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WELCOME - This first Australasian Society for Biomaterials & Tissue Engineering (ASBTE) NEWS of 2008 has information on the upcoming annual ASBTE Conference 2009, as well as society news items including: summaries of the AGM and World Biomaterials Congress in Amsterdam in May, as well as the ASBTE Symposium earlier in Feb; 2007 and 2008 travel grant reports; and ASBTE Student Column. We hope you like the new layout of the Newsletter and that you enjoy reading it.

ASBTE Annual Conference 2009 – 1st Call

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. Please plan these dates into your calendar. Further information and a call for abstracts will soon be available on www.biomaterials.org.au.

Request for input from ASBTE members

The new 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).

19th Annual Australasian Society for Biomaterials & Tissue Engineering Conference

combined with the

**3rd Indo-Australian Conference on Biomaterials,
Implants, Tissue Engineering & Regenerative
Medicine (BITE&RM)**

**January 21-23,
2009, Sydney,
Australia**

World Biomaterials Congress (WBC)

Amsterdam, May 28th – June 1st 2008.

Report by Keith McLean & Tim Woodfield

The 8th World Biomaterials Congress was held in Amsterdam from May 28th to June 1st and more than 40 Australian and New Zealand members of ASBTE attended the meeting. The meeting was held in a typical large conference venue – Amsterdam RAI – a concrete mausoleum some six or so train or tram stops from the heart of Amsterdam. The Congress was attended by around 3000 delegates and with over 2700 abstracts submitted and 1600 oral presentations, there was plenty to get through. Despite the number of attendees many people caught up with old friends and colleagues from around the world.

The Congress began with the opening ceremony which included a parade of Society Presidents at which Justin Cooper-White represented ASBTE, as well as announcing the ASBTE Student Travel Award Winners. The Congress Chair, Professor Wouter Dhert, opened the meeting and was followed by a very clever reconstruction of Rembrandt's famous painting "The Nightwatch" with live participants. From the "painting" emerged retiring Professor Klaas de Groot who also welcomed guests.

The grand finale of the opening ceremony was, well, let's just call it an eye opening piece of modern dance (at least that is the male perspective!). Former President, Laura Poole-Warren, was close to being evicted during the performance! Drinks (including Heineken) and nibbles followed the opening ceremony and the *poffertje* (pancake) stall seemed to be the highlight of the occasion at least if the queue was any indication!

The Congress proper started on Thursday morning with the first plenary session followed by a day of symposia and offered papers in 9 concurrent sessions. The Congress continued in the same vein over the remaining three days and the scientific quality of the meeting was generally very high with the Plenary of Professor Sam Stupp a real highlight. Five of the Congress Symposia were arranged and/or Chaired by ASBTE Members and many presentations and orals were made by members. Fitness was improved by the sprinting required to get to and from often geographically distant rooms and even at weeks end a Sat Nav would have been useful for some attendees. Australian companies and institutions were represented in the excellent exhibition.

At Thursday lunchtime the 18th AGM of the ASBTE was held and the new committee and other representatives were elected. On Friday, Justin Cooper-White, Laura Poole-Warren and Keith McLean represented the Society at a meeting of the newly formed Asian Biomaterials Federation.

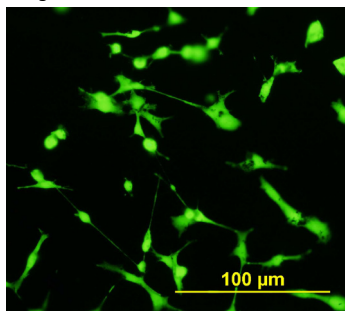
Friday evening was the occasion of the Congress Dinner which was held in an enormous and very historic location: The Amsterdam Convention Factory. The Factory is a heritage site of the time of Peter the Great and the great shipyards of the Dutch East Company. Staying with the international flavour of the World Congress, the food and entertainment reflected a range of different cultures. Part of the evening's entertainment saw several members trying their luck on the bucking bull, being photographed next to glamorous models dressed as various Dutch cheeses, and the new President and others carrying two enormous plastic cows around the dance floor. The city of Amsterdam proved an interesting venue and Australian delegates were spotted with their orange conference bags around town at a number of the city's cultural delights or in the art galleries.

The Congress concluded Sunday and attendees left after a successful few days ready to meet again in 4 years time in China.



Reports from recipients of the ASBTE Travel Award 2007

Rylie Green, GSBmE, University of New South Wales



RGC-5 cells grown on functionalised polymers

My visit to the University of North Texas, Health Sciences Center (UNTHSC), Fort Worth, USA was used to obtain supporting data for my PhD on novel conducting polymers for vision prosthesis electrode coatings. Validation experiments were conducted on materials

that were tailored specifically for the cloned retinal ganglion cell, RGC-5, developed by Professor Neeraj Agarwal at UNTHSC.

During this visit I gained experience in the use of both the RGC-5 and primary retinal ganglion cells cultured from young rat retinas. The data obtained will contribute to towards my PhD and a manuscript is currently being prepared for publication based on these results. Most significantly I was able to demonstrate that electroactive polymers could be tailored through biomolecule incorporation to produce cell differentiation in the RGC-5 cell line.

My collaboration with a range of researchers experienced in the field of vision neuroscience allowed me to gain important knowledge that will affect my continuing research in the development of electrode coatings for use in vision prostheses. I was able gain practical experience in culturing, maintenance and *in vitro* survival of retinal

ganglion cells obtained from primary sources. This collaboration with the UNTHSC School of Neuroscience will be integral in the progression of conducting polymer development for vision prostheses.

Additionally, I attended and presented at two conferences, BIOSURF VII International Conference on "Functional Interfaces for Directing Biological Response", August 29-31, 2007, Zurich, Switzerland; and the 21st European Conference on Biomaterials (ESB), in Brighton UK from 9th to 13th September 2007. My presentation at ESB was awarded the Rudolf Cimdens Prize and resulted in the publication of a related article in the Journal of Materials Science: Materials in Medicine.

I would like to thank ASBTE for the opportunity to work with leaders in the field of vision neuroscience and broaden my knowledge of the area.

Kinnari Bhadang, Monash University

The ASB grant facilitated travel and research undertaken at the Department of Pathology at Adelaide University under the supervision of Dr. David Haynes. Human osteoblasts were grown on the bioceramic + layer by Layer (LbL) polymer coatings where the polymers used were poly-L-lysine and heparin. The bioceramic coating substrate was comprised of 100% hydroxyapatite (HA) and a 40% mechanical blend of fluorapatite and hydroxyapatite (FHA) onto which the polymers were assembled. LbL coating were used as a scaffold to present immobilised human recombinant bone morphogenetic protein.

The results indicated that the osteoblasts did not attach and proliferate very effectively on LbL coatings terminating with heparin compared to poly-L-lysine. 40% FHA LbL coatings terminating with poly-L-lysine provided the best surface for osteoblast proliferation and expression of alkaline phosphatase activity after 7 days cell culture experiment. It didn't provide the best surface for osteoblast attachment when compared to 100% HA without any LbL but a significantly higher number of osteoblasts and were observed in the case of 40% FHA LbL coating with the passage of time. Layer by layer scaffolds were used to present immobilized rhBMP-2 which can subsequently be delivered to the target site of the implant. Immobilized rhBMP-2 produced a better cell response in terms of higher osteoblast numbers and the alkaline

phosphatase activity compared to use the rhBMP-2 in soluble form using the same concentration and substrate. Alkaline phosphatase activity was seen to be similar for all concentrations of soluble rhBMP-2, however the immobilized rhBMP-2 exhibited a higher activity compared to the soluble delivery of the protein. This shows the potential of modified 40% FHA LbL to be used as a coating for osteoconductive environment with the LbL matrix to be used as a scaffold for the presentation of proteins and other factors to the target site.

ASBTE 18th Annual General Meeting 2008 (held May 29th at WBC, Amsterdam) Summary by Tim Woodfield

Minutes of the AGM were recently circulated to members. The new ASBTE Committee elected for 2008-2009 comprises of Keith McLean (President); Justin Cooper-White (Vice President); Lisbeth Grondahl (Secretary); Jorge Garcia (Treasurer); Penny Martens; Sunil Kumar; Tim Woodfield and Yin Xiao. We have 3 students representatives this year: - Brooke Farrugia, Lauren Clement and Ivan Djordjevic.

ASBTE Membership 2008

If you've not updated or renewed your ASBTE membership for 2008, then membership forms are available at www.biomaterials.org.au.

Reports from recipients of the ASBTE Travel Award 2008

Brooke Farrugia, GSBmE, University of New South Wales

The aim of my visit to the Ian Wark Research Institute (IWRI) was to carry out surface analysis on fabricated polyurethane nanocomposites. The work carried out was to obtain data to help interpret results from assays conducted looking at the cellular interaction with the nanocomposite materials.

During my visit I was able to gain experience using two surface analysis techniques; x-ray photoelectron spectroscopy (XPS) and time-of-flight secondary ion mass spectrometry (ToF-Sims). Along with experimental experience I was able to receive data analysis interpretation from Professor Hans Griesser and Mr Marek Jasieniak, as well as an insight into the interactions between polymer surfaces and biological environments.

The materials that were analysed during my visit to IWRI consisted of a neat control polyurethane

(PEU), PEU loaded with unmodified silicate (MMT), and PEU loaded with MMT that had been modified with organic compounds that had been chosen due to their structure and functionality. Prior to surface analysis of the materials, studies had been conducted within the laboratories of GSBmE looking at fibroblast interaction with the materials. The results from the fibroblast interaction assays showed that there was a significant difference between some of the materials that contained modified MMT as compared to other test materials. A hypothesis for the difference in fibroblast adhesion between the materials was that blooming of the organic compounds used to modify the silicate may be

occurring at the surface of the materials.

The preliminary surface analysis results that were obtained from my visit showed evidence supporting the hypothesis that blooming of the organic compounds occurs at the surface of the fabricated materials. Along with the data that was obtained, the visit has also enabled me to set up collaborations with researchers from IWRI for further surface analysis studies.

I would like to thank ASBTE for the opportunity to visit the Ian Wark Research Institute.

ASBTE Symposium - Analytical Methods for Biomaterials, Tissue Engineering and Nanotechnology, Canberra, Feb 22nd 2008.

Report by Brooke Farrugia

This year, due to the World Biomaterials Congress being held, three day annual ASBTE conference was replaced with a one day symposium with an emphasis on "*Analytical methods for biomaterials, tissue engineering and nanotechnology*." The symposium was held at the National Museum of Australia in Canberra, located right on Lake Burley Griffin.

The morning started off with a talk from Dr. Åsa Jamting from the National Measurement Institute who gave us an insight into 'Techniques for Nano-particle and Nano-structure Characterisation'. After morning tea we were treated to two talks that focused on the regulatory avenue that is required for medical devices. The first talk was from Dr. Shirley Bolis from the Therapeutic Goods Administration with a presentation on 'The use of ISO10993 for Demonstrating Regulatory Compliance of Medical Device Materials'; the second talk was from A/Prof. Laura Poole-Warren from the University of New South Wales who gave us an insight into the 'Biological Evaluation of Medical Devices: Focus on analysis of devices with biological components'.

We were then treated to a delicious lunch out on the deck which had a magnificent view out over the lake. During lunch there was also time for a poster session that showed a selection of work from researches who had travelled to the symposium, the research that was on display ranged from biosynthetic grafts to poly(vinyl alcohol) and heparin copolymers as well as various other interesting topics in between.

After lunch the presentations continued with talks that focused towards analytical techniques for characterising various biomaterials with Prof. Hans Griesser from the University of South Australia informing us on techniques that are used for surface analysis and Prof. Michael James from The Bragg Institute at ANSTO from whom we learnt about the use of neutron scattering techniques.

The day was then concluded with a presentation from Dr. Jorge Garcia from the Therapeutic Goods Administration who showed us some interesting case studies into what can go wrong in the world of medical devices.

During the breaks an announcement was also made awarding the students who had been successful in receiving both the 2008 International and Local travel grants and the 2008 World Biomaterials Congress travel awards.

In conclusion the symposium was a success and also a nice opportunity to be able to view a range of presentations that showed us a broad observation into various analytical methods that are used to characterise materials as well as an insight into another side of the medical devices world that is not always seen.

The ASBTE wishes to thank Jorge Garcia for all the time an effort put into arranging this excellent symposium.



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, and with the AGM being held at the World Biomaterials Congress we may have lost one representative but we have gained two new ones. It is sad to say that we are losing Dougal who is coming towards the end of his PhD but we are welcoming Lauren and Ivan as the two new student reps, here is a quick introduction from our two new student reps:

Lauren: My name is Lauren Clements and I am currently in my second year of my PhD working at both at Flinders University, SA and CSIRO, Clayton, VIC. My research is centred on the preparation of 2-directional gradient surfaces that display variations in surface properties including topography, surface chemistry and wettability and the subsequent cellular response to such surfaces. This project is under the supervision of A/Prof Nicolas Voelcker and Dr A/Prof Helmut Thissen.

Ivan: My name is Ivan Djordjevic and I am currently enrolled in a PhD

program at the Ian Wark Res. Institute, University of South Australia. My PhD work involves synthesis, characterisation and biological evaluation of novel citric-acid based co-polyesters that are used for fabrication of tissue engineering scaffolds. I am one of the recipients of ASBTE travel grant this year. This grant took me to WBC 2008 where I presented my work in one of the poster sessions.

Since the last issue there have been two major events that the society has been involved in including the ASBTE Symposium and the 8th World Biomaterials Congress. While the symposium was a great success we would just like to say what a great representation there was from ASBTE students at the Congress. With the Congress being the Olympics of the biomaterials world that only comes around once if you're lucky within the period of completing a PhD it's such a great opportunity to be able to come face to face with the researchers that you only know through reading about their research in articles. Along with all of the

interesting and insightful plenary and symposium presentations to attend as well as numerous posters to view, one of the highlights of the Congress I would have to say would be attending the ICF-BSE College of Fellows special session where the debate "This house believes that the Pre-Clinical Testing of New Biomaterials is a Waste of Time" took place.

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>) and since we are always interested in hearing fellow students research interests and if there is anything in particular that you would like to see featured on the student page or this column please let us know.

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ASBTE Website (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).

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



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

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