THE AUSTRALASIAN SOCIETY FOR BIOMATERIALS & TISSUE ENGINEERING

ASBTE *NEWS*

NOVEMBER 2014

Our next society conference:

Call for abstracts	Open
Call for papers deadline	17th November
Notification of abstract acceptance	9th January 2015
Author registration and Early bird registration deadline	23rd January 2015
Conference opens	7th April 2015
Conference closes	10th April 2014

We are excited to announce that the 24th Annual ASBTE conference will be held together with the 5th ISSIB meeting at Doltone House Sydney, Australia. As both meetings will be held concurrently and with many joint sessions, there will be ample opportunity for domestic and international researchers in the field of Biomaterials, Surface Science and Tissue Engineering to meet, have a great time and discuss collaborations that will define the breakthroughs of the future. Joint sessions will focus on topics including bio-interfaces, antimicrobial coatings, analysis of biomaterial surfaces and interfaces, biomolecules and cells at surfaces and interfaces as well as nanoparticles. Sessions included in the ABSTE program include drug delivery, scaffolds, implantable devices, stem cell therapies, biopolymers, biomechanics and tissue engineering. Sessions in the ISSIB program include functional coatings, patterned biomaterials, nanofabrication, bioreactors and biosensors.

...Conference information continued on page 2

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ASBTE NEWS is a biannual newsletter that covers news from The Australasian Society for Biomaterials & Tissue Engineering. If you have a news item that you wish to be included please contact the editors:

Bryan Coad (Bryan.Coad@unisa.edu.au)
Veronica Glattauer (Veronica.Glattauer@csiro.au)

2015 ASBTE / ISSIB Conference Continued

...Conference information continued from page 1

Confirmed Speakers

Plenary: **Michael Grunze**, Emeritus Chair Professor, University of Heidelberg, Germany

Milica Radisic, Professor, University of Toronto, Canada

Martina Stenzel, Professor, University of New South Wales

Keynote: **Wei-Bor Tsai**, Professor, National Taiwan University, Taiwan

Gilson Khang, Professor, Chonbuk National University, Korea

Chengzhong (Michael) Yu, Professor, The University of Queensland, Australia

Tomaso Zambelli, Professor, ETH Zürich, Switzerland

Min Wang, Professor, The University of Hong Kong, Hong Kong

Marcela Bilek, Professor, The University of Sydney, Australia

For more information go to

issib2015.smalltalkevents.com.au

Selected abstracts will be published in **Biointerphases**

You can help us to promote this conference by downloading promotional slides and posters from the webpage issib2015.smalltalkevents.com.au/ISSIB2015/Home/Welcome/Promotion.aspx

A Forum on Medical Manufacturing: Additive Manufacturing of Medical Devices and Implants

18 November 6—9 PM

RMIT University, Building 55 Carlton, VIC

Further information Prof. Milan Brandt (Milan.Brandt@rmit.edu.au)

To register: www.medical-manufacturing@eventbrite.com.au

There is no charge for this event

ASBTE Memberships for 2015: Become a new member or renew NOW

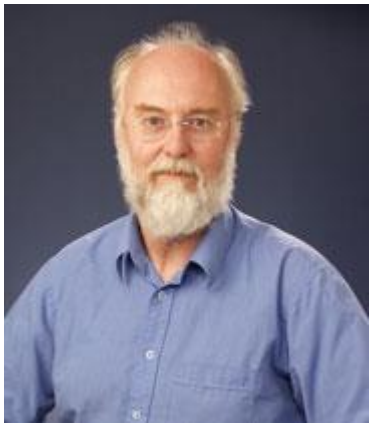
Membership Rates (Australian dollars): Full Member (Calendar Year) $80

Student Member (Calendar Year) $40

Membership forms are available at www.biomaterials.org.au

Celebrating a career in biomaterials on the occasion of John Ramshaw's retirement

Dr John A M Ramshaw is our longest serving member who was the foundation stone to the formation of our Society and the incorporation of the ASB (now ASBTE) to the International Union of Societies for Biomaterials Science and Engineering (IUSBSE). He received the inaugural ASBTE Award for his tireless dedication to advancing the vision of the society. The society was formed in May 1989 after a meeting in Leura co-ordinated by Dr Alan Jones from Department of Industry Technology and Commerce. But it was John who was the integral player who had the vision to form the Society, to integrate the disparate and diverse research groups working in the broad area of Biomaterials, to give Biomaterials Research a National focus and purpose. John Ramshaw was a Founding member of the Society that formed in 1989 and Inaugural President from 1990-1991. Indeed it was John who substantially wrote the ASBTE constitution and Statement of Purpose and vision.



Dr. John Ramshaw, co-founding member of the ASBTE, retires after 34 years at CSIRO

Over the 20 years of the ASBTE John has continued to promote the goals of our Society. Of the 20 National meetings, John has been on the Organising Committee of at least 7 and has been indirectly involved with many more. He was also the key Organiser and promoter of the International Implant meeting in Melbourne 1995 that put our Society on par with the other International Biomaterial Societies. It was largely due to John's efforts that the ASB was accepted as the 5th member of the IUSBSE, and John served as the ASB International Liaison Officer for many years and later served as Secretary where he wrote the By-Laws. John was one of key people involved in the promotion and development of the 7th World Biomaterials Congress in Sydney 2004, being on the Organising Committee as well as Program Co-Chair.

John Ramshaw's outstanding dedication and drive towards promoting the goals of the Society are backed up by his outstanding and sustained contributions in the chemistry and commercial applications of extracellular matrix proteins, particular collagens. His contributions have been recognised nationally and internationally by election as Fellow, Australian Academy of Technological Science and Engineering; Fellow, Biomaterials Science and Engineering; Fellow, Royal Australia Chemical Institute. He has received the prestigious CSIRO Medal for Research Achievement on two occasions as a member of the NovoSorb Biodegradable Polymer Technology Team, and as a member of the PhotoSeal Technology Team. John has received and continues to receive numerous awards and acclamations for his research: in 2014/2015 he is the recipient of the Barry Preston Award for his lifetime achievements in Matrix Biology pertaining to collagen research and applications. And he is the recipient of the Chandra P Sharma Award for outstanding and lifetime contributions to the field of Biomaterials.

John has served on various Advisory Boards, Expert Panels and Major Committees, including the Therapeutic Device Evaluation Committee Panel on Biomaterials (1990-2002), Secretary, International Union of Societies for Biomaterials Science and Engineering (2000-2009), Australia-India Strategic Research Fund Advisory Panel (2006 -), the GELITA Health Initiative Scientific Advisory Panel (2003-). He has an excellent publication record and a unique grasp of the balance of research as well as the importance of commercial outcomes. Dr John Ramshaw recently retired from CSIRO after 34 years of service. He has influenced and advised many friends and colleagues into successful research paths. He retains an Honorary Fellow position at CSIRO.

Contributed by Jerome Werkmeister

Recognition of Retiring ASBTE Members

The ASBTE wishes to recognise the outstanding achievement and service of key members upon their retirement. The ASBTE Executive committee are therefore pleased to announce that we have established a new initiative for recognising retiring members who have made significant and long-term contributions to the Society, including 20+ years ASBTE membership and who have served on the ASBTE committee.

The form of this recognition is in the award of a special plaque (presented at the next ASBTE event/annual meeting post retirement), a reduced registration fee at any annual ASBTE meeting, and the honour of a "lifetime member" status. The "lifetime member" concept is under consideration given that it would be a new membership category and will need to be put forward for consideration by ASBTE members at the next AGM in 2015 in Sydney. However, we considered it important that the recent retirement milestones of members be recognised by the Society at this time.

On behalf of all ASBTE members past and present, we wish to pass on our congratulations and thanks to **John Ramshaw** on his dedication to Biomaterials research and for his vision and hard work, along with the founding members **Rolfe Howlett**, **John Bateman**, **Graham Ellender** and **Jerome Werkmeister**, to establish the ASBTE. The Society continues to thrive as well as grow Australasia's long-standing international reputation in biomaterials and tissue engineering science and their translation.

Tim Woodfield, ASBTE President

ASBTE Awards and Travel Grant Information

2015 ASBTE Lab Travel Awards Info

2015 ASBTE Lab Travel Awards Info

Call for applications: open

Deadline: 24th Nov 2014

Eligibility: Open to those who have been ASBTE members since June 2014 or longer and who have renewed their membership for 2015

Grants of up to $4,000 for local travel during 2015 for postgraduate research students and early-career researchers. Please visit the ASBTE webpage for further information, guidelines, application forms and updates: www.biomaterials.org.au

2015 SBTE Conference Travel Awards Info

2015 ASBTE Conference Travel Awards Info

Calls for application: open

Deadline: 15th Dec 2014

Eligibility: Open to those who are current ASBTE members and who have renewed their membership for 2015

The ASBTE will fund conference travel awards of up to $500 each to assist selected postgraduate research students and early-career researchers to attend the 24th Annual Conference of the ASBTE and 5th ISSIB. Applicants must be current financial members of the ASBTE and must have submitted an abstract for presentation at the conference by the deadline. The conference travel awards are intended to help those who have difficulty getting to the conference through shortage of funds. The decisions on the awards will be made by the ASBTE Committee and may vary in amount at the discretion of the committee. Application forms are provided on the ASBTE website. www.biomaterials.org.au

ASBTE Award of Excellence Info

ASBTE Award of Excellence

Call for applications: open

Deadline 31st Dec 2014

Awarded at ISSIB/ASBTE conference

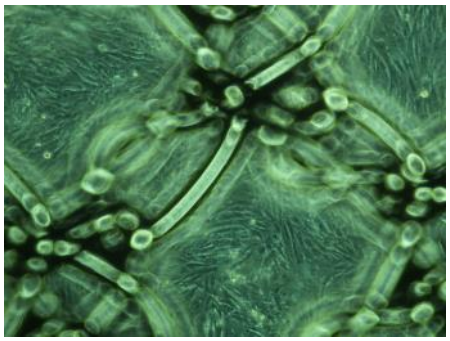
This award recognizes a member of ASBTE who has made a significant contribution to the Society and has an outstanding record in developing, maintaining and promoting the goals of the Society. Please visit the ASBTE webpage for further information, guidelines, application forms and updates: www.biomaterials.org.au

Spotlight on Funding

Some highlights of recent NHMRC / ARC and New Zealand competitive funding success

Towards Clinical Translation of a Cell-based Therapy for Pelvic Organ Prolapse (POP)

Caroline Gargett, **Jerome Werkmeister**, John Arkwright and Anna Rosamilia through Monash MIMR-PHI were awarded an **NHMRC project grant** of $1,058,058 for 4 years. The work will examine our new mesh designs with eMSC for treatment of POP in newly developed large sheep models. CSIRO is involved with mesh, explant analyses including biological, biochemical and biomechanical analyses as well as using the CSIRO fibre optic device to monitor pre and post treatment. The grant also includes evaluation of the efficacy of the CSIRO adapted probe in a cohort of control women and women with different clinical stages of POP.



Coupling an injectable gel and MSC microtissues to enhance cartilage repair

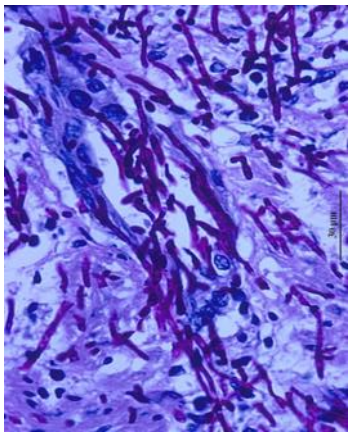
Articular cartilage doesn't heal when injured, and if left untreated cartilage degrades and joints lose function in the disabling disease of osteoarthritis (OA). OA is the most common cause of pain and disability in Australia, affecting 1.6 million Australians and a predicted 3 million by 2030. A team from Queensland University of Technology comprised of Dr. Michael Doran, A/Prof. **Travis Klein**, Prof. **Yin Xiao**, and Prof. Ross Crawford aim to help repair cartilage defects and over the next 3 years of their **NHMRC-funded grant**. They will be developing a new injectable hydrogel-based cartilage regeneration platform that incorporates microtissues formed from progenitor cells, as well as growth factors to help guide the development of new cartilage tissue.

Cancer research at QUT

Breast and prostate cancer are the most common cancers in Australian women and men, respectively. Cancer metastasis to bone greatly increases mortality rates and understanding the processes involved in bone metastasis is critical to preventing metastasis and increasing survivorship. Prof. **Dietmar Hutmacher** and his group have recently been applying their expertise in biomaterials and bone tissue engineering to develop in vitro and in vivo models of cancer and cancer metastasis. He is leading a new **NHMRC-funded project**, along with Prof. Filipe Cardoso, A/Prof. Jean-Pierre Levesque, Dr Boris Holzapfel, and Dr Brett Hollier, to further develop humanized chimeric metastasis models and test potential new therapeutics for breast cancer metastasis. Additionally, Dr. **Nathalie Bock** has been awarded an **NHMRC Early Career Fellowship** to further the development of bioengineered prostate cancer models.

Combating fungal biofilm growth on surfaces

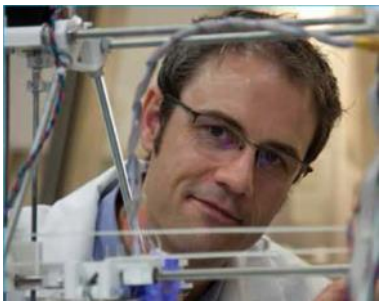
Hospital acquired infections are a public health crisis and a leading cause of death world-wide. In the USA over 200 people die each day from hospital acquired infections with over 80% of these related to contaminated surfaces of implanted medical devices. The understanding of how to fight fungal infections from surfaces will be given a major boost by a $355,000 **ARC Discovery grant**. Professor **Hans Griesser** and Senior Research Fellow Dr. **Bryan Coad** of UniSA's Mawson Institute will lead the grant along with research leaders from the UK and Switzerland. The four-year research program will develop advanced material surface coatings at UniSA and unravel the design principles needed to transform them into 3-D polymeric platforms. Direct visualization of fungal cells on surfaces using live cell imaging will reveal the fate of cells and provide direct evidence for the mechanisms of action.



Candida albicans becomes deadly when it forms biofilms on surfaces and invades tissues.

Amplifying bone growth in titanium implants

A Christchurch-led team is developing the next generation of 3D-printed joint replacements, where patients' bones can grow through and around the implants for a stronger, longer-lasting solution.



The team, led by **Dr Tim Woodfield** (pictured) of the University of Otago, Christchurch, has just been awarded more than $3.2 million over 4 years in funding from the **NZ Government's Ministry of Business, Innovation and Enterprise** (MBIE).

Investigators also include Prof Gary Hooper, Dr Mark Walton, **Seamus Tredinnick**, Dr Justin Fernandez.

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Auckland University and New Zealand companies Enztech and Ossis are part of the cutting-edge team. Enztec and Ossis have already been producing custom-designed titanium implants for patients with complex needs for more than six years. This includes replacements of large and unusually-shaped areas of bone lost due to accidents or cancer.

The aim of the project is to develop a better system for 3D printing titanium implants. This includes perfecting surfaces and shapes which maximise the growth of bone in and around the implant.

Stem cell research at Swinburne

Dr **Peng-Yuan Wang** was awarded a **Discovery Early Career Researcher Award** (DECRA). The project aims to use nanotopography approaches to improve the efficiency of generating induced Pluripotent Stem Cells (iPSCs) by changing cell behaviour at biomaterial surfaces. The significance is that iPSCs have enormous potential in stem cell therapy, regenerative medicine, and disease-specific treatment, with the potential to replace other stem cell types. The expected outcomes are that cellular reprogramming process for iPSCs generation will be improved and the canonical reprogramming factors might be reduced using surface nanotopographies of self-assembled colloidal crystals. The benefits are the promotion of productivity, the reduction of costs, and the application of iPSC derivatives, aimed at future clinical applications.

Dr Peng-Yuan Wang

ASBTE *News* publishes on grant funding, lab profiles, and recent publications of note. To have your news published in the next newsletter, contact the editor: bryan.coad@unisa.edu.au

ASBTE Student Representatives

ASBTE Student representatives organise student get-togethers, lectures, and special events for ASBTE students.

Contact them to join or suggest any activities of interest.

New South Wales	**Ulises Aregueta**	u.areguetarobles@student.unsw.edu.au
New Zealand	**Seamus Tredinnick**	seamus.tredinnick@pg.canterbury.ac.nz
Queensland	**Robyn Aston**	robyn.aston@uqconnect.edu.au
South Australia	**Morteza Kafshgari**	hasmy023@mymail.unisa.edu.au
Victoria	**Peter Koegler**	Peter.Koegler@csiro.au

World Biomaterials Congress: Call for Symposia

WBC2016 is seeking innovative proposals for "New Frontier" symposia topics related to Biomaterials Science and Tissue Engineering. The proposal submission deadline is 1st March 2015.

Details for submission can be found here:
http://wbc2016.org/index.php/program/call-for-symposia

ASBTE on LinkedIn

The ASBTE group on LinkedIn provides the latest news and discussions for society members.

If you are a LinkedIn member, search for "ASBTE - The Australasian Society for Biomaterials and Tissue Engineering" in groups and request to join the group. Or type in the following web address:

www.linkedin.com/groups?home=&gid=6512061

ASBTE Website www.biomaterials.org.au

Any member wishing to supply news items, links, PhD scholarships, job listings, or other relevant information to the ***website*** should contact the Executive Officer (Helmut.Thissen@csiro.au)

Spotlight on Conferences

ASBTE Annual Conference 2015

World Biomaterials Congress 2016

Upcoming Conferences

Conference	Location	Dates	Deadlines	Website
Advanced Materials & Nanotechnology (AMN7)	Nelson, New Zealand	8 – 12 Feb 2015	Online registration closes 4th Feb 2015	www.amn-7.com
ASBTE / ISSIB Conference	Sydney, Australia	7 – 10 Apr 2015	Abstract deadline 17th Nov 2014	www.issib2015.smalltalkevents.com.au
5th Asian Biomaterials Congress	Taipei Taiwan	6 – 9 May 2015	Abstract submissions open soon	abmc5.com.tw
Biomaterials International 2015	Kenting Taiwan	1 – 5 Jun 2015	Abstract deadline 31st Jan 2015	www.biomaterials.tw
35th Australasian Polymer symposium	Gold Coast, Australia	12 – 15 Jul 2015	Abstract deadline 30th Jan 2015	35aps.org.au
27th European conference on biomaterials ESB 2015	Krakow, Poland	30 Aug - 3 Sep 2015	Abstracts open 1st Dec 2014 and close 31st Jan 2015	www.esb2015.org
Tissue Engineering and Regenerative Medicine International Society World Congress 2015	Boston, USA	8 – 11 Sep 2015	Abstract submissions open Feb 2015	www.termis.org/wc2015/
World Biomaterials Congress	Montreal, Canada	18 – 22 May 2016	Call for symposia closes 1st Mar 2015. Abstracts open early 2015.	wbc2016.org

Lab visit reports: Seamus Tredinnick and Andrea Leong

Seamus Tredinnick – PhD candidate at the University of Canterbury, New Zealand

Host Lab: Asst Prof Mia Woodruff's Biomaterials and Tissue Engineering (BTM) group at the Institute of Health and Biomedical Innovation, Queensland University of Technology

Background

Seamus' research interests are in the development of patient specific orthopaedic devices manufactured via the electron beam melting (EBM) of titanium alloys. Specifically, Seamus uses this additive manufacturing process to create integral tissue scaffolds that promote osseointegration. Seamus holds an industry backed FRST fellowship and works with Prof J Geoff Chase at the Mechanical Engineering Department, University of Canterbury and Dr Tim Woodfield's Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) group at the University of Otago Christchurch.

Lab visit

Supported by the **ASBTE**, Seamus applied and optimised advanced resin embedding histology and histomorphometric processes at the BTM group and is establishing a resin histology capability with the CReaTE group. The interface between biomaterials and living tissue is of particular value for evaluating the in vivo performance of orthopaedic devices. However, analysing this for permanent metallic implants has always been difficult. At the BTM group, Seamus used Technovit 9100 New resin and the EXAKT cutting and grinding method to produce histological sections of EBM Ti6Al4V scaffold materials following a pre-clinical field trial in sheep. The optimisation of Goldner's trichrome staining allowed the clear visualisation of bone ingrowth and bone to implant contact, which were quantified via semi-automated digital histomorphometry. A protocol based capability was developed to enable the blinded study of multiple treatment groups.

Bone ingrowth after 3 weeks into EBM Ti6Al4V scaffold in a sheep tibia drill-hole model. 50 µm ground resin section with Goldner's trichrome stain.

The **ASBTE** support was instrumental in the ongoing establishment of a resin histology capability with the CReaTE group. Here, a direct section preparation capability is being developed for Technovit 9100 New resin embedded biopsies, using a Leica SP1600 saw microtome. This capability will be used to study both the aetiology and treatments for musculoskeletal disease, including metallic and polymer based scaffolds for tissue engineering applications.

Seamus is sincerely grateful for the financial support of the **ASBTE**, as well as Associate Professor Mia Woodruff's BTM group for providing substantial expertise and laboratory assistance for this project.

Seamus was awarded two ASBTE travel grants in 2014: an **ASBTE Conference Travel Grant** to attend the 2014 ASBTE conference in Lorne, Victoria, Australia as well as an **ASBTE Laboratory Travel Grant.**

Andrea Leong – PhD candidate University of New South Wales / Brien Holden Vision Institute, Sydney

Host Lab: Biointerface Engineering Lab (a node of the Australian National Fabrication Facility), Swinburne University, Melbourne

Background

The aim of my PhD project is to contribute to the development of a surface coating for surgically implanted medical devices. My experimental work involves preparing surfaces comprising covalently -attached artificial cationic peptides, and testing the antibacterial efficacy and cytocompatibility of these surfaces.

Our coating process starts with an amine-functionalised surface. We chose plasma polymer coating to provide amine surface chemistry because it deposits a tough film, and can do so on irregularly shaped objects and most substrate materials. This technique led us to the Biointerface Engineering Lab, which has strong capabilities in plasma polymer coating.

Lab visit

We planned to coat inert fluorinated ethylene propylene (FEP) substrates with a plasma polymer of allylamine, varying parameters to find those which maximised the density of surface amines. We prepared co-polymers of allylamine with 10 or 20% acrylic acid to investigate the effect on surface amine density and stability.

To determine the density of amine groups on our various samples, surface amines were subjected to a derivatisation reaction which allowed us to then calculate their amount from the XPS data. To measure the thickness of the deposited film, ellipsometry was performed on silicon wafer samples that had been coated alongside FEP substrates. This indicated a plasma polymer thickness in the tens of microns, as expected.

Outcomes

My visit provided me with plenty of experimental samples, and thorough characterisation of those samples. I also gained valuable knowledge regarding the possibilities as well as the limitations of the techniques I am currently using.

I am very thankful for the opportunity afforded to me by the **ASBTE Travel Grant**, and to the Biointerface Lab for hosting me. It was fantastic to have the equipment and expertise for plasma polymer coating, wet chemistry, XPS, ellipsometry and other techniques all in adjacent labs.

I encourage current postgraduate students in biomaterials research to investigate the best national and international facilities for their work, and apply for this grant if eligible.

Seamus' and Andrea's research was supported by ASBTE Grants

See Page 4 of the Newsletter for information on how you can apply for grants to support your research

The ASBTE webpage has further information, guidelines, application forms and updates: www.biomaterials.org.au