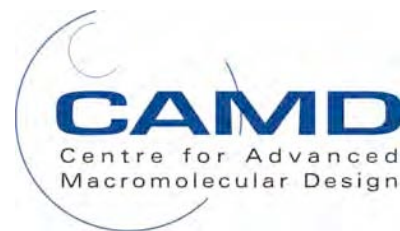


CAMD NEWS

News from the Centre for Advanced Macromolecular Design



Director's Introduction: 2008 - A Busy Year Of Change

2007 closed with CAMD undergoing a performance review at UNSW with the outcome of a few minor recommendations regarding administration improvements but high praise for scientific output and the recommendation for continuation. We would like to thank Professor Graeme George who provided his time as the external reviewer. The year 2008 has been characterised by major personnel changes. Professor Chris Barner-Kowollik and Dr Leonie Barner returned to Germany to take up positions at the University of Karlsruhe and The Fraunhofer Institute for Chemical Technology respectively. Both made huge contributions to the success of CAMD since its inception and we wish them well in their new life. Following this loss of key personnel, UNSW Management decided to make two new senior academic appointments and we expect two new staff members to join us in 2009. In addition, a new Research Manager was appointed, Dr Michael (Mikey) Whittaker who re-joined CAMD after spending a number of years at the AIBN, University of Queensland with Dr Michael Monteiro. Dr Volga Bulmus was appointed to a tenured position at UNSW in the School of Biotechnology and Biomolecular Sciences, as a Senior Lecturer. A/Prof John Foster (also School of Biotechnology and Biomolecular Sciences) returned from a period of release as a 'Marie Curie International Incoming Fellow' at Forschungszentrum-Juelich in Germany to start a Biopolymer research group closely associated with CAMD. Professor Tom Davis continued his appointment (into a third year) as a VIP Professor at the Institute of Materials Research and Engineering in Singapore.

Several student exchanges maintained the CAMD strategy of building strong International linkages, with Björn Mathes (PhD student) visiting from the University of Marburg for three months. Also from Germany we welcomed Martin Hetzer visiting for 6 months from the Heinrich-Heine-Universität, Düsseldorf. Going the other way, a CAMD PhD student (Sam Pearson) went to the University of Marburg for three months. In addition, two CAMD PhD students (Simon Ting and Eunhee Min) spent three months at the University of Pau. Dr Jingquan Liu spent one month at Shandong University, building up a long term collaboration which should lead to further exchanges in years to come. We were also fortunate to have Professor Filip Du Prez from the University of Ghent, who spent a six month period of sabbatical at CAMD.

A new Linkage Grant was awarded to Professor Chris Barner-Kowollik and Dr Phil Barker (Bluescope Steel) to continue an Industrial collaboration on the degradation of polymers. The funding is for the next three years. The Project will now be directed by Professor Tom Davis at CAMD (although with the continued input of CBK!). This grant now means that CAMD has worked on funded projects with Bluescope Steel (formerly BHP) for twelve years continuously. The Engineering Faculty also provided seed funds for the Establishment of a new Research Centre, to be associated with CAMD. The theme of the Centre will be research into nanomedicine related to cancer treatment (title still to be determined!). The research Centre will involve close collaboration with A/Prof Maria Kavallaris at the Children's Cancer Institute.

Three members of CAMD received significant recognition for their performance in 2008. A/Professor Martina Stenzel and Professor Rob Burford received the Sangster Award and the Applied Research Medal respectively from the Royal Australian Chemical Institute. The CAMD Manager, Steve Jacenyik was awarded the "Technical Staff Excellence Award" from the Engineering Faculty at UNSW. Professor Tom Davis and A/Professor Martina Stenzel gave Plenary and Invited lectures respectively, at the 30th Australian Polymer Symposium held in Melbourne in December 2008.

CAMD members (both ex- and current) are also playing a significant role in the flagship journal for Australian Chemistry, the Australian Journal of Chemistry, with A/Professor Stenzel appointed as an Associate Editor and Professor Chris Barner-Kowollik as a Handling Editor.

Finally, on behalf of the Management Team I would like to offer our best wishes to all the members and friends of CAMD for the coming year.

New Postdocs



Dr. Sadik Amajjahe

Dr. Sadik Amajjahe studied chemistry at the University of Duesseldorf (Germany) where he received his Masters in 2005. During his PhD under the supervision of Prof. Dr. Helmut Ritter (Duesseldorf/Germany) he worked on the field of polymerizable ionic liquids. Beside the investigation of the interaction of these polyelectrolytes with microwaves, he also investigated the host-guest formation of monomeric and polymeric ionic liquids with Cyclodextrins. In March 2008, he joined CAMD, where he is currently a research associate. His investigations are mainly focused on the synthesis of novel RAFT agents for controlled living polymerizations and the generation of polymeric materials with complex architectures. The obtained macromolecular structures should be applied for drug delivery systems.

Dr. Gaojian Chen

Dr. Gaojian Chen joined CAMD in December 2007. He obtained his PhD in October 2007 from the University of Warwick in U. K., under the direction of Prof. David M Haddleton. His PhD research focused on the surface modifications of different materials using atom transfer radical polymerisation (ATRP) and the synthesis of novel glycopolymers and their applications in bioconjugation and protein separation. Currently, Gaojian's project concerns the synthesis of nanoparticles and the development of drug release containers for the targeted delivery of platinum anticancer agents to hepatocytes.

Dr. Jan Devroede

Dr. Jan Devroede joined CAMD in February 2008, two months after receiving his PhD degree in the group of Prof. Dr. C. E. Koning at the Eindhoven University of Technology. Although his PhD study focussed on a fundamental study on the suppression of the formation of THF during the synthesis of PBT, he has now taken up a completely new challenge in his post-doctoral research, which involves 'polymer grafting oriented towards surface engineering'. This comprises the final period of a three year Australian Research Council (ARC) Industry Linkage project in collaboration with Carl Zeiss Vision.

Dr. Andrew Gregory

Dr. Andrew Gregory joined CAMD in January 2008. He obtained his PhD in December 2007 from the University of Nottingham in the United Kingdom, working with Professor Steven Howdle. His PhD research focussed on uniting 'Green Chemistry' and the RAFT technique for controlled dispersion polymerisations in supercritical carbon dioxide. A range of homo- and co-polymer structures were produced in an environmentally benign system. Andrew's current research looks at utilising RAFT to synthesise defined polymer architectures which can be conjugated with platinum based drugs. This allows the creation of novel drug delivery vessels which can be used for the treatment of liver cancer.

Dr. Kok Hou Wong

Dr. Kok Hou Wong completed his PhD at CAMD in 2007. His PhD research was focused on the fabrication of honeycomb structured porous films for biomedical applications using biocompatible, polystyrene based amphiphilic block copolymers. He also investigated the mechanism of "breath figure" formation techniques of porous films and constructed the current airflow casting system in CAMD. At 28thAPS, he was awarded the Treloar prize for his poster presentation entitled "Honeycomb structured porous films: Cell culture scaffold from Polypyrrole containing block copolymer". After PhD, Kok Hou took up a post-doctoral position with Prof. Bob Gilbert at University of Queensland, before returning to UNSW for a joint post-doctoral position between CAMD and Photonic Research Group (EE&T) in 2008. Kok Hou is currently working in collaboration with A/Prof. Francois Ladouceur, Head of Photonic Research Group on the fabrications of honeycomb structured porous polymer matrix for future conformal digital display applications.

Dr. Lei Tao

Dr. Lei Tao joined CAMD in September 2008. He got the PhD degree in 2006 from University of Warwick, UK, under the supervision of Prof. David M. Haddleton, his PhD study focused on the synthesis of polymers by 'Metal Mediated Living Radical Polymerization' (MMLRP) and the application of those polymers in protein conjugation area. In 2006, he joined Prof. Heather Maynard' group in University of California, Los Angeles (UCLA) as a Post-doc, his research included the polymer synthesis by Radical Addition Fragment Transfer (RAFT), modification of those polymer chain ends to bioreactive moieties, and preparation of polymer-protein conjugation. His current research interest at CAMD is to modify proteins with biocompatible polymers synthesized by RAFT and the potential application of the polymer-protein conjugates in drug delivery.

Welcome Back Mikey!

Dr. Mikey Whittaker rejoins CAMD after an absence of almost 6 years. After being awarded his PhD in 2000 Dr. Whittaker joined a biotech start-up and was based at CAMD as part of a technology transfer agreement until mid-2003. During this time he conceived and reduced to practice novel methodologies for the modification, synthesis and assembly of polymer surfaces for the controlled display of antibodies.

In 2004 Dr. Whittaker joined A/Prof. Michael Monteiro's research group within the Australian Institute of Bioengineering and Nanotechnology (AIBN) at the University of Queensland. In the subsequent 4 years Dr. Whittaker developed novel strategies for the synthesis of water soluble polymers and polymeric nanoparticles for use as drug delivery vehicles and for the bioremediation of water. He was also part of the team that developed new pathways to synthesise complex polymer architectures with high precision and purity using a combination of "click" and living free radical chemistry.

Dr. Whittaker currently holds an ARC Discovery grant (2008-2010: with Profs. Istvan Toth and Rod Minchin, collaborating with A/Prof. Monteiro) which is investigating the nanotoxicology and biodistribution of precisely engineered polymer/inorganic hybrid nanoparticles.

Dr. Mike Whittaker joined CAMD in September 2008 as Research Manager and Senior Research Fellow



Samuel Pearson

Sam finished his Bachelor of Engineering with Honours in Industrial Chemistry at the University of New South Wales in 2007 after completing an honours project at CAMD focusing on polymers for gene delivery. He extended his work on this topic for the first 6 months of his PhD in 2008 before completing a three month linkage project on monofunctionalised gold nanoparticles at Marburg University in Germany. His current research with A/Prof. Martina Stenzel focuses on developing polymer carriers for gold and platinum complexes for the treatment of rheumatoid arthritis and various types of cancer.

Edgar Wong

Edgar Wong completed his BE in Chemical Engineering (Hons 1) at The University of New South Wales (UNSW) in 2007 and is now doing his PhD in Industrial Chemistry at CAMD since February 2008 under the supervision of Prof. Christopher Barner-Kowollik and A/Prof. Martina Stenzel. His first publication, which arises from a research project he undertook during his honours year in 2007, was published in *Macromolecular Rapid Communications* in early 2008 entitled "Laser Induced Marking of Polymer Chains with Radical Spin Traps". Currently, his research focuses on the development of novel free radical polymerization systems to control molecular weight distributions. He also has a keen interest in the development of efficient polymer conjugation protocols on a joint project with A/Prof. Stenzel and Prof. Barner-Kowollik. Part of his PhD tenure will be spent in Prof. Barner-Kowollik's labs at the University of Karlsruhe.

Mohd Firdaus Yhaya

Mohd Firdaus Yhaya completed his Masters in Polymer Engineering from Universiti Teknologi Malaysia in August 2007. His Masters thesis entitled "Development of Scratch and Abrasion Resistant Coating Materials Based on Nanoparticles Cured by Radiation". In March 2008, he started his PhD in CAMD with Dr. Leonie Barner, then A/Prof. Martina Stenzel under the sponsorship of Universiti Sains Malaysia (USM). After completing his PhD, he will be teaching Coatings Chemistry and Technology in USM. His research is focused on the design of core-shell microspheres using RAFT polymerization techniques.

Bianca Blunden

Bianca completed her Bachelor in Industrial Chemistry in 2007 and obtained a Master in Commerce in 2008. In 2008, she enrolled in a PhD project at CAMD under the supervision of A/Prof. Martina Stenzel. Bianca works on the synthesis of nanoparticles with incorporated pendant groups capable of strong H-bonding. These particles are investigated as alternative drug carriers, especially for the delivery of genes, to replace toxic cationic polymers.

Khairil Juhanni binti Abd Karim

Juhanni received her Bachelor Degree in Engineering from Gifu University, Japan with major in Applied Chemistry in 2001. She furthered her studies in Analytical Chemistry (major in Ion Chromatography) at Gifu University, Japan and graduated with Masters in Engineering in 2003. She is currently attached with the Universiti Teknologi Malaysia, Skudai, Malaysia as a lecturer while undertaking her PhD project (UNSW) 'Polymeric Platinum Drugs for Cancer Treatment' under the supervision of A/Prof. Martina Stenzel.

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A/Prof. Martina Stenzel

Congratulations Martina on receiving the Sangster Award. This RACI Polymer Division award recognises the outstanding achievement of young Australian polymer scientists while their careers are still developing.

Prof. Rob Burford

Also recognised by the Royal Australian Chemistry Institute, Rob Burford received the Applied Research Medal. This Medal recognises a scientist who has contributed significantly towards the development of, or innovation through, applied research, or in industrial fields.

Dr. Volga Bulmus

Volga became a Senior Lecturer at the School of Biotechnology and Biomolecular Sciences (<http://www.babs.unsw.edu.au>; <http://www.biopolymers.unsw.edu.au>). Dr. Bulmus has on-going collaborations with Prof. Davis (CAMD), A/Prof. Maria Kavallaris (Children's Cancer Institute Australia), Prof. Rose Amal (Particle and Catalysis Research Group), Dr. Heather Maynard (University of California Los Angeles, USA), Dr. Hadi Zareie (University of Technology Sydney)

Dr. Anthony Granville

Anthony is one of two recipients of the Faculty of Engineering Department's Academic Fellowship award. He is currently working his ARC Discovery (with Dr. L. Barner and Prof. Axel Müller) grant utilising his background in surface polymerisation and modifications research into the design of polymeric microspheres for biological applications and separations.

Steve Jacenyik

Steve was awarded the "Technical Staff Excellence Award" from the Engineering Faculty at UNSW. This was largely in recognition of his tireless efforts in quantum engineering to make funds appear from nowhere.

A/Prof. Fank Lucien

Congratulations to Frank for his promotion in 2008 to Associate Professor.



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In 2008, we had to say a sad farewell to our CAMD colleagues Prof Christopher Barner-Kowollik and Dr Leonie Barner.

Christopher came to CAMD in 2000 as a Postdoc and made his way through the ranks the following years. He was dedicated to the investigation of mechanistic aspects of RAFT polymerization and he build up extensive expertise at CAMD in the mass spec analysis of polymers.

His wife Leonie joined him in 2001 and took up the positions as a research manager at CAMD. Next to the research management, she persuaded her own research and investigated different surface grafting techniques using RAFT.

They left sunny Sydney in June 2008 to settle in Karlsruhe in Germany.

Christopher joined the Karlsruhe University/Karlsruhe Institute of Technology and is heading now the preparative macromolecular chemistry group, while Leonie is now a team leader at the Fraunhofer Institute for Chemical Technology in Pfnztal, Germany.

They both are very much missed at CAMD and we wish them all the best for their future.



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Björn Mathes

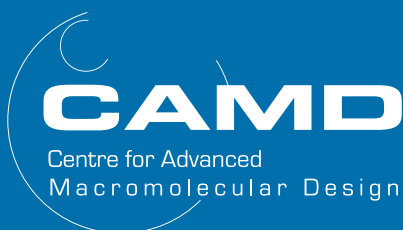
Björn Mathes has graduated in chemistry at the Philipps-Universität Marburg, Germany in 2007 and now continues with his PhD research at the same university under the supervision of Prof. Joachim H. Wendorff. He spent three months at CAMD at the beginning of this year to work on 'Surface modification of nanoporous alumina with honeycombed structured films' under the supervision of A/Prof. Martina Stenzel. This collaborative project between Prof. Wendorff and CAMD is supported by the DFG (Deutsche Forschungsgemeinschaft) and the ARC (Australian Research Council).

Martin Hetzer

Martin is visiting from Düsseldorf, Germany, where he is currently enrolled in a combined chemistry-business degree at the Heinrich-Heine-Universität. Under the supervision of A/Prof. Martina Stenzel he is synthesising functional sugar monomers using "click" chemistry and investigating there subsequent polymerisation using RAFT. During his time in Australia Martin not only has carried out some excellent research but more importantly become very proficient at surfing. Fully enjoying the Australian experience.

Prof. Filip Du Prez

Professor Filip Du Prez visited from the University of Ghent (Belgium) for a six month period of sabbatical at CAMD. During this time Filip not only forged strong friendships and collaborative ties with Martina, Tom and Chris but managed to see quite a bit of Australia with his family as well. Filip's research interests include polymeric nano- and microparticles, step growth polymerization in combination with 'click' chemistry, stimuli-responsive polymers, polymeric solid supports for catalysts, shape memory polymers, polymer membranes and advanced copolymer structures. He is author of more than 85 refereed publications, 6 book chapters, (co-)chairman of 9 (inter)national conferences on polymer chemistry related topics and his group actively participated to conferences with more than 230 contributions. He is member of the editorial board of Polymer, Designed Monomers and Polymers, Journal of Macromolecular Science (Pure and Applied Science) and Reactive & Functional Polymers. PCR is partner in a number of collaborations with industrial partners including Dow, Recticel, Resilux and others. While here, Filip was invited to give seminars at Sydney University (NSW) and the Australian Institute for Bioengineering and Nanotechnology (AIBN) within the University of Queensland. CAMD looks forward to long and fruitful association with Filip.



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