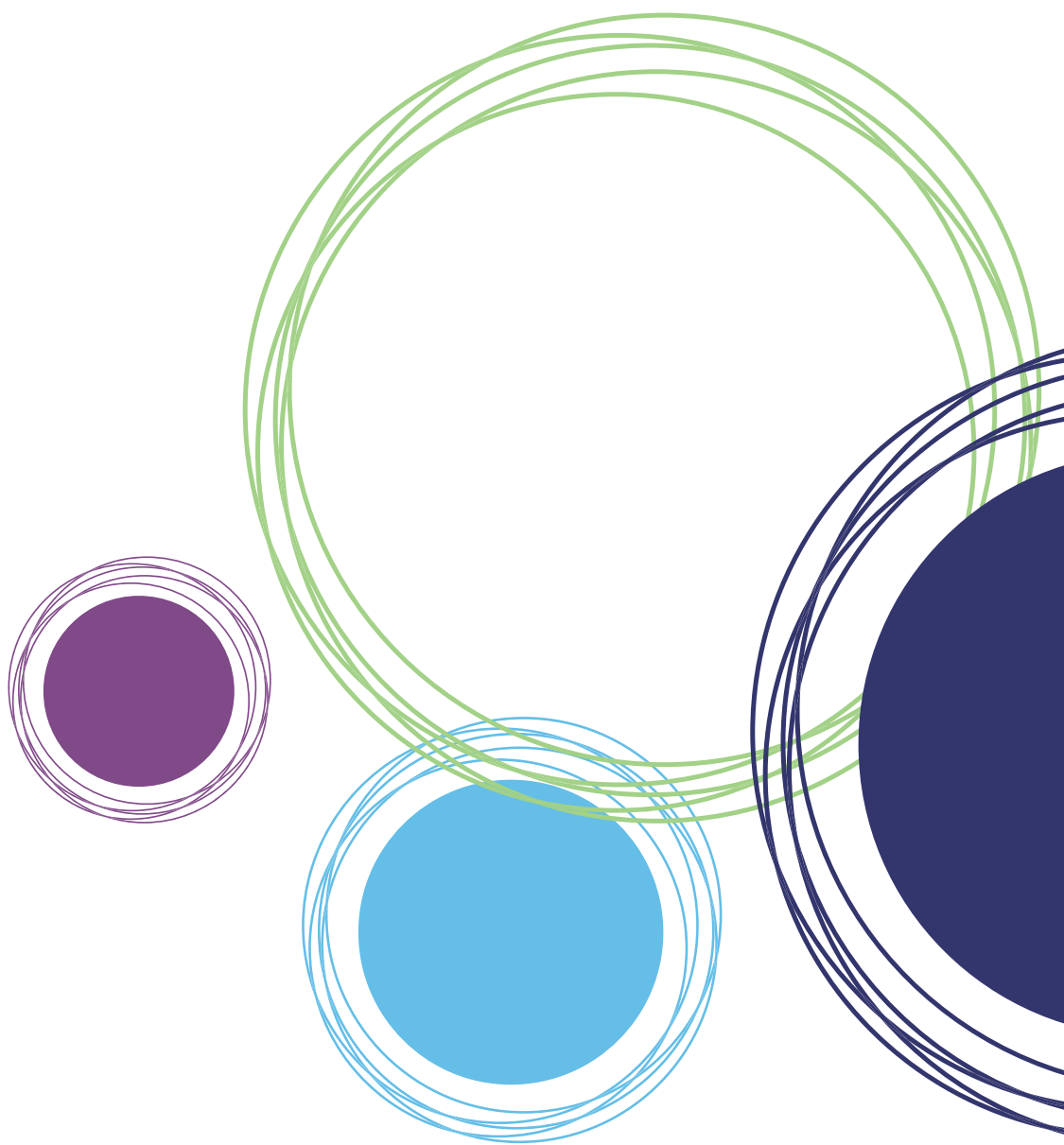


AUSTRALIAN INSTITUTE FOR  
MUSCULOSKELETAL SCIENCE – AIMSS  
**2017 ANNUAL REPORT**





# THE MISSION

To become one of the most important musculoskeletal research institutions worldwide.

# THE VISION

Our vision is improving health and well being of the communities in which we live and work through interactive and integrated ageing and musculoskeletal research and advocacy by building networks between research, clinicians and the general community to enhance the general understanding, treatment and prevention of musculoskeletal disease both locally and globally.





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# INTRODUCTION TO AIMSS

**AIMSS is a vibrant research institute which occupies an important area of the Western Centre for Health, Research and Education (WCHRE). Our mission is to develop and promote collaboration between our members, while focusing on performing high quality multi-disciplinary and translational research on ageing and musculoskeletal diseases.**

The Australian Institute for Musculoskeletal Science (AIMSS) is a national reference centre for research into ageing and disorders of bone, muscle and joint. AIMSS provides an innovative and collaborative environment for clinicians and researchers to translate biomedical research into direct health outcomes.

The Institute also promotes disease prevention with the establishment of community-based programs based on disease-specific interventions, including exercise and nutrition. AIMSS is a collaborative research Institute formed between Western Health, The University of Melbourne and Victoria University.

AIMSS seeks to cultivate long-term, collaborative relationships with other researchers, clinicians, research institutes, healthcare organizations, societies and community groups around the world.

## CORE FACILITIES

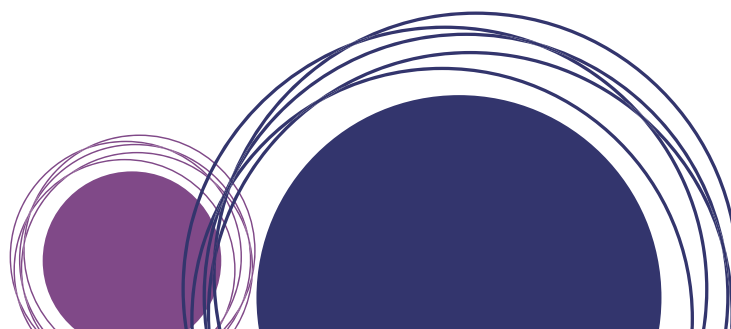
### Western CHRE

AIMSS is housed within state-of-the-art facilities at the Centre for Health Research and Education (CHRE) at Sunshine Hospital, a \$51.6 million development providing unprecedented opportunities for researchers from Western Health, Victoria University, and The University of Melbourne. The centre also provides training facilities for undergraduate and postgraduate doctors, and a centre for the education and training of nurses and allied health professionals.



### Musculoskeletal Imaging Unit

The Musculoskeletal Imaging Unit offers diagnostic tools to support a comprehensive platform for musculoskeletal health assessment including a DXA (Dual-emission X-ray absorptiometry) scan, used primarily to evaluate bone mineral density and total body composition, and pQCT (Peripheral Quantitative Computed Tomography) for measuring peripheral bone mineral density, volumetric bone mineral density, plus other measures such as the stress-strain index (SSI), the geometry of the bone, and muscle and fat mass. The bone density unit is available to both clinical and research patients.





### Gait and Balance Gym (Gabagym)

The Gait and Balance Gym is a novel model of care that provides comprehensive evaluation and treatment programs to improve gait and balance and to prevent falls and fractures in high risk patients. Our tools are directed to study the effects of exercise on muscle function, body composition, glucose uptake and bone density. It also provides the opportunity to develop exercise interventions into disease states such as sarcopenia and frailty. Both the Gait and Balance Gym (Gabagym) and our metabolic gym support research on exercise and exercise-based interventions. The Gabagym contains a broad suite of modern equipment including resistance and cardiotraining equipment, 3D virtual reality balance training, gait assessment mats, and wholebody vibration platforms.

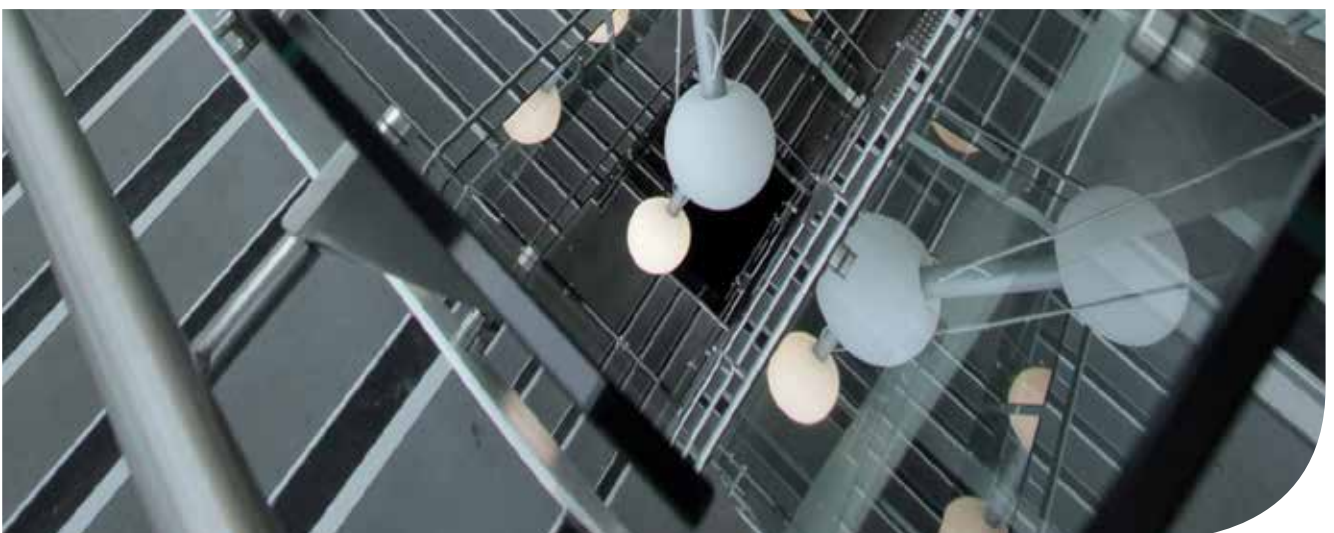


### Clinical trial rooms

AIMSS has access to eight clinical consulting rooms facilitating the large numbers of clinical trials conducted by our Institute. We have the capacity to run Phase II, III and IV clinical trials.

### Laboratories

AIMSS has access to state-of-the-art laboratory space within the WCHRE building including PC2 containment, cell culture, imaging, flow cytometry, bone histomorphometry, muscle biology and function, living cells imaging, and animal holding facilities.





# AIMSS STAKEHOLDERS



## Western Health

Western Health is a foundation partner of AIMSS. In addition, all hospitals belonging to Western Health (Sunshine, Footscray and Williamstown) are research hubs attached to AIMSS where internationally recognised high quality clinical trials are conducted.



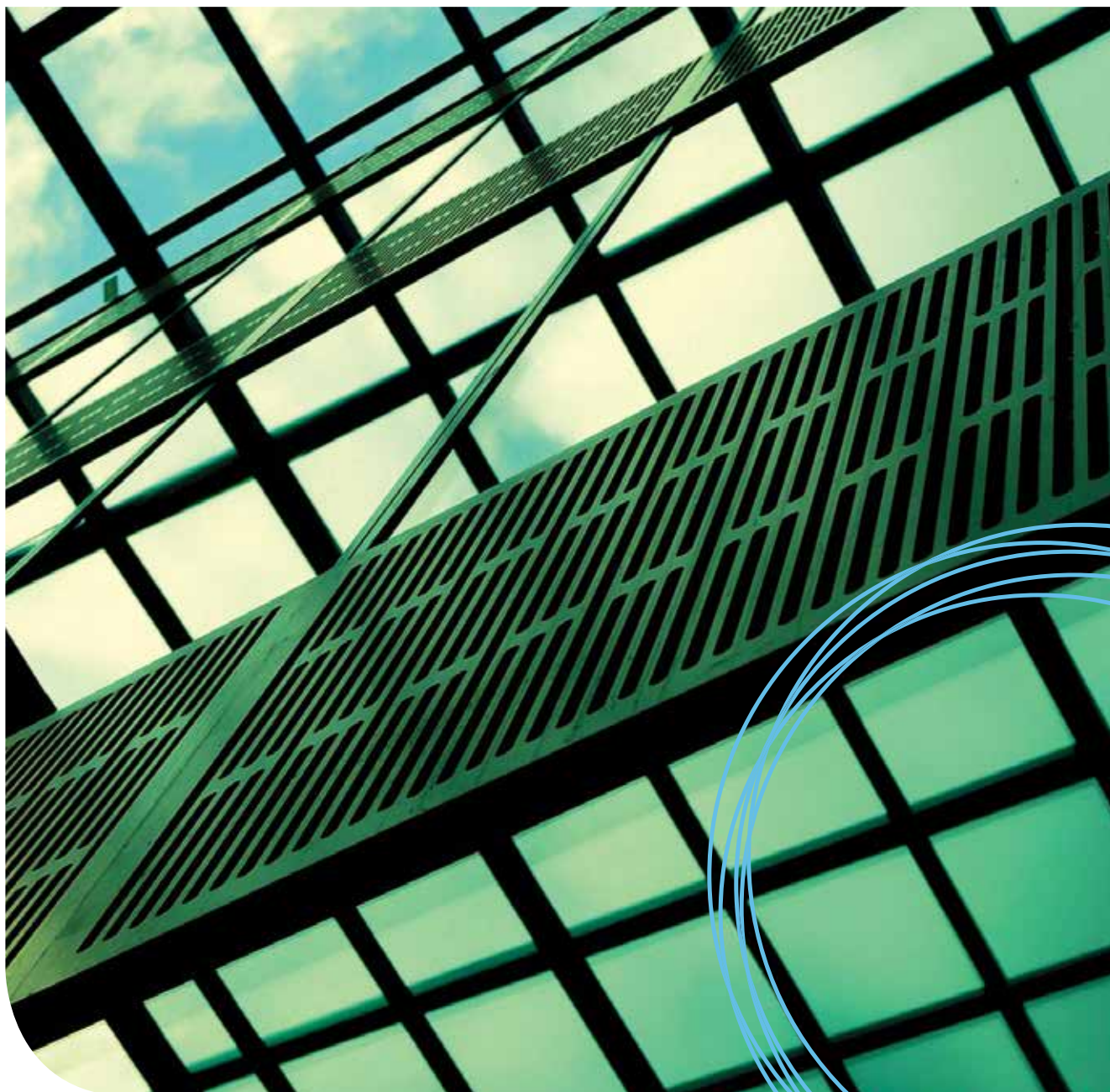
## Victoria University

Victoria University is a foundation partner of AIMSS through the School of Biomedical and Health sciences in the Faculty of Health, Engineering and Science.



## The University of Melbourne

The University of Melbourne is a foundation partner of AIMSS through the Department of Medicine-Western Health and Melbourne Medical School





# DIRECTOR'S REPORT



**Welcome to the Australian Institute for Musculoskeletal Science (AIMSS). Our Institute, which re-focused on ageing and musculoskeletal research in 2016, passed through a major re-structuring in 2017 while preparing to establish and maintain a solid research and funding strategy in 2018.**

Our renewed mission is to develop and promote collaboration between our members, while focusing on performing high quality multi-disciplinary and translational research on ageing and musculoskeletal diseases. Whereas we maintain our original mission to serve our local communities, results from our translational research activities go beyond our borders. AIMSS is now an internationally projected research institute with more than 70 academic members, and ongoing collaborations with more than 90 universities and research groups around the world.

We are active members of Biomed Victoria and many other consortia in Victoria and Australia that focus on translational research and the development and implementation of public health policies on musculoskeletal diseases. Internationally, we belong to the Research Ageing Network of the International Association of Geriatrics and Gerontology (IAGG) and the WHO, the Capture the Fracture Program of the International Osteoporosis Foundation (IOF), and of many other international initiatives dedicated to the promotion of healthy ageing and musculoskeletal research around the world.

In 2017, our members represented AIMSS and its stakeholders all over the world. We broke records in terms of abstract submissions, oral and poster presentations, and invited plenary speakers. The brand name "AIMSS" is now recognised as a leader in musculoskeletal research not only in Australia but around the world.

Our research goes from biomedical to clinical sciences. We also run a busy clinical trials unit and state-of-the-art imaging facilities with capacity to analyse any component of the musculoskeletal system from the cell to the organ. Our Gait and Balance Gym (Gabagym) is a unique research program in

which our participants are trained to maintain their independence, improve their quality of life, and prevent falls and fractures.

We also perform high-class research on population health, clinical epidemiology and health economics. Our activities and research programs are varied. AIMSS Program Directors are leaders in the field with strong networks of collaborators locally and around the world. Our Postgraduate programs, which are run by the University of Melbourne and Victoria University, bring many fantastic opportunities to students at all levels, and from many different nationalities.

Our international visiting scholar program was extremely successful in 2017 with 12 visiting scholars from 7 different countries from Europe and America. Our visiting scholars come from several backgrounds (physicians, allied health professionals, biomedical researchers) and develop a project during their stay at AIMSS. Thanks to this program, our teams published 15 papers reporting the results of our scholars' projects. For 2018, we expect more than 20 visiting scholars who will share the "AIMSS experience".

In summary, AIMSS is intended to become one of the most important musculoskeletal research institutes worldwide. We are a happy and very productive team of researchers working to improve the quality of life of our communities. This annual report summarises our accomplishments for 2017 and our plans for 2018, which are being fully and very successfully accomplished.

A handwritten signature in black ink, appearing to read 'G. Duque', written over a light blue grid background.

Professor Gustavo Duque  
**Director AIMSS**



# AIMSS STRUCTURE & GOVERNANCE FOR 2017

Director - **Prof Gustavo Duque**

Deputy Director - **Prof Alan Hayes**

Clinical Research Manager - **Ms Rita Kinsella**

Basic Sciences Coordinator - **Dr Lakshman Singh**

Coordinator Exercises Services - **Mr Steven Phu**

Laboratory Manager/Coordinator - **Mrs Varsha Lal**

Senior Development Manager - **Ms Gwen McMaster-Fay**



Prof Alan Hayes. Deputy Director AIMSS

## **AIMSS Advisory Committee**

A/Prof Alex Cochram - Western Health

Dr John Gallichio - Western Health

Dr Arlene Wake - Western Health

Prof Geoff McColl- University of Melbourne

Prof Warren Payne - Victoria University

Prof Karen Dodd - Victoria University.

Prof. Gustavo Duque - AIMSS

## **AIMSS Management Committee**

Professor Gustavo Duque - Chair

Prof Alan Hayes - Deputy Chair

Dr Lakshman Singh - Basic Sciences

A/Prof John Price - Post graduate programs

Dr Sharon Brennan-Olsen

Community & Population Services

Mr Bill Karanatsios - Research office- Western Health

Mrs Rita Kinsella - Clinical Research

Mr James Sorensen

Members in Training Representative

A/Prof Damian Myers - Basic Sciences

Ms Gwen McMaster-Fay - Minutes

## **AIMSS Scientific Advisory Council**

Prof Edward Janus

A/Prof Christine Rodda

A/Prof Keith Lim

Prof John Hamilton

Prof Kim Bennell

Prof Andrea Maier

A/Prof Shane Hamblin

Prof Natalie Sims

A/Prof Phong Tran

A/Prof Kris Gosh





# AIMSS PROGRAM DIRECTORS

**A Program Director is based at AIMSS, Western Health affiliated Hospitals or AIMSS Partner Research Institutes, and demonstrates a high level of commitment with the Institute. Optimally, a Program Director has sufficient funding to run his/her own research programs at AIMSS and also have graduate students under his/her supervision, which could be based at AIMSS.**

## **Prof Gustavo Duque**

(Director AIMSS) - ageing and osteosarcopenia - Biomedical - translational.

This is a strong translational research program aimed to identify the mechanisms of age related musculoskeletal diseases and frailty. This program focus' on the age-related changes in muscle and bone and their significance in the pathogenesis of sarcopenia, osteoporosis, osteosarcopenia and physical frailty.

## **Prof Alan Hayes**

(Deputy Director AIMSS) – Sarcopenia-Biomedical – Translational & Clinical

The overall program investigates the importance of muscle mass and function for healthy ageing. Loss of muscle mass and strength is an independent risk factor for morbidity and mortality in a range of diseases, such as diabetes and cancer, and of course ageing.

## **A/Prof John Price**

(Graduate Program Director- Basic Sciences)- Cancer & Musculoskeletal Biomedical & translational

The focus areas of the program are to better understand the biology and the key molecular determinants of cancer metastasis, especially as it relates to the bone, to identify novel therapeutics that can effectively target the metastatic cancer cell, and to investigate the pathways responsible for the negative impact of cancer therapeutics upon the musculoskeletal system.

## **Prof John Hamilton**

Joint-Basic Sciences

The main focus of Prof Hamilton's current research is the control of the development of cells of the monocyte/macrophage lineage and the function of this lineage in inflammatory disease and pain.

Prof Hamilton's work has specific relevance to arthritic disease and pain in particular, but also has wide implication for many aspects of inflammation and pathology and therefore many diseases. Several potential targets for drug intervention and four recent Phase II trials in rheumatoid arthritis have arisen from his work.

## **A/Prof Damian Myers**

Imaging-Biomedical & Translational

The study of the musculoskeletal system relies upon diverse imaging modalities such as X-ray imaging, Magnetic Resonance Imaging (MRI) and Positron emission tomography (PET). In basic science projects the key imaging technique used is microscopy and this includes many advanced forms of microscopy such as fluorescence imaging, live-cell imaging and confocal microscopy.

## **Dr Lakshman Singh**

(Director: Basic Sciences Research) -Bone- Biomedical & Translational

Under the Bone – we are working on a few interesting projects including the search for novel bone anabolic(s) (bone forming agent(s)), identifying bone disorders by measuring a rare population of cells (circulating osteoprogenitor cells – COP cells), and developing a novel animal model that could facilitate in understanding Inflammatory Bowel Disease (IBD) and association of bone degradation with this disease.

## **A/Prof Christine Rodda**

Musculoskeletal Research in Children & adolescents

Currently the musculoskeletal development division is being developed by A/Professor Christine Rodda, Paediatric Endocrinologist with establishes expertise in growth, skeletal development and vitamin D metabolism and Dr Rachel Duckham, a senior research scientist with considerable depth and breadth of experience in RCT's concerning children's musculoskeletal health.

## **A/Prof Keith Lim**

Joint-Clinical

The program has diverse research interests building on a solid clinical and teaching base of eight consultants, an advanced trainee registrar, a clinical/research fellow, a research clinical trials nurse, and research fellows/

## **Prof Kim Bennell**

Joint-Translational

Kim's research focuses on conservative non-drug management of osteoarthritis with an emphasis on the role of non-drug, non-surgical interventions in both prevention and management.

## **Prof Natalie Sims**

Bone-Biomedical-Translational

## **Dr Sharon Brennan-Olsen**

Social Epigenomics & Population Health/Musculoskeletal

This program of research investigates musculoskeletal diseases as a socioeconomic related health outcome: health and disease are shaped not only by biology, but also by several demographic, economic, policy and behavioural factors – 'the social determinants of health'. This unique program of research also investigates the meeting of the 'social' and the 'biological' in musculoskeletal disease.



# AIMSS PROGRAM DIRECTORS

## **Dr Ebrahim Bani Hassan**

Imaging-Clinical

This relatively newly established program that is growing fast and includes multitudes of projects that involve state-of-the-art image acquisition and analyses. The centre also provides services to the referrals by external departments and collaborators that want to assess their patients and/or research subjects for musculoskeletal health or losing/gaining weight and fat mass.

## **Prof Andrea Maier**

Ageing-Biomedical & Clinical

## **A/Prof Shane Hamblin**

Endocrinology-Clinical

The Endocrinology & Diabetes Unit at Western Health provides a broad clinical service covering type 1 and type 2 diabetes. Metabolic bone studies include the effect of parathyroidectomy on a number of outcomes in Western Health patients who have a variety of ethnic backgrounds and often low Vitamin D levels, collaborative research with Prof Duque on the effects of parathyroidectomy in frail older persons (Frail-pathy study), obstetric endocrinology and studies of trimester specific normal thyroid function reference intervals in the Western Health population.

## **A/Prof Kris Ghosh**

Ageing-Clinical

Our objective is to achieve excellence in the continuum of aged care in the western suburbs of Melbourne by working with, and for, the frail and elderly. We aim to promote healthy, active, productive and successful ageing through teaching and research in geriatric medicine.

Being one of the largest aged care and subacute services in Australia provide us the opportunity to be at the fore front of clinical research in collaboration with AIMSS and other institutions.

## **Prof Tissa Wijeratne**

Neurosciences and the Musculoskeletal System: Clinical and Translational

This group does various age related clinical research (on dementia care, falls and mobility, chronic wound care, venous leg ulcers, geriatric rehabilitation) and also quality assurances projects. Being one of the largest aged care and subacute services in Australia provides us the opportunity to be at the forefront of clinical research in collaboration with AIMSS and other institutions.

It is also interested in basic science, clinical and translational research with a particular interest in small blood vessel disease (brain, eye, spinal cord, peripheral nerves, muscles and bones) which link neurosciences-musculoskeletal system and chronic diseases such as diabetes, osteoporosis, chronic renal disease, chronic heart failure and rheumatological disorders such as chronic osteoarthritis.

## **A/Prof Phong Tran**

Bone-Surgical

The department of orthopaedic surgery at Western Health is one of the busiest orthopaedic departments in Victoria. Over 3000 orthopaedic operations are performed per year and 24000 clinic appointments. Our range of services include both elective and trauma, in adult and paediatric surgery. Our research is clinically focused, and aims at improving the outcome of our patients.

## **Mrs Rita Kinsella**

(Clinical Research Manager)  
Musculoskeletal and Allied Health

The Musculoskeletal and Allied Health program focuses on investigator initiated research trials with a specific emphasis on translational and tangible outcomes aimed at improving the health and wellbeing of those from both the hospital and wider community in which we serve.

## **A/Prof Kulmira Nurgali-**

Regenerative Medicine- Stem Cells-  
appointed 2017

This interdisciplinary program joins together researchers developing novel therapies and technologies to restore structure and functions of tissues and organs affected by diseases, injury and age. Our research aims to reveal therapeutic potential and mechanisms of action of mesenchymal stem cells including circulating osteoprogenitor (COP) cells for the treatment of osteoporosis, sarcopenia, bone frailty and injury, damaged cartilage, muscular dystrophy, enteric neuropathy associated with inflammatory bowel disease and damage to the organs caused by anti-cancer chemotherapy.

## **A/Prof Itamar Levinger**

Sarcopenia/Clinical  
appointed 2017

The main aim of the Sarcopenia-Clinical Program is to identify novel pharmacological and non-pharmacological (exercise and diet) interventions to prevent, manage and treat sarcopenia and its associated comorbidities and improve the quality of life of people with sarcopenia. The program brings together a wide variety of disciplines and expertise including exercise science, physiology, medicine, cardiology and endocrinology.



# PROJECT DIRECTORS

A Project Director is responsible for one or several research projects within the priority research areas at AIMSS. The Project Director does not have to be based at AIMSS but should commit to perform at least 25% of his/her project at AIMSS or at one of Western Health affiliated Hospitals. Project Directors will be under the guidance and supervision of a Program Director according to his/her areas of expertise.



**Dr Emma Rybalka**

Sarcopenia:  
Biomedical & translational

Basic science projects focused on investigating the molecular regulators of muscle growth, the influence of mitochondrial dysfunction in muscle wasting conditions, fatty acid signalling in obesity and diabetes, and producing suitable models to investigate sarcopenic obesity. Translational projects investigate nutritional and pharmacological compounds to treat sarcopenia, preclinical evaluations for muscular dystrophy therapies, and applications to improve muscle coordination and decrease neuromuscular fatigue. The research team use a wide range of skills, particularly in the basic science areas of cell culture and animal models to identify the mechanisms behind the clinical conditions being investigated, and undertaking pre-clinical testing of therapeutic compounds. Human-based evaluations are performed in collaboration with other members of AIMSS as well as external collaborators to translate findings into clinical practice.



**Dr Rachel Duckham**

Musculoskeletal development

The specific areas of focus within this division comprise: Musculoskeletal development during childhood and adolescence in both health and disease, Effects of Vitamin D deficiency on musculoskeletal development, genetic abnormalities of vitamin D metabolism, Embryonic musculoskeletal development and imprinting (this area is yet to be established).



**Prof Nigel Stepto**

Cancer & the Musculoskeletal System

The focus areas of the program are to better understand the biology and the key molecular determinants of cancer metastasis, especially as it relates to the bone; to identify novel therapeutics that can effectively target the metastatic cancer cell; and to investigate the pathways responsible for the negative impact of cancer therapeutics upon the musculoskeletal system.



**A/Prof Andrew McAinch**

Sarcopenia:  
Biomedical & translational

The research team use a wide range of skills, particularly in the basic science areas of cell culture and animal models to identify the mechanisms behind the clinical conditions being investigated, and undertaking pre-clinical testing of therapeutic compounds. Human-based evaluations are performed in collaboration with other members of AIMSS as well as external collaborators to translate findings into clinical practice.



**Dr David Scott**

Imaging-Clinical

This program includes multitudes of projects that involve state-of-the-art image acquisition and analyses. This centre also provides services to the referrals by external departments and collaborators that want to assess their patients and/or research subjects for musculoskeletal health or losing/gaining weight and fat mass.



**Dr Craig Goodman and Dr David Roufett**

Sarcopenia: Biomedical & Translational



The research team use a wide range of skills, particularly in the basic science areas of cell culture and animal models to identify the mechanisms behind the clinical conditions being investigated and undertaking pre-clinical testing of therapeutic compounds. Human-based evaluations are performed in collaboration with other members of AIMSS as well as external collaborators to translate findings into clinical practice.



# MEMBERS IN TRAINING

Students/trainees under the supervision of a Program or Project or Director are automatically considered Member-in-Training of AIMSS with the same privileges and responsibilities than the other members of AIMSS. To apply to a Member-in-Training Membership, the Member's training program is expected to last at least 6 months. The Member-in-Training is nominated by his/her Supervisor and is based at AIMSS or at one of Western Health affiliated Hospitals.



Members In training including Honours, UROP, PhD and Masters students from the University of Melbourne and Victoria University and Clinical trainees from Western Health.

Doctoral students were active, presenting their work at the Australian Physiological Society, Australian Society for Medical Research, the 10th International Conference on Cachexia, Sarcopenia and Muscle Wasting, Rome and ANZSSFR

## Members in Training - 2017

**James Sorensen, Jesse Zanker, Robin Wilson, Ben Butcher, Cara Timpani, Jessica Clarke, Michael Bullen, Shakya Dayaratne, Ahmed Mohan, Danielle Debruin, Tabitha Cree, Joseph Polidano, Jack Bolton, Sarah Hoskins, Darci Green, Shilpa Sharma, Rhian Stavely, Alba Moreno, Nick Freedman, Karen Hill, Cassandra Smith, Emily Walker, Abdullif Dib, Natalie Hyde, Charlett Giuliani, Dean Campelj, Lucy Troup, Kelly Fleur**



# AIMSS SEMINAR SUMMARY

Our AIMSS Seminar Series which were implemented in 2016 to bring worldwide respected leaders in the field to present their results and to develop new potential collaborations with our local members, has been a success in terms of content and audiences.

**March 2017: Prof John Hamilton - The University of Melbourne**

"A new GM-CSF-dependent pathway in inflammation".

**April 2017: Dr David Scott - The University of Melbourne and Monash University**

Sarcopenic obesity: Effects on physical function, falls and fracture risk in older adults.

**May 2017: Prof Michael McClung - Oregon (USA) and Australian Catholic University**

"Managing Osteoporosis in Challenging Populations".

**June 2017: Prof Astrid Fahrleitner Pammer - University of Graz (Austria)**

"Why Teriparatide is different? The need for an anabolic treatment in severe osteoporosis".

**July 2017: Dr Paul Gregoveric - Baker Institute**

"Using gene delivery technologies to study and treat skeletal muscle wasting and frailty"

**August 2017: Prof Gordon Wallace - University of Wollongong**

"Advances in Biomaterials and 3D Bioprinting: Bringing New Dimensions to Experimental Biology".

**September 2017 Prof Kerrie Sanders - Australian Catholic University and University of Melbourne**

"Vitamin D and Osteoporosis"

**October 2017: Prof Koen Milisen - Leuven University (Belgium)**

AIMSS Symposium keynote speaker. "Implementing falls prevention strategies: inspiring examples from Flanders (Belgium)".

**November. 2017 : Prof Manuel Montero Odasso - University of Western Ontario (Canada)**

"Frailty and cognitive impairment in older adults: Fellow travellers or partners in crime?"



Dr Ebrahim Bani Hassan and Prof Michael McClung at the refreshments after the May Seminar and Prof Manuel Montero-Odasso presenting at the November seminar



# AIMSS SYMPOSIUM

The second AIMSS Symposium was held on Monday 22nd October 2017. This Symposium was aimed to provide a platform for our local researchers to present their results. It was also an excellent networking opportunity for our members and visitors.

Professor Koen Milisen was the invited Keynote Speaker presenting both at the opening symposium and also at the Sub Acute and Aged Care meeting during Western Health Research Week on the Wednesday.

An informal "Meet the Professor Breakfast" provided the opportunity for professionals from all areas of Aged Care from AIMSS, Western Health, Victoria University and University of Melbourne to share time with Prof Milisen and collaborate.



## AIMSS RESEARCH WEEK PRIZES

### **BEST POSTER PRESENTATION:**

**Effects of vitamin D supplementation on skeletal muscle function and fatigue in sedentary and physically active mice.**

**Author/s:** Danielle Debruin, Rybalka Emma, Goodman Craig, Hayes Alan

### **BEST PODIUM PRESENTATION:**

**Association between limits of stability and lower limb function, static balance and fear of falling in community dwelling older adults**

**Author/s:** Steven Phu, Kinsella Rita, Vogrin Sarah, Al Saedi Ahmed, Duque Gustavo

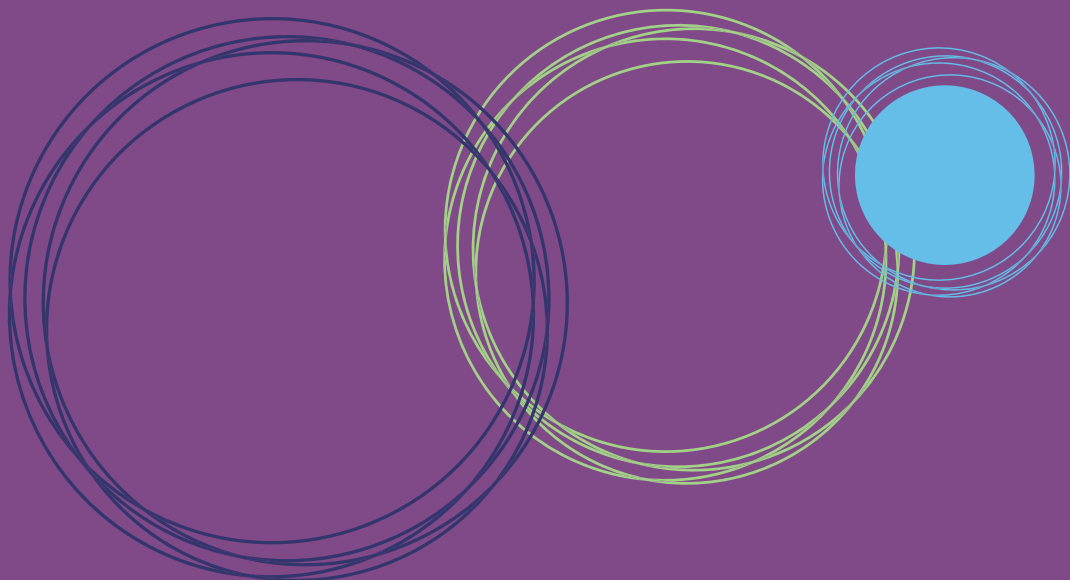
### **MOST PUBLISHED MEMBER OF AIMSS 2016:**

**Dr Sharon Brennan-Olsen**

**Awarded at the AIMSS Symposium 2017**



Dr Sharon Brennan-Olsen Most published Author 2016 with Prof Gustavo Duque





# AIMSS SYMPOSIUM



Dr Rachel Duckham. Podium presenter

**MONDAY 23<sup>th</sup> OCTOBER 2017**

**AIMSS SESSION**

**3:00PM - 5:00PM**

**(AUDITORIUM WCHRE SUNSHINE)**

<b>MONDAY 23 OCTOBER 2017</b>		
<b>CHAIR: Professor Gustavo Duque Director AIMSS</b>		
<b>TIME</b>	<b>TITLE</b>	<b>SPEAKER</b>
3:00pm - 3:10pm	Introduction	<b>Prof Gustavo Duque</b> Director AIMSS
3.10pm - 4:00pm	<b>KEYNOTE ADDRESS:</b> <b>Title: Implementing falls prevention strategies:</b> <b>inspiring examples from Flanders (Belgium)</b>	<b>Professor Koen Milisen</b> University of Leuven, Belgium
<b>PODIUM PRESENTATIONS</b>		
4:00pm - 4:10pm	Adenylosuccinic Acid Therapy for the Treatment of Duchenne Muscular Dystrophy: A Pre-clinical Evaluation of Safety and Efficacy	<b>Emma Rybalka</b>
4.10pm - 4.20pm	Effects of long-term sedentary behaviour on the cortical bone mass and distribution during growth: The HAPPY bone Study	<b>Rachel Duckham</b>
4.20pm - 4.30pm	BGP-15 protects against oxaliplatin-induced skeletal myopathy and mitochondrial reactive oxygen species production in mice	<b>James Sorensen</b>
4:30pm - 4:40pm	Association between limits of stability and lower limb function, static balance and fear of falling in community dwelling older adults	<b>Steven Phu</b>
4:40pm - 4:50pm	Sarcopenic obesity is associated with lower tibial cortical area and thickness in community-dwelling older adults	<b>David Scott</b>
4:50pm - 5:00pm	Arthritis diagnosis and symptoms are positively associated with specific physical job exposures in lower and middle-income countries: Cross-sectional results from the World Health Organization's Study on global AGEing and adult health (SAGE)	<b>Darci Green</b>
5:00pm - 6:30pm	<b>Dept of Medicine- WH Research Expo</b> <b>ATRIUM WCHRE</b>	



# BREAKFAST INVITE

As part of AIMSS participation in the Western Health Research week an informal breakfast was held for affiliated health care professionals to meet and discuss current care for frail older persons and specifically delirium, falls and restraint use and development of geriatric care models with visiting key note speaker at the 2017 AIMSS spelling Symposium Prof Koen Milisen, Professor of Care for Older Persons at the Department of Public Health and Primary Care (Belgium), and Clinical Nurse Scientist at the Division of Geriatric Medicine at the University Hospital of Leuven.

Many attended the opportunity to discuss current care for frail older persons and specifically delirium, falls and restraint use and development of geriatric care models.



You are invited to our **AIMSS Symposium 2017:**  
“Implementing falls prevention strategies:  
inspiring examples from Flanders (Belgium)”



**Guest Speaker: Dr Koen Milisen**  
PhD, RN

Dr. Koen Milisen (PhD, RN) is full Professor of Care for Older Persons at the Department of Public Health and Primary Care, KU Leuven (Belgium) and Clinical Nurse Scientist at the Division of Geriatric Medicine at the University Hospitals of Leuven (Belgium). He has extensive clinical, teaching and research expertise in the care for frail older persons. More specifically his work focuses on delirium, falls and restraint use; and on the development of geriatric care models. Dr. Milisen is president of the Flemish Center of Expertise for Falls and Fracture Prevention, president of the UZ Leuven Delirium Working Group, council member of the European Delirium Association and section editor of section editor of BMC Geriatrics.

This presentation will provide an overview about good clinical practice initiatives and implementation research as coordinated by the Centre of Expertise for Fall & Fracture Prevention in Flanders (Belgium). Dr. Milisen has published over 180 papers in peer-reviewed journals. Publication list available at: <https://lirias.kuleuven.be/cv?u=U0011583>

## Details

Monday 23rd October 2017

3:00 - 4:00pm (followed by podium presentations)

Western Centre for Health Research and Education (WCHRE)

Auditorium – Level 1

176 Furlong Road, St. Albans, VIC

Enquiries: [gwen.mcmaster@unimelb.edu.au](mailto:gwen.mcmaster@unimelb.edu.au)



# WESTERN HEALTH RESEARCH WEEK 2017— AIMSS POSTER PRESENTATION ABSTRACTS

1. Project Title: A New Flow Cytometry Method to Quantify Lamin A Expression in Circulating Osteoprogenitor (COP) Cells Author/s: Ahmed Al Saedi<sup>1,2</sup>, Piumali Gunawardene<sup>3,4</sup>, Sandra Bermeo<sup>3,5</sup>, Lakshman Singh<sup>1,2</sup>, Steven Phu<sup>1,2</sup>, Pushpa Suriyaarachchi<sup>3</sup>, Gustavo Duque<sup>1-3</sup>
2. Project Title: Sarco-osteopenia vs. Sarco-osteoporosis: Towards a Unified Definition of Osteosarcopenia Author/s: Gustavo Duque <sup>1, 2</sup>, Pushpa Suriyaarachchi<sup>3</sup>, Ebrahim Bani Hassan <sup>1, 2</sup>, Ahmed Al Saedi <sup>1, 2</sup>, Carmen Curcio<sup>2</sup>, Fernando Gomez <sup>2,4</sup>
3. Project Title: A novel form of congenital rickets due to a recurrent gain of function mutation in CYP3A4 Author/s: C.P. RODDA<sup>1</sup>, M. Levine<sup>2</sup>, J.D. Roizen<sup>2</sup>, M.K. Javaid<sup>3</sup>, P.R. Ebeling<sup>4</sup>, H. Nguyen<sup>4</sup>, P. Dewez<sup>5</sup> and N.J Shaw<sup>6</sup>
4. Project Title: Is there a social gradient of sarcopenia? A meta-analysis and systematic review protocol Author/s: GREEN D, FREDMAN N, RIZVI A, DUQUE G, BRENNAN-OLSEN S.
5. Project Title: Fat Distribution in Elderly Men: Metabolic and Inflammatory Profiles Author/s: BANI HASSAN E. <sup>1,2</sup>; Demontiero O. <sup>3</sup>; Ng A. <sup>4</sup>; Duque G. <sup>1,2</sup>
6. Project Title: Doxorubicin induces dose-dependent cachexia in mice Author/s: <sup>12</sup>Sorensen J. C., <sup>12</sup>Butcher B, <sup>12</sup>Timpani C. A., <sup>123</sup>Hayes A., <sup>123</sup>Rybalka E.
7. Project Title: Osteoanabolic action of Picolinic Acid in Human Mesenchymal Stem Cells: Effect on canonical wnt/beta-catenin pathway Author/s: Singh L
8. Project Title: Is there an independent association of muscle mass and strength on bone measures in school-aged children? The vitamin D in pregnancy study Author/s: Hyde NK, Wark JD, BRENNAN-OLSEN SL, Hosking SM, Pasco JA
9. Project Title: Targeting eotaxin-1 and CCR3 receptor alleviates enteric neuropathy and colonic dysfunction in guinea pig TNBS colitis Author/s: FILIPPONE R, Jovanovska V, Robinson AM, Stavely R, Apostolopoulos V, Nurgali K
10. Project Title: A spotlight on preventing falls and fractures in older adults: The Osteosarcopenia Roadshow<sup>©</sup> Author/s: BRENNAN-OLSEN SL, Phu S, Bani Hassan E, Duque G
11. Project Title: Osteogenesis and Adipogenic potential of Mesenchymal Stem Cells derived from Winnie mice models of Spontaneous Chronic Colitis: implications for IBD-associated Osteopenia Author/s: Sharma S, Nurgali K, Sharma S, Duque G.
12. Project Title: The correlation between Kellgren Lawrence radiographic score and response to conservative treatments in patients with osteoarthritis of the knee. Author/s: Keith L, Albert L, ZHEYI Z
13. Project Title: The anabolic effect of Picolinic acid on Wnt signalling pathway in vitro Author/s: Ahmed Al Saedi <sup>1,2</sup>, Lakshman Singh <sup>1,2</sup>, Gustavo Duque <sup>1,2</sup>
14. Project Title: Benefits of Fatty Acid Synthase Inhibition: Impacts of Lipotoxicity in Myoblasts. Author/s: Lam B
15. Project Title: Effects of vitamin D supplementation on skeletal muscle function and fatigue in sedentary and physically active mice Author/s: DEBRUIN D, Rybalka E, Goodman C, Hayes A
16. Project Title: The association between lean tissue and the risk for bowel cancer Author/s: GREEN D, BRENNAN-OLSEN S, WILLIAMS L, SAJJAD M, HOLLOWAY K & PASCO J.
17. Project Title: Marrow Fat associations with Visceral and Subcutaneous Fat in Elderly Men Author/s: E. BANI HASSAN <sup>1,2</sup>, O. Demontiero <sup>3</sup>, A. Ng <sup>4</sup>, G Duque <sup>1,2</sup>
18. Project Title: Mid-Thigh Muscle and Bone Masses are Sensitive Indices of Bone and Muscle Loss in Older Fallers Author/s: BANI HASSAN E <sup>1,2</sup>; Suriyaarachchi P <sup>3</sup>; Boersma D <sup>3</sup>; Duque G <sup>1,2</sup>



# WESTERN HEALTH RESEARCH WEEK 2017— AIMSS POSTER PRESENTATION ABSTRACTS

19. Project Title: A Novel HSF1 Inhibitor as a Potential Anti-cancer Therapeutic.  
Author/s: POLIDANO J, Nguyen C.H, Myers D.E, Wilce J.A, and Price J.T
20. Project Title: The role of circulating osteoprogenitor (COP) cells in osteosarcopenic obese older individuals  
Author/s: Mr. Michael Marazita, Prof. Gustavo Duque, Ms. Rita Kinsella, Dr. Lakshman Singh
21. Project Title: Is there an independent association of muscle mass and strength on bone measures in school-aged children? The vitamin D in pregnancy study  
Author/s: Hyde NK, Wark JD, BRENNAN-OLSEN SL, Hosking SM, Pasco JA
22. Project Title: Mesenchymal Stem Cell Therapy Prevents Alterations To Mucosal Serotonin Release Kinetics In Mice With Spontaneous Chronic Colitis  
Author/s: STAVELY R, Fraser S, Sharma S, Rahman A A, Stojanovska V, Sakkal S, Apostolopoulos V, Bertrand P and Nurgali K.
23. Project Title: Health literacy and the uptake of osteoporosis prevention recommendations in women  
Author/s: Hosking SM, Pasco JA, Beauchamp A, Buchbinder R, BRENNAN-OLSEN SL
24. Project Title: Fractures in indigenous compared to non-indigenous populations: A systematic review of rates and aetiology  
Author/s: BRENNAN-OLSEN SL, Vogrin S, Kinsella R, Leslie WD, Toombs M, Duque G, Hosking SM, Holloway KL, Doolan BJ, Williams LJ, Page RS, Pasco JA, Quirk SE
25. Project Title: Geographic region, socioeconomic position and the utilisation of primary total joint replacement for hip or knee osteoarthritis across western Victoria: A cross-sectional multilevel study of the Australian Orthopaedic Association National Joint Replacement Registry  
Author/s: BRENNAN-OLSEN SL, Vogrin S, Holloway KL, Page RS, Sajjad MA, Kotowicz MA, Livingston PM, Khasraw M, Hakkennes S, Dunning TL, Brumby S, Pedler D, Sutherland A, Venkatesh S, Williams LJ, Duque G, Pasco JA





# RESEARCH MEETINGS

This is an invaluable information sourcing meeting, together with opportunities to meet and network with AIMSS members on a monthly basis. Meetings in 2017 included guest speakers

**Silvio Tiziani:**

**Chief operating officer Australian Regenerative Medicine Monash University - ARMI,**  
"CCRM Australia - Enhancing Commercialisation of Australian Regenerative Medicine" .

A visit to the **Australian Synchrotron**, see report in detail below.

**Dr Paul Barrett, Business Development Director University of Melbourne**

on "Commercialisation of Medical Discoveries ,and Members In Training presentations".

## "THE USEFULNESS OF SYNCHROTRON LIGHT IS LIMITED ONLY BY OUR IMAGINATION"

On June 16th 2017 AIMSS members including many Members in Training attended an informative and educational guided tour of the Australian Synchrotron. Organised by AIMSS Program Director in Imaging, A/Prof Damian Myers. The tour provided much incentive and interest.

The Australian Synchrotron (AS) is a major research facility that has capabilities relevant to all science disciplines. Recent reports of analysis of art works and novel findings in archaeology and the

earth sciences demonstrate the breadth of the capabilities at the Australian Synchrotron. The AS falls under the authority of the Australian Nuclear Science Technology Organisation (ANSTO) which is the peak scientific facility in Australia.

The Australian Synchrotron is a 3rd generation synchrotron and has many scientific and medical imaging applications. In particular, the Imaging and Medical Beamline (IMBL) was the last beamline completed (9 beamlines in total at the moment) and enables

advanced phase-contrast X-ray imaging, CT and microbeam radiation therapy (MRT); these are just a few of the applications being developed at this important facility.

Prof Andrew Peele – AS Director, Prof Michael James – AS Head of Science, Dr Daniel Hausermann – AS Principal Scientist of the IMBL, and Dr Andrew Stevenson – Lead Scientist on the IMBL and Principal Scientist with CSIRO (X-Ray Physics and Instrumentation) welcomed the AIMSS visit.





# BULLETINS

are published quarterly to profile activities and the AIMSS team



Newsletter of the Australian Institute for Musculoskeletal Science (AIMSS)

Volume 2, Issue 1  
January-March 2017

Western Health

VICTORIA UNIVERSITY  
MELBOURNE AUSTRALIA

THE UNIVERSITY OF  
MELBOURNE

## My AIMSS

Hello, my name is **Professor Alan Hayes** and I am the Deputy Director of AIMSS and also a Program Director in Sarcopenia – Biomedical and translational. I have been involved in AIMSS since its formation and location at the Western Centre for Health Research and Education (WCHRE). AIMSS was well supported financially by The University of Melbourne, and formed a key platform for Victoria University's application for Collaborative Research Network funding. With Western Health seeing AIMSS as its flagship institute, the three entities supported AIMSS and were keen to advance research in the areas of bone, muscle and joint. I have had the opportunity to work with some fabulous people from Western Health's Physiotherapy department and develop strong collaborative partnerships with a number of colleagues, both internal and external through the strong networking that has occurred.



Unfortunately, the three areas of bone, muscle and joint were exactly that, three mostly separate areas, and with subsequent staff movements, it is fair to say momentum was lost. However, with change comes opportunity, and the arrival of Prof. Gustavo Duque has seen a reinvigoration of AIMSS with a renewed enthusiasm for it to be the best musculoskeletal institute in Australia (I would like to aim for the world, but Gustavo has said one step at a time!). AIMSS has provided me new opportunities for collaborative grants and an involvement in sponsored clinical trials. Importantly, the outward face of AIMSS has made huge inroads and it is now a member of BiomedVic and the prestigious International Association of Geriatrics and Gerontology (IAGG) Global Ageing Research Network. I am looking forward to presenting a symposium and oral presentation at the IAGG conference in July this year. AIMSS is also providing excellent support for its members and members in training (students), including travel grants, access to a Biostatistician and Seed Grants. With new income generating initiatives to further support research, a number of new Project Directors as well as newly dedicated AIMSS staff, and the excellent facilities available at the WCHRE, in 5 years' time I am to be confidently able to say I am part of AIMSS, the best musculoskeletal institute in Australia!

## From our Director

### AIMSS is busy

"Busy" is the most frequently mentioned word at AIMSS these days. In addition to their NHMRC applications, our members have been dedicated to increasing their research productivity, expanding their collaborations, recruiting new students, and obtaining funding from multiple sources.



Following the well-known principle of "publish or perish", our members have already published 21 peer-reviewed papers in 2017 (a 200% growth compared with March 2016). In addition, we had a very active participation at the World Congress of Osteoporosis in Florence (Italy), with three symposia and several papers and poster presentations. The First Australian and New Zealand Conference for Sarcopenia and Frailty Research, which was organised by AIMSS, was a total success. The quality of the presentations can be seen in a special issue of the Australasian Journal on Ageing (<http://online.library.wiley.com/doi/10.1111/ajag.2017.36.issue-S1/issue-toc>). In summary, we are happily busy, and proud of sharing our accomplishments with you.

**Prof. Gustavo Duque – Director AIMSS**



Newsletter of the Australian Institute for Musculoskeletal Science (AIMSS)

Volume 2, Issue 3 September–November 2017

Western Health

VICTORIA UNIVERSITY  
MELBOURNE AUSTRALIA

THE UNIVERSITY OF  
MELBOURNE

## My AIMSS :

**Prof Tissa Wijeratne: Program Director Translational Clinical Neurosciences-musculoskeletal system research.**

Hello, my name is Professor Tissa Wijeratne and I am the newest addition to the busy and happy family of AIMSS, as the program director of translational clinical neurosciences-musculoskeletal system research. I am also the Chair of Western Health's Department of Neurology, which runs the busiest neurology/stroke inpatient and outpatient services in Victoria. It is a privilege to join this amazing family of super-talented academics who are exceptionally nice people. I am sure our family is on the way to bring the very best of translational research to the bedside.



Our recent publication in *Lancet Neurology* ([http://www.thelancet.com/journals/lanneu/article/PIIS1473-4422\(17\)30299-5/fulltext](http://www.thelancet.com/journals/lanneu/article/PIIS1473-4422(17)30299-5/fulltext)) revealed that neurological disorders are the most common cause of disability worldwide. Right now, almost 3 billion people are disabled because of such disorders. There is a strong relationship between the brain and the musculoskeletal system. Our team is passionate about promoting better brain health and better musculoskeletal health through translational collaborative research. Apart from my academic, clinical and research activities in Melbourne, I maintain active full Professorial appointment in a leading Sri Lankan University and have been an active member of many global committees of the World Federation of Neurology for nearly a decade now. I am extremely pleased to announce that the inaugural Ted Munst award of the World Federation of Neurology (WFN) was presented to me, for my contributions to educational activities (particularly to our work supporting the development of young neurologists within the WFN). Ted Munst was the Emeritus Professor of Neurology at the Tufts University School of Medicine, and is regarded as the father of medical education in neurology. I am married with two children. I thoroughly enjoy bushwalking and birding in my youth. I was a journalist. I am a big fan of social media, currently leading the social media team at AIMSS and the social media team of the World Federation of Neurology.

## From our Director

### AIMSS is "Synchronic"

As part of our off-campus activities for our members, we organised a visit to the Australian Synchrotron. This experience was very illustrative and exciting for everybody. The Australian Synchrotron is Australia's largest and arguably most successful scientific user facility, benefiting over 3000 researchers from academia, medical research institutes, government and other research organisations, and industry. The facility has now been directly involved in the generation of more than 700 publications in refereed journals.



After our visit, AIMSS and the Synchrotron have become research partners. Based on our strength in musculoskeletal research, AIMSS will initiate several important collaborations and agreements with the Synchrotron aimed to facilitate the development of new imaging techniques for musculoskeletal research in animals and humans. AIMSS will promote and support applications to access the services available at the Synchrotron. In addition, a specific seed grant will be created to fund projects involving both AIMSS members and the Synchrotron. This type of partnership is a clear example of our capacity building strategy. The outcomes of this strategy could take a couple of years. In the meantime, stay synchronised.

**Prof. Gustavo Duque – Director AIMSS**



## Our Team Member of the Month



Steven Phu is an Accredited Exercise Physiologist and Research Assistant with strong foundations in AIMSS, the University of Melbourne and Western Health. His role encompasses work in both clinical and research areas.

As an exercise physiologist, Steven is responsible for conducting assessments at the Falls and Fractures Clinic and implementing exercise programs for falls prevention at the Gait and Balance Gym (GabaGym). Active areas of research include the effect of various programs on falls and fracture prevention, sarcopenia and frailty in older adults.

Having recently moved to Melbourne from Sydney, Steven has been slowly exploring the sights and food in Melbourne. In his spare time he enjoys reading, keeping fit playing soccer, camping and is often planning for his next adventure.

## AIMSS Publication of the Month

**Sarcopenic Obesity and Its Temporal Associations With Changes in Bone Mineral Density, Incident Falls, and Fractures in Older Men: The Concord Health and Ageing in Men Project.** Scott D, Seibel M, Cumming R, et al. *J Bone Miner Res*. 2017 Mar;32(3):575-593.

This paper concludes that in older men, EWGSOP-defined sarcopenic obesity is associated with increased fall rates over 2 years, and FNHI-defined sarcopenic obese men have increased fracture risk over 6 years compared with non-sarcopenic obese men.



Abstract submission and registration for the 2017 Annual Meeting of the ANZSFR are open. A great networking opportunity and the best setting to present your research results: [www.anzsfrmeeting.com.au](http://www.anzsfrmeeting.com.au)

## Short News:

- Welcome to our new Members of AIMSS: Program Director A/Prof. Tissa Wijeratne and Clinical Trials Assistant Michael McLaughlin
- Welcome back to our team: Dr. David Scott (Clinical Research Assistant) from her maternity leave
- Our best wishes to our Project Director Dr. David Scott in his new position at Monash University
- We are recruiting for our clinical trial on a new treatment for older people with sarcopenia. For more information contact our Research Coordinator Merima via e-mail: [mim@unimelb.edu.au](mailto:mim@unimelb.edu.au)

## Our Collaborator of the Month



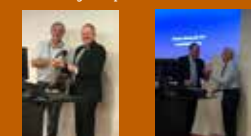
**Professor Svetlana Solovieva** is Senior Scientist at the Finnish Institute of Occupational Health (FIOH), Helsinki. The FIOH specialises in well-being at work, research, advisory services and training.

Professor Solovieva leads a large program of research focusing on occupational exposures and musculoskeletal symptomatology, disability and disease. She is the lead developer of a physical Job Exposure Matrix (JEM) that utilized two large population surveys to construct the JEM and to test matrix performance. This year she is a Chief Investigator in one of our NHMRC applications, which was submitted by AIMSS' Program Manager Dr Sharon Brennan-Olsen. The collaboration between Professor Solovieva and Dr Brennan-Olsen also involves a data linkage analyses, currently underway, using the JEM and a large population-based dataset of ~44,000 individuals from 6 lower and middle income countries, the latter developed by the World Health Organization.

## AIMSS Seminar Series

Our AIMSS Seminars for April and May have been a total success in terms of attendance, quality of the presentations, and outstanding speakers. Prof John Hamilton (University of Melbourne) & Prof Michael McClung (University of Oregon, USA), delighted the audience with their depth of experience and knowledge.

We hope to see you all at our next Seminars where we will learn from our outstanding national and international guest speakers.



Prof Duque Director of AIMSS presenting Prof. John Hamilton (left) and Michael McClung (right) with our traditional tokens of appreciation for their excellent presentations at our AIMSS Seminars for April and May.



Prof Duque presenting Prof Karen Dodd (VVC, new Dean College of Health and Biomedicine, Victoria University) who joined us at our May seminar.

## Our Team Member of the Month



**Merima Murthadozic**, is the Clinical Trial Coordinator for the University of Melbourne, and is responsible for the overall management and coordination of pharmaceutical clinical trials undertaken through Western Health, AIMSS and the University of Melbourne.

Her role involves preparing and obtaining ethical approval, recruiting study participants, conducting study related activities, monitoring participants and closely collaborating with clinicians and pharmaceutical companies to assist in achieving results that add to scientific knowledge. Beginning her career in Psychology, Merima is a knowledgeable Project Manager/Coordinator, with over 7 years' expertise contributing to the successful completion of primary health programs and global clinical trials. Outside of work, Merima is a mum of two boys, and in 2018 will be ticking off another item of her 'to do list' by commencing an MBA. She hopes to pursue managerial roles in the near future.

## Paper of the Month

**Acute exercise alters skeletal muscle mitochondrial respiration and H2O2 emission in response to hyperinsulinemic-euglycemic clamp in middle-aged obese men.** Trewin AJ, Levinger I, Parker L, Shaw CS, Serpiello FR, Anderson MJ, McConell GK, Hare DL, Stepto NK. *PLoS One*. 2017 Nov 21;12(11):e0188421.

In obese, older and sedentary men, acute exercise modifies skeletal muscle mitochondrial respiration and H2O2 emission responses to hyperinsulinemia in a respiratory state-specific manner, which may have implications for metabolic diseases involving insulin resistance.



**October: Prof Koen Milisen:** Implementing falls prevention strategies: inspiring examples from Flanders (Belgium).

**November: Prof Manuel Montero-Odasso:** Frailty and cognitive impairment in older adults: Fellow travellers or partners in crime?



Prof Duque & Montero-Odasso and International visiting fellows, Sonia & Esther from Spain and Genesis from Mexico

## Our Collaborator of the Month



**Prof. Cedric Anweiler** of Centre Hospitalier Universitaire d'Angers Geriatrician, recently elected Dean of Medicine at the University of Angers (France). Prof. Anweiler has strong ongoing collaborations with our members.

Areas of collaboration include multiple aspects of vitamin D in the musculoskeletal system, frailty, and sarcopenia. He is a co-investigator in several ongoing trials at AIMSS.

The most recent publication from Prof. Anweiler in collaboration with AIMSS was: **Vitamin D and walking speed in older adults: Systematic review and meta-analysis.** Anweiler C, Henin S, Walrand S, Montero-Odasso M, Duque G, Duval GT. *Maturitas*. 2017 Dec;106:8-25.

## AIMSS Seed Grants

Four Seed Grants were awarded to our members to support our local research projects at AIMSS.



James Sorensen: 2017 Seed Grant Recipient Prof. Tissa Wijeratne: 2017 Seed Grant Recipient

## AIMSS 2017 Seed Grant Recipients

**\$15,000 to Prof Tissa Wijeratne, Dr Ebrahim Bani Hassan, Dr Leanne Shih, "Stroke-Mimic and Transient Ischemic Attack (TIA): Associations with inflammatory biomarkers, osteosarcopenia and cognitive impairment – a pilot and feasibility study".**

**\$10,000 to Prof Kulmira Nurgali, Prof Gustavo Duque, Prof Alan Hayes, Shilpa Sharma, Rhan Staveland, "Inflammatory Bowel Disease-associated osteoporosis: identification of mechanisms and therapeutic targets".**

**\$10,000 to James Sorensen, Dr Emma Ryhka, Prof Alan Hayes, "How do common childhood regimes induce life long skeletal muscle dysfunction and wasting when administered to paediatric mice?"**

**\$10,000 to Prof John Hamilton, Prof Keith Lim, and Dr Cecil Hor, "Analysis of synovial fluid and peripheral blood samples from patients with rheumatoid arthritis, using patients with osteoarthritis as controls".**



# EDUCATION AT AIMSS

Education is one of the main activities at AIMSS. Our Institute acts as a facilitator of learning and as a well structured site for practice and supervision. Our education programs go from biomedical to clinical and social sciences and benefit students from all disciplines including medicine, nursing, allied health professions and social sciences.





# EDUCATION AT AIMSS

## International Visitors program

Established via the Department of Medicine – Western Health (The University of Melbourne), the International Visitors Program offers multiple opportunities to physicians and allied health professionals to develop their research skills (biomedical or clinical) at AIMSS. This is a very flexible program regarding learning objectives and scope. Our visitors could spend a minimum of 1 month and a maximum of 6 months at AIMSS. For more information on this program, please contact: [paula.casas@unimelb.edu.au](mailto:paula.casas@unimelb.edu.au).

## Higher Degree by Research

AIMSS hosts students from our two stakeholders, the University of Melbourne and Victoria University. Some of our members hold joint appointments with these two Universities. Potential students should identify their areas of research interest and identify their potential supervisor based on their specific research programs and ongoing projects. The application process will depend on the selected University.

For more information on how to apply to the University of Melbourne, please follow this link:

<https://futurestudents.unimelb.edu.au/info/research>

For more information on how to apply to Victoria University, please follow this link:

<https://www.vu.edu.au/study-at-vu/how-to-apply/graduate-research-applicants>

## Honours at AIMSS

The Department of Medicine at Melbourne Medical School offers several Honours Programs. These programs could be completed at AIMSS under the supervision of our Program and Project Directors. For more information please follow this link: <http://medicine.unimelb.edu.au/school-structure/medicine-and-radiology/study/honours>

Victoria University has a well-established Honours Program. This program could be completed at AIMSS under the supervision of one of our Program and Project Directors. For more information, please follow this link:

<https://www.vu.edu.au/courses/bachelorof-science-honours-biomedical-sciences-shbm>

## UROP Students



This program was established in collaboration with Biomed Victoria. Our members supervise UROP students in a regular basis.

For more information about this program, please visit this website: <http://biomedvic.org.au/urop/about-urop/>

## Visiting Fellows

This Program is aimed at Australian physicians, allied health professionals, nurses and other researchers interested in either completing small research projects or developing specific research skills at AIMSS.

Duration of this program goes from 1 month to one year. For more information about this program, please contact: [gwen.mcmaster@unimelb.edu.au](mailto:gwen.mcmaster@unimelb.edu.au)



# ANNUAL REPORT – GEROSCIENCES, AGEING AND OSTEOSARCOPENIA PROGRAM



## Program description

This is a strong translational research program aimed to identify the common mechanisms of age-related musculoskeletal diseases and frailty. This program focus' on the age-related changes in muscle and bone and their significance in the pathogenesis of sarcopenia, osteoporosis, osteosarcopenia and physical frailty.

The biomedical section of this program is dedicated to the understanding of age-related changes in mesenchymal stem cell differentiation and the mechanisms that explain their predominant differentiation into fat. This team also investigates the mechanisms of lipotoxicity in the pathogenesis of sarcopenia and osteoporosis, while looking at new potential therapeutic approaches to prevent this phenomenon. This program also involves the development and testing of multiple animal models of accelerated ageing and osteosarcopenia.

Our translational team focuses on the development and testing of new therapies for osteoporosis, sarcopenia and osteosarcopenia. With several patents already obtained by this team, our research activities focus on understanding the mechanism of action of these new treatments, their potential toxicity and therapeutic modalities, and completion of the preclinical validation of these compounds.

Our clinical trials unit was the leading team in two clinical trials testing new medications for sarcopenia. We also run 15 investigator initiated trials testing new interventions to identify and treat sarcopenia, osteoporosis, osteosarcopenia, frailty and disability.

## Publications

1. Annweiler C, Henni S, Walrand S, Montero-Odasso M, Duque G, Duval GT. Vitamin D and walking speed in older adults: Systematic review and meta-analysis. *Maturitas*. 2017 Dec;106:8-25.
2. Brennan-Olsen S, Vogrin S, Holloway KL, Page RS, Sajjad MA, Kotowicz MA, Livingston PM, Khasraw M, Hakkennes S, Dunning TL, Brumby S, Pedler D, Sutherland A, Venkatesh S, Williams LJ, Duque G, Pasco JA. Geographic region, socioeconomic position and the utilisation of primary total joint replacement for hip or knee osteoarthritis across western Victoria: a cross-sectional multilevel study of the Australian Orthopaedic Association National Joint Replacement Registry. *Arch Osteoporos*. 2017 Nov 6;12(1):97.
3. Hassan EB, Duque G. Osteosarcopenia: A new geriatric syndrome. *Aust Fam Physician*. 2017 Nov;46(11):849-853.
4. Beauchet O, Allali G, Sekhon H, Verghese J, Guilain S, Steinmetz JP, Kressig RW, Barden JM, Szturm T, Launay CP, Grenier S, Bherer L, Liu-Ambrose T, Chester VL, Callisaya ML, Srikanth V, Léonard G, De Cock AM, Sawa R, Duque G, Camicioli R, Helbostad JL. Guidelines for Assessment of Gait and Reference Values for Spatiotemporal Gait Parameters in Older Adults: The Biomathics and Canadian Gait Consortiums Initiative. *Front Hum Neurosci*. 2017 Aug 3;11:353.



# ANNUAL REPORT – GEROSCIENCES, AGEING AND OSTEOSARCOPENIA PROGRAM

5. Medina-Gomez C, Kemp JP, Dimou NL, Kreiner E, Chesi A, Zemel BS, Bønnelykke K, Boer CG, Ahluwalia TS, Bisgaard H, Evangelou E, Heppel DHM, Bonewald LF, Gorski JP, Ghanbari M, Demissie S, Duque G, Maurano MT, Kiel DP, Hsu YH, C J van der Eerden B, Ackert-Bicknell C, Reppe S, Gautvik KM, Raastad T, Karasik D, van de Peppel J, Jaddoe VWV, Uitterlinden AG, Tobias JH, Grant SFA, Bagos PG, Evans DM, Rivadeneira F. Bivariate genome-wide association meta-analysis of pediatric musculoskeletal traits reveals pleiotropic effects at the SREBF1/TOM1L2 locus. *Nat Commun*. 2017 Jul 25;8(1):121.
6. Hirschfeld HP, Kinsella R, Duque G. Osteosarcopenia: where bone, muscle, and fat collide. *Osteoporos Int*. 2017 Oct;28(10):2781-2790.
7. Zanker J, Duque G. Rapid Geriatric Assessment of Hip Fracture. *Clin Geriatr Med*. 2017 Aug;33(3):369-382.
8. Gunawardene P, Al Saedi A, Singh L, Bermeo S, Vogrin S, Phu S, Suriyaarachchi P, Pignolo RJ, Duque G. Age, gender, and percentage of circulating osteoprogenitor (COP) cells: The COP Study. *Exp Gerontol*. 2017 Oct 1;96:68-72.
9. Brennan-Olsen SL, Vogrin S, Leslie WD, Kinsella R, Toombs M, Duque G, Hosking SM, Holloway KL, Doolan BJ, Williams LJ, Page RS, Pasco JA, Quirk SE. Fractures in indigenous compared to non-indigenous populations: A systematic review of rates and aetiology. *Bone Rep*. 2017 Apr 27;6:145-158.
10. Silva RB, Aldoradin-Cabeza H, Eslick GD, Phu S, Duque G. The Effect of Physical Exercise on Frail Older Persons: A Systematic Review. *J Frailty Aging*. 2017;6(2):91-96. doi: 10.14283/jfa.2017.7.
11. Bermeo S, Al-Saedi A, Kassem M, Vidal C, Duque G. The Role of the Nuclear Envelope Protein MAN1 in Mesenchymal Stem Cell Differentiation. *J Cell Biochem*. 2017 Dec;118(12):4425-4435.
12. Duque G, Daly RM, Sanders K, Kiel DP. Vitamin D, bones and muscle: myth versus reality. *Australas J Ageing*. 2017 Mar;36 Suppl 1:8-13.
13. Duque G. Introduction to abstracts presented at the first Australia and New Zealand conference on sarcopenia and frailty research. *Australas J Ageing*. 2017 Mar;36 Suppl 1:7.
14. Brennan-Speranza TC, Mor D, Mason RS, Bartlett JR, Duque G, Levinger I, Levinger P. Skeletal muscle vitamin D in patients with end stage osteoarthritis of the knee. *J Steroid Biochem Mol Biol*. 2017 Oct;173:180-184.

## Collaborators:

### Australia:

#### Sydney

Dr Pushpa Suriyaarachchi - Sydney Medical School Nepean  
Dr Tara Brennan-Speranza – University of Sydney  
Dr Oddom Demontiero – Sydney Medical School Nepean  
Dr Piumali Gunawardene - Sydney Medical School Nepean  
Dr Christian Girgis – Royal North Shore Hospital (Sydney)

#### Melbourne (outside AIMSS)

Prof. Andrea Maier – Royal Melbourne Hospital  
Prof Cassandra Szoek – Royal Melbourne Hospital and ACU  
Prof Mathis Grossman – Austin Health  
A/Prof. Pazit Levinger – Australian Catholic University  
Prof Rob Daly – Deakin University

#### Perth

Prof Richard Prince – UWA  
Prof Charles Inderjeeth – UWA  
Dr Marc Sim – UWA  
A/Prof Joshua Lewis – Edith Cowan University



# CHILD AND ADOLESCENT MUSCULOSKELETAL DEVELOPMENT



## **A/Professor Christine Rodda**

Program Director: Child Adolescent Musculoskeletal Development.

Optimisation of musculoskeletal health in children and adolescents is the major focus of this group.

There is the challenging hypothesis that osteoporosis and sarcopenia, conditions in the elderly are best delayed or prevented by lifestyle factors established during childhood and adolescence. Dr Rachel Duckham, post-doctoral research fellow, whose major research area focuses on exercise and nutrition in children and adolescents. At the International Conferences in Children's Bone Health, in Wurzburg in June, Dr Duckham presented her pQCT findings from a longitudinal study "The HAPPY Bone Study" which investigated the effect of long term sedentary behaviour on nearly 100 peripubertal boys and girls. The major finding of this study showed that tibial total and cortical bone size and strength, as measured using pQCT was reduced in sedentary children, potentially putting these children at increased risk for developing osteoporosis later in life.

In November 2017, Dr Sharon Brennan Olsen, Dr Rachel Duckham and A/Professor Christine Rodda presented a symposium entitled "Critical windows: Early-life precursors to sarcopenia and osteosarcopenia" at the Australian and New Zealand Society for Sarcopaenia and Frailty Research, (ANZSSFR) held in Adelaide in November.

Dr Michael Bullen, orthopaedic Surgical trainee, is developing pQCT as a technique to evaluate fracture healing. He has now validated the technique including assessment of the effect of both plaster of Paris and polyester casting, and of fracture healing in children. Dr Bullen has now converted to undertaking a PhD, to which he will add the effect of vitamin D deficiency on fracture healing in children.

## **2017 Publications:**

Roizen J.D., Li D., O'Lear L., Javaid M.K., Shaw N.J., Ebeling P.R., Nguyen H.H., Rodda C.P., Thummel K.E., Thacher T.D., Hakonarson H., Levine M.A. (2018). CYP3A4 mutation causes Vitamin D-dependent rickets type 3. *Journal of Clinical Investigation*. 128: 1913-1918

Bullen M., Kinealy J., Blanchard R., Rodda C., Pivonka P. (2017) Comparison of the moulding ability of Plaster of Paris and polyester cast material in the healthy adult forearm. *Injury*. 48: 2586-2589

Huynh, J., Lu, T., Liew, D., Doery, JCG, Tudball, R., Jona, M., Bhamjee, R. and Rodda, C.P. (2017) Vitamin D in newborns: a random controlled trial comparing daily and single oral bolus Vitamin D in infants. *J Paediatrics and Child Health* 53: 163 – 169



# SOCIAL EPIGENOMICS AND POPULATION HEALTH



## **Dr Sharon Brennan-Olsen**

Programme Director - Social  
Epigenomics & Population Health

In the second year of her NHMRC Career Development Fellowship, Dr Sharon Brennan-Olsen led this successful AIMSS research program, which focused on the interplay between environment and health: in other words, how social experiences translate into biological expression of disease. By the end of 2017, this program had: achieved seventeen peer-reviewed publications, attracted six Members in Training and one new Project Director approved to begin the following year (Dr Lynne Millar), had organised and presented a number of Symposia, and boasted a range of achievements from our team members.

### **Members in training:**

During 2017, the program had six Members in Training; Sarah Hosking, Natalie Hyde, Darci Green, Nick Fredman, Aoun Rizvi, and Elizabeth de Gabrielle. During late 2017, Hosking was awarded her PhD (health literacy and osteoporosis prevention) and received a 2017 UCB Fellowship from the World Congress of Osteoporosis and International Osteoporosis Foundation. Hyde continued her work into in utero influences on bone health of offspring supported by her first post-PhD Fellowship. Green was involved as a Research Assistant on the MISD study, (Musculoskeletal health: Inflammation and Social Determinants in young adults) and provided administrative support to Brennan-Olsen in the organisation of the 2017 AIMSS Retreat. Green was also awarded an AIMSS PhD Scholarship to undertake her PhD project (to begin in 2018), which is to be a randomized controlled trial investigating the role of protein supplementation in ameliorating sarcopenia in patients with cancer.

Fredman was involved as a Research Assistant and began investigating the association between proinflammatory cytokines and social determinants. Rizvi joined the team to undertake his MD research project, as part of his medical degree, and began to work on the SEBA study (Sarcopenia: Environmental and Biological determinants in older Adults) which had received ethical approval to begin. de Gabrielle provided general administrative support to the team and wrote up her 2016 Hons project for publication (childhood asthma and incident fracture).

### **Knowledge translation:**

This program places high value on translating research findings for general and specific population groups, and also involving stakeholders in these processes. In addition to publishing the findings of a community engagement project to translate osteoporosis prevention by using an oversized jigsaw, Brennan-Olsen also coordinated the development and implementation of the AIMSS Osteosarcopenia Roadshow, an RACGP accredited workshop for GPs, which was presented in April and November 2017. She also coordinated the first two of the AIMSS OsCard series: (i) Osteosarcopenia, and (ii) Falls and Fracture Prevention in Residential Aged Care Facilities (RACF). One copy of the latter-listed OsCard was provided to every RACF in Australia.



## 2017 PUBLICATIONS:

Our program published seventeen papers this year, as listed below:

1. Brennan-Olsen SL, Cook S, Leech MT, Bowe SJ, Kowal P, Naidoo N, Page RS, Ackerman IN, Hosking SM, Pasco JA, Mohebbi M. Prevalence of arthritis according to age, sex and socioeconomic position in six lower-to middle-income countries: The World Health Organization Study on global AGEing and adult health (SAGE)-Wave 1. *BMC Musculoskeletal Dis*. 2017;18:271
2. Brennan-Olsen SL, Vogrin S, Holloway KL, Page RS, Sajjad M, Kotowicz M, Livingston P, Khasraw M, Hakkennes S, Dunning T, Brumby S, Pedler D, Sutherland A, Venkatesh S, Williams LJ, Duque G, Pasco JA. Geographic region, socioeconomic position, and the utilisation of primary total joint replacement for hip or knee osteoarthritis across Western Victoria: A cross-sectional multilevel study of the Australian Orthopaedic Association National Joint Replacement Registry. *Arch Osteoporos*. 2017;12(1):97
3. Brennan-Olsen SL, Kinsella R, Vogrin S, Leslie WD, Toombs M, Duque G, Hosking SM, Holloway KL, Doolan BJ, Williams LJ, Page RS, Pasco JA, Quirk SE. Fractures in indigenous compared to non-indigenous populations: A systematic review of rates and aetiology. *Bone Rep*. 2017;6:145-158
4. Brennan-Olsen SL, Pasco JA, Hosking SM, Dobbins AG, Williams LJ. Poor quality of life in Australian men: Associations with obesity, mobility, lifestyle behaviours and mental health symptomatology. *Maturitas*. 2017; 103:32-36
5. Brennan-Olsen SL, Hosking SM, Dobbins AG, Pasco JA. Translating osteoporosis prevention guidelines: A case study of participatory action and the development of an oversized jigsaw. *J Aging Health*. 2017; 29:531-45
6. Hyde NK, Brennan-Olsen SL, Wark JD, Hosking SM, Holloway KL, Pasco JA. Maternal vitamin D and offspring trabecular bone score. *Osteoporos Int*. 2017; 28:3407-3414
7. Hyde NK, Brennan-Olsen SL, Wark JD, Hosking SM, Pasco JA. Maternal dietary nutrient intake during pregnancy and offspring linear growth and bone: The Vitamin D in Pregnancy Cohort Study. *Calcif Tiss Int*. 2017;100:47-54
8. Hyde NK, Brennan-Olsen SL, Bennett K, Moloney D, Pasco J. Maternal nutrition during pregnancy: intake of nutrients important for bone health. *Mat Child Nut*. 2017; 21:845-51
9. Riancho JA, Brennan-Olsen SL. The epigenome at the crossroad between social factors, inflammation and osteoporosis risk. *Clin Rev Bone Miner Metab*. 2017;15:59-68.
10. Pasco JA, Mohebbi M, Holloway KL, Brennan-Olsen SL, Hyde NK, Kotowicz MA. Musculoskeletal decline and mortality: prospective data from the Geelong Osteoporosis Study. *J Cachexia, Sarcopenia Muscle*. 2017; 8:482-9
11. Orford NR, Bailey M, Bellorno R, Pasco JA, Cattigan C, Elderkin T, Brennan-Olsen SL, Cooper DJ, Kotowicz MA. The association of time and medications with changes in bone mineral density in the two years after critical illness. *Critical Care*. 2017; 21:69.
12. Holloway KL, Yousif D, Bucki-Smith G, Hosking SM, Betson AG, Williams LJ, Brennan-Olsen SL, Kotowicz MA, Sepetavc A, Pasco JA. Lower limb fracture presentations at a Regional Hospital. *Arch Osteoporos*. 2017, 12:75
13. Stuart AL, Mohebbi M, Pasco JA, Quirk SE, Brennan-Olsen SL, Berk M, Williams LJ. Patterns of psychotropic medication use over two decades in Australian women. *ANZ J Psych*. 2017;51:1212-1219
14. Quirk SE, Berk M, Pasco JA, Brennan-Olsen SL, Chanen AM, Koivumaa-Honkanen H, Burke L, Jackson HJ, Hulbert C, Olsson C, Moran P, Stuart AL, Williams LJ. The prevalence, age distribution and comorbidity of personality disorders in Australian women. *Aust NZ J Psych*. 2017; 51:141-50
15. Nasir B, Kisely S, Hides L, Ranmuthugala G, Brennan-Olsen SL, Easton C, Wenitong A, Nicholson GC, Gill N, Hayman N, Kondalsamy-Chennakesavan S, Toombs M. An Australian Indigenous community-led suicide intervention skills training program: Community consultation findings. *BMC Psychiatry*. 2017;17:219.
16. Quirk SE, Stuart AL, Berk M, Pasco JA, Brennan-Olsen SL, Koivumaa-Honkanen H, Honkanen R, Lukkala PS, Chanen AM, Kotowicz MA, Williams LJ. Personality disorder is an excess risk factor for multiple physical morbidity among women with mental state disorders. *Psychiatry Res*. 2017; 257:546-9
17. Chandrasekaran V, Brennan-Olsen SL, Stuart AL, Pasco JA, Berk M, Hodge JM, Williams LJ. Association between bipolar spectrum disorder and bone health: a meta-analysis and systematic review protocol. *BMJ Open*. 2017; 7:e013981



# SOCIAL EPIGENOMICS AND POPULATION HEALTH



## Conferences

Our team had a strong presence at international and national conferences this year, which included Symposia, oral presentations, and Plenary Posters, as follows:

At the annual WCO-IOF-ESCEO, this year held in Florence, Italy, our team presented six posters, and Brennan-Olsen conceptualised and coordinated two Symposiums: (i) 'Bone: A reflection of the social gradient' and (ii) 'Parental influences on bone: Multidisciplinary evidence'. For the first-listed Symposium, Brennan-Olsen was one of the presenters, and for the latter listed Symposium, two of our MITs, Hosking and Hyde, were presenters. At the ASBMR meeting in Denver, USA, the work by Brennan-Olsen and Green investigating job exposures in lower- and middle-income countries was selected to be presented as a Plenary Poster. At the ANZSSFR meeting in Adelaide, our team had two oral presentations, one poster, and Brennan-Olsen conceptualised, coordinated and presented in a Symposium titled 'Critical windows: Early-life precursors to sarcopenia and osteosarcopenia'. Our team presented five posters at the ANZBMS meeting in Brisbane, another poster was presented at the Australian Pharmaceutical Science Association meeting in Brisbane. Finally, at the annual Western Health Research Week, our team represented AIMSS with eight posters, and one oral presentation by Green.

## Other Achievements

In addition to the achievements of our MITs (mentioned above), Brennan-Olsen received an Establishment Grant from the University of Melbourne to investigate bone, inflammation and social disadvantage: this was developed into the previously mentioned MISD and SEBA studies. She was acknowledged as the most published member of AIMSS and invited to speak at the Australian Catholic University's Colloquium series. Brennan-Olsen completed the 'Executive Ready' Leadership Development Program, which was funded by a Scholarship from Women and Leadership Australia. She was also nominated for, and invited to join, the Women in Bone and Mineral Science Committee of the ASBMR.

Dr Brennan Olsen was also nominated for and invited to join, the Women in Bone and Mineral Science Committee of the ASBMR.



# REPORT ON THE ACTIVITIES AT THE IMAGING AND IMAGE ANALYSIS UNIT



## Research Highlights

- Definition of better regions of interest to study osteoporosis and sarcopenia and their associations using imaging modalities
- Studying the association of marrow, visceral/subcutaneous and inter/intra muscular fat depots with the progress of osteoporosis and sarcopenia.
- Study of the predisposing factors to falls and fractures through the Falls and Fractures Clinic
- Studying the development of osteoporosis and sarcopenia as a comorbidity of other systems' diseases, e.g. in hospitalised fracture patients, stroke patients etc. and investigating the preventive methods.



## Dr Ebrahim Bani Hassan

Programme Director -

Imaging Clinical

Project Director: Dr David Scott

## Educating and training young people

The imaging and image analysis unit provides such services and education to many young researchers and clinicians of various backgrounds. Other than our postgraduate (e.g. PhD) students that directly or indirectly use the facilities for their research, every month our unit hosts several students from medical, exercise physiology and science backgrounds who conduct their placement, honours project or "scholarly select research projects" at the imaging unit. In addition, this unit is active in inducting advanced trainees from several countries who are being hosted by AIMSS.

## How AIMSS engages other scientists and the public

The imaging unit has established several research collaborations with internationally leading institutes in Australia and constantly exchanges research materials and expertise with such institutes. The imaging unit is an integral part of AIMSS extension programs such as Osteosarcopenia Roadshow (for GPs), and is also involved in attracting research volunteers or provision of free imaging services in the International Osteoporosis Day. Hence, this unit is involved in the education of the both specialists and public.

## Research activities and publications

Such activities and publications have been reflected at AIMSS website under Current Research Projects.

## Research group reports

1. Florian Roeber, Ebrahim Bani Hassan et al.; An automated, high-throughput platform for diagnosis of cattle gastrointestinal nematodes using multiplex-tandem PCR: An Australian-European validation study: Veterinary Parasitology (accepted Dec 2016).
2. Ebrahim Bani Hassan\*, Ali Moshaverinia, Fareeba Sheedfar, Christina McCowan, Taghi T. Bazargani, Ava Hosseinzadeh, Ramin Saghafi, Javad Ashrafihelan, Ian Beveridge; A report of the unusual lesions caused by *Thelazia gulosa* in cattle. Veterinary Parasitology: Regional Studies and Reports. Jan 2017, Vol 7, 62–65.
3. Mahboubeh Moradian, Reza Rahchamani, Ebrahim Bani Hassan, Ashoor-Mohammad Gare bash, Abbas Zeyghami; The effects of Vitamin A and D injection on passive transfer of IgG and other haematological parameters in a calf model. Journal of Ruminant Research, Vol. 4(2), 2016.
4. Ebrahim Bani Hassan, Michiko Mirams, Eleanor J Mackie, Robert C Whitton; An observational study of the prevalence of macroscopic and microscopic subchondral bone pathologic changes in the distal metacarpi/metatarsi of racing Thoroughbred horses presenting for post-mortem examination. Australian Veterinary Journal (Accepted manuscript, 2016)



# ENDOCRINOLOGY & DIABETES



## **Prof Shane Hamblin**

Head of Endocrinology and  
Program Director

The Unit has focused on the following research areas in 2017.

The effect of depression and diabetes distress on the likelihood of presenting to hospital with diabetic ketoacidosis

The effect on blood glucose levels of glucocorticoid treatment in pregnant women treated with insulin for gestational diabetes

Multi-site study of the incidence of sodium glucose co-transporter 2 inhibitor (SGLT2i) associated diabetic ketoacidosis in all Melbourne and Geelong public hospitals (led by Western Health)

Evaluation of trabecular bone score in a variety of clinical conditions

Melbourne Public Hospitals consensus of the diagnosis and management of subclinical hypothyroidism during pregnancy (led by Western Health)

We presented at the US Endocrine Society meeting, Endocrine Society of Australia Annual meetings and the Australasian Diabetes in Pregnancy Society Annual meeting.

A number of clinical case reports were also published in 2017.







### **Prof John Price**

Programme Director -  
(Graduate Program Director-  
Basic Sciences)- Cancer &  
Musculoskeletal Biomedical  
& translational.

Cancer currently accounts for approximately 30% of all deaths within Australia. The progression of a tumour from one that is localised at the initial or primary site of growth, such as the breast or prostate, to one that spreads to other sites within the body, a process known as metastasis, is a major cause of death amongst patients. A major site of metastasis in many common cancers such as breast, prostate, melanoma and lung is the bone. Within the program of Cancer and the Musculoskeletal System we have recently identified a number of novel molecular mediators of the metastatic process, particularly in bone metastasis from breast cancer and melanoma.

We have progressed in our development of 'first-in-class' inhibitors towards HSF1 that will effectively target not only the metastatic cancer cell but also the metastatic niche within bone via osteoclast differentiation.

We have continued to bring novel insights into the potential detrimental impacts of cancer therapeutics on metastatic propensity due to their impact on the bone microenvironment and the promotion of viable metastatic niches through osteoclast formation.

### **Funding**

A/Prof JT Price, Adrian Lim (Industry Partner; SimPharma PTE) Pre-clinical Evaluation of DAA-I and Related Molecules for the Treatment of Cancer \$234,689.49. 2/10/17 – 31/12/18

A/Prof JT Price, "Development of HSF1 Inhibitors for the Treatment of Metastatic Cancers", Stop the Mets, \$17,000. 30/11/17

### **Publications**

Ryan C. C. Chai, Jessica L. Vieusseux, Benjamin J. Lang, Chau H. Nguyen, Michelle M. Kouspou, Kara L. Britt and John T. Price Histone Deacetylase Activity Mediates Acquired Resistance towards Structurally Diverse HSP90 Inhibitors. *Mol Oncol*. 2017 11(5):567-583 (IF: 5.367)

Ryan C. Chai, Michelle M. McDonald, Rachael L. Terry, Nataša Kovačić, Jenny M. Down, Jessica A. Pettitt, Sindhu Mohanty, Shruti Shah, Gholamreza Haffari, Jiakexu, Matthew T Gillespie, Michael J. Rogers, John T. Price, Peter I. Croucher and Julian M.W. Quinn. Melphalan Modifies the Bone Microenvironment by Enhancing Osteoclast Formation. *Oncotarget*. 2017, DOI/10.18632 (IF: 5.168)

Fingleton B, Lange K, Caldwell B, Bankaitis KV; Board of the Metastasis Research Society. Perspective on the interpretation of research and translation to clinical care with therapy-associated metastatic breast cancer progression as an example. *Clin Exp Metastasis*. 2017 Dec;34(8):443-447.

### **Members-in-Training**

J. Polidano (Ph.D)  
Development of Novel Inhibitors of HSF1 as Therapeutics for Metastatic Cancers (Primary Supervisor, University of Melbourne )

T. Cree (Ph.D)  
Investigating the Roles of FK506 Binding Proteins in Cell Proliferation and Differentiation (Primary Supervisor, Victoria University)

C. Giuliani (Ph.D)  
The role of Autophagy in Anti-cancer Therapeutic Resistance (Primary Supervisor, Victoria University)



# BASIC SCIENCES AND ADVANCED MEDICAL IMAGING



## Research Themes

- Advanced medical imaging
- Fluorescence microscopy / Confocal LASER scanning microscopy / Live-cell imaging
- Translational use of 3D stem cell cultures for the study of musculoskeletal tissue interactions

## A/Prof Damian Myers

Program Director for Medical imaging and Basic Sciences.

### Program description

The study of the musculoskeletal system relies upon diverse imaging modalities such as X-ray imaging, Magnetic Resonance Imaging (MRI) and Positron emission tomography (PET). In basic science projects the key imaging technique used is microscopy and this includes many advanced forms of microscopy such as fluorescence imaging, live-cell imaging and confocal microscopy. Through our Medical Imaging Program we have also initiated a formal agreement with the Australian Synchrotron, part of the Australian Nuclear Science Technology Organisation.

### Publications

Ye K, Traianedes K, Robins SA, Choong PFM, Myers DE. Osteochondral repair using an acellular dermal matrix-pilot in vivo study in a rabbit osteochondral defect model. J Orthop Res. 2017 Dec 15. doi: 10.1002/jor.23837

### Collaborators

#### Melbourne

Prof Paul Mulvaney, School of Chemistry, University of Melbourne  
Anneke Ryan, School of Chemistry, University of Melbourne  
Prof Ma Qian, Professor of Advanced Manufacturing and Materials and Professor of Design, Multifunctional Structures at RMIT University  
Dr Gui Na

#### Wollongong

Prof Gordon Wallace, University of Wollongong, Intelligent Polymer Research Institute  
Dr Zhilian Yue, University of Wollongong, Intelligent Polymer Research Institute  
Dr Stephen Beirne, University of Wollongong, Intelligent Polymer Research Institute

#### United States of America

Prof Jeff Gimble – Tulane University  
Dr Trivia Frazier – Tulane University

#### Australian Synchrotron

Dr Andrew Stevenson, CSIRO X-Ray Physics and Instrumentation Laboratory, CSIRO and Principal Scientists, Imaging and Medical Beamline, Australian Synchrotron, ANSTO  
Dr Daniel Hausermann, Principal Beamline Scientist, Imaging and Medical Beamline, ANSTO  
Dr Chris Hall, Senior Beamline Scientist, Imaging and Medical Beamline, ANSTO  
Dr David Paterson, Principal Scientists, X-ray Fluorescence Beamline, ANSTO  
Successful beamline applications at the Australian Synchrotron:  
Beamtime on the Imaging and Medical Beamline: M12452/ Period 2017/3  
X-ray microscopy detection of platinum and investigation of trace metal distribution in enteric neurons in a small animal model of oxaliplatin therapy: K Nurgali/  
AIMSS visit to the Australian Synchrotron: 16-06-2017  
Conducted AIMSS Scientific Meeting at AS



# SARCOPENIA - BIOMEDICAL & TRANSLATIONAL



**Prof Alan Hayes**  
(Deputy Director AIMSS)  
– Sarcopenia-Biomedical –  
Translational & Clinical

The Sarcopenia – Biomedical & Translational Research Program has an overall focus on reducing the global burden of muscle wasting conditions. The team of Project Directors investigate the molecular pathways controlling muscle growth, understanding chemotherapy-induced muscle wasting, pre-clinical application of potential therapeutic adjuncts for muscular dystrophy and using exercise and natural supplements for the treatment of sarcopenia. These studies range from cell culture, through animal models to human trials and involve a number of international collaborators:

Craig Goodman collaborates with Associate Professor Troy Hornberger from University of Wisconsin.

Alan Hayes in collaboration with Emma Rybalka and Craig Goodman obtained \$60,000 funding from Bega Cheese to examine a new proprietary protein for the treatment of sarcopenia.

Emma Rybalka continued work supported by Santhera Pharmaceuticals on the pre-clinical investigation of idebenone for the treatment of muscular dystrophy. Idebenone is currently in a phase III clinical trial.

Emma Rybalka was also awarded a \$100,000 Industry Leverage grant co-funded by VU to collaborate with Dr Dirk Fischer from Universitäts-Kinderspital Beider (University Children's Hospital), Basel in Switzerland.

Alan Hayes continued a \$55,000 National Strength and Conditioning International Collaboration Grant with Professor Sandor Dorgo from the University of Texas at El Paso, USA, aiming to combat sarcopenia in diverse ethnic groups of older adults. Alan presented the preliminary findings from this study at the International Association

of Geriatrics and Gerontology conference in San Francisco as well as the ANZSSFR conference in Adelaide.

Cara Timpani graduated with a PhD entitled 'Characterising and evaluating the efficacy of metabolic therapies for the treatment of Duchenne Muscular Dystrophy' under the supervision of Emma Rybalka and Alan Hayes. Cara's thesis was highly commended and she won the Vice-Chancellors Award for Excellence in Research and Research Training (Research Degree Graduate).

Doctoral students Dean Campelj and James Sorensen, who are both developing animal models of chemotherapy-induced muscle dysfunction to mimic specific cancer treatments under the primary supervision of Emma Rybalka, presented their work at the Australian Physiological Society, Australian Society for Medical Research and the 10th International Conference on Cachexia, Sarcopenia and Muscle Wasting, Rome and ANZSSFR. James was also successful in obtaining \$10,000 of AIMSS Seed funding for his work.

Doctoral student Danielle Debruin, who is working on developing combination therapies for the treatment of sarcopenia under the primary supervision of Alan Hayes, presented her work at the Australian Physiological Society, Australian Society for Medical Research and the Australian and New Zealand Society for Sarcopenia and Frailty Research (ANZSSFR) 2nd annual conference, amongst others. The quality of the work and presentations saw Danielle receive several awards, including Western Health Research Week Best Poster Presentation Award, ANZSSFR travel grant and Highest Ranked Biomedical Abstract Award, as well as being runner up of the Best First Year PhD Presentation Award at the Victoria University Postgraduate Research Conference.



# SARCOPENIA - BIOMEDICAL & TRANSLATIONAL



The group had 19 publications in 2017, including:

Goodman CA, Frey J, Coenen A, You J-S, Barker R, Frankish B, Murphy R & Hornberger T. Insights into the role and regulation of TCTP in skeletal muscle. *Oncotarget* 8: 18754-18772, 2017.

Hanson ED, Nelson AR, West DWD, Violet JA, O'Keefe, L Phillips, SM & Hayes A. Attenuation of Resting but Not Load-Mediated Protein Synthesis in Prostate Cancer Patients on Androgen Deprivation. *Journal of Clinical Endocrinology and Metabolism* 102: 1076-1083, 2017.

Rybalka E, Timpani CA, Cheregi BD, Sorensen JC, Nurgali K & Hayes A. Chemotherapeutic agents induce mitochondrial superoxide production and toxicity but do not alter respiration in skeletal muscle in vitro. *Mitochondrion*. 2017; doi: 10.1016/j.mito.2017.10.010).

Scott D, Shore-Lorenti C, McMillan L, Mesinovic J, Clark R, Hayes A, Sanders K, Duque G & Ebeling P. Associations of components of sarcopenic obesity with bone health and balance in older adults. *Archives of Gerontology and Geriatrics* 75: 125-131, 2017.

Sorensen JC, Petersen A, Timpani CA, Campelj DG, Cook J, Trewin A, Stojanovska V, Stewart M, Hayes A & Rybalka E. BGP-15 protects against Oxaliplatin-induced skeletal myopathy and mitochondrial reactive oxygen species production in mice. *Frontiers in Pharmacology* 8:137, 2017

Timpani CA, Hayes A & Rybalka E. Therapeutic strategies to address neuronal nitric oxide synthase deficiency and the loss of nitric oxide bioavailability in Duchenne Muscular Dystrophy. *Orphanet Journal of Rare Diseases* 12: 100, 2017.

Timpani CA, Trewin A, Blazev R, Stojanovska V, Robinson A, Goodman C, Nurgali K, Betik A, Stepto N, Hayes A, McConell GK & Rybalka E. Attempting to compensate for reduced nNOS protein with nitrate supplementation cannot overcome metabolic dysfunction but rather has detrimental effects in dystrophin-deficient mdx muscle. *Neurotherapeutics*. 2017; Vol. 14(2):429-446.





# FRACTURE CARE AND PREVENTION PROGRAM REPORT

To date, all essential components of the Fracture Care and Prevention Program have been implemented at Western Health and are functioning appropriately. Our Fracture Care and Prevention Program was evaluated by the International Osteoporosis Foundation (IOF) and has received recognition of best care practice. It was awarded with Silver 84%, the only one in Victoria .

## Fracture Liaison Service

Fracture Liaison Service, commonly known as FLS, a coordinator-based, secondary fracture prevention service aims to close the care gap for fracture patients and enhance communication between health care providers by delivering a care pathway for the treatment of fragility fracture patients. Since August 2016, our local FLS has assessed 836 patients, liaised with 366 GPs, referred 160 high risks patients to the Falls and Fractures Clinic, and arranged 345 osteoporosis treatments. Over this period our FLS has prevented approximately 115 hip fractures, resulting in savings of \$4,275,000.

## Falls and Fracture Clinic (FFC)

FFC was implemented in October 2016 with the aim of providing our aged care patients with a comprehensive state-of-the-art risk assessment for falls and fractures and care plans, which include pharmacological and non-pharmacological interventions to prevent new or recurrent falls and fractures. 219 patients have been assessed at our FFC in which 160 were referred via our FLS and 59 directly referred by GPs. The FFC has a care coordination system in which the nurse coordinator Solange Bernardo (AIMSS FLS nurse), is responsible for the care plans designed during the case conference. Solange coordinates the administration of osteoporosis treatment, including encouraging

our patients to join patient support programs for osteoporosis treatment and nutritional supplements as well as regular exercise programs available at Western Health such as the Gait and Balance Gym (Gabagym) and/or community exercise programs.

## Australian and New Zealand Hip Fracture Registry (ANZHFR) and the Orthogeriatric Program - ANZHFR

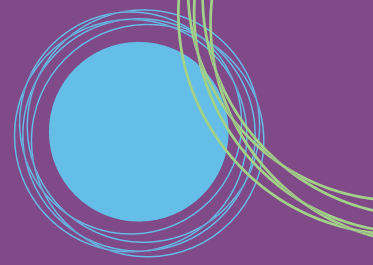
The ANZHFR is designed to help professionals providing care for people with a hip fracture to deliver consistent, effective and efficient care. Every person with a hip fracture should be given the best possible chance of making a meaningful recovery from a significant injury and strategies should be put in place to reduce the occurrence of future falls and fractures. The recommendations reflect the journey of a person with a hip fracture and take into account their perspective, as well as the perspective of their family and carers.

WH has approximately 400 hip fractures per year. After appropriate ethics application and approval, Prof. Gustavo Duque is now the Chief Investigator responsible of this project at Western Health. Data collection and entry to the registry commenced early last year and it's ongoing. With the collaboration of the orthopaedics department we currently collect 100% data of hip fractured patient presenting at Western Health. This activity has placed Western Health on the map of institutions taking appropriate care of hip fracture patients in Australia, which is considered an important component of the accreditation process for health care institutions.





# FRACTURE CARE AND PREVENTION PROGRAM REPORT



A Hip Fracture Working Group was developed earlier this year with the aim to improve care via quality assurance improvement activities, guideline development and implementing national standards to enhance best practice for hip fracture patient at Western Health. This multidisciplinary group consists of health care professionals from multiple areas.

## **Gait and Balance Gymnasium (GABAGYM)**

The AIMSS Gabagym was implemented in 2016 to provide specialised care to patients who are at risk of falls and fractures. As part of a short term restorative care setting, the Gait and Balance Gym takes patients through one of 3 programs including virtual reality balance training, whole body vibration and exercise based balance training. By doing so, programs can be targeted towards each individuals specific needs. Survey of the patients who have attended our programs resulted in 75% scoring it as excellent (25% good) and all rating the program as meeting their needs, with feedback praising the comprehensive nature of the program and increased confidence in performing daily activities.

## **Research Programs**

The Falls and Fractures Clinic and Gait and Balance Gym have databanks approved by Western Health for research purposes. With over 300 participants, data which has been collected from these clinics play a pivotal role in the research conducted by our teams. In the past year we have had more than 10 overseas visiting research fellows from a multidisciplinary background including geriatricians and physiotherapists. As part of their program, a research project must be completed. This has included research targeting sarcopenia and osteosarcopenia, falls, fractures, and interventions for these diseases and events.



The Gaba Gym at AIMSS is unique program where participants are trained to maintain their independence and prevent fractures and falls under the supervision of Steven Phu, Master Of Exercise Physiology



# Your opportunity to **GET INVOLVED**

Professor Gustavo Duque and his research team are looking for participants for clinical studies involving bone and muscle health to develop new treatments.

We are seeking participants aged 55 years and above from any of the following areas:

1. Lower back pain
2. Low vitamin D
3. Obesity
4. Past falls and/or fractures
5. Balance problems
6. Muscle weakness

For more information, please contact us on  
**(03)8395 8135** or [rita.kinsella@wh.org.au](mailto:rita.kinsella@wh.org.au)



# VICTORIAN SENIORS FESTIVAL OCTOBER



Contributing to the raising of the profile of AIMSS with work being undertaken for the public awareness of musculoskeletal diseases and for recruiting for the clinical research, AIMSS took part in the Victorian Seniors Celebration Day, which was held at Federation Square on Sunday October 8th 2017.

With 13,000 people in attendance and Melbourne turned on its best with the weather for the day,

The AIMSS information booth was constantly busy from 8am through to 4pm. As part of the day, members of the public were provided with not only showbags containing information about AIMSS and clinical research, but in attendance were the AIMSS exercise physiologist Steven Phu and radiographer Dr Ebrahim Bani Hassan, available to answer the public's questions about exercise and bone densitometry. AIMSS Clinical Research Manager Merima Murathodzic and Prof Gustavo Duque were in attendance to provide their support and information.

The AIMSS team worked hard at the Victorian Seniors Celebration Day on Sunday 8th October, with great deal of interest from the attendees in relation the related activities at AIMSS, the clinics that are held and the research that is currently being conducted.



Ahmed Al Saedi, Hadeer Fatlee, Michael McLaughlin, Merima Murthodovic and Steven Phu



# WORLD OSTEOPOROSIS DAY

In conjunction with Osteoporosis Australia, some of the AIMSS team held a booth in the foyer of Sunshine hospital to raise awareness of Osteoporosis. As part of our efforts we highlighted the interventions and services that are available for those that live within the western suburbs of Melbourne, as well as the services that AIMSS provides in diagnosing and combating this disease that affects so many people around the world were highlighted.

In conjunction with World Osteoporosis Day, AIMSS officially opened its imaging facilities at Sunshine Hospital.

Dr Shiki Joseph, the Acting Director for Aged Care at Western Health was on hand to cut the ribbon and officially open the facility that houses a pQCT machine and 2 Hologic Bone Density scanners which conducts body composition scans (including muscle and fat mass) in addition to traditional bone density.



Dr Shiki Joseph opening the imaging facility



Solange Bernardo AIMSS Fracture Liaison Service (FLS) and Fracture Care and Prevention Coordinator at Western Health and AIMSS.



# 2017 AIMSS SEED GRANTS WINNERS

The AIMSS Seed Grants Program, which is only available to AIMSS members, provides funding to local projects with the aim of generating valuable data to be included in major funding applications.

## **\$15,000.00 - Prof Tissa Wijeratne, Dr Ebrahim Bani Hassan, Dr Lakshman Singh**

"Stroke, Stroke Mimic and Transient Ischemic Attack (TIA): Associations with inflammatory biomarkers, osteosarcopenia and cognitive impairment – a pilot and feasibility study".

## **\$10,000 - Prof Kulmira Nurgali, Prof Gustavo Duque, Prof Alan Hayes, Shilpa Sharma, Rhian Stavely.**

"Inflammatory Bowel disease- associated osteoporosis identification of mechanisms and therapeutic targets".

## **\$10,000: James Sorensen, Dr Emma Rybalka, Prof Alan Hayes.**

"How do common childhood regimes induce lifelong skeletal muscle dysfunction and wasting when administered to paediatric mice?"

## **\$10,000 Prof John Hamilton, Prof Keith Lim, and Dr Cecil Hor.**

"Analysis of synovial fluid and peripheral blood samples from patients with rheumatoid arthritis, using patients with osteoarthritis as controls".



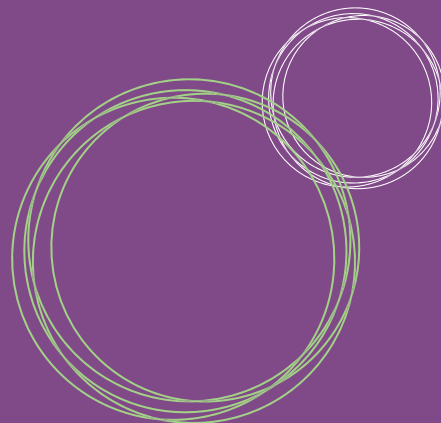
Prof Tissa Wijeratne and Prof Gustavo Duque



James Sorensen and Prof Gustavo Duque



Shilpa Sharma and Prof Gustavo Duque





# SCHOLARSHIPS AND TRAVEL GRANTS



AIMSS offers 1-2 PhD Scholarships/year. Applicants must be under the supervision of a member of AIMSS. The duration of the scholarship is up to 3 years. It provides an allowance of approximately \$30,000 per year.

Applicants must be Australian citizens and must have obtained an Australian Bachelor's Degree with Honours (or equivalent qualification) in a relevant area of study including science, medicine or health related field within the last five years. Acceptance to a PhD Program (either at the University of Melbourne or Victoria University) is mandatory.

## **2017 PhD Scholarship recipients:**

**Dr Jesse Zanker  
Shilpa Sharma**

## **Travel Grants 2017**

The AIMSS Travel Grant program is set up to provide financial assistance for AIMSS Members to participate in cross-institutional visits, present at international conferences, and meet special research needs. The grants should be used to supplement local area funding for future events or activities. Funding for a maximum of \$2,000 will be considered on a case-by-case basis with a maximum of 5 grants being allocated every year.

## **Awarded in 2017:**

**Dr Rachel Duckham  
Dr Sharon Brennan-Olsen  
Ahmed Al Saedi  
Steven Phu  
Danielle Debruin**



# A SPOTLIGHT ON PREVENTING FALLS AND FRACTURES IN OLDER PERSONS



## THE OSTEOSARCOPENIA ROADSHOW was launched in 2017

Under the planning and direction of Dr Sharon Brennan-Olsen, Senior Research Fellow and Program Director 'Population Health-Musculoskeletal Diseases', AIMSS and capably supported and assisted by Professor Gustavo Duque, Director, AIMSS, Mr Steven Phu, Accredited Exercise Physiologist and Research Assistant, AIMSS, and Dr Ebrahim Bani Hassan, Densitometrist/Radiographer and Research Fellow, AIMSS, the Osteosarcopenia Roadshow® was designed to educate General Practitioners as to the biological mechanisms, diagnostic methods, and treatment of osteoporosis and sarcopenia in older persons, and to educate on osteosarcopenia as a new concept to be included in their daily practice.

The Osteosarcopenia Roadshow® is a 2 hour RACGP-accredited workshop and completion earns 4 category 2 QI and Continuing Medical Education (CME) points for general practitioners. Successful completion of the workshop includes participation in the interactive activities and completion of an online pre- and post-workshop multiple-choice.

### Learning objectives:

By the end of this workshop, participants were able to:

- Understand the pathophysiology of osteoporosis and sarcopenia,
- Identify common and specific risk factors for osteoporosis and sarcopenia,
- Perform appropriate clinical assessments for osteoporosis and sarcopenia in clinical practice,
- Order an appropriate set of blood tests and imaging to identify secondary causes of osteoporosis and sarcopenia.
- Implement an evidence-based care plan for osteosarcopenic patients.

### Workshop participants are provided with the following teaching materials:

- Pre-workshop questionnaire of 10 multiple-choice questions
- hardcopy workbook for use during the workshop,
- One iPad per four participants (for use during the workshop), - with online access to the major risk calculation algorithms for osteoporosis,
- One dynamometer per participant to measure handgrip strength, - each participant to retain for use in the clinic,
- One stopwatch per participant to measure gait velocity (for use during the workshop).
- Handouts/pamphlets for on sarcopenia and osteoporosis,
- A post-workshop questionnaire of 20 questions, which includes the 10 questions from the pre-workshop questionnaire,
- An evaluation form

### Contact details

The Osteosarcopenia Roadshow®

**Email:** Dr Sharon Brennan-Olsen at: [sbrennan@unimelb.edu.au](mailto:sbrennan@unimelb.edu.au)

The Australian Institute for Musculoskeletal Science (AIMSS),

**Email:** AIMSS Manager at: [gwen.mcmaster@unimelb.edu.au](mailto:gwen.mcmaster@unimelb.edu.au)





# AIMSS SPRING RETREAT

## **West Waters Hotel and Entertainment Complex (Ballroom 1), 10-20 Lake Street, Caroline Springs, Friday, August 25th 2017, 3pm-5.30pm.**

The purpose of the Spring Retreat was to determine how AIMSS was performing from the perspective of the institute members, to provide a forum that encouraged honest and constructive feedback and to enable small-group brainstorming activities. Facilitator Guidelines were distributed and discussed with the five Facilitators. Seating arrangements were planned, to ensure that each of the five tables included a mix of Researchers, Clinicians, Program Managers, Project Managers, Students, Members-in-Training and Staff.

The event began with a presentation from Ms Suellen Bruce, the Executive Director of People, Culture and Communications at Western Health. Suellen is committed to supporting quality patient care, improving skills in workforce planning and people services, across both NSW and Victoria. Sue was behind the 'Positive Workplace Culture' Program at Western Health, which promotes an environment free of negative workplace behaviours. The ultimate message behind that program is 'The standard you walk past is the standard you accept'.

The full PowerPoint presentation also encompassed a general feedback session from the AIMSS Chair that related to responses ascertained from the Pre-Retreat Survey. Questions that related predominantly to knowledge about AIMSS.

The main element of the Spring Retreat was small and large-group brainstorming to ascertain, from the perspectives of AIMSS members, answers to three questions:

Question 1: In what areas could AIMSS improve?

Question 2: How could these areas be improved?

Question 3: In what areas does AIMSS excel?





# BENEFITS OF BECOMING A MEMBER OF AIMSS:



- Staying abreast of AIMSS research: invitations to AIMSS seminars, meetings, workshops and opportunities to participate in working groups
- Discovering opportunities to collaborate or sponsor research
- Access to a unique environment for networking within the musculoskeletal health and research-community
- Enhanced relationships between clinicians and researchers
- Eligible for Seed Grants, Scholarships and Travel Grants
- Limited access for researchers to AIMSS facilities/equipment/instrumentation
- Potential to co-fund new collaborative research activities with AIMSS
- Potential to co-fund and co-supervise student scholarships for collaborative research between AIMSS and the affiliate organisation
- Access to new research funding through joint grant applications
- Eligible for financial support for activities that support the strategic goals of AIMSS
- Joint education programs and symposia
- Translating research into clinical outcomes through the AIMSS network
- Developing new strategies for promoting musculoskeletal health and interventions
- AIMSS is a leader in basic, translational and clinical research as evidenced by our strengths and abilities.

Our integration into the Western Centre for Health and Research and Education has also provided AIMSS with consultation facilities where we work closely with Western Health and universities to conduct clinical trials.





# PUBLICATIONS & AWARDS

## 2017 PUBLICATIONS:

After a period of steady growth in the number of publications, our members duplicated their publication outputs in 2017 and broken existing AIMSS records. The increase in numbers was also associated with an increase in the average impact factors of the publications.



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## Chapters

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# AIMSS IN THE NEWS

## Health & Wellbeing



### INACTIVE KIDS AT RISK OF FALLS AND FRACTURES IN OLD AGE

Sedentary children are more likely to suffer musculoskeletal disorders like osteoporosis in later life making them more prone to debilitating falls and fractures in old age

*By Dr Sharon Brennan-Olsen and Associate Professor Christine Rodda, University of Melbourne and Dr Rachel Duckham, Deakin University*

*Dr Brennan-Olsen, Associate Professor Rodda and Dr Duckham are all affiliated with the [Australian Institute for Musculoskeletal Science \(AIMSS\)](#), a collaborative research institute of University of Melbourne, Western Health, and Victoria University.*

First published on 20 September 2017 in [Health & Wellbeing](#)

## Australian Institute for Musculoskeletal Science - 11 December 2017

AIMSS was featured in the below article of the Courier Mail, for research into developing therapies for bone and muscle loss.

COURIERMAIL.COM.AU SATURDAY NOVEMBER 25 2017

NEWS 05

# Muscling in on old age

BRIGID O'CONNELL

## Medical research into an 'exercise boost' drug

AUSTRALIAN researchers are developing and testing new "fountain of youth" treatments designed to make us stronger into old age.

The therapies aim to mimic or intensify the effects of exercise and slow ageing by improving muscle strength.

Older adults and people with muscle wasting as a result

of disease or cancer treatment are the first targets of the international drug trial to boost muscle mass and function.

The drug works in combination with an exercise program and protein supplements.

Researchers from Melbourne's Australian Institute of Musculoskeletal Science

are also developing a therapy – with candidates currently being tested in animal models – to treat the common age-related combination of loss of bone and muscle.

Researchers from the Baker Heart and Diabetes Institute have doubled the size of muscles in the legs of mice within

four weeks of a gene therapy treatment. Their unique approach uses a virus to deliver treatment into muscle cells – blocking the effects of myostatin, a powerful inhibitor of muscle growth – and reprogram cells from the inside.

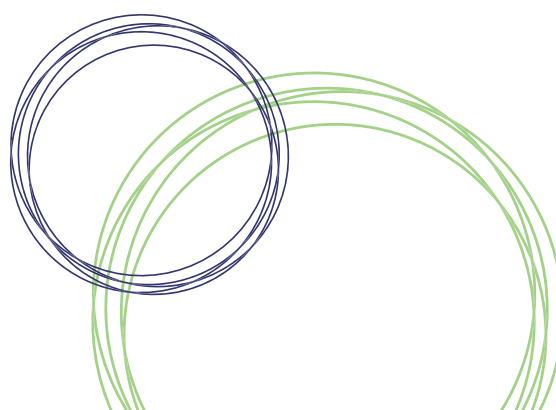
Baker researchers hope their work could one day

benefit people suffering muscle wasting through surgery or rehabilitation, newborns failing to thrive, in conditions such as muscular dystrophy and help the average adult achieve bigger health benefits from exercise.

But in the meantime, until an "exercise boost pill" is on the

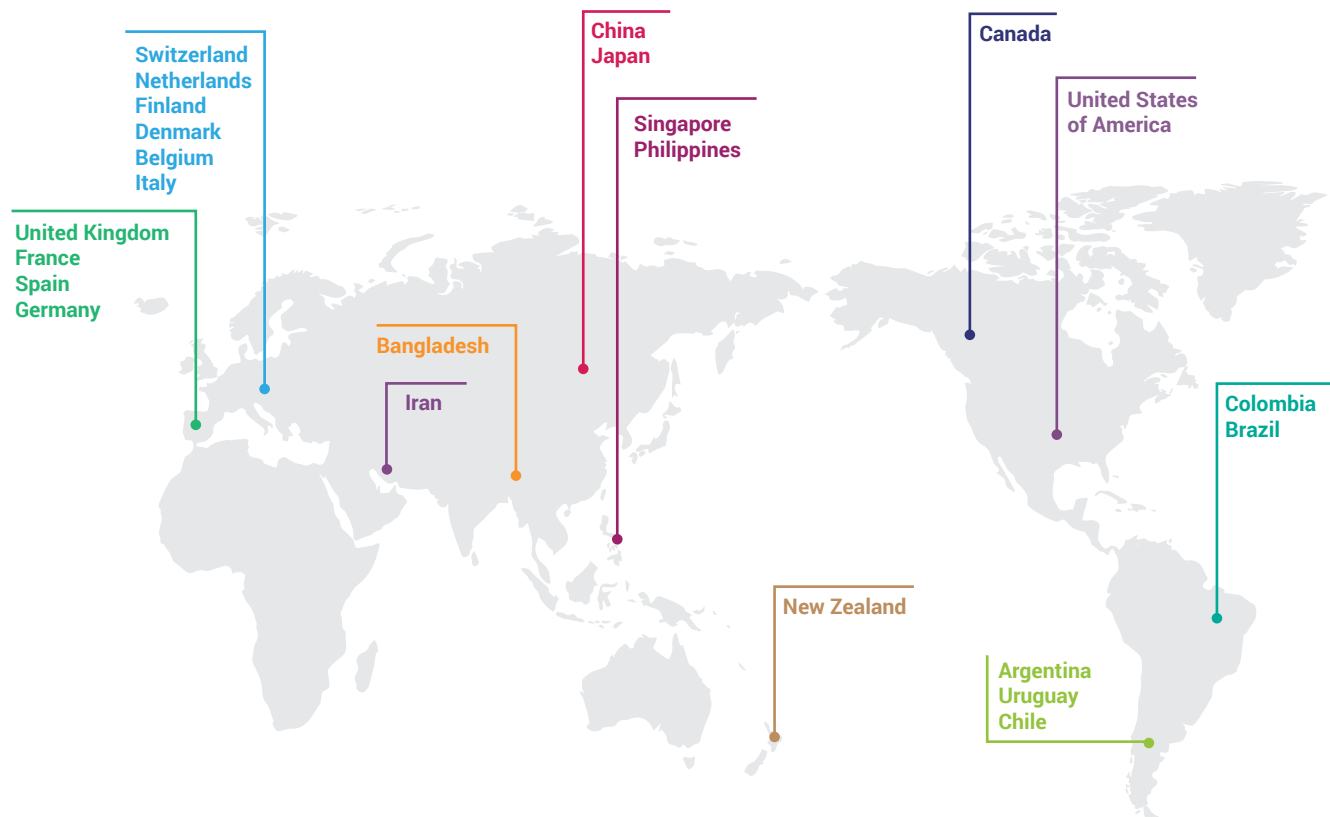
market, there is growing evidence that exercise is still one of the easiest and effective ways to help protect against everything from dementia, recovery after stroke, heart disease and glaucoma.

The Centre for Eye Research Australia has produced some of the first evidence that exercise may help prevent and treat one of the most common causes of blindness.





# INTERNATIONAL COLLABORATIONS



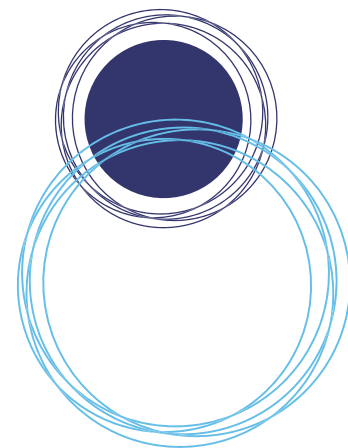
Our members have developed strong and very productive collaborations with world leaders in the field.

## Professor Gustavo Duque - Ageing and Osteosarcopenia

### International:

#### USA

Prof Stephanie Studenski – NIA (Baltimore)  
 Prof Douglas P Kiel – Harvard University (Boston)  
 Dr David Karasik – Harvard University and Israel  
 Dr Peggy Cawthon – UCSF (San Francisco)  
 Dr Mark Hamrick – University of Augusta (Augusta, GA)  
 Dr Carlos Isales - University of Augusta (Augusta, GA)  
 Prof Bruce Troen – University of Buffalo (Buffalo)  
 Dr Neil Binkley – University of Wisconsin (Wisconsin)  
 Dr Robert Pignolo – Mayo Clinic (Rochester)  
 Dr Jeremy Walston – Johns Hopkins University (Baltimore)  
 Prof Jane Cauley – University of Pittsburgh (Pittsburgh)  
 Prof Jeff Gimble – Tulane University  
 Dr Lilian Plotkin – Indiana University  
 Dr Roberto Civitelli – Washington University (St Louis)  
 Prof John Morley – St Louis





# INTERNATIONAL COLLABORATIONS

## Canada

Dr Alexandra Papaioannou – McMaster University (Hamilton, ON)  
Dr Richard Kremer – McGill University (Montreal)  
Dr Jack Adachi – McMaster University (Hamilton, ON)  
Dr Lora Giangregorio – University of Waterloo (Waterloo, ON)  
Dr Manuel Montero-Odasso – University of Western Ontario (London, ON)  
Prof. Olivier Beauchet – McGill University (Montreal)

## Colombia

Prof Fernando Gomez – Universidad de Caldas (Manizales)  
Dr Carmen Lucia Curcio – Universidad de Caldas (Manizales)

## Brazil

Prof Maysa Seabra Cendoroglo – Federal University of Sao Paulo  
Dr Alberto Frisoli Jr – University of Sao Paulo  
Prof Luis Garcez Leme – University of Sao Paulo

**Argentina** Dr Marcelo Shapira – Universidad de Buenos Aires

**Uruguay** Dr Aldo Sgaravati – Hospital Nacional de Montevideo

## Chile

Prof Pedro Paulo Marin Larrain – Catholic University of Chile  
Dr Felipe Salech – National University

## Spain

Prof Leocadio Rodriguez-Manas – Getafe (Madrid)  
Prof Pedro Abizanda – Castilla la Mancha  
Prof Alfonso Cruz-Jentoff – Hospital Ramon y Cajal (Madrid)

## France

Prof Cedric Annweiler – University of Angers  
Dr Guillaume Duval - University of Angers

**Belgium** Prof Koen Milisen – University of Leuven

**Denmark** Prof Moustapha Kassem – University of Southern Denmark

**Austria** Prof Markus Herrmann – University of Graz

**Switzerland** Prof Heike Bischoff-Ferrari – University of Zurich

**Sweden** Prof Mattias Lorentzon – University of Gothenburg

**Singapore** Dr Alvin Ng – NUS

**Taiwan** Prof Liang-Kung Chen – National Yang Ming University

**New Zealand** A/Prof Debra Waters – University of Otago





# INTERNATIONAL COLLABORATIONS

## **Prof Alan Hayes: Prof Alan Hayes – Sarcopenia-Biomedical –Translational & Clinical**

Dr Erik Hanson – University of North Carolina, USA  
Professor Stuart Phillips – McMaster University Canada  
Professor Sandor Dorgo

## **Prof John Hamilton - Joint Basic Sciences**

T.Lawrence, M.Sieweke (Marseilles), France  
K.Mills (Dublin),  
T.Wynn (NIH),  
I.Forster (Bonn),  
J.Smith (GSK),

## **A/Prof Kulmira Nurgali Regenerative Medicine - Stem Cells**

Professor Raquel Abalo - Universidad Rey Juan Carlos, Spain  
Professor Mark Kelley - Indiana University, USA

## **Prof Andrew McAinch Sarcopenia: Biomedical & translational**

Associate Professor Sudip Bajpeyi – University of Texas at El Paso, Texas, USA  
Professor George King – Texas Woman's University, Texas, USA  
Dr Kayte Jenkin – Emory University, Atlanta, USA  
Dr Erik Hanson – University of North Carolina, North Carolina, USA

## **Dr Ebrahim Bani Hassan Program Director – Imaging- Clinical**

Moredun Research Institute, Pentlands Science Park, Bush Loan, Penicuik, EH26 0PZ, UK  
Department of Virology, Parasitology and Immunology, Faculty of Veterinary Medicine, Ghent University,  
Salisburylaan 133, 9820 Merelbeke, Belgium  
e Merial LAVPH, 29 Avenue Tony Garnier, 69007 Lyon, France

Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Iran  
Department of Epidemiology, University of Groningen, University Medical Center Groningen, Groningen,  
The Netherlands  
Veterinary Faculty of the University of Tehran, Iran  
Department of Molecular Biology, Umeå University, Umeå, Sweden  
University of Applied Science and Technology, Mollasadra, Yazd, Iran  
Veterinary Faculty of Tabriz University, Iran

## **A/Prof Christine Rodda Musculoskeletal Research in Children & adolescents**

International Conference in Children's Bone Health (ICCBH), Wurzburg Germany, 2017

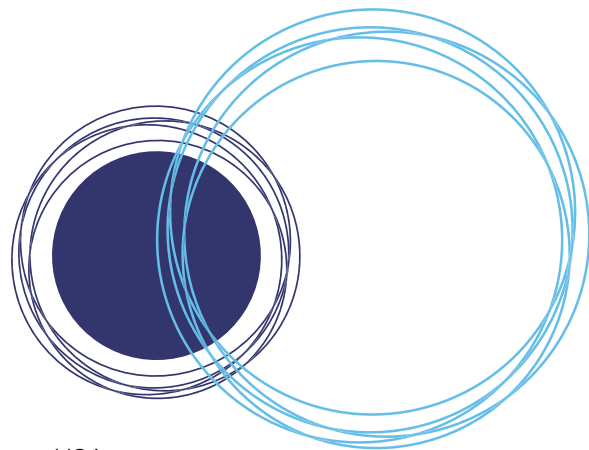
## **Dr Craig Goodman Projector Director Sarcopenia: Biomedical & Translational**

Assoc Prof Troy Hornberger Dept. of Comparative Biosciences at the University of Wisconsin-Madison, USA



## **A/Prof. Tissa Wijeratne - Neurosciences and the Musculoskeletal System**

Professor Wolfgang Grissold,  
University of Vienna, Austria  
Professor Valery Feigin, University of Auckland  
Professor David Dodick, Mayo Clinic, Arizona  
Professor Saroj Jayasinghe, University of Colombo,  
Sri Lanka  
Professor Sisira Siribaddana, Dean,  
Faculty of Medicine, University of Rajarata  
Professor Vladimir Hachinski, Ontario, Canada  
Professor Ralph Sacco, President,  
American Academy of Neurology  
Professor Raad Shakir, President,  
World Federation of Neurology, UK





# AIMSS PROFILED AT THE AUSTRALIAN AND NEW ZEALAND SOCIETY FOR SARCOPENIA AND FRAILTY RESEARCH THE AUSTRALIAN

The Australian and New Zealand Conference for Sarcopenia and Frailty Research Conference November 24-25th 2017. This conference, which was initially sponsored and organised by AIMSS in 2016, was attended by more than 160 delegates from 8 countries who met in Adelaide to share knowledge and research results on sarcopenia, ageing and frailty.



## Australian and New Zealand Society for Sarcopenia and Frailty Research

2017 ANNUAL MEETING • ADELAIDE, SA • 24 & 25 NOVEMBER



### It is my pleasure to welcome you to the Australian and New Zealand Society for Sarcopenia and Frailty Research 2017 Annual Meeting.

Following the successful inaugural conference in Melbourne last November, the 2017 conference is in Adelaide, South Australia also known as the Festival City.

Both Sarcopenia and Frailty are increasingly important and affect many people, especially those aged 80 years and older. Identifying, preventing and treating these conditions will better allow older people achieve healthy ageing.

Over two days, there will be opportunity to hear from internationally renowned scientists and clinicians and collectively, we will improve our knowledge base in these important health related topics.

There will be opportunity to showcase new research as well as network with our colleagues where we can share ideas and forge collaborations. The abstracts will be published in a special issue of the Australasian Journal of Ageing.

This national conference is multidisciplinary in nature and will be attractive not only to clinicians but also scientists from multiple disciplines not limited to epidemiology, food science, bench-top research and health economics.

On behalf of our Scientific/Steering Committee, I would like to welcome you to Adelaide.



**Prof Renuka Visvanathan**  
Convenor, Australian and New Zealand Society for Sarcopenia and Frailty Research 2017 Annual Meeting

**VENUE**  
Adelaide Health and Medical Sciences Building,  
The University of Adelaide, North Terrace,  
Adelaide, South Australia

#### For further information:

Lara Malcolm, Meeting Manager  
The Meeting People Pty Ltd  
PO Box 764, Mitcham SA 5062

**T** +61 8 8177 2215  
**M** +61 (0)411 439 410  
**E** [lara@themeetingpeople.com.au](mailto:lara@themeetingpeople.com.au)  
**W** [anzssrmeeting.com.au](http://anzssrmeeting.com.au)

### Invited speakers include



**Prof Cyrus Cooper OBE**  
United Kingdom



**Dr Manuel Montero-Odasso**  
Canada



**Professor Matteo Cesari**  
France



**Dr Olga Theou**  
Canada



**Dr Paul Gregorevic**  
Australia



**Assoc Prof Debra Waters**  
New Zealand



**Assoc Prof Dina LoGiudice**  
Australia



# AIMSS IN ADELAIDE FOR ANZSSFR INFORMATION BOOTH

The AIMSS team visited Adelaide as part of the Australian and New Zealand Society for Sarcopenia and Frailty Research (ANZSSFR) conference. This provided an opportunity for researchers and clinicians from all around the world to present the latest research that has been completed in the areas of Sarcopenia and Frailty. The Minister for Aged Care, the Hon Ken Wyatt, AM, MP opened the conference and was impressed and enthusiastic with the groundbreaking work being undertaken into this very real and important disease facing Australians now, and in the future.



Prof Gustavo Duque



Dr Ebrahim Bani Hassan



Hon Ken Wyatt Min for Ageing



# 2017 AIMSS BUDGET

AIMSS 2017		
<b>INCOME (Black: Confirmed, Green: Expected)</b>		
State & Local Government Grants	\$	
Western Health funding	\$	90,000.00
Other Grant Income (Pharma)	\$	24,000.00
Clinical Trials	\$	62,500.00
Contributions from other Higher Education Providers	\$	90,000.00
Course Fees and Charges	\$	20,000.00
Professional Services (DXA)	\$	15,300.00
Clinical/Research Services (F&F Clinic and Gabagym)	\$	133,200.00
Teach (VU)	\$	12,000.00
Profits from Sacrophenia and Frailty Conference	\$	50,000.00
FMDHS Funding	\$	90,000.00
<b>TOTAL</b>	<b>\$</b>	<b>587,000.00</b>
<b>EXPENDITURE</b>		
<b>Total Permanent Salaries</b>	<b>\$</b>	<b>156,680.00</b>
Clinical Research Coordinator (0.6 FTE)	\$	90,000.00
DXA/pQCT Technician (0.6 FTE)	\$	43,680.00
Biostatistician (0.2 FTE)	\$	21,000.00
Advertising - permanent staff	\$	2,000.00
<b>Total Casual Salaries - Teaching</b>	<b>\$</b>	<b>124,700.00</b>
Receptionist (0.6 FTE)	\$	35,000.00
Development Manager	\$	56,800.00
Internships	\$	8,400.00
UROP Students	\$	24,500.00
<b>Consumables Supplies</b>	<b>\$</b>	<b>28,300.00</b>
Signage	\$	2,500.00
Business cards - production	\$	800.00
Promotional merchandise/materials	\$	5,000.00
Annual research report	\$	5,000.00
Publications	\$	8,000.00
Other (refreshments, meetings)	\$	4,000.00
Staff set up costs	\$	3,000.00
<b>Infrastructure related</b>	<b>\$</b>	<b>2,000.00</b>
Postage	\$	2,000.00
<b>Other Services</b>	<b>\$</b>	<b>10,000.00</b>
Contracted services - website	\$	10,000.00
<b>Scholarships &amp; Student Related</b>	<b>\$</b>	<b>75,000.00</b>
PhD scholarships	\$	58,000.00
Travel grant	\$	15,000.00
Advertising PhD scholarships	\$	2,000.00
<b>Travel, Conference &amp; Entertainment</b>	<b>\$</b>	<b>28,200.00</b>
Visiting scientist/academic scheme	\$	10,000.00
Attendance to the ICSFR	\$	10,000.00
AIMSS seminar series	\$	3,500.00
Trophies - Speakers	\$	1,200.00
AIMSS Scientific Day	\$	3,500.00
<b>Grant expenses</b>	<b>\$</b>	<b>45,000.00</b>
Seed funding program	\$	45,000.00
<b>Expensed Assets</b>	<b>\$</b>	<b>80,000.00</b>
Research equipment (strategic purchase) DXA Machine	\$	80,000.00
<b>TOTAL</b>	<b>\$</b>	<b>549,880.00</b>
<b>GRAND TOTAL</b>	<b>\$</b>	<b>37,120.00</b>



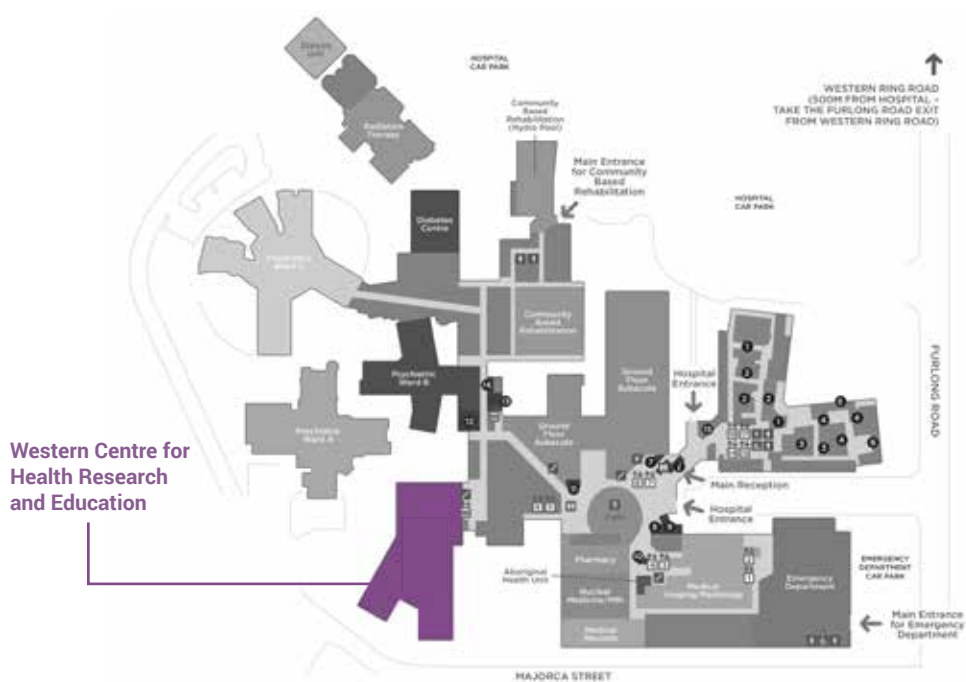
# NOTES

Handwriting practice lines consisting of 20 horizontal dotted lines.









## SUPPORTING AIMSS

Find AIMSS on Twitter  @AIMSSresearch and Facebook 

For all enquiries please contact Gwen McMaster-Fay Manager - Australian Institute for Musculoskeletal Science (AIMSS)  
MELBOURNE MEDICAL SCHOOL - WESTERN PRECINCT, THE UNIVERSITY OF MELBOURNE & WESTERN HEALTH  
Level 3 WCHRE, 176 Furlong Road, St Albans, VIC, 3021, Australia

Email: [gwen.mcmaster@unimelb.edu.au](mailto:gwen.mcmaster@unimelb.edu.au) Website: [www.aimss.org.au](http://www.aimss.org.au) T: +61400 505585 or +61438 354911