



**UNSW**

# Centre for Vascular Research

Annual Report 2008



# Contents

Director's Report .....	2
Research in the Centre.....	4
Biochemistry in Vascular Medicine Group (USyd) .....	4
Cancer and Molecular Immunology Group (ANU).....	5
Cancer and Vascular Biology Group (ANU).....	6
Cellular Membrane Biology Group (UNSW).....	7
Complex Systems in Biology (UNSW) .....	9
Macrophage Biology Group (UNSW) .....	10
Molecular Genetics Group (SEALS) .....	11
Redox Cell Signalling Group (UNSW) .....	12
Stem Cell and Megakaryocyte Group (UNSW).....	13
Transcription and Gene Targeting Group (UNSW).....	15
Vascular Biology Laboratory (Monash) .....	16
Centre Supported Students .....	18
Publications.....	21
External Research Funds .....	33
Prizes and Awards .....	42
Activities Outside the Centre.....	43
Seminar Program 2008 .....	47
CVR Management and Advisory Committees.....	49

## Director's Report

CVR furthered its mission of better understanding fundamental mechanisms in the cell and molecular biology of the vascular system, and to develop new treatments to combat vascular disorders.

Levon Khachigian's group produced key advances in our understanding of transcription factor structure-function, particularly the role of phosphorylation (of Sp1) as a 'molecular switch' that opens the door to normally dormant disease-causing genes being rapidly expressed. In addition, the group identified a key transcription factor (ATF-4) activated by balloon angioplasty that stimulates the production of growth factors known to cause blood vessel disease. This resulted in a prioritised communication in *Circulation Research*, with a second article in the same journal attracting an independent commentary.

Work from Wendy Jessup's group, in partnership with colleagues in France and the Netherlands, provided novel insights into the mechanisms that control cholesterol accumulation in tissue macrophages, the driving force in the development of atherosclerosis. They showed that two membrane transporters, ABCA1 and ABCG1, act in concert to export excess cholesterol and prevent its accumulation in macrophages. This work was also published in *Circulation Research*.

Work from Len Kritharides' group has further explored the biochemistry and biology of apolipoprotein E as an important regulator of cholesterol metabolism and immunity. His group showed that apolipoprotein E secretion is regulated by protein kinase A and this resulted in an invited review in *Arteriosclerosis Thrombosis and Vascular Biology*.

Miles Davenport's group explored the role of the immune system in chronic infection with a focus this year on T cell receptor repertoire. An article was published in *Nature Reviews Immunology*, and another five in the major discipline journal, *Journal of Immunology*.

Shane Thomas' group discovered new mechanisms that control the activity of the important immune control enzyme indoleamine 2, 3-dioxygenase (IDO). They identified specific amino acids that upon modification modulate enzyme activity, and senior-authored an invited review in *Antioxidant Redox Signaling* on oxidative mechanisms causing endothelial dysfunction.

In a landmark paper in *Journal of Biological Chemistry*, Roland Stocker and his group challenged the 30 year-old dogma that superoxide is responsible for the reductive activation of indoleamine 2, 3-dioxygenase (IDO), by showing that cytochrome b5 reduces and activates human IDO.

Katharina Gaus' group continued to explore the organisation of lipids and proteins within the plasma membrane that define mechanisms of signal transduction. In 2008, the group made a major breakthrough by demonstrating that membrane restructuring is functionally important. In work published in *PLoS ONE*, they managed to specifically impair membrane condensation at T cell activation sites using the oxysterol 7-ketocholesterol.

CVR researchers had considerable success in attracting competitive research funding from national and international sources including the National Institutes of Health, Human Frontiers Science Program, NHMRC Program and Project Grants, ARC Discovery Projects and ARC Linkage Infrastructure, Equipment and Facilities (LIEF) schemes. This includes first time grants to younger investigators. For example, CJ Martin Fellow Mary Kavurma was awarded her first NHMRC project grant, and Donna Dinnes was awarded a Canadian Postdoctoral Research Fellowship. Katharina was awarded an extremely competitive NHMRC Senior Research Fellowship. This year also saw the announcement of her promotion to Associate Professor at UNSW, and Len promoted to full Professor at the University of Sydney. Total competitive grant income to CVR staff at UNSW alone was in excess of \$5 million.

CVR had over 20 MSc and PhD students enrolled at UNSW in 2008. Five students (Estella Sanchez-Guerrero, Fernando Santiago, Kristine Malabanan, Nicole Tan, Shafqat Inam) were recognised for excellence in research by inclusion in the Inaugural Dean's List. Jun Ni and Nicole Tan won Young Investigator Awards at the 15th International Vascular Biology Meeting (IVBM) held in Sydney. Timothy Schlub and Daniel Chan both received support to attend training workshops in the USA. Daniel also received a travel award to present Australian Society for HIV Medicine conference in Perth, and Timothy received a travel award from the Australasian Society for Immunology. Lily Guo won a Young Investigator award and Donna Dinnes a Poster Prize at the Australian Atherosclerosis Conference held in Sydney. Zamil Mattar scored first class honours and received the award for the highest honours mark achieved in the Department of Pathology this year.

CVR researchers continued to serve the wider research community through membership of grants and fellowships evaluation panels for the NHMRC and National Heart Foundation, and service on the editorial boards of journals. In particular, this year Levon, Wendy, Shane and I served on the executive organisation committee of the 15th International Vascular Biology Meeting, one of the most prestigious international biomedical conferences in blood vessel biology and disease. The meeting, which Levon chaired, attracted over 500 national and international delegates and featured an exceptional scientific programme featuring 130 talks and around 400 posters. It also provided around 40 Travel Grants that allowed future leaders in vascular biology to make their way to Sydney, and hosted a meeting of the Heads of International Vascular Biology Organisations.

After sixteen rewarding years as Director of CVR, I will retire early 2009. It is certainly time that I did so, that conviction being supported by the strength of the new leadership with Levon Khachigian as Director and Wendy Jessup and Deputy Director. They will have time to settle in before the move of CVR into the new Lowy Building in late 2009. I should like to record my gratitude to my colleagues and friends in CVR and the University, and wish them all good fortune.

Colin Chesterman AO  
CVR Director

# Research in the Centre

## Biochemistry in Vascular Medicine Group (USyd)

*Group Leader: Prof Roland Stocker*

### **Our research aims**

The research program in our laboratory focuses on oxidative processes in vascular medicine. We examine the hypothesis termed 'The Oxidative Response to Inflammation Hypothesis of Atherosclerosis' which states that cardiovascular risk factors contribute to the accumulation of lipoproteins within the vascular wall, resulting in inflammation. It is this inflammation that is thought to drive the production of reactive oxygen and nitrogen species, which modulate and amplify vascular inflammation. Thus the oxidative stress, e.g., the oxidation of biological molecules, critically influences the development of atherosclerotic lesions, although it does not directly contribute to the underlying cause of atherosclerosis.

Our current research projects aim to:

- Develop novel redox-active drugs that protect against atherosclerotic diseases and diabetes based on their ability to induce the enzyme heme oxygenase-1.
- Enhance present knowledge of heme oxygenase-1 biology at the cellular and whole organism level, with an emphasis on the ability of the enzyme to regulate cell growth, iron homeostasis, and antioxidant activity.
- Investigate the contribution of the enzyme indoleamine 2,3-dioxygenase to the regulation of vascular tone, with an emphasis on inflammation and interaction with nitric oxide synthase.
- Identify oxidants and enzymes that affect the redox state and redox processes following receptor tyrosine kinase activation in vascular cells.

### **Achievements in 2008**

In 2008, we established a novel ELISA for the detection of specifically modified apolipoprotein A-I that may contribute to malfunctioning HDL. This is a significant achievement because it allows us to translate our research findings to the clinical setting. Further, we discovered a novel reducing factor for the cellular enzyme indoleamine 2,3-dioxygenase. This will be a useful tool for the study of the biology of this enzyme and its antioxidant activities.

We also discovered a novel endogenous compound that contributes to the regulation of blood pressure in inflammation. This discovery will greatly enhance our efforts to identify how the enzyme indoleamine 2,3-dioxygenase contributes to the regulation of the vascular tone. We established novel analytical tools to selectively quantify superoxide formation in cell cytosol and mitochondria, and novel methodologies to assess the function of small arteries.

To identify novel oxidants and enzymes we established yeast genetics as an additional research tool. This high-throughput approach will aid us to describe how receptor tyrosine kinase activation modulates redox state and redox process.

### **Future Plans**

We plan to fully characterise the role of heme oxygenase-1 in the mobilisation of endothelial progenitor cells. This includes the identification of how heme oxygenase-1 protects cells from oxidative damage. To take the cellular studies to the next step, we have started to establish a mouse model in which the expression of heme oxygenase-1 is enhanced. Finally, we will focus our research efforts on examining the role of indoleamine 2,3-dioxygenase in atherosclerosis.

## **Cancer and Molecular Immunology Group (ANU)**

*Group Leader: Dr Mark Hulett*

### **Our research aims**

The ability of tumour cells to grow in an uncontrolled manner and to spread throughout the body is what makes cancer such a deadly disease. Our research aims to better understand the molecular basis of tumour angiogenesis (new blood vessel growth) and metastasis in order to develop inhibitors of these key processes in cancer.

A current target of the laboratory is heparanase, an enzyme that degrades heparan sulphate (HS) - an important structural component of the extracellular matrix and vascular basement membrane. HS acts as a barrier to the migration of tumour cells and as a depot for growth factors important for cell proliferation. The degradation of HS by heparanase promotes cell invasion and liberates growth factors that stimulate angiogenesis and tumour growth. Research projects are aimed at defining the precise function of heparanase in tumour progression and developing drug inhibitors to the enzyme for use as anti-cancer agents.

### **Achievements in 2008**

Highlights include the generation of heparanase deficient mice by gene targeting and the establishment of a number of inflammatory disease and tumour progression models to determine the role of heparanase in these disease processes. We have also identified and characterised a novel cell surface receptor for heparanase, the calcium-independent mannose-6 phosphate receptor (CIMPR), and shown that it is important for the display of heparanase by cells to enhance their invasive capacity.

### **Plans for the future**

Our plans for the future focus on (i) using the heparanase gene knockout mice to directly assess the role of heparanase in inflammation and tumour progression, (ii) to further define the molecular basis of heparanase gene dysregulation in the above disease settings, and (iii) to investigate the role of the CIMPR in the intracellular trafficking of heparanase.

## **Cancer and Vascular Biology Group (ANU)**

*Group Leader: Prof Chris Parish*

### **Our research aims**

Our group aims to develop new treatments for cancer and autoimmune diseases such as Type 1 diabetes and systemic lupus erythematosus. Our research focuses on the molecular basis of cell adhesion, cell migration and cell invasions. We are particularly interested in how these cellular processes contribute to the immune system, tumour metastasis and angiogenesis (the growth of new blood vessels).

Our specialised expertise and experience lies in the design, synthesis and evaluation of novel oligosaccharides, e.g., sugar-based drug candidates. Supported over many years by generous industry R&D grants, our research focuses on three areas: Firstly, we aim to understand how these drugs prevent the spread of cancer and inhibit its growth by starving tumours of a blood supply. Secondly, we examine the effect of these drugs on certain autoimmune diseases, with our novel drugs compensating for deficiencies that cause autoimmune diseases such as systemic lupus erythematosus (SLE) and type 1 diabetes. We have also been studying the plasma protein, histidine-rich glycoprotein (HRG), which inhibits cell adhesion and plays an important role in regulating complement activity. Thirdly, we are developing ways of harnessing the immune system against cancer. Our group carries out basic research on the immune system and cancer growth, which can potentially result in a better understanding of these systems.

### **Achievements in 2008**

Previous achievements of our laboratory revealed that tumour-specific CD4+ T cells exhibiting a cytokine profile characteristic of chronic asthma are capable of clearing established lung and visceral metastases of B16 melanoma. Importantly, these metastases are resistant to conventional cytotoxic T lymphocytes (CTLs) attack but CD4+ Th2 cells clear these tumours by recruiting tumoricidal eosinophils, a process dependent on the eosinophil chemokine eotaxin.

Utilising the immunological knowledge outlined above and a technique for targeting tumour antigens to dendritic cells, a vaccine against human melanoma was manufactured in 2008 and will enter clinical trials in melanoma patients in mid-2009.

We have discovered a new mechanism which allows cells of the immune system to communicate and dramatically enhances the immune response to a pathogen/cancer. Activated B cells rapidly donate their B cell antigen receptor (BCR) to bystander B cells. This transfer between adjacent B cells is amplified by specific antigens and results in the dramatic expansion of immune-competent B cells and antigen presentation to CD4+ T cells. Understanding the molecular mechanisms mediating receptor transfer may allow us to enhance an immune response to pathogens and cancers.

### **Plans for the future**

- Perform a Phase I clinical trial of our melanoma vaccine in melanoma patients.
- Better understand the new cell-cell communication process we have identified in the immune system.
- Identify new sugar-based drugs that inhibit Type I diabetes development.

## **Cellular Membrane Biology Group (UNSW)**

*Group Leader: A/Prof Katharina Gaus*

### **Our research aims**

We are interested in how cells communicate with each other and their environment. For a cell to respond to a chemical signal, the information has to be transmitted across the outer skin of the cell – a membrane that contains lipids including cholesterol. For a signal to reach the interior of the cell, a receptor on the cell surface typically recognises the chemical outside the cell and ‘signals’ that it detected a specific chemical signature. The conundrum about this receptor signalling is that it often involves tens if not hundreds of proteins, resulting in a signalling frenzy with positive and negative feedback loops. And what’s more, different surface receptors use the same signalling machinery, yet transmit very different messages. So how does the cell know what the original message was?

We think that the membrane sorts the signals into discrete regions of the cells and, by keeping signals localised, the message does not get lost even if a lot of different proteins take part in the process. To literally see how the cell does this, we have developed light microscopy tools to image the cell signalling in action.

We are particularly interested in immune cell signalling. If the message is not transmitted correctly in white blood cells, our immune system does not function correctly and has either over- or under-reactions. Because the membrane contains a lot of cholesterol, we would like to know how high cholesterol levels in the blood affect the signalling process. This may lead us to identify the causal link between obesity and immune disorders that has resulted in many clinical complications.

### **Achievements in 2008**

2008 was a great year, with the arrival of a number of state-of-the-art light microscopes, funded by an ARC LIEF grant (total budget \$1.8M). These microscopes will form the nucleus of the BioMedical Imaging Facility (BMIF) that will be housed in custom-built space on the lower ground floor of the new Lowy Cancer Research Centre. The BMIF will operate as part of the UNSW Analytical Centre with expert technical staff and will open the door for other researchers to use high-resolution microscopy.

Our own research had some exciting highlights in 2008. We published data indicating that an oxidized form of cholesterol that is predominately found in atherosclerotic lesions completely prevents the activation of T cells, a type of white blood cell. This finding further underlines how important it is to understand what fats do to our immune cells.

### **Plans for the future**

The arrival of the new high-resolution microscope greatly accelerates the research of our group. We no longer need to travel across town to do our imaging and are looking forward to a highly productive 2009. But we don't just plan to take pretty images: by looking at individual proteins; we hope to find out where the message of our cells is lost when the cholesterol levels are too high or too low.

## Complex Systems in Biology (UNSW)

*Group Leader: A/Prof Miles Davenport*

### **Our research aims**

There are currently a large number of successful vaccines for acute infections like influenza, measles, and smallpox. However, it has proved much more difficult to develop vaccines for chronic (persistent) infections like HIV or the hepatitis C virus. The CSB group studies the interactions between the host immune system and the infectious organism in a variety of animal and human infections. We apply statistical, mathematical and computational tools to understand the dynamics of infection, and how this determines whether a patient becomes ill or controls infection.

### **Achievements in 2008**

In 2008 we published a number of articles investigating how variability in the host immune response and in the HIV virus occurs. Working with experimental scientists at the University of Melbourne, we have investigated how HIV mutates and evolves during infection. By modelling the dynamics of how HIV evolves in an infected animal, we have identified how the virus 'escapes' immune recognition very early in infection.

We have also performed a number of studies investigating how the body recognises a virus using 'killer T cells', which are able to eliminate infected cells. Using a bioinformatics approach and computer simulation we have identified how patterns of immune recognition are determined in different individuals and how this impacts on the outcome of infection.

### **Plans for the future**

Our work is progressing rapidly towards understanding how the 'resting' immune system develops, how it responds to recognise a virus after vaccination or infection, and how viruses in turn respond by avoiding immune recognition. By combining studies of immune recognition at the molecular level (the interaction between host and viral proteins), at the level of individual cells and viruses, and within the host as a whole, we aim to develop a better understanding of immunity and how we can develop vaccines to control chronic infections like HIV.

## Macrophage Biology Group (UNSW)

*Group Leaders: Prof Wendy Jessup and Prof Len Kritharides*

### **Our research aims**

A major interest of the group is the role of leucocytes in cardiovascular disease. Much of our recent research addresses the role of macrophages in vascular cholesterol accumulation. In the early stages of atherosclerosis, excess cholesterol is deposited predominantly within lipid-engorged macrophages ('foam cells') that accumulate in the artery wall. Foam cells appear early and persist throughout the process of atherosclerosis. Besides being the main engine of lipid accumulation, they are also implicated in other aspects of plaque biology, such as the remodelling of the extracellular matrix in the plaque cap that leads to its weakening and increased susceptibility to rupture and thrombosis. Prevention or reversal of foam cell formation is therefore an important target for anti-atherosclerosis therapy. One of our goals is to understand the molecular events that lead to foam cell formation in the human artery.

Apolipoprotein E (apoE) is an important secretory product of macrophages that is protective against atherosclerosis. We have previously discovered that macrophage apoE secretion is stimulated by HDL and apoAI (the main protein component of HDL), and one of our major research aims is to determine how apoE secretion is controlled and the intracellular signalling pathways responsible for this process.

We are also continuing our broader study of the relationships between cholesterol metabolism and inflammation, and investigating the relationships between dendritic cell biology and cholesterol accumulation and clearance. Dendritic cells play an important role in immune defence and inflammation, processes that are also central to the development of atherosclerosis.

### **Recent research achievements and future plans.**

We earlier found that two transporter proteins (ABCA1 and ABCG1) on the surface of macrophages work cooperatively to export excess cholesterol and to maintain normal cell cholesterol levels. We believe that these proteins do not function normally in atherosclerosis, where excess cholesterol accumulates within macrophages. This may be because the transporters are not expressed optimally, or because the natural cholesterol acceptors (HDL) to which they export cholesterol are impaired. We have recently examined how ABCG1 expression and activity is controlled, with the aim of developing methods to enhance its activity in diseased vessels and thereby prevent further cholesterol deposition. We have found that human ABCG1 is expressed as two distinct isoforms, and that these isoforms differ significantly in the way their activity is controlled. The functional significance of these isoforms in human macrophages is the subject of current studies. We also plan to isolate and characterise HDL from human arteries in order to

determine whether arterial HDL is functional as a cholesterol acceptor. This will include detailed mass spectrometry-based lipidomic and protein compositional studies, in collaboration with the UNSW Biomedical Mass Spectrometry Unit and expertise recently developed in our group. We also plan to apply the powerful technique of yeast genetics to identify other proteins that control cholesterol export.

We are applying similar proteomic technology to study the post-translational processing of apoE by macrophages and to detect other molecules secreted together with apoE.

Our initial studies into the signalling regulation of apoE secretion identified an important role for PKA in regulating the transport of apoE containing vesicles. Recent studies from our group have identified a role for protein phosphatase 2B, the target of the immunosuppressant Cyclosporin A. We have found that Cyclosporin potently inhibits apoE secretion, and this has important implications for the contributions of Cyclosporin to inflammatory processes in the vessel wall.

In our research of dendritic cell biology, we have found that high cholesterol reduces their maturation and some aspects of their functional activity. In collaboration with colleagues in Paris, we have also found that dendritic cells also control cholesterol levels in the circulation. Over the next year we will study these observations *in vivo* and *in vitro* to further explore the relationship between the immune system and atherosclerosis.

## Molecular Genetics Group (SEALS)

*Group Leaders: Dr Michael Buckley and A/Prof Robert Lindeman*

### **Recent research achievements and future plans**

The focus of the research activities of the Molecular Genetics Group is disease gene identification. The group identified its third disease gene in 2008 by showing that the SLC29A3 gene was mutated in the rare autosomal recessive disorder of pigmented hypertrichosis with insulin dependent diabetes mellitus. This research led to a plenary presentation at the European Society of Human Genetics Meeting where the six papers of greatest interest from among the 1700 proffered abstracts were showcased. In addition, the group continues to make progress in evaluating the function of Sp110, in which we have previously documented mutations to cause a syndrome of veno-occlusive disease with immunodeficiency. In collaboration with Dr Stuart Tangye of the Garvan Institute, the role of Sp110 in T and B cell development and interaction are under examination.

Catalina Palma, who is completing a PhD, has been investigating the influence of synthetic scaffolds coated with a variety of adhesion molecules on the growth and differentiation of USSC (unrestricted somatic stem cells) derived from cord blood. These cells have mesenchymal potential, and their differentiation has been demonstrated by Catalina to be influenced by the surfaces on which they are cultured.

Robert Knight, under the joint supervision of Dr Alla Dolnikov and Robert Lindeman, has been investigating the activity of the wnt pathway inhibitor Bio on the engraftment of human haemopoietic progenitors in mice and in particular on angiogenesis. The contribution of endothelial progenitor cells to haematopoiesis and angiogenesis is also being examined in a similar model.

Our group is participating in clinical trials, including a first-in-human trial of an Akt inhibitor in advanced haematological malignancies. We are also evaluating the impact of cardiac T2\* MRI estimation of cardiac iron on the management of patients with thalassaemia major, and validating T2\* measurement of hepatic iron against the gold standard Ferriscan estimate.

## Redox Cell Signalling Group (UNSW)

*Group Head: Dr Shane Thomas*

### **Our research aims**

The Redox Cell Signalling Group has two primary areas of research interest, of relevance both to cardiovascular disease and to the control of the immune system:

1. Cardiovascular disease: In cardiovascular disease, endothelial cells, which form the barrier between the flowing blood and the artery wall, become 'dysfunctional'. Endothelial dysfunction can increase the risk of heart attack for a cardiovascular disease patient. Growing evidence indicates that a protein that the immune system normally uses to destroy infectious agents can cause such endothelial dysfunction. This protein, called myeloperoxidase (MPO), accumulates in the diseased arteries of cardiovascular disease patients, just below the endothelial cells. We are studying how MPO causes endothelial dysfunction and hope to discover novel drugs capable of removing MPO from diseased arteries, leading to improved endothelial function.
2. Immune control: A protein called indoleamine 2,3-dioxygenase (IDO) is important in controlling the immune system in normal and disease conditions, including cancer, inflammation, infectious disease and autoimmunity. Despite its important role, relatively little is known about how the activity of this protein is controlled and we aim to redress this void in knowledge.

### **Recent research achievements and future plans**

In 2008, we made significant progress towards understanding the mechanisms through which myeloperoxidase (MPO) causes endothelial dysfunction. We have found that MPO acts by binding to specific proteins within the vascular endothelium where it produces damaging reactive species. These species subsequently alter the activities of several proteins in endothelial cells and reduce the adhesive properties and hence survival of endothelial cells. At the same time, impairment of other functions reduces the production of molecules that endothelial cells rely on to maintain a healthy blood vessel. We are continuing to unravel the complex mechanisms by which modification of select protein targets by MPO causes endothelial dysfunction. Together with Prof Chris Parish and Dr Craig Freeman (CVR, ANU) we have identified several classes of novel drugs that are capable of selectively binding to MPO and removing this damaging enzyme from the vascular endothelium. We now plan to test if these agents can improve endothelial dysfunction in relevant models of cardiovascular disease.

In 2008, we also discovered several control mechanisms for indoleamine 2,3-dioxygenase (IDO). We found that the activity of IDO in human immune cells is tightly regulated by the actions of key regulatory proteins also expressed in these cells. Identifying precisely how these regulatory proteins control IDO activity will increase our understanding of the human immune response. In related studies, we have identified a class of drugs that are capable of potently inhibiting IDO activity. We have made good progress into understanding the precise molecular mechanism by which these drugs inhibit IDO and now plan to explore the extent to which these drugs can inhibit IDO in the context of cancer. This is of interest because certain cancer cells can express IDO to protect themselves from the patient's immune system, and drugs that effectively inhibit IDO therefore represent potential anti-cancer drugs.

## **Stem Cell and Megakaryocyte Group (UNSW)**

*Group Leader: Prof Beng H. Chong*

### **Our research aims**

Our research focuses on three areas: (1) platelet production, (2) immune thrombocytopenic disorders, and (3) cardiac stem cells.

1. Platelets are blood cells involved in haemostasis (blood clot formation). Dysregulation of platelet production leads either to low blood platelet levels and consequently bleeding, or high platelet levels resulting in thrombosis, stroke and heart attack. Our aim is to study transcriptional regulation of platelet production. This research may provide insights into the mechanisms of platelet disorders resulting in better diagnosis and treatment.

2. Immune thrombocytopenic disorders are diseases in which individuals produce pathologic antibodies that destroy platelets. These disorders occur when a patient becomes allergic to a drug such as heparin (heparin-induced thrombocytopenia or HIT), or they may occur for no known reason, for example, in patients with Idiopathic Thrombocytopenic Purpura (ITP). Our aim is to study the mechanisms of immune thrombocytopenic disorders and may lead to improved diagnosis and treatment.
3. Cardiac stem cells (CSCs) are immature cells that can differentiate to become heart muscle cells, endothelial (blood vessel) cells or other cell types found in the heart. After myocardial infarction or heart attack, the stem cells move from their niche to the damaged area of the heart and repair the damaged tissue. The gene or transcription factors that regulate cardiac growth and hypertrophy are GATA-4 and FOG-2. Our aim is to study the migration and differentiation of CSCs in a mouse myocardial infarction model. Additionally, we are investigating SUMOylation and nuclear import of GATA-4 and FOG-2 in cardiac muscle hypertrophy.

### **Achievements in 2008**

1. Our group transfected GATA-1 and NFE-2 into bone marrow progenitor cells using a retrovirus vector and showed that over-expression of these genes led to enhanced megakaryocyte differentiation and increased proplatelet and platelet formation. We also identified that IFI-16 is a thrombopoietin-responsive gene that mediates megakaryocyte growth via the JAK/STAT pathway. These data provide further understanding of the mechanism of platelet production.
2. We have identified the GPIIb/IIIa as the major platelet antigen of the quinine-induced antibody and have further mapped the antibody-binding site to the C-terminal region of GPIIb/IIIa extracellular domain. We have similarly mapped the HIT antibody to the 'P' surface of the PF4 tetramer. This data provides further insights into the pathophysiology of drug-induced thrombocytopenia.
3. We have identified SDF-1 and CXCR4 as an important ligand-receptor system that mediates the migration of the 'side population' (SP) stem cells from the site of injection to the infarction site. We found that *in vivo* the SP stem cells differentiated to mature cardiac muscle cells and endothelial cells, suggesting that SP cells can play a role in tissue repair following heart muscle damage, e.g., from a heart attack.

### **Plans for the future**

Platelet production: we intend to study further the interaction between GATA-1 and Fli-1 in the regulation of platelet production. In addition we will study the role of SUMOylation of Fli-1 in megakaryopoiesis.

Immune thrombocytopenias: we will attempt to map the antibody binding sites of the rifampicin-, abciximab-, tirofiban- and vancomycin-induced antibody on their respective platelet glycoproteins. We also intend to characterise the 'pathogenic' and 'non-pathogenic' antibody in HIT.

## Transcription and Gene Targeting Group (UNSW)

*Group Leader: Prof Levon Khachigian*

### **Our research aims**

Cardiovascular disease and cancer remain the most prevalent causes of morbidity and mortality. The pathogenesis of these and a myriad of related diseases is underpinned by molecular and cellular changes in our blood vessels. Our research is uncovering key networks of transcriptional control and inducible gene-regulatory circuits that lead to vascular disease. We are also developing new experimental drugs that have the potential to treat a diverse range of health problems, from cancer and inflammation through to eye and heart disease.

Our research program has two major objectives:

1. To better understand how harmful genes are controlled in vascular cells. This part of the program investigates signalling and transcriptional mechanisms of pro-inflammatory cytokine-dependent gene expression, post-translational mechanisms that modify protein behaviour, proteinase control, the isolation and characterisation of new genes induced or repressed by vascular cell injury, and the molecular control of vascular cell migration and proliferation. We have considerable expertise in animal models of neointima formation, angiogenesis, tumour growth, myocardial ischemia, and inflammation.
2. To develop new vascular therapeutic agents. We are harnessing the outcomes of our fundamental research by pioneering the development of novel 'anti-gene-' and 'gene-therapeutic' strategies targeting key regulatory genes in a myriad of vascular disorders. This involves strategic collaborations with a range of clinical specialists, academics and drug development consultants.

### **Research achievements in 2008**

Among numerous achievements in 2008, we made important advances in our understanding of transcription factor structure-function, particularly the role of transcription factor phosphorylation (of the zinc finger transcription factor Sp1). Sp1 phosphorylation is a 'switch' that opens the door to normally dormant, disease-causing genes, like platelet-derived growth factor, quickly being expressed in cells that cause vascular narrowing. In addition, we have identified that another transcription factor (ATF-4) is activated by balloon angioplasty, which in turn stimulates the expression of growth factors, like vascular endothelial growth factor, that trigger vascular disease. These findings resulted in a prioritised communication in the premier basic science cardiovascular research journal, *Circulation Research*, and a second article in the same journal that attracted an independent commentary.

### **Future Plans**

We will continue our mission of aiming to better understand fundamental mechanisms in the cell and molecular biology of the vascular system, and the pathogenesis of vascular disease and to develop new treatments to combat vascular disorders. One of these settings is coronary reperfusion after a heart attack. Although reperfusion has been a mainstay therapy to reduce infarct size, this intervention also results in myocardial injury by initiating a marked inflammatory reaction, and new treatments are keenly sought. We are developing DNA-based strategies to reduce cardiomyocyte inflammation and apoptosis, and improve heart function. We are conducting an exhaustive set of safety testing on these novel therapeutics, and clinical trials with these agents should commence in patients in 2009.

We will also continue working with other groups within and outside CVR to expand our research. For example, with collaborators at McGill University, we are investigating the role of the transcription factor Egr-1 in its control of angiopoietin-1 (Ang-1), an important regulator of angiogenesis in endothelial cells that promotes migration, proliferation, and differentiation. Mary Kavurma, with NHMRC Project Grant funding, will be investigating the role of TRAIL in the process of arterial narrowing after and angioplasty, as well as in the pathogenesis of atherosclerosis.

## **Vascular Biology Laboratory (Monash)**

*Group Leaders: Prof Michael Berndt and Dr Robert Andrews*

### **Our research aims**

Thrombotic disease such as heart attack and stroke is the leading cause of death in the Western world. In thrombosis, platelet adhesion, activation and aggregation are initiated by two main platelet-specific adhesion receptors: glycoprotein (GP)VI that binds collagen, and the GPIb-IX-V complex that binds von Willebrand Factor (VWF). Both receptors form a unique complex on the platelet surface that facilitates adhesion and triggers signalling cascades. This initiates thrombus formation under conditions of arterial shear rates that is typically for the physiological conditions that cause heart attacks and strokes. Research in the Vascular Biology Group focuses on the ligand binding, signalling and regulation of the GPIb-IX-V, GPVI and other platelet receptors.

### **Achievements in 2008**

We have identified a dual proteolytic pathway for regulation of platelet receptors. Uniquely, our research shows that GPVI (ectodomain shedding) and the immune receptor FcRIIIa provide a key link between platelet dysfunction associated with thrombocytopenia induced by (auto)immune diseases.

Platelet glycoprotein (GP)Ib-IX-V, that binds von Willebrand factor (VWF) and other ligands, and GPVI, that binds collagen, form an adhesion-signalling complex unique to platelets, and which is critical for the initiation of thrombus formation at arterial shear rates. Key findings in 2008 from our laboratory advance the understanding of the function of GPIb-IX-V/GPVI at the level of ligand binding (VWF), signalling downstream of these receptors, and regulation of receptor expression by metalloproteinase-mediated ectodomain shedding:

First, a new mechanism for thiol-dependent regulation of VWF binding to GPIb-IX-V binding has been identified. This involves disulfide bonding between the GPIb (ligand-binding) and (regulatory) subunits with the receptor. Interestingly this is the mechanism by which the snake venom, botrocetin, induces physiological response by activating the relevant GPIb/VWF-dependent signalling cascades in platelets.

Second, we described the signalling protein Lyn of the Src-kinase family as the critical early effector of GPIb/VWF-dependent activation of the (secretion-independent) cGMP pathway leading to platelet aggregation. This involves a new redox-regulated pathway for Lyn activation (involving the direct association with GPIb-IX-V and GPVI of the Lyn-regulatory protein, TRAF-4). Furthermore, we succeeded in mapping the discrete binding sites on GPIb cytoplasmic tail for the signalling protein 14-3-3, and the p85 subunit of phosphatidylinositol 3-kinase (PI3K) involved in both cGMP-dependent and cGMP-independent signalling pathways downstream of Lyn activation. Third, we elucidated the pathways for immune complex-mediated ectodomain shedding of GPVI via Fc RIIa. This is relevant to anti-platelet autoimmune diseases such as heparin induced thrombocytopenia (HIT) or idiopathic thrombocytopenia purpura (ITP). The clinical importance of this pathway has been demonstrated in a patient with ITP (due to an anti-GPVI auto-antibody) where there is ~10-fold increase in soluble plasma GPVI levels and a corresponding increase in the level of proteolysed GPVI detectable on circulating platelets (cf. normal platelets where essentially all of the GPVI is in an intact, uncleaved form). Further, it has been shown that ligands acting at GPVI lead to proteolytic inactivation of both GPVI (ectodomain shedding by ADAM10) and Fc RIIa (intracellular proteolysis by calpain). Together, these findings will provide the foundation for future translation of this research into the clinical evaluation of GPIb-IX-V and/or GPVI signalling/shedding in the initiation/progression of immune/thrombotic disorders.

## Centre Supported Students

Student Name	Location	Thesis Topic	Supervisor(s)
S Azahri	UNSW	Mechanistic involvement of TRAIL in vascular biology and atherosclerosis	Prof L Khachigian, Dr M Kavurma
M Balamurali	UNSW	Dynamics of immune escape in HIV	A/Prof M Davenport, Dr J Petravac
V Benson	Concord	DNAzyme effects in diabetes	Dr H Lowe, Prof L Khachigian
M Caramins	POW	Genetic determinants of the platelet count in the mouse	Dr M Buckley, A/Prof R Lindeman
D Carter	St George	Transcriptional regulation of cardiac development	Prof B Chong, Dr J Perdomo
S Cartland	UNSW	Macrophage and dendritic cell migration in atherosclerosis progression and regression	Prof W Jessup, Dr K Gaus
D Chan	UNSW	T cell homeostasis in HIV	A/Prof M Davenport, Dr J Petravac
C Chan	UNSW	Targeting c-Jun in age related macular degeneration	Prof L Khachigian, Prof C Chesterman
J Chan	UNSW	Transcription regulation in vascular smooth muscle cells	Prof L Khachigian, Prof C Chesterman
B Changsiri	USyd	The role of indoleamine 2,3 dioxygenase in the regulation of vascular tone in humans	Prof D Celermajer, Prof R Stocker
S Cliffe	POW	Genetic characterization of rare disorders by linkage analysis: Veno-occlusive disease with immunodeficiency, and hypertrichosis with insulin dependent diabetes mellitus	Dr M Buckley, A/Prof R Lindeman
L Coupland	ANU	The role of platelets in tumour metastasis	Prof C Parish, Dr L Hindmarsh
X Du	UNSW	Atherosclerosis control of cholesterol export from macrophages	Prof W Jessup, Prof L Kritharides
E Fock	St George	Molecular regulation and enhancement of megakaryopoiesis and thrombopoiesis by the p45 subunit of NF-E2	Prof B Chong, Dr F Yan
D Guo	UNSW	Protein Kinase A and related pathways in the regulation of apolipoprotein E secretion and catalase activity	Prof L Kritharides, Prof W Jessup

Student Name	Location	Thesis Topic	Supervisor(s)
Y He	ANU	Functional role of nuclear heparanase	Dr S Rao, Prof C Parish, Dr C Freeman
V Hsieh	UNSW	Molecular mechanisms of cholesterol export from macrophages in atherosclerosis	Prof W Jessup, Prof L Kritharides
S Inam	UNSW	Small molecule inhibitors as novel anticancer drugs	Prof L Khachigian, Dr L Lourenco-Dias
R Knight	POW	Angiogenic potential of cord blood progenitor cells	Dr A Dolnikov, A/Prof R Lindeman
M Kurniawan	UNSW	T cell receptor repertoire in health and disease	A/Prof M Davenport, Dr V Venturi
G Le Saux	UNSW	Modified silicon surfaces for controlled cell interactions	Prof J Gooding, A/Prof K Gaus
Q Li	UNSW	Lipid analysis of wild-type and Caveolin-knockout mouse embryonic fibroblasts	Dr K Gaus
C Li	USyd	Heme oxygenase and iron homeostasis	Prof R Stocker, Dr S Thomas
M Liu	UNSW	Mechanisms regulating platelet-derived growth factor D transcription in vascular smooth muscle cells	Prof L Khachigian, Prof C Chesterman
S Liu	St George	Regulation of human thrombopoietin	Prof B Chong, Dr X-M Jiang
A Magenau	UNSW	The role of lipid rafts in actin-mediated phagocytosis	A/Prof K Gaus
K Malabanan	UNSW	Roles of activation transcription factor-4 and YrdC in the response of vascular smooth muscle cells to injury	Prof L Khachigian
M Mattar	UNSW	The role of oxidative stress in endothelial dysfunction	Dr S Thomas
E McNaughton	ANU	B cells as antigen presenting cells	Prof C Parish, Dr B Quah
J Ni	UNSW	Targeting immediate-early genes in bypass graft stenosis	Prof L Khachigian, Prof C Chesterman
C Palma	POW	Differentiation potential of cord blood progenitor cells	A/Prof R Lindeman
A Philips	St George	Transcription regulation and nuclear import mechanisms involved in mammalian heart development	Prof B Chong, Dr J Kwok

<b>Student Name</b>	<b>Location</b>	<b>Thesis Topic</b>	<b>Supervisor(s)</b>
I Poon	ANU	The role of histidine-rich glycoprotein in necrotic cell clearance and regulation of degradative enzymes	Prof C Parish, Dr M Hulett
Y Ramaswamy	IDRU	Signalling in bone morphogenesis	Dr H Zreiqat, Prof L Khachigian
M Rodriguez	UNSW	The structure-function relationship of plasma membrane domains in endothelial cells	A/Prof K Gaus
E Sanchez-Guerrero	UNSW	Signalling and transcription in vascular smooth muscle cells	Prof L Khachigian, Prof C Chesterman
F Santiago	UNSW	Isolation and characterisation of novel genes in response to vascular injury	Prof L Khachigian, Prof C Chesterman
T Schlub	UNSW	Modelling in infection and immunity	A/Prof M Davenport, Dr V Venturi
E Sutcliffe	ANU	Coordinated changes in chromatin composition accompany inducible gene transcription in human T cells	Dr S Rao, Prof C Parish
N Tan	UNSW	Gene expression during activation of smooth muscle cells	Prof L Khachigian, Prof C Chesterman
T Tan	UNSW	Differentiation and migration of Sca-1+/CD31-cardiac side population cells in a murine myocardial ischemic model	Prof B Chong, Dr S Liang
A Waldman	UNSW	Role of transcription factor c-Jun in acute inflammation and intimal thickening in bypassed vein grafts: insights using DNazymes	Prof L Khachigian, A/Prof M Perry, Prof C Chesterman
X-S Wang	USyd	A novel ELISA to detect methionine sulfoxide-containing apolipoprotein A0	Prof R Stocker, A/Prof S Mahler
D Williamson	UNSW	The role of membrane condensation in T cell signalling	A/Prof K Gaus
R Wood	Monash	Identification and characterization of cell surface receptors for heparanase: Implications in health and disease	Dr M Hulett
A Yeung	USyd	Anti-viral actions of Indoleamine 2,3-dioxygenase	Prof N King, Dr S Thomas
N Zhang	UNSW	Transcription regulation of platelet-derived growth factor receptor-alpha	Prof L Khachigian, Prof C Chesterman

# Publications

## Chapters

Chong, BH, Kidson-Gerber, G. Deep vein thrombosis and pulmonary embolism. In *Disease Index (Fourth Edition)*, Mathias, T. (ed.), MIMS Australia, 2008.

## Refereed Journal Articles

Arthur, J. F., Gardiner, E. E., Kenny, D., Andrews, R. K., and Berndt, M. C. (2008). Platelet receptor redox regulation. *Platelets* 19, 1-8.

Benson, V. L., Khachigian, L. M., and Lowe, H. C. (2008). DNAzymes and cardiovascular disease. *British Journal of Pharmacology* 154, 741-748.

Böcking, T., Kilian, K. A., Gaus, K., and Gooding, J. J. (2008). Modifying porous silicon with self-assembled monolayers for biomedical applications: the influence of surface coverage on stability and biomolecule coupling. *Advanced Functional Materials* 18, 3827-3833.

Buzza, M. S., Dyson, J. M., Choi, H., Gardiner, E. E., Andrews, R. K., Kaiserman, D., Mitchell, C. A., Berndt, M. C., Dong, J. F., and Bird, P. I. (2008). Antithrombotic activity of human granzyme B mediated by cleavage of von Willebrand factor. *Journal of Biological Chemistry* 283, 22498-22504.

Chavez, L. L., Davenport, M. P., Shiver, J. W., Tussey, L. G., Cox, K. S., Bachinsky, M., Wang, F., Huang, L., Schleif, W. A., Davies, M. E., et al. (2008). The effect of early versus delayed challenge after vaccination in controlling SHIV 89.6P infection. *Virology* 381, 75-80.

Wang, X.S., and Stocker, R. (2008). Detection of specifically oxidized apolipoproteins in oxidized HDL. In *Advanced Protocols in Oxidative Stress I*. Vol. 477. Armstrong, D. (ed.). Humana Press, New York. 49-63.

Chong, B. H., Braithwaite, J., Harris, M. F., and Fletcher, J. P. (2008). Venous thromboembolism - a major health and financial burden: how can we do better to prevent this disease? *Medical Journal of Australia* 189, 134-135.

Chung, T., Lim, W. C., Sy, R., Cunningham, I., Trotman, J., and Kritharides, L. (2008). Subacute cardiac toxicity following autologous haematopoietic stem cell transplantation in patients with normal cardiac function. *Heart* 94, 911-918.

Dass, C. R., Choong, P. F. M., and Khachigian, L. M. (2008). DNAzyme technology and cancer therapy: cleave and let die. *Molecular Cancer Therapeutics* 7, 243-251.

Dass, C. R., Friedhuber, A. M., Khachigian, L. M., Dunstan, D. E., and Choong, P. F. M. (2008). Biocompatible chitosan-DNAzyme nanoparticle exhibits enhanced biological activity. *Journal of Microencapsulation* 25, 421-425.

Dass, C. R., Friedhuber, A. M., Khachigian, L. M., Dunstan, D. E., and Choong, P. F. M. (2008). Downregulation of c-jun results in apoptosis-mediated anti-osteosarcoma activity in an orthotopic model. *Cancer Biology & Therapy* 7, 1033-1036.

Dass, C. R., Galloway, S. J., Clark, J. C. M., Khachigian, L. M., and Choong, P. F. M. (2008). Involvement of c-Jun in human liposarcoma growth - Supporting data from clinical immunohistochemistry and DNazyme efficacy. *Cancer Biology & Therapy* 7, 1297-1301.

Dass, C. R., Khachigian, L. M., and Choong, P. F. M. (2008). c-Jun is critical for the progression of osteosarcoma: Proof in an orthotopic spontaneously metastasizing model. *Molecular Cancer Research* 6, 1289-1292.

Dass, C. R., Khachigian, L. M., and Choong, P. F. M. (2008). c-Jun knockdown sensitizes osteosarcoma to doxorubicin. *Molecular Cancer Therapeutics* 7, 1909-1912.

Davenport, M. P., Loh, L., Petravic, J., and Kent, S. J. (2008). Rates of HIV immune escape and reversion: implications for vaccination. *Trends in Microbiology* 16, 561-566.

Dunkley, S., Phillips, L., McCall, P., Brereton, J., Lindeman, R., Jankelowitz, G., and Cameron, P. (2008). Recombinant activated factor VII in cardiac surgery: Experience from the Australian and New Zealand Haemostasis Registry. *Annals of Thoracic Surgery* 85, 836-844.

Emmett, L., Van Gaal, W. J., Magee, M., Bass, S., Ali, O., Ben Freedman, S., Van der Wall, H., and Kritharides, L. (2008). Prospective evaluation of the impact of diabetes and left ventricular hypertrophy on the relationship between ischemia and transient ischemic dilation of the left ventricle on single-day adenosine Tc-99m myocardial perfusion imaging. *Journal of Nuclear Cardiology* 15, 638-643.

Fock, E. F., Yan, F., Pan, S., and Chong, B. H. (2008). NF-E2-mediated enhancement of megakaryocytic differentiation and platelet production *in vitro* and *in vivo*. *Experimental Hematology* 36, 78-92.

Gardiner, E. E., Al-Tamimi, M., Mu, F. T., Karunakaran, D., Thom, J. Y., Moroi, M., Andrews, R. K., Berndt, M. C., and Baker, R. I. (2008). Compromised ITAM-based platelet receptor function in a patient with

immune thrombocytopenic purpura. *Journal of Thrombosis & Haemostasis* 6, 1175-1182.

Gardiner, E. E., Karunakaran, D., Arthur, J. F., Mu, F. T., Powell, M. S., Baker, R. I., Hogarth, P. M., Kahn, M. L., Andrews, R. K., and Berndt, M. C. (2008). Dual ITAM-mediated proteolytic pathways for irreversible inactivation of platelet receptors: de-ITAM-izing FcγRIIa. *Blood* 111, 165-174.

Glaros, E. N., Kim, W. S., Quinn, C. M., Jessup, W., Rye, K. A., and Garner, B. (2008). Myriocin slows the progression of established atherosclerotic lesions in apolipoprotein E gene knockout mice. *Journal of Lipid Research* 49, 324-331.

Holmes, T., O'Brien, T. A., Knight, R., Lindeman, R., Shen, S., Song, E., Symonds, G., and Dolnikov, A. (2008). Glycogen synthase kinase-3 beta inhibition preserves hematopoietic stem cell activity and inhibits leukemic cell growth. *Stem Cells* 26, 1288-1297.

Holmes, T., O'Brien, T. A., Knight, R., Lindeman, R., Symonds, G., and Dolnikov, A. (2008). The role of glycogen synthase kinase-3 beta in normal haematopoiesis, angiogenesis and leukaemia. *Current Medicinal Chemistry* 15, 1493-1499.

Hoover, W. G., Hoover, C. G., and Petravic, J. (2008). Simulation of two- and three-dimensional dense-fluid shear flows via nonequilibrium molecular dynamics: Comparison of time-and-space-averaged stresses from homogeneous Doll's and Sllod shear algorithms with those from boundary-driven shear. *Physical Review E* 78.

Irving-Rodgers, H. F., Ziolkowski, A. F., Parish, C. R., Sado, Y., Ninomiya, Y., Simeonovic, C. J., and Rodgers, R. J. (2008). Molecular composition of the peri-islet basement membrane in NOD mice: a barrier against destructive insulinitis. *Diabetologia* 51, 1680-1688.

Jessup, W., Herman, A., and Chapman, M. J. (2008). Phytosterols in cardiovascular disease: innocuous dietary components, or accelerators of atherosclerosis? *Future Lipidology* 3, 301-310.

Kavallaris, M., Meachem, S. J., Hulett, M. D., West, C. M., Pitt, R. E., Chesters, J. J., Laffan, W. S., Boreham, P. R., and Khachigian, L. M. (2008). Perceptions in health and medical research careers: the Australian Society for Medical Research Workforce Survey. *Medical Journal of Australia* 188, 520-524.

Kavurma, M. M., and Bennett, M. R. (2008). Expression, regulation and function of trail in atherosclerosis. *Biochemical Pharmacology* 75, 1441-1450.

Kavurma, M. M., Schoppet, M., Bobryshev, Y. V., Khachigian, L. M., and Bennett, M. R. (2008). TRAIL stimulates proliferation of vascular smooth muscle cells via activation of NF-kappa B and induction of insulin-like growth factor-1 receptor. *Journal of Biological Chemistry* 283, 7754-7762.

Kavurma, M. M., Tan, N. Y., and Bennett, M. R. (2008). Death receptors and their ligands in atherosclerosis. *Arteriosclerosis Thrombosis and Vascular Biology* 28, 1694-1702.

Kedzierska, K., Thomas, P. G., Venturi, V., Davenport, M. P., Doherty, P. C., Turner, S. J., and La Gruta, N. L. (2008). Terminal deoxynucleotidyltransferase is required for the establishment of private virus-specific CD8(+) TCR repertoires and facilitates optimal CTL responses. *Journal of Immunology* 181, 2556-2562.

Kedzierska, K., Venturi, V., Valkenburg, S. A., Davenport, M. P., Turner, S. J., and Doherty, P. C. (2008). Homogenization of TCR repertoires within secondary CD62L(high) and CD62L(low) virus-specific CD8(+) T cell populations. *Journal of Immunology* 180, 7938-7947.

Kidson-Gerber, G., and Lindeman, R. (2008). Adherence to desferrioxamine and deferiprone and the impact of deferiprone co-prescription in thalassaemia major patients. Does the addition of

deferiprone improve adherence? *British Journal of Haematology* 142, 679-680.

Kidson-Gerber, G. L., Francis, S., and Lindeman, R. (2008). Management and clinical outcomes of transfusion-dependent thalassaemia major in an Australian tertiary referral clinic. *Medical Journal of Australia* 188, 72-75.

Kilian, K. A., Bocking, T., Gaus, K., and Gooding, J. J. (2008). Introducing distinctly different chemical functionalities onto the internal and external surfaces of mesoporous materials. *Angewandte Chemie-International Edition* 47, 2697-2699.

Kilian, K. A., Bocking, T., Lai, L. M. H., Ilyas, S., Gaus, K., Gal, M., and Gooding, J. J. (2008). Organic modification of mesoporous silicon rugate filters: the influence of nanoarchitecture on optical behaviour. *International Journal of Nanotechnology* 5, 170-178.

Kim, W. S., Elliott, D. A., Kockx, M., Kritharides, L., Rye, K. A., Jans, D. A., and Garner, B. (2008). Analysis of apolipoprotein E nuclear localization using green fluorescent protein and biotinylation approaches. *Biochemical Journal* 409, 701-709.

Kockx, M., Jessup, W., and Kritharides, L. (2008). Regulation of endogenous apolipoprotein E secretion by macrophages. *Arteriosclerosis Thrombosis and Vascular Biology* 28, 1060-1067.

Li, R. W., Freeman, C., Yu, D., Hindmarsh, E. J., Tymms, K. E., Parish, C. R., and Smith, P. N. (2008). Dramatic regulation of heparanase activity and angiogenesis gene expression in synovium from patients with rheumatoid arthritis. *Arthritis and Rheumatism* 58, 1590-1600.

Lim, S. Y., Raftery, M., Cai, H., Thomas, S., and Geczy, C. (2008). S-nitrosylated S100A8 suppresses mast cell activation: Novel anti-inflammatory properties. *Journal of Leukocyte Biology* 84, A18-A18.

Liu, J., Joglekar, M., Ware, J., Fitzgerald, M. E., Lowell, C. A., Berndt, M. C., and Gartner, T. K. (2008). Evaluation of the physiological significance of botrocetin/ von Willebrand factor *in vitro* signaling. *Journal of Thrombosis & Haemostasis* 6, 1915-1922.

Loh, L., Petravic, J., Batten, C. J., Davenport, M. P., and Kent, S. J. (2008). Vaccination and timing influence SIV immune escape viral dynamics *in vivo*. *Plos Pathogens* 4, e12.

Maghzal, G. J., Thomas, S. R., Hunt, N. H., and Stocker, R. (2008). Cytochrome b5, not superoxide anion radical, is a major reductant of indoleamine 2,3-dioxygenase in human cells. *Journal of Biological Chemistry* 283, 12014-12025.

Malabanan, K. P., Kanellakis, P., Bobik, A., and Khachigian, L. M. (2008). Activation transcription factor-4 induced by fibroblast growth factor-2 regulates vascular endothelial growth factor-A transcription in vascular smooth muscle cells and mediates intimal thickening in rat arteries following balloon injury. *Circulation Research* 103, 378-387.

McGaughran, J., Sinnott, S., Susman, R., Buckley, M. F., Elakis, G., Cox, T., and Roscioli, T. (2006). A case of Beare-Stevenson syndrome with a broad spectrum of features and a review of the FGFR2 Y375C mutation phenotype. *Clinical Dysmorphology* 15, 89-93.

Melenhorst, J. J., Lay, M. D. H., Price, D. A., Adams, S. D., Zeilah, J., Sosa, E., Hensel, N. F., Follmann, D., Douek, D. C., Davenport, M. P., and Barrett, A. J. (2008). Contribution of TCR-beta locus and HLA to the shape of the mature human V beta repertoire. *Journal of Immunology* 180, 6484-6489.

Mitchell, A., Rentero, C., Endoh, Y., Hsu, K., Gaus, K., Geczy, C., McNeil, H. P., Borges, L., and Tedla, N. (2008). LILRA5 is expressed by synovial tissue macrophages in rheumatoid arthritis, selectively induces pro-inflammatory cytokines and IL-10 and is regulated by TNF-alpha, IL-10 and IFN-gamma. *European Journal of Immunology* 38, 3459-3473.

Mo, X., Luo, S. Z., Munday, A. D., Sun, W., Berndt, M. C., Lopez, J. A., Dong, J. F., and Li, R. (2008). The membrane-proximal intermolecular disulfide bonds in glycoprotein Ib influence receptor binding to von Willebrand factor. *Journal of Thrombosis & Haemostasis* 6, 1789-1795.

Mu, F. T., Andrews, R. K., Arthur, J. F., Munday, A. D., Cranmer, S. L., Jackson, S. P., Stomski, F. C., Lopez, A. F., and Berndt, M. C. (2008). A functional 14-3-3zeta-independent association of PI3-kinase with glycoprotein Ib alpha, the major ligand-binding subunit of the platelet glycoprotein Ib-IX-V complex. *Blood* 111, 4580-4587.

O'Neill, H. C., and Quah, B. J. (2008). Exosomes secreted by bacterially infected macrophages are proinflammatory. *Science Signaling* 1, pe8.

Out, R., Jessup, W., Le Goff, W., Hoekstra, M., Gelissen, I. C., Zhao, Y., Kritharides, L., Chimini, G., Kuiper, J., Chapman, M. J., et al. (2008). Coexistence of foam cells and hypocholesterolemia in mice lacking the ABC transporters a1 and g1. *Circulation Research* 102, 113-120.

Palma, C. A., Lindeman, R., and Tuch, B. E. (2008). Blood into beta-cells: can adult stem cells be used as a therapy for Type I diabetes? *Regenerative Medicine* 3, 33-47.

Pato, C., Stetzkowski-Marden, F., Gaus, K., Recouvreur, M., Cartaud, A., and Cartaud, J. (2008). Role of lipid rafts in agrin-elicited acetylcholine receptor clustering. *Chemico-Biological Interactions* 175, 64-67.

Peace, A. J., Tedesco, A. F., Foley, D. P., Dicker, P., Berndt, M. C., and Kenny, D. (2008). Dual antiplatelet therapy unmasks distinct platelet reactivity in patients with coronary artery disease. *Journal of Thrombosis & Haemostasis* 6, 2027-2034.

Petravic, J. (2008). Equilibrium calculation of the friction coefficient for a massive particle moving in finite liquid volume. *Journal of Chemical Physics* 129.

Petravic, J. (2008). Force autocorrelation function in linear response theory and the origin of friction. *Journal of Chemical Physics* 129, 094503.

Petravic, J., and Harrowell, P. (2008). On the equilibrium calculation of the friction coefficient for liquid slip against a wall (vol 127, art no 174706, 2007). *Journal of Chemical Physics* 128, 114502.

Petravic, J., Loh, L., Kent, S. J., and Davenport, M. P. (2008). CD4(+) target cell availability determines the dynamics of immune escape and reversion *in vivo*. *Journal of Virology* 82, 4091-4101.

Petravic, J., Ribeiro, R. M., Casimiro, D. R., Mattapallil, J. J., Roederer, M., Shiver, J. W., and Davenport, M. P. (2008). Estimating the impact of vaccination on acute simian-human immunodeficiency virus/simian immunodeficiency virus infections. *Journal of Virology* 82, 11589-11598.

Quah, B. J. C., Barlow, V. P., McPhun, V., Matthaei, K. I., Hulett, M. D., and Parish, C. R. (2008). Bystander B cells rapidly acquire antigen receptors from activated B cells by membrane transfer. *Proceedings of The National Academy of Sciences of The United States of America* 105, 4259-4264.

Rentero, C., Magenau, A., Williamson, D., Tedla, N., and Gaus, K. (2008). Membrane Domains as Signaling Centers in Macrophages and T-Cells: From Concepts to Experiments. *Immunology, Endocrine & Metabolic Agents in Medicinal Chemistry* 8, 336-348.

Rentero, C., Zech, T., Quinn, C. M., Engelhardt, K., Williamson, D., Grewal, T., Jessup, W., Harder, T., and Gaus, K. (2008). Functional implications of plasma membrane condensation for T cell activation. *PLoS ONE* 3, e2262.

Rudd, B. D., Brien, J. D., Davenport, M. P., and Nikolich-Zugich, J. (2008). Cutting edge: TLR ligands increase TCR triggering by slowing

peptide-MHC class I decay rates. *Journal of Immunology* 181, 5199-5203.

Sanchez-Guerrero, E., Midgley, V. C., and Khachigian, L. M. (2008). Angiotensin II induction of PDGF-C expression is mediated by AT1 receptor-dependent Egr-1 transactivation. *Nucleic Acids Research* 36, 1941-1951.

Schulz, E., Dopheide, J., Schuhmacher, S., Thomas, S. R., Chen, K., Daiber, A., Wenzel, P., Munzel, T., and Keaney, J. F. (2008). Suppression of the JNK pathway by induction of a metabolic stress response prevents vascular injury and dysfunction. *Circulation* 118, 1347-1357.

Smith, M. Z., Asher, T. E., Venturi, V., Davenport, M. P., Douek, D. C., Price, D. A., and Kent, S. J. (2008). Limited maintenance of vaccine-induced simian immunodeficiency virus-specific CD8 T-cell receptor clonotypes after virus challenge. *Journal of Virology* 82, 7357-7368.

Suzuki, K., Juelich, T., Lim, H., Ishida, T., Watanebe, T., Cooper, D. A., Rao, S., and Kelleher, A. D. (2008). Closed chromatin architecture is induced by an RNA duplex targeting the HIV-1 promoter region. *Journal of Biological Chemistry* 283, 23353-23363.

Sy, R. W., Chawantanpipat, C., Richmond, D. R., and Kritharides, L. (2008). Thrombocytopenia and mortality in infective endocarditis. *Journal of the American College of Cardiology* 51, 1824-1825.

Sydnies, M. O., Bezos, A., Burns, C., Kruszelnicki, I., Parish, C. R., Su, S., Rae, A. D., Willis, A. C., and Banwell, M. G. (2008). Synthesis and biological evaluation of some enantiomerically pure C8c-C15 monoseco analogues of the phenanthroquinolizidine-type alkaloids cryptopleurine and julandine. *Australian Journal of Chemistry* 61, 506-520.

Tan, N. Y., Midgley, V. C., Kavurma, M. M., Santiago, F. S., Luo, X., Peden, R., Fahmy, R. G., Berndt, M. C., Molloy, M. P., and Khachigian,

L. M. (2008). Angiotensin II-inducible platelet-derived growth factor-D transcription requires specific ser/thr residues in the second zinc finger region of Sp1. *Circulation Research* 102, E38-E51.

Tanous, D., Hime, N., and Stocker, R. (2008). Anti-atherosclerotic and anti-diabetic properties of probucol and related compounds. *Redox Report* 13, 48-59.

Thomas, S. R., Witting, P. K., and Drummond, G. R. (2008). Redox control of endothelial function and dysfunction: Molecular mechanisms and therapeutic opportunities. *Antioxidants & Redox Signaling* 10, 1713-1765.

Venturi, V., Chin, H. Y., Asher, T. E., Ladell, K., Scheinberg, P., Bornstein, E., van Bockel, D., Kelleher, A. D., Douek, D. C., Price, D. A., and Davenport, M. P. (2008). TCR beta-Chain Sharing in Human CD8(+) T Cell Responses to Cytomegalovirus and EBV. *Journal of Immunology* 181, 7853-7862.

Venturi, V., Chin, H. Y., Price, D. A., Douek, D. C., and Davenport, M. P. (2008). The role of production frequency in the sharing of simian immunodeficiency virus-specific CD8(+) TCRs between macaques. *Journal of Immunology* 181, 2597-2609.

Venturi, V., Kedzierska, K., Tanaka, M. M., Turner, S. J., Doherty, P. C., and Davenport, M. P. (2008). Method for assessing the similarity between subsets of the T cell receptor repertoire. *Journal of Immunological Methods* 329, 67-80.

Venturi, V., Price, D. A., Douek, D. C., and Davenport, M. P. (2008). The molecular basis for public T-cell responses? *Nature Reviews Immunology* 8, 231-U214.

Wimmer-Kleikamp, S. H., Nievergall, E., Gegenbauer, K., Adikari, S., Mansour, M., Yeadon, T., Boyd, A. W., Patani, N. R., and Lackmann, M. (2008). Elevated protein tyrosine phosphatase activity provokes Eph/ephrin-facilitated adhesion of pre-B leukemia cells. *Blood* 112, 721-732.

Wong, J., Quinn, C. M., Gelissen, I. C., and Brown, A. J. (2008). Endogenous 24(S),25-epoxycholesterol fine-tunes acute control of cellular cholesterol homeostasis. *Journal of Biological Chemistry* 283, 700-707.

Wong, J., Quinn, C. M., Gelissen, I. C., Jessup, W., and Brown, A. J. (2008). The effect of statins on ABCA1 and ABCG1 expression in human macrophages is influenced by cellular cholesterol levels and extent of differentiation. *Atherosclerosis* 196, 180-189.

Yang, M., Ng, M. H. L., Li, C. K., Chan, P. K. S., Liu, C., Ye, J. Y., and Chong, B. H. (2008). Thrombopoietin levels increased in patients with severe acute respiratory syndrome. *Thrombosis Research* 122, 473-477.

Yin, H., Liu, J., Li, Z., Berndt, M. C., Lowell, C. A., and Du, X. (2008). Src family tyrosine kinase Lyn mediates VWF/GPIb-IX-induced platelet activation via the cGMP signaling pathway. *Blood* 112, 1139-1146.

Zhao, L., Gaudry, L., Dunkley, S., Brighton, T., Guo, Z. X., Ye, Z. L., Luo, R. Z., and Chesterman, C. N. (2008). Modulation of platelet and leucocyte function by a Chinese herbal formulation as compared with conventional antiplatelet agents. *Platelets* 19, 24-31.

Zreiqat, H., James, B., Brieger, D., Kritharides, L., and Lowe, H. C. (2008). Acute coronary stent thrombosis: Toward insights into possible mechanism using novel imaging methods. *Thrombosis And Haemostasis* 99, 976-977.

## Non-refereed Journal Articles

Berndt, M. C., and Andrews, R. K. (2008). New direction for WE thrombin.[comment]. *Arteriosclerosis, Thrombosis & Vascular Biology* 28, 205-207.

Chong, B. H. (2008). Diagnosis of drug-induced thrombocytopenia. *International Journal of Laboratory Hematology* 30, 10-11.

Kidson-Gerber, G., Gemmell, R., Weaver, J., Prasan, A., and Chong, B. H. (2008). A prospective study of aspirin and clopidogrel resistance in patients with cardiovascular disease: comparison of serum thromboxane B2 measurements with the results of whole blood aggregometry, PFA

100, cone & plate analyser and VerifyNow system. *International Journal of Laboratory Hematology* 30, 13-14.

Parry, L., Gemmell, R., Ho, S., and Chong, B. (2008). Assessment of quick spin centrifugation and the impact on routine coagulation results. *International Journal of Laboratory Hematology* 30, 103-104.

Triccas, J. A., and Davenport, M. P. (2008). Infectious diseases - Too little, too late for tuberculosis. *Immunology and Cell Biology* 86, 293-294.

## Journal Letters and Notes

Andrews, R. K., and Berndt, M. C. (2008). Microparticles facilitate neutrophil/platelet crosstalk (Commentary). *Blood* 112, 2174-2175.

Andrews, R. K., and Berndt, M. C. (2008). Platelet adhesion: a game of catch and release.[comment]. *Journal of Clinical Investigation* 118, 3009-3011.

Berndt, M. C., and Andrews, R. K. (2008). Systems biology meets platelet biology.[comment]. *Blood* 112, 3920-3921.

Jessup, W., and Kritharides, L. (2008). Lipid metabolism: recent progress in defining the contributions of cholesterol transporters to cholesterol efflux *in vitro* and *in vivo*. *Current Opinion in Lipidology* 19, 212-214.

Jessup, W. (2008). Lipid metabolism: sources and stability of plasma sphingosine-1-phosphate. *Current Opinion in Lipidology* 19, 543-544.

Khachigian, L.M., Bobik, A., Kanellakis, P., and Malabanan, K. (2008). Regulation of Vascular Endothelial Growth Factor A by Activating Transcription Factor 4 Response. *Circulation Research* 103, E119-E119.

## Patents

Kilian, Böcking, Gooding, Gaus, UNSW, A Sensor Structure and a Method of Fabricating the Same (New South Innovations), Provisional 200802248, Australia 2008.

Kilian, Gooding, Lai, Böcking, Gaus, UNSW, A Method and Sensor for the Detection of Species, (New South Innovations), Provisional 2008906373, Australia 2008.

Chong, B. Patent in China: Panoxalial (compounds from ginseng) for treatment of cytopenic disorders. Patent approval numbers: CXZL 0800047 and CXZL 0800048 in June and July 2008.

## Invited Talks

### Prof Beng Chong

#### International:

- *Venous Thromboembolism: Bringing evidenced-based findings to clinical practice.* Invited speaker, The Medical Forum, University of Hong Kong, Hong Kong, 2-4 May 2008.
- *Venous Thromboembolism: What are the barriers to thrombo-prophylaxis.* Invited speaker, Hong Kong Society of Haematology Meeting, Hong Kong, 6 May 2008.
- *Transcription regulation of megakaryopoiesis.* Invited speaker, Department of Paediatrics, University of Hong Kong, Hong Kong, 5 May, 2008.
- *New paradigms in management of Idiopathic Thrombocytopenic Purpura.* Invited speaker (plenary lecture), 5<sup>th</sup> Congress of the Asian-pacific Society on Thrombosis and Haemostasis, Singapore, 18-20 September 2008.
- *New Paradigm in the Management of Idiopathic Thrombocytopenic Purpura.* Invited speaker (State of Art Lecture), 49<sup>th</sup> Conference of the Korean Society of Hematology, Jeju Island, Korea, 31 October - 1 November 2008.
- Chair of Platelet Immunology Session, International Society of Thrombosis and Haemostasis, Scientific and Standardization sub-committee (SSC) meeting, Vienna, Austria, 2-5 July 2008.

#### National:

- *Diagnosis of drug-induced thrombocytopenia.* Invited speaker (State of Art Lecture), XXI<sup>st</sup> International Symposium on Technical Innovations in Laboratory Hematology (ISLH 2008), Sydney, 28 April – 1 May 2008.
- *Differentiation and migration of Sca-1+/CD31-cardiac 'side population' stem cells in a murine myocardial ischemic model.* Invited speaker, 2nd Annual Stem Cell Symposium at UNSW, Sydney, 28 November 2008.

### A/Prof Miles Davenport

#### International:

- *Influence of Target cell availability on the dynamics of immune escape and reversion.* Session chair and speaker, 15<sup>th</sup> International HIV Dynamics and Evolution Conference, Santa Fe, USA, 27-30 April 2008.
- Research seminar speaker, Pennsylvania Center for AIDS Research, University of Pennsylvania, Philadelphia, USA, 25 August 2008.

National:

- *The dynamics of viral escape of the immune response in HIV*. Invited speaker, Modelling of Infectious Diseases NIDMA Workshop, National Centre for Immunisation Research and Surveillance, Sydney, 25-27 February 2008.
- *Dynamics of immune escape and reversion in SHIV: Implications for vaccination*. Session chair, 2nd Australian Vaccines and Immunotherapeutics Development meeting, Surfers Paradise, 14-16 May 2008.

#### **A/Prof Katharina Gaus**

International:

- Invited speaker, Keystone Symposium on Molecular Basis for Membrane Organization, Big Sky, Montana, USA, 12-17 January 2008.
- Research seminar speaker, Cell Biology Department, University of North Carolina, Chapel Hill, USA, 1 October 2008.

National:

- Invited speaker, Hunter Cell Biology Meeting, Hunter Valley, 1-4 March 2008.
- Invited speaker, 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1-5 June 2008.
- Research seminar speaker, Fluorescence Imaging Group, Melbourne, 13 August 2008.
- Invited speaker, Excellence in Microscopy Symposium, University of Sydney, Sydney, 3-5 December 2008.

#### **Dr Mark Hulett**

National:

- *Heparanase in health and disease*. Invited speaker, Department of Surgery, Austin Hospital, Melbourne, July 2008
- *Cell surface-expressed cation-independent mannose 6-phosphate receptor (CD222) binds enzymatically active heparanase independently of mannose 6-phosphate to promote extracellular matrix degradation*, Invited speaker, ComBio 2008, Canberra, 21-25 September 2008.
- *Organization and expression of the genome*. Session chair, 29<sup>th</sup> Lorne Genome Conference, Lorne, 17-21 February 2008.

#### **Prof Wendy Jessup**

International:

- Invited speaker and session chair, 5<sup>th</sup> Annual Congress of the French Atherosclerosis Society, Biarritz, France, 12-14 June 2008.

National:

- Session chair and speaker, 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1-5 June 2008.

### **Prof Levon Khachigian**

International:

- Invited speaker, 7<sup>th</sup> International Symposium on Frontiers in Life Sciences, Changsha, China, 16-19 April 2008.
- Invited speaker, 1st International Conference on Drug Design & Discovery, Dubai, United Arab Emirates, 1-4 February 2008.
- *Vascular biology: molecular regulation in vascular cells*. Chair, Experimental Biology'08, San Diego, USA, 5-9 April 2008.
- Invited speaker, Department of Ophthalmology, AUB Medical Center, American University of Beirut, Lebanon, 2008.
- Invited speaker, Center of Pediatric Nephrology and Transplantation, Cairo University, Egypt, 2008.

National:

- Invited speaker, Cardiac Society of Australia and New Zealand, Adelaide, 9 August 2008.
- Invited speaker, Baker-IDI Heart Research Institute, Melbourne, 2008.
- Invited speaker, Walter & Eliza Hall Institute Biotechnology Centre, Bundoora, 2008.
- Invited speaker, Institute of Molecular Biosciences, Brisbane, 2008.
- Invited speaker, Hanson Institute, Adelaide, 2008.
- Invited speaker, Therapeutics Centre, St Vincent's Hospital, Sydney, 2008.
- Invited speaker, NSi Commercialisation Workshop, UNSW, Sydney, 2008.
- Invited speaker, GSK Australia, Boronia, Victoria, 2008.
- Invited speaker, Co-Chair, Plenary sessions, 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1-5 June 2008.
- *Transcription mechanisms*. Chair, 29<sup>th</sup> Lorne Genome Conference, Lorne, 17-21 February 2008

### **Prof Len Kritharides**

International:

- *Regulation of macrophage protein secretion and atherosclerosis*. Invited speaker, World Congress on Heart Disease, Toronto, Canada 29 June 2008.
- HDL- mechanistic insights and clinical implications. World Hellenic Biomedical Association, Paphos, Cyprus, 29 September 2008.

National:

- Invited speaker, ASEANZ Weekend Specialist Meeting, 1 June 2008.
- *Mechanistic aspects of the protective effects of HDL cholesterol*. Invited speaker, Department of Immunology St George Hospital, Sydney 18 April 2008.

### **Prof Chris Parish**

International:

- *Cancer immunosurveillance and immunotherapy by Th2 immunity*. Invited plenary lecturer, 2nd International AllergoOncology Symposium, Vienna, Austria, 11-12 April, 2008.
- *Heparan sulfate mimetics as novel inhibitors in cancer*. Invited symposium speaker. 15th International Vascular Biology Meeting, Sydney, 1-5 June, 2008.
- *Heparanase as a mechanism and as a target*. Invited symposium speaker, .XXII International Congress of the Transplantation Society. Sydney, Australia 10-14 August, 2008.

National:

- *Medical research in the 21<sup>st</sup> century*. Invited keynote speaker, Order of Australia National Conference, Canberra, 15 February, 2008.
- *Novel approaches to targeting vaccine antigens to dendritic cells*. Invited symposium speaker, 2nd Australasian Vaccines and Immunotherapeutics Development Conference. Gold Coast, 14-16 May, 2008.
- *Role of heparanase and heparan sulfate in type 1 diabetes*. Invited symposium speaker, Inaugural Australian Islet Study Group meeting, Sydney, 9 October 2008.
- *Heparanase, heparan sulfate and platelets: Key regulators of tumour metastasis and angiogenesis*. Invited plenary lecturer, Scientific Research Meeting, Royal North Shore Hospital, Sydney, 19 November, 2008.

### **Prof Roland Stocker**

International:

- *Antioxidant aspects of CoQ<sub>10</sub>*. Invited plenary lecturer, International CoQ<sub>10</sub> Association Meeting, Prague, Czech Republic 12-13 September 2008.
- *When and how antioxidants protect against atherosclerosis and related diseases*. Selected lecturer, 14<sup>th</sup> Biennial Meeting of the Society for Free Radical Research International, Beijing, China, 18-22 October 2008.
- *Vascular effects of heme oxygenase-1*. Research seminar speaker, University of Washington, Seattle, USA 18 March 2008.

National:

- *Heme oxygenase and oxidative stress*. Invited speaker, 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1-5 June 2008.
- *When and how antioxidants protect against atherosclerosis*. Invited lecturer, Annual Scientific Meeting, Bosch Institute, Sydney, 13 June 2008.
- *Assessment of cellular oxidative stress using low molecular weight probes*. Australian Health and Medical Research Congress. Symposium, Brisbane, 16-21 November 2008.
- Invited speaker, 16<sup>th</sup> Annual Meeting of the Society for Free Radical Research (Australasia), Melbourne, 30 November - 3 December 2008.
- *Everything you always wanted to know about heme oxygenase-1, antioxidants and inflammation*. Invited speaker, Meeting of the European Union Framework 6 Program on Microparticles University of Sydney, Sydney, 8 February 2008.
- *Vascular effects of heme oxygenase-1*. Invited speaker, Kolling Institute, Royal North Shore Hospital, Sydney, 11 April 2008.
- *Lipoproteins/Proteomics: HDL - Diagnostic utility in CVD*. Invited speaker, GE HealthCare Symposium, University of Sydney, Sydney, 1 May 2008.
- *Vascular effects of heme oxygenase-1*. Invited speaker, Garvan Institute of Medical Research, Sydney, 13 May 2008.
- *When and how antioxidants protect against atherosclerosis*. Department of Pharmacology, Monash University, Melbourne, 4 August 2008.
- *Diabetes, inflammation and oxidative stress*. Department of Endocrinology, Royal Prince Alfred Hospital, Sydney, 15 October 2008.

#### **Dr Shane Thomas**

National:

- *Myeloperoxidase and endothelial dysfunction*. Invited speaker, 16<sup>th</sup> Meeting of The Australasian Society for Free Radical Research, Melbourne, 29 November – 3 December 2008.
- *Myeloperoxidase and endothelial dysfunction*. Invited speaker, 9<sup>th</sup> International Symposium on Resistance Arteries (ISRA), Hamilton Island, 17 – 21 February 2008.
- *Oxidative Stress and Related Disorders*. Invited session chair (workshop), 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1 – 5 June 2008.

# External Research Funds

## Program Grants

	Years	(\$ pa)
NHMRC Program Grant No. 455395 'Vascular Biology' Prof CN Chesterman (UNSW), Prof M Berndt (Monash), Prof BH Chong (UNSW), Prof PJ Hogg (UNSW), Prof LM Khachigian (UNSW), Prof C Parish (ANU), Prof R Stocker (USyd)	2007-11	3,023,581
Heart Research Institute NHMRC Program Grant No. 482800 'Atherosclerosis: Lipoproteins, cell biology and vascular physiology ' Prof W Jessup (UNSW)	2008-12	789,658
Cancer Institute NSW Translational Program Grant No.06/TPG/1/04 'Novel Gene-Targeted Therapies for Basal Gel Carcinoma ' Prof L Khachigian (UNSW)	2007-11	1,337,204
<b>Total 2008 Program Grant Funds: \$5,150,443</b>		

## Project Grants

	Years	(\$ pa)
NHMRC Project Grant No. 455301 'Molecular mechanisms in cholesterol export' Prof W Jessup (UNSW)	2007-09	171,950
NHMRC Grant No. 455333 'C-Jun DNAzymes as novel cardioprotective agents in ischaemia-reperfusion injury' Prof L Khachigian (UNSW), Dr H Lowe (UNSW)	2007-09	120,278
NHMRC Project Grant No. 455251 'Regulation of the secretion of apolipoprotein E by macrophages' Prof L Kritharides (UNSW)	2007-09	171,950
NHMRC Project Grant No. 454553 (Sub account) 'Cost and benefit of immune escape mutation in HIV' A/Prof M Davenport (UNSW)	2007-09	29,813
NHMRC Project Grant No. 461240 (Sub account) 'Evaluating the T cell calculus' A/Prof M Davenport (UNSW), Dr P Hodgkin, Dr F Battye, Prof R De Boer, Dr A Perelson	2008-09	73,750
NHMRC Project Grant No. 461262 (Sub account) 'Mechanisms regulating antigen presentation during primary and recall responses of T cells following pathogen infection' A/Prof M Davenport (UNSW)	2007-09	62,378
NHMRC Project Grant No. 510225 'Membrane order at T cell activation sites' A/Prof K Gaus (UNSW)	2008-10	169,695
ARC Discovery Grant No. DP0663378 'PKC-zeta- dependent Sp1 phosphorylation: Regulatory insights using novel phospho-specific Sp1 antibodies and peptide decoys' Prof L Khachigian (UNSW)	2006-08	95,438

	Years	(\$ pa)
ARC Discovery Grant No. DP0556554 'Lipid raft and cytoskeleton organization: How membrane domains give cells direction' A/Prof K Gaus (UNSW)	2005-09	49,531
ARC Discovery Project No. DP0771340 'Understanding the T cell repertoire in health and disease' A/Prof M Davenport (UNSW), A/Prof S Turner (UMelb)	2007-09	137,366
ARC Discovery Project No. DP0772356 (Sub account) 'Control of interfacial architecture on the molecular, nano- and micro-scale to stimulate and monitor cellular responses' Prof J Gooding (UNSW), Dr K Gaus (UNSW)	2008-09	50,000
NHF Grant No. G 06S 2564 'Molecular mechanisms for cholesterol export to HDL from foam cell macrophages' Prof W Jessup (UNSW), Prof L Khachigian (UNSW)	2007-08	61,500
NHF Grant No. G 06S 2586 'Novel catalytic oligonucleotides for the treatment of acute myocardial infarction' Dr H Lowe (UNSW), Prof L Khachigian (UNSW)	2007-08	61,500
NHF Grant No. G 07S 3036 'Transcription factor c-Jun as a therapeutic target for the inhibition of intimal thickening' Prof L Khachigian (UNSW)	2008-09	64,500
NHF Grant No. G 07S 3060 'Macrophage & dendritic cell migration in atherosclerosis progression & regression' Prof W Jessup (UNSW), Dr K Gaus (UNSW)	2008-09	61,492
NHF Grant No. G 07S 3055 'The effects of hyperlipidemia on membrane domains and signalling in endothelial cells' A/Prof K Gaus (UNSW)	2008-09	62,556
Cardio Vascular Lipid Research Grant(Pfizer Australia) 'The Cholesterol Transporter ABCG1 and Diabetic Arteriosclerosis' Dr V Hsieh (UNSW)	2008	50,000

	<b>Years</b>	<b>(\$ pa)</b>
Human Frontier Science Program Ref. No. RGY0079/2008-C 'Olfactory receptor neurons - linking membrane organization to neuronal functionality' A/Prof K Gaus (UNSW)	2008-11	117,000
Cure Cancer Australia 'Tryptophan metabolism and survival of human tumour cells' Dr S Thomas (UNSW)	2008	75,000
<b>Total 2008 Project Grant Funds: \$1,685,697</b>		

## Fellowships

	<b>Years</b>
NHMRC Fellowship No. 350865 Prof L Khachigian (UNSW)	2005-09
NHMRC Fellowship No. 510108 Prof W Jessup (UNSW)	2008-12
NHMRC CJ Martin Fellowship No. 300587 Dr M Kavurma (UNSW)	2004-08
NHMRC/NHF Career Development Award No. 350986 A/Prof K Gaus (UNSW)	2005-09
NHMRC RD Wright Career Development Award No. 401113 Dr S Thomas (UNSW)	2006-10
NHF Award No. O 06S 2719 Dr R Bhindi (UNSW)	2007-08
Viertel Senior Medical Research Fellowship A/Prof M Davenport (UNSW)	2005-09
Vice Chancellor's Postdoctoral Fellowships (UNSW) Dr Jian-Mei Li	2008-10
<b>Total 2008 Fellowship Funds: \$907,980</b>	

## Scholarships

	Years
Australian Postgraduate Award N Tan (UNSW)	2005-08
Australian Postgraduate Award D Carter (UNSW)	2005-08
Endeavour International Postgraduate Research Scholarship A Magenau (UNSW)	2005-08
NHMRC Scholarship No. 466017 S Cartland (UNSW)	2007-09
NHMRC Scholarship No. 455420 M Rodriguez (UNSW)	2007-09
NHMRC Training Scholarship No. 510441 D Williamson	2008-10
Australian Postgraduate Award T Schlub (UNSW)	2007-10
UIPA Scholarship D Chan (UNSW)	2007-10
UPA Scholarship L Guo (UNSW)	2006-08
<b>Total 2008 Scholarship Funds: \$171,135</b>	

## Equipment Grants

	Year	(\$ pa)
UNSW Major Research Equipment & Infrastructure scheme 'Triversa Nanomate system,mounting kit, computer and installation ' Prof W Jessup (UNSW)	2008	124,500

	Year	(\$ pa)
ARC Linkage Infrastructure Equipment and Facilities Grant No. LE0882855 'High Resolution Imaging of Live Cells and Tissue ' A/Prof K Gaus (UNSW), Prof L Khachigian (UNSW), A/Prof M Kavallaris, Prof MD Willcox, Prof IW Dawes, Prof SL Kjelleberg, Prof J Gooding, Prof R Amal, A/Prof LA Poole-Warren, Prof R Stocker (USyd), Prof NJ King , Prof MA Vadas, Prof CR Murphy, A/Prof FC Braet, A/Prof AD Conigrave, Prof AS Weiss, Prof TW Hambley, Dr P Thordarson, Dr AR Parker, Prof EM Goldys, Prof HK Nevalainen, Prof NH Packer, Dr JR Rabeau	2008	1,800,000

**Total 2008 Equipment Grants: \$1,924,500**

## Infrastructure Grants, Operating Funds & Institutional Support

	Year	(\$ pa)
Prince of Wales Hospital Haematology Research Operating Fund	2007	140,000
CVR Infrastructure allocation (UNSW)	2008	587,663
Fellow Enhancement (UNSW) Prof L Khachigian (UNSW)	2008	35,000
Fellow Enhancement (UNSW) Prof W Jessup (UNSW)	2008	35,000
Fellow Enhancement (UNSW) A/Prof K Gaus	2008	35,000
Fellow Enhancement (UNSW) Dr M Kavurma (UNSW)	2008	10,000
Early Career Research grant (UNSW) Dr M Kavurma (UNSW)	2008	10,053

	<b>Year</b>	<b>(\$ pa)</b>
Early Career Research-Faculty (UNSW) Dr M Kavurma (UNSW)	2008	19,947
Early Career Research-Faculty (UNSW) Dr C Rentero (UNSW)	2008	19,947
Early Career Research grant (UNSW) Dr C Rentero (UNSW)	2008	10,053
UNSW Faculty Research Grant Dr S Thomas (UNSW)	2008	30,000
UNSW Faculty Research Grant Dr V Venturi (UNSW)	2008	30,000
UNSW Goldstar Award A/Prof K Gaus (UNSW)	2008	40,000
<b>Total 2008 Infrastructure Grants, Operating Funds &amp; Institutional Support: \$1,002,663</b>		

## Industry Funding & Donations

	<b>Years</b>	<b>(\$ pa)</b>
Sanofi 'Aventis Protocol EFC5945 ' Prof B Chong (UNSW)	2006-09	10,500
Pfizer Australia Protocol A5571010 'A phase 2B, randomised, multi-center, dose-ranging study assessing safety & efficacy of PD 0348283 ' Prof B Chong (UNSW)	2006-08	24,402
Royalty income from NSI	2008	109,581
<b>Total 2008 Industry Funding &amp; Donations: \$144,483</b>		

## Grants administered at other institutions

	Years	(\$ pa)
NHMRC Grant No. 436879 'Ligand interactions of platelet glycoprotein Ib-IX-V in thrombosis' Dr RK Andrews (Monash)	2007-09	116,500
NHMRC Project Grant No. 418064 'Antigen receptor sharing by lymphocytes during an immune response' Prof C Parish (ANU), B Quah	2007-09	91,750
NHMRC 'Tryptophan metabolism and vascular tone' Prof NH Hunt (CIB), Prof R Stocker (USyd)	2006-08	150,000
JDRF-NHMRC Special Program Grant in Type I Diabetes C Parish (ANU), C Simeonovic, C Freeman, G Hoyne	2008-12	600,000
ARC Centre of Excellence Grant 'Integrative Legume Research' Prof C Parish (ANU), Dr P Bhalla, Prof C Beveridge, Dr B Carroll, Prof B Rolfe, Prof M Djordjevic, Prof P Gresshoff, Dr G Weiller, Dr U Mathesius, Dr R Rose, Prof M Singh	2007-10	100,000
Biomedical Research Council of Singapore (BMRC) 'Mechanism of vascular protection by haem oxygenase' B Halliwell (USingapore), R Stocker (USyd), F Watt (USingapore)	2007-09	SGD\$ 240,000
IPDF-INRC grant 'Proteomics and lipidomics of cardiovascular disease; role of heme oxygenase-1' Prof R Stocker (USyd)	2008	10,000
ROTRF-JDRG Research Grant C Simeonovic and C Parish (ANU)	2007-09	CHF 100,000

## Fellowships administered at other institutions

	Years
NHMRC No. 284234 Senior Research Fellowship Dr RK Andrews (Monash)	2004-08
The University of Sydney Professorial Fellowship Prof R Stocker (USyd)	2007-11
Medical Foundation Fellowship, The University of Sydney Prof R Stocker (USyd)	2007-09
NHMRC Senior Principal Research Fellowship No. 401106 Prof R Stocker (USyd)	2006-10
CJ Martin Fellowship Dr S Wimmer-Kleikamp	2007-09

## Scholarships administered at other institutions

	Years
NHMRC B Changsiri (USyd)	2008
NHMRC C Li (USyd)	2008
Australian Postgraduate Award A Qawasmeh (USyd)	2008
Australian Postgraduate Award X Wang (USyd)	2008

# Prizes and Awards

## **Cancer and Molecular Immunology & Cancer and Vascular Biology Groups**

- Ivan Poon 2008 Ruth Gani Memorial Travelling Fellowship for Human Genetics.
- Ivan Poon, 2008 ASMR ACT Young Investigator Forum Poster Prize.
- Ivan Poon, Finalist, New Investigator Symposium, 28th Annual Scientific Meeting of the Australian Society for Immunology.
- Carly Smith, Network of Genes and Environment in Development, Travel Award.

## **Redox Cell Signalling Laboratory**

- Muhammed Zamil Mattar, Denis Wakefield prize for the highest honours mark awarded in the Department of Pathology, UNSW.

## **Transcription and Gene Targeting Group**

- Jun Ni, Young Investigator Award, 15th International Vascular Biology Meeting.
- Nicole Tan, Young Investigator Award, 15th International Vascular Biology Meeting.
- Shafqat Inam, John G Hunter Memorial Fellowship, Australian Medical Association.
- Dr Mary Kavurma, Early Career Research Grant, UNSW.
- Jian-Mei Li, UNSW Vice-Chancellor's Research Fellowship.

# Activities Outside the Centre

## Editorial Board Membership

### Prof Beng Chong

- *Journal of Asia Pacific Hematology Oncology*, Editorial Board

### A/Prof Katharina Gaus

- *Biochemical Journal*, Editorial Advisor

### Prof Wendy Jessup

- *Atherosclerosis*, Editorial Board
- *Arteriosclerosis, Thrombosis and Vascular Biology*, Editorial Board
- *Biochimica et Biophysica Acta (Cell Biology of Lipids)*, Editorial Board
- *Essays in Biochemistry*, Editorial Board

### Prof Levon Khachigian

- *Open Cardiovascular Medicine Journal*, Editorial Board
- *Recent Patents on CNS Drug Discovery*, Editorial Board
- *Endothelium*, Associate Editor
- *American Journal of Pathology*, Editorial Board
- *Open Medicinal Chemistry Journal*, Editorial Board
- *Journal of Cardiothoracic-Renal Research*, Editorial Board
- *International Journal of Molecular Medicine*, Editorial Board

- *Recent Patent Reviews on Cardiovascular Drug Discovery*, Editorial Board
- *Recent Patents on Anti-Infective Drug Discovery*, Editorial Board
- *International Atherosclerosis Society Focus Group - Vascular Biology and Atherosclerosis*, Editorial Board
- *Current Drug Targets - Cardiovascular and Haematological Disorders*, Editorial Board

### Prof Len Kritharides

- *Atherosclerosis and Current Clinical Pharmacology*, Editorial Board

### Prof Chris Parish

- *Immunology and Cell Biology*, Editor-in-Chief

### Prof Roland Stocker

- *Redox Report*, Editorial Board
- *Free Radical Biology & Medicine*, Editorial Board

### Dr Shane Thomas

- *International Journal for Tryptophan Research*, Editorial Board
- *Clinical Science*, Member of the scientific advisory panel

## External Policy and Research Review Committees

### **Prof Beng Chong**

- NHMRC Project Grant Assessment Panel (Haematology & Tumour Immunology)
- St George Medical Research Foundation, Deputy chair, Grant review committee

### **A/Prof Miles Davenport**

- Member of the Immune Based Therapies Working Group at the National Centre for HIV Epidemiology and Clinical Research

### **Dr Mark Hulett**

- Chair NHMRC training Awards Panel

### **Prof Wendy Jessup**

- Heart Foundation, 2008 Fellowships Committee.
- NHMRC 2008 Discipline Panel 6C (Cardiovascular)

### **Prof Levon Khachigian**

- Chair, NHMRC Program Grants Review Panel (Biomedical, Panel B)
- Assessor, Diabetes Australia Research Trust
- Assessor, U.S.-Israel Binational Science Foundation, Israel
- Expert Working Group, Balnaves Foundation Young Researcher's Fund, Children's Cancer Institute Australia

- Chair, National Biomedical Scholarships Panel, National Heart Foundation of Australia
- Member, Scientific Grants Committee, Muscular Dystrophy Association of NSW
- Judging Panel, AMGEN Medical Research Award
- Chair, Judging Panel, NHMRC Association of Research Fellows (NARF) Postdoctoral Award
- Judging Panel, UNSW Eureka Award for Scientific Research, The Australian Museum

### **Prof Len Kritharides**

- Mater Medical Research Institute, Qld, Member of Scientific Advisory Board

### **Prof Chris Parish**

- Member, Medical Research Advisory Committee, Australian Cancer Research Foundation
- Scientific Consultant, Lipotek, Pty. Ltd.

### **Prof Roland Stocker**

- Member, Selection Committee, The Linus Pauling Institute Prize for Health Research
- Member, Review Committee, Annual Bibliography of Significant Advances in Dietary Supplement Research, NIH Office of Dietary Supplements
- Consultant, AstraZeneca, AtheroGenics Inc

## Organisation of Major Conferences

### **A/Prof Miles Davenport**

- Member, Expert Advisory Committee for the Australian Vaccine and Immunotherapeutic Development Conference, Brisbane 2008

### **Dr Mark Hulett**

- Organiser, Lorne Genome Conference, February 2008, Lorne

### **Prof Wendy Jessup**

- Treasurer, International Vascular Biology Meeting, Sydney, June 2008

### **Prof Levon Khachigian**

- Scientific Program and Organising Committee, 17<sup>th</sup> Scientific Meeting Australian Vascular Biology Society, Canberra
- Program Committee, ACRF Drug Discovery Symposium, Children's Cancer Institute Australia for Medical Research

- Congress Chair and Scientific Program Co-Chair, 15<sup>th</sup> International Vascular Biology Meeting, Sydney (Darling Harbour), June 1-5, 2008
- Scientific Program Chair & Member of the International Advisory Board, Cardiovascular Drug Design and Discovery Section, 1<sup>st</sup> International Conference on Drug Design and Discovery, February 3-6, 2008, Dubai, United Arab Emirates

### **Prof Chris Parish**

- Chair, Scientific Program Committee, 38<sup>th</sup> Annual Scientific Meeting, Australasian Society for Immunology, Canberra, 7-11 December, 2008
- Convenor, Tumour Immunology Workshop, 38<sup>th</sup> Annual Scientific Meeting, Australasian Society for Immunology, Canberra, 7 December, 2008

### **Dr Shane Thomas**

- Member of the Local Organizing Committee for the 15<sup>th</sup> International Vascular Biology Meeting, Sydney, 1<sup>st</sup> – 5<sup>th</sup> June, 2008

## Office Bearer & Professional Association

### **Prof Beng Chong**

- Member of Scientific and Standardization committee of International Society of Thrombosis and Haemostasis.
- Co-chair of Platelet Immunology Subcommittee of International Society of Thrombosis and Haemostasis.

### **A/Prof Miles Davenport**

- Vice-President, Australasian Society for Immunology.

### **A/Prof Katharina Gaus**

- Treasurer, Australian New Zealand Society for Cell and Developmental Biology
- Treasurer, Australian Vascular Biology Society (until June 08)

### **Dr Mark Hulett**

- President, Australian Society for Medical Research

### **Prof Wendy Jessup**

- Member of the Board of Governors, Heart Research Institute.

### **Prof Levon Khachigian**

- Chair, Meeting of the Heads of International Vascular Biology Organisations (HIVBO), 15<sup>th</sup> International Vascular Biology Meeting, Sydney

### **Prof Len Kritharides**

- Cardiac Society of Australia and New Zealand- Member of Board of Directors
- Heart Research Institute Sydney- Member of Board of Governors

### **Prof Chris Parish**

- Member, Council of the International Union of Immunological Societies

### **Prof Roland Stocker**

- Deputy-Chairman, International Coenzyme Q<sub>10</sub> Association
- Chairman, Finance Committee, International Coenzyme Q<sub>10</sub> Association
- Member, Executive Committee, International Coenzyme Q<sub>10</sub> Association
- Chairman, Scientific Advisory Committee, International Coenzyme Q<sub>10</sub> Association

## Seminar Program 2008

**John Pimanda** – “Gene regulatory networks in early blood development”

**Qiong Li** – “Lipid analysis of wild type and caveolin knockout mouse embryonic fibroblasts”

**Catalina Palma** – “Conversion of cord blood stem cells into insulin producing cells”

**Matthew Lay** – “How correlation analysis of human TCR frequencies from CD4+ and CD8+ Tc allows us to unravel the mystery of TCR repertoire shaping”

**Ning Zhang** – “Transcriptional regulation of PDGF receptor alpha by IL1beta and FGF2”

**Lisa Matthias** – “The CD4 allosteric disulphide regulates HIV-1 entry”

**Macarena Rodriguez** – “Endothelial cell plasma membrane domains are differentially modulated by sterol enrichment”

**Catherine Tabrett** – “Do disulphide bonds play a role in prion diseases?”

**Kristine Malabanan** – “ATF-4 induced by FGF-2 regulates VEGF-A transcription in vascular SMCs and mediates intimal thickening in rat arteries following balloon injury”

**Megan Hitchins** – “Colorectal cancer and epigenetic inheritance”

**Anthony Don** – “Sphingosine 1-phosphate regulates vascular homeostasis and cellular stress”

**Donna Dinnes** – “Macrophage-biomaterial interactions – the foreign body response”

**Pierre Dilda** – “From GSAO to PENAO”

**Wolfgang Weninger** – “Visualising immune responses in tumours and infections”

**Shane Thomas** – “Redox control of endothelial function”

**Sabine Wimmer-Kleikamp** – “Imaging mechanisms of receptor activation in cellular signaling systems”

**Prof Avrum Gotlieb** – “Activated valve interstitial cells repair diseased heart valves”

**Jirka Neuzil** – “Mitochondrial Complex II is a new target for anti-cancer drugs”

**Roger Daly** – “A novel role and regulatory mechanism for the oncogenic signal transducer Gab2”

**Jason Wong** – “Profiling the platelet nucleotide binding proteome”

**Denuja Karunakaran** – “Programmed autologous cleavage of platelet receptors”

**Sian Cartland** – “Cholesterol and cell migration”

**Maaik Kockx** – “Cyclosporin A decreases apolipoprotein E secretion from human macrophages via a Protein Phosphatase 2B-dependent and ABCA1-independent pathway”

**Dimitri Sviridov** – “HDL therapie: mostly harmless”

**Simon Liang** – “Differentiation and migration of Sca1+/CD31- Cardiac Side Population Cells in a mouse myocardial ischaemic model”

**Janka Petravic** – “Estimating the impact of vaccination in acute SHIV/SIV infection”

**Helena Liang** – “Mechanism of de-encrypting Tissue Factor by denitrosylation”

**Nicole Tan** – “Angiotensin II-Inducible PDGF-D transcription requires phosphorylation of serine and threonine residues in the second zinc finger of Sp1”

**Victar Hsieh** – “Function and regulation of ATP-Binding Cassette G1 and its role in lipid metabolism”

**Astrid Magenau** – “Lipids in phagocytosis”

**Tim Ganderton** – “Investigating the self-association of von Willebrand factor through internal domains”

**Jianmei Li** – “Ischemic brain damage is prevented by temporary pretreatment of angiotensin II type 1 receptor blocker, valsartan, via increase in capillary density”

**Mary Kavurma** – “The role of TRAIL in atherosclerosis”

**Simon Cliffe** – “Mutations in a nucleoside transporter gene ‘PHID’ are associated with Type-1 Diabetes Mellitus and hyperpigmented hypertrichosis”

**Feng Yan** – “Regulation of erythroid and megakaryocytic differentiation in a GATA-1 deficient cell line”

**Teresa Brophy** – “Functional analysis of the Tissue Factor allosteric disulphide bond”

**Matthew Traini** – “Screening for modifiers of amyloid-beta aggregation”

**Jun Ni** – “DNAzyme targeting transcription factor c-Jun reduces intimal hyperplasia in human saphenous vein explants and inhibits vein graft stenosis in rabbit”

**Till Boecking** – “How do endocytic vesicles shed their clathrin coat: Fluorescence imaging at the single molecule level”

**Vanessa Venturi** – “A molecular basis for the sharing of T cell receptors in human CD8+ T cell responses to cytomegalovirus and Epstein-Barr virus”

**Amanda Yeung** – “Role of indoleamine 2,3-dioxygenase in a murine viral STD model”

**Tim Schlubb** – “Division-linked differentiation determines CD8+ T cell phenotype *in vivo*”

**Youra Lee** – “Characterization of Apolipoprotein E glycosylation in human macrophages using proteomics”

**Bo Wang** – “Egr-1 in inflammation”

**Jeffrey Chan** – “Regulation of TRAIL and YrdC in vascular injury”

**Danielle Park** – “Defining the mechanism of action of GSAO-OG: a novel imager of apoptotic cells”

**Christina Schroeder** – “Multimerisation of proteins via Von Willebrand factor type C domain”

**Jose Perdomo** – “SUMO modification is required for the activity of FOG-2 in cardiomyocytes”

**Mi-Jung Kim** – “Understanding the mechanism of ATP-binding cassette transporter A1 (ABCA1)-mediated cholesterol efflux in the presence of apolipoprotein A1”

**Daniel Chan** – “SUMO modification is required for the activity of FOG-2 in cardiomyocytes”

**Ingrid Gelissen** – “Differential expression and stability of two isoforms of ABCG1 in human cells and tissues”

**Hong Cai** – “Dz13 Targeting C-Jun Inhibited Squamous Cell Carcinoma growth and Metastasis”

**Mohammed Freeman** – “Studies into the Mechanisms of Post-Translational Control of Indoleamine 2, 3-Dioxygenase”

**Ying Morgan** – “Translational Research and Development of Therapeutic DNAzyme for Inhibition of Skin Cancer Growth”

# CVR Management and Advisory Committees

## Management Committee

Prof C Geczy  
Prof C Chesterman  
Prof F Shanon  
Prof T Campbell  
A/Prof R Wilson  
Prof I Daves

The CVR Management Committee met on 25 May 2008 and 18 December 2008.

## Scientific Advisory Committee

Prof R Graham  
Prof M Vadas  
Prof L Beilin