THE AUSTRALASIAN SOCIETY FOR BIOMATERIALS & TISSUE ENGINEERING

ASBTE *NEWS*

OCTOBER 2012

WORLD BIOMATERIALS CONGRESS

The 9th World Biomaterials Congress took place from 1-5 June 2012 in Chengdu, China. Again the ASBTE was well represented at this important congress, which brings together Biomaterials Societies from around the world once every 4 years. The ASBTE contributed to this by providing travel grants totalling AU$ 10,600 to students and early career researchers. Furthermore, the ASBTE provided support for symposia organised and chaired by ASBTE members.

At the opening ceremony, the inaugural ASBTE Award for Research Excellence was presented to Prof. Dietmar Hutmacher. At the same ceremony, two ASBTE members were also awarded the title of Fellow of Biomaterials Science and Engineering (FBSE). Please see page 2 for further details.

The 2012 Annual General Meeting of the ASBTE was also held at this conference. Here A/Prof. Lisbeth Grøndahl took over as President of the society, while the previous President Dr. Thilak Gunatillake, who has had a very successful term, continues to serve as Vice-President. The new ASBTE committee elected during this meeting is seen below.

The freshly elected ASBTE Committee (from left): Prof. Nico Voelcker, Dr. Penny Martens (Treasurer), Dr. Helmut Thissen, Dr. Thilak Gunatillake (Vice-President), A/Prof. Lisbeth Grøndahl (President), Dr. Katharina Ladewig and Dr. Tim Woodfield (Secretary). Absent: Dr. Michael Mucalo (photo: K. McLean)

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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New IUSBSE Fellows and Secretary

ASBTE members Prof. Laura Poole-Warren (UNSW) and Prof. Dietmar Hutmacher (QUT) were elected as Fellows of the International Union of Societies for Biomaterials Science and Engineering (IUSBSE) in recognition of their professional standing and their outstanding contributions to the field of Biomaterials Science and Engineering. The new Fellows were introduced during the opening ceremony of the 9th World Biomaterials Congress in Chengdu, China. Congratulations to Laura and Dietmar on this well-earned recognition!

ASBTE member and previous President and Secretary, Dr. Keith McLean (CSIRO) was elected as Secretary of the IUSBSE. Keith will hold this key position for the next 4 years and will work closely with the President of the IUSBSE, Prof. Nicholas Peppas - for example on the 10th World Biomaterials Congress, which will be held in Montreal, Canada (18-22 May 2016, www.wbc2016.org). While the IUSBSE Secretary and President have non-voting roles, Prof. Laura Poole-Warren (UNSW) and Prof. Justin Cooper-White (UQ) will continue as voting ASBTE delegates to the IUSBSE. Congratulations again Keith!

For more information on the IUSBSE, please see: www.worldbiomaterials.org

Dr. Keith McLean: The new secretary of the IUSBSE (photo: H. Thissen)

Awards

CSIRO Medal for Research Achievement

The multidisciplinary PhotoSeal™ Surgical Tissue Sealant Team was awarded a prestigious CSIRO Medal for the development of a new technology platform and a series of new biomedical materials that will help provide solutions to currently unmet needs in surgery and regenerative medicine.

Members of the team identified the great potential for a rapid and simple photochemical process to crosslink soluble mammalian proteins and form useful hydrogel-based biomaterials. This work was underpinned by CSIRO research towards the synthesis of crosslinked recombinant resilin, an extraordinarily efficient rubber protein found in insects.

How the technology works: Irradiation with visible light is used to trigger tyrosine crosslinking (photo: CSIRO)

Some of the PhotoSeal™ team members (from left): Dr. Tony Vuocolo, Dr. Christopher Elvin, Dr. Alan Brownlee and Dr. Jerome Werkmeister (photo: CSIRO)

Specifically, the team developed an advanced surgical tissue sealant, PhotoSeal™, and trialed it successfully in a range of animal surgical models.

The technology has been licensed to an Australian investment company and holds promise to deliver new biomedical materials that are cheaper and easier to use whilst exhibiting superior mechanical and biological properties than currently available products.

If you have a recent event, award or exciting article that may be of interest to ASBTE members, please contact the editors of this newsletter: Helmut Thissen (helmut.thissen@csiro.au) and Katharina Ladewig (kladewig@unimelb.edu.au)

ASBTE Award for Research Excellence

Inaugural Award goes to Prof. Dietmar Hutmacher

The ASBTE Award for Research Excellence recognizes a member of the society who has made a significant contribution to the fields of Biomaterials and Tissue Engineering.

During the opening ceremony of the World Biomaterials Congress 2012 held in Chengdu, Dr. Thilak Gunatillake, the President of ASBTE, awarded the inaugural ASBTE Medal for Research Excellence to Prof. Dietmar Hutmacher.

Prof. Hutmacher is currently the Queensland University of Technology (QUT) Chair in Regenerative Medicine, Institute of Health and Biomedical Innovation.

Prof Hutmacher first graduated in Biomedical Engineering from the University of Applied Sciences (Aachen, Germany) from where he went on to earn his MBA from Henley, UK in 2000 and PhD in 2001 from the National University of Singapore.

His distinguished career so far can be described as one of a multi-disciplinary biomedical engineer, an educator and an inventor. Dietmar has made major contributions to our understanding of bone repair and regeneration, and has taken bone tissue engineering concepts along the entire course from the laboratory through to clinical applications. He has received over AU$ 35 million in competitive grant funding.

Dietmar has served on editorial boards of prestigious international journals, has published over 220 journal articles with over 6500 citations, has a h-index of 40, contributed 35 book chapters, edited 4 books and has given hundreds of conference presentations. Dietmar is also ranked 45th worldwide in citations per paper in Materials Science over the past decade (Thomson-Reuters).

He has given over 30 keynote lectures at international conferences and has been a very active member of the ASBTE as well as the Tissue Engineering & Regenerative Medicine International Society - Asia Pacific (TERMIS-AP). He has also been a mentor and supervisor for 21 PhD students, 15 Masters students and several postdoctoral scientists.

Dietmar has received numerous awards from institutions around the world and holds adjunct Professorships in prestigious US Universities.

Presenting the award: ASBTE president Dr. Thilak Gunatillake, presenting the award to Prof. Dietmar Hutmacher (photo: K. McLean)

ASBTE awards: Announcement of ASBTE Awards at the WBC 2012 opening ceremony (photo: K. McLean)

Among the most recent recognitions are the title of Fellow of Biomaterials Science and Engineering (see this newsletter) and an Australian Research Council Future Fellowship (2012).

Congratulations again Dietmar!

New ASBTE Student Representatives

Several new student representatives were appointed at the 2012 ASBTE Annual General Meeting: Adoracion Pegalajar Jurado (Swinburne/VIC), Khoon Lim (UNSW/NSW), Chandi Goonasekera (UQ/QLD), Clementine Pradal (UQ/QLD) and Kai Chan (UOtago/NZ)

Please get in touch with your fellow students if you have any suggestions, news or issues you'd like to discuss. You can find contact details and further information on the student page of the ASBTE website: www.biomaterials.org.au

If you are a member of the society and you have received a poster/presentation award at the closing ceremony of the World Biomaterials Congress, the ASBTE would love to hear from you. Please contact the ASBTE secretary with your details: Tim Woodfield (tim.woodfield@otago.ac.nz)

Science Meets Parliament

SCIENCE MEETS PARLIAMENT

Dr. Kate Fox

On October 16th and 17th, I along with Dr Katharina Ladewig was fortunate to attend the Science Meets Parliament event as representatives of the ASBTE. The annual event seeks to close the gap between scientists and government. In particular, the event is set up to give scientists a better understanding of the political process, how policy is developed, and the influence of the media in the development of science policy.

The event provided significant opportunities to network and meet other scientists from around Australia and compare notes particularly on the current Australia research funding climate. The first day was spent pretty much educating the audience as to the best ways to get your message across whether that be through influencing political policy, lobbying parliaments or through general outreach. Speakers included the opposition minister for innovation Sophie Mirabella, print journalists and over dinner at Parliament House the Minister for Tertiary Education, Skills, Science and Research senator Hon Chris Evans and privy to the launch of the Friends of Science Parliamentary group chaired by Richard Marles MP and Karen Andrews MP.

In addition, we were lucky enough to hear the National Press Club address of Nobel Laureate Prof. Brian Schmidt speak on his opinion on the future of Australian Science as well as participate in a fairly underwhelming Q and A session with Senator Hon Chris Evans. In this session, Senator Evans was pushed on topics that are of significant interest to members of the ASBTE. Of most relevance was the perceived gap between the research funded by the ARC and the research funded by the NHMRC. As you well know, the ARC has tightened the funding rules to specifically make medical research exempt from their funding schemes, however, the NHMRC requires some clinical trials really to attain funding here. Biomaterials research thus does not fit nicely into any scheme without significant space used in applications to argue its relevance. Senator Evans was non-committal and suggested that it was not his problem to fix.

The next day, we were rounded up and sent off to spread the message to our nominated politicians. I was fortunate to meet within a small group with Karen Andrews MP, a coalition member from the Gold Coast and co-chair of the Friends of Science. The two topics I chose to speak on were:

At Science Meets Parliament (from left): Dr. Katharina Ladewig, Dr. Jessica Kvansakul and Dr. Kate Fox (photo: Lorna Sim/Science & Technology Australia)

1) The retention of women (and men) in science when the competitive government grant systems do not truly account for career breaks and suggesting that more thought needs to be placed on not only attracting girls into science but the steps that need to be put into place to keep those that are currently in science; and

2) better mechanisms to fund medical device and biomaterials research when a three-four year government funding period does not provide enough time to generate a device capable of attracting commercial interest without the Government being able to underwrite some of the risk.

Dr Ladewig met with Dr Dennis Jensen MP, the federal member for Tangney (WA) and the most highly educated member of either House. Dr Ladewig had planned to speak with Dr Jensen MP about the issues affecting early career researchers in the current research funding environment of universities. However, instead they discussed the reasons why international researchers move to Australia and he suggested some mechanisms for scientists to use politics to further science. This was not uncommon with other participants also reporting that they did not get an opportunity to discuss the issues that affected them. The Science Meets Parliament concluded with a cocktail with the Greens Party where Adam Bandt proved to be very much interested in scientific affairs.

As a whole, we felt privileged to be able to attend such an event and represent the ASBTE. We both found it very eye opening but wish that we were given more opportunity across the two days to speak with more politicians and policy makers. We thank ASBTE for their support.

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)

Travel Grant Report

Dr. Katharina Ladewig

Dept. of Chemical and Biomolecular Engineering
The University of Melbourne

Dr. Katharina Ladewig, an early career researcher at The University of Melbourne (UoM), was the lucky recipient of two ASBTE travel grants this year. Katharina's research interests centre on the development of novel materials for regenerative medicine, gene and drug delivery, and other biomedical applications. She holds a prestigeous ARC Super Science Fellowship in the area of tissue engineering and is a member of the Polymer Science Group (Prof. Greg Qiao) at The University of Melbourne.

Katharina received an ASBTE Lab Travel Grant ($1,000) to visit Prof. Carsten Werner's group at the Max-Bergmann Center für Biomaterialien (MBC), Dresden, Germany, earlier this year as well as an ASBTE Conference Travel Grant ($300) to attend the 9th World Biomaterials Congress held in Chengdu, China in early June.

Dresden's beautiful old city skyline at night (photo: B.P. Ladewig)

MBC director and Biofunctional Polymer Materials theme leader Prof. Carsten Werner hosted her at the institute between January and May 2012 which aimed to foster new collaborations between German and Australian biomaterials researchers. Together with key researchers from the Biohybrid Hydrogel group Dr. Uwe Freudenberg and Dr. Mikhail Tsurkan Katharina worked on various approaches to mimic the diversity of the extracellular matrix (ECM) – a matrix that constitutes the natural environment of any cell within the body. The group previously developed a hybrid gel system incorporating heparin and synthetic star-shaped polyethyleneglycol (starPEG) which provides tunable material properties (e.g. adjustable mechanical characteristics and hydration) and enhanced biological functions.[1] Key to this approach is the high affinity of heparin for reversible binding and release of different cytokines and chemokines (e.g. growth factors). Through the incorporation of peptide structures as crosslinkers between the two main building blocks (heparin and star-PEG), it is possible to control enzyme-mediated degradation and promote cell binding through presentation of adhesion ligand sequences. The newly established collaboration between the MBC and the Polymer Science Group at UoM focuses on developing novel ways to immobilize small hydrophobic drugs within the biohybrid

Katharina visiting the old city of nearby Wroclaw, Poland (photo: B.P. Ladewig)

hydrogel platform and mediate their release based on cellular demand. Initial results obtained during Katharina's overseas stay were very promising and a number of *in vivo* experiments are currently underway both in Australia and in Germany in order to test the first iteration of the modified biohybrid hydrogel platform. Other UoM-based researchers of this newly established collaboration include A/Prof. Andrea O'Connor, Prof. Greg Qiao, Prof. Geoff Stevens, and Dr. Anton Blencowe with the Melbourne Materials Institute (MMI) providing seed funding for associated research costs in 2012.

During her stay in Dresden, Katharina also participated in the 13th Dresden Polymer Discussions, a series of symposia organized on a biannual basis by the Leibniz Institute for Polymer Research Dresden (IPF), Germany, to foster in-depth discussions of specific polymer science and engineering questions. Under the headline Molecular Bioengineering meets Polymer Science this year's discussions brought together leading experts from different fields of polymer science to discuss novel concepts in biology-inspired polymer research. Since polymers provide the basis for much of the functionality found in natural systems, advances in the field of molecular bioengineering largely depend on progress being made in polymer science and engineering. Many exiting topics such as adaptive and self-healing materials, mechanisms of molecular recognition, assembly, and transport, as well as matrices for exploitation of the endogenous regenerative potential of many living organisms were discussed. The symposium was an excellent opportunity to showcase some of Australia's existing research in the field and Katharina presented a paper.[2]

Members of the Biofunctional Polymer Materials theme at MBC (photo: M. Binner, MBC)

(Travel grant report cont from previous page):

Katharina hopes to return to Germany in mid-2013 to conduct further experiments at the institute and is in the process of arranging a visit from Prof. Werner and some of his key researchers.

With the aid of the ASBTE Conference Travel Grant Katharina was able to attend the 9th World Biomaterials Congress, which was held in Chengdu, China in June 2012. There she presented a paper entitled 'Quantifying In Vivo Biodegradation of Biodegradable Polymers under Stress' which was based on work performed in collaboration between UoM and the O'Brien Institute (Fitzroy, Australia).[3]

During the conference the ABSTE also held its Annual General Meeting and Katharina was elected to the ASBTE committee.

[1] Tsurkan, M.V., Chwalek, K., Levental, K.R., Freudenberg, U., and Werner, C., *Modular Star PEG-Heparin Gels with Bifunctional Peptide Linkers,* Macromolecular Rapid Communications, 2010, 31(17):1529-1533.; Tsurkan, M.V., Levental, K.R., Freudenberg, U., and Werner, C., *Enzymatically degradable heparin-polyethylene glycol gels with controlled mechanical properties,* Chemical Communications, 2010, 46(7):1141-1143.

[2] Ladewig, K., Blencowe, A., Henderson, T., Hartnett, T., Rowe, K., Palmer, J., Abberton, K., Penington, A., Morisson, W., Stevens, G., Qiao, G., and O'Connor, A., *Smart Scaffolds for Soft Tissue Engineering and Drug Delivery Applications,* 13th Dresden Polymer Discussions: Molecular Bioengineering Meets Polymer Science, 1-3 April 2012, Dresden, Germany.

[3] Ladewig, K., Hartnett, T., Rowe, K., Palmer, J., Stevens, G., Abberton, K., Penington, A., Morisson, W., and O'Connor, A., *Quantifying in vivo Biodegradation of Biodegradable Polymer Under Stress,* 9th WBC, 1-6 June 2012, Chengdu, China.

ASBTE Annual Conference 2013

22nd Annual Conference of the ASBTE 2013

The ASBTE is delighted to invite you to beautiful Barossa Valley, South Australia for the 22nd Annual Conference of the ASBTE which will be held together with the 5th Indo-Australian Conference on Biomaterials, Implants and Tissue Engineering. You can find further details under:

www.themeetingpeople.com.au/asbte2013

Prof. Nico Voelcker (Convenor)



2-5 April 2013
At the Weintal Barossa Hotel

Call for Papers Opens	**Now Open**
Registration Opens	**01 November 2012**
Call for Papers Closes	**16 November 2012**
Notification of Abstract Acceptance	**14 December 2012**
Program Available	**10 January 2013**
Early Bird Registration Closes	**01 February 2013**

ASBTE Travel Awards

Please watch out for announcements and further information on travel awards that the ASBTE will be offering associated with this conference: www.biomaterials.org.au