

January 2009

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**WELCOME** - This first Australasian Society for Biomaterials & Tissue Engineering (ASBTE) NEWS of 2009 has information on the upcoming annual ASBTE Conference 2009, as well as society news items including: summaries of the QUT Orthopaedic & Trauma Research Group; 2008 travel grant reports; and ASBTE Student Column. We hope you enjoy reading it.

## **ASBTE Annual Conference 2009 - Jan 21<sup>st</sup> -23<sup>rd</sup>, Sydney**

We are pleased to announce that the 19th Annual ASBTE Conference will be combined with the 3rd Indo-Australian Conference on Biomaterials, Implants, Tissue Engineering & Regenerative Medicine (BITE&RM), and will be held in Sydney, Australia from January 21-23, 2009.

This year's combined annual meeting is looking to be very exciting with a high level of attendance across members in Australasia and India. The **latest programme** is available on the conference website for you to view ([www.biomaterials.org.au/conference/program](http://www.biomaterials.org.au/conference/program)).

Please get online to **register** and book accommodation as space is filling up fast. Also, now is a great time to **renew your ASBTE membership** to take advantage of the reduced registration fee for members. Further information is available on [www.biomaterials.org.au/](http://www.biomaterials.org.au/)

## **NOTE: ASBTE 19<sup>th</sup> Annual General Meeting 2009 to be held at the conference venue on Friday 23<sup>rd</sup> Jan 2009 at 9am**

On the agenda:

- President's, Secretary's, Treasurer's, FASTS Reports
- Website -update
- ASBTE International Travel Grants - Update.
- Election of Officers, Committee Members and Student Representatives
- TERMIS meeting Sydney 2010
- 2010 ASBTE Meeting: Place and timing
- Proposal for an ASBTE Award of Excellence

3rd Indo-Australian Conference on

## **Biomaterials, Implants, Tissue Engineering & Regenerative Medicine (bite&rm)**

In conjunction with the 19th Annual Conference of the

## **Australasian Society for Biomaterials and Tissue Engineering (ASBTE)**

21-23 January 2009,

The University of New South Wales (UNSW)  
SYDNEY, AUSTRALIA



3rd Indo-Australian Conference on

## Biomaterials, Implants, Tissue Engineering & Regenerative Medicine (bite&rm)

In conjunction with the 19th Annual Conference of the

## Australasian Society for Biomaterials and Tissue Engineering (ASBTE)

We are delighted to invite you to join us in Sydney in January 2009 for the 3rd Indo-Australian Conference on Biomaterials, Implants, Tissue Engineering & Regenerative Medicine (BITE&RM), held in parallel with the 19th Australasian Society for Biomaterials and Tissue Engineering (ASBTE) annual conference.

We look forward to welcoming leading researchers from India to continue the wonderful tradition set in the previous Indo-Australian meetings held in India. The Indo-Australian BITE&RM meetings were initiated following a symposium on biomaterials and bioengineering at Manipal Academy of Higher Education (MAHE), Manipal in February 2004 between Indian and Australian researchers. This laid the foundation for the first Indo-Australian Conference which was held at Sri Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Trivandrum in January, 2005. The 2nd Indo-Australian Conference on Biomaterials, Implants, Tissue Engineering & Regenerative Medicine (BITE&RM) conference was also hosted by SCTIMST and was held in January 2007. At that meeting it was decided that the meeting would be held every 2 years and that the next meeting would be held in Australia in 2009.

Both the 1st and 2nd conferences brought together approximately 10 to 15 Australian and up to 60 Indian researchers. Additionally, students from both Australia and India attended and presented posters highlighting their research outcomes. We hope that out of this 3rd meeting, we will bring together Australasian researchers from across ASBTE with leading Indian researchers to develop:

- Greater awareness of the research being conducted in the field in the two countries.
- Increased research opportunities between the two countries with the aim of developing cutting edge research collaborations.
- Development of joint applications to AISRF and global funding networks for collaborative research programs.
- Exploration of joint programs for Postdoctoral Fellows and ECRs between research institutions.

So join us in Sydney to share your latest research, rekindle some old friendships with ASBTE colleagues and strike up some new collaborations with our Indian neighbours.

**Laura Poole-Warren (Conference Chair)**

**Keith McLean (Program Chair)**

**Justin Cooper-White (Program Chair)**

### Invited Speakers:



**Professor Marcus Textor (ETH Zurich, Switzerland)**

Prof. Textor is an ad hominem professor at ETH Zurich, Laboratory for Surface Science and Technology, and head of a research group dedicated to the area of surfaces and interfaces in bio-related fields of material science. [Read more](#)



**Dr Kishore Udipi (Former Research Director, Medtronic, USA)**

Dr. Udipi received his Ph.D. in Polymer Chemistry from the University of Akron, USA and was a NASA postdoctoral fellow at Princeton University. He has worked at Phillips Petroleum, Monsanto and Medtronic. [Read more](#)



**Dr Hala Zreiqat (University of Sydney)**

Dr. Zreiqat is a National Health and Medical Research (NH&MRC) Council Fellow and Head of the Tissue Engineering and Biomaterials Research Unit in the Faculty of Engineering, University of Sydney. [Read more](#)



**Professor Julie Campbell (University of Queensland)**

Prof. Campbell is an NHMRC Senior Principal Research Fellow at the University of Queensland. Prof. Campbell uses stem cell biology to bioengineer new blood vessels for transplantation. [Read more](#)

The **latest programme** is available on the conference website for you to view ([www.biomaterials.org.au/conference/program](http://www.biomaterials.org.au/conference/program)).

Please get online to **register** ([www.biomaterials.org.au/conference/reg.php](http://www.biomaterials.org.au/conference/reg.php))

## Reports from recipients of the ASBTE Travel Award 2008

### Nicole Fong (University of New South Wales)

From September 2007 to June 2008, I was fortunate enough to spend some time working in Columbia University, New York. The aim of my visit was to conduct research as part of my PhD degree on polyurethane nanocomposites for use as antibacterial urinary catheters. Working in the Department of Surgery, I was able to utilise an *in vitro* urinary tract model, developed in Columbia's labs, that allowed me to determine the antibacterial efficacy of polyurethane nanocomposite materials that I have been investigating.

Nanocomposites are composite materials with nano-sized inclusions. In my thesis, polyurethane is used as the matrix material, and the silicate, montmorillonite, is used as the nanofiller. To achieve good dispersion within the polymer matrix, the silicate was organically modified using an antimicrobial compound, prior to being incorporated into the polyurethane, thus conferring antibacterial properties to the resulting material.

My work at Columbia University involved learning techniques to assemble and maintain the urinary tract model. This included the preparation of my nanocomposites into tubular structures representative of a

urinary catheter, working with several bacterial strains, as well as assessing the release profile of the antibacterial agents incorporated in my test materials through spectrophotometry. Results from this work demonstrated that some of my test materials, with higher loadings of the antimicrobial compound, remained free from infection in the urinary tract model for over 30 days. This was significant as urinary catheters can become infected in less than 7 days in clinical settings.

During this travel period, I also presented my work at the European Society for Biomaterials conference in Brighton, London, as well as the World Congress for Biomaterials in Amsterdam. Attendance at these conferences allowed me to meet other colleagues in the biomaterials field and learn more about the latest research being conducted in this area around the world.

I would like to thank ASTBE for the opportunity to experience work and life in New York. The trip allowed me to gain invaluable experience working in an overseas lab, broadened my knowledge and skills in working with bacteria and *in vitro* models, and also established a collaboration with Columbia University.

### Aparna Jejuriar (University of Queensland)

My PhD project encompasses synthesis, fabrication and optimization of alginate hydrogel based biomaterials that will represent the next generation in cartilage replacement therapy. Novel ionically crosslinked alginate hydrogel systems have been developed and studied extensively parting the first stage of my PhD thesis. However, there is a need to develop covalently crosslinked alginate hydrogels in order to overcome the major drawback of long term instability of the hydrogels in the presence of suitable chelating agent. The aim of my visit to the Indian Institute of Technology Madras (IITM) was to develop one novel group of covalently crosslinked alginate hydrogel systems. The work was done under the guidance of Prof. A. Jayakrishnan.

Oxidized alginate is widely used in the fabrication of biomaterials. We were able to demonstrate formation of covalent crosslinks in alginate biopolymer network using oxidized alginate as the crosslinker. Thus, novel alginate hydrogels were synthesized from oxidized and non oxidized alginate using an acid catalysis. Stable gels were produced by varying the degree of oxidation of the crosslinker and

the ratio of alginate to crosslinker. The gels were further investigated for water uptake and up to 200% was observed. Chemical and physical characterization and properties evaluation of these novel hydrogels is currently underway at UQ.

During the trip to IITM I gained an understanding of chemistry in the covalent crosslinking of alginate hydrogels. Although alginate hydrogels are widely used and extensively studied they are complex systems to work with. Prof. Jayakrishnan provided insight into tailoring of alginate. The practical experience and data gained are a significant contribution towards my PhD. Apart from accessing Prof. Jayakrishnan's expertise, interactions with fellow researchers at IITM have proved to be beneficial in my continuing research.

I would like to thank ASBTE for the opportunity to work with leading researcher in the field of Biomaterials. The work done has not only broadened my knowledge of the area but has contributed to successful implementation of my PhD project.

## Request for input from ASBTE members

The ASBTE Committee met recently and discussed initiatives to promote the Society to Members. In the past few years a considerable effort has been made to provide support to ASBTE students and early career researchers through either conference travel grants or the international and national travel grant awards.

The committee is keen to explore options to support the wider membership of the Society. This support might come in the form of the creation of an ASBTE Medal for

distinguished service to the Society or to Biomaterials Research in Australia and New Zealand or a travel grant for non-students or members with restricted access to travel grants through their university or research institution.

The committee invites comments on these suggestions and welcomes other proposals designed to increase benefits available to the wider membership. Please send comments/suggestions to Lisbeth Grondahl...

([l.grondahl@uq.edu.au](mailto:l.grondahl@uq.edu.au)).



## Reports from recipients of the ASBTE Travel Award 2008

### Lauren Clements (Flinders University and CSIRO)

During April 2008 I visited the National Institute of Standards Technology (NIST) located in Gaithersburg, Maryland, USA. Within the Polymers Division, world leading research in the field of chemical gradients is conducted.

As my PhD is centred on the preparation of 2-directional gradients and the subsequent cellular response, the research being conducted at NIST is of outstanding interest to my PhD project. The primary focus of my visit was to learn gradient preparation techniques that I could then apply to my PhD research back in Australia. Gradients of coating thickness were prepared using their custom built flow coater. Using polystyrene as a model system, thickness gradients were applied to graded porous silicon (pSi) substrates that I had prepared prior to departing Australia. Following annealing of the polystyrene layer, the dewetting properties of the film were investigated using optical microscopy and atomic force microscopy. Wettability gradients were prepared using UV irradiation of

immobilised n-octadecyldimethylchlorosilane. By varying the UV exposure time across the substrate, a wettability gradient was achieved. Similarly the dewetting of polystyrene layers was investigated using these substrates. In addition to the gradient preparation techniques mentioned above, microchannels, 3D scaffolds, dip coating and annealing temperature gradients were utilised to create gradient surfaces.

Attendance at the world Biomaterials congress in Amsterdam from the 28<sup>th</sup> of May to the 1<sup>st</sup> of June allowed me to speak with experts in the field. Networking with such a high calibre of researchers from all over the globe provided me with many ideas to apply to my own research.

I would like to thank the ASBTE for providing me with the opportunity to learn from researchers from one of the finest nanotechnology research institutes in the world and also to learn from and network with leaders in the field at the World biomaterials Congress.

### Introducing: Orthopaedic & Trauma Research Group

#### Institute of Health and Biomedical Innovation, Queensland University of Technology

#### *Report by Yin Xiao*

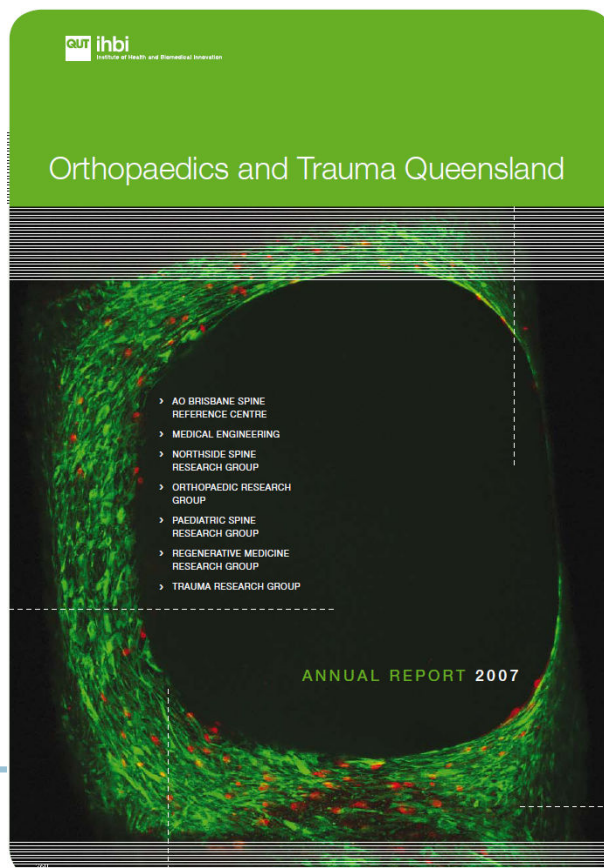
Orthopaedics and Trauma Queensland is an internationally recognised research group that is developing into an international leader in research and education. It provides a stimulus for research, education and clinical application within the international orthopaedic and trauma communities.

Orthopaedics and Trauma Queensland develops and promotes the innovative use of engineering and technology, in collaboration with surgeons, to provide new techniques, materials, devices, procedures and manufacturing techniques for medical devices. Its integration with clinical practice and strong links with hospitals ensure that the research will be translated into practical outcomes for patients.

The group undertakes clinical practice in orthopaedics and trauma and applies core mechanical and electrical engineering skills to challenges in medicine. The research is built on a strong foundation of knowledge in biomechanics, fluid mechanics and biomaterials, and incorporates expertise in cell biology, mathematical modelling, human anatomy and physiology. New knowledge is being developed and applied to the full range of orthopaedic diseases and injuries, fractures and spinal deformities.

For more information about the group members and current research projects please see the following link:

[http://eprints.qut.edu.au/archive/00014767/01/14984\\_ORTHO\\_ANNUAL\\_REPORT\\_V6.pdf](http://eprints.qut.edu.au/archive/00014767/01/14984_ORTHO_ANNUAL_REPORT_V6.pdf)



## **ASBTE Student Column**

### ***Report from the ASBTE Student Reps (Brooke Farrugia, Lauren Clements & Ivan Djordjevic)***

Welcome once again to the student column of the ASBTE newsletter. 2008 has come and gone, which means that many of our fellow student researchers have been busy in the lab wrapping up final experiments for the year, or for those of you who are nearing submission, trying to get those final corrections from supervisors before they head off on their Christmas holidays.

This year — as you would already know — the ASBTE meeting is being held in conjunction with the BITM&RM meeting at the University of New South Wales. As the ASBTE student representatives, we would like to invite all of the students that will be attending the conference to get together for an informal meeting as a way of getting to know fellow researchers both ASBTE members as well as other students who have travelled here for this great event. Details of the session are currently being planned but keep an eye out on the website...

<http://www.biomaterials.org.au/conference/index.php>

...and at the conference for further information. While this is planned as an informal get together we do encourage input from all of the ASBTE student members so if there is anything that you would like to have included at the students get together please let us know.

Do you have an aspect of your research that you would

like to share with fellow students? If so please feel free to let us know your thoughts for the next student column! We, as the student representatives of ASBTE, would like to welcome and encourage research students out there to let us know how your projects are going or if you have any information that you would think fellow colleagues would appreciate.

As one last reminder don't forget to have a look at the student page on the ASBTE website...

<http://www.biomaterials.org.au/index.php?id=9>

We are always interested in hearing fellow students' research interests. Please let us know if there is anything in particular that you would like to see featured on the student page or this column.

Hope to see you all in Sydney!

#### **Student Editors:**

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### **ASBTE Website ([www.biomaterials.org.au](http://www.biomaterials.org.au))**

Remember, any member wishing to supply news items, links, PhD scholarships, job listings, or other relevant information should submit these to Dr Penny Martens ([p.martens@unsw.edu.au](mailto:p.martens@unsw.edu.au)).

**Interested in becoming a member of ASBTE?** Membership Rates: Full Member (Calendar Year) \$60; Student Member (Calendar Year) \$30. Membership forms are available at [www.biomaterials.org.au](http://www.biomaterials.org.au)



**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:

Tim Woodfield ([tim.woodfield@canterbury.ac.nz](mailto:tim.woodfield@canterbury.ac.nz))

Yin Xiao ([yin.xiao@qut.edu.au](mailto:yin.xiao@qut.edu.au))

### **ASBTE Membership 2009**

If you've not updated or renewed your ASBTE membership for 2009, then membership forms are available at [www.biomaterials.org.au](http://www.biomaterials.org.au).