THE AUSTRALASIAN SOCIETY FOR BIOMATERIALS & TISSUE ENGINEERING

ASBTE *NEWS*

AUGUST 2011

ASBTE—Class of 2011

Queenstown, New Zealand was the perfect backdrop for the 21st ASBTE held from 27th-29th April this year. Once again, the international pulling power of the society was demonstrated with inspiring presentations by plenary speakers Profs Marcus Textor, Patrick Stayton, Rui Reis and Michael Khor as well as a raft of other international guests. The whole conference had a very cosy, 'family' feel about it which was especially evident during question time at the student talks where some of the guest professors would ask questions and make suggestions as though they were mentoring their own students. What a great example for how conferences should be. On behalf of the ASBTE committee, we'd like to thank the organisers, George Dias, Tim Woodfield, Michael Mucalo, Thilak Gunatillake, Penny Martens, Mark Staiger and Malcolm Blakey from QT Event Management as well as the sponsors: Izon, CSIRO, Agresearch, ATA Scientific, Biointerphases journal, Phillips Ormonde Fitzpatrick, Watermark, PolyNovo, Southern Lights Biomaterials, and the University of Otago.

This issue of the newsletter is mostly dedicated to the Queenstown conference but also includes the very popular (they even have a facebook group) student column and travel reports from Rylie Green who recently travelled to the Martin Research Group (MRG) laboratories in Delaware, and from Sungchul Baek who visited the National Institute for Material Science (NIMS), Tsukuba, Japan. Happy reading!

The next gathering of the society will take place at the World Biomaterials Congress in June 2012 in Chengdu, China. See you there! *Eds Tim Dargaville and Helmut Thissen*

INSIDE THIS ISSUE:

World Biomaterials Congress meeting Chengdu, China June 1-5 2012
Abstract deadline: **30th September 2011**
Early bird registration: **20th March 2011**
see page 6 for ASBTE travel grants

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 submit these to Michael Mucalo (m.mucalo@waikato.ac.nz)

New Membership and Renewals: 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 & Tissue Engineering. If you have a news item that you wish to be included please contact the editors:

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Student Column

Report from the ASBTE Student Reps (Cara, Nathalie, Dori, Agnieszka and Shaylin)

Welcome to the student column of the ASBTE newsletter. The most recent AGM saw Dewi, Thanh and Lauren finish up as student reps as they will be graduating soon- congratulations! We'd like to particularly thank Lauren for all her hard work over the last 3 years as a student rep. We have 5 student reps this year- Cara, Nathalie, Dori, Shaylin and Agnieszka. Lots of people, we know, but we have big plans! Let us introduce ourselves....

Cara: Hi, I'm Cara Young, and I'm in my 3rd year of my PhD at the Graduate School of Biomedical Engineering at UNSW in Sydney. My PhD research is part of a project looking at biosynthetic hydrogels for the immunoisolation of pancreatic islets. My project involves the fabrication and characterisation of poly(vinyl alcohol) hydrogel microspheres to encapsulate cells and the incorporation of bioactive molecules with the aim of improving encapsulated cell viability and function. I'm working with Dr Penny Martens and Prof Laura Poole-Warren.

Dori: Hola, my name is Adoracion Pegalajar Jurado and I just started the third year of my PhD at Swinburne University of Technology (Melbourne). My research is focused on interaction of nano-structured polymers with bacteria and protein. The aim of this project is to isolate the role of nano-topography and surface chemistry on bacterial attachment, and protein adsorption. This project is funded by the Advanced Manufacturing CRC and it is under the supervision of Prof Sally McArthur, Prof Russell Crawford, Dr. Christopher Easton and Dr. Patrick Hartley.

Nathalie: Hello I'm Nathalie and I'm in my 2nd year of my PhD at the Institute of Health and Biomedical Innovation (IHBI) at QUT in Brisbane under the supervison of Drs Tim Dargaville, Mia Woodruff and Prof Dietmar Hutmacher. I did my undergrad at the European School of Materials Science and Engineering, in France, followed by two years as a research assistant in Bologna, Italy. My project involves the fabrication and characterization of polymeric microspheres, made by electrospraying, and the encapsulation of bioactive molecules for regeneration of tissues by controlled release, in the aim of providing more reproducible and tuneable release profiles than microspheres made by the traditional fabrication methods.

Shaylin: Hi, my name is Shaylin Shadanbaz and I am a PhD student in the department of Anatomy and Structural Biology at the University of Otago in Dunedin, New Zealand. I currently work with Dr. George Dias and Dr Christine Jasoni of the University of Otago and Dr Mark Staiger of the University of Canterbury in the field of biomaterials. Our primary focus is the development of a biodegradable metallic implant for orthopaedic use. Specifically, my project involves the design and development of surface coatings for the corrosion control of degradable metals in physiological environments.

Agnieszka: My name is Agnieszka Zuber. I'm PhD student at the Mawson Institute at University of South Australia under the supervision of Prof Rob Short. I graduated from the Medical University of Silesia in Poland receiving a Masters degree. The aim of my PhD project is to prepare a multilayer surface supporting the culture of a retinal pigment epithelium cell sheet ready for transplantation to people who suffer from age-related macular degeneration. Poly(lactic-co-glycolic acid) and plasma polymer are used as a base layer.

This year's conference in Queenstown was fantastic- what a beautiful place to have a conference! The 5 minute oral presentation session chaired by your student reps was a great way for many students and ECRs to communicate their research and to kick off the conference. The conference was a great success and as always a good opportunity to hear about world class research and strengthen old and begin new collaborations. Congratulations to all students and ECRs who won prizes and travel grants for the conference. Well done! The conference is always also a great opportunity to catch up with fellow biomaterials researchers. The student get together was great, with most students (and students-at-heart!) coming out to get to know each other, celebrate successful presentations and have some fun.

In exciting news, we have been planning a series of student/ECR events to facilitate student networking within ASBTE and also to get more students involved in the society. In October we will be holding a seminar in each of Melbourne, Sydney, Brisbane, Adelaide and Christchurch. There will be an invited speaker, followed by a student get together. We hope that this will not only encourage new students to join ASBTE, but also provide an opportunity for us to meet up again, talk about our research and have some fun. We will also be asking for help from all members to publicise the events. Stay tuned for details on the event in your city!

Remember we will also post information on the student page on the ASBTE website:

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

as well as our facebook page:

http://www.facebook.com/group.php?gid=338352205119.

And as always please let us know if there is anything you'd like to see from us or any news you'd like to share.

Hope to see you at one of our events in October!

Cara, Nathalie, Dori, Agnieszka and Shaylin

Travel Reports

Dr Rylie Green undertook travel from August – December in 2010, supported an ASBTE International Travel Grant. Rylie was invited to the Martin Research Group (MRG) laboratories in Newark, Delaware, USA. The MRG are at the forefront of research into conducting polymers as biomaterials with a specific focus on medical electrodes. Dr Green graduated with her PhD in conducting polymers for vision prosthesis electrodes in 2009 and has continued to work as a research associate at the University of New South Wales with an aim to establish her own group with prominence in this field. The trip to Delaware aimed to facilitate collaborations between UNSW and the MRG and additionally provide Rylie with training and experience in new fabrication techniques, including direct fabrication of electrodes within brain tissue.

Rylie was involved in three main collaborative projects during her visit. In her first project Rylie was trained and performed electrodeposition of conducting polymers directly into brain tissue. The materials formed in the brain tissue were electrically characterised and histological sections were taken. This work demonstrated that conducting polymers can be grown directly in the cortex and form fibrillar clouds which grow along the extra cellular matrix. As a result of this work a presentation was given at the Brain Machine Interface Symposium in Lund, Sweden by Professor Martin, head of the MRG, and a collaborative conference proceedings paper is currently being prepared.

Rylie sightseeing at Independence Mall, Washington D.C.

Rylie also initiated collaborations with the Griffin Lab in the School of Psychology at the University of Delaware. Assistant Professor Amy Griffin uses implanted electrodes to analyse cells in the rat hippocampus. The data obtained in these experiments provides insights into decision making processes pertaining to spatial awareness within the brain. However, due to fibrous encapsulation Dr Griffin can only analyse data for a limited period of time (roughly 2 months). Rylie designed a process to coat the conventional gold microwires with conducting polymers with an aim to extend the useable lifetime of the implanted electrodes. These devices have been implanted in the rat hippocampus and the results will be obtained over the coming months in a continuing collaboration.

Finally, Rylie worked with the MRG to modify a rheological setup to allow fabrication of conducting polymers through materials under test conditions. The successfully adapted rheometer will allow electrodeposition of conducting polymers through hydrogels while monitoring the effect on mechanical properties of the gel. This is likely to be an important piece of equipment in future collaborative efforts which will look at the mechanical effect of depositing polymers through living tissue.

Being in the USA and close to many cities Rylie was also able to attend and present her work at the New Jersey Biomaterials Symposium, New Brunswick, N.J. Rylie's time in the USA was highly beneficial with several joint research projects initiated and at least two collaborative publications being prepared at present. Finally, Rylie was able to use grant funds to support her travel to Buenos Aires, Argentina, where she presented a talk at the IEEE Engineering in Medicine and Biology Conference in September, 2010. The support of the ASBTE greatly appreciated and highly recommended for other ECRs.

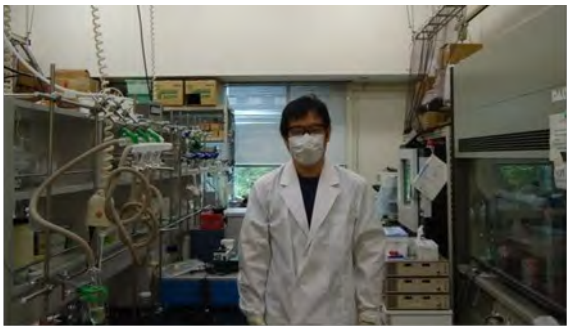
Sungchul Baek: With the assistance of an ASBTE Travel Grant, I visited the National Institute for Material Science (NIMS), Tsukuba, Japan to learn techniques to graft nano-sized polymer brushes on a non-polymer substrate. These brushes will be utilized in modifying the structure and properties of conducting polymer (CP) coatings used in neural interface applications.

Surface initiated atom transfer radical polymerisation (SI-ATRP) is the technique of grafting polymer chains from a substrate. My work at NIMS focused on the theory and practice of SI-ATRP. This included generating theoretical predictions from polymerisation conditions, preparing polymer brushes with different monomers, and characterising the product by ellipsometry, gel permeation chromatography (GPC), Multi Angle (Laser) Light Scattering (MALS) and nuclear magnetic resonance (NMR).

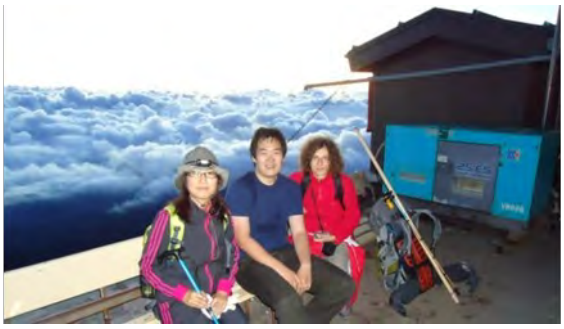
My host, Dr. Kobayashi, and the trainer, Dr. Yoshikawa, made my three-month stay at NIMS such a gratifying experience. Not only had they shared their research expertise, but they invited me to attend the Japanese Polymer Society Symposium in Hokkaido, the northernmost island of Japan, as well as to climb Mount Fuji (3776m), the highest mountain in Japan. *(continued next page)*

(Travel report cont from previous page):

On my way to Japan, I also presented my work at the Tissue Engineering and Regenerative Medicine International Society - Europe (TERMIS-EU) conference in Dublin. I would like to thank ASBTE for funding this wonderful research experience in overseas. I gained valuable research insight, travelled round the world and more importantly built lasting friendship with the Biofunctional Materials Group at NIMS.



In the lab at the NIMS Tsukuba

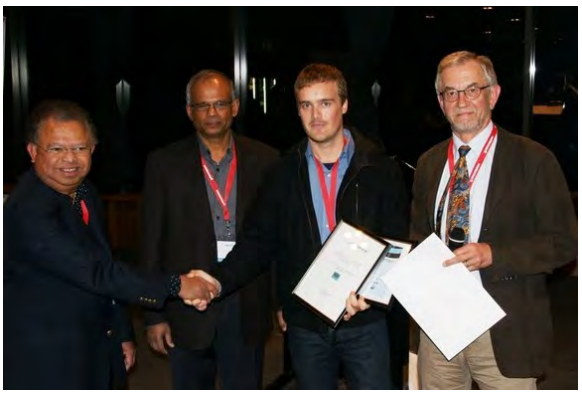


Sung with Drs Kobayashi and Yoshikawa on Mt Fuji

21st ASBTE Conference Award Recipients

Dr **Lisa White** (University of Nottingham) accepting the award for best young investigator oral presentation from ASBTE Treasurer Dr **Penny Martens** for her talk "Controlling the morphology and mechanical properties of supercritical fluid foamed scaffolds"

Nathalie Bock (Queensland University of Technology) and **Ryan Hartwell** (University of British Columbia) tied for the award of best student oral presentation. Nathalie presented her work on "Electrospraying, a reproducible method for production of polymeric microspheres for protein delivery", while Ryan presented "The use of integrative, non-rejectable allogenic skin substitutes to treat diabetic wound". The awards were presented by Dr **Keith McLean**



Toby Brown (Queensland University of Technology) accepts the award for best student poster titled "Melt electrospinning printing of tissue engineering scaffolds" from **George Dias**, **Thilak Gunatillake** and **Marcus Textor**

Queenstown Photo Gallery









2012 Travel Grants and ASBTE Annual Conference Travel Awards

ASBTE is pleased to call for applications for our 2012 Lab Travel Grants and ASBTE Annual Conference Travel Awards.

ASBTE Lab Travel Grants: ASBTE will fund one or more travel grants of up to a total of $5000 for international travel to laboratories and two of up to $1500 each for local travel during 2012 for postgraduate research students and early-career researchers. Guidelines and application forms are provided on the ASBTE website (www.biomaterials.org.au).

Completed application forms and a copy of a CV must be submitted to Prof. Nico Voelcker via e-mail (nico.voelcker@flinders.edu.au), with Subject "ASBTE Lab Travel Grant Application" by **5 pm Friday 4 November 2011**

ASBTE Annual Conference Travel Awards: ASBTE will fund ten conference travel awards of up to $1500 to assist postgraduate research students and early-career researchers to attend the 9th WBC 1-5 June 2012 in Chengdu, China. 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).

Completed application forms and supporting documentation as per the guidelines must be submitted to Prof. Nico Voelcker via e-mail (nico.voelcker@flinders.edu.au), with Subject "ASBTE Conference Travel Award Application" by **5 pm Friday 27 January 2012**.

One Minute With...Steve McInnes

Steve McInnes

***ASBTE member since**: 2011*

***What are you working on now?** The finishing touches to my PhD thesis entitled "Development of porous silicon/polymer composites for the controlled release of drugs" at Flinders University under the supervision of Prof. Nicolas Voelcker. My thesis work includes the preparation of biodegradable inorganic/organic materials from porous silicon by grafting poly(L-lactide) or vinylbenylthymine and studying the drug release properties. I have also studied drug release from composites created using the iCVD deposition of poly(methacrylic acid-co-ethylene dimethacrylate) (pH switchable) and poly(N-isopropylacrylamide) (temperature switchable) conformal coatings on pSi. As well as this I have been developing new porous silicon microparticles as scaffolds for automated DNA synthesis (biopolymer growth) and studying the subsequent release of the synthesised strands in vitro. We believe that biodegradable hybrid materials will find uses in tissue engineering and drug delivery. Some of my other work involves a research associate position with Prof. Keryn Williams of the Flinders Medical Centre on a collaborative project to deliver Infliximab to the eye for the treatment of Uveitis which affects an estimated 17 people per 100,000 and is responsible for 10 % of all cases of serious visual loss in developed countries.*

***What/who motivates and inspires you?** I have a particular connection with cancer treatment as my family has a long history with battling the disease. Since I was 9 years old my, mother, father and uncle have all been affected by the disease. I hope that one day the materials I'm developing in my research can be use to help cure those diagnosed with cancer.*

Where did you study previously?
I obtained my BSc in Nanotechnology from Flinders University in 2005. I'm currently studying and working under Prof. Nicolas Voelcker at Flinders University.

***What made you choose science?** Science came naturally to me and I have always had great teachers who taught science in a captivating way. Science also provided me with a creative outlet other than the arts (which I was terrible at!).*

***Favourite science teacher and why?** Prof. Joe Shapter (Flinders University). Joe made undergrad chemistry simple to understand, he has a wonderful gift of being able to take something quite complicated and explain it in a simplistic and humorous manner. A skill I one day hope to wield as well he does.*

***What do you hope to achieve in the next 12 months?** Finish my PhD and become a doctor. Everything else can wait!*

***Favourite holiday destination?** Too many to choose just one! New Zealand is so beautiful, while Fiji and the Cook Islands are so relaxing and stress free, but I also love the history that you find throughout Europe. I would also really love to see South America and Egypt.*

***What are you reading now?** Too many scientific papers and The Righteous Men by Sam Bourne (its very Dan Brown!).*

***If I wasn't doing this (job) I'd be....**Playing netball for Australia… wait I already do that! Ummm probably something sports related, maybe physiotherapy, sports management or personal training.*

"One minute with..." profiles an ASBTE member. If you have someone in your group you would like to see profiled please email Tim (t.dargaville@qut.edu.au) or Helmut (helmut.thissen@csiro.au).

The nominations are open **for the ASBTE Medal For Research Excellence 2012**: The nominations should accompany (a) name and affiliation of three nominating members and a statement from each describing the reasons for the nomination (b) name, address and affiliation of the nominee (c) A detailed Curriculum Vitae of the nominee. Please forward nomination via e-mail to Dr Thilak Gunatillake (thilak.gunatillake@csiro.au) before 31st Dec 2011. Please visit the ASBTE website for details.