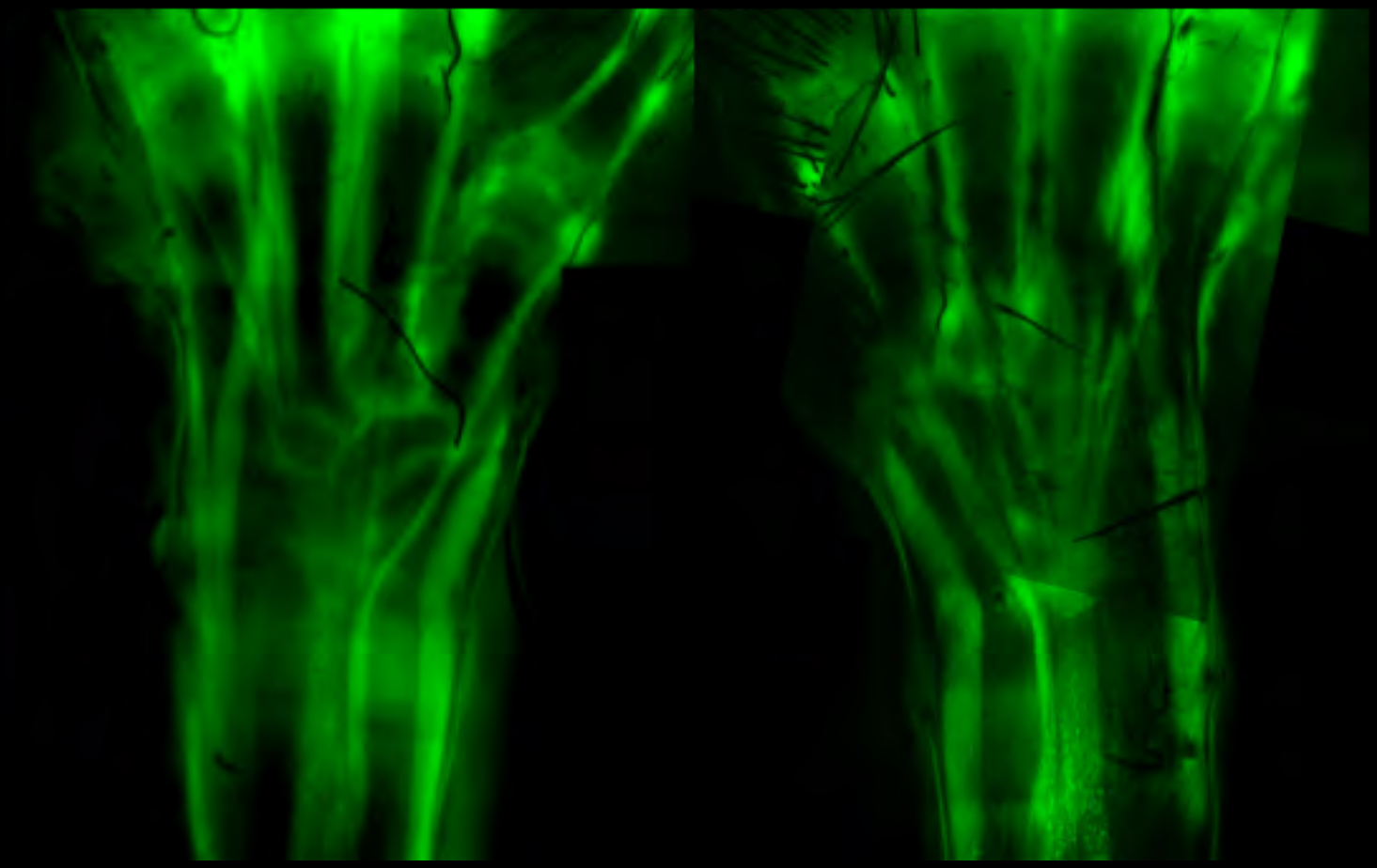
Issue 7, February 2022

ANZBMS Newsletter



President's vision for ANZBMS

Member achievements

Publication highlights

Cover image: Epifluorescence images of flexor tendons from Wildtype (left) and Sparc$^{-/-}$ (right) mice on Scx-GFP reporter background at embryonic day 18. GFP, green fluorescent protein. Courtesy of Ming H. Zheng and colleagues. (See Pg. 7)

In this issue

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Next Issue: May 2022

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Welcome to the ANZBMS newsletter

Happy new year!

In this issue, we introduce our new ANZBMS President, Prof. Mark Forwood, who shares with us details about his vision for ANZBMS and some advice for early career investigators (Pg. 3). We have also included the details of the ANZBMS council that will be working with Mark.

Congratulations to the members that have received awards recently (Pg. 5). The ANZBMS is currently offering funding for Grants-In-Aid (in conjunction with the Bone Health Foundation) and also travel grants to support training (further details Pg. 5).

This edition we highlight a range of ANZBMS member articles about:

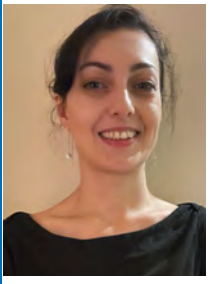
- Maternal Vitamin D and fracture risk in offspring
- Role of SPARC in tendon
- Bone microarchitecture in transgender adults

Have news to share? Want to provide us with feedback? Contact us at newsletter@anzbms.org.au

Happy reading!

Newsletter Editorial Board

ANZBMS Newsletter Editorial Board

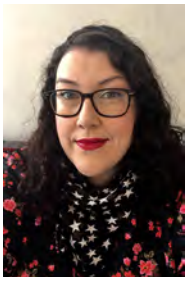


Niloufar Ansari

Martha Blank

Nicolas Hart

Madhuni Herath



Victoria Leitch

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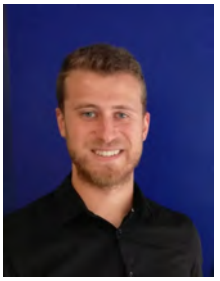

James Smith

Natalie Wee

Emma West

Statement from the Incoming President

Professor Mark Forwood

ANZBMS President
Chair of Anatomy,
School of Pharmacy and Medical Sciences
Griffith University, Gold Coast

As incoming President, what is your vision for ANZBMS?

In 1994, I returned to Brisbane from Indiana University School of Medicine where I was an NHMRC Fellow with David Burr and Charles Turner. Not only was that an incredible learning opportunity, it highlighted the importance of mentors, networks and professional societies. I had joined the ORS and ASBMR during that time, and attended The Sun Valley Hard Tissue Workshops, led by Web Jee, Harold Frost and Mike Parfitt. I was impressed by the opportunities to meet and interact with leaders in our field, who until that time had been citations in my thesis. As I planned my return to UQ, Ego Seeman encouraged me to join the ANZBMS, still in its youth in 1994.

ANZBMS has remained my primary professional society for education, networking and presenting our work nationally. I saw the intrinsic value in our Society for the communication of bone and mineral science across basic, translational and clinical research. I also saw instrumental value in building a track record in professional service. In 1997, I was first elected Council as the Qld representative and became Honorary Treasurer from 1999 to 2005. In 2017, I was again elected to Council, now taking the opportunity to contribute back to ANZBMS and its mission. It is an honour to serve the Society as President for the next two years.

During my ANZBMS tenure, funding of research from traditional sources has undergone atrophy, career paths in musculoskeletal science have weakened, and Government has waged a war of attrition on support for research. We have challenging financial pressures and marginal power as individual societies to influence policy.

One of my visions for the next two years is to harness the collective strength of our musculoskeletal societies and foundations. I want to bring our musculoskeletal organisations together in a forum to identify the challenges for musculoskeletal research in Australia and New Zealand, develop a framework for collective advocacy to Government and funding agencies, identify knowledge and policy gaps in our region and facilitate mechanisms to share and improve access to useful resources, knowledge and networks.

As John Donne wrote "No man is an island…". ANZBMS has a great depth of membership from our founding scientists and clinicians to a renewed Council and an active and motivated Early Career Investigator Committee. I want to draw on that experience to plan the forum and to review the Strategic Plan of ANZBMS to ensure that it is fit for the environment in which we currently work.

What part of your research do you enjoy the most?

It's easy to say that "eureka moment" when the data analysis provides unequivocal support for our hypothesis. However, like our children, it's difficult to identify a favourite. I enjoy working with colleagues and students across the range of research activities from identification of research questions, designing experiments to test hypotheses and getting them funded (more enjoyable than not getting them funded!). Certainly, working in the lab, or with colleagues, discussing interesting scientific questions is more rewarding than dealing with administration and bureaucracy.

What advice would you give our ECIs that you have learned during your career?

Be well prepared and open to opportunity. On being prepared: do your homework on your field and its history; scrutinise potential supervisors or laboratories; talk to their past/present students and postdocs to understand the environment and lab management; identify the level and duration of funding; and, master your laboratory, writing and presentation skills. In a competitive environment, understand research integrity and ethics, and don't compromise those principles – good science and discipline knowledge is the only bulwark against "fake news".

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Council Member

Associate Professor Michelle McDonald
Garvan Institute/University of New South Wales

Council Member

Member achievements

2022 Member of the Order of Australia

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Professor Tuan Nguyen, Garvan Institute of Medical Research

For significant service to medical research, to osteoporosis and fracture prevention, and to tertiary education

Please read Tuan's reflection on this award here.

2022 ASBMR John Haddad Young Investigator Award

Dr Natalie Wee, St Vincent's Institute

This award supports selected young investigators to present their research at the Advances in Mineral Metabolism meeting (USA).

ANZBMS Opportunities

ANZBMS-Bone Health Foundation (BHF) Grants in Aid

- Funding to generate data to strengthen their application and enhance their competitiveness in subsequent major grant rounds

Eligibility: 3 - 18 years post-PhD (Additional criteria - please see website)
Application Due: 5 pm March 12th 2022

Christine and T. Jack Martin Research Travel Grant Applications (supported by AMGEN)

- Participate in online training courses to acquire new expertise, or
- Travel within Australia and New Zealand to acquire new expertise, or work on a substantially justified cooperative project.

Eligibility: All ANZBMS members are eligible
Application Due: 1st March 2022

For more information and application details, please see the ANZBMS website.

Member publications

Percival MA, Pasco JA, Hosking SM, Williams LJ, Holloway-Kew KL, Wark JD, Hyde NK. Maternal vitamin D and offspring fracture risk: the Vitamin D in Pregnancy Study. Arch Osteoporosis 2021;16(1) doi: 10.1007/s11657-021-01023-3.

What is the background of the study?

Vitamin D is important for bone health and strength. Previous studies have reported that maternal vitamin D exposure during pregnancy may impact the offspring's later life bone health, such as bone mineral density; however, there have been few studies examining fracture risk.

What did you find and what message do you want readers to take away?

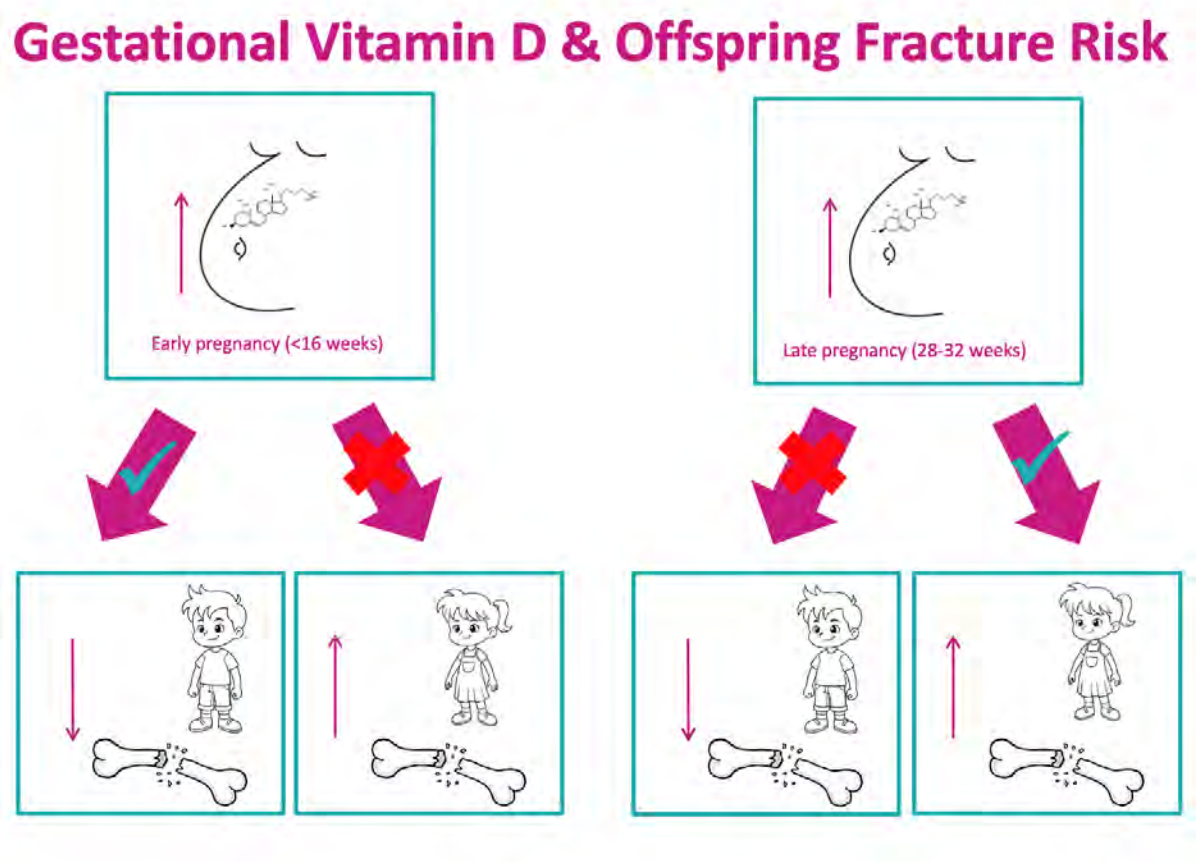
There is some evidence of a sexually dimorphic association between maternal vitamin D and offspring fracture risk in childhood. Higher maternal 25(OH)D at early gestation (<16 weeks) was associated with a lower fracture risk in boys, while at 28-32 weeks' gestation it was associated with a higher fracture risk in girls.

What is an application of your finding?

The findings of this study, together with other studies, may help inform vitamin D recommendations and guidelines during pregnancy

Did you face any challenges during the study?

Unfortunately, due to privacy issues, we were not able to obtain information about fractures in the children after the year 2013 (when the children were between 9-11 years old). Therefore, this study was only able to look at associations in childhood. We hope to look at fractures up to early adulthood in this cohort in the future.



Member publications

Wang T, Wagner A, Gehwolf R, Yan W, Passini FS, Thien C, Weissenbacher N, Lin Z, Lehner C, Teng H, Wittner C, Zheng Q, Dai J, Ni M, Wang A, Papadimitriou J, Leys T, Tuan RS, Senck S, Snedeker JG, Tempfer H, Jiang Q, Zheng MH, Traweger A. Load-induced regulation of tendon homeostasis by SPARC, a genetic predisposition factor for tendon and ligament injuries. Sci Transl Med. 2021. 13(582):eabe5738.

What is the background of the study?

Mechanical loading within a physiological range is key for regulating tendon development, homeostasis and degeneration. Secreted protein acidic and rich in cysteine (SPARC) also named osteonectin is highly expressed in both tendon and bone matrix, but little was known in its biological function.

What did you find and what message do you want readers to take away?

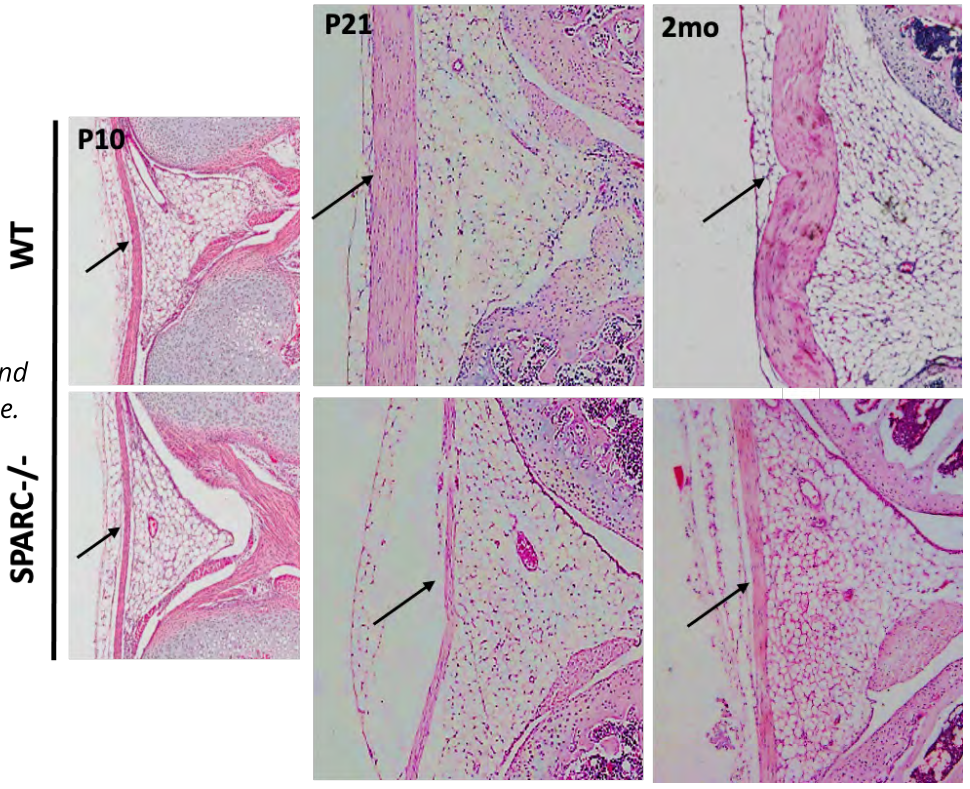
Mice lacking SPARC have hypotrophy of tendon and higher prevalence of spontaneous tendon ruptures. Three-dimensional tendon constructs without SPARC showed load-dependent impairment of ribosomal S6 kinase activation, resulting in reduced type I collagen synthesis. A missense mutation (c.388 T>G) of SPARC was identified in patients with rotator cuff tendon and ACL rupture.

What is an application of your finding?

SPARC is essential for load-induced tissue homeostasis for tendon and possible bone. Mutation of SPARC is an identifiable risk of tendon rupture in patients. As it has been reported previously that another homozygous missense mutation (c.497G>A) of SPARC causes osteogenesis imperfect and joint hyperlaxity, we speculated that SPARC may also regulate mechanical transduction of bone tissue.

Did you face any challenges during the study?

The study was a long journey supported by a grant from NHMRC in 2012. Revision took almost 16 months with additional work. Early career researchers were struggling with the funding support.



H&E staining of patellar tendons (indicated by arrows) at P10, P21, and 2-month-old WT and Sparc-null mice.

Member publications

Bretherton I, Ghasem-Zadeh A, Leemaqz SY, Seeman E, Wang X, McFarlane T, Spanos C, Grossmann M, Zajac JD, Cheung AS. Bone Microarchitecture in Transgender Adults: a Cross Sectional Study. JBMR 2022 doi: 10.1002/jbmr.4497

What is the background of the study?

Sex hormones regulate bone remodeling, yet the effects of gender affirming hormone therapy on bone health in transgender adults are poorly understood. We used high resolution pQCT to compare distal radial and tibial microarchitecture in a cross-sectional study of 41 trans men (compared with 71 cis female controls) and 40 trans women (compared with 51 cis male controls) on established hormone therapy.

What did you find and what message do you want readers to take away?

We found that bone microarchitecture was not compromised in trans men, perhaps because aromatization of administered testosterone prevented bone loss. However, in trans women bone microarchitecture was compromised- trans women had lower total vBMD, higher cortical porosity and lower trabecular bone volume. This finding was surprising because estradiol slows bone remodelling. These findings may be explained if pre-existing deficits in microstructure present before treatment existed, or if estradiol dosages used were insufficient to offset reduced testosterone available for aromatization.

What is an application of your finding?

Prospective studies are needed to confirm our findings but in the meantime, we recommend proactive measures to optimise bone health in all trans adults such as ensuring adequate vitamin D, dietary calcium intake, weight bearing exercise, as well as smoking cessation. More specifically, in trans women, we recommend ensuring adequate estradiol replacement, particularly in the presence androgen blocking agents or bilateral orchidectomy.

Did you face any challenges during the study?

The major challenge is designing high quality studies to answer clinically important questions without the use of randomised controlled trials. It would be unethical to withhold access to gender affirming care to a transgender control group and as such we must rely on observational data and causal inferences.

Save the date - Annual Scientific Meeting

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Calendar of Events and Webinars

AUSTRALIAN & NEW ZEALAND

ANZBMS Clinical Densitometry Course
2 – 3 April 2022 (Virtual)
More information here

Endocrine Society of Australia Seminar Meeting 2022
29 April – 1 May 2022
Launceston, Tasmania
More information here

Royal Australasian College of Surgeons Annual Scientific Congress 2022
2 – 6 May 2022
Brisbane, Queensland
More information here

Australian Rheumatology Association Annual Scientific Meeting
18 – 22 May 2022
Hybrid meeting with satellite hubs
More information here

Australian and New Zealand Society for Sarcopenia and Frailty Research Annual Scientific Meeting
7 – 9 July 2022
Brisbane, Queensland
Abstracts due 1 May 2022
More information here

INTERNATIONAL

BRS Oxford Clinical Training Course in Osteoporosis and Other Metabolic Bone Diseases
28 – 30 March 2022
Merton College, Oxford, UK
More information here

10th International Conference on Children's Bone Health
Abstracts due: 14 February 2022
2 – 5 July 2022
Dublin, Ireland
More information here

BRS Annual Scientific Meeting 2022
6 – 8 July 2022
Manchester, UK
Abstracts due 7 March 2022
More information here

49th International Musculoskeletal Biology Workshop (ORS)
23 – 27 July 2022
Snowbird, Utah
More information here

ASBMR Webinar Series
Monthly webinars
More information here

ECTS 2022
7 – 10th May 2022 (Helsinki, Finland)
More information here

ECTS Webinar Series
More information here

IO - ASBMR Rare Bone Disease TeleECHO
Delivered virtually the first Thursday of each month 15:00 EST
More information here

OI Foundation Osteogenesis Imperfecta TeleECHO clinic series
Delivered virtually the second Wednesday of each month 15:00 EST
More information here

ANZBMS-MEPSA-ANZORS 2022

SAVE THE DATE 1st – 4th AUGUST, 2022

Gold Coast Convention & Exhibition Centre

Combined Scientific Meetings of the Australian and New Zealand Bone and Mineral Society, The Molecular and Experimental Pathology Society of Australasia & The Australian and New Zealand Orthopaedic Research Society.

Abstract Submission Deadline: **Friday 3rd June**
Earlybird Registration Deadline: **Friday 3rd June**

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