researchers and clinicians, learn from the latest advances in bone and metabolic health, and contribute to collaborative research initiatives.

Markarian AM, Taaffe DR, Galvao DA, Peddle-McIntyre CJ, Wilkie JC, Bettariga F, Newton RU. Longitudinal changes in skeletal muscle in children undergoing cancer treatment: a systematic review and meta-analysis. Eur J Pediatr. 2025 Jul;184(8):513. doi: 10.1007/s00431-025-06349-5.

Featured author: Anna Maria Markarian

PhD Candidate, Exercise Medicine Research Institute, Edith Cowan University
E: a.markarian@ecu.edu.au

What is the background of the study?

Skeletal muscle loss during chemotherapy has been linked to poorer outcomes and reduced survival across several types of cancer. However, the extent and progression of muscle loss during treatment for childhood cancers remain unclear. Given that body composition, particularly muscle mass, can influence drug distribution, clearance, and cancer treatment tolerance, gaining insight into these changes in children with cancer may help identify those at increased risk and guide the timing of targeted interventions.

What did you find?

This systematic review and meta-analysis synthesized findings from 20 longitudinal studies involving 646 children aged 2.5 to 14.7 years undergoing cancer treatment. A significant decline in muscle mass was observed during the early, intensive phase of treatment (standardized mean difference [SMD] = -0.36). While changes in muscle mass at later follow-up points were not statistically significant (SMD = -0.08; 95% CI: -0.27 to 0.10; p = 0.36), the extent of muscle loss varied significantly by assessment method (p = 0.048), with computed tomography scans detecting more substantial deficits than hydration-sensitive techniques such as dual-energy X-ray absorptiometry or bioelectrical impedance analysis. Notably, muscle loss frequently occurred alongside significant increases in fat mass (SMD = 0.64; 95% CI: 0.06 to 1.22; p = 0.03).

What is the application of these findings?

Muscle loss, especially when accompanied by fat gain, may indicate early metabolic dysregulation during treatment. Additionally, because chemotherapy dosing is typically based on body surface area (calculated from height and weight), failing to account for underlying body composition could increase the risk of drug-related toxicity. This review also highlights the need for more sensitive and standardized methods to monitor body composition in paediatric oncology. Early detection of muscle loss could support the timely introduction of targeted interventions, such as exercise therapy, to preserve muscle mass and potentially improve treatment outcomes and long-term health in children with cancer.

Scott G Wilson, Purdey J Campbell, Dhanya Sooraj, Kassandra Leatherbarrow, Benjamin H Mullin, Suzanne J Brown, Kun Zhu, Shelby Mullin, Bryan K Ward, Jordan Zhang, Jonathon Torchia, Frank Dudbridge, Jiake Xu, Nathan J Pavlos, David Chandler, John P Walsh. Genome topology analysis and transcriptomics of human osteoclasts reveals enhancer-promoter interactions at loci for bone traits and diseases. JBMR Plus. https://doi.org/10.1093/jbmrpl/ziaf120

Featured author: Dr. Scott Wilson

Adjunct Professor, School of Biomedical Sciences, University of Western Australia
E: scott.wilson@uwa.edu.au

What is the background of the study?

The genome does not function as a simple linear string of nucleotides but is folded into a 3D architecture, with chromatin loops bringing distant regulatory elements into physical contact with their target genes. Technologies such as Hi-C, and its higher-resolution derivative Micro-C, map these contacts across the genome, revealing how enhancer–promoter communication is shaped by cell type specific topology. Because most genome-wide association studies (GWAS) signals for osteoporosis reside in non-coding regions, often acting through enhancers, understanding chromatin organisation in bone cells is essential to link genetic variants with function. However, high-resolution chromatin contact maps in osteoclasts have been lacking.

What did you find?

We generated the first high-resolution Micro-C dataset of genome topology in human osteoclasts, derived from primary blood precursors of healthy donors. From more than 69 million chromatin interactions, we defined over 18,000 chromatin loops in the osteoclasts. Integration with GWAS data revealed that >12,000 putative bone phenotype associated variants, including sentinel SNPs and those in strong linkage disequilibrium (r^2 > 0.6), map within osteoclast chromatin contact regions. Functional enrichment highlighted pathways central to osteoclast biology and bone health, including WNT signalling, NOD-like receptor signalling, chemokine signalling, and stem cell pluripotency. These results demonstrate that chromatin topology in osteoclasts is distinct, and in some instances contacts intersect directly with genetic risk loci for bone traits and osteoporosis.

What is the application of these findings?

This osteoclast-specific genome topology resource provides a crucial framework for interpreting GWAS hits in bone disease. By linking non-coding variants to their potential target genes through physical chromatin contacts, these data enable more precise prioritisation of causal regulatory variants and their effector genes. The integration of Micro-C with epigenomic annotations (e.g. histone modifications, chromatin accessibility) will facilitate improved predictive modelling of enhancer–gene relationships. Ultimately, this resource lays the groundwork for functional studies of osteoporosis risk loci and therapeutic target discovery in osteoclast biology.

Qin S, Wang W, Chen L, Yu M, Zhao C, Zeng H, Chu H, Zhang K, Wu S, Cui R, Zheng Y, Bai Y, Xu J. A3D printed osteochondral lineage-specific biphasic scaffolds for functional repair of full-thickness articular cartilage defects in weight-bearing area. Biofabrication. doi: 10.1088/1758-5090/ade8a9.

Featured author: Shengnan (Iris) Qin

Guangzhou Red Cross Hospital, Jinan University, Guangzhou
The University of Western Australia
E: iris.qin@research.uwa.edu.au

What is the background of the study?

Articular cartilage injuries—particularly full-thickness defects—remain a formidable challenge in orthopaedic and sports medicine due to the tissue's limited self-healing capacity. Although strategies like autologous chondrocyte implantation (ACI) have shown promise, they suffer from practical limitations including donor site morbidity, tissue availability, and the need for multiple surgical procedures. In the clinical setting, transplanting small osteochondral cylinders remains a common approach, yet suitable alternatives to these autografts are urgently needed.

What did you find?

To provide a practical alternative for real-world clinical use, we developed a biphasic, cell-free, and growth factor-free scaffold as a clinically viable substitute for autologous osteochondral plugs. Prioritizing clinical practicality, our design is intentionally simple—combining a 3D-printed GelMA/hydroxyapatite (HAP) layer with a collagen layer, joined via a freeze-drying process. This rationally designed simplicity—often underappreciated—is key to facilitating real-world translation, as overly complex constructs risk limited clinical adoption.

Functionally, the scaffold mimics the osteochondral interface: the GelMA/HAP layer promotes osteogenesis, while the collagen layer supports hyaline cartilage regeneration. Freeze-drying introduces interconnecting microporosity across both layers, enhancing cell migration, nutrient diffusion, and tissue integration. In vitro, the scaffold supports cell adhesion, proliferation, migration, and spontaneous differentiation into chondrogenic and osteogenic lineages without the addition of cells or biochemical cues.

Most compellingly, in vivo implantation into a rabbit full-thickness cartilage defect model demonstrated substantial neotissue formation after 12 weeks. The biphasic scaffold promoted layered regeneration of hyaline cartilage and subchondral bone, outperforming control groups that followed natural endochondral ossification with limited structural restoration.

What is the application of these findings?

By eliminating the need for exogenous cells or growth factors, our scaffold avoids common clinical hurdles such as cell sourcing, immunogenicity, and regulatory complexity. Its modular, scalable, and minimally manipulated design makes it an ideal candidate for rapid clinical translation—particularly in treating localized osteochondral lesions where plug transplantation is already established practice.

In summary, this work highlights a shift in tissue engineering philosophy: from complexity toward clinical feasibility. Through simple material selection and purposeful efficiency, we present a next-generation biphasic scaffold that holds high translational promise for orthopaedic surgeons and patients alike. Our study offers not just a biomaterial, but a practical pathway toward improving outcomes in cartilage repair surgery.

ANZBMS Researchers:
We want to share & celebrate your wins!

We are on the lookout for members who have celebrated success (awards and publications) to be highlighted in the Spotlight or Publication sections for the upcoming editions of the newsletter. If you know of someone or want to self-nominate, please email us at **newsletter@anzbms.org.au**

The ANZBMS Newsletter Editorial Board is searching for new members!

Open to all ANZBMS members at any stage in their career. For more information and to apply, please e-mail **newsletter@anzbms.org.au** with up to 150 words explaining why you would be a good addition to the newsletter team.

Calendar of Events