Australasian Wound & Tissue Repair Society

VOLUME 2 ISSUE 3 OCTOBER 2009

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Join AW&TRS Now!

Society News Update

First I would like to issue a warm welcome to all our new members of the Australasian Wound & Tissue Repair Society. The special offer which we ran during August attracted another 30 members to the Society bringing our membership total to over 70 which we are really pleased about. We are delighted that so many of you have decided to join or renew your membership and will strive to make it a worthwhile experience for you over the coming year.

Our conference organising committee, ably lead by Drs Hilary Wallace and Mark Fear are putting together a fabulous program of speakers for our 2nd conference to be held in Perth 2010. Inside this issue of the newsletter you will find lots of information about the conference including updates about the speakers and news about the "Masterclass" workshop which will be a great opportunity to present your research in a relaxed and informal environment. We are extremely privileged to have two world-class speakers coming to Perth, who regularly publish in Nature and Science coming to talk about their research. They are definitely too good to miss!

We have also arranged for the abstracts of this meeting to be published in the American Journal "Wound Repair & Regeneration". For more information go to pages 2-3 and visit our conference website ***http://awtrs2010.mtci.com.au/*** where you can submit your abstracts to what promises to be a great meeting.

Another great meeting was recently attended by twelve AWTRS members- the 9th Joint meeting of the European Tissue Repair Society and the American Wound Healing Society held in Limoges, France August 2009. This was a excellent showcase for the Australian wound research community with nine of our delegates giving platform presentations and one of our members coming home with a "Best Poster Award." For more information about the conference you will find a highly entertaining overview written by Prof Michael Woodward, President of AWMA on pages 4-7.

Finally, if there are any budding science writers out there who would like to contribute news, reports or articles to the newsletter we are always happy to receive them. Just send to: A/Prof Ian Darby: ian.darby@rmit.edu.au

A/Prof Allison Cowin,
AW&TRS President

AWTRS 2010 ~ 2nd Australasian Wound & Tissue Repair Society Meeting:

Crossing the Boundaries

22nd - 24th March, 2010, Perth

Submit your abstracts now at *http://awtrs2010.mtci.com.au/*

We extend a very warm invitation to Perth for our second conference, AWTRS 2010 (March 22-24, 2010). The theme is 'Crossing the Boundaries' and will bring together experts from diverse disciplines related to tissue repair and wound healing. We are very fortunate to have secured two wonderful international keynote speakers with contrasting areas of expertise: Professor Paul Martin from the University of Bristol (UK) with the latest on inflammation in wound healing biology, and Professor Jeffrey Hubbell from the École Polytechnique Fédérale de Lausanne (Switzerland) on tissue engineering for regenerative medicine (see below for biographies). We have a great line-up of national and international speakers in what is developing into a very full program. Now is the time to submit your abstracts to complete the picture – Abstracts close on November 27.

For those with an interest in the clinical side of wound repair a **special deal** is available for attendance at the first day of the Australian Wound Management Association conference, immediately following AWTRS 2010. See the conference website for details.

A half day pre-conference **Master Class** is planned for March 22. This special event is open to all conference attendees. A small number of abstracts will be selected for presentation and Prof. Paul Martin and Prof. Rob Short (Mawson Institute, UniSA) will use these presentations to lead an informal discussion on the science behind the presentations, in what we hope will be an extremely interactive session. Paul and Rob will also give an overview of the research interests and activities of their laboratories and their insights into the future of wound and tissue repair research.

March is a great time to visit Perth, so put AWTRS 2010 in your diary, register on-line and book your flights! This is a conference for everyone interested in the science behind wound healing and tissue repair – whether you are a new post-graduate student, a clinician or an Emeritus Professor….

We look forward to welcoming you to Perth for what we hope will be a wonderful conference.

Hilary Wallace and Mark Fear (on behalf of the AWTRS 2010 Organizing Committee)

International speakers include:

Jeffrey Hubbell (Switzerland), is Professor of Bioengineering and Chemical Engineeringat the Ecole Polytechnique Fédérale de Lausanne (EPFL).Trained as a chemical engineer, his research activities are in matrix and morphogen engineering for regenerative medicine and polymer chemistry for nonviral transfection vectors, drug delivery, and immunotherapy. He is author of more than 250 papers in peer-reviewed journals. He is Associate Editor of Biotechnology and Bioengineering and Associate Editor of the Journal of Biomaterials Science, Polymer Edition. Previous to moving to Lausanne, he taught at the Swiss Federal Institute of Technology Zurich, at the California Institute of Technology, and at the University of Texas in Austin. He holds a BS from Kansas State University and a PhD from Rice University.

Paul Martin (UK) is a Professor of Cell Biology in the Biochemistry and Physiology Departments at the University of Bristol. He did a Biology Degree at the University of Sussex and studied for his PhD with Dr Julian Lewis at Kings College London and subsequently in Oxford. He set up lab in the Anatomy Dept at Oxford and then moved to the Anatomy Department of UCL, London for 10 years, where he established models to study scar free embryonic wound healing in mouse and zebrafish and *Drosophila*. The twin foci of Professor Martin's lab are to analyse parallels between the tissue movements that underlie embryonic development and those of wound healing, and to investigate the genetics and cell biology of wound inflammation, in the search for clues how best to modulate the inflammatory response to prevent scarring as wounds heal.

Key Dates:

Abstracts close November 27, 2009

Notification of acceptance December 11, 2009

Early bird registration closes January 8, 2010

For more details see conference website: http://awtrs2010.mtci.com.au

The 5th Joint Meeting of the Wound Healing Society and the European Tissue Repair Society, Limoges, France, August 25-29 2009. Conference report by A/Prof Michael Woodward

This fifth joint meeting of the (USA) WHS and the ETRS, in conjunction with the other international partners including AWMA and AWTRS, was a high quality meeting highlighting the latest in basic tissue repair research and its clinical applications. Some 20 Australians attended, of a total of around 300 registrants, so we had a strong presence. Australians presented plenary lectures, invited and free papers and several posters- with one poster by AWTRS member Dr James Waters winning one of the three Young Investigator awards for best poster.

Limoges, famous for porcelain, is a mediaeval half-timbered cathedral town on the Vienne river

The opening plenary on the first full day covered stem cells and Geoffrey Gurtner from Stanford reviewed the negative effect that diabetes has on the attraction of bone marrow endothelial precursor cells to ischaemic areas. This is mediated by reduced HIF-1α binding to P400 but more importantly leads to less compensatory vascular growth in ischaemic areas, and ultimately to gangrene. Trials of vascular endothelial stem cells in diabetics are in progress, His team are aiming to better identify these stem cells so they can be more accurately separated out and then infused in sufficient quantities. Kenneth Liechty from Missisippi also spoke in this stem cell session on mesenchymal (stromal) stem cells and diabetic wound healing. These stem cells increase growth and other factors and do seem to improve wound healing. Larger wounds appear to have more a reparative response, leading to scarring, than a regenerative response, and this may be influenced by increasing mesenchymal stem cells in the healing wound. The next stem cell speaker, Pampee Young from Nashville, spoke of “super” mesenchymal stem cells that may further enhance their effectiveness in wound healing. An inhibitor of a specific pathway (wnt signalling), called sFRP2, seems to generate these “super” cells. Finally, Jean-Jacques Latiallade from Clamart, France, spoke of using mesenchymal stem cells in radiation burns after excision of necrotic tissue. All improved after years of suffering prior to this therapy.

It was the next session that even more clearly highlighted the depth of talent in the tissue repair community. These young investigators truly shone with the breadth of their knowledge and perspective. John Paul Tutela from New York explored the use of topical gene therapy to augment vascularity and improve diabetic wound healing. The master cell cycle

regulator p53 is upregulated in diabetic wound healing. His team used topical gene therapy with p53 silencing RNA (siRNA) and found this augmented the vasculogenic cytokine profile and increased endothelial cell markers in diabetic wound healing- in short, this gene therapy may improve diabetic wound healing.

The next speaker however was possibly the highlight of the conference- he did win one of the three Young Investigator paper prizes. Tero Jarvinen from Finland, working in Santa Barbara, used bacteriophages (viruses that attack bacteria) to deliver a library a billion peptides to see which honed in on skin and tendon wounds. One of these peptides, CARSKNDC, has a predilection for early wound healing and was then combined with a therapeutic agent, Decorin, that inhibits TGF-β and should prevent fibrosis, promoting instead tissue regeneration- not repair. He described this fusing of a target-seeking with a therapeutic agent as “synaphic” therapy- you heard it first here. Ali Modarressi, from Lausanne, described how hypoxia impairs skin myofibroblast differentiation and function, a pertinent talk as the discoverer of this most important cell, Giulio Gabbiani, was honoured the next day in a lunchtime session. These cells cause both wound contraction and scarring, and are an obvious target of tissue repair research. Other speakers in the session discussed an injectable biodegradable polyurethane scaffold to assist wound repair and regeneration, and how mechanically stretching a wound may restore myofibroblast differentiation in hypoxia. Certainly mechanical factors and wound healing were a theme of the meeting (topical negative pressure, ultrasonic shock waves, electrical forces and others). In this way, wound healing sits somewhat apart from the rest of medicine. The beneficial effects of topical erythropoietin were also discussed, with a reduced wound healing time in diabetic rats.

Some of the Australian delegates attending the conference dinner

The plenaries the following day discussed the molecular and cellular basis of tissue regeneration. Mathias Schäfer from Zürich spoke of the transcription factor Nrf2 which protects cells against oxidative stress. Activation of this on the one hand protects cells from UVB cytotoxicity but on the other hand disturbs keratinocyte differentiation. Sarah Herrick from Manchester spoke about fibroblasts and myofibroblasts in peritoneal pathology- especially post surgical adhesions and endometriosis. In these conditions, brand new fibrotic tissue is created and understanding this may lead to a range of anti-fibrotic

(L to R) are A/Prof Michael Woodward (President of AWMA) , A/Prof Allison Cowin (President of the AWTRS) and Dr Rachael Murray.

therapies that at the very least could be used by surgeons after abdominal treatments.

The final talk of this session was inspirational and potentially groundbreaking. Colin McCaig from Aberdeen presented data on the electrical control of wound healing. The skin is vertically electrically charged (100mv) and a wound affects this, essentially creating a horizontal gradient that attracts cells to the wound. The cells affected by an electrical gradient include inflammatory, epithelial and nerve cells. He showed superb videos that demonstrated cells migrating along electrical gradients and turning around when that gradient was reversed. Certain drugs can affect this gradient, and this may lead to specific wound healing therapies.

The next day's plenaries tackled the vital issue of nervous system repair. The essential role of the Schwann cell was discussed by the first speaker, Piotr Topiloko, working in Paris. These intriguing cells sprout towards denervated regions, secondarily attracting nerve cells to the region. He showed that when a nerve is cut, axonal neurones attempt to reconnect with the distal neural bundles, but may well enter the wrong one, and indeed many simply fail to find their way across the gap. A great deal of work is required to translate these observations into better neural therapies, but the journey has clearly begun towards this last horizon of wound regeneration- brain and spinal injury repair. Our stroke patients, brain tumour sufferers, quads and paras are keenly waiting.

Australia's AWTRS secretary, Rachael Murray, spoke about macrophages and inflammation in adult wounds. The mucosa is spared this response, and heals without scaring. If we could also reduce the number of macrophages in burns we could achieve a similar (beneficial) response- but how to do this? Anti-integrins, which counteract adhesion proteins, look promising, and are already in use in other conditions, but need more work in wounds. Another approach would be to inhibit macrophage migration, rather than numbers- but all these need more work. Another Australian, Leila Cuttle from the Royal Brisbane Children's, trumped the session with a superb distillation of her thesis on burns first- aid. Whilst this required additional in- depth dissection at dinner that night, overlooking the Vienne, the presentation was superb and extremely informative. She challenged all the dogma, even to the above-the-call extent of reputedly providing her own saliva, to show what really works with burns first aid and wound healing. She reviewed the cold, but not iced, water for 10-20 minutes history of burns first-aid, which includes animal faeces (still used in some parts of

Africa), breast milk, onions and even flour. She showed from elegant experiments that we need to treat new burns with running cold, but not iced, water for 10-20 minutes (up to 3 hours after the wound, but the earlier the better). Her work has changed the first-aid approach of the Queensland ambulance service- surely that is more than most PhDs achieve!

The final day began with a plenary from an invited speaker to Perth next year, Paul Martin- and he is to be missed only with full knowledge of what you are missing! What a superbly knowledgeable and eloquent speaker! He reviewed inflammation and regeneration and talked of the first signal, hydrogen peroxide, from the wounded epithelium that attracts macrophages. This could lead to a range of therapeutic options that might move wound repair to wound regeneration, the holy grail of the meeting. Ken Muneoka from New Orleans then showed that even humans are salamanders, to a degree. These amphibians can regenerate limbs, and we can regenerate digit tips- as long as the wound is quite distal. The grail here is to regenerate from more proximal injuries, and indeed to regenerate joints. BMP (a metalloprotease) is integral to this process but timing, dose and boundaries of effectiveness need more work. The P2 and P3 fibroblasts act differently in this response with the P3 group being more interested in nail regeneration. Kazuo Kishi from Tokyo then reviewed foetal mice tissue regeneration, introducing the audience to the evocative sonic hedgehog gene. This important gene determines tissue differentiation and foetal organ development. It is not expressed in tissue regeneration, but is expressed in tissue repair where it seems to be associated with scar formation.

There were other very useful talks on the molecular basis of impaired wound healing in diabetics (Sabine Eming from Cologne) and the role bacteria play in poor healing (David Thomas from Cardiff). Sabine noted that you can modify the influences of bacteria even without changing (elevated) sugar levels- eg by using hyperbaric oxygen or platelet–derived growth factors. Several drug therapies, not specifically targeting the sugar level, may also be effective. David spoke of the importance of anaerobes in diabetes- related ulcers (DFUs), pointing out that wound swabs usually only isolate 20% of the organisms present.

So, in conclusion, this was a very worthwhile conference and I doubt any attendees, or indeed readers of this report, will fail to identify with at least some relevant material.

(L to R) are A/Prof Michael Woodward (President of AWMA) , A/Prof Allison Cowin (President of the AWTRS) and PhD student Zlatko Kopecki.

A/Prof Michael Woodward ,
President of AWMA

Research Profile: A/Prof Joe Rothnagel

I started my journey into the biology of the integument with an Honours project on the characterisation of mRNAs expressed in the chick feather under the supervision of Professor George Rogers at The University of Adelaide. I stayed with George for my PhD studies but my research area changed from avian mRNAs to hair protein characterisation. My project was on the characterisation of an abundant yet enigmatic hair protein (trichohyalin) and an enzyme that converts the arginine residues present in trichohyalin to citrulline (pepdityl-arginine deiminsase).

I left Adelaide in 1985 for Bethesda, Maryland for my first postdoctoral fellowship in the laboratory of Dr. Peter Steinert at the National Institutes of Health. Peter was just starting to venture into the molecular biology of keratins and their associated proteins and my brief was to isolate and sequence the transcript for filaggrin – a keratin bundling protein. I succeeded in sequencing the mRNA, well at least part of the 14 kb transcript, which at the time was the largest mammalian mRNA to be so characterised. In 1988, I was asked by Professor Dennis Roop to help establish a laboratory at Baylor College of Medicine, Houston. My intended short stay lasted 7 years! Out of this Texas experience (fuelled by Dennis' penchant for fun times, amazing food and almost toxic margaritas) emerged a couple of fine studies on the barrier protein loricrin and on the genetic basis of several keratin disorders. I finally made my way back to Australia in 1995 (now with a family in tow) to settle in sunny Brisbane and to set up my own laboratory at The University of Queensland.

In the early years we characterized several genes and their protein products including, keratin 6a/6b, filaggrin and filaggrin2, Gli1 and Frizzled3. About 8 years ago our research interests expanded to include post-transcriptional regula-

Research Profile: A/Prof Joe Rothnagel

tion of gene expression. This led to the development of short *cis*-sequences (GeneDimmer™ & GeneBooster) that can be used to turn up or down gene expression. This development has resulted in Australian and USA patents and a spin-off company.

Our laboratory is also investigating the role and regulation of alternative splicing of key transcripts that are expressed during skin development and presumable during wound healing as well. This work has resulted in the identification of alternatively-spliced exons of the *Gli1* oncogene that produce differing 5' leader sequences with differing translational capacities. Characterisation of these alternative transcripts led to us to examination on the role of uAUGs and uORFs in translation regulation. We found a surprisingly high rate of ribosome reinitiation in mRNAs containing multiple uAUGs and resulted in a re-examination of the role of uAUGs and the "first AUG rule of translation". So at the present time I find my research interests have broadened somewhat to not only include cutaneous biology but also basic regulatory processes present in all cells.

A/Prof Joe Rothnagel

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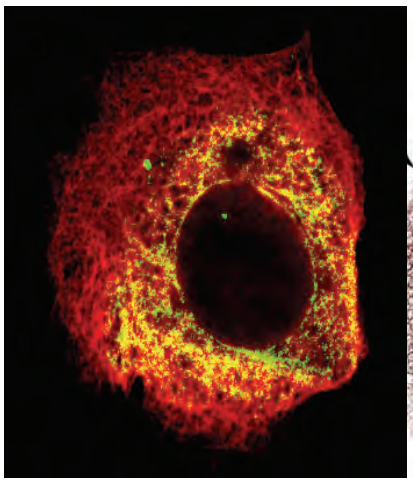

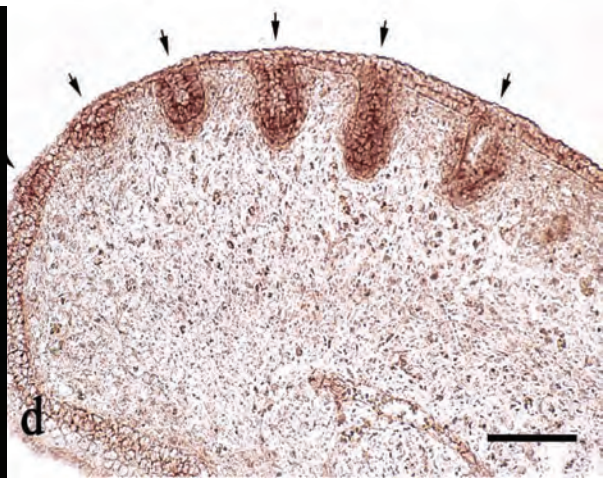

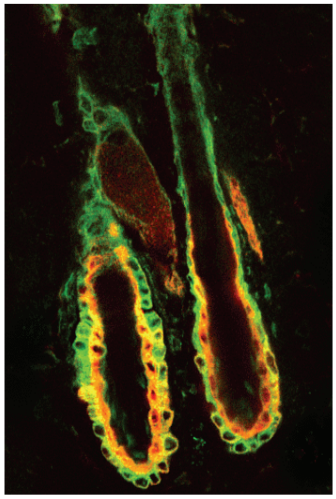

EXPAND YOUR RESEARCH COLLABORATIONS THROUGH THE AWTRS WEB SITE

The AWTRS consists of numerous researchers from basic scientists through to clinicians, the majority of whom are actively involved in many different aspects of wound and tissue repair research. To promote collaboration between the different facets of wound and tissue repair research, the AWTRS is offering our members the chance to add their research interests and a link to their own website to the AWTRS website (www.awtrs.org).

Benefits of having an AW&TRS member's research directory on the web site:

1. Establishing a research contacts database will facilitate collaborations in wound and tissue repair research.

2. Help to expand your research collaborative network with colleagues and others working in the areas of wound and tissue repair.

3. Have you ever had a really interesting result but do not have the expertise in the laboratory to follow it up? The useful links researchers' page will allow you to search and contact the most suitable researcher with the appropriate expertise.

4. Enable students and postdoctoral scientists who would like to work in the field of wound research to search for potential laboratories to work in.

How do I go about adding my name, research interests and web page link to the AWTRS web site?

1. Become an AWTRS member (or renew your membership for 2009).

2. E-mail Rachaelm@chw.edu.au with these details:
    1. Your name.
    2. No more than 5 key words that best describe your research.
    3. Your research page web URL.

We look forward to hearing from you.

Upcoming Wound & Tissue Repair Meetings 2010

The 2nd Australasian Wound and Tissue Repair Society Meeting

AWTRS 2010 ~ *Crossing the Boundaries*

22-24 March, 2010 ~ Perth Convention and Exhibition Centre Western Australia

We invite you to Register on-Line for the exciting AWTRS 2010 meeting and pre-conference Workshop/Master Class, March 22-24, 2010.

Important dates:

- **November 27, 2009: Registration and submission of abstracts** to be considered for Oral/Poster presentation selection
- **January 8, 2010: Close of Early Bird registration**

Proceedings published in *Wound Repair and Regeneration*

***AWTRS 2010** is followed by the Australian Wound Management Association (AWMA) 2010 Conference with attractive reciprocal membership discounts.*

Professor Jeffrey Hubbell (Switzerland) *Tissue engineering*

Professor Paul Martin (UK) *Wound healing and inflammation*

Professor Fiona Wood (Aus) *Systemic responses to burn injury*

Professor Prue Hart (Aus) *Vitamin D and the Skin Immune System*

Professor Rob Short *(Aus)* *Surface engineering technologies - for cell therapy, tissue engineering and life science research tools*

PRESENTERS also include

A/Professor Allison Cowin *(Aus)*
A/Professor Ian Darby *(Aus)*
Professor Sarah Dunlop *(Aus)*
Dr Laura Edsberg *(USA)*
Dr Mark Fear *(Aus)*
Professor Hans Griesser *(Aus)*
A/Professor Chris Jackson *(Aus)*
Dr Pritinder Kaur *(Aus)*
Dr Susan McLennan *(Aus)*
Dr James McMillan *(Aus)*
Dr Rachael Murray *(Aus)*
A/Professor Steve Mutsaers *(Aus)*
Professor Cees Oomens *(The Netherlands)*
Professor Laura Poole-Warren *(Aus)*
Professor Zee Upton *(Aus)*
Dr Hilary Wallace *(Aus)*
Dr Jerome Werkmeister *(Aus)*

Convenors: Dr Hilary Wallace, *University of Western Australia* **Dr Mark Fear,** *McComb Foundation, University of Western Australia*
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Upcoming Wound & Tissue Repair Meetings 2009

Australasian Wound & Tissue Repair Society

Pre-Conference Wound & Tissue Repair Master Class 2010

Monday March 22, 2010 (1:30-5:30pm), Perth Convention & Exhibition Centre

Pre-conference Workshop precedes the 2nd Australasian Wound and Tissue Repair Society Meeting being held at the Perth Convention and Exhibition Centre, and is followed immediately by the Conference Dinner.

Featuring Professor Paul Martin (University of Bristol, UK) and Professor Robert Short (Director, Mawson Institute, University of South Australia), keynote speakers for AWTRS 2010, and facilitated by Professor Zee Upton (Institute for Health and Biomedical Innovation, QUT, Australia).

An opportunity not to be missed by every wound and tissue researcher attending the AWTRS 2010 meeting! "Go for Gold" and combine the conference and Workshop program in your registration.

Workshop-only registration options also available.

Register on-line ~ http://awtrs2010.mtci.com.au

Prof. Paul Martin - presenter

Prof. Robert Short - presenter

Prof. Zee Upton - facilitator

Paul Martin and Rob Short are internationally recognized experts in wound and tissue research. Paul leads basic research in wound healing and inflammation in "flies and fish and mice", and Rob's research program embraces surface engineering technologies - for cell therapy, tissue engineering and life science research tools. Zee Upton is a leader in Australian wound healing research and a lively facilitator.

This informal half day program will include:

- Presentations by researchers and post-graduate students of their current research
- An interactive and extended discussion on the science of each presentation led by Paul Martin and Rob Short
- A display of some of the latest technologies for enabling research

Paul and Rob will also talk about the key activities and interests of their laboratories, and provide their insights into the future "landscape" of tissue repair research and career opportunities

Submit abstracts and register on-line: http://awtrs2010.mtci.com.au Those participants selected will also be eligible for Poster and/or Oral presentations in the main program (if registered).

Fees:	Member Full Program of Workshop + AWTRS 2010 meeting:	AUD485 (AUD345 student fee)
	Member Workshop only:	AUD100 (AUD50 student fee)

Upcoming Wound & Tissue Repair Meetings 2009

Upcoming Wound & Tissue Repair Meetings 2009

ASBTE
The Australasian Society for Biomaterials and Tissue Engineering

20th Annual ASBTE Conference
Celebrating 20 Years

10th – 12th February 2010
QUT Gardens Point Campus, Brisbane, Queensland

Important Dates

October 2009	Call for Abstracts **Now Open**
Late October 2009	Online Registration Opens
13 November 2009	Abstract Submission Deadline
27 November 2009	Author notification of abstract submissions
15 December 2009	Early Bird Registration Deadline
15 December 2009	Registration Deadline Date for authors

Conference Topics include:

- **Tissue Engineering**
- **Polymers in Tissue Engineering and Drug Delivery**
- **Stem Cells and Regenerative Medicine**
- **Biomaterials**
- **Implantable Devices**
- **Cell-Material Interactions**
- **Clinical Applications**

The Conference aims to build on the foundations of previous meetings and will bring together scientists, engineers and clinicians to discuss their latest results. At the same time you may enjoy the opportunity to explore beautiful Brisbane from the ideally located venue right in the heart of the city.

ASBTE
The Australasian Society for Biomaterials and Tissue Engineering

www.asbte2010.org.au

Upcoming Wound & Tissue Repair Meetings 2009

COMBIO2009

CHRISTCHURCH CONVENTION CENTRE
CHRISTCHURCH, NEW ZEALAND, 6 –10 DECEMBER, 2009

Matthew Turnbull (NZSPB/ASPS) and David Palmer (NZSBMB) invite you to join us at ComBio2009 in Christchurch. We are planning a comprehensive and wide ranging scientific programme with plenty of the traditional ComBio features. We also hope that you will take the opportunity to use Christchurch as a gateway to the fantastic New Zealand landscape.

Protein Structure and Function	Cells and Development	Signal Transduction and Gene Regulation		Genetics and Genomics
Emily Parker/Juliet Gerrard (U Canterbury)	Phil Crosier (U Auckland), Ian McLennan (Otago U)	Pete Shephard (U Auckland)	Jack Heinemann (U Canterbury)	Tony Merriman (U Otago)
Bostjan Kobe/Jenny Martin (U Queensland)	Peter Gunning (Westmead), Peter Koopman (U Queensland)	Phil Robinson (CMRI)/Christina Mitchell (Monash U)	Merlin Crossley (U Sydney)	Christine Wells (Griffith U)

Plant Biology	Plant Ecophysiology and Global Change Biology	Microbiology	Agricultural and Horticultural Science	Medical Science
David Collings (U Canterbury)	Margaret Barbour (Landcare Research, NZ)	Andrew Hudson (ESR, NZ)	Jon Hickford (Lincoln U)	Allan Herbison (U Otago)
Steve Tyerman (U Adelaide)	Owen Atkin (ANU)	Hatch Stokes (Macquarie U)	Julian Heyes (Crop + Food Research, NZ)	Phil Hogg (UNSW)

International Speakers

Sir John Walker FRS	Nobel Prize in Chemistry 1997	Michael Karin	Signalling in inflammation	Yair Shachar-Hill	Plant central metabolism and biomass production - metabolic flux analysis
		Doug Eaton	Why we don't drown every day; a new paradigm for lung fluid balance		
Vern L. Schramm	Enzymatic transition states and inhibitor design	Misha Perouansky	Mechanisms of anesthetic action	John Grace	Nitrogen and carbon cycles under climate change
Janet L. Smith	Enzyme domains in assembly lines for antibiotic biosynthesis	Caroline McMillen	Fetal and postnatal programming of obesity and metabolic disease	Guillaume Tcherkez	Isotopic fractionation in plant metabolism
David Ornitz	Fibroblast growth factors in development and disease	Pankaj Sah	Generation of patterned neuronal activity in the brain	Brent Helliker	Oxygen isotopes and the temperature of tree canopies
Benjamin Geiger	Mechanisms underlying environmental sensing via focal adhesions	Tim Wiltshire	Genetic variation in mice: modeling disease, pharmacogenetics, and basic biology	Aled Edwards	Genome-scale studies of the structure and function of protein families
Nadia Rosenthal	Regeneration of muscle in mice	Wan Lam	Title to be advised	Terry Yamaguchi	Wnt signaling in morphogenenisis
				Rudi Amman	Analyzing the microbial catalysis of biogeochemical cycles
Peter Lobel	Lysosomal Proteomics and Disease	Chris Hawes	Imaging secretory pathway dynamics in living cells		

Earlybird Registration closes 21 August 2009

Registration information and on-line registration: www.conference.canterbury.ac.nz/combio09
Enquiries – Email: combio09@uco.canterbury.ac.nz, **Phone**: +64 3 364 2534

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Australasian Wound & Tissue Repair Society 2009 Membership

1 YEAR membership

Ordinary Annual Membership $50
Student Annual Membership $25
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NEW 3 YEAR membership option

Ordinary Annual Membership 3 years $140
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MEMBERS' BENEFITS INCLUDE:

AW&TRS Quarterly Newsletter – contains news of upcoming meetings, extensive coverage of meetings and workshops, research highlights, job adverts and much more.

Free subscription to AWMA Journal "Wound Practice & Research" – one of the primary sources of information for Medical, Nursing, Allied Heath, Wound Care Practitioners and Wound Research Scientists throughout the Australasia-Pacific region.

Reduced subscription rates to the leading wound research journal: subscribe to Wound Repair and Regeneration for just 76 GBP.

The chance to add you Research Profile with a brief description of your research and a web link to the AW&TRS web site – AW&TRS members can add a brief researchers profile and web link to AW&TRS web site, which means not only will other researchers be able to see what you do but you can look for specialists to collaborate with in the area you are interested.

Advanced notification of the AW&TRS biennial meeting as well as focus meetings.

Significant discounts on registration rates for the AW&TRS conferences – members are entitled to a discount from the regular registration rate.

Travel Awards for young AW&TR investigators at AW&TRS biennial meetings – details of these travel awards will posted on the web site prior to meetings.

Young Investigator Awards at AW&TRS biennial meeting – details of these awards will posted on the web site prior to meetings.

To join as a **NEW** member or **RENEW** your membership for 2009 go to www.awtrs.org and click on the membership link