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### Annual Review 2013
The John Curtin School of Medical Research

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Canberra celebrated its Centenary during 2013, and throughout the year The John Curtin School of Medical Research participated in those celebrations with our community. We hosted conferences, invited the public to our School for lectures and open days, heard presentations by Nobel Laureates, congratulated the John Curtin Medical Research Foundation on its first year of operation, and continued to undertake groundbreaking medical research. As an ongoing legacy of the Centenary, the ACT Government partnered with The Australian National University to establish a Centenary Chair in Cancer Research at JCSMR, to strengthen and develop our cancer research program. We expect to appoint the successful candidate in 2014.

In 2013, JCSMR Director Professor Julio Licinio left the School to join the South Australian Health and Medical Research Institute (SAHMRI) as Deputy Director for Translational Medicine, and Head of the Mind and Brain Theme. Staff and students thanked him for his efforts at JCSMR at a farewell in April, and he has our continued thanks for his efforts in establishing both Translational Medicine at ANU, and The John Curtin Medical Research Foundation (JCMRF). This Foundation, established in 2012, celebrated its First Anniversary in March with a Gala Dinner at Old Parliament House. Nobel Laureate Professor Peter Doherty, and ACT Chief Minister Ms Katy Gallagher spoke to guests at the dinner about the importance of medical research in day-to-day life, and ways in which the community could provide their support. For more information about the work of JCMRF please see: jcmrf.anu.edu.au

JCSMR worked closely with the ACT Government Centenary Committee to celebrate World Day of Immunology in April, by bringing our two living Nobel Laureates back to Canberra. Both Professor Peter Doherty and Professor Rolf Zinkernagel participated in the 14th Frank and Bobbie Fenner Conference, and each subsequently presented a public lecture in the series: Big Ideas, Big Talk. ANU students and researchers, as well as members of our local community, were delighted to have the opportunity to hear these two eminent scientists speak, and to meet with them individually over refreshments. Their presence certainly added to our celebration of 100 years of Science in Canberra.

Following the opening of Stage 3 of our new building in 2012, JCSMR staff and students have enjoyed the opportunities provided by the new spaces, including the laboratories, and meeting rooms such as the Science Forum. In order to ensure that we do not lose sight of our history and past achievements, we have decided to name some of our rooms in honour of Emeritus staff members. We began this tradition in 2009, naming the Videoconferencing Room in memory of Professor Gordon Ada, a leading immunologist, and a laboratory in honour of Professor Frank Gibson, a pre-eminent biochemist. The first room to be officially named in Stage 3 is the David Curtis Reading Room, named in honour of Professor David Curtis. Professor Curtis was Director of JCSMR from 1989 until his retirement in 1992. Professor Curtis has generously donated his books and manuscripts to be housed in the Reading Room, and the inclusion of current journal issues and comfortable Fred Ward armchairs provides staff and students with a very pleasant quiet and sunny environment in which to catch up on their reading.

Toward the end of 2013, a full Review of Medical and Health Sciences was undertaken at ANU. JCSMR will seek to implement a number of the recommendations of the review over the coming year, including restructuring of our Departments, and increasing support to our early and mid-career researchers. I look forward to bringing you updates on our progress.

I would like to mention a few very important Honours and Awards achieved by JCSMR staff and students in 2013. Congratulations to Professor Chris Goodnow, Head of the Immunology Department, who was elected a Member of the US National Academy of Sciences in 2013, in recognition of distinguished and continuing achievements in original research. The Future Justice Prize, which recognises individuals and organisations that are making a significant contribution to the advancement of the present generation whilst securing and strengthening the life chances of future generations, was awarded to Professor Jill Gready. Dr Anselm Enders, Leader of the Ramaciotti Immunization Laboratory received the inaugural Gordon Ada Young Investigator Award, and presented the 2013 Gordon Ada Oration. The Finkel Prize, which recognizes research which leads to better health outcomes in developing countries, was awarded to Dr Dan Wijesundara. Congratulations to all these scientists on the important work they have undertaken to receive these awards.

I hope that you enjoy reading this Review, which provides a snapshot of the year 2013. For further details of our current research projects, and the activities of our staff and students please visit: jcsmr.anu.edu.au

Professor Christopher Parish
Director, The John Curtin School of Medical Research
August 2014
COMMITTEES

**Executive Committee**
- Professor Philip Board
- Dr Anna Cowan
- Professor Angela Dulhunty
- Professor Chris Goodnow
- Professor Julio Licinio (Co-Chair) (until April)
- Mr Gerard Lillicrap
- Dr Claudio Mastronardi (from July)
- Dr Madeleine Nicol (from October)
- Professor Chris Parish (Co-Chair)
- Professor Greg Stuart
- Professor David Tremethick
- Professor Carola Vinuesa

**External Relations Committee**
- Professor Philip Board (Chair)
- Dr Anna Cowan
- Dr Anselm Enders
- Ms Anneloes De Graeff (until September)
- Professor Julio Licinio (until April)
- Dr Gerard Lillicrap
- Dr Riccardo Natoli (from February)
- Dr Madeleine Nicol
- Professor Chris Parish
- Professor Thomas Preiss

**Group Leaders Forum**
- Professor Carola Vinuesa (Chair)
  All Group Leaders and Laboratory Leaders belong to the Group Leaders Forum, which meets monthly to discuss matters of importance relating to JCSMR

**Education Committee**
- Associate Professor John Bekkers
- Dr Annette Blackburn
- Dr Anna Cowan (Chair)
- Professor Simon Easteal
- Miss Preethi Eldi
- Professor Chris Parish
- Mr Roy Ramiscal
- Professor Ma-Li Wong (until April)

**Operations Committee**
- Dr Jennifer Clancy
- Mr Denis Coombes
- Professor Angela Dulhunty (Chair)
- Dr Suzanne Fowler
- Ms Cathy Gillespie
- Ms Sonya Glasson (until June)
- Dr Mark Hayes (from July)
- Professor Caryl Hill
- Mr Gerard Lillicrap
- Ms Stephanie Palmer
- Dr Charani Ranasinghe
- Ms Michelle Townsend
- Mr Dennis Vukoja
- Mrs Esmee Weil

**Safety Committee**
- Professor Philip Board (Chair) (until August)
- Ms Megan Clydesdale
- Mr Mick Devoy
- Dr Renae Domaschenz
- Dr Julia Ellyard
- Dr Sonya Glasson (until June)
- Dr Mark Hayes (from July)
- Mrs Angela Higgins
- Mr Gerard Lillicrap
- Dr Peter Milburn
- Ms Suzy Pace
- Ms Jackie Stenhouse
- Dr Krisztina Valter (Chair) (from September)

**Animal Users Committee**
- Associate Professor Ruth Arkell (RSB)
- Dr Anneke Blackburn
- Mr Anthony Barker (ex officio) (from October)
- Professor Philip Board
- Ms Katrina Bowditch (ex officio)
- Ms Megan Clydesdale (ex officio) (until September)
- Dr Lucy Coupland
- Professor Angela Dulhunty
- Dr Suzanne Fowler (ex officio)
- Associate Professor Guna Karupiah
- Associate Professor Brett Lidbury
- Professor Klaus Matthaei
- Dr Riccardo Natoli
- Dr Ian Parish
- Dr Charani Ranasinghe
- Dr Charmaine Simeonovic
- Associate Professor Christian Stricker (Chair)
- Dr Narci Teoh (Canberra Hospital)

**New Revenue Streams Committee (until April)**
- Dr Vicki Athanasopoulos
- Dr Ed Bertram
- Professor Philip Board
- Ms Anneloes De Graeff
- Professor Angela Dulhunty
- Professor Simon Easteal
- Dr Julia Ellyard
- Professor Julio Licinio
- Mr Gerard Lillicrap
- Professor Ted Maddess
- Dr Madeleine Nicol
- Professor Chris Parish
- Mr Geoff Spillem
- Professor Greg Stuart
- Dr Steve Winslade (Chair)

**Workshop Committee**
- Professor Angela Dulhunty (Chair)
- Professor Caryl Hill
- Mr Denis Coombes
- Ms Michelle Townsend
- Mr Gerard Lillicrap

**Gender Equity Committee (from September)**
- Associate Professor Ehsan Arabzadeh
- Associate Professor Ian Cockburn
- Dr Lucy Coupland
- Dr Julia Ellyard (Chair)
- Dr Rebecca Hadlock
- Associate Professor Brett Lidbury
- Dr Lisa Miosge
- Dr Madeleine Nicol
- Dr Ian Parish
- Dr Rebecca Sweet
- Professor Carola Vinuesa
Community

Centenary of Canberra 2013
14th Frank and Bobbie Fenner Conference
The John Curtin Medical Research Foundation 1st Anniversary Dinner
The David Curtis Reading Room
Our Community
Open Day
In conjunction with celebrations of the Centenary of Canberra in 2013, and timed to coincide with World Day of Immunology, The John Curtin School of Medical Research hosted the 14th Frank and Bobbie Fenner Conference on Immunological Research in April. Support from the Centenary committee allowed us to bring two of our world-renowned scientists, Nobel Laureates Professor Peter Doherty and Professor Rolf Zinkernagel back to Canberra for the event. Both presented a keynote seminar at the conference, and also gave a public lecture to which the whole Canberra community was invited, in the series: Big Ideas, Big Talk. Both the conference and the public events were exceptionally well attended, and JCSMR received congratulatory messages to say how wonderful it was that in Canberra, we have the opportunity to hear such eminent speakers.
The John Curtin Medical Research Foundation was established in 2012 to raise the public profile of medical research at The Australian National University.

Through the tireless efforts of the Board Members, much needed funds are being raised to support young researchers through the early stages of their academic career, and to purchase important items of equipment required to ensure we continue our cutting edge research projects.

The Foundation Board held a Gala Dinner at Old Parliament House in March 2013 to celebrate their 1st Anniversary.

For more information about the Foundation visit: jcmrf.anu.edu.au
On Friday 12 July 2013, family, friends and colleagues gathered at a small ceremony to dedicate the David Curtis Reading Room on level 3 of the JCSMR Building.

The room is named in honour of Emeritus Professor David R Curtis AC MBBS PhD FAA, Head of the JCSMR Department of Pharmacology (1973 – 1989) and Director of the School (1989-1992).

Our thanks to Professor Curtis for his very kind gift to the School of his many books and manuscripts, which are now housed in this room for the benefit of all our staff and students.

1. Professor Chris Parish with the Curtis Family
2. Professor Chris Parish and Emeritus Professor David Curtis at the dedication of the Reading Room
3. The commemorative plaque
4. Mrs Joanna Webber, Professor Curtis and Dr Cameron Webber
5. Emeritus Professor William Levick and Emeritus Professor David Curtis in the newly dedicated Reading Room
6. Ms Belinda Curtis and Professor David Curtis
We invite our local community in to see through The John Curtin School of Medical Research on our Annual Open Days. We warmly invite you to attend our next Open Day, speak with a scientist, take a Discovery Tour of our building, and hear about the important research we undertake in fields including cancer, diabetes, vision, and autoimmune disease.

For information about our next Open Day, please visit jcsmr.anu.edu.au

1. Tiffany Cripps describing the work of the Biomolecular Resource Facility to Open Day visitors
2. Dr Jason Potas and a young visitor to JCSMR Open Day
3. Hands on science experiments on Open Day
4. Dr Angelo Theodoratos explaining his research
5. Tatiana Vassileva speaking about research on crop improvements to feed the world as the population increases
6. Open Days offer the opportunity for a closer look at JCSMR research!
COMMUNITY ACTIVITIES
1. The Sarah Grace Sarcoma Foundation presenting a cheque to Professor Chris Parish and Dr Lucy Coupland to support a PhD Scholarship in Sarcoma research at JCSMR
2. His Excellency Mr Raul Gangotena, Mr Gerry Lillicrap, Professor Chris Parish and Mr Jeremy Hansen at a Christmas morning tea to celebrate a successful year at JCSMR
3. Mr John Miles and Professor Chris Goodnow with Dr John Altn who was awarded the Dewar-Milne Prize in Immunology
4. Mrs Nancy Ganter, Ms Janet Henry and Mrs Helen Benneworth at The JCSMR Director's Morning Tea in December
5. Ms Diana Lipscombe, Dr Rose Mason, Ms Belinda Curtis and Ms Marilyn Fenner at JCSMR to celebrate the 50th Anniversary of the award of the Nobel Prize to Sir John Eccles in 1963
6. Professor John Bekkers' laboratory hosted National Youth Science Forum visitors in January
7. National Youth Science Forum students visit the School
8. Professor Peter Doherty, Mr Neil Ada and Ms Louise Spencer congratulate Dr Anselm Enders, recipient of the inaugural Gordon Ada Early Career Researcher Award
Research in Review 2013

Eccles Institute of Neuroscience
Department of Genome Biology
Department of Immunology
Department of Molecular Bioscience
Department of Pathogens and Immunity
Department of Translational Medicine
The Australian Phenomics Facility
The Imaging and Cytometry Facility
Australian Cancer Research Foundation Biomolecular Resource Facility
Eccles Institute of Neuroscience

Head of Department
Professor Greg Stuart

Group
Blood Vessel Group
Neuroimmunology & Cardiovascular Dysfunction Laboratory
Cerebral Cortex Group
Diagnostics for Eye Diseases Group
Neural Coding Group
Neuronal Network Group
Neurophotonics Laboratory
Neuronal Signalling Group
Brain Development Laboratory
Neuronal Integration Laboratory
Retinal Cell Damage and Repair Group
Retinal Development and Aging Group
Neural Control Systems Laboratory
Synapse and Hearing Group
Visual Neuroscience Group

Leader
Professor Caryl Hill
Dr Rebecca Haddock
Associate Professor John Bekkers
Professor Ted Maddess
Associate Professor Ehsan Arabzadeh
Associate Professor Christian Stricker
Dr Vincent Daria
Professor Greg Stuart
Dr Zan-Min Song
Professor Greg Stuart
Dr Krisztina Valter-Kocsi
Professor Jan Provis
Dr Jason Potas
Professor Bruce Walmsley
Professor Trevor Lamb
Hypertension is a major risk factor for cardiovascular disease, which itself is the leading cause of premature death worldwide. However, some 30% of hypertensive patients exhibit a therapy resistant form which does not respond to current clinical treatments.

The regulation of blood pressure depends on the ability of the heart to pump blood and on the function of the smallest blood vessels within tissues and organs around our body. These small vessels provide the greatest resistance to blood flow and efficient tissue oxygenation. We propose that many adverse cardiovascular events result from alterations to the function of these microvessels and that studying these changes will identify novel therapeutic targets for the treatment of therapy resistant hypertension.

Blood vessels constrict due to the activity of muscle cells in their walls and relax due to factors released by the layer of cells which line them; the endothelium. Our studies have shown that small arteries are subject to multiple diverse stimuli that can cause relaxation or constriction. Importantly, blood vessels need to integrate these opposing stimuli to produce a coordinated response and maintain adequate tissue perfusion. This coordination results from the coupling of cell activity within the vascular wall by channels called gap junctions.

We have tested the importance of the endothelium and gap junctions by developing genetically modified mice with endothelial-selective defects in their gap junctions. We have found that these mice develop arterial stiffening and mild hypertension, characteristics which occur during ageing and cardiovascular disease. Our results demonstrate that the proteins which are important for coordination of the endothelium are crucial to the maintenance of peripheral vascular function.

In the muscle cells, we have found that the oxidative stress which accompanies cardiovascular disease is responsible for changes in the mechanisms by which small resistance vessels constrict. In our animal models of cardiovascular disease, we find that calcium influx, which is essential for vascular constriction, now involves an additional ion channel in the cell membrane, which was not previously considered to play this role and we have identified the enzyme which causes these changes. Our current studies are aimed at testing whether hypertension can be ameliorated by pharmacological antagonism of these targets.

Our studies are providing and testing new targets which impact on the peripheral vasculature and its role in the regulation of blood pressure.
Cardiovascular disease is the leading cause of death in Australia and high blood pressure, or hypertension, is the single biggest risk factor for developing this disease. The causes of hypertension are both biomedical and lifestyle oriented; with the probability of developing hypertension being significantly increased in individuals who are overweight or obese. Today over 60% of the Australian adult population is considered overweight.

Clinically, successful treatment of obesity-related hypertension is often problematical, with many overweight patients being resistant to first-line anti-hypertensive treatments. This is further complicated by the fact that some treatments are associated with unwanted side effects on the metabolic abnormalities that occur in the overweight and the obese.

The incidence of hypertension and obesity is linked to increased activity of the sympathetic nervous system. Therefore obesity-related hypertension is considered neurogenic. Work in our laboratory has revealed that increases in blood pressure in obesity occur as a consequence of an increase in the growth of sympathetic nerves that cover the surface of blood vessels important for controlling blood pressure. This increased innervation leads to increased nerve-mediated vasoconstriction, increased peripheral resistance and increased blood pressure. The focus of our group is therefore to understand the pathways that control these processes with a view to improving pharmaceutical treatment of hypertension in the overweight and obese.

Interaction between the immune and sympathetic nervous systems

Increasing evidence suggests that cells of the immune and sympathetic nervous systems ‘talk’ with each other in order to maintain proper blood pressure regulation. Given that obesity is recognized as a low-grade, chronic inflammatory disease, this interaction is likely disturbed under hypertensive conditions that occur in the overweight and obese. We have shown that increased infiltration of nerve growth factor (NGF)-producing immune cells into the vascular wall is not only crucial, but also a prerequisite, to pathological sympathetic nerve growth and the development of hypertension in the obese.

Oxidative stress and the sympathetic nervous system

Elevation in the production of reactive oxygen species (ROS) in the vascular wall is a key feature of cardiovascular diseases, including hypertension and obesity. Excessive ROS production in obesity is known to lead to increased oxidative stress and inflammation; as well as to dysregulation of the sympathetic nervous system and control of blood pressure. We have been investigating the link between oxidative stress and changes in the vascular sympathetic nerve network that occur in obesity-related hypertension. This research increases our understanding of the interaction between the immune and sympathetic nervous systems in this disease and provides new therapeutic targets for reducing the more harmful effects of obesity on the cardiovascular system.
Eccles Institute of Neuroscience

Cerebral Cortex Group

Associate Professor John Bekkers

Brain diseases come in many forms, but roughly speaking there are two broad types. The first type are diseases that cause the death or degeneration of nerve cells (neurons) in the brain. These are called neurodegenerative disorders and include Alzheimer's Disease and Parkinson's Disease, which mainly affect older people. The second type are diseases that occur when neurons are healthy but are wired up incorrectly to other neurons. These are called circuit disorders and include schizophrenia, autism and epilepsy, which occur in young as well as older people. Unfortunately, our understanding of circuit disorders lags well behind that of neurodegenerative disorders, in part because our understanding of brain circuits is so primitive. In my laboratory we are trying to fill this gap in our knowledge of circuits by studying one of the simplest brain regions, the primary olfactory cortex.

The olfactory cortex is located at the base of the front of the brain, just behind the nose. Its job is to enable us to recognise and remember odours by building up an ‘odour image’ when we sniff the bouquet of chemicals that comprise an aroma.

By understanding how this particular brain circuit makes sense of the world of odours, we hope to uncover general principles about the operation of brain circuits that will help us to understand what goes wrong in circuit disorders.

Our strategy has been to take a bottom-up approach, first by working out the circuit diagram for the olfactory cortex of mice by studying small pieces of mouse brain in a dish, and second by measuring what this circuit actually does in the whole animal. During the past year we have made excellent progress towards achieving our aims. For example, a PhD student in the group has found that one type of neuron in the olfactory cortex responds to fewer odours than other types of neurons, supporting a hypothesis we developed from our earlier experiments in the dish. By analysing the pattern of responses we can work out how different types of neurons process odour information.

In another experiment we have been using a laser microscope to image individual neurons in the olfactory cortex, both under normal conditions and when the cortex is experiencing an epileptic seizure. The figure shows an example from this experiment. The green ovals are dye-filled neurons, which change their brightness when they are active during a seizure (coloured traces on right). This method allows us to study how seizures spread through this particular brain circuit.

Although the brain is an exceptionally complex organ, we are optimistic that our work will reveal much about brain circuits and why they go wrong in diseases.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/cerebral-cortex
Eccles Institute of Neuroscience

Diagnostics for Eye Diseases Group

Professor Ted Maddess

Our lab attempts to understand vision and also to find ways to quantify functional impairment of our visual system. That work is aided by our new set of labs that opened last year at JCSMR. The new labs are collectively known as the JCSMR Clinical Suites. Much of our research is about trying to develop better ways to quantify the patchy blindness that occurs in a number of eye diseases and neurological problems. The distribution and extent of such patchy blindness is conventionally mapped by devices called perimeters. Our past research led to the development of the FDT/Matrix perimeters sold by Carl Zeiss, which have been on the market for several years, thus earning the ANU some income. Perimeters conventionally involve presenting light stimuli at a set of standard test locations in front of subject, i.e. at locations across their field of view. Each time a stimulus is presented the subject presses a button to report that they saw it. That process is slow and prone to errors. Much of our current work involves developing a new automated perimeter, which displays multiple stimuli to both eyes at the same time, and also objectively measures the responses of the two eyes at the same time. No button presses are needed because the responses of the eyes are determined by automatically tracking the diameter of the test subject’s pupils. That also makes the new test non-contact. Overall the new test is thus potentially faster and more accurate. After 8 years work we now have a well-developed prototype instrument. We are currently seeking investment partners to bring the instrument to market. In 2013 we completed projects that used the prototype to investigate: diabetic retinopathy, glaucoma, epilepsy, macular degeneration, migraine, and multiple sclerosis. The basic findings were that our standard tests did not cause seizures or migraine (but could detect if a person had had a recent migraine), and was very good at accurately diagnosing early-stage retina disease. In other studies we have investigated limitations of some standard ophthalmic test instruments. We also completed studies on the basis of normal visual function.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/diagnostics-eye-diseases
Eccles Institute of Neuroscience

Neural Coding Group

Associate Professor Ehsan Arabzadeh

An important challenge to Neuroscience is to understand how the brain generates a reliable representation of the world around us. Our group focuses on an “expert” system, the rodent whiskers, which are used to sense the world around the rat. We investigate how the elegant cortical circuitry underpins efficient processing of the sensory signals that can guide the animal’s decisions. Over the last decade, new electrophysiological and imaging methods have emerged for observation of neuronal activity. These methods allow us to relate a detailed and quantitative characterisation of sensation and behaviour to the underlying cellular and molecular mechanisms at work in the brain. The lab has a broad interest in systems neuroscience spanning areas such as sensory coding and adaptation. We characterise the activity of brain cells from cortex and deep brain structures in anaesthetised as well as awake behaving rodents, and apply methods such as information theory to quantify the way by which neurons represent sensory stimuli or control the animal’s behaviour.

The rodent whisker system

The rodent whisker-barrel pathway is our model system of choice. It is also the rat’s sensory system of choice for exploring the environment and collecting information about the location, shape, size and texture of objects around it.

The system is well suited to examining neural coding issues because of its functional efficiency and its elegant structural organisation. The whisker area of somatosensory cortex (known as barrel cortex) is arranged as a topographic map of the whiskers. This means that sensory signals arising in one whisker are channelled through a restricted population of cells and can be characterised by recording electrodes or through optical imaging.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neural-coding
Eccles Institute
of Neuroscience

Neural Network Group

Associate Professor
Christian Stricker

Release of neurotransmitter in the form of vesicles is the means by which nerve cells communicate with each other. There are two modes by which transmitter is released: spontaneous and action potential mediated release. The former is due to random release of vesicles of transmitter, the latter due to calcium-mediated release of synchronised vesicles. In recent years, we have found evidence that release of calcium from calcium stores in nerve endings increases the release of transmitter. In particular, signalling via receptors on the nerve endings that produce the molecule IP3 causes increased spontaneous release. Using calcium imaging directly from individual nerve terminals, we now have direct evidence that spontaneous release of calcium occurs in these nerve terminals.

Noradrenaline and serotonin are two neuromodulators in the brain, which are released diffusely by cells located in specific nuclei. Both have the ability to signal via G protein-coupled receptors, which can lead to IP3 production. Drugs that mimic their action are known for their abuse potential (amphetamines, LSD). In addition, many antipsychotic drugs have a strong anti-adrenergic/serotonergic effect. Yet the way by which both affect communication between neurons is poorly understood. The aim of our research is to unravel the molecular mechanisms involved in modulation of neuronal networks.

Surprisingly, we have found that both noradrenaline and serotonin increase spontaneous transmitter release via their action to increase IP3 production. However, action potential evoked transmitter release was depressed. This reduction is caused downstream of the same receptor activation. In fact, spontaneous release remains elevated while action potential mediated release is depressed. This depression happens despite increased calcium release from stores.

Dissecting the molecular mechanism, we have found that the depression of action potential mediated release is caused by a signalling step immediately after G protein activation, but before phospholipase C activation. This suggests that the depression by noradrenaline and serotonin is most likely caused by Gβγ directly affecting the release machinery.

The fact that both neuromodulators cause increased spontaneous, but depressed action potential mediated release, points to the fact that either there are two distinct mechanisms of vesicle release or that there are two populations of vesicles that can be released in nerve terminals. These findings shed new light on the molecular mechanisms underlying transmitter release.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neuronal-network
Eccles Institute of Neuroscience

Neurophotonics Laboratory

Dr Vincent Daria

The neurophotonics group is involved in a multi-disciplinary collaborative venture between physicists and neuroscientists to make use of novel optical techniques to analyse the brain. In this collaboration, we develop a two-photon microscope, which incorporates a 3D holographic laser projector. The microscope allows us to render the 3D morphology of a neuron while the holographic projector produces multiple laser foci projected along the neuron’s dendritic tree. Each focus functions as a probe capable of manipulating and recording neuronal activity. To manipulate neuronal activity, we introduce chemically caged neurotransmitters, which can be uncaged by light. Using the holographic laser projector, we can dynamically configure the light pattern to uncage the neurotransmitter and locally stimulate synapses at multiple sites along the dendritic tree of a neuron. This process emulates the many synapses neurons receive from neighbouring neurons. In addition, using calcium sensitive and voltage-sensitive dyes, we can use each focus to monitor changes in fluorescence, enabling optical recording of neuronal activity.

How a neuron processes all these input signals, ultimately leading to an output (or action potential), is an important problem in neuroscience that is not yet fully understood. Such venture could provide us with a better understanding of how these neurons process information thereby extending our capacity to understand neuronal dysfunction, e.g. neuropsychiatric and neurodegenerative diseases. The dynamic properties of using light induced generation and recording of neuronal signals have clear advantages over conventional electrical stimulation using micropipettes. This will significantly speed up the study of neuronal circuits, which brings us closer to understanding how the brain works.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neurophotonics
Eccles Institute of Neuroscience

Neuronal Signalling Group
Professor Greg Stuart

The Neuronal Signalling Laboratory within the Eccles Institute conducts basic research on how nerve cells in the brain process information. This work involves recording activity from single nerve cells (technically called neurons) using both electrical and optical techniques. Over the past year we have been investigating the following issues:

Inhibition in the brain

There are two main types of neurons in the brain: Those that increase nerve impulse generation (excitatory cells) and those that reduce nerve impulse generation (inhibitory cells). These different cell types work in balance to regulate brain activity. The main chemical transmitter used by inhibitory neurons is the amino acid gamma aminobutyric acid, or GABA for short. In this project we have investigated the mechanism of action of a particular type of GABA receptor called the GABA_B receptor. In contrast to earlier work we find that the coupling of this receptor to the pathway that ultimately leads to inhibition is different in different cell types, and can be regulated by external pH. We hypothesize this may help to maintain inhibition at a constant level during hypoxia. This research has relevance to stroke.

Coding of visual information

Visual information received by our eyes is combined in the brain to form a single view of the outside world. In order to generate a single coherent map of visual space, input from the two eyes is combined in the brain. This convergence occurs at the level of the cortex. How the cortex integrates visual information from the two eyes is unclear. In this project we have been investigating how single neurons in primary visual cortex process information from the two eyes. This research has relevance to diseases of the visual system as occurs in various forms of blindness.

Signalling in dendritic spines

Input onto many neurons in the brain occurs onto specialized projections on dendrites called dendritic spines. Calcium signaling in dendritic spines is known to be critical of induction of synaptic plasticity, which is thought to underlie memory formation in the brain. We have recently shown that calcium signaling in dendritic spines during action potentials is regulated by calcium-activated potassium channels localized within spines. This research has relevance to diseases associated with loss of memory such as Alzheimer’s disease.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neuronal-signalling
The large intestine is controlled by the nerve cells within the gut wall. Hence, the lack of these neurons has serious consequences from bowel obstruction to death. About 1/5000 infants are born with a blocked gut due to the lack of nerve cells in the wall of the large bowel, a condition known as Hirschsprung’s disease. Although surgical removal of affected gut is a life saving procedure, some patients are left with other neurological disorders, including seizures, mental retardation and brain related breathing problem or deafness. The structural and molecular changes in the brains of these patients are unknown due to the lack of brain tissues.

There is a strain of rat with Hirschsprung’s disease, which has a mutation in the same gene (endothelin receptor B) and has the same phenotype as humans with Hirschsprung’s disease. Our recent study in the neonatal rats with Hirschsprung’s disease showed an increased cell death and decreased nerve cell production in several brain regions including the cerebellum and the hippocampus. The cerebellum is responsible for motor coordination and the hippocampus is involved in learning and memory. To overcome the problem of premature death of mutated rats, we developed a surgical procedure (colostomy) to make the gut to open on the abdominal wall in neonatal rats, which allows the rats to survive into adulthood (6 weeks). This operation makes our study of the structural and molecular changes in brains and associated functional changes in adult Hirschsprung’s rats possible for the first time.

We hypothesize that the brain changes that we observed in neonatal mutant rats will extend into adulthood and create functional deficits. We will analyse the brains of adult mutant rats in three major aspects: structural changes, molecular changes and functional changes. Since this rat model has a mutation in the same gene as some patients with Hirschsprung’s disease, this study will shed light on brain abnormalities in human Hirschsprung’s disease and will provide a scientific basis for future clinical intervention. More generally in describing the effects of a mutation in this gene in Hirschsprung’s rats, we are describing the effect of a gene on general neurological development, which may have effects relevant to the general population in health and ageing.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neuronal-signalling/brain-development
Our laboratory is looking at the processes that occur during retinal injury or disease, in order to understand how the retina may be healed. Ultimately, our goal is to identify and test therapies to provide benefit to sufferers of some retinal diseases.

Our laboratory provided scientific data to suggest that 670nm red light irradiation might be a useful treatment against the loss of photoreceptors, the principal vision cells in the retina. We have shown the protective effect of 670nm light in retinal damage caused by bright light or high oxygen concentration. Our latest findings in models of retinopathy of prematurity (ROP) were the first to demonstrate its potential benefit in this condition. This therapy is non-invasive and may prove to be an inexpensive preventative treatment for ROP and chronic lung disease associated with prematurity. Encouraged by the success of these results, a Phase I clinical trial was initiated in the Canberra Hospital this year.

The retina is the outpost of the brain, containing mainly nervous tissue, but there is another important group of cells also present in the tissue, glia. One such cell is the Muller cell, the principal support structures in the retina. As part of their role, they respond to injury by activating an immune response, produce neuroprotection and in the later stages of the disease, by the formation of glial scars to “heal” the injured tissue. To modulate these responses and minimise scar formation offers another important therapeutic target. Our results so far have shown that treatment with 670nm light reduces the Muller cell reaction and proliferation.
We are interested in development and aging of the retina, especially the macula. The macula is responsible for all of our ‘useful’ vision, mediated by very high densities of neurons and photoreceptors needed to process visual information with a high degree of accuracy. As we age, and depending on genetic predisposition and lifestyle choices (eg, smoking), this high level of metabolic activity often leads to localized oxidative stress and onset of low level / para-inflammatory processes. We have been using a bright light-induced rat model of retinal degeneration to better understand the progression of oxidative stress towards inflammation and degeneration. We find a range of genes expressed that is strikingly similar to those identified in human retinas affected by age-related macular degeneration, including chemokines that attract macrophages into the retina from the periphery. Developing a better understanding of the role of inflammatory process in retinal degeneration, and how to control them is the core business of our experimental work.
Eccles Institute of Neuroscience

Neural Control Systems Laboratory

Dr Jason Potas

The central nervous system is a command centre that controls various aspects of our everyday lives using autonomic and conscious control systems. We are interested in understanding how information is coded, relayed and processed by the peripheral and central nervous systems, and how this information is utilised and integrated. Also of interest are how these systems are affected by injury and disease, how they adapt or are modified and the mechanisms involved. A better understanding of how the brain processes information will provide us with new strategies for tackling the challenges associated with neural injury and disease as well as provide us with new insight into designing novel artificial control systems.

One of our investigations examines sensory pathways with the long-term view of developing a sensory prosthesis. Our future goal is to one day decode sensory information from below a spinal cord lesion and artificially relay this to higher brain centres where sensory perception could be experienced in the absence of intact spinal pathways following injury. We aim to decode electrical signatures in the brainstem to extract information that can tell us what part of the body is experiencing sensory input as well as the quality or nature of that sensation. The figure below demonstrates a functional map generated by recording responses at different locations (black circles) on the surface of the brainstem that were evoked by stimulation of two different nerves. We believe these electrical signatures can be decoded to predict the anatomical location and sensory quality of the source input. If successful, we will be able to extract information from these signatures to tell us what part of the body is experiencing sensory input as well as the quality of that sensation. While a tactile sensory prosthetic device is currently futuristic, data obtained from our basic research is improving our understanding of sensory information processing.

We are also investigating the use of light therapy and nanofibre scaffolds for promoting recovery following peripheral nerve and spinal cord injuries. We have demonstrated that the use of red light (670 nm) following contusion to the spinal cord can improve a variety of parameters following spinal cord injury such as the improvement of behavioural and electrophysiological outcomes, the promotion of anti-inflammatory cell populations, reduction of cell death and increasing neural sprouting. In collaboration with Engineering (ANU), we have developed novel nanofibre scaffolds that have been able to alter the inflammatory response following peripheral nerve injury. Not only does this have potential therapeutic value, but it also offers novel ways to investigate the role on inflammation in nervous tissue recovery.

jcsmr.anu.edu.au/research/eccles-institute-neuroscience/neural-control-systems
In order to understand the structural arrangement of the vertebrate retina, and why it appears to be built ‘inside-out’, with its photoreceptors on the side furthest away from the light, it is necessary to appreciate how the eye evolved.

Professor Trevor Lamb has collected and analysed a broad array of findings that bear on this issue. The findings that he synthesised came from diverse fields: the molecular genetics of opsin genes, and of the genes for phototransduction (the process that transforms captured light into neural responses); the embryological development of the retina; the comparative morphology of photoreceptors and retinas across many living species; and, finally, evidence from the fossil record.

The results of this far-ranging work, published in *Progress in Retinal and Eye Research*, support the following scenario for the evolution of our photoreceptors and retina:

- The first rhodopsin arose a little over 700 million years ago, a result of a mutation in the gene for a conventional G protein-coupled receptor.
- By the time that deuterostomes (our lineage) diverged from protostomes (the majority of invertebrates), around 600 million years ago, two distinct classes of photoreceptor, called C (ciliary) and R (rhabdomeric) had evolved. Both classes are still present in almost all animals living today.
- In the retinas of chordates (animals with a dorsal nerve cord), the C photoreceptors became cones, and later also produced rods. In contrast, the role of R cells changed in chordates, so that they became the retinal ganglion cells that transmit signals to the brain.
- By about 550 million years ago, the ancestors of vertebrates had evolved a pair of light-sensitive organs on either side of the head, but these organs were not yet ‘eyes’, as they did not possess a lens. Instead, they probably played a ‘time-keeping’ role, reacting to cycles of day and night, just like the pineal organ does in today’s non-mammalian vertebrates.
- By 500 million years ago, in the earliest vertebrates, those organs had evolved a lens and had become true eyes. In addition, numerous other changes had occurred, such as the development of extra- and intra-ocular muscles, increased computational power within the retina, and dedicated visual processing regions in the brain.
- In this way, the earliest fishes already had eyes remarkably similar to those of modern vertebrates. Indeed, the subsequent evolutionary changes to vertebrate eyes that have occurred over the last 400–500 million years can be viewed as ‘fine-tuning’ of an already excellent pair of visual organs.

Professor Lamb’s synthesis has permitted a deeper understanding of why our retina is arranged in the way that it is. Moreover, it suggests possible future experiments to test and refine this astonishing scenario.
Department of Genome Biology

Head of Department
Professor David Tremethick

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Department of Genome Biology

Alternatives to Animal Research through Bioinformatics Group

Associate Professor Brett Lidbury

AARB was established to develop alternative methods and strategies to replace animals and animal products, while achieving health progress through fundamental biomedical research. As required by alternative research approaches, the nature of our research is focused entirely on human biology and disease, with the inherent challenge of how to overcome the variation and diversity of humans while pursuing biomedical discovery.

Our primary research interests include questions on infectious disease, particularly the genetic basis of resistance or susceptibility to disease post-infection, the role of infection and immunity in chronic fatigue syndrome (CFS/ME), as well as issues in laboratory medicine associated with enhanced diagnosis and assay redundancy.

As an alternative to animal models, the group relied primarily on pattern recognition methods from the field of knowledge discovery, applied to mass human data sources. To obtain the desired research outcomes, the group has expertise in advanced statistics and in silico machine learning, as well as virology, laboratory medicine and molecular genetics. This style of investigation will also rely upon biological validation in the laboratory, thus blending in silico methods with "wet lab" results and genetic data, and hence developing a systems approach.

Of particular note to overcoming human complexity, AARB uses sophisticated machine learning techniques, for example support vector machines (SVM), on human data (Figure 1). This algorithm allows the modelling of spaces between points (kernels) in high dimensional space, providing a powerful method for detecting disease or infection associated patterns in complex data. In concert with SVMs, recursive partitioning, or “tree” methods, are also used to untangle human data.

The development of a possible animal replacement alternative for the study of CFS/ME was completed during late 2013, and combined a human volunteer study with the pattern recognition and statistical methods described above. An experimental cohort that fulfilled the Canadian Criteria for chronic fatigue, and a non-fatigued control cohort, was recruited for this study. From these human cohorts pathology blood test results, genetic, serum cytokine, gut microbiology and participant clinical data were collected. This extensive data collection was interrogated via machine learning algorithms to identify data networks that detect potential CFS/ME biomarkers, to assist diagnosis and monitoring, and furthermore, enhance prediction of CFS/ME severity and outcome. The Alison Hunter Memorial Foundation (AHMF) provided funding support.

In summary, AARB advanced fundamental biomedical science without reliance on animals, or products derived directly from animals. Specific aims include the deeper understanding of pathology, and as an applied aspect to such fundamental discovery, advance medical diagnostics and disease prediction. In the lead up to 2014, AARB also established the JCSMR research support unit Innovative Methods and Alternatives to Animal Research.

Dr Alice Richardson is a visiting Fellow at JCSMR and from June to December 2013 she was present in person at the School, being on study leave. Her home institution is the Faculty of Education, Science, Technology & Mathematics at the University of Canberra. She is an Assistant Professor in the Mathematics & Statistics Academic Program. During her time at the School she contributed to the research efforts in the Alternative to Animal Research through Bioinformatics group (Genome Biology), hosted by Associate Professor Brett Lidbury.

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It is now clearly established that the central regulator of eukaryotic gene transcription is the organization of the genome into chromatin. Chromatin performs this crucial function by partitioning the genome into domains that are either open and transcriptionally active or closed and repressed.

Chromatin is built from nucleosomes (histones plus DNA), the universal repeating protein-DNA complex in all eukaryotic cells. Significantly, the tail of each histone protrudes on the outside of the nucleosome and is subject to an extensive range of enzyme-catalysed modifications of site-specific amino acid residues in response to intrinsic and external signals. Functionally, it has been argued that the combination of such modifications is recognized or read by specific chromatin-binding proteins involved in regulating transcription and/or chromatin structure. However, our recent work has shown that the functional readout of specific histone modifications is not sufficient to control chromatin function but is also dependent upon the composition of the underlying nucleosome.

The key way the biochemical composition of the nucleosome is altered by the substitution of one or more of the core histones with the corresponding histone variant. Our studies have focused on a major essential variant of H2A, H2A.Z, and have demonstrated that one of its fundamental functions is to maintain the stability of chromosomes. Specifically, it maintains the integrity of the centromere and surrounding heterochromatin where it assembles, surprisingly, compacted domains using both active and inactive histone modifications. Most recently, we have discovered a new type of nucleosomal particle that contains not two molecules of H2A.Z per nucleosome (as found at the centromere) but only one (i.e. a heterotypic nucleosome containing both H2A/H2A.Z rather than H2A.Z/H2A.Z). Significantly, this new type of nucleosome is highly unstable and found at active promoters and other open regions of chromatin.

In an attempt to provide a dynamic link between chromatin structure and function, our in vitro structural studies have discovered a specific macromolecular determinant (an acidic patch) located on the surface of a nucleosome responsible for the ability of H2A.Z to promote the compaction of chromatin and the formation of heterochromatin. Most interestingly, we have recently discovered a new H2A histone variant in the mouse that lacks this acidic patch which we have designated H2A.Lap1 (Lack of an acidic patch), and consistent with our model, incorporation of this variant into nucleosomes inhibits chromatin condensation, in contrast to H2A.Z.

Excitingly, using a high-throughput, deep-sequencing approach, we have identified this histone variant as a novel chromatin component of the transcriptional start site (TSS) of active genes expressed during spermatogenesis, including those genes that escape X chromosome inactivation. We therefore propose a novel model whereby H2A.Lap1 coordinately regulates gene expression by directly opening the chromatin structure of the TSS at genes regulated during spermatogenesis. Excitingly, we also detect heterotypic H2A.Z/H2A nucleosomes at active promoters during spermatogenesis demonstrating that there is a novel process of histone variant selectivity whereby either H2A.Lap1 or H2A.Z/H2A is targeted to a specific promoter. Genes specific for spermatogenesis appear to receive H2A.Lap1 while H2A.Z is targeted to housekeeping genes. Most recently, we have exciting new data implicating H2A.Lap1 in a novel function, a role in testis and brain-specific mRNA splicing. This suggests that H2A.Lap1 may not only regulate how the genome is expressed but also how it is spliced.

jcsmr.anu.edu.au/research/genome-biology/chromatin-transcriptional-regulation
A CONCEPTUAL BIOLOGY APPROACH TO UNDERSTANDING PROTEIN FUNCTION IN ANIMALS AND PLANTS

Department of Genome Biology

Computational and Conceptual Biology Group

Professor Jill Gready

We are interested in understanding how proteins carry out their functions in the cell and how they have been sculpted by evolution to do so. Our findings provide the basic knowledge to understand proteins’ normal functions in plants and animals, their dysfunctions in disease and how they might be improved by protein re-engineering.

Rapid, free online access to huge amounts of biological data in international databanks – especially nucleotide and protein sequences and structures – as well as multiple sources of scientific information provide new means for posing and answering research questions. We employ an approach, christened conceptual biology, which integrates data and information to create hypotheses and initially test them. In essence, we re-purpose results generated by others, and create novel links (“maps”) between them. We then interrogate the combined data “matrix” to make predictions of protein structure and function for test by experiment and computation.

The effectiveness of this approach is illustrated by our rapid progress in current research on improving photosynthetic efficiency for increased crop yield. Photosynthesis in plants converts energy from sunlight and carbon from atmospheric CO2 into energy-rich biological sugars and O2 required for all life – plant and animal. The enzyme Rubisco captures the CO2 into sugars, but paradoxically it is quite slow and inefficient. Two approaches for improving Rubisco performance in plants are re-engineering the enzyme itself and introducing the modified gene into the plant by genetic transformation, or by introducing naturally occurring ‘better’ variant Rubiscos into the plant by breeding.

We have developed new unique, and complementary, technologies for both approaches, and validated them in plants. Both use the conceptual biology approach to exploit available sequence and functional knowledge, modern capabilities for gene sequencing and other molecular and cellular methods, the vast resources in seed banks and supercomputing power. For example for Rubisco re-engineering, we combined insights from computational studies of the enzyme’s reaction mechanism with phylogenetic analyses on public structural and sequence data, to make precise predictions of which protein residues (amino acids) to mutate and to what alternative amino acid. This overcomes the otherwise limiting combinatorial problem of too many mutational possibilities.

The program is being undertaken within a large conceptual, computer-based and experimental program with collaborators in the Research School of Biology, the commercial (Bayer Bioscience) and not-for-profit (GRDC) agbiotech industries and external testing facilities. Although our technology has many potential applications (material crops, biofuel production, carbon sequestration) our current focus is on food production to address the critical problem of global food security. We have structured handling of intellectual property to allow concurrent commercial and public-good applications so that the new technology will be available at no cost to subsistence farmers in lesser-developed countries, assisting in improving food security and reducing poverty.

jacsmr.anu.edu.au/research/genome-biology/computational-conceptual-biology

External testing of the mutant model plants at The Plant Accelerator facility in Adelaide.
As humans, we have experienced substantial evolutionary change over the past few hundred thousand years. Our social and cultural environments have played a predominant role and psychological and neurological change has been particularly important. One of the surprising features of this process is that it has led, not to an optimal ‘type’ of human, but to extensive physical, psychological and cognitive diversity. Some of this diversity has evolved by natural selection, but some of it is an unintended side effect of the evolutionary process.

The extensive changes to our biology and psychology brought about by the complex evolutionary dynamic between our ancestors and their environments have resulted in vulnerabilities, trade-offs and imbalances, which now affect our health and make us susceptible to disease.

In our research we ask ‘Why are people so different from each other?’ ‘How have these differences between people arisen during human evolution?’ and ‘How do these differences affect health and susceptibility to disease?’ Our overall aim is to develop better approaches to managing health and intervening to prevent disease that incorporate knowledge of our peculiar evolutionary past and the biological and psychological differences between people that it has produced.

By studying variation in DNA sequences in human genomes we characterize how evolutionary forces, such as natural selection, have shaped it. We use this information to design studies of how the evolutionary history of genetic variation influences how it contributes to physiological and psychological diversity and affects mental and physical health, particularly in old age.

jcsmr.anu.edu.au/research/genome-biology/genome-diversity-health
Department of Genome Biology

Translational Genomics Group

Associate Professor Mauricio Arcos-Burgos

The goal of our research is to identify genetic variations underpinning inherited disorders as a tool of genetic-epidemiological intervention. Our studies led to the discovery of genes/loci predisposing to several complex genetic disorders, i.e. attention deficit/hyperactivity disorder (ADHD), Alzheimer's disease (AD), membranous nephropathy, non-syndromic cleft lip with or without cleft palate (NS-CL/P), major depressive disorder (MDD), among other mendelian disorders. We do maintain a large international collaboration, involving research groups from the Americas, Europe, and Australia, providing a unique source of genomic, clinical, environmental, and demographic information from thousands of patients of different ethnicities. This body of collaborative work described new genes/loci associated to devastating conditions and provided the framework for defining biomarkers, prognostic assays, and personalized treatment options for ADHD, AD, MDD, and Membranous Nephropathy.

Our mission is to create a wide spectrum of clinical, demographic, and genomic data about complex disorders to improve human health. Our values are guided by Dobzhansky's outline of genetic diversity and human equality, transparency, equal footing, and maximal networking between researchers and participants. Our vision hypothesizes that genomic information in the context of our everyday to day living will be fundamental to maximize your life quality and expectations of wellbeing.


HUMAN DISEASES WITH GENETIC PREDISPOSITION
THE DISCOVERY OF RNAMERICA

Department of Genome Biology

RNA Biology Group

Professor Thomas Preiss

Our genome is a complex machine churning out a myriad of different RNA molecules representing short-lived ‘working’ copies of individual genomic DNA segments, while the genome itself is kept safely in the nucleus of each of our cells. A subset of these RNA molecules, called messenger RNAs, encodes information for the production of proteins, the entities in cells that carry out most of the cellular functions. Overall, the flow of genetic information from DNA via RNA to protein is called the ‘central dogma’ of Molecular Biology and is key to all life on earth. One of the motivations of the Human Genome Project was then, to discover the additional protein coding genes that separate us from other species and might explain our unique human characteristics. Surprisingly, such genes were not found and instead new research has brought to the fore that most regions of our genome actually do not carry information for the production of proteins but instead give rise to ‘noncoding’ RNAs, many of which are probably regulating the expression and utilisation of the protein-coding genes and messenger RNAs. This surprising addition of a whole new ‘continent of noncoding RNA’ to the map of our genome is somewhat reminiscent to Columbus’ discovery of America while searching for a new sea route to Asia (see figure).

The RNA Biology Group is studying the role of coding and noncoding RNA in the process of ‘reading’ the information contained in our genes and interpreting it to build and maintain a functioning organism. At the core of this process is the ‘translation’ of the code of messenger RNAs into proteins. The RNA Biology Group studies the mechanisms and patterns of this mRNA translation and its regulation by RNA-binding proteins and noncoding RNAs as a means of controlling gene activity. These studies continue a long tradition that began with ground-breaking work performed by ANU scientists John Shine and Lynn Dalgarno in 1975. Translation takes place on cellular nano-devices called ribosomes, and is aided by numerous accessory factors. Control at this translational level and its dysregulation is increasingly recognised as an important factor in human health and disease. Pathologic mechanisms may perturb the entire cellular translation program or some specific aspect of it, leading to, for instance, malignant cell proliferation in cancer and inappropriate cell death or growth in cardiac disease.

The RNA Biology Group further engages in collaborative research with medical scientists around the world. They apply their RNA Biology in the elucidation of processes such as the generation of induced pluripotent cells for stem cell therapy, or study the molecular pathology of important human diseases such as cancer, diabetes and obesity, Alzheimer’s and heart disease.

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Department of Immunology

Head of Department
Professor Chris Goodnow

Group

Cancer and Vascular Biology Group
Cell Biology Laboratory
Diabetes/Transplantation
Immunobiology Laboratory

Immunogenomics Group
Immunogenomics Bioinformatics Laboratory
Immune Tolerance & Signalling Laboratory
Ramaciotti Immunization Genomics Laboratory

Infection and Immunity Group
Host Defence Laboratory
Inflammation and Viral Immunopathology Laboratory

Molecular Mucosal Vaccine Immunology Group

Translational Research Unit

Leader

Professor Chris Parish
Professor Chris Parish
Dr Charmaine Simeonovic

Professor Chris Goodnow
Dr Thomas Dan Andrews
Professor Chris Goodnow
Dr Anselm Enders

Associate Professor Guna Karupiah

Dr Geeta Chaudhri

Dr Charani Ranasinghe

Dr Matthew Cook
(jointly with Canberra Hospital)
The Cancer and Vascular Biology Group is particularly interested in identifying novel approaches to controlling cancer and autoimmune diseases, such as Type I diabetes. When primary cancers arise they cannot grow beyond 1-2 millimetres in diameter unless they induce the growth of new blood vessels that supply them with oxygen and nutrients and remove toxic byproducts of metabolism. Similarly, blood vessels play an important role in the spread of cancer cells to other organs, the cancer cells having to use a range of degradative enzymes to digest their way through blood vessel walls, particularly when they lodge in distant organs.

The Cancer and Vascular Biology Group has been able to develop relatively simple sugar-based drugs that inhibit blood vessel growth in tumours and block a key enzyme, called heparanase, that degrades the complex sugar molecule heparan sulfate and aids cancer spread (metastasis). One of these drugs (Muparfostat) is being currently tested in a Phase III clinical trial in liver cancer patients. The Group has also shown that platelets play a crucial role in cancer spread (metastasis) and represent a target for the development of new anti-metastatic drugs. Heparanase inhibitors have also been investigated as potential new anti-inflammatory agents and have been shown to control the development of Type 1 diabetes in mice. The diabetes studies have also revealed that heparan sulfate is expressed at extraordinarily high levels by the insulin-producing cells in the pancreas and is, in fact, essential for the survival of these cells. Indeed, loss of heparan sulfate from the insulin-producing cells is associated with both Type 1 and Type 2 diabetes, although via different mechanisms, immune cell-derived heparanase clearly being involved in heparan sulfate loss in Type 1 diabetes. These studies have raised the interesting possibility that heparanase inhibition/heparan sulfate replacement therapy could be used as a treatment for Type 1 and Type 2 diabetes. In fact, heparan sulfate-like drugs have been developed that can inhibit diabetes progression and are being prepared for clinical trials in Type 1 diabetes patients.

In parallel studies the Group is investigating, in collaboration with the biotechnology company Lipotek, a number of clever vaccination strategies that stimulate the immune system to recognise cancer cells as foreign and eliminate them. One of these cancer vaccines completed a promising Phase I clinical trials in melanoma patients in 2011 and is being further perfected. Finally, basic immunological research by the Cancer and Vascular Biology Group has resulted in important advances. First, a blood borne protein, called histidine-rich glycoprotein, has been identified which may play an important role in controlling autoimmune diseases, such as systemic lupus, by aiding the elimination of dead and dying cells. Second, the Group has discovered a novel form of membrane exchange between cells of the immune system, which has the potential to dramatically enhance the immune response to both pathogens and cancer. Third, recent studies suggest that heparan sulfate, expressed at high levels by a small subset of stromal cells in the thymus, plays a crucial role in T cell development in the thymus.
Beta cell failure in Type 2 diabetes is characterized by loss of intracellular core proteins.

Dr Charmaine Simeonovic

Beta cell failure in Type 2 diabetes is characterized by loss of intracellular heparan sulfate (HS) and heparan sulfate proteoglycan (HSPG) core proteins. HS is a complex polysaccharide which is synthesised directly onto HSPG core proteins. Type 2 diabetes (T2D) is a “metabolic syndrome” disease characterized by insulin resistance, lipolysis and hyperglycaemia. To compensate for insulin resistance, pancreatic islet beta cells substantially increase their production of insulin, inducing endoplasmic reticulum stress (ER stress). To relieve ER stress, the unfolded protein response (UPR) pathway dampens protein production, exacerbating insulin insufficiency. Failure of the UPR pathway to compensate for ER stress ultimately results in beta cell death, necessitating insulin therapy in humans.

We have previously demonstrated that normal insulin-producing islet beta cells in the pancreas contain very high intracellular levels of HS, a property which is essential for their survival. Our studies have also shown that normal mouse islet beta cells strongly express a number of intracellular HSPG core proteins (including collagen type XVIII, syndecan-1 and CD44). This panel of HSPGs therefore represents the source of HS inside beta cells. The intracellular localisation of HSPG core proteins in beta cells is particularly unusual, because collagen type XVIII is conventionally localised in extracellular matrix i.e., not inside cells, and syndecan-1 and CD44 core proteins are normally found on the cell surface.

T2D in the db/db mouse, like T1D, is characterised by a significant loss of intra-islet HS. In db/db mice, however, the intra-islet levels of the HSPG core proteins for collagen type XVIII, CD44 and syndecan-1 also show a significant decline prior to overt obesity and the onset of hyperglycaemia. These findings raise the possibility that beta cell death in T2D may result from a defect in HS synthesis, primarily resulting from a decline in HSPG core protein synthesis. In vitro we have found that the induction of ER stress in MIN-6 beta cells (a cell line), using treatment with thapsigargin, also leads to a significant decline in the intracellular levels of HSPG core proteins and a significant increase in apoptosis. Our studies indicate that unlike T1D where beta cell HS is degraded by heparanase, ER stress in T2D down-regulates HSPG core protein levels, leading to diminished HS synthesis and beta cell failure. These findings constitute a new paradigm for the molecular processes leading to beta cell death in T2D. HS replacement using HS mimetics early in T2D disease could potentially play a vital role in preserving beta cell survival, thereby preserving the insulin-secreting function of islet beta cells and obviating the need for insulin therapy.
UNDERSTANDING THE GENETIC BASIS OF DISEASE

High performance computing now has a central place in biological science, and we are biologists-turned-computer-scientists that control and analyse genomic data to create information. Our team has a multidisciplinary background and draws experience from large, international public genome projects. Our systems run in a high-performance computing infrastructure provided by the National Computation Infrastructure, based in part at the ANU campus.

Our initial experience with high-throughput genome sequence data derives not from human genomes, but almost 2000 individual genomes of the mouse. Through analysis of these mouse genomes, we have gained an understanding of the genetic basis of dozens of mouse diseases that provide a model for human diseases.

Our work with the mouse genome has proven a good training ground for our current work with human genomes. The genome of the laboratory mouse is almost identical between different mice, however, the genomes of people differ considerably from person to person – and how we all differ genetically from one another explains much about our differing susceptibilities to disease and cancer.

Two project areas that are a current focus of our activities are analysis of a) human genomes to identify genetic determinants of autoimmune diseases, in collaboration with our colleagues in the Immunogenomics Laboratory, and the recently established Centre for Personalised Immunology, and b) matched tumour and germline human genomes to identify genetic changes associated with melanoma, in collaboration with the Melanoma Institute of Australia and BioPlatforms Australia.

Our focus remains on developing information systems that allow processing of, often massive, genomic data to produce targeted information to better understand the genetic basis of disease. We are collaborative by nature, as our work is a component of large, multidisciplinary projects that bring together researchers working in medicine and genomics, data scientists, computational biologists, clinicians and patients.

jcsmr.anu.edu.au/research/immunology/immunogenomics/immunogenomics-bioinformatics
IMMUNE REGULATION

Department of Immunology

Immunogenomics Group

Professor Chris Goodnow

The group discovers molecular and cellular mechanisms and genes regulating the immune response:

> to prevent autoimmunity against self antigens (e.g., lupus, diabetes, rheumatoid arthritis, thyroiditis) and allergy;

> to prevent uncontrolled growth of lymphoid malignancies (leukemia, lymphoma and myeloma);

> to promote immunity and immunological memory against viruses and bacteria (immunization and immunological memory).

We aim to answer central questions about the mechanisms of tolerance and immunity in B and T cells, and to create a collaborative environment where the next generation of scientific leaders can establish independent lines of research while drawing upon shared expertise and resources. To achieve these aims, we develop and use state-of-the-art methods from mouse and human molecular genetics and genomics, biochemistry and cell biology, cell signalling, cellular immunology and clinical immunology.

Highlights in 2013 include the discovery by PhD student James Wang with Research Fellow Dr Keisuke Horikawa that common mutations in human lymphoma re-wire the way B lymphocytes respond to normal components of our body. Normally, B cells carrying antibodies that react with self – so-called “autoantibodies” – are stimulated to commit cellular suicide, ensuring the immune system does not attack our own body. But when these B cells acquired a mutant form of the MYD88 gene, as often occurs in the development of human B cell non-Hodgkin’s lymphoma and Waldenstrom’s Macroglobulinemia, the “forbidden clones” switched their response: instead of dying they responded by growing, copying themselves over and over. However James and his colleagues discovered that nature has evolved provisions for this violation of the normal rules of cell behaviour: the effects of MYD88 mutation are rapidly countermanded by cell suicide. Only when the suicide process is corrupted by a second commonly occurring lymphoma mutation, such as inactivation of TNFAIP3 or enforced expression of BCL2, does the MYD88 mutation fully switch the way the cell responds to self. Published in the prestigious Journal of Experimental Medicine, these findings illuminate how the body normally avoids autoimmunity, how lymphoma develops, and a potential explanation for the co-occurrence of autoimmune disease and lymphoma.

Another 2013 highlight was the discovery by Research Fellow Stephen Daley that a massive number of T lymphocytes developing in the thymus gland are normally culled in two sequential waves because their receptor for antigen (“T cell receptors, TCR”) binds too strongly to normal self-components. Until now, evidence that we avoid developing autoimmune diseases by clonal deletion of self-reactive T cells has rested on study of individual TCRs with narrow properties, but it had not been possible to measure the extent, stage and mechanism of clonal deletion in the normal immune repertoire comprising millions of different TCRs. Published in a 17 page landmark article in the Journal of Experimental Medicine, Dr Daley revealed a way to do this by measuring each of the millions of cells for their expression of a protein, Helios, that is selectively induced when their TCR binds too strongly to self. This revealed that one third of maturing thymus T cells were culled for self-reactivity when they were semi-mature, in line with earlier predictions, but that over half were culled at an earlier stage when they had first tested their TCR and established that it fitted the body’s histocompatibility molecules, because the fit with self was too strong. These findings reveal how hard the immune system must work to avoid autoimmune diseases like Type 1 diabetes, and open up new ways to understand how disease-inducing T cells slip through these safeguards.

jcsmr.anu.edu.au/research/immunology/immunogenomics
Department of Immunology

Ramaciotti Immunization Genomics Laboratory

Dr Anselm Enders

The Ramaciotti Immunization Genomics Laboratory was established in 2008 through a Major Initiative Award from the Clive and Vera Ramaciotti Foundation to Dr Anselm Enders and Professor Chris Goodnow. The laboratory focuses on elucidating the genes and mechanisms controlling the development and function of the immune system with a special focus on B-lymphocytes. Normal development of B-lymphocytes and the production of antibodies by them is essential for protection against recurrent infections, and the protection provided by most currently employed vaccines. Any defect in the genetic control of B-lymphocyte development or function can lead either to immunodeficiency, autoimmunity or B cell malignancy. Because of this importance, the generation of B-lymphocytes is one of the most thoroughly studied mammalian cell developmental systems.

Despite these efforts, key steps required to shape the mature B-lymphocyte compartment are yet to be discovered. To identify novel genes and pathways in B-lymphocyte development and function we screen mice after random ENU mutagenesis for defects in the development of B-lymphocytes, or the generation of an immune response after immunization. Once a strain is identified we find the causative mutation by sequencing all exons in an affected animal. Over the last few years this approach has led to the establishment of more than 30 different strains, and the unexpected discovery that a defect in a widely expressed transporter of specific phospholipids called ATP11C leads to a defect in the early development of B-lymphocytes. Further defects found in these mice included a defect in the survival of red blood cells and also the development of liver tumors. We are currently following up on this discovery to identify the molecular pathways that are dependent on the phospholipid composition of the cell membrane.

We also discovered that a protein (called SPPL2A) of previously unknown in vivo function is essential for the normal survival of mature B cells. At the moment we try to understand what causes the survival defect and if this dependence of mature B cells on SPPL2A could be used for future treatments of B cell malignancies or B cell mediated autoimmune diseases. A further focus of the lab is the investigation if genes identified in the ENU screens contribute to the disease of patients with immunodeficiencies. We also try to better understand the phenotype of patients by careful analysis of appropriate mouse models. These studies are done in cooperation with clinicians from the University of Freiburg, Germany.

jcsmr.anu.edu.au/ramaciotti-immunization-genomics
Much of our current understanding of the induction and maintenance of long-lived antibody response is based on studies using non-replicating model antigens. We are therefore using a well-established model of orthopoxvirus infection in its natural host to characterize critical features of long-term humoral immunity to virus. We are defining the attributes of viral antigen that elicit the most efficacious antibody responses, and which lead to optimal induction and maintenance of long-term humoral immunity.

As the outcome of an infection is dependent on the interaction between viral and host genes, we are also investigating how some virus-encoded immune evasion molecules subvert or dampen the host antiviral response. These studies will not only provide a better understanding of the workings of the immune system but will potentially pave the way for utilization of recombinant virus-encoded proteins to treat certain chronic inflammatory diseases.

We are investigating the contribution of actin-based motility to (i) virus pathogenesis and (ii) viral spread within a natural host. We are targeting the Abl-family kinases to assess these processes. Our goal is to assess whether well-established anti-cancer drugs can be used as antiviral agents.

We are using a systems biology approach to understand immune regulatory networks in antiviral immunity. Novel regulators of the innate and adaptive immune responses to poxviruses are being elucidated using forward genetics, ENU mutagenesis and systems biology. The aim is to reveal the signaling and gene regulatory networks that underpin the immune response to infection.

The overall aim of our research program is to gain a better understanding of the immune response to viral infections, which will be key to developing novel therapeutic and vaccination strategies to combat viral diseases.

jcsmr.anu.edu.au/research/immunology/infection-immunity/host-defence

NEW STRATEGIES TO FIGHT VIRAL DISEASES
Department of Immunology

Inflammation and Viral Immunopathology Laboratory

Dr Geeta Chaudhri

Our research is directed towards a better understanding of virus-host interactions and the immune response to infection with a view to develop more effective vaccines and selective treatments that would minimise the damaging effects of an established infection. We are pursuing this goal using a range of viral (for example, pox and influenza A) and animal models. Our studies allow us to dissect the roles of leukocyte subsets, cytokines, antibody and a number of signalling molecules in viral infection and disease. The immune effector mechanisms that are generated to control and clear virus instead often cause immunopathology that has serious, sometimes lethal, consequences for the host. We have therefore directed our research effort toward dissecting out the immunological parameters that allow the rapid resolution of virus infection with minimum pathology. These studies are being carried out in parallel with others that attempt to reveal the many strategies that viruses have evolved to subvert the host immune response.

It is well accepted that both resident and recruited macrophages are involved in initiating and maintaining inflammation in response to infection. More recent studies point to a role for these cells in regulating the switching off mechanisms in the resolution of inflammation, once infection has cleared. Thus resolution of inflammation and return to tissue homeostasis is now thought to be an active and coordinated process which terminates the processes involved in the inflammatory response. There is now growing evidence that the ability of macrophages to modify their function based on the changing signals from their environment, and switch from M1 to M2, is an essential step in the resolution of inflammation and pathology. We are investigating this process and the mechanisms involved in immunopathology as well as resolution of viral disease.

A major area of focus has been the cytokine tumour necrosis factor (TNF); expressed in both soluble and membrane forms. We have demonstrated that membrane TNF participates in reverse signalling, a process whereby interaction with its receptor leads to the transmission of signal in the direction of the cell expressing membrane TNF. The biological outcomes, resulting from activation of this pathway are currently being elucidated in our laboratory and we believe it constitutes a major route through which information transfer occurs when TNF receptors (TNFR) bind to membrane TNF. Of the strategies used by viruses to attenuate the host response, many are directed toward interfering with TNF function, thus implicating this cytokine as an important player in virus-host interactions. Poxviruses, including ectromelia virus, encode molecules homologous to TNFR. Using this model, we have found that host TNF is up regulated during infection and that membrane TNF plays a role distinct from soluble TNF in the response to infection. This is due, in part, to the ability of membrane TNF to participate in reverse signalling. Further, virus encoded TNFR utilises the same pathways as soluble host TNFR to modulate immunopathogenesis, during this infection.

We are investigating the possibility that recombinant viral proteins, which have been engineered by nature through evolution to limit the immune response and inflammation, may be used as therapeutic agents to combat diseases where inflammation and immunopathology are a problem.

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Department of Immunology

Molecular Mucosal Vaccine Immunology Group

Dr Charani Ranasinghe

Globally there are approximately 34 million people infected with HIV-1 with the majority of infected individuals currently living in sub-Saharan Africa and Asia, reflecting the need for HIV treatment/prevention in low-income countries. The populations of infected individuals in developed countries are also considerable with significant costs for clinical care. Thus, it is thought that a vaccine is the best strategy and also likely the only long-term cost effective solution to contain the HIV-1 epidemic and to reduce the financial burden of the disease in both developing and developed countries.

HIV-1 is first encountered at the genital-rectal tract, and primary CD4+ T depletion occurs in the gut mucosa. Hence, a vaccine that can induce immunity at these primary sites of infection (genital-rectal tract) is thought to be the best strategy in disease prevention. It is now well established that to induce sustained mucosal immunity, a vaccine should be delivered to the mucosae (i.e. intranasal, intra rectal, oral routes). Although HIV is a disease of the mucosae all the HIV-1 clinical vaccine trials tested to date have been systemic vaccine trials (delivered to the blood compartment), and these have yielded poor outcomes in humans. Interestingly, no mucosal vaccine strategy has yet entered into a clinical trial.

Our studies have revealed that mucosal delivery can induce CD8 T cells of higher quality with better protection compared to systemic delivery, and this is related to the activity of cytokines IL-4 and IL-13. We have now developed a series of novel mucosal/systemic vaccine strategies that can transiently block IL-4/IL-13 activity at the vaccination site and induce triple action immunity. For example: i) excellent high “quality” mucosal and systemic CD8 T cell immunity with excellent T cell mediated protective immunity, ii) excellent gag-specific antibody class switching and also iii) Env-specific B cell immunity, which are hallmarks of protective efficacy in HIV controllers. We are currently assessing mechanisms of these vaccines and we intend to translate these vaccines into a clinical trial in the near future.

jcsmr.anu.edu.au/research/immunology/molecular-mucosal-vaccine-immunology
Department of Pathogens & Immunity

Head of Department
Professor Carola Vinuesa

Group
Humoral Immunity and Autoimmunity Group
The Malaria Immunology Group

Leader
Professor Carola Vinuesa
Associate Professor Ian Cockburn
CONTROLLING THE QUALITY AND QUANTITY OF ANTIBODY RESPONSES TO PREVENT AUTOIMMUNITY

Department of Pathogens & Immunity

Humoral Immunity & Autoimmunity Group

Professor Carola Vinuesa

Long-lasting antibody responses are a key component of the mammalian immune system; they protect us from the constant challenge of pathogenic bacteria and viruses. The quality of the antibodies that B cells produce matters: effective protection requires production of antibodies with high affinity. Affinity improvement occurs as a consequence of random mutation targeted at the genes that encode for the B cell receptor. Mutated B cells can be selected by a subset of T cells known as T follicular helper (Tfh) cells to become long-lived plasma cells that will secrete high affinity antibody for decades. However, this ability to produce long-lasting high affinity antibodies is a double-edged sword: perturbations can result in over 80 different autoimmune diseases that collectively affect 3-5% of the population.

These diseases include lupus, Type 1 diabetes, rheumatoid arthritis, and typically occur when the immune system cannot differentiate between invading pathogens and the body’s own cells, resulting in the destruction of tissues.

Our research aims to understand autoimmune disease pathogenesis utilizing two different but complementary approaches:

1) Unraveling the complex interactions between Tfh and B cells, and their regulation. Our team is deciphering molecules and pathways that regulate T:B interactions and ultimately the production of potent, long-lasting immunity.

On-going projects in the laboratory are focusing on the role of microRNAs, RNA-binding proteins, neuropeptides, soluble factors, and novel surface receptors on Tfh cells and germinal center B cell selection.

2) Identifying the genetic lesions that cause autoimmune diseases in patients. Currently, autoimmune diseases are chronic and incurable, and existing treatments mainly consist of non-specific inhibition of the immune system, causing serious side-effects. By precise identification of gene variants responsible for disease in each patient, we can begin to understand disease pathogenesis, and take an individualized approach to therapy.

Current projects are focused at identifying rare gene variants in patients with systemic and organ-specific autoimmune diseases through exome sequencing, proving causality via CRISPR/Cas9 DNA editing, and establishing precise mouse models of each patient’s disease so we can understand how disease develops and identify the most effective treatment.

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A VACCINE TO PREVENT MALARIA

Department of Pathogens & Immunity

The Malaria Immunology Group

Associate Professor Ian Cockburn

2013 saw the establishment of the Malaria Immunology research group within the Department of Pathogens and Immunity. This was made possible by the recruitment of Associate Professor Ian Cockburn to the school from Johns Hopkins University in Baltimore, USA. Associate Professor Ian Cockburn was joined by a post-doctoral fellow – Dr Johanna Dups – from the Australian Animal Health Laboratories and a research assistant – Yeping Cai from the Department of Translational Medicine, JCSMR.

The group is focused on understanding immune responses to the Plasmodium parasite that causes the disease malaria. Malaria kills 0.5–2 million people each year, mainly in Africa. A safe and effective vaccine is likely needed for the control or eradication of this disease. Immunization by irradiated malaria-infected mosquitoes has been shown to protect people against malaria. Irradiated parasites do not divide and cause infection but are capable of activating the immune system to make protective responses against infection. The parts of the immune system that contribute the most to protection are B cells, which make antibodies, and CD8+ T cells – specialized cells capable of killing parasite infected cells in the liver.

Research highlights this year include the first direct observations of T cells killing parasites in the infected liver. This was made possible by the use of Intra-vital imaging technology. Using this the group was able to begin to address a key question in T cell biology – how do these cells find and eliminate their targets. It was found that CD8+ T cells were capable of forming large clusters around parasite-infected cells. Surprisingly killing appeared to be a protracted process, an observation that contrasts with data from in vitro suggesting that a single activated CD8+ T cells can rapidly kill multiple targets. The group will continue to investigate the molecular basis of our observations using a newly purchased 2-photon microscope at The John Curtin School of Medical Research.

This year the group has also begun a totally new research direction - investigating how Plasmodium-specific B cells and antibodies develop in response to vaccination. We are developing a range of tools to track and analyse these cells. In the coming years we aim to use these tools to understand how our most promising vaccination strategies work and how we can make them better.

jcsmr.anu.edu.au/research/pathogens-immunity/malaria-immunology
Department of Molecular Biosciences

Head of Department
Professor Angela Dulhunty

Group
Biomolecular Interactions Group
Cancer Metabolism and Therapy Group
Cardiac and Skeletal Proteomics Group
Cytokine Molecular Biology and Signalling Group
Epigenetics and Genome Stability Group
Molecular Genetics Group
Muscle Research Group
Stem Cells and Gene Targeting Group

Leader
Dr Marco Casarotto
Dr Anneke Blackburn
Dr Nicole Beard
Professor Ian Young
Dr Danny Rangasamy
Professor Phil Board
Professor Angela Dulhunty
Professor Klaus Matthaei
The main focus of the work in my laboratory has been to explore the diverse structural and physical properties of biomolecules in order to gain a greater understanding of the physiological roles they play in the body. A number of diverse structure-based strategies including nuclear magnetic resonance (NMR) spectroscopy, molecular biology, protein-engineering and rational drug design techniques are employed to address important biological questions. A wide range of medically relevant projects are carried out, all designed to provide a unique insight into the role that specific biomolecules play in a number of disease states. By understanding these roles it is then possible to identify and design novel therapeutic agents for particular diseases. This work has been published in diverse biological and chemical journals that reflect the broad application of our research and encompass areas such as physiology, microbiology, biochemistry, pharmacology, drug design/delivery and molecular biophysics. Listed below are some of the projects that are being studied.

The dihydropyridine and ryanodine receptors (DHPR & RyR) play essential roles in muscle function and my contribution has been to determine how these proteins signal to each other in skeletal excitation-contraction (EC) coupling. Because the protein machinery present in skeletal and cardiac muscle is very similar, it is important to identify key differences in the makeup and function of these two systems. The 15 kD intracellular II-III loop region of the DHPR is implicated in skeletal muscle function and we have been responsible for elucidating the first high resolution structure study of this region. We have also determined that the skeletal b-subunit of DHPR has distinct interactive properties compared with its cardiac counterpart. This work has laid the foundation for us to propose a series of novel hypotheses that are currently being evaluated not only in my laboratory but world-wide.

Epigenetic Enzymes activate or silence genes by epigenetically ‘tagging’ the amino terminal tails of histone proteins and are critical molecular mediators of a number of biological processes. The contribution of epigenetic enzymes in the regulation of human cancers is an exciting area and critical to the development of new therapies. We aim to combine our expertise in epigenetics, cancer, pathology, structural biology and drug design to demonstrate that various enzymes are novel epigenetic regulator of human cancers, and propose a clear and integrated translational strategy to treat cancers with novel small molecule inhibitors. Using a multidisciplinary approach underpinned by internationally competitive basic science, we will be able to apply our novel studies on epigenetic regulation to personalised approaches to therapy.

Virions or virus ion channels are small membrane proteins capable of forming multimeric ion channels and they are expressed in a number of viruses including influenza A (M2), HIV-1 (Vpu) and Hepatitis-C (P7). We have developed a strategy that employs surface plasmon resonance techniques to measure the affinity of a number of antiviral drugs to these ion channels and in the case of the M2 and Vpu ion channels, have used this technology to elucidate the mode of binding of various drug compounds.

jcsmr.anu.edu.au/research/molecular-bioscience/biomolecular-interactions  

DRUG DESIGN
TARGETING THE SWEET TOOTH OF CANCER

Department of Molecular Bioscience

Cancer Metabolism and Genetics Group

Dr Anneke Blackburn

It was first recognized in the 1930s that cancer cells use glucose differently to normal cells. Normal cells use oxygen to metabolize glucose for energy production, whereas cancer cells preferentially metabolize glucose for the production of cellular building blocks via a pathway that does not require oxygen and results in the accumulation of lactic acid. Other aspects of metabolism in cancer cells also differ from normal tissues, and these differences are yet to be exploited for therapeutic purposes. The Cancer Metabolism and Genetics Group is studying the effect of redirecting cancer metabolism on the growth and death of breast cancer cells. We are particularly interested in dichloroacetate (DCA), an old drug that inhibits the anaerobic metabolism of glucose to lactic acid. This drug has been used for many years in patients with a rare metabolic disorder and so it is known to be safe and have minimal side effects, and therefore has potential to move rapidly into the clinic for use in cancer treatment. We have demonstrated that dichloroacetate is able to stop the growth of metastatic breast cancer cells both in vitro and in vivo in animal models.

While dichloroacetate alone does not kill breast cancer cells, taking away the drive to grow makes the cells more likely to die when co-treated with existing anti-cancer drugs. This could mean the dose of current anti-cancer drugs could be lowered, thus reducing toxic side effects but without loss of effectiveness. We are currently investigating which drugs DCA works best with.

We are also interested in the genetic factors that contribute to breast cancer susceptibility, and in the outcomes for women identified with very high predisposition for developing breast cancer. We are investigating the possible role of the vitamin D / calcium pathway in breast cancer in mice genetically predisposed to developing cancer. These mice carry a mutation in the tumour suppressor gene p53 and are a model of the multiple tumour syndrome, Li-Fraumeni Syndrome. Experiments such as this take several years to complete, but the discovery of modifiable risk factors for breast cancer prevention would greatly improve the outlook and quality of life for women carrying mutations in breast cancer predisposition genes.

jcsmr.anu.edu.au/research/molecular-bioscience/cancer-metabolism-genetics
UNDERSTANDING HOW BLOOD CELL DEVELOPMENT IS REGULATED BY CYTOKINES: IMPLICATIONS FOR ALLERGY, ASTHMA AND LEUKEMIA

Department of Molecular Bioscience

Cytokine Molecular Biology and Signalling Group

Professor Ian Young

We are studying the role of three hormone-like proteins (cytokines; IL-3, IL-5 and GM-CSF) which stimulate the expansion of inflammatory cells in asthma and may also have a role in leukemia. The cytokines bind to cell surface receptors and influence the growth, maturation and activation state of blood cells. In asthma, the symptoms are caused by an allergic reaction in the lung and the production of inflammatory cells. The inflammatory cells include CD4+T helper-2 lymphocytes (Th2 cells), eosinophils, mast cells, basophils, neutrophils and macrophages, all of which have all been linked to the pathogenesis of asthma with different cell subsets predominating in specific asthma subtypes. Our aim is to elucidate the molecular details of the cytokine-receptor interactions and how these interactions initiate signals across the cellular membranes. We have previously determined the 3D structure of the main signalling receptor (hbetac) shared by these cytokines using X-ray crystallography and more recently have determined the structure of the mouse beta-IL-3 receptor (collaboration with Paul Carr, Colin Jackson and David Ollis, ANU and James Murphy, Walter & Eliza Hall Institute of Medical Research, Melbourne). We are continuing with the structure of cytokine-receptor complexes. Our aim is to understand the two different modes of receptor activation which influence whether blood cell-forming stem cells undergo maturation or self-renewal in response to IL-3. By elucidating the mechanisms controlling blood cell maturation we aim to develop new treatments to control inflammation in asthma (collaboration with Paul Foster, University of Newcastle) and to understand the involvement of the IL-3 receptor system in myeloid leukemia (collaboration with Professor Y Chen and Dr Y Wu, Fujian Medical University, China).

DISCOVERY OF HOW RETROVIRAL RELICS COULD LEAD TO THE GENOMIC CHAOS OF CANCER

Department of Molecular Bioscience

Epigenetics and Genome Stability Group

Dr Danny Rangasamy

Breast cancer is the most common malignant disease in women. The worldwide incidence of breast cancer continues to rise, and has become a leading cause of cancer deaths. More than 90% of breast cancers are sporadic or acquired somatic mutations. It is believed that genomic chaos might promote the accumulation of genetic changes in apparently normal breast tissue, even before histological abnormalities are detectable. Although genomic chaos is commonly found in invasive carcinomas, little is known about the timing of critical changes in early tumorigenesis or changes associated with the transition from normal cells to primary breast carcinoma. We have recently identified retroviral relics “LINE-1 retrotransposons” that are differentially expressed in normal and breast cancer tissue. In healthy tissues, the expression of LINE-1 is completely absent throughout the cell cycle.

In contrast, it is overexpressed in patients with breast cancer. The unchecked LINE-1 activity would create havoc on the genome, initially through insertional mutations and later by genomic instability through high levels of double-strand DNA breaks, deletions, and genomic rearrangements. Although the mechanistic pathways that activate LINE-1 expression are not known, its expression and its effect on genomic instability have given rise to suggestion that it may serve as useful biomarkers in the early diagnosis of breast cancer or in the prediction of cancer onset. Specifically, LINE-1 biomarker is useful in the prediction of genetic changes associated with the transition from normal to hyperplasia to in situ breast carcinoma to invasive breast cancer. With collaboration of the Department of Pathology, the Canberra Hospital, we are currently testing this biomarker using a panel of breast cancer tissues and serum samples.

Given the deleterious nature of retrotransposon activity in cancer development, we are interested in the mechanisms by which the retroviral relics are regulated in somatic cells. Using deep-sequencing technology combined with microarray analysis, we have recently identified a class of small non-coding endo-siRNAs as a key regulator of retrovirus in the human genome. Currently, we are testing the epigenetic role of endo-siRNAs including DNA methylation and RNAi-mediated silencing pathways. This research project will shed new light into how and why disease states arise in breast tissues and how the expressions of retroviral relics activate the process of cancer development. Unravelling the relationship between small regulatory endo-siRNAs and DNA methylation in the development of cancers may provide new strategies for future therapeutic and diagnostic approaches.

The research of the Muscle Group falls into three areas. The first is excitation-contraction (EC) coupling which allows an electrical signal on the cell surface to release calcium from its internal store though the RyR. EC coupling depends on interactions between the RyR and a dihydropyridine receptor (DHPR) calcium channel in the surface membrane. In the heart this enables RyR activation by calcium ions that enter from outside the cell through the DHPR. In skeletal muscle there is a depolarisation-dependent signal transmitted from the DHPR to the RyR by direct interactions between the proteins. Despite years of investigation, we still do not know which parts of the proteins interact to achieve the coupling.

The second area is the changes in the ryanodine receptor that lead to heart and skeletal muscle disease. There are many risk factors for these disorders including smoking, diet, obesity and exercise as well as chemotherapy. In addition, there are risk factors that we are born with, which include genetic changes in the RyR and the molecules that control its ability to open and release calcium ions. We are working to understanding how these factors impact on RyR function. We have discovered that a natural enzyme which is present in all muscle cells is a potential pharmacological agent for treating heart failure and we are refining the molecule for better therapeutic potential.

The third area is the elusive problem of how proteins that are located right inside the calcium ion store can regulate RyR activity in a manner that depends on the amount of calcium stored, to ensure that fewer calcium ions are released if the store is depleted. To understand this problem, we isolate the individual proteins and then reconstruct the protein complex that they form with the RyR, at the same time controlling calcium concentration in the store and measuring the ionic current flowing through the RyR ion channel.

Department of Translational Medicine

Head of Department
Professor Julio Licinio (until April)
Dr Claudio Mastronardi (from April)

Group
Pharmacogenomics Group
Translational Medicine Group
  Translational Endocrinology Team
  Translational Psychiatry Team

Leader
Professor Ma-Li Wong
Professor Julio Licinio
Dr Gilberto Paz-Filho
Dr Claudio A Mastronardi
In 2013, the Department of Translational Medicine steadily developed the areas of education, community outreach and research. We successfully hosted educational activities at the international and national levels, convening the Graduate Certificate and Master of Translational Medicine Programs, along with related courses. The Department also promoted the 4th Bootes Course on Translational Medicine, with the theme Stem Cells in Human Health, hosting speakers from the ANU, CSIRO, Monash University and University of Melbourne, and attracting close to 40 registered attendees.

In our community outreach initiatives, we hosted a Clinical Research Open Day on 1 June, attended by almost 200 members of the community, who learned about our research into obesity and hypertension. We also participated in ANU Open Day. We took these opportunities to expand public awareness, to foster avenues for philanthropic funding and to recruit research participants for our clinical projects.

Our research aims at understanding the endocrine-neuroimmune-gene interactions of relevance to human disease, particularly obesity and depression, both as separate entities and interfacing disorders. We aim at leading by example by engaging with basic, clinical and population researchers. Because of our broad interest, we are well suited to interact with researchers working at different levels (basic science, clinical and population research), as well as private companies.

This line of work includes studies aimed at identifying molecular pathways and regulatory mechanisms that are activated in the brain and peripheral tissues by inflammatory stress. By studying the changes in gene expression in the hypothalamus, adrenals and spleen, before and after the induction of systemic inflammatory response syndrome (SIRS) through the injection of bacterial lipopolysaccharides, we have identified genes that could aid in the development of biomarkers or therapeutic agents against SIRS and sepsis.

By transplanting fat from normal mice into genetically obese, leptin-deficient mice (ob/ob) (See Figure), we have shown that cells from the implant migrate into distant organs of the recipient mice. This suggests that the distant infiltration of graft-originated, leptin-producing cells contributes to the improvement of diabetes and to remarkable weight loss in those genetically obese mice. Our ongoing studies will characterise the effects and nature of those adipose-derived cells that infiltrate distant organs after fat transplantation, by performing metabolic, histologic, hormonal, genomic and flow cytometry analyses. Our model will demonstrate the interactions between the adipose tissue and distant organs, providing the foundation for the development of novel therapies based on fat transplantation against diabetes and obesity.

In our clinical studies, we aim at understanding how body fat, high blood glucose, high blood lipids and high blood pressure affect mood, quality of life and overall brain function (such as memory, logic and ability to solve puzzles). In addition, by employing whole exome sequencing, we have been able to identify novel genes that might be associated with severe early-onset obesity in children. In one particular case of a severely obese child, we were able to identify the first human case of a novel mutation in a gene that is closely related to the regulation of body weight, through the leptin-melanocortin pathway in the hypothalamus.

Body weight comparison between a leptin-deficient (right) and leptin-sufficient (left) mice.
The Australian Phenomics Facility (APF) is the School's nationally accessible service organisation for creating, characterising and curating mouse models of human disease. Biomedical researchers use the APF’s large-scale research infrastructure to investigate a range of biological questions to better understand the genetic components underlying a wide range of human diseases and access disease models for the development of new therapies. In conjunction with the activities located in the Hugh Ennor Building the APF also manages the resources in the School’s containment suites, the Director’s Lab and the Stage 3 animal facilities.

During 2013 the facility continued to receive Federal Government support from the Education Investment Fund Super Science Program and the newly created Collaborative Research Infrastructure Scheme. The year focused on introducing a systems approach and improved client services. Towards this end the facility developed the APF Client Service Charter, released a new unified sample storage database and created new reporting functions within the APF’s animal management database.

Throughout 2013 the APF continued to expand the Missense Mutation Library (MML) to a capacity of 12,833 Single Nucleotide Variants (SNVs) publically listed and providing the Australian research community with thousands of mutant mice for use in understanding disease biology. The mutations listed on the MML have been integrated with third-party databases to enhance their content value which include Mutagenetix, Orphanet rare diseases, novel genes, protein domains, SIFT predictions and PubMed. The release of the ‘Gene Watch’ feature also resulted in an expanding list of subscribers monitoring close to 1000 different genes.

The APF continued to support the Australian Phenome Bank (APB) – a centralised repository for all genetically modified mouse strains held in Australia either live or as cryopreserved material. The associated public database, now containing a total of 3,499 strains, allows researchers to search for murine strains, housed or archived in Australia, carrying mutations in particular genes, strains with transgenic alterations and for mice with particular phenotypes, http://pb.apf.edu.au/phenbank. Of these strains, 1,961 are contained within the frozen archive and after successfully implementing improved mouse IVF techniques the team successfully re-animated 65 strains from the cryopreserved sperm stock.
International highpoints came in the visits to Rome, Spain, China, Singapore, Japan and Korea where APF staff presented on the significant mouse resources available through the facility and associated collaborative partners. The facility was welcomed as a new member of the Asian Mouse Mutagenesis Resource (AMMRA) and Phenotyping Consortium (AMPC). This facilitates researcher access to mouse resources in Asia and standardise phenotyping protocols and genetic background controls that are crucial for comparing data from different research laboratories. As part of the new alliance, in 2014, the APF will host the Annual Meeting of the AMPC alongside presenting the School’s 16th Frank & Bobbie Fenner Conference “Towards precision medicine: Phenotyping human diseases in mice.\\n\\n**Highlights\\n\\n> Colony Management - In addition to regular animal care each week, (managing around 9000 cages), the team freed up valuable researcher time by performing various tasks including breeding management, routine examinations, injections, genotyping and sample collection, as well as providing comprehensive training for new students and researchers utilising the facility.

> Genome Sequencing - The APF acquired new automated high throughput equipment to remove the reliance on manual processing of samples and streamlines the enrichment of DNA libraries for the exome sequencing pipeline. This equipment and was funded by an ANU Major Equipment Grant and contributions from several research groups within the ANU.

> Facility Outreach - APF databases for the MML and APB were revamped with a new look-and-feel for a stronger online presence, resulting in 2071 and 1596 unique visitors to the websites respectively. They also gained additional international exposure through connection to other popular research groups websites: International Mouse Phenotyping Consortium (mousephenotype.org) and International Mouse Strain Resource (findmice.org).

www.apf.edu.au

pb.apf.edu.au
The Imaging and Cytometry Facility provides access to imaging and flow cytometry equipment and a histology service as well as technical expertise, support and training. The facility’s services are available to all researchers and students and other interested parties across ACT.

The flow cytometry lab supports a wide range of flow cytometry techniques including full service multi-parametric cell sorting of up to 30,000 per second and single cell sorting as well as supported self-service analysis of complex cell populations using benchtop flow cytometers. The latest versions of analysis software, FlowJo and BD Diva, are available to use with training and support. A 561nm laser was added this year to the BD Fortessa benchtop flow cytometer which has increased the number of parameters to 18 for this instrument. Further upgrades to other instruments are planned for early 2014.

The imaging labs provide access to high end confocal and multi-photon microscopy as well as live and fixed cell and tissue fluorescence and light microscopy. Analysis software is available for quantification of images including Imaris, Mediacy ImagePro and Auto Deblur and Leica Deconvolution. This year saw the setup of a new small animal imaging suite in the Facility. The Perkin Elmer IVIS Spectrum and Quantum FX micro CT were installed in April 2013. This instrumentation was previously unavailable in the ACT and is used for non-invasive longitudinal monitoring of disease progression, cell trafficking and gene expression pattern in living animals. The IVIS Spectrum optical imaging system is able to image, with high-sensitivity, in-vivo fluorescence and bioluminescence at a resolution to 20 microns. It features 28 high efficiency filters spanning the range of 430 – 850nm, can image in epi- or trans-illumination fluorescence mode, create a 3D tomographic reconstruction for both fluorescence and bioluminescence and allows a high throughput of up to five mice per image.

The Quantum FX micro CT is a fast, low dose instrument with a resolution to 10 microns. With fast imaging speeds as short as 17 seconds the instrument is suited for projects with a large number of samples as well as in-vivo imaging. Images from both instruments can be easily co-registered i.e. an optical 3D tomographic image can be merged with the micro computed tomographic image to show functional optical signals with anatomical detail. A number of training sessions have been run since April this year to introduce this equipment to researchers.

The Histology lab is a full service, fast turnaround area with a very experienced histologist who provides advice to both experienced researchers and novice users. Along with routine stains and techniques, a large number of special stains and techniques are available on request.

http://jcsmr.anu.edu.au/research/research-facilities/microscopy-cytometry-resource-facility-mcrf
The Australian Cancer Research Foundation, Biomolecular Resource Facility (BRF) provides consultancy and service provision in the areas of genetic sequencing, peptide synthesis, mass spectrometry, tetramer synthesis, chromatography and antibody purification to ANU researchers, as well as the wider scientific community.

High Throughput DNA sequencing (HTS) continues to constitute a significant proportion of the BRF workload. The BRF is a service node of Genomics Australia (part of Bioplatforms Australia). As part of this consortium, we have been sequencing genomes and biopsies from a large cohort of melanoma patients. We finished sequencing all samples in the middle of the year. Data analysis for all consortium samples is being done at JCSMR and was ongoing throughout 2013.

Other large-scale projects include providing sequencing for the Australian Phenomics Facility at JCSMR for identification of single nucleotide polymorphisms in mutant mouse strains. The facility acquired significant new equipment during 2013. Major Equipment Committee funds were awarded for a new Illumina MiSeq. This is a benchtop next generation sequencer made to have smaller output compared with our larger instrumentation. Its applications include sequencing small bacterial genomes, or targeted amplification on regions of interest, suitable for the clinical setting. On the theme of large-scale analysis, we acquired a Perkin Elmer LabChip GX which is a high throughput microfluidics platform which can assess the quality and quantitation of DNA and RNA in a high throughput manner, being able to analyse 96 samples in less than an hour. Similarly, we were able to add functionality to one of our Realtime PCR instruments with an Open Array platform. This allows real-time PCR assays for SNP genotyping, gene expression and miRNA expression with 12,000 data points per run enabling large scale population studies looking at a large number of genes. For the protein biologists, we now house the Millipore Direct Detect system which is an infrared based technology allowing accurate quantitation of biomolecular samples such as proteins and peptides, lipids and carbohydrates. This platform is distinct because only small volumes of protein are required and measurements can occur in complex mixtures and buffers.

brf.anu.edu.au
Staff and Student achievements

Graduates
Prizes and Awards
GRADUATES

PhD

Mark James Abraham
Challenges and Progress with Molecular Dynamics Simulation of Disordered Peptides

Animesh Agrawal
Rubisco Sequence-Structure-Function: Coevolution and Codon Bias of rbcl Gene

Long Chen
Understanding the Mechanism that Regulates LINE-1 Retrotransposons in Breast Cancer Cells

Hugh French
The Influence of Genetic Variation on Inducible Gene Expression

Alexander Hadjinicolaou
Optimal Electrical Activation of Retinal Ganglion Cells

Sau Kuen Lee
Understanding Pathogenic and Physiological T Follicular Helper Cell Formation

Ryan Robert Taylor
Neural Computation of Statistical Structure

Yang Xi
Adjuvant Activity of Interferon Epsilon and Toll-Like Receptor-9 to Enhance HIV-Specific Mucosal Immunity

MNeuroscience (Research)

Daniela Andrea Espinoza Oyarce
Eva Pillai

MTranslational Medicine

Zheyi Li
Shali Zhao

Neuroscience Honours

Haihan Jiao
Andrew Micallef
Tanja Racic
Iris Zhu
Mr Hannes Bergmann
Travel award to attend the 2nd IFReC-SlgN Winter School on Advanced Immunology, Sentosa Island, Singapore
Best Oral Presentation 2nd IFReC-SlgN Winter School on Advanced Immunology, Sentosa Island, Singapore
ASI Travel Bursary to attend the 43rd Annual Meeting of the Australasian Society For Immunology, Wellington, NZ

Mr Daniel Chaston
American Physiological Society, Cardiovascular Research Recognition Award

Ms Fui Jiun Choong
TTS/IPITA Young Investigator Travel Award to attend the 14th World Congress of International Pancreas and Islet Transplantation Association (IPITA) Monterey, CA, USA
Transplantation Society of Australia and New Zealand Travel Award
Transplantation Society of Australia and New Zealand Young Investigator Book Prize

Dr Anselm Enders
The inaugural Gordon Ada Early Career Researcher Award – presented to an early career researcher at JCSMR who has made major contributions to biomedical research

Dr Edward Bertram
JCSMR Director’s Travel Award to attend the 2013 Translational Research and Entrepreneurship Short Course at Indiana University – Purdue University Indianapolis, Indianapolis, IN, USA

Nilisha Fernando
Best student poster presentation: 3rd International Conference on Clinical and Experimental Ophthalmology, Chicago, IL, USA

Professor Chris C Goodnow
Elected as a member of the US National Academy of Sciences
Professor Jill E Gready
The Future Justice Prize

Dr Rebecca Haddock
Young Investigator Award: Joint Australian and New Zealand Microcirculation Society, Australian Vascular Biology Society Meeting, Barossa Valley, SA
Radiation Oncology Private Practice Trust Fund Award: Best Laboratory Research Oral Presentation, Canberra Hospital Annual Research Meeting, Canberra, ACT

Mr Yogesh Jeelall
Lorne Cancer Conference Travel Bursary to attend 2013 meeting, Lorne, VIC

Mr Mayank Khanna
JCSMR Director's Travel Award to attend the 2013 Translational Research and Entrepreneurship Short Course at Indiana University – Purdue University Indianapolis, Indianapolis, IN, USA

Ms Candice Lee
JCSMR Director's Travel Award to attend the 2013 Translational Research and Entrepreneurship Short Course at Indiana University – Purdue University Indianapolis, Indianapolis, IN, USA

Ms Suhyun Lee
Invited Guest Speaker Award – Oral presentation and Press Conference through the Featured Poster Session, The Endocrine Society Meeting, San Francisco, CA, USA

Mr Shaun Lehmann
ANU Chancellor's Letter of Commendation for outstanding academic performance

Dr Yalin Liao
Awarded The John Stocker Postdoctoral Fellowship 2014-2017
Conference Travel Grant to attend Global Young Scientist Summit, One North, Singapore

Ms Susan Morton
Best Oral Presentation Prize: Now you see it, now you don't: Switchable Transgenic Mice, The Australian Society for Medical Research (ASMR), ACT Branch New Investigators Forum, Canberra, ACT
Best Oral Presentation involving Biochemistry (ASBMB) Prize: Now you see it, now you don't: Switchable Transgenic Mice.

Professor Christopher R Parish
Named Director of The John Curtin School of Medical Research
The 3rd Annual John Curtin Lecture: Cancer: Is a vaccine possible?

Dr Gilberto Paz–Filho
The Endocrine Society Promotion and Tenure Workshop Travel Grant Award

Mr Alvin Pratama
Student Presentation Prize: ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

Professor Jan Provis
ANU College of Science Award: Outstanding Contribution to Student Learning

Ms Jennifer Robertson
Winner: 3-Minute Thesis competition, The John Curtin School of Medical Research, ANU, Canberra, ACT
Winner, 3-Minute Thesis competition, ANU College of Medicine, Biology and Environment, ANU, Canberra, ACT
Runner-up: 3-Minute Thesis competition, The Australian National University, Canberra, ACT
Dr Zahra Sabouri
Poster prize: The Australian Society for Medical Research (ASMR), ACT Branch New Investigators Forum, Canberra, ACT

Ms Tennille Sibbritt
Promega Student Award for Research Excellence: Gene expression and Organisation, 34th Annual Lorne Genome Conference, Lorne, VIC
Vice-Chancellor’s Higher Degree Research Travel Grant to attend the 18th Annual Meeting of the RNA Society, Davos, Switzerland
RNA 2013 Travel Fellowship: 18th Annual Meeting of the RNA Society, Davos, Switzerland

Dr Charmaine Simeonovic
Transplantation Society of Australia and New Zealand (TSANZ) Travel Award to attend the 14th World Congress of the International Pancreas and Islet Transplant Association Meeting, Monterey, CA, USA

Ms Monika Srivastava
Australasian Society of Immunology International Post-graduate Travel Award to attend the EMBL Conference, Heidelberg, Germany

Dr Rebecca Sweet
American Association of Immunologists Travel Grant to attend the 15th International Congress of Immunology, Milan, Italy

Professor David Tremethick
The inaugural ANU College of Medicine, Biology and Environment Prize for Outstanding Research Achievement, awarded in recognition of a particularly meritorious paper or papers that were published in the preceding calendar year

Ms Shubhanshi Trivedi
ANU Vice-Chancellor’s High Degree Research Travel Grant Award to attend the International Congress of Mucosal Immunology meeting, Vancouver, BC, Canada

Dr Krisztina Valter-Kocsi
Awarded a Senior Fellowship in The Higher Education Academy, UK

Dr Harpreet Vohra
Australian Endeavour Fellowship from The Australian Government for travel to Stanford University “to develop knowledge and skills in flow cytometry using new cutting edge technology currently unavailable in Australia”

Mr James Q Wang
Lorne Cancer Conference Travel Bursary to attend 2013 meeting, Lorne, VIC

Mr Danushka K Wijesundara
The Alan and Elizabeth Finkel Prize Travel Bursary to attend Keystone Symposium: HIV Vaccines (X2), CO, USA

Mr Mehmet Yabas
ASI Travel Bursary to attend the 43rd Annual Meeting of the Australasian Society For Immunology, Wellington, NZ
ASI Postgraduate International travel Award to attend Keystone Symposium: B Cell Development and Function, Keystone, CO, USA
Visitors and Collaborations

Research Collaborations and Visitors to the School

Visitors to JCSMR present their research findings through Group, Department or School Seminars and workshops, and collaborate with our staff and students in our world-class research facilities.

Staff and students at JCSMR continue to enjoy close collaborative ties with other researchers at The Australian National University. In addition, they enjoy scientific associations with colleagues locally, regionally, nationally and internationally.
Dr John Altin
Applications Development, Prognosys Biosciences, San Diego, CA, USA

Dr Claire Anderson
Division of Plant Science, Research School of Biology, The Australian National University, Canberra, ACT

Professor Kaarin Anstey
Centre for Research on Ageing, Health and Wellbeing, Research School of Population Health, The Australian National University, Canberra, ACT

Dr Tal Arnon
Department of Microbiology & Immunology, University of California, San Francisco, CA, USA

Assistant Professor Regan Ashby
The Faculty of Education, Science, Technology and Mathematics, University of Canberra, Bruce, ACT

Professor Emily Banks
National Centre for Epidemiology and Population Health, The Australian National University, Canberra, ACT

Professor Mark Bellgrove
School of Psychology and Psychiatry, Monash University, Clayton, VIC

Dr Rachel Bashford-Rogers
Wellcome Trust Sanger Institute, Cambridge, UK

Dr Purmina Bhat
University of Queensland Diamantina Institute, Brisbane, QLD

Dr Brian Billups
Department of Pharmacology, University of Cambridge, Cambridge, UK

Professor Roland Brandt
Department of Neurobiology, University of Osnabrück, Osnabrück, Germany

Assistant Professor Timothy Bredy
Queensland Brain Institute, The University of Queensland, Brisbane, QLD

Dr Anne Bruestle
Campbell Family Cancer Research Institute, Toronto, ON, Canada

Associate Professor Richard Callaghan
Human Disease and Membrane Transport Laboratory, Research School of Biology, The Australian National University, Canberra, ACT

Dr Rafael Casellas
Genomics and Immunity Section and Laboratory of Molecular Immunogenetics, The National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health, Bethesda, MD, USA and Center for Cancer Research, National Cancer Institute, Bethesda, MD, USA

Professor Rhodri Ceredig
Regenerative Medicine Institute, National University of Ireland, Galway, Ireland

Professor Macdonald Christie
Pharmacology, School of Medical Sciences, Sydney Medical School, The University of Sydney, Sydney, NSW

Dr Rebecca Coill
School of Biochemistry & Immunology, Trinity Biomedical Sciences Institute, Dublin, Ireland

Dr Lyndsey Collins-Praino
Taub Institute for Research on Alzheimer's Disease and the Aging Brain, Columbia University Medical Center, New York, NY, USA

Professor Michael Cowley
Department of Physiology, Monash University, Clayton, VIC

Dr Amanda Craig
Translational Neuroscience Facility and Department of Physiology, University of New South Wales, Randwick, NSW

Mr Alex Delbridge
Molecular Genetics of Cancer Division, The Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC

Professor Geoff Farrell
ACT Health, ANU Medical School and Liver Research Unit, Canberra Hospital, Canberra, ACT

Professor Mark A Febbraio
Cellular and Molecular Metabolism Laboratory, Baker IDI Heart & Diabetes Institute, Melbourne, VIC

Professor Robert French
Department of Physiology and Pharmacology, Medicine, University of Calgary, Calgary, Alberta, Canada

Dr Thaddeus C George
DVS Sciences, Sunnyvale, CA, US

Dr Bronwyn Gunn
Department of Microbiology and Immunology, University of North Carolina School of Medicine, Chapel Hill, NC, USA

Professor Glenda Halliday
Neuroscience Research Australia, Sydney, NSW

Professor Douglas Hanahan
Swiss Institute for Experimental Cancer Research, Lausanne, Switzerland and School of Life Sciences, The Swiss Federal Institute of Technology, Lausanne, Switzerland

Professor Philip Hogg
Lowy Cancer Research Centre, Sydney, NSW

Dr Jeff Holst
Centenary Institute of Cancer Medicine and Cell Biology, Camperdown, NSW

Professor Marc Jenkins
Department of Microbiology, University of Minnesota, Minneapolis, MN, USA

Dr Victoria Johnston
Department of Physiology, Monash University, Clayton, VIC

Dr Axel Kallies
Division of Molecular Immunology, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC

Professor Moustapha Kassem
Laboratory of Molecular Endocrinology, Medical Biotechnology Centre, University of Southern Denmark, Odense, Denmark

Professor Rajiv Khanna
Australian Centre for Vaccine Development, Queensland Institute of Medical Research, Brisbane, QLD
Assistant Professor Evelyn Lambe  
Department of Physiology, University of Toronto, Toronto, ON, Canada

Associate Professor Mong-Hong Lee  
Department of Molecular and Cellular Oncology, The University of Texas MD Anderson Cancer Center and The University of Texas Graduate School of Biomedical Sciences, Houston, TX, USA

Professor Gordon Lynch  
Department of Physiology, The University of Melbourne, Melbourne, VIC

Professor Vaughan Macefield  
Integrative Physiology, School of Medicine, University of Western Sydney, Campbelltown, NSW

Professor Charles Mackay  
Department of Immunology, Monash University, Clayton, VIC

Associate Professor Alexander Maier  
Biomedical Sciences and Biochemistry, Research School of Biology, The Australian National University, Canberra, ACT

Dr Judith Mandl  
Lymphocyte Biology Section, Laboratory of Systems Biology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, USA

Professor Sonya Marshall-Gradisinik  
National Centre for Neuroimmunology and Emerging Diseases, Griffith Health Institute, Griffith University, Gold Coast, QLD

Professor David McConkey  
Department of Cancer Biology and Department of Urology, University of Texas MD Anderson Cancer Center, Houston, TX, USA

Professor Eileen McLaughlin  
School of Environmental and Life Sciences, The University of Newcastle, Newcastle, NSW

Dr James Murphy  
The Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC and Department of Medical Biology, University of Melbourne, Melbourne, VIC

Professor Daniel Osorio  
School of Life Sciences, University of Sussex, Sussex, UK

Dr Justin O’Sullivan  
The Liggin Institute, University of Auckland, Auckland, New Zealand

Dr Weiming Ouyang  
US Food and Drug Administration, USA

Professor Ed Palmer  
Laboratory of Transplantation Immunology & Nephrology, The Basel Institute for Immunology Basel, Switzerland

Dr Jose Polo  
Reprogramming and Epigenetics Laboratory, Monash University, Clayton, VIC

Dr Satyajit Rath  
National Institute of Immunology, New Delhi, India

Professor Linda Richards  
Queensland Brain Institute, The University of Queensland, Brisbane, QLD

Dr Alice Richardson  
Mathematics & Statistics Academic Program, The University of Canberra, Bruce, ACT

Dr Samantha Salvage  
Department of Physiology, Development and Neuroscience, University of Cambridge, Cambridge, UK

Professor Tim Senden  
Department of Applied Mathematics, Research School of Physics and Engineering, The Australian National University, Canberra, ACT

Professor Frances Separovic  
School of Chemistry, Bio21 Institute, The University of Melbourne, Melbourne, VIC

Dr R Shankar  
CSIR Institute of Himalayan Resource Technology, Palampur, India

Dr Nikolay Shirokikh  
Moscow Regional State Institute of Humanities and Social Studies, Ministry of Education of Moscow Region, Kolomna, Moscow Region, Russia

Dr Avinash R Shenoy  
Faculty of Medicine, Department of Medicine, Imperial College, London, UK

Professor Rob Shepherd  
Bionics Institute, Melbourne, VIC

Associate Professor Barry Slobedman  
Cytomegalovirus Research Group, Westmead Millennium Institute of Medical Research, Sydney, NSW

Dr Kosuke Takemura  
Department of Human Pathology, Tokyo Medical and Dental University, Tokyo, Japan

Professor Patrick Tam  
Embryology Research Unit, Children’s Medical Research Institute, Westmead, Sydney, NSW

Professor Narci Teoh  
School of Clinical Medicine, ANU Medical School and Gastroenterology and Hepatology Research Unit, Canberra Hospital, Canberra, ACT

Associate Professor Michael Valenzuela  
Regenerative Neuroscience Group, Brain & Mind Research Institute, University of Sydney, Sydney, NSW

Scientia Professor Fred Westbrook  
School of Psychology, University of New South Wales, Randwick, NSW

Dr Murray Whitelaw  
School of Molecular and Biomedical Science, University of Adelaide, Adelaide, SA

Dr Vihandha Wickramasinghe  
MRC Cancer Unit, University of Cambridge, Cambridge, UK
COLLABORATIONS

Dr T Dan Andrews
Professor N Hayward Queensland Institute of Medical Research, Brisbane, QLD
Professor G Mann Westmead Hospital, Sydney, NSW
BioPlatforms Australia, Sydney, NSW

Dr T Dan Andrews and Professor Chris C Goodnow
Genetic determinants of clinical response to TNF antagonist drugs in rheumatoid arthritis
Dr C Perera, Canberra Hospital, Canberra, ACT

Ms Nurdiana Anuar, Professor David Tremethick and Dr Tatiana A Soboleva
An investigation on the role of histone variant H2A.Lap1

Dr Ehsan Arabzadeh
Whisker sensory system, from receptor to behaviour

Professor M Diamond International School for Advanced Studies, Trieste, Italy
Informational basis of sensory adaptation

Professor C Clifford Department of Psychology, University of Sydney, Sydney, NSW
Neuronal and behavioural correlates of choice

Professor F Westbrook Department of Psychology, University of New South Wales, Sydney, NSW
The role of context in sensory processing

Dr N Price Department of Physiology, Monash University, Clayton, VIC

Associate Professor Mauricio Arcos-Burgos
Genetics of ADHD and disruptive behaviours

Dr M Muenke National Human Genome Research Institute, National Institutes of Health, Bethesda, MD, USA

Dr M Casas, Dr J-A Ramos-Quiroga and Dr M Ribases Vall d’Hebron Institut de Recerca (VHIR) through the International Multicentre Persistent ADHD Collaboration Consortium (IMPACT), Barcelona, Spain

Dr MT Acosta Children’s National Hospital, Children’s Research Institute (CRI), Washington, DC, USA
Genetics of autoimmune disorders

Dr J-M Anaya Centre for Autoimmune Diseases Research, University of Rosario, Bogota, Colombia
Genetics of ADHD

Dr M Bellgrove School of Psychological Sciences, Monash University, Melbourne, VIC
Genetics of Major Depressive Disorder and genetics of Morbid Obesity

Professor J-Licinio and Professor M-L Wong Translational Medicine, Flinders University, Adelaide, SA and South Australian Health and Medical Research Institute, Adelaide, SA
Genetics of ADHD and substance use disorders

Dr E Proal Neuroingenia, Mexico City, Mexico
Genetics of substance use disorders

Dr J DeLeon Department of Psychiatry, University of Kentucky, Lexington, KY, USA
Genetics of ADHD

Dr F Levy School of Psychiatry, University of New South Wales, Randwick, NSW
Genetics of Alzheimer’s Disease and mild cognitive impairment, and genetics of dysphoria

Neurosciences Group University of Antioquia, Medellin, Antioquia, Colombia

Associate Professor John M Bekkers
Excitability and hyperexcitability of neural circuits in the rodent piriform cortex

Professor S Nelson Brandeis University, Waltham, MA, US
Professor G Augustine National University of Singapore, Singapore and Korea Institute of Science and Technology, Seoul, Republic of Korea

Dr M McDonnell Institute of Telecommunications Research, University of South Australia, Adelaide, SA
Test of novel anticonvulsants for clinical applications

Dr J Daniel Children’s Medical Research Institute, University of Sydney, Sydney, NSW

Dr Andrew Bell
Studies of otoacoustic emissions from the human cochlea

Dr W Jedrzejczak Institute of Physiology and Pathology of Hearing, Warsaw, Poland

Dr Edward M Bertram
Role of TNF family member LIGHT in EAE

Dr M Staykova, Dr D Linares and S Fordham Neurosciences Research Unit, The Canberra Hospital, Canberra, ACT

Dr K Pfeffer and Dr S Scheu Institute of Medical Microbiology and Hospital Hygiene, University of Dusseldorf, Dusseldorf, Germany
Identifying genes involved in Sensory and Metabolic pathways

Professor JK Seong, Seoul National University, Seoul, Republic of Korea
Dr Edward M Bertram and Professor Chris C Goodnow
China-Australia Centre for Phenomics Research

Professor H Tang Centre for Infection and Immunity, Chinese Academy of Sciences, Institute of Biophysics, China

Dr Edward M Bertram, Ms Belinda Whittle, Dr T Dan Andrews and Mr Matthew Field
Identifying genes involved in EAE and immunity
Dr J Gommerman and Dr L Osborne University of Toronto, ON, Canada
Identifying rare disease genes
Dr T Dudding, Dr B Kamien, Dr H Goel and Dr A Ronan Hunter Genetics, Newcastle, NSW

Dr Anneke C Blackburn
Mouse mammary tumour susceptibility loci
Professor DJ Jerry Veterinary and Animal Sciences, University of Massachusetts, Amherst, MA, US
Targeting breast cancer with dichloroacetate and the mitochondrial toxin PENAO
Professor PJ Hogg and Dr PJ Dilda Lowy Cancer Research Centre, University of New South Wales, Sydney, NSW
Targeting of Two Aspects of Metabolism (TOTAM) for Cancer Therapy
Professor JE Dahstrom Anatomical Pathology, ACT Pathology, Canberra Hospital and ANU Medical School, The Australian National University, Canberra, ACT and Associate Professor D Yip Medical Oncology, Canberra Hospital, Canberra, ACT and ANU Medical School, The Australian National University, Canberra, ACT

Human breast cancer modifier gene discovery through the Kathleen Cunningham Foundation Consortium for Research into Familial Breast Cancer (kConFab)
Dr A Spurdle The Molecular Cancer Epidemiology Laboratory, Queensland Institute of Medical Research, Brisbane, QLD

Dr G Chenevix-Trench Cancer Genetics Laboratory, Queensland Institute of Medical Research, Brisbane, QLD
Understanding anthracycline induced cardiotoxicity
Dr N Beard, University of Canberra, Bruce, ACT

Professor Philip G Board
Determination of glutathione transferase structures
Professor M Parker St Vincent’s Medical Research Institute, Melbourne, VIC
Function of Zeta and Omega class GSTs
Professor MW Anders Department of Pharmacology and Physiology, University of Rochester Medical Centre, Rochester, NY, US
Structure of γ-glutamyl cyclotransferase
Associate Professor A Oakley School of Chemistry, University of Wollongong, Wollongong, NSW
The expression of γ-glutamyl cyclotransferase in human cancer
Professor Y Eishi and Dr K Takemura Department of Human Pathology, Tokyo Medical and Dental University, Tokyo, Japan
The role of Omega class GSTs in TLR4 signalling
Professor L Neill and Dr R Coll School of Biochemistry and Immunology, Trinity Biomedical Sciences Institute, Trinity College, Dublin, Ireland

Dr Marco G Casarotto
Molecular recognition of the ryanodine receptor
Dr M Samso Department of Physiology and Biophysics, VCU School of Medicine, Richmond, VA, US
Determination of glutathione transferase structures
Professor M Parker Biota Structural Biology Laboratory, St Vincent’s Institute, Melbourne, VIC
Interactions between the alpha and beta subunits of the dihydropyridine receptor
Associate Professor A Oakley Department of Chemistry, University of Wollongong, Wollongong, NSW
Structure and function of lysine demethylase enzymes
Dr S Rao Department of Applied Science, University of Canberra, Canberra, ACT
Effects of drugs that block Vpu ion channels
Professor W Fischer School of Biomedical Science and Engineering, National Yang-Ming University, Taipei, Taiwan
Design and development of M2 influenza A inhibitors
Professor W Hu Guangzhou Institute of Biomedicine and Health, Chinese Academy of Sciences, Science Park, Guangzhou, China

Mr Aaron Chuah
Alpine Frog and Bettong Genotyping by Sequencing
Dr S Banks Fenner School of Environment and Society, The Australian National University, Canberra, ACT
Genotyping by Sequencing
Dr J Borevitz Research School of Biology, The Australian National University, Canberra, ACT
Tomato RNA-seq Differential Expression Analysis
Dr A-M Catanzariti Research School of Biology, The Australian National University, Canberra, ACT
Arabidopsis RNA-Seq Differential Expression and Degradome Investigation

Dr C Helliswell CSIRO Plant Industry, Canberra, ACT
Genotyping by Sequencing Australian Native Plants
Dr E James Royal Botanic Gardens, Melbourne, VIC
Abalone and Alpine Plant Genotyping By Sequencing
Dr A Miller Departments of Zoology and Genetics, Faculty of Science, The University of Melbourne, Melbourne, VIC
Transcriptome sequencing and differential expression analysis of four Arabidopsis cultivars
Dr Iain Searle School of Molecular and Biomedical Science, University of Adelaide, SA
Mr Aaron Chuah and Professor Trevor Lamb
TriPyGDU: Transcriptome-RNAseq Interactive Python Graphical Data Unifier

Dr D Hunt Lions Eye Institute & University of Western Australia Oceans Institute, The University of Western Australia, Perth, WA

Associate Professor Ian Cockburn
Imaging the CD8+ T cell response to malaria parasites in the liver

Dr R Amino and Dr R Menard Institut Pasteur, Paris, France
Assistant Professor V Ganusov Theoretical Immunology Laboratory, University of Tennessee, Knoxville, TN, USA
Understanding B cell responses to malaria vaccine antigens at the single cell level

Dr R Seder Vaccine Research Centre, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, USA
Dr Francis Ndungu Kenya Medical Research Institute, KEMRI-Wellcome Trust Research Programme, Kilifi, Kenya
Professor Kevin Marsh Nuffield Department of Medicine, University of Oxford, Oxford, UK

Professor Matthew C Cook
Australian and New Zealand Antibody Deficiency Allele (ANZADA) study

Dr S Adelstein and Dr R Garsia Department of Immunology, Royal Prince Alfred Hospital, Camperdown, NSW
Dr T DeMalmanc. HAPS Immunology, Newcastle, NSW
Dr P Hisssaria Royal Adelaide Hospital, Adelaide, SA
Dr M French School of Pathology and Laboratory Medicine, The University of Western Australia, Perth, WA
Dr S Choo Royal Melbourne Children’s Hospital, Melbourne, VIC
Professor D Campbell and Dr S Mehr The Children’s Hospital at Westmead, Westmead, NSW

Genomic medicine for human immune deficiency

Dr D Tscharke Research School of Biology, The Australian National University, Canberra, ACT
Dr D Fulcher Department of Immunopathology, The Children’s Hospital at Westmead, Westmead, NSW
A randomised trial to assess antibody and cellular responses to hepatitis B vaccine in patients with chronic kidney disease (VaccineCKD)

Dr K Karp Canberra Hospital, Canberra, ACT
CCR5 expression on B cells in immune deficiency

Professor H Korner University of Tasmania, Hobart, TAS
STAT3 and hyper IgE syndrome

Dr S Tangye Garvan Institute of Medical Research, Sydney, NSW

Professor Matthew C Cook and Dr Stephen Daley
Immune response after adult thymectomy

Professor G Chong Canberra Hospital, Canberra, ACT

Professor Matthew C Cook and Professor Chris C Goodnow
Cell of origin of B cell Non-Hodgkin’s lymphoma

Dr D Talauiikar Canberra Hospital, Canberra, ACT

Professor Matthew C Cook, Professor Chris C Goodnow and Professor Carola G Vinuesa
Australian point mutation in systemic lupus erythematosus (APOSLE) study

Professor P Gatenby Canberra Hospital, Canberra, ACT
Dr S Adelstein and Dr R Garsia Department of Immunology, Royal Prince Alfred Hospital, Camperdown, NSW
Dr D Mallon Fremantle Hospital, Fremantle, WA
Dr S Alexander The Children’s Hospital at Westmead, Westmead, NSW
Dr S Riminton Department of Immunology, Concord Repatriation General Hospital, Concord, NSW

Dr D Fulcher Department of Immunopathology, The Children’s Hospital at Westmead, Westmead, NSW

Dr Lucy Coupland
Mechanisms and novel treatment avenues for auto-immune cytopenias

Dr J D’Rozario and Dr P Crispin Haematology Department, Canberra Hospital, Canberra, ACT
Characterisation of erythrocyte abnormalities in hemoxygenase-1 deficient mice

Professor R Stocker, Dr R Winter and Dr S Fraser Sydney Medical School, The University of Sydney, Sydney, NSW

Dr Stephen Daley
Pulmonary hypertension caused by a novel ENU-induced variant of Tomm40

Professor L Arnolda The Canberra Hospital, Canberra, ACT and ANU Medical School, The Australian National University, Canberra, ACT

Dr Vincent Daria
Adaptive wavefront correction of efficient delivery of light through brain tissues

Dr S Lee Research School of Engineering, The Australian National University, Canberra, ACT
Synthesising photo-switchable nanoparticle agents for cell imaging and analysis

Dr A Tricoli Research School of Engineering, The Australian National University, Canberra, ACT
Analysing Soft-matter interactions using multiple beam optical tweezers

Professor E Sevick Research School of Chemistry, The Australian National University, Canberra, ACT
Professor Angela Dulhunty
Ryanodine receptor regulation in health and disease

Dr NA Beard Centre for Research in Therapeutic Solutions, University of Canberra, ACT
Various aspects of ryanodine receptor physiology

Dr D Laver Hunter Medical Research Institute, University of Newcastle, Newcastle, NSW
Contribution of splicing defects and mutations on ryanodine receptors function

Professor RT Dirksen and Dr L Wei Department of Pharmacology and Physiology, University of Rochester Medical Centre, Rochester, NY, USA
Actions of triadin and calsequestrin on excitation-contraction coupling

Professor RT Dirksen and Dr L Wei Department of Pharmacology and Physiology, University of Rochester Medical Centre, Rochester, NY, USA
CPVT mutations in the cardiac RyR

Professor M Varsanyi Institut für Physiologische Chemie, Ruhr Universität, Bochum, Germany
FRET analysis of DHPR beta subunit binding to the skeletal RyR

Professor B Fruen Biochemistry, Molecular Biology and Biophysics, University of Minnesota, Minneapolis, MN, USA
Accessory protein binding sites on the 3D profile of RyR1 and RyR2

Professor T Wagenknecht and Dr Z Liu Wadsworth Center, New York State Department of Health, Albany, NY, USA
The 3D location of the binding domains in RyR1

Assistant Professor M Samso Department of Physiology and Biophysics, Virginia Commonwealth University, Richmond, VA, USA
Abnormalities in ryanodine receptor activity in human heart failure

Professor C dos Remedios Department of Anatomy, The University of Sydney, Sydney, NSW
Single channel activity of RyRs from normal human and DM1 muscle

Professor K North and Dr N Clarke Discipline of Paediatrics and Child Health, The Children’s Hospital at Westmead, The University of Sydney, Sydney, NSW
New cardiac ryanodine receptor inhibitors for the treatment of heart failure

Professor L Arnolda Canberra Hospital, Canberra, ACT and ANU Medical School, The Australian National University, Canberra, ACT
Mutations in CLIC-2 proteins leading to ryanodine receptor channelopathy heart failure and intellectual deficit

Professor C Schwartz and Dr E Axelov JC Self Research Institute of Human Genetics, Greenwood Genetic Center, Greenwood, SC, USA and Department of Physics, Computational Biophysics and Bioinformatics, Clemson University, Clemson, SC, USA
Actions of \( \phi \)-LTX-Lw1a on ryanodine receptors

Professor J Smith and Professor P Alewood Institute for Molecular Biosciences, The University of Queensland, St Lucia, QLD
The roles of calsequestrin in fast and slow twitch skeletal muscle

Professor F Protasi CeSI, Center for Research on Ageing, Department of Neuroscience and Imaging, Università Gabriele d’Annunzio, Chieti, Italy
Effects of aging on the distribution of excitation-contraction coupling proteins in human skeletal muscle

Professor Paul Smith Trauma and Orthopaedic Research Unit, Canberra Hospital, Canberra, ACT
Effects of the beta subunit of the DHPR on excitation-contraction coupling

Professor M Schneider Biochemistry and Molecular Biology, University of Maryland School of Medicine, Baltimore, MD, USA

Dr Julia Ellyard and Professor Carola Vinuesa Loss-of-functional variants in AIRE

Professor P Peterson and Dr M Saare Institute of Molecular and Cell Biology, University of Tartu, Estonia
IFN-alpha secretion in SLE

Professor P Hertzog Centre for Innate Immunity and Infectious Diseases, Monash Institute of Medical Research, Melbourne VIC

Dr Anselm Enders Analysis of the putative phospholipid transporter ATP11C

Professor S Broer Research School of Biology, The Australian National University, Canberra, ACT
Analysis of liver tumor development in ATP11C deficient mice

Professor N Teoh Canberra Hospital, Canberra, ACT
Analysis of NKT development and function in mouse strains with ENU induced point mutations

Professor D Godfrey Department of Microbiology and Immunology, University of Melbourne, Melbourne, VIC
Analysis of MHC invariant chain processing and development of dendritic cells in SPPL2A deficient mice

Professor J Villadangos Department of Microbiology and Immunology, University of Melbourne, Melbourne, VIC
Genetic analysis of humans with immunodeficiency of unknown aetiology

Professor H Eibel and Professor S Ehl Centre for Chronic Immunodeficiency, Freiburg, Germany, Professor K Schwarz University of Ulm, Ulm, Germany
Dr Anselm Enders and Dr Edward M Bertram

Broad based phenotyping of genes that affect the immune system

Professor M Hrabe De Angelis, Dr H Fuchs and Dr V Gailus-Durner and the members of the German Mouse Clinic, Helmholtz Zentrum, Munich, Germany

Professor Chris C Goodnow

Human antibody repertoires

Dr D Dunn-Walters King’s College, London, UK Professor D Kipling Cardiff University, Cardiff, UK

Professor Chris C Goodnow and Dr Edward M Bertram

Role of hnRNPLL in generating protective immunity to mycobacteria tuberculosis

Dr B Saunders and Professor W Britton Mycobacterial Research Group, Centenary Institute of Cancer Medicine and Cell Biology, Sydney, NSW

Mutagenetix – A database of mutations and phenotypes induced by ENU

Professor B Beutler University of Texas Southwestern Medical Center, Dallas, TX, USA

International Mouse Phenotyping Consortium

Professor S Brown MRC Harwell, Oxford, UK

Professor Chris C Goodnow, Dr Edward M Bertram, Dr Katrina Randall and Dr Stephen Daley

Identifying genes for immunity and tolerance

Dr J Oyster, Professor L Lanier, Professor A Weiss and Dr Jeroen Roose University of California, San Francisco, CA, USA

Professor Chris C Goodnow and Professor Matthew C Cook

Nudflp1 aborts tolerogen-induced division and differentiation of CD4+ T cells to prevent Th2 inflammation and autoimmunity

Professor S Tan and Dr J Howitt Florey Neurosciences Institute, The University of Melbourne, Melbourne, VIC Dr S Kumar Centre for Cancer Biology, SA Pathology, Adelaide, SA Dr L Wu Department of Immunology, Genentech, San Francisco, CA, USA

Professor Chris C Goodnow and Dr Michael Dobbie

Australian Phenomics Network Project: ES cell to Mouse Service

Associate Professor I Smyth Department of Biochemistry & Molecular Biology Faculty of Medicine, Nursing & Health Sciences, Monash University, Clayton, VIC

Australian Phenomics Network Project: ENU Variant Collection

Professor B Kile Chemical Biology Division, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC

Professor S Foote Australian School of Advanced Medicine, Faculty of Human Sciences, Macquarie University, Sydney, NSW

Australian Phenomics Network Project: Mouse Pathology

Professor John Furness Autonomic and Sensory Neuroscience Laboratory, University of Melbourne, Melbourne, VIC

Professor N Dear Research and Biomedical Services, South Australian Health and Medical Research Institute, Adelaide, SA

Australian Phenomics Network Project: Australian Phenome Bank Cryopreservation

Dr P Sharp Animal Resources Centre, Murdoch University, Canningvale, WA

Australian Phenomics Network Project: RNAi technologies

Associate Professor R Teasdale Molecular Cell Biology Division, Institute for Molecular Bioscience, Brisbane, QLD Professor R Johnstone Gene Regulation Laboratory, Peter MacCallum Cancer Centre, Melbourne, VIC

Dr L Winteringham Leukaemia Research Group, The Harry Perkins Institute of Medical Research, Nedlands, WA

Dr R Dickins Molecular Medicine Division, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC

Professor Chris C Goodnow and Dr Anselm Enders

NKT cell mutations

Professor D Godfrey Department of Immunology, The University of Melbourne, Melbourne, VIC

Professor Chris C Goodnow, Dr Keiskuke Horikawa, Mr Yogesh Jeelall and Associate Professor Matthew C Cook

Human lymphoma mutations

Dr T Talaulikar Canberra Hospital, Canberra, ACT

Professor Chris C Goodnow and Dr Ian Parish

Imaging proximal T cell signalling

Professor K Gaus Centre for Vascular Research, University of New South Wales, Sydney, NSW
Professor Chris C Goodnow and Professor Carola G Vinuesa
Immunity and Infection Genomics Consortium

Dr R Cornall Nuffield Department of Clinical Medicine, Oxford University, Oxford, UK
Professor J Bell The Weatherall Institute of Molecular Medicine, Oxford University, Oxford, UK
Professor W Britton and Dr B Saunders Centenary Institute of Cancer Medicine and Cell Biology, The University of Sydney, Sydney, NSW
Professor M Lathrop National Centre for Genotyping, Evry, France

Professor Chris C Goodnow, Professor Carola G Vinuesa and Professor Matthew C Cook
Molecular and cellular studies of the adaptive immune response in health and disease

Professor C Mackay and Professor F Mackay-Fisson, Monash University, Clayton, VIC
Professor J Sprent, Emeritus Professor A Basten, Dr S Tangye, Dr R Brink and Dr Daniel Christ Garvan Institute of Medical Research, Sydney, NSW

Professor Chris C Goodnow and Ms Belinda Whittle
Melanoma Project and SNV Detection

Mr C Broadley Australian Genome Research Facility, Westmead, NSW

Professor Chris C Goodnow, Dr Steve WInslade and Dr T Dan Andrews
Framework Data Sets

Mr A Gilbert Bioplatforms Australia, Sydney, NSW

Professor Jill E Gready
Characterization of photosynthetic efficiency and nutritional quality of the “Inca” superfoods, potato and quinoa, of Andean for breeding improved cultivars with increase productivity and nutritional benefits

Dr C Rodriguez Universidad Técnica de Ambato, Ambato, Ecuador
Development of ANU technology for the design of variant Rubisco proteins with improved catalytic activity

Professor JE Evans Research School of Biology, The Australian National University, Canberra, ACT
Dr J van Rie and Dr A Gallé Bayer Bioscience, Ghent, Belgium

Dr Rebecca Haddock
Role of NOX-2 in obesity-related hypertension

Associate Professor GG Drummond
Department of Pharmacology, Monash University, Melbourne, VIC

Professor Caryl E Hill
Subcellular localisation of voltage dependent calcium channels and gap junctions in the vasculature

Dr SL Sandow Department of Pharmacology, School of Medical Sciences, The University of New South Wales, Sydney, NSW
Blood pressure recordings in freely moving animals

Dr R Brown Department of Physiology, Monash University, Melbourne, VIC
Modulation of gap junctional coupling by mutations in connexin40

Dr A Ashton Division of Perinatal Research, King’s College Institute of Medical Research, Royal North Shore Hospital, University of Sydney, NSW
Role of T-type calcium channels in vasoconstriction and blood pressure

Professor PB Hansen Department of Cardiovascular and Renal Research, University of Southern Denmark, Odense, Denmark
Modulation of hemi channel function by mutations in connexin40

Professor K Machaca Department of Physiology and Biophysics, Weill Cornell Medical College-Qatar, Education City, Doha, Qatar
Professor S Broer Research School of Biology, The Australian National University, Canberra, ACT
Modulation of gap junctional coupling in oocytes by mutations in connexin40

Professor BJ Nicholson Department of Biochemistry, University of Texas Health Sciences Center, San Antonio, TX, US

Associate Professor
Gavin Huttley

Reconstruction of coral phylogeny

Dr S Forêt Research School of Biological Sciences, The Australian National University, Canberra, ACT
Mathematical models of sequence divergence

Dr C Burden Mathematical Sciences Institute, The Australian National University, Canberra, ACT
Annotation of novel genomes; and, identifying genes undergoing natural selection

Dr A Papanicolaou CSIRO Ecosystem Sciences, Canberra, ACT
Development of a software library for genomic biology; numerous other projects related to the evolutionary dynamics of sequence divergence

Professor R Knight Department of Chemistry and Biochemistry, University of Colorado, Boulder, CO, USA
Development of Markov-process models to measure the influence of sequence-neighbourhoods on mutation dynamics

Associate Professor VB Yap
Department of Statistics and Applied Probability, National University of Singapore, Singapore
Associate Professor Gavin Huttley and Dr Åsa Pérez-Bercoff

Understanding the genetic causes of virulence in fungal pathogens

Professor W Meyer Molecular Mycology Research Laboratory, Centre for Infectious Disease and Microbiology, Westmead Millennium Institute, Westmead Hospital, Sydney Medical School Westmead, The University of Sydney, Westmead, NSW

Professor H Nevalainen and Professor I Paulsen Department of Chemistry and Biomolecular Sciences, Macquarie University, Sydney, NSW

Dr T Newsome School of Molecular Bioscience, University of Sydney, Sydney, NSW

Pathophysiological significance of reverse signalling through membrane TNF

Professor A Alcamí Centro de Biología Molecular Severo Ochoa, Madrid, Spain

Associate Professor Guna Karupiah, Dr Geeta Chaudhri and Professor Chris C Goodnow

Systems approach to immunity and inflammation

Professor R Ulevitch The Scripps Research Institute, La Jolla, CA, USA

Professor B Butler University of Texas Southwestern Medical Center, Dallas, Texas, USA

Professor A Adernet Seattle Biomedical Research Institute, Seattle, WA, USA

Professor G Nolan Department of Microbiology and Immunology, Stanford University, Palo Alto, CA, USA

Professor Trevor D Lamb

Evolution of the vertebrate eye

Professor SP Collin, Professor D Hunt and Associate Professor N Hart School of Animal Biology, University of Western Australia, Perth, WA

Recovery of human cone photoreceptors following bleaching

Dr O Mahroo Department of Physiology, Development and Neuroscience, University of Cambridge, Cambridge, UK

Associate Professor Brett Lidbury

Systematic review and meta-analyses as a complementary technique to enhance predictions from pattern recognition involved in a novel animal replacement system

Professor M Ritkes-Hoitinga and Dr K Wever SYRCLE, Radboud University Nijmegen, The Netherlands

Pattern recognition in pathology data and in vitro validation of diagnostic data networks

Associate Professor T Badrick Faculty of Health Sciences and Medicine, Bond University, Gold Coast, QLD

Viral diseases and genetics of the host response

Associate Professor M Heise Department of Genetics, University of North Carolina, Chapel Hill, NC, USA

Metabolomic profiles and clinical microbiology of ME-CFS

Dr H Butt, Associate Professor P Gooley and C Armstrong Bio21 Institute and University of Melbourne, Melbourne, VIC

Knowledge discovery in pathology databases for enhanced laboratory diagnosis

G Koerbin ACT Pathology, Canberra Hospital, Canberra, ACT

Immunology of ME-CFS

Professor S Marshall Griffith Health Institute, Griffith University, Gold Coast, QLD

Biomedical and clinical study of ME-CFS patients

Dr D Lewis CFS Discovery, Donvale Specialist Medical Centre, Donvale, VIC

Professor Ted Maddess

Multifocal visual evoked potentials

Dr SN Abdullah Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Bandar Seri Begawan, Brunei

Sources of triphasic waves in hepatic encephalopathy

Dr I Al Homoud King Faisal Specialist Hospital and Research Centre, Saudi Arabia

Polarisation sensitivity in squid eyes

Professor Y Nagai Kokushikan University, Tokyo, Japan

Multifocal visual evoked potentials and visual attention in multifocal pupillography

Associate Professor Y Rosli Universiti Kebangsaan Malaysia, Bangi Selangor, Malaysia

Causes of glaucoma

Professor W E Sponsel Department of Biomedical Engineering, San Antonio, TX, USA

Professor JD Victor Brain and Mind Research Institute and Department of Neurology, Cornell Weill Medical College, New York, NY, USA

Dr Andrew James

MRI and source modelling

Dr S Inverso Pasteur Institute, Paris, France

Modelling of cochlear mechanics

Professor HP Wit University of Groningen, Groningen, The Netherlands

Lessons from Nature

Dr H Trueman CSIRO Ecosystem Sciences, Canberra, ACT

Dr Ben Kaehler

Genetic distance for a general non-stationary Markov Substitution Process

Associate Professor VB Yap Department of Statistics and Applied Probability, National University of Singapore, Singapore

Lessons from Nature

Dr H Trueman CSIRO Ecosystem Sciences, Canberra, ACT

Associate Professor Guna Karupiah and Dr Geeta Chaudhri

Modulation of the immune response by virus-encoded cytokine homologs

Professor M Buller St Louis University, St Louis, MO, USA

Professor A Alcamí Centro de Biología Molecular Severo Ochoa, Madrid, Spain

Induction of long-lived antiviral humoral immunity

Dr T Newsome School of Molecular Bioscience, University of Sydney, Sydney, NSW

Professor R Brink Garvan Institute for Medical Research, Sydney, NSW

Actin-based motility as a virulence mechanism and potential as an antiviral target

Dr T Newsome School of Molecular Bioscience, University of Sydney, Sydney, NSW

Pathophysiological significance of reverse signalling through membrane TNF

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Causes of glaucoma

Professor W E Sponsel Department of Biomedical Engineering, San Antonio, TX, USA

Professor JD Victor Brain and Mind Research Institute and Department of Neurology, Cornell Weill Medical College, New York, NY, USA
Disruption of the extracellular matrix by heparanase

**Dr Claudio A Mastronardi**  
_translational studies in obesity_

Professor S Bornstein and Dr M Ehrhart – Bornstein  
University of Dresden, Dresden, Germany

Professor Rachel Li  
Trauma and Orthopedic Research Laboratory, ANU College of Medicine, Biology and Environment, The Australian National University, Canberra, ACT

**Associate Professor S Rao**  
Department of Endocrinology of the Federal University of Parana, Curitiba, Brazil

Dr V Borba  
Department of Obstetrics and Gynecology, University of Curitiba, Brazil

**Dr Hardip Patel**  
Mauricio Arcos-Burgos

Whole exome sequencing of extreme morbid obese patients: Translational implications for obesity and related disorders

Professor M Boguszewski  
Professor C Boguszewski  
Universidade Federal do Parana, Department of Pediatrics, Brazil

Professor J Licinio  
South Australian Health and Medical Research Institute, Adelaide, SA

Dr Gilberto Paz-Filho  
Congenital leptin deficiency

Dr T Delibasi  
Department of Endocrinology, Ankara Hospital, Ankara, Turkey

Clinical Endocrinology: Multinodular goitre, metabolic syndrome, obesity and thyroid disorders

Professor H Graf  
Professor C Boguszewski  
Professor C Boguszewski

Professor M-L Wong  
Professor M Boguszewski

Clinical Endocrinology: Multinodular goitre, metabolic syndrome, obesity and thyroid disorders

**Dr Jason Potas**  
670 nm light reduces alldynia following spinal cord injury

Associate Professor L Henderson  
Anatomy & Histology, School of Medical Sciences, The University of Sydney, Sydney, NSW

The use of nanofibre material for nervous tissue regeneration

Dr D Nisbet  
Engineering, The Australian National University, Canberra, ACT

**Dr Hardip Patel**  
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The use of nanofibre material for nervous tissue regeneration

Dr D Nisbet  
Engineering, The Australian National University, Canberra, ACT
New pharmacological agents that isolate individual fibre types in the peripheral nerve

Professor RT Sudo Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

Dr Jason Potas, Professor Greg Stuart and Professor Ted Maddess

Functional mapping of the dorsal column nucleus: A new approach to sensory pathway evaluation following spinal cord injury

Professor J Morley University of Western Sydney, Campbelltown, NSW, Dr S Redmond Graduate School of Biomedical Engineering, The University of New South Wales, Sydney, NSW

The use of nanofibre material for nervous tissue regeneration

Dr D Nisbet Engineering, The Australian National University, Canberra, ACT

Mr Alvin Pratama

MicroRNA-146a represses T follicular helper cell accumulation

Dr R Casellas Genomics and Immunity Section, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health, Bethesda, MD, USA Dr Andreas Hulthoff Chronic Immune Reactions Group, German Rheumatism Research Centre Berlin, Berlin, Germany

Professor Thomas Preiss

A sustained dietary change increases epigenetic variation in isogenic mice

Associate Professor C Suter The Victor Chang Cardiac Research Institute, Sydney, NSW Professor David Martin Children’s Hospital Oakland Research Institute, Oakland, CA, US

The prevalence and roles of 5-methylcytosine in eukaryotic transcriptomes

Associate Professor C Suter The Victor Chang Cardiac Research Institute, Sydney, NSW Professor S Clark and Professor J Mattick The Garvan Institute of Medical Research, Sydney, NSW

Sequence diversity in the murine cardiomyocyte miRNA population

Professor Jan Provis Modelling and managing retinopathy of prematurity

Professor T Chan-Ling University of Sydney, Sydney, NSW

Dr Charani Ranasinghe

HIV envelope antibody studies

Dr R Center Department of Microbiology and Immunology, The University of Melbourne, Melbourne, VIC

HIV-1 Pox-viral vaccine vectors

Dr D Boyle CSIRO Livestock Industries, Australian Animal Health Laboratory, Geelong, VIC

HIV-1 mucosal vaccines and murine influenza-HIV-1 studies

Dr J Stambas Deakin University and CSIRO Animal Health Laboratories, Geelong, VIC

TNF family members and immune responses to viral infection and tetramer studies

Dr L Sedger School of Medical and Molecular Biosciences, The University of Technology, Sydney, NSW

Mucosal HIV, TB vaccines and CD8 T-cell avidity

Professor A Ramsay Gene Therapy Program, Louisiana Vaccine Centre, Louisiana State University Health Sciences Centre, New Orleans, LA, USA

Human HIV-specific T cell immunity & T cell avidity studies

Professor A Kelleher Immunovirology and Pathogenesis Program NCHECR, The University of New South Wales, Sydney NSW and St Vincent’s Centre for Applied Medical Research, Sydney, NSW

HIV/SIV macaque vaccine studies

Professor S Kent and Dr R De Rose Department of Microbiology and Immunology, The University of Melbourne, Melbourne, VIC

Mucosal vaccine strategies against Chlamydia

Professor K Beagley Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, QLD
Dr Katrina Randall

**DOCK8 in T cells**

**Dr J Oliaro** Peter MacCallum Cancer Centre, Melbourne, VIC

Dr Katrina Randall, Dr Stephen Daley, Mr Daniel Hu and Professor Chris C Goodnow

The Anaef mutation in T cell development

**Dr J Roose** University of California San Francisco, San Francisco, CA, USA

Dr Danny Rangasamy

Toward repurposing antiviral drugs in the treatment of psoriasis

**Professor J-P Molès** Institut national de la santé et de la recherche médicale, Montpellier, France

Exploring the role of L1 retrotransposon and Rad21 in CRC Cancer

**Dr X Huiling** Peter MacCallum Cancer Centre, Melbourne, VIC

Prognostic value of LINE-1 retrotransposon expression in breast cancer

**Professor JE Dahlstrom** Anatomical Pathology, ACT Pathology, Canberra Hospital and ANU Medical School, The Australian National University, Canberra, ACT

Analysis of epigenetic factors in mouse embryonic neural stem cells exposed to hyperglycemia

**Professor ST Dheen** Department of Anatomy, National University of Singapore, Singapore

Insertional mutagenesis system to identify epigenetic factors that control embryonic stem cells differentiation

**Dr N Lenka** National Centre for Cell Science, Pune University Campus, Ganeshkhind, Pune, India

Dr Daniel Ryan

Structural and functional analysis of a cancer-linked co-regulator complex

**Professor Joel Mackay** School of Molecular Biosciences, University of Sydney, Sydney, NSW

Acetylation of histone H3 at lysine 64 regulates nucleosome dynamics and facilitates transcription

**Dr R Schneider** Department of Functional Genomics, Institut de Génétique et de Biologie Moléculaire et Cellulaire (IGBMC), CNRS UMR, Strasbourg, France

Dr Charmaine J Simeonovic

Heparan sulfate expression in isolated human islets and islet transplants

**Professor S Bornstein** and **Dr B Ludwig** University Clinic Carl-Gustav-Carus, Technical University, Dresden, Germany

Heparan sulfate and heparanase expression in human pancreas

**Clinical Associate Professor JD Wilson** Department of Endocrinology, Canberra Hospital, Canberra, ACT

Dr Charmaine J Simeonovic, Ms S Dhounchak and Professor Christopher R Parish

Loss of islet heparan sulfate in T2D in db/db mice

**Professor T Biden** and **Dr R Laybutt** Garvan Institute of Medical Research, Sydney, NSW

Dr Charmaine J Simeonovic, Professor Christopher R Parish and Ms Fui Juin Choong

Remodelling of the islet BM after islet isolation and transplantation

**Professor R Rodgers** Department of Obstetrics and Gynaecology, The University of Adelaide, Adelaide, SA **Dr H Irving-Rodgers** School of Medical Science, Griffith University, QLD

Dr Zan-Min Song

Hirschsprung's Disease and its relationship to immunity

**Associate Professor David Croaker** Canberra Hospital, Canberra, ACT

Stem cell implantation as a possible future treatment for Hirschsprung's disease

**Professor Heather Young** and **Professor John Furness** Department of Anatomy and Neuroscience, University of Melbourne, Melbourne, VIC

**Associate Professor Christian Stricker**

Short-term dynamics in small networks

**Dr M McDonnell** Institute of Telecommunications Research, University of South Australia, Adelaide, SA

Professor Greg J Stuart

Action potential initiation and interaction with inhibitory synaptic events

**Professor M Häusser** The Wolfson Institute for Biomedical Research, University College, London, UK

Role of HCN channels in absence epilepsy

**Dr S Petrou** Howard Florey Institute, The University of Melbourne, Melbourne, VIC

Professor S Berkovic

Department of Medicine, Austin Health, The University of Melbourne, Melbourne, VIC

**Associate Professor T O'Brien** Department of Medicine, The University of Melbourne, Melbourne, VIC
Professor David Tremethick
The role of histone variants in modulating chromatin fibre dynamics
Dr K Luger Department of Biochemistry and Molecular Biology, Colorado State University, Fort Collins, CO, USA
Chromatin remodeling during early development
Dr A Peters Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland
Chromatin remodeling during oogenesis
Dr J Bowles Institute for Molecular Bioscience, University of Queensland, Brisbane, QLD
Chromatin function in differentiation and cancer
Professor SA Grigoryev Department of Biochemistry and Molecular Biology, Milton S Hershey Medical Centre, Penn State University College of Medicine, Hershey, PA, USA
Dr Kristzina Valter
Slow-release treatment options in drug delivery to the retina
Professor S Bisti University of L’Aquila, L’Aquila, Italy
The effects of VCP treatment in the degenerative retina
Professor GJ Kotwal Kotwal Bioconsulting and ST Kitts Medical School, WI, USA Professor GJ Arason University of Iceland, Reykjavik, Iceland
Muller cell reactive gliosis and its control, using in vivo and in vitro models
Dr M Madigan Save Sight Institute, University of Sydney, Sydney, NSW and Department of Optometry, University of NSW, Sydney, NSW
670 nm red light treatment in retinal degenerations
Professor JT Eells University of Wisconsin, Milwaukee, WI, USA
The effects on 670 nm light in retinal damage
Dr R Essex ANU Medical School, The Australian National University, Canberra, ACT
Oxygen-induced retinopathy and 670 nm light
Professor JE Dahlstrom Anatomical Pathology, ACT Pathology, Canberra Hospital and ANU Medical School, The Australian National University, Canberra, ACT
Dr A Kent, Dr R Essex and Dr A-L Mohamed ANU Medical School, The Australian National University, Canberra, ACT and ACT Health, The Canberra Hospital, Canberra, ACT
Professor Carola G Vinuesa
Role of single nucleotide polymorphisms in the development of systemic lupus erythematosus
Dr D Gale Imperial College, London, UK Dr A Bowie Trinity College, Dublin, Ireland Dr A Weber The University of Tübingen, Tübingen, Germany Professor R Brink Immunology Program, Garvan Institute of Medical Research, Sydney, NSW Associate Professor S Alexander Westmead Hospital, Westmead, NSW Dr M Alarcon-Riquelme University of Granada, Granada, Spain Professor P Petersen Molecular Pathology, University of Tartu, Tartu, Estonia
Neural-like signaling in germinal centre response
Professor C Doglioni Department of Pathology, San Raffaele Hospital, Milan, Italy
Regulation of Tfh cells by microRNA-146a
Dr D Baltimore Biology and Biological Engineering, California Institute of Technology, Pasadena, CA, USA
Rhoquin and RNA regulation
Dr J Babon The Walter and Eliza Hall Institute for Medical Research, Melbourne, VIC
Tfh metabolism
Dr J Babon The Walter and Eliza Hall Institute for Medical Research, Melbourne, VIC Professor M Febbraio Baker IDI Heart and Diabetes Institutes, Melbourne, VIC Assistant Professor RG Jones Department of Physiology, McGill University, Montreal, QC, Canada Dr A Kallies Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC
Analysis of human Tfr cells
Professor S Sakaguchi Immunology Frontier Research Center, Osaka University, Osaka, Japan
Role of mTOR in Tfh cell metabolism
Professor M Boothby Vanderbilt University School of Medicine, Nashville, TN, USA
Control of RNA and miRNA homeostasis
Dr R Casellas Genomics and Immunity Section, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health, Bethesda, MD, USA
Professor Bruce Walmsley
Mechanisms of central neuronal integration
Professor REW Fyffe and Mr AS Deardorff Boonshoft School of Medicine, Wright State University, Dayton, OH, USA
Mr Hao Yang
Characterization of the interactions between RNA and ‘moonlighting’ metabolic enzymes in rodent cardiomyocytes and their change in response to stress
Professor M Hentze European Molecular Biology Laboratory (EMBL), Heidelberg, Germany
Professor Ian G Young
Role of IL-3 receptor in myeloid leukaemia
Professor YZ Chen and Dr Y Wu Fujian Medical University, Fuzhou, China
Cytokine receptors
Dr J Murphy Molecular Medicine Division, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC
Role of cytokines in allergic inflammation
Professor PS Foster School of Biomedical Sciences and Pharmacy, University of Newcastle, Newcastle, NSW
AUSTRALIAN PHENOMICS FACILITY COLLABORATIONS

Australian Phenomics Network Project: ES cell to Mouse Service
Professor I Smyth Department of Biochemistry and Molecular Biology and Department of Anatomy and Developmental Biology, Monash University, Melbourne, VIC

Australian Phenomics Network Project: ENU Variant Collection
Dr B Kile Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC
Professor S Foote Menzies Research Institute Tasmania, Hobart, TAS and Macquarie University, Sydney, NSW

Australian Phenomics Network Project: Mouse Pathology
Professor J Furness University of Melbourne, Melbourne, VIC
Dr T Kuchel South Australian Health and Medical Research Institute, Adelaide, SA

Australian Phenomics Network Project: Australian Phenome Bank Cryopreservation
Dr D Hopwood Animal Resources Centre, Murdoch, WA

Australian Phenomics Network Project: RNAi technologies
Professor R Teasdale Institute for Molecular Bioscience, The University of Queensland, Brisbane, QLD
Professor R Johnstone Peter MacCallum Cancer Centre, Melbourne, VIC
Dr L Winteringham Western Australian Institute for Medical Research, Perth, WA

Systems Approach to Immunity and Inflammation
Professor R Ulevitch The Scripps Research Institute, La Jolla, CA, USA

Mutagenetix – A database of mutations and phenotypes induced by ENU
Professor B Beutler University of Texas Southwestern Medical Center, Dallas, TX, USA

China- Australia Centre of Phenomics Research
Professor H Tang Chinese Academy of Sciences, Institute of Biophysics, Beijing, China

International Mouse Phenotyping Consortium
Professor S Brown (Chair), Harwell MRC, Harwell Science and Innovation Campus Oxfordshire, UK

Melanoma Project and SNV Detection
Mr C Broadley Australian Genome Research Facility

Developing a new imaging and brain atlas tool
Professor G Galloway and Dr A Janke Centre for Advanced Imaging, National Imaging Facility, University of Queensland, Brisbane, QLD

Framework Data Sets
Mr A Gilbert Bioplatforms Australia, Sydney, NSW
Staff and Student lists

Department of Genome Biology
Department of Immunology
Eccles Institute of Neuroscience
Department of Molecular Bioscience
Department of Translational Medicine
Department of Pathogens and Immunity
Australian Phenomics Facility
School Administration
School Services
The ACRF Biomolecular Resource Facility and Genome Discovery Centre
Students
Chromatin and Transcriptional Regulation Group

Professor and Leader
Tremethick, DJ, BSc(Hons), (USyd), PhD (MacqU)

Research Fellow
Soboleva T, MSc (MSU), PhD (MSU)

Postdoctoral Fellows
Cook AJL, BMedSci(Hons) (USyd), PhD (USyd) (until June)
Domaschenz RM, BSc(Hons) (Adel), PhD (Cambridge) (until February)
Nekrasov M, PhD (Heidelberg)
Ryan DP, BSc(Hons) (USyd), PhD
Westman B, BSc(Hons) (USyd), PhD (until January)

Visiting Fellows
Cook AJL, BMedSci(Hons) (USyd), PhD (USyd) (from July)
Hapel A
Shannon MF, BSc(Hons), PhD (National University of Ireland)
Domaschenz RM, BSc(Hons) (Adel), PhD (Cambridge) (from March)
Westman B, BSc(Hons) (USyd), PhD (from February)

Computational Genomics Group

Associate Professor and Leader
Huttley GA, BSc(Hons) (MacqU), PhD (UC Riverside)

Postdoctoral Fellows
Kaehler B, BSc (UNSW), BEng(Hons) (UNSW), MQuantitative Finance (UTS), PhD
Pérez-Bercoff Å, PhD (Dublin)

Visiting Fellow
Verbyla K, BSc(Hons) (Adel), PhD (UMelb) (until January)

Visiting Student
Zhu Y, BSc(Hons), B Comm

Computational and Conceptual Biology Group

Professor and Leader
Gready JE, BSc(Hons), PhD (USyd), FRACI

Senior Research Officers
Cummins PL, BSc(Hons), PhD (USyd)
Kannappan B, BSc (Madras), MSc, PhD (Pune)
Matthews PR, BSc(Hons), PhD (ANU)

Research Officer
Howles P, BA (USyd), BSc (Adel), BSc(Hons), PhD (part-time)

Postdoctoral Fellows
Alonso-Cantabrana H, BSc(Hons), PhD (U Alicante) (until January)
Vassilieva T, MSc (Novosibirsk)

Research Assistants
Good G, BSc (MacqU) (part-time) (until January)
Mani-George A, BSc, (Mahatma Gandhi, India), MSc (Bharathiar, India)
Wallace MJ, BSc (Wollongong)

Visiting Fellow
Aramrego W, PhD, DSc (ULond), FRSC, FRACI

Professor and Head of Department
Tremethick DJ, BSc(Hons), (USyd), PhD (MacqU)

Departmental Administrator
Stenhouse J, BA

Alternatives to Animal Research Through Bioinformatics Group

Associate Professor and Leader
Lidbury BA, BSc(Hons) (Newcastle), PhD

Visiting Fellows
Gahan M, BA/BSc(Hons), Postgraduate Diploma in Forensic Science (LaTrobe), PhD (Monash)
Richardson AM, BA(Hons) (Well), MStats, PhD

Visiting Student
Shang GF, Master of Medical Immunology (Tongji Medical University, China)

School Visitor (Statistical Consulting Unit, ANU)
Neeman T, BA (Harvard), MA, PhD (Virginia)

GENOME BIOLOGY
Genome Diversity and Health Group

**Professor and Leader**
Easteal, S, BSc(Hons) (St Andrews), MBA, PhD (Griffith)

**Postdoctoral Fellow**
Das D, BSc(Hons) (Presidency College, Kolkata), MSc (Madurai Kamaraj), PhD (JNCASR, Bangalore) (from April)

**Senior Technical Officer**
Tan X, BSc (Shandong), MSc (China Pharmaceutical)

**Research Assistants**
Prichard Z, BSc(Hons) (UNSW), PhD (until October)
Pryce, K, BAppSci (UHAN, Nijmegen), BTech (Gilde College, Venlo) (from May)

RNA Biology Group

**Professor and Leader**
Preiss T, Dipl Chem (Philipps University, Marburg Germany), PhD (Newcastle upon Tyne), Habil (Heidelberg)

**Research Fellows**
Archer SK, BSc(Hons), PhD
Clancy JL, BSc(Hons) (UNSW), PhD (UNSW)

**Postdoctoral Fellows**
Beveridge N, (UNewcastle)
Liao Y, PhD (UC Davis)
Patel H

**Senior Technical Officer**
Pagler E, BSc (Santo Tomas)

**Visiting Fellows**
Shankar R (from July)
Shirokikh N (July-December)

Translational Genomics Group (from March)

**Associate Professor and Leader**
Arcos-Burgos M, MD, PhD (University of Cauca, Colombia)

**Research Assistant**
Cai Y, BMed (Bejing Medical University, China)

Departmental Visiting Fellows

Barlin G, PhD, DSc (USyd), FRACI
Cox G, BSc, PhD (UMelb), FAA
Denborough M, MD, ChB (Cape Town), MD (UMelb), DPhil (Oxon), DSc (UMelb), FRCP
Morrison JE, BSc (USyd), MSc (UQ), DPhil (Oxon), DSc
Rodriguez M-C (September – November)
IMMUNOLOGY

Professor and Head of Department
Goodnow CC, Goodnow CC, BSc(Vet) (USyd), BVSc(Hons) (USyd), PhD (USyd), FAA, FRS, NAS

Departmental Administrator
Weil ETF

Cancer and Vascular Biology Group

Professor and Leader
Parish CR, BAgSc (UMelb), PhD (UMelb)

Research Fellow
Quah B, BSc, PhD

Postdoctoral Fellow
Coupland L, BSc(Hons), PhD, RN

Visiting Fellows
Chong G, MBBS (Hons), BMedSc (Monash) FRACS, FRCS (C) FRCS (E), Diplomate, American Board of Surgery (USA)
Cooper PD, BSc (Hons) (ULond), PhD (ULond), DSc (ULond)
Freeman C, BSc(Hons) (Adel), PhD (Adel)
Hindmarsh Ej, BSc(Hons) (USyd), PhD
Li RW, MD (China Medical University), PhD (Southern Cross)
Price J, BSc(Hons) (UMelb), PhD (UMelb)
Staykova M, PhD (USofia)
Warren HS, BSc(Hons), PhD (UQ)
Zhang DH, BMed (2nd Military Medical University, PR China)

Senior Technical Officer
Bezos A, BSc (USyd), MSc (USyd)

Technical Officer
Browne A, BA (ANU), Dip Ed (UNE) (part-time)

School Visitor
Wang J, MSc (UNSW)

Editorial/Administrative Assistant
Parish B, BSc (Madras), BSc, MSc, GradDipCompStudies (UC) (part-time)

Diabetes/Transplantation Immunobiology Laboratory

Fellow and Laboratory Leader
Simeonovic CJ, BSc(Hons), PhD

Visiting Fellows
McCullagh P, MBBS (UMelb), DPhil (Oxon), MRCP (Lond), MD (UMelb)
Wilson JD, BSc(Hons), MBCh, BA(O)(Hons), MD (Queens, Belfast), MRCP (UK), FRACP

Technical Officers
Brown D, AssDipAppPath (CIT) (casual)
Hamilton P, Certificate II (Animal Tech) (CIT) (part-time)
Popp SK, BSc, AssDipAppSci (Biol) (CIT) (part-time)

Visiting Scholar
Hayashi K (from October)

Immunogenomics Group

Professor and Leader
Goodnow CC, BSc(Vet) (USyd), BVSc(Hons) (USyd), PhD (USyd), FAA, FRS, NAS

Laboratory Manager
Townsend M, PathTech Cert (TAFE), AssDipAppPath (Bruce TAFE)

Bioinformatics Laboratory

Bioinformatics Fellow
Andrews TD, BSc(Hons), PhD

Bioinformaticians
Cho V, BSc (Auck), PhD
Field M, BSc (Biol)/BSc (Computer Sci) (UBC)
Johnson S, BCompSci (part-time) (from February)
Shao Y, BSc(Hons) (until January)

Immune Tolerance and Signalling Laboratory

Professor and Laboratory Leader
Goodnow CC, BVSc (USyd), BSc(Vet)(Hons) (USyd), PhD (USyd), FAA, FRS, NAS

Research Fellow
Bertram E, BSc(Hons) (Adel), PhD (Adel)

CJ Martin Fellows
Parish IA, BSc(Hons), PhD (WEHI)
Reed JH, BSc(Hons) (Flinders), PhD (Flinders) (from August)

Research Fellows
Daley S, BVSc (UQ), DPhil (Oxon)
Horikawa K, MD (Chiba), PhD (Tokyo)

Visiting Fellows
Cornall R, PhD
Fahrer A, BSc(Hons) (UMelb), PhD (UMelb)
Randall K, MB (UNSW), BS (UNSW), BSc (UNSW), FRACP, FRCPA, PhD
Wilson A, BSc(Hons) (UC), RN

Research Technicians
Balakishnan B, BSc(Hons)
Howard D, BSc
Law H, BSc
Miosge L, BSc(Hons), PhD
Rayner J, BSc (until December)
Sontani Y, BSc(Hons) (Murdoch), PhD

Laboratory Assistant
Kanazawa Y (casual)
Ramaciotti Immunization Genomics Group

Senior Research Fellow and Leader
Enders A, MD, PhD (Freiburg)

Research Technician
Barthel N, DipBiol (Freie Univ, Berlin)

Infection and Immunity Group

Associate Professor and Leader
Karupiah G, BSc (Hons), MSc (Malaya), PhD

Host Defence Laboratory

Associate Professor and Laboratory Leader
Karupiah G, BSc (Hons), MSc (Malaya), PhD

Inflammation and Viral Immunopathology Laboratory

Fellow and Laboratory Leader
Chaudhri G, BSc(Hons), PhD

Visiting Fellows
Belz G, BV Biol (UQ), BVSc(Hons) (UQ), PhD (UQ) (until February)
Newsome TP, BSc(Hons) (UMelb), PhD (Inst Molecular Pathology, Vienna)
Scalzo A, BSc (Hons) (UMelb), PhD (UMelb) (until March)

Senior Technical Officer
Eldi P, MBBS (India), MSc (UQ) (part-time)

Technical Officer
Patel V, PhD (until February)

Molecular Mucosal Vaccine Immunology Group

Fellow and Leader
Ranasinghe C, BSc (Uni Rouen, France), MPhil (Uni Colombo), PhD (UWA)

Research Fellow
Jackson R, BSc(Hons) (Monash), PhD (Edin)

Adjunct Fellow
Sedger L, BAAppSci(Hons) (UTS), PhD

Visiting Fellows
Mullbacher A, BSc, MSc (Auck), PhD
Stambas J, BSc(Hons) (UMelb), PhD (UMelb)

Technical Officer
Ravichandran J, BSc (India), BSc(Hons) (UMelb) (part-time)

Visiting Technical Officer
Buchanan A, BHealthSci (UC)

Translational Research Unit (joint with The Canberra Hospital)

Professor and Leader
Cook M, MB, BS (USyd), FRACP, FRCPA, PhD (USyd)

Research Assistants
Chand R, BSc(Hons) (UMelb)
Srivastava U, MSc
Wilson A, BSc(Hons) (UC), RN (part-time)
ECCLES INSTITUTE OF NEUROSCIENCE

Professor and Head
Stuart GJ, BSc(Hons) (Monash), PhD, FAA

Departmental Administrator
Khalidi D

Senior Technical Officer
Rodda GR, PTC

Blood Vessel Group
Professor and Leader
Hill CE, BSc(Hons), PhD, DSc (UMelb)
Postdoctoral Fellow
Howitt L, BSc (USyd), PhD (UNSW)

Neuroimmunology & Cardiovascular Dysfunction Laboratory
Leader
Haddock RE, BSc (Wollongong), BSc(Hons), PhD

Cerebral Cortex Group
Associate Professor and Leader
Bekkers JM, BSc(Hons) (Griffith), MSc (Manchester), PhD (Cambridge)
Postdoctoral Fellows
Choy J, BSc (UMS), PhD
Suzuki N, BSc (Tsukuba), MMedSci (Tsukuba), PhD (Tokyo)
Research Assistant
Tang S-M (until February)

Development of Visual Diagnostics of Eye Disease Group
Professor and Leader
Maddess T, BSc (Hons) (UBC), PhD
Research Fellows
Barbosa M, BSc, MSc, PhD (São Paulo)
Carle C, BSc(Hons), PhD
Sabeti F, BOptometry(Hons), GradCertOcuThera, PhD
Centre Manager
Webster B, BSc
Visiting Fellows
Bell A
Hughes A
Levick W
Mallikarjunan R
Penfold P
Sarac Ö
Stronks C
Vidovic M
Xiang F
University Fellow and Emeritus Professor
Horridge A
Ibbotson M

Human Neuroimaging Group
Associate Professor and Leader
James AC, BSc(Hons) (Adelaide), PhD (ANU)

Neural Coding Group
Associate Professor and Leader
Arabzadeh E, MD, PhD
Postdoctoral Fellow
Adibi M, PhD
Research Assistant
Sizemova A

Neuronal Network Group
Associate Professor and Leader
Stricker C, MD (Zurich), PhD (Bern)
Research Fellow
Cowan AI, BSc(Hons), PhD

Neurophotonics Laboratory
Leader
Daria V, PhD (Osaka University)
Research Assistant
Sane S (from May)
Neuronal Signalling Group

**Professor and Leader**
Stuart GJ, BSc (Hons) (Monash), PhD, FAA

Brain Development Laboratory

**Leader**
Song Z-M, MMSc (Jiamusi), PhD (Flinders)

Neuronal Signalling Laboratory

**Professor and Leader**
Stuart GJ, BSc (Hons) (Monash), PhD, FAA

**Postdoctoral Fellows**
Breton J-D, MSc, PhD (Strasbourg)
Ikeda K, BA (UC Boulder), PhD
Keshavarzi S (from May)

**Visiting Fellows**
Gabrei S
To M-S

Retinal Cell Damage and Repair Group

**Professor and Leader**
Valter K, MD, PhD, GradCert HE

**Postdoctoral Fellow**
Biswaas S, PhD (from November)

**Visiting Fellows**
Madigan M

Retinal Development and Aging Group

**Professor and Leader**
Provis J, BSc(Hons) (UNSW) PhD (UNSW)

**Postdoctoral Fellow**
Rutar M, BMedSc (Hons), PhD

**Research Co-ordinator**
Natoli R, BSc (Hons) (USyd), PhD

Neural Control Systems Laboratory

**Leader**
Potas JR, BMedSc(Hons) (USyd), PhD (USyd)

Synapse and Hearing Group

**Professor and Leader**
Walmsley B, BE, PhD (Monash), DSc (UNSW)

Visual Neuroscience Group

**Professor and Leader**
Lamb TD, BE (UMelb), ScD (Cambridge), FRS, FAA

**Visiting Fellow**
Jarvinen JLP, MSc (Helsinki), PhD (Cambridge)

University Fellow and Emeritus Professor

Curtis DR, AC, MBBS (UMelb), PhD, FRACP, FAA, FRS
MOLECULAR BIOSCIENCE

Professor and Head of Department
Dulhunty AF, BSc (USyd), PhD, DSc (UNSW)

Departmental Administrator
Mitigas R

Biomolecular Interactions Group

Fellow and Leader
Casarotto MG, BSc(Hons) (UMelb), PhD (UMelb)

Postdoctoral Fellow
Norris NC, BSc (Adv)(Hons) (USyd), PhD (York)

Technical Officer
Aditya S, BBiotech(Hons)

Visiting Fellows
Fan J, BSc (Fudan), MSc (Fudan), PhD (Auck)
Lim PS, BMedSci, PhD
Zafar A, PhD

Visitor
Rosenberg M, PhD

Cancer Metabolism and Genetics Group

Fellow and Leader
Blackburn A, BSc(Hons) (UNSW), PhD

Laboratory Technician
Rooke M, BMedSci (Pharm Sci) (CSU)

Cardiac and Skeletal Muscle Proteomics Group

Leader
Beard NA, BAppSci(Hons) (LaTrobe), PhD

Laboratory Technician
Janczura, M

Technical Assistants
Ayad S, BSc (Assuit, Egypt) (from April)
Kerdo E, BSc
Thekkedam C, BScBioTech(Hons) (Wollongong)
Cytokine Molecular Biology and Signalling Group

**Professor and Leader**
Young IG, MSc (UMelb), PhD

**Postdoctoral Fellow**
Abdus F, BSc(Hons) (Bangladesh), MSc (UWSyd), PhD

**Visiting Fellows**
Chen J, BSc, MMed (China), PhD (Flinders)
Murphy J, BSc, PhD

**Visiting Scholar**
Yong W, MMed (China), MD (China)

**Technical Officers**
Dai J, BSc, MBiotech
Ewens C
Wen B, MB (China), MSc (China), PhD

Epigenetics and Genome Stability Group

**Fellow and Leader**
Rangasamy D, MSc, M Tech (India), PhD (UK)

Molecular Genetics Group

**Professor and Leader**
Board PG, BSc(Hons), PhD (UNE)

**Postdoctoral Fellow**
Theodoratos A, BSc(Hons) (USyd) PhD

Visiting Fellows
Baker R, BSc(Hons) (UNSW), PhD
Coggan M
Dahlstrom J, MBBS(Hons), FPAC, PhD, FRCPA, FFOP, FFSc, GradCertEdSt (HigherEd), SFHEA
Hayes MT, BSc (USyd), MSc (USyd), DipEd (Tert) (UNE), PhD (QUT) (until October)
Lee E, BSc(Hons) PhD
Liu D, PhD (USyd) (from March)
Shield A, BBiotech(Hons) (Flinders), PhD (Flinders)
Ramshaw IA, MSc (Brunel), PhD

Visiting Scholar
Takemura K, PhD

Laboratory Technicians
Cappello J, BSc (UC), AD AppSciAnSci (CIT)
Tummala P, BSc (Nagarjuna U) MSc (MSU), PhD (OU)

Muscle Research Group

**Professor and Leader**
Dulhunty AF, BSc (USyd), PhD, DSc (UNSW)

**Senior Research Advisor**
Gallant E, PhD (Minnesota)

**Postdoctoral Fellows**
Karunasekara YA, MD (USSR), PhD
Mirza S, BSc(Hons) (Dhaka), MSc(BioTech) (UNSW), PhD
Talukder S, BSc(Hons) (Dhaka), MSc(Dhaka), PhD (Tokushima) (until February)

**Visiting Fellow**
Tierney L, BSc, MSc (Otago), PhD

**Senior Technical Officer**
Pace S, BSc (UTS)

**Laboratory Technician**
Stivala J

Stem Cells and Gene Targeting Group

**Professor and Leader**
Matthaei KI, BSc(Hons) (UNSW), PhD

**Visiting Fellows**
Barharvand H
Frese M, BSc (Osnabrück), PhD (Freiburg)
TRANSLATIONAL MEDICINE

Professor and Head of Department
Licinio J, MD (Universidade Federal da Bahia, Brazil), FAPA (until April)

Head of Department
Mastronardi CA, PhD (University of Buenos Aires, Argentina) (from April)

Departmental Administrator
Vitler L

Translational Medicine Group

Professor and Group Leader
Licinio J, MD (Universidade Federal da Bahia, Brazil), FAPA, FRANZCP (until April)
Mastronardi CA, PhD (University of Buenos Aires, Argentina) (from April)

Research Fellows
Mastronardi CA, PhD (University of Buenos Aires, Argentina)
Paz-Filho G, MD (Universidade Federal do Paraná, Brazil)

Technical Officers
Cai Y, BMed (Beijing Medical University, China) (until September)
Koskinen A (until March)

Visiting Fellows
Boguszewski CL
Rettori V

Pharmacogenomics Group

Professor and Group Leader
Wong M-L, MD (São Paulo, Brazil), FRANZCP

Technical Officer
Cai Y, BMed (Beijing Medical University, China) (until September)

Translational Genomics Group

Associate Professor and Group Leader
Arcos-Burgos M, MD PhD (University of Cauca, Colombia)

Technical Officer
Cai Y, BMed (Beijing Medical University, China) (until September)

PATHOGENS AND IMMUNITY

Professor and Head of Department
Vinuesa CG, LMS(MBBS) (Madrid), DRCOG (Lond), MSc, PhD (Birmingham)

Departmental Administrator
Morales D

Humoral Immunity and Autoimmunity Group

Elizabeth Blackburn NHMRC Research Fellow
Vinuesa CG, LMS(MBBS) (Madrid), DRCOG (Lond), MSc, PhD (Birmingham)

CJ Martin Fellow
Ellyard J, BAs, BSc(Hons), PhD

Post-doctoral Fellows
Athanassopoulos V, BSc(Hons), PhD (UMelb)
Duan T, MBBS (Nanjing), PhD
Sweet R, BSc (UCLA), MSc (Yale), MPhil (Yale), PhD (Yale)

Visiting Fellows
Good M, AO, BSc, MBBS, PhD, MD, DSc
Walter G, BA (Cantab), MBChB (Edinburgh), MRCP (UK), MD

Laboratory Technical Staff
Cheng T (until October)
Williams N

Research Assistant
Lee SK, MBioTech (Flinders) (April – October)

Malaria Immunology Group

Group Leader
Cockburn I, MBiochem (Oxon), PhD (Edin)

Postdoctoral Fellow
Dups J, BVSc (UQ), PhD (UMelb) (from October)

Laboratory Technician
Cai Y, BMed (Beijing Med) (from September)
AUSTRALIAN PHENOMICS FACILITY AND ANIMAL SERVICES

Director
Winslade SL, BA(Hons) (UNE), PhD (UNE)

Chief Scientific Officer
Goodnow CC, BVSc(Hons) (USyd), BScVet (Hons) (USyd), PhD (USyd), FAA, FRS, NAS

Chief Operating Officer
Sjollema GE, BSc(Hons), MFM

Head of Animal Services
Fowler S, BSc, BVMS (Murdoch)

Head of International Programs
Bertram E, BSc(Hons) (Adel), PhD (Adel)

Scientific Business Manager
Dobbie MS, BAppSc (UTS), MSc (USyd), PhD (Lond)

Liaison Officer
Hewitt L, BMedSci (UC)

Departmental Administrator
O’Keefe R

Scientific Programs
Scientific Programs Manager
Balakishnan B, BSc(Hons)

Scientific Project Coordinators
Koffler J, DipAnTech (CIT), BSc
Morris L, BSc(Hons) (Lond), MSc(Res) (Edin), PhD (Edin) (from December)
Tunningley R, BMedSci

Scientific Project Technician
Lorenzo A, BSc Biol (RP)

Australian Phenome Bank
Phenome Bank Curator
Read SH, BSc(hons) (Adel), PhD (Adel)

Cryopreservation and IVF Coordinator
du Boulay C, Cert IV Vet Nursing (CIT), Dip AppSci (CIT)

IVF and Cryopreservation Technician
Thomsen N, BSc(hons) (UQ) (from April)

Quarantine Coordinator
Ross N, FLAT, Dip AppSci Animal Tech (CIT)

Quarantine Technician
Hunt B

Information Technology
IT Manager
Wu P, BSc(Hons), BCompSci (Canada)

IT Officers
Fang Y (until November)
Hongyu M
Quinn G
Shaw F
Tan J, BCompSci (UA), MComp (from September)

Genomics
Head of Genomics Research
Whittle B, BSc(hons)

Genomics Coordinators
Mann D, BSc(Hons)
Zhang Y, BSc, MSc (China)

Genomics Technical Officers
Agrawal P, BSc, MSc, PhD (India) (until September)
Armstrong M (from November)
Fitzgerald L, AssocDip Animal Sci, Cert IV Vet Nursing (CIT)
Gao J, BSc (China), MBiotech(Hons)
Liang R, BSc, MSc (China)
Liu M, BSc, MSc (China)
Paikova A, BBus (QUT), BSc(hons) (UQ)
Patel V (from July)
Sakthivel G, BMedSci(Hons) (from November)
Sayeed S, BSc, MSc (Bangladesh), PhD (UK)
Schoning J, BBiotech(Hons) (from July)

Animal Services
Animal Services Managers
Bowditch K
Clydesdale M

Animal Services Coordinators
Barker A
Bolton S-M
Burke H, BBehaveStudies (Swinburne)
Gooding D, Cert IV Training and Assessment

Technicians
Allsop I, Cert III Animal Tech (CIT) (from November)
Aquino W, BAniSci (UWS) (from December)
Arthur M
Barker A
Boljun M
Burke J
Bush T (from September)
Chau K, Dip Animal Tech (CIT)
Cover G
Figueroa S (until February)
Fowlie C
Haas P
Hamilton R
Hartley S
Hebdia M (until July)
Irvin M (until November)
Jarvis L
Kaya MS, BSc (U Newcastle)
Lin Q
Lockley J
Lorenzi L
McWilliam D
Petty K (until October)
Pobieje A, DipAniTech (CIT) (from July)
Portway C (from July)
Prewett B
Reid C (until June)
Sibley B
Sparrow M
Spencer C
Steen E (from November)
Tanbot S, Dip AppSci (Animal Tech) (CIT) (from December)
Vithanage U (from November)
Watson D
Young S

Building Maintenance Supervisor
Hosking A

Storeperson/Maintenance Assistant
Smith D
SCHOOL ADMINISTRATION

**Director**
Licinio J, MD (Universidade Federal da Bahia, Brazil) FAPA (until April)
Parish CR, BAgSc (UMelb), PhD (UMelb) (from April)

**Deputy Director**
Board PG, BSc(Hons), PhD (UNE)

**Business Manager**
Lillicrap G, FCPA, FIA (Aust)

**Executive Assistant to Director**
Vitler L

**Reception**
Azzopardi N (from January)
Patel A (until January)

**Outreach and Communications Unit**

**Manager**
Nicol MJ, BSc (Wollongong), BSc(Hons), PhD

**Senior Multimedia Officer**
Edwards K, PhotCert

**Education**

**Associate Director Education and Medical Sciences Graduate Convener**
Cowan A, BSc(Hons), PhD, GradCertHE

**Student Administrator**
Riley W

**Purchasing**
Dowling E (November – December)
Enright L (until April)
Townsend K (May – November)
Wozniak P, Cert IV GPC

**Safety & Training**

**Advisors**
Glasson S (until October)
Hayes MT, BSc (USyd), MSc (USyd), DipEd (Tert) (UNE), PhD (QUT) (from October)

SCHOOL SERVICES

**Facilities and Services**

**Manager**
Coombes D

**Operations Assistant**
Ciuffetelli L

**Senior Storeperson**
Clements R

**Storeperson**
Talbot A

**Media & Washup**

**Manager**
Coombes D

**Supervisor and Technical Officer**
Gilmartin L, Cert III Lab Skills (CIT)

**Technician**
Munday K

**Microscopy and Cytometry Resource Facility (MCRF)**

**Head**
Gillespie CM, GradCertMic (USyd)

**Histologist**
Prins AS, BAppSci (RMIT)

**Flow Cytometry Specialist**
Vohra H, MSc(Hons) (Punjab), PhD (PGIMER)

**Flow Cytometry and Microscopy Operator**
Devoy M, BSc(Hons)

**Technical Services**

**Manager**
Coombes D

**Technical Officers**
Cremer P
Gair L
Jordan T
Kynoch M
Percival M
Rhall G
Scharrer E

**Administrative Assistant**
Dowling E
THE ACRF BIOMOLECULAR RESOURCE FACILITY AND GENOME DISCOVERY UNIT

Manager
Palmer S, BSc(Hons), MBA (Tech Management) (La Trobe)

Technical Specialist
Millburn P, BSc(Hons), PhD (Sheffield)

Genomics Team
Cripps T, BSc(Hons)
Higgins A, CBLT (USQ)
Ohms S, MBChB, ME, PhD (Auck)
Peng K, PhD (Wuhan)
Zhang K, MSc (Fudan), PhD

Proteomics Team
McAndrew K, AssDipAppSci (UC)
Zhang K, MSc (Fudan), PhD

Genome Discovery Unit
Buckley B, BA(Hons) (UQ)
Chuah A, BEng(Hons) (NUS)
Jack C, BSc (Wellington)

Parker B, BSc (UQ), MBBS (UQ), PhD (USyd)
Patel H, BPharm, MBiotech, PhD

Honorary Visitors
Gock A, BAppSci (CSU)
Rodriguez M-C, (September-November)

Administrative Assistants
Stenhouse J, BA (until March)
Jack M, BA(Hons) (Wellington) (April – October)
PhD Students
Achuthan S
Agahari F, BSc(Hons) (Japan)
Albarracin R (until September)
Ali E
Al Rumaih Z, MSc (Biotech)
Alshekaili J, BSc, MD
Agrawal A, BSc, MSc (JNKVV, Jabalpur)
Dipl Bioinformatics (BAB, Bangalore)
Andrews, S
Anuar ND, BSc(Hons), MSc (Malaysia)
Bell S, BSc(Hons)
Bergmann H, D.Vet.Med. (Hanover, Germany)
Bock T, BSc(Hons)
Chan S-Y, BBiotech(Hons) (until May)
Chaston D, BSc(Hons)
Cho E, BSc (Auck), GradDipSci (Auck)
Choong FJ, BMedSci(Hons) (until July)
Dalefield M
Da Silva E
Dave P
Eldi R, MBBS (India) MSc (UQ)
Fernando N
Galgamuwe R, MBBS, MSc (Sri Lanka)
Gang B, BBiomedSci (Otago)
Go M-A, BSc, MSc (U Philippines)
Han SY, BSc(Hons)
Hadjincalou A (until March)
Hanna A, BSc(Hons)
Hausner S
Hu Daniel, BMedSci(Hons) (USyd)
Hu Di
Huang H, BBiomedSci(Hons) (Otago)
Hussain M, BSc(Hons)
Hynes C, BSc(Hons)
Jeelall Y, BBiomedSci(Hons) (UMelb)
Ji J, BSc(Hons) (USyd) (until September)
Jiang S, MBBS FRACP
Johnson-Saliba M, PhD
Jones S, BMedSci(Hons) (UNSW)
Khanna M, BBiomedSci(Hons) (Victoria, Wellington)
Kingston Z
Kolic M
Lee C
Lee E, BSc, MSc (UC)
Lee S, BBiomedSci, MSc (Auck)
Li J, BMedSci(Hons) (until November)
Li L, BSc(Biotech)
Mapp S, MBBS (UMelb), FRACP, FRCPA (until August)
Mei Y, BSc(Hons) (Ottawa)
Menon D, BBiotech, MBiotech
Mishra A, BSc, MSc (Nepal)
Mohan A, BTech (India)
Morse A
Morton S, BSc(Hons)
Newman S, BSc(Hons)
Papa I
Pratama A, PhD(Hons)
Ramiscal R, BSc(Hons)
Ratnadikawara M
Rebbeck R, BMedSci(Hons)
Robertson J, BSc(Adv)(Hons)
Rudinski S, BSc(Hons)
Sabour Z, MD
Samarasinghe K
Saxena K, BBiotech
Seamons J
Shaflk A
Shen Q, MBiochem
Sibbritt T, BSc(Hons)
Simon Davis DA, BSc(Hons) (Adel)
Singh M, BSc(Hons) (Otago)
Sinha D, BSc, MSc (India)
Soetanto, R
Srivastava M, MSc (Rewa)
Stojakovic A (until October)
Tan A, BBiotech(Hons) (until October)
Tan X, BSc, MSc
Townsend D, BAppSci(Hons) (UC), BForensicSci (UC)
Tran L
Trivedi S, BBiotech, MBiotech (Research)
Tuazon J, BSc, MD (until February)
Vassilieva T, MSc (Novosibirsk) (until June)
Velez J
Wang J, BBiomedSci(Hons) (UMelb), BSc(Hons) (UMelb)
Wijesundara D, BBiotech(Hons)
Willemse H, BSc(Hons), MSc
Wium E, BMedSci(Hons)
Wong R (until May)
Xi Y, BEng (Jilin, China), MSc (Biotech)
(Flinders) (until February)
Yabas M, MPhil
Yang H
Yap J, MBioTech(Hons)
Yoon J
Honours Students
Brookes T
Chen T
Cook S
El Eryani G
Emerson K
Hasan M
Jiao H
Johar A
Lee J
Micallef A
Moran I
Racic T
Sane S
Spierings E
Steele S
Wallace D
Worley M
Zhu I

MNeuroscience Students
Burton C
Choi B
Espinoza-Oyarce D
Hammado N
Haque F
Kaide J
Martenzon H
Mehdi A
Owens-Walton C
Pillai E
Rajput S
Ravi I
Senga S
Sharp G
Zhang T
Zinamidar A

MTranslational Medicine Students
Alexander P
Barry P
Dunn C
Forster R
Li Z
Rodriguez A
Zhao S

Research Placement
Aw V
Bruggeman K
Fam H
Fernandez P
Kaya S
Li J
Shallal M
Silva A
Sofoulis L
Ugool M

MPhil Students
Choi S (until August)
Li Z
Pearce J
Zhang Y

MBiotech (Research) Student
Dhounchak S
Publications, Presentations and Community Outreach 2013

The 2013 list of publications from The John Curtin School of Medical Research includes peer reviewed journal articles reviews, short communications and book chapters.

Listed here are the presentations made by staff and students of JCSMR at local, national and international research institutions, conferences and workshops throughout the year.

JCSMR staff and students continue to sit on numerous editorial boards, to assist with national and international granting bodies as expert assessors, and to belong to many scientific societies. They are also involved with community activities outside the School. Here we list some of these activities.


Alsharifi, M, Koskinen, A, Wijesundara, DK, Bettadapura, J and Mullbacher, A (2013) MHC Class II-Alpha chain knockout mice support increased viral replication that is independent of their lack of MHC Class II cell surface expression and associated immune function deficiencies. PLoS One 8(6):e69458


Furuya, Y and Mullbacher, A (2013) Type I IFN exhaustion is a host defence protecting against secondary bacterial infections. Scandinavian Journal of Immunology 78(5):395-400


Go, MA, To, MS, Stricker, C, Redman, S, Bacher, HA, Stuart, GJ and Daria, VR (2013) Four-dimensional multi-site...
photolysis of caged neurotransmitters. Frontiers in Cellular Neuroscience 7(10): 3389


Ramiscal, RR and Vinuesa, CG (2013) T-cell subsets in the germinal center. *Immunological Reviews* 252(S1):146-155


Redzwan, NM, Vijayan, D, Ma, C, Tangye, S, Brink, R, Vinuesa, C and Batten, M (2013) IL-27 signals to both B and T cells support germinal center function and the development of GC-driven lupus. *Cytokine* 63(3):292-292

Richardson, AM and Lidbury, BA (2013) Infection status outcome, machine learning method and virus type interact to affect the optimised prediction of hepatitis B virus immununassay results from routine pathology laboratory assays in unbalanced data. *BMC Bioinformatics* 14:206


Wijesundara, DK, Jackson, RJ, Tscharke, DC and Ranasinghe, C (2013) IL-4 and IL-13 mediated down-regulation of CD8 expression levels can dampen anti-viral CD8(+) T cell avidity following HIV-1 recombinant pox viral vaccination. *Vaccine* 31(41):4548-4555


PRESENTATIONS

Dr Ehsan Arabzadeh
Population coding and sensory adaptation
Keynote Speaker: International Brain Research Organisation (IBRO) Neuroscience Summer School, Tehran, Iran
Neural coding and efficiency in rats
Computational and Systems Neuroscience (COSYNE) Workshops, Salt Lake City, UT, USA
Neural coding in the rat whisker barrel system
JCSMR School Seminar Series, The John Curtin School of Medical Research, ANU, Canberra, ACT

Associate Professor
John M Bekkers
Odor-evoked responses of identified interneurons in the piriform cortex in vivo
Gordon Conference: Inhibition in the Central Nervous System, Les Diablerets, Switzerland
Smells interesting: The surprising complexity of the piriform cortex
Center for Neuroscience, University of California Davis, Davis, CA, USA

Dr Andrew Bell
Resonance or travelling wave? An alternative interpretation of cochlear mechanics
Eccles Institute of Neuroscience Seminar Series, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Theories of cochlear mechanics
Live video presentation: Institute of Physiology and Pathology of Hearing, Warsaw, Poland

Dr Edward M Bertram
Next-Gen Mouse Models for Understanding Human Disease
Joint Conference of Human Genetics Meeting / International Congress of Genetics: Genetics and Genomics of Global Health and Sustainability, Singapore
Next-gen ENU Mouse Models for understanding human disease
Korean Institute of Science and Technology, Seoul, Republic of Korea
Next-gen ENU Mouse Models for understanding human disease
Yonsei University College of Medicine, Seoul, Republic of Korea
Next-gen ENU Mouse Models for understanding human disease
Korean Research Institute of Bioscience and Biotechnology, Ochang, Republic of Korea
Phenotyping Pipeline at the Australian Phenomics Facility
60th Japanese Society for Laboratory Animal Science, Tsukuba, Japan
Commercialisation – An Australian Perspective
Translational Research and Entrepreneurship Short Course at Indiana University, Indianapolis, IN, USA
The Australian Missense Mutation Library: an immediate source of thousands of new mouse models to study human disease
Infrafrontier/ International Mouse Phenotyping Meeting, CNR Headquarters, Rome, Italy

Dr Anneke Blackburn
Dichloroacetate: from environmental hazard to cancer therapy
6th Annual Scientific Meeting of the Australasian College of Toxicology and Risk Assessment, Canberra, ACT
Invited speaker
Calvary ACT MRI Health Forum, Calvary Hospital, Bruce, ACT
Targeting cancer metabolism with dichloroacetate
Fred Hutchison Cancer Research Center, Seattle, WA, USA
Targeting cancer metabolism with dichloroacetate
School of Biology University of Massachusetts, Amherst, MA, USA

Mr Bob Buckley
Data describing Autism Spectrum Disorder in Australia: information relating to diagnoses, prevalence, service access and outcomes
APAC’13 The Asia Pacific Autism Conference, Adelaide, SA
Introducing Bioinformatics
The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Associate Professor
Mauricio Arcos-Burgos
Translational Genomics: On the Right Track
Key Note Speaker: Colombian Congress of the Biology Society, Colombia
Genetic Isolates & Human Disease
Department of Anthropology, The Australian National University, Canberra, ACT

Dr Vicki Athanasopoulos
Functional overlap of ROQUIN-1 and ROQUIN-2 in the repression of mRNAs controlling Tfh cell accumulation and systemic inflammation
15th International Congress of Immunology, Milan, Italy

Dr Marconi Barbosa
Locally countable properties and the perceptual salience of textures
Australasian Ophthalmology and Vision Science Meeting, Hobart, TAS
Dr Corinne Carle
Variation in pupillary responsiveness with age and visual field location
Australian Ophthalmic and Visual Sciences Meeting (AOVSM), Hobart, TAS
It’s not what you show, it’s the way that you show it: Stabilising midbrain gain-control in multifocal pupil perimetry
Canberra Health Annual Research Meeting (CHARM), Canberra, ACT

Dr Julian Choy
Mapping of intracortical circuitry in the anterior piriform cortex using optogenetics
Sensory Neuroscience Symposium, University of Western Sydney, Campbelltown, NSW

Mr Aaron Chuah
TriPyGDU: Transcriptome-RNAseq Interactive Python Graphical Data Unifier
Lorne Genomics Conference, Lorne, VIC

Associate Professor Ian Cockburn
Visualizing Immunity to Plasmodium liver stages
14th Frank and Bobbie Fenner Conference: Perspectives on Immune Recognition, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
It’s moving… it’s alive: What movies can tell us about immunity to malaria
School Seminar, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Immunity to Malaria – from immunization to basic science and back again
Plenary Speaker ACT and NSW Australasian Society for Immunology Annual Branch Retreat, Bowral, NSW
In vivo imaging reveals destruction of malaria liver-stages by local action of CD8+ T cells
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

Dr Adam Cook
A balancing act between the chaperone NASP and lysosomal degradation to fine-tune histone supply and maintain genome integrity
ComBio 2013, Perth, WA

Professor Matthew C Cook
Genetics of primary antibody deficiency
The Royal College of Pathologists of Australasia Pathology Update, Melbourne, VIC
Germinal centres
19th Annual Institute for Clinical Pathology and Medical Research Immunology Workshop, The Royal College of Pathologists of Australasia, Westmead Hospital, Sydney, NSW

Dr Lucy Coupland
Manipulation of self-recognition systems to prevent antibody-mediated thrombocytopenias
The 4th Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Dr Stephen Daley
Delineating clonal deletion from T-regulatory cell differentiation in CD4+ thymocytes
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand
Foxp3+ T-reg cells are a cytokine-dependent bi-product of the CCR7+ wave of thymic clonal deletion
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

Dr Michael Dobbie
The Australian Phenomics Network: Creating and Delivering New Research Tools and Resources
11th Transgenic Technology Meeting, Guangzhou, PR China
Phenomics - Ways and Means
European Molecular Biology Laboratory Australia PhD Course, Melbourne, VIC
What is the APN?
South Australian Health and Medical Research Institute, Adelaide, SA
The Next-Gen Mouse and the Missense Mutation Library Delivering New Resources for Understanding Human Disease
27th International Mammalian Genome Conference, Salamanca, Spain

Dr Vincent Daria
Advancing neurophotonics using 4D photostimulation
Medical University of Innsbruck, Innsbruck, Austria
Brain oxygenation and vascular imaging
Session Chair: European Conferences on Biomedical Optics: Neurophotonics, Munich Germany
Efficient neuronal excitation using wavefront-corrected holographic photostimulation
European Conferences on Biomedical Optics: Neurophotonics, Munich, Germany
Spatio-temporal light modulation for neurophotonics
Seminar Speaker: European Laboratory for Non-linear Spectroscopy, Florence, Ital
Spatio-temporal light modulation for neurophotonics and quantum microscopy
Seminar Speaker: Technical University of Denmark, Lyngby, Denmark
Quantum probing of living cells
Asia Communications and Photonics Conference, Beijing, China
Four-dimensional probing of neurons in brain tissue
Shaping the Waves: Engineering Optical Waveform for Biomedical imaging, Howard Hughes Medical Research Institute, Janelia Farm, VA, USA
Professor Simon Easteal
The National Centre for Indigenous Genomics
Life Sciences Institute, National University of Singapore, Singapore
The National Centre for Indigenous Genomics
Wellcome Trust Centre for Human Genetics, University of Oxford, Oxford, UK

Dr Anselm Enders
The intramembrane protease SPPL2A promotes B cell and CD8- DC survival by cleavage of MHC invariant chain
14th Frank and Bobbie Fenner Conference: Perspectives on Immune Recognition, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Using mice to understand the human immune system
The 4th Bootes Course on Translational Medicine: The Pathway from Dicovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
B-cell survival, surface BCR and BAFFR expression, CD74 metabolism and CD8- DCs require the intramembrane endopeptidase SPPL2A
Keystone Symposium: B Cell Development and Function, Keystone, CO, USA

Professor Chris C Goodnow
IgD and removal of self-cross-reactivity from antibodies
Institute for Immunity, Transplantation and Infection, Stanford, CA, USA
Clonal Anergy, the Function of IgD, and Redemption of Self-Reactive Antibodies in Germlinal Centers
Keystone Symposium: B Cell Development and Function, Keystone, CO, USA

Mrs Angela Higgins
Sequencing trouble shooting
CSIRO Plant Industry, Canberra, ACT

Professor Caryl Hill
T-type calcium channels and the vasculature
Danish Cardiovascular Research Academy Annual Symposium, The Sandbjerg Estate, Sønderborg, Denmark
Endothelial gap junctions contribute to the pathogenesis of arterial disease
Keynote speaker: Professorial Inauguration Symposium, University of Southern Denmark, Odense, Denmark
Nitric oxide deficit elicits oxidative stress and augments T-type calcium channel contribution to vascular tone
Experimental Biology 2013 Symposium: Oxidative Stress, Boston, MA, USA
Blood flow and tissue perfusion: Cunning control through electromechanical coupling
Eccles Institute of Neuroscience Seminar Series, The John Curtin School of Medical Research, Australian National University, Canberra, ACT
Towards treatment of therapy resistant hypertension
Heart Foundation Willing Hearts Club Event, Phillip, ACT

Dr Keisuke Horikawa
Single amino acid change in Tnfaip3 inactivates its DUB activity and dysregulates B cell responses
Keystone Symposium: B Cell Development and Function, Keystone, CO, USA
Autoimmunity and Lymphoma
Cancer Collaborative Group Seminar, Translational Research Institute, Brisbane, QLD

Professor Jill E Gready
Improving Rubisco performance
ANU Photosynthesis Initiative International Advisory Group Workshop, The Australian National University, Canberra, ACT

Dr Rebecca Haddock
The role of NOX2 in sympathetic hyperinnervation and underlying obesity-related hypertension
Australian & New Zealand Microcirculation Society / Australian Vascular Biology Society Joint Scientific Meeting, Barossa Valley, SA
NGF-producing immune cells drive sympathetic neurogenic hypertension
Canberra Hospital Annual Research Meeting, Canberra, ACT
Associate Professor
Gavin Huttley
Sequence, Assemble, Annotate, Align ... Species Tree?
Keynote Presentation; Genetics Society of Australasia Conference, The University of New South Wales, Randwick, NSW
Sequence, Assemble, Annotate, Align ... Species Tree?
Australasian Mycological Society Conference, Adelaide Convention Centre, Adelaide, SA
Introduction to programming for scientists using Python
TIC Presentation, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Extracting biological information from sequence variation
EMBL Australia PhD program, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC
Extracting information from DNA sequences using models of sequence evolution
BioInfoSummer 2013, University of Adelaide, Adelaide, SA
The state of reproducible computation in genomic biology
Invited Keynote: Maths of Planet Earth, Australian Mathematical Sciences Institute, Melbourne, VIC

Mr Cameron Jack
Introductory Python
The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Dr Ben Kaehler
Estimating Genetic Distances Using Non-Stationary Processes
Genetics Society of Australasia Conference, The University of New South Wales, Randwick, NSW
Estimating Genetic Distances Using Non-Stationary Processes
TIC Presentation, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Associate Professor
Brett Lidbury
Life Exists Beyond GTR Bioinfosummer 2013 Workshop: Flexible Molecular Evolution Modelling in Python, The University of Adelaide, Adelaide, SA

From lab coat to high dimension feature space – An example of bioinformatics in biomedical research
Continuing Education series, IP Australia, Woden, ACT

Professor Trevor Lamb
The origin and evolution of vertebrate photoreceptors
FASEB Summer Research Conference: Biology and Chemistry of Vision, Steamboat Springs, Colorado, USA

Dr Yalin Liao
Impact of growth factors on early development
Faculty of Health Seminar, University of Canberra, Bruce, ACT

Professor Ted Maddess
Novel diagnostic targets in glaucoma: Targeting multifocal pupil perimeter in glaucoma
World Glaucoma Congress, Vancouver, BC, Canada
ORIA plenary: Highlights of Australian research, on Professor Peter Bishop and ORIA
45th Royal Australian and New Zealand College of Ophthalmologists Congress, Hobart, TAS

Dr Claudio Mastronardi
Encapsulated cell therapies for insulin-dependent diabetes: What role the stem cell?
The 4th Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Biology of Systemic Inflammatory Response Syndrome (SIRS)
The 4th Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Dr Peter Milburn
Investigating the enteric microbiome of Native Australian Lizards with Roche 454 FLX 16S rRNA Gene Amplicon Sequencing
Advances in Genome Biology, Miami, FL, USA

Life Exists Beyond GTR Bioinfosummer 2013 Workshop: Flexible Molecular Evolution Modelling in Python, The University of Adelaide, Adelaide, SA

Invited Keynote: Maths of Planet Earth, Australian Mathematical Sciences Institute, Melbourne, VIC

3rd International Conference on Proteomics & Bioinformatics, Philadelphia, PA, USA

Knowledge discovery from pathology data via machine-learning to enhance laboratory diagnosis and provide an alternative to animal models in fundamental research and toxicology

3rd International Conference on Proteomics & Bioinformatics, Philadelphia, PA, USA

Virus-human interactions demonstrated by Ross River virus illustrate a molecular basis for pathogen spread, and guides mathematical insights for the early detection of bio-invasion threats

Maths for Planet Earth (MPE) BioInvasion and BioSecurity Workshop, CSIRO Discovery Centre, Canberra, ACT

Non-animal alternatives for biomedical research

Introduction to Animal Research Workshop, University of Sydney, Sydney, NSW

In silico pattern recognition as a basis for animal replacement alternatives in fundamental biomedical research

CReST Seminar series, University of Canberra, Bruce, ACT

From lab coat to high dimension feature space – An example of bioinformatics in biomedical research
Continuing Education series, IP Australia, Woden, ACT

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Impact of growth factors on early development
Faculty of Health Seminar, University of Canberra, Bruce, ACT

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Dr Peter Milburn
Investigating the enteric microbiome of Native Australian Lizards with Roche 454 FLX 16S rRNA Gene Amplicon Sequencing
Advances in Genome Biology, Miami, FL, USA
Dr Maxim Nekrasov

Different strategies of chromatin remodelling at the transcription start sites
Practical Workshop on High-Throughput Sequencing Data Analysis, Okinawa OIST, Japan

Professor Chris R Parish

New insights into Type 1 diabetes development and therapy
15th International Congress of Immunology, Milan, Italy
Carbohydrate-based therapeutic as anti-cancer drugs
Lowy Cancer Symposium: Discovering Cancer Therapeutics, The Lowy Cancer Research Center, The University of New South Wales, Randwick, NSW
Novel role for heparan sulfate in thymic development of CD8+ T cells
14th Frank and Bobby Fenner Conference - Perspectives on Immune Recognition, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Translation from scientific discovery to clinical application
ACT Annual Scientific Meeting of the College of Surgeons, Canberra, ACT
New insights into Type 1 diabetes development and therapy
James Cook University, Cairns, QLD
Heparan sulfate: A multifunctional polysaccharide with considerable therapeutic potential
Institute for Glycomics, Griffith University, Gold Coast, QLD
Cancer: Is a vaccine possible?
The 3rd Annual John Curtin Lecture, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Dr Ian Parish

Effector T cells self-regulate during chronic viral infection by IL-10 over-production*
Centre for Biodiscovery & Molecular Development of Therapeutics, James Cook University, Cairns, QLD
Blimp-1 triggers the formation of immunoregulatory IL-10 producing Th1 cells during chronic viral infection
15th International Congress of Immunology, Milan, Italy
Multifocal defects in transcription factor expression occur during peripheral CD8+ T cell tolerance
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

Dr Hardip Patel

Mechanisms of dosage compensation and Z inactivation in snakes
Genetics Society of Austraasia Annual Meeting, Sydney, NSW
Dosage compensation and Z inactivation in snakes
Genome Biodiversity Conference, Canberra, ACT

Dr Gilberto Paz-Filho

Molecular pathways involved in the improvement of nonalcoholic fatty liver disease
International Endocrine Scholars Oral Session, 95th Annual Meeting of The Endocrine Society, San Francisco, CA, USA
Overview of Translational Medicine
The 4th Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

Dr Åsa Pérez-Bercoff

Function and evolution of genes in the human protein interaction network
TIC Presentation, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Understanding virulence in fungal pathogens
Australian Mycology Society (AMS) Joint Conference, Adelaide, SA
Understanding virulence in fungal pathogens
Genetics Society AustralAsia (GSA) conference, Sydney, NSW

Professor Thomas Preiss

Principles of gene regulation at the RNA level
EMBL Australia PhD program, Walter and Eliza Hall Institute of Medical Research, Melbourne, VIC
RBP atlas: an exploration of interactions between mRNA and proteins and their impact on cardiomyocyte biology
ComBio 2013, Perth, WA
Gene regulation and the discovery of RNAmerica
University of Canberra, Bruce, ACT
microRNA changes en route to distinct cellular states of induced pluripotency
36th Annual Meeting of the Molecular Biology Society of Japan, Kobe, Japan

Professor Jan Provis

The macula, the fovea and bloody supply: What do we know and how does it help?
Ida Mann Plenary Lecture: 45th Royal Australian and New Zealand College of Ophthalmologists Congress, Hobart, TAS
Using light to model and manage AMD
6th Asia and Oceania Conference on Photobiology, Sydney, NSW
The macular, vascular patterning and the fovea
The Bosch Institute Annual Scientific Meeting on Neuroscience: Modern Challenges and Australian Pioneers, University of Sydney, Sydney, NSW
Dr Charani Ranasinghe

Mucosal HIV-1 vaccines
Australian Institute of Medical Scientists
NSW South West Division Annual Conference, Canberra, ACT
HIV-1 pox viral-based vaccination: The role of IL-10 vs IL-13 transient inhibition in modulating CD8 T cell immunity
Australian Centre for Hepatitis and HIV Virology Research Conference, Blue Mountains, NSW
Novel vaccine strategies to enhance protective mucosal immunity against HIV
The 4th Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
How do novel IL-13Ra2 adjuvanted vaccines modulate HIV-specific mucosal immunity, CD8 T cell avidity and protective immunity
16th International Congress of Mucosal Immunology, Vancouver, BC, Canada
IL-4 and IL-13 regulates CD8 co-receptor expression to dampen the quality of anti-viral CD8+ T cell immunity following HIV-1 prime-boost
15th International Congress of Immunology, Milan, Italy
HIV-1 IL-13Ra2 adjuvanted vaccines modulate antigen-presenting cell subsets at the lung mucosa and induce high avidity HIV-specific CD8 T cells
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

Dr Katrina L Randall

A missense variant of RasGRP1 increases tonic mTOR signaling resulting in aberrant accumulation of helper T cells and production of autoantibodies
5th International conference on B cells and Autoimmunity, Como, Italy
DOCK8 is critical for the survival and function of NKT cells
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

Dr Joanne Reed

CR3 Negatively Regulates Toll-like Receptor Signaling via the Degradation of MyD88
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

Dr Matthew Rutar

Macrophages and microglia in AMD
Panellist: Association for Research in Vision and Ophthalmology, Special Interest Group (SIG) Seattle, WA, USA

Dr Faran Sabeti

Diagnostic accuracy of multifocal pupillographic objective perimeter in the age-related eye disease study cohort
World Ophthalmology Congress 2013, Tokyo, Japan

Dr Charmaine J Simeonovic

Islet heparan sulfate is a critical biomarker for Type 1 and Type 2 diabetes
Australian Institute of Medical Scientists – NSW South West Division Annual Conference, Canberra, ACT
Cell migration and inflammation in Type 1 diabetes: a critical role for heparanase
31st Annual Scientific Meeting, Transplantation Society of Australia and New Zealand, Canberra, ACT
Cell migration and inflammation in Type 1 diabetes: a critical role for heparanase
Benaroya Research Institute, Seattle, WA, USA
Islet isolation results in heparanase-independent loss of beta cell heparan sulfate (HS) and increased susceptibility to oxidant-mediated damage
5th International Meeting of the Islet Society, Vancouver, BC, Canada
Loss of beta cell heparan sulfate (HS) during islet isolation increases susceptibility to oxidant-mediated damage
Annual Scientific Meeting of the Australian Diabetes Society and the Australian Diabetes Educators Association, Sydney, NSW
Islet isolation results in loss of beta cell heparin sulfate (HS) and increased susceptibility to oxidant-mediated damage
14th World Congress of the International Pancreas and Islet Transplant Association, Monterey, CA, USA
Heparan sulfate (HS) deficiency in isolated islets is due to oxidative damage and not heparanase (Hpse)-mediated degradation
Immunology of Diabetes Society 13th International Congress, Lorne, VIC
Heparan sulfate (HS) status of human islet beta cells is a sensitive marker of beta cell integrity
Immunology of Diabetes Society 13th International Congress, Lorne, VIC
Type 1 diabetes: Discovery of a new therapy
The Australian National University Innovation Showcase, Sydney, NSW
Dr Tatiana Soboleva
A new function for histone variants in the tissue-specific regulation of pre-mRNA splicing
The Annual Scientific Meeting of the Endocrine Society of Australia and the Society for Reproductive Biology, Sydney, NSW

Dr Zan-Min Song
Reduced neural proliferation and increased cell death in the hippocampus and dentate gyrus of a rat model of Hirschsprung’s disease
3rd International Neural Regeneration Symposium, Shenyang, China
Intracranial imaging of the spotting lethal rat using Micro CT scanning
26th International Symposium of Pediatric Surgical Research, Cape Town, South Africa

Professor Greg Stuart
Single neuron computation
Telluride Neuromorphic Cognition Engineering Workshop, Telluride, CO, USA
Dendritic spines
Marine Biology Laboratory, Woods Hole, MA, USA
Synaptic integration in binocular visual cortex
Howard Hughes Medical Research Institute, Janelia Farm, VA, USA
Session Chair
Gordon Conference: Inhibition in the Central Nervous System, Les Diablerets, Switzerland

Dr Rebecca Sweet
B cell extrinsic MyD88 and FcR common gamma chain control contraction of the autoreactive B cell response
Lorne Conference on Infection and Immunity, Lorne, VIC

Professor David Tremethick
H2A.Z inheritance during the cell cycle and its impact on promoter organisation and dynamics
Gordon Conference on Chromatin Structure and Function, Lucca (Barga), Italy
H2A.Z inheritance during the cell cycle and its impact on promoter organisation and dynamics
Cold Spring Harbor Laboratories meeting on Epigenetics and Chromatin, Cold Spring Harbor, NY, USA
A unique H2A histone variant occupies the transcriptional start site of active genes
Lorne Genome Conference, Lorne, VIC
The link between chromatin structure and function during early development
Peter Macallum Cancer Institute, Melbourne, VIC
The link between chromatin structure and function during early development
Department of Biochemistry & Molecular Biology, Monash University, Clayton, VIC
The role of histone variants in regulating differentiation and development
Murdoch Children’s Medical Research Institute, Melbourne, VIC

Professor Carola Vinuesa
Regulation of Tfh cell-mediated selection in germinal centers
Keystone Symposium: B Cell Development and Function, Keystone, CO, USA
Control of Tfh Cells
Keystone Symposium: on Advances in the Knowledge and Treatment of Autoimmunity, Whistler, BC, Canada
Selection of memory B cells by T cells
Department Biochemistry and Molecular Biology, Monash University, Clayton, VIC
 Novel layers of regulation of Tfh cell biology and pathology
The 78th Cold Spring Harbor Laboratory Symposium on Quantitative Biology Immunity and Tolerance, Cold Spring Harbor, NY, USA
Invited speaker
Seminar Program, The University of Adelaide, Adelaide, SA
Regulation of Tfh cells
T Follicular Helper Cell Gordon Conference, Chinese University of Hong Kong, China,
Leaders in Science and Medicine Seminar Garvan Institute, Sydney, NSW
How T cells control the quality of antibody responses
4th International Symposium Regulators of Adaptive Immunity, Erlangen, Germany,
Regulation of T cell help for B cells
First Argentinean Spring Course on Advanced Immunology, Los Cocos, Cordoba Province, Argentina
Novel mechanisms controlling mouse and human follicular T cell homeostasis
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand
S Achuthan and AC Blackburn
Targeting glucose metabolism - a strategy for overcoming drug resistance in breast cancer
25th Lorne Cancer Conference, Lorne, VIC

R Albarracin
Therapeutic potential of 670 nm light in retinal disorders
3rd International Conference on Clinical & Experimental Ophthalmology, Chicago, IL, USA

H Bergmann
B-cell survival, surface BCR and BAFF-R expression and CD74 metabolism require the intramembrane endopeptidase SPPL2A
2nd IFReC-SigN Winter School on Advanced Immunology, Sentosa Island, Singapore
Intramembrane endopeptidase SPPL2A regulates MHC class II antigen Presentation Pathway
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW
B-cell survival, surface BCR and BAFF-R expression and CD74 metabolism require the intramembrane endopeptidase SPPL2A
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

S Biswas-Legrand, M Madigan and K Valter
Development of an in vitro human Muller cell model to mimic gliosis in response to retinal detachment: a platform to investigate the effects of 670nm red light treatment
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT

T Bock
The impact of SK channels on dendritic spikes in cortical L5 pyramidal neurons
Gordon Research Seminar and Conference on Dendrites: Molecules, Structure and Function, Les Diablets, Switzerland

D Chaston
Expression of dysfunctional connexin40 in vascular endothelium enhances myogenic constriction and reduces artery distensibility
Experimental Biology, Boston, MA, USA

T Chen, Y Zhu and GA Huttley
Do nucleosome-flanking sequences influence the recruitment of specific histone variants?
“Science Passport” presentation, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Do nucleosome-flanking sequences influence the recruitment of specific histone variants?
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT
A new alignment algorithm for motif discovery (MIRE)
Techniques in Computational Genomics seminar series, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT

FJ Choong
Roles for heparan sulfate and heparanase in islet transplantation
14th World Congress of International Pancreas and Islet Transplantation Association (IPITA) Monterey, CA, USA
Heparan sulfate and heparanase: Biomarkers of islet integrity and damage in islet transplantation
The Transplantation Society of Australia and New Zealand (TSANZ), Annual Scientific Meeting, Canberra, ACT

N Fernando, G Kotwal and K Valter
The protective effect of VCP against light-induced retinal degeneration
3rd International Conference on Clinical and Experimental Ophthalmology, Chicago, IL, USA
The protective effect of the complement inhibitor VCP against light-induced retinal degeneration
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT

N Fernando, D Garnett, G Kotwal and K Valter
VCP as a potential treatment for the retina: evidence from an AMD animal model
15th International Congress of Immunology, Milan, Italy

A Go, MS To, C Stricker, S Redman, HA Bachor, G Stuart and VR Daria
Four-dimensional photostimulation: Stimulating neurons in space and time
Janelia Farm Shaping the Waves Conference, Ashburn, VA, USA
Four-dimensional photostimulation: Stimulating neurons in space and time
Society for Neuroscience Annual Meeting, San Diego, CA, USA
Four-dimensional photostimulation for studying dendritic integration
Gordon Research Seminar and Conference on Dendrites: Molecules, Structure and Function, Les Diablets, Switzerland
Simultaneous 3D multisite photostimulation with high-speed switching
European Conference on Biomedical Optics (ECBO), Munich, Germany
3D multi-site photostimulation with high-speed switching
33rd Annual Meeting of the Australasian Neuroscience Society, Melbourne, VIC
BP Gang, PJ Hogg, PJ Dilda and AC Blackburn
Dichloroacetate sensitizes cancer cells towards apoptosis
Keystone symposium: Tumor Metabolism, Keystone, CO, USA

F Haque, F Maclean, D Nisbet and J Potas
In vivo macrophage polarisation using electrospun nanofibres functionalised with interleukin-10 in the peripheral nervous system
4th Australian Neurotrauma Symposium, Hobart, TAS

D (Daniel) Hu
Increased mTOR activity and naïve-to-memory cell conversion in Rasgrp1\textsuperscript{Wt} CD4+ T cells
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

D (Di) Hu and J Potas
Effect of 670 nm photobiomodulation on Spinal Cord Injury
Canberra Health and Research Meeting (CHARM), Canberra Hospital, Canberra, ACT

D (Di) Hu, S Zhu and J Potas
The effect of 670nm light treatment on recovery of spinal cord injury
4th Australian Neurotrauma Symposium, Hobart, TAS

H Huang
Functional differences between two classes of layer 2 principal neurons in the piriform cortex in vivo
33rd Annual Meeting of the Australasian Neuroscience Society, Melbourne, VIC

D (Di) Hu, S Zhu and J Potas
The effect of 670nm light treatment on recovery of spinal cord injury
4th Australian Neurotrauma Symposium, Hobart, TAS

M Kolic, AYH Chain, AC James, T Maddess and CF Carle
Structure and function in multifocal pupillographic objective perimetry (mPOP)
Association for Research in Vision and Ophthalmology, Seattle, WA, USA

M Kolic, AC James, R Essex, T Maddess and CF Carle
The effect of iris colour on pupil response with multifocal pupil objective perimeter
Australasian Ophthalmology and Vision Science Meeting, Hobart, TAS

M Kolic, AYH Chain, AC James, T Maddess and CF Carle
Differential odour-processing by two classes of principal neurons in the piriform cortex in vivo
Society for Neuroscience Annual Meeting, San Diego, CA, USA

A Mishra, AC Blackburn, C Parish, M-L Wong and J Licinio
Leptin increases metastatic potential of breast cancer cells
AACR Tumor Invasion and Metastasis Conference, San Diego, CA, USA

D (Di) Hu, J Potas and S Zhu
Effects of 670 nm photobiomodulation on recovery following hemi-contusion spinal cord injury
XXXVII Annual Meeting of the Brazilian Society of Neuroscience and Behaviour Belo Horizonte, MG - Brazil

Y Jeelall
Investigating the effects of lymphoma mutations enhancing NF-\textit{\textbeta} signalling
Lorne Cancer Conference, Lorne, VIC

Y Mei, L Tze, A Enders, EM Bertram and CC Goodnow
The CD8 T cell deficiency in ‘Duan’ mice
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

A Mishra, AC Blackburn, C Parish, M-L Wong and J Licinio
Leptin increases metastatic potential of breast cancer cells
AACR Tumor Invasion and Metastasis Conference, San Diego, CA, USA
S Morton
Impairment of endothelial Connexin40 causes hypertension in mice via an EDH-independent pathway
Joint meeting of Australian Vascular Biology Society (AVBS) and Australian and New Zealand Microcirculatory Society (ANZMS), Barossa Valley, SA

Interference with endothelial gap junctional coupling via Connexin40 produces hypertension in mice
Canberra Health and Research Meeting (CHARM), Canberra Hospital, Canberra, ACT

M Ratnadiwakara, R Williams, M Rooke and AC Blackburn
Vitamin D metabolism, PTH and breast cancer susceptibility in mice
European Conference on Cancer Genomics, Heidelberg, Germany

J Robertson
Electrical stimulation alters patterns of epileptiform activity in the piriform cortex
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT

Z Sabouri, K Horikawa, K Randall, R Brink and CC Goodnow
Antibody redemption: removal of self-reactivity from IgD+ anergic B cells by purifying selection in germinal centers
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT

A Pratama
MicroRNA-146a represses Th1 cell program
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW

T Racic and K Valter
Can 670nm red light treatment ameliorate damage following retinal detachment? Observations from a rodent model
Australasian Ophthalmology and Vision Science Meeting, Hobart, TAS

M Ratnadiwakara, R Williams and AC Blackburn
Vitamin D, parathyroid hormone, Cyp2r1 and breast cancer susceptibility in mice
American Association for Cancer Research: Breast Cancer Research Conference, San Diego, CA, USA

JWG Seamons, A Bubna-Litic, MS Barbosa and T Maddess
Isotrigon texture discrimination by a small number of underlying neural mechanisms
Australasian Ophthalmology and Vision Science Meeting, Hobart, TAS

T Sibbitt, BJ Parker, DT Humphreys, HR Patel, AL Statham, SJ Clark and T Preiss
The association of RNA cytosine methylation with post-transcriptional regulation and cancer
RNA Network of Australasia: RNA Society Seminar, Research School of Biology, The Australian National University, Canberra, ACT

T Sibbitt, BJ Parker, HR Patel, DT Humphreys, JE Squires, NJ Beveridge, SJ Clark and T Preiss
RNA methylation: a mechanism for post-transcriptional control that is deregulated in cancer?
18th Annual Meeting of the RNA Society, Davos, Switzerland

T Sibbitt, HR Patel, DT Humphreys, JE Squires, SJ Clark and T Preiss
Investigating the role of RNA methylation in post-transcriptional regulation using a prostate cancer cell model
34th Annual Lorne Genome Conference, Mantra Lorne, Lorne, VIC

S Sane
Wavefront correction for optimised light delivery into brain tissue
The ANZCOP (Australian and New Zealand Conference on Optics and Photonics) Conference, Fremantle, WA
M Singh
Tracking and identifying autoimmune-inducing T cell clones in Aire-/-Cblb-/- mice
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand
Tracking and identifying autoimmune-inducing T cell clones in Aire-/-Cblb-/- mice
Keystone Symposium: Advances in the Knowledge and Treatment of Autoimmunity, Whistler, BC, Canada
Tracking and identifying autoimmune-inducing T cell clones in Aire-/-Cblb-/- mice
RCAI International Summer Program, Yokohama, Japan

A Theodoratos, JE Dahlstrom, R Galgamuwa, JA Smiles, L Tian, AC Blackburn and PG Board
Prevention of cisplatin-induced nephrotoxicity by dichloroacetate
10th International ISSX (International Society for the Study of Xenobiotics) Meeting, Toronto, ON, Canada

S Trivedi, R Jackson, L Sedger, J Stambas and C Ranasinghe
Intranasal delivery of recombinant HIV-1 fowl poxvirus vaccines can induce excellent high avidity CD8 T immunity by recruiting unique antigen presenting cell subsets to the lung mucosae
16th International Congress of Mucosal Immunology, Vancouver, BC, Canada

J Vélez
Translational genomics of complex traits: Attention Deficit/Hyperactivity Disorder and Alzheimer’s disease
Program in Human Genetics, University of Chile School of Medicine, Santiago, Chile

JQ Wang, Y Jeelall, K Horikawa, and CC Goodnow
MYD88 mutations in B cells – effects on NF kappaB activity, B cell survival and proliferation
Lorne Cancer Conference, Lorne, VIC

DK Wijesundara, RJ Jackson, DC Tscharke and C Ranasinghe
IL-4 and IL-13 regulate CD8 co-receptor expression to dampen the quality of anti-viral CD8+ T cell immunity following HIV-1 prime-boost vaccination
15th International Congress of Immunology, Milan, Italy

DK Wijesundara, DC Tscharke, RJ Jackson, and C Ranasinghe
Dynamic regulation of IL-4 receptor alpha (IL-4Ra) following viral infections and HIV-1 vaccination correlates with anti-viral CD8+ T cell quality
Keystone Symposium: HIV Vaccines (X2), Keystone, CO, USA

M Yabas
ATP11C controls early B cell development but not their function
University of Chicago, Chicago, IL, USA
ATP11C controls early B cell development by blocking pre-BCR signaling
University of Texas Southwestern Medical Center, Dallas, TX, USA
ATP11C controls early B cell development but not their function
Keystone Symposium: B Cell Development and Function, Keystone, CO, USA

Deficiency of the P4-type ATPase ATP11C in mice causes stomatocyte formation and anemia due to a shortened erythrocyte lifespan
Canberra Health Annual Research Meeting, Canberra, ACT

The putative aminophospholipid translocase ATP11C controls early B-cell development but not their function
43rd Annual Scientific Meeting, Australasian Society for Immunology, Wellington, New Zealand

H Yang
Characterization of the interactions between RNA and ‘moonlighting’ metabolic enzymes in rodent cardiomyocytes and their change in response to stress
The Australian Society for Medical Research (ASMR, ACT Branch) New Investigator’s Forum, Canberra, ACT

JY Yap
Thymic epithelial cells can delete the majority of strongly self-reactive CD4+ thymocytes in the natural TCR repertoire
ACT and NSW Australasian Society of Immunology Annual Branch Retreat, Bowral, NSW
Ms Nur Diana Anuar
Member: Australia-Malaysia Muslim Family Association (AMMF)
Member: Malaysian Postgraduate Student Association (MyPSA)
Organizing committee member: MyPSA for GAZA Fundraiser, Canberra, ACT

Dr Stuart Archer
Grant-Assessor: NHMRC
Reviewer: PLoS One

Professor Mauricio Arcos-Burgos
Editorial Board Member: Molecular Genetics and Genomics Medicine
Editorial Reviewer: Nature Genetics; Molecular Psychiatry; Human Genetics, Nephron; Bioinformatics; Translational Psychiatry, Annals of Human Genetics; The ANU Undergraduate Research Journal

Ms Bhavani Balakishnan
Presenter and Host: Academic visit from Indiana University Purdue University (IUPUI)
Workshop Presentation: Missense Mutation Project, a gene driven approach for generating mouse models for cancer research, Lorne Cancer Conference, Lorne, VIC

Dr Nicole Beard
Presenter and Host: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Chair: Organising committee: Gage Conference on Muscle Excitation-Contraction Coupling
Secretary: Gage Conference Society
Academic Editor: PLoS One
Council Member: Australian Physiological Society
Member: Cardiac Society of Australia and New Zealand
Member: Biophysical Society USA

Associate Professor John M Bekkers
Director: Australian Course in Advanced Neuroscience (ACAN), Moreton Bay Research Station, North Stradbroke Island, QLD
Reviewing Editor: Neuroscience Letters; Frontiers in Neuroscience; BMC Neuroscience
Chair: JCSMR Scholarships Committee
Convenor: JCSMR School Seminar program
Member: JCSMR Education Committee
Member: ANU Neuroscience Management Committee
Member: Eccles Institute of Neuroscience Director Search Committee
Council Member: Australasian Neuroscience Society
Ex officio Member: ACAN Management Committee of the Australasian Neuroscience Society
Member: Australasian Neuroscience Society
Member: Australian Physiological Society
Member: Society for Neuroscience US
Member: International Brain Research Organization (IBRO)
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter and Host: JCSMR Outreach Program, Canberra, ACT
Judge: Australasian Brain Bee Challenge Final, Australasian Neuroscience Society, Gold Coast, QLD

Dr Edward M Bertram
Steering Committee Member: International Mouse Phenotyping Consortium
Finance Sub-Committee Member: International Mouse Phenotyping Consortium
Participant: Australian Government-European Union 2nd Workshop on Research Infrastructure

Dr Anneke Blackburn
Coordinator: Cancer Biology Forum, JCSMR, ANU, Canberra, ACT
Presenter and Host: JCSMR Outreach Program, Canberra, ACT
Member: American Association for Cancer Research
Member: Australian Association for Medical Research (ASMFR)
Member: Kathleen Cunningham Consortium for Research into Familial Breast Cancer (kConFaB)
Invited Speaker: ACT Cancer Council Pink Ribbon Breakfast: Targeting cancer metabolism with dichloroacetate
National Breast Cancer Foundation National Research Roadshow: Targeting cancer metabolism with dichloroacetate
Invited speaker: Zonta Club of Canberra Breakfast meeting: Targeting cancer metabolism with dichloroacetate

Professor Philip G Board
Member: ACT Gene Technology Advisory Council
Awards Committee Member: International Society for the Study of Xenobiotics
Editorial Board Member: The Open Drug Metabolism Journal; Drug Metabolism Reviews; The Sirraj Medical Journal

Dr Jean-Didier Breton
Chair: Neuroscience Seminar series, JCSMR, ANU, Canberra, ACT
Co-organiser: Annual Neuroscience Kioloa Colloquium, ANU Coastal Campus, Kioloa, NSW
Presenter and Participant: Australian Brain Bee Challenge, ACT Regional Finals, JCSMR, Canberra, ACT
Member: Australasian Neuroscience Society
Member: Society for Neuroscience US
Member: Federation of European Neuroscience Society
Member: French Neuroscience Society
Mr Bob Buckley
Member: The Australasian Genomics Technologies Association (AMATA)

Dr Corinne Carle
Member: Australasian Neuroscience Society (ANS)
Member: Association for Research in Vision and Ophthalmology
Committee Member: Australian Society for Vision Research
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter and Participant: Clinical Research Suites Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT

Dr Marco G Casarotto
Presenter and Host: JCSMR Outreach Program, Canberra, ACT
Council Member: Australian Society for Biochemistry and Molecular Biology (ASBMB)
Member: Australian Society for Medical Research (ASMR)
Member: Australian Biophysics Society (ABS)
Member: Biophysical Society US
Member: NHMRC Grant Review Panel: Biochemistry and Cell Biology

Dr Geeta Chaudhri
Member: American Society Virology
Member: Federation of Clinical Immunological Societies
Member: Australasian Society for Immunology
Member: International Society for Cytokine and Interferon Research

Dr Julian Choy
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter and Participant: Australian Brain Bee Challenge, ACT Regional Finals, JCSMR, Canberra, ACT
Member: Australasian Neuroscience Society

Mr Aaron Chuah
Member: The Australasian Genomics Technologies Association (AMATA)

Dr Jennifer Clancy
Member: Australian Society for Biochemistry and Molecular Biology
Member: Australian Society for Medical Research
Member: RNA Network of Australasia
Member: JCSMR Operations Committee
Grant-Assessor: NHMRC, ARC
Reviewer: Circulation Research; PLoS One; microRNA; F1000Research

Associate Professor Matthew Cook
Chairman: Royal Australasian College of Physicians, Joint Specialist Advisory Committee, Immunology and Allergy
Member: Royal Australasian College of Physicians Curriculum committee
Member: Royal Australasian College of Physicians College education committee
Examiner: Royal College of Pathologists of Australasia (Immunopathology)
Member: NHMRC Grant review panel
Editorial Board Member: Clinical and Translational Immunology

Ms Tiffany Cripps
Member: The Australasian Genomics Technologies Association (AMATA)

Dr Stephen Daley
ACT Branch Councillor: Australasian Society for Immunology
Editor: News and Commentary section: Immunology and Cell Biology
Convenor: Celebration of Professor Chris Parish’s Honorary Life Membership of the Australasian Society for Immunology, JCSMR, Canberra, ACT

Dr Vincent Daria
Co-Chair: Neurophotonics Session, European Conferences on Biomedical Optics, Munich, Germany
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter: Australian Course in Advanced Neuroscience (ACAN), North Stradbroke Island, QLD
Editorial Board: ISRN Optics
Member: Australasian Neuroscience Society
Member: Optical Society of America
Member: The International Society for Optics and Photonics
Member: Australian Optical Society
Dr Debjani Das
Member: Cognitive Neuroscience Society
Member: International Behavioural and Neural Genetic Society
Member: Society for Social Neuroscience
Member: Australian Society for Psychiatric Research
Reviewer: Addiction; Addiction Biology; PLoS ONE; Journal of Attention Disorders; Psychological Medicine; Developmental Psychobiology; Social Psychiatry and Psychiatric Epidemiology

Dr Michael Dobbie
Exhibition Booth Host: Research Infrastructure, Annual Australian Science Communicators National Conference, Sydney, NSW

Dr Guowen Duan
Honorary Fellowship: CSIRO

Professor Angela F Dulhunty
Immediate Past President: Australian Society for Biophysics
Organiser: Curtin Conference on Muscle, Canberra, ACT
Member: Australian Physiological Society
Member of the National Committee for Biomedical Sciences
Member: ARC College
Member: Biophysical Society US
Editorial Board Member: Calcium Binding Proteins; Ion Channels; The Biochemical Journal
Grant Assessor: ARC AusReader, NHMRC, European, USA and NZ Granting agencies

Dr Anselm Enders
ACT Branch Councilor: Australasian Society of Immunology
Member: CMBE Research Committee
Member: RSB Honours Convening committee
Member: Australasian Society for Immunology
Member: European Society for Immunodeficiencies

Professor Christopher C Goodnow
Member: Australian Academy of Science Special Elections Committee
Medical Science Review Board Member: Juvenile Diabetes Research Foundation
Member: Infection and Immunity Strategic Advisory Committee, The Wellcome Trust, UK
Editorial Board Member: Immunity; The Journal of Experimental Medicine; Mammalian Genome; Journal of Autoimmunity; BMC Biology
Communicating Editor: International Immunology
Council Member: EMBL Australia
Member: Australasian Society for Immunology
Member: American Association for the Advancement of Science
Member: American Association of Immunologists

Professor Jill Gready
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Editorial Board Member: Bioinformatics and Biology Insights
Member: ANU Supercomputing Time Allocation Committee
Co-convenor: ANU Photosynthesis Initiative Scientific Committee
Fellow: Royal Australian Chemical Institute
Member: Australian Society for Biochemistry and Molecular Biology (ASBMB)
Member: Australian Society for Biophysics

Dr Rebecca Haddock
Panel Member: NHMRC Early Career Fellowships
Committee Chair: JCSMR Scholarships Committee
Committee Member: Level A/B representative, JCSMR Executive Committee
ACT Representative: Australian and New Zealand Microcirculation Society
Member: National Association of Research Fellows
Member: Australian Physiological Society
Member: Australian Society of Pharmacologists and Toxicologists (Cardiovascular SIG Committee member)
Ms Angela Higgins
Member: The Australasian Genomics Technologies Association (AMATA)

Professor Caryl E Hill
Guest Reviewing Editor: Journal of Physiology (London)
Committee Member: Cardiovascular Special Interest Group, Australian Physiological and Pharmacological Society
Committee Member: NHMRC Early Career Researcher Awards Committee
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Committee Member: JCSMR Operations Committee
Management Committee Member: Histology, Electron Microscopy and FACS, JCSMR
Member: JCSMR Workshop Users Committee
Management Committee Member: ANU Centre for Advanced Microscopy
Member: Australian Physiological Society
Member: Australian Neuroscience Society
Member: ANZ Microcirculation Society
Member: American Physiological Society
Member: American Neuroscience Society
Member: ANZ Microcirculation Society

Dr Lauren Howitt
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Member: Cardiovascular SIG Committee, Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists
Member: Australian and New Zealand Microcirculation Society

Associate Professor Gavin Huttley
Convenor: Techniques in Computational Genomics Seminar Series
Convenor: Bioinformatics drop-ins
Organising committee chair: Workshop on Bioinformatics for High Throughput Sequencing
Academic Head: Genome Discovery Unit
Chair: Genome Discovery Unit Operations Committee
Member: Genetics Society of AustralAsia
Member: Society for Molecular Biology and Evolution
Reviewer: PLoS Genetics; PLoS ONE
Grant Reviewer: ARC, NHMRC program grants
Media interviews: The medical significance of snake venom, ABC Radio, AFP, 3AW
Editorial Board Member: Frontiers in Evolutionary and Population Genetics; Biology Direct; PLoS ONE

Ms Carly Hynes
Organiser: NSW miRNA Users Workshop, RNA network of Australasia and ASBMB
Reviewer: PLoS ONE
Member: The RNA Society
Member: The Australian Society for Medical Research (ASMR)
Member: Australian Society for Biochemistry and Molecular Biology (ASBMB)
Member: Australasian Microarray and Associated Technologies Association (AMATA)
Member: Golden Key International Honour Society

Mr Cameron Jack
Member: The Australasian Genomics Technologies Association (AMATA)

Dr Ben Kaehler
Member: Genetics Society of AustralAsia

Associate Professor Guna Karupiah
Vice-President: Federation of Immunological Societies of Asia Oceania (FIMSA)
Vice-President - Federation of Clinical Immunological Societies (FOCIS)
Member: American Association of Immunologists
Member: American Society for Microbiology
Member: American Society Virology
Member: International Society for Cytokine and Interferon Research
Member: Australasian Society for Immunology
Member: Australian Society for Medical Research (ASMR)

Professor Trevor D Lamb
Consulting Editor: Journal of Physiology

Dr Yalin Liao
Member: Nutrition Society of Australia
Member: Canberra Society of Chinese Scholars
Participant: National Scientists and Mathematicians in Schools Program, in association with Canberra Girls Grammar School, Deakin, ACT
Professor Julio Licinio
Review Panel Member: US National Institute of Mental Health, National Institutes of Health Interventions Committee for Adult Mood and Anxiety Disorders (ITMA)
Member: United States Department of Health and Human Services, Secretary Advisory Committee on Genetics, Health and Society
Scientific Program Committee Chair: American Psychiatric Association
Member, Membership and Scientific Program Committees: American College of Neuropsychopharmacology
Course Co-Convener: The Bootes Course on Translational Medicine, JCSMR, Canberra, ACT
Member: Scientific Program Committee: American College of Psychiatrists
Member: Communications Committee: Association for Clinical Research Training
Founding President: International Society of Pharmacogenomics (ISP)
Member: American Society of Human Genetics
Member: Association for Patient-oriented Investigation
Member: Collegium Internationale Neuro-Psychopharmacologicum (CINP)
Member: Society for Neuroscience USA
Member: The Endocrine Society
Member: American Federation for Medical Research
Member: Society of Biological Psychiatry Fellow: The Royal Australian and New Zealand College of Psychiatrists
Co-Chair: ANU College of Medicine, Biology & Environment, Committee for Academic Health Science Centre and Translational Research
Editor-in-Chief: Molecular Psychiatry
Editor-in-Chief: The Pharmacogenomics Journal
Editor-in-Chief: Translational Psychiatry
Editorial Board Member: Australian and New Zealand Journal of Psychiatry
Member: National Selection Committee: Australian-American Fulbright Commission
Committee Member: ANU Genome Discovery Advisory Committee
Member: NHMRC - Promoting & Maintaining Good Health Expert Working Group
President: International Society of Translational Medicine
Member: National Science Colloquium
Review Panel Member: National Institute for Health Research Biomedical Research Centres and Biomedical Research Units, United Kingdom
Member: NHMRC Genetics Review Panel
Organising Committee Member: Sarah Grace Sarcoma Foundation
Member: Australasian Society for Psychiatry Research
Editorial Board Member: Translational Medicine: Current Research Journal

Associate Professor Brett Lidbury
Public lecture: Replacing Animals in Medical Research - A World View and the Australian Perspective
Manning Clark House, Forrest, ACT

Dr Fiona Lithander
Member: Year 1 and Year 2 Examination Committees, ANU Medical School, ANU, Canberra, ACT
Member: Phase 1 Committee, ANU Medical School
Council Member: ACT Branch, Nutrition Society of Australia
Member: Nutrition Society Australia
Member: Australia New Zealand Obesity Society
Member: Nutrition Society, UK & Ireland
Member: Association for the Study of Obesity, UK
Registered Nutritionist: Association for Nutrition, UK
Judge: ASMR New Investigator Forum, Canberra, ACT
Presenter and Participant: Clinical Research Suites Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT

Dr Fabio Longordo
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Member: Australasian Neuroscience Society
Member: Swiss Neuroscience Society
Member: Society for Neuroscience USA
Professor Ted Maddess

Director: ARC Centre of Excellence in Vision Science
Section Editor: Clinical and Experimental Ophthalmology
Session Chair: International Imaging and Perimetry Society meeting
Chair: Organising Committee: AOVSM meeting, Melbourne, VIC
Member: American Academy of Neurology (AAN)
Member: American Academy of Ophthalmology (AAO)
Member: Association for Vision Research and Ophthalmology (ARVO)
Member: Imaging and Perimetry Society (IPS)
Member: International Society for Clinical Electrophysiology of Vision (ISCEV)
Member: Royal Australian & NZ College of Ophthalmology (RANZCO)
Member: Optical Society of America (OSA), Vision Sciences Society (VSS)
Member: Board of Administration: National Vision Research Institute (Melbourne)
Member: Scientific Advisory Board of EyeCo Pty Ltd
Organising Committee Member: International Imaging and Perimetry Society, Melbourne, VIC
Member: Eccles Institute of Neuroscience Director Search Committee
Member: Zinkernagel/Doherty Fellowship Selection Committee, JCSMR
Member: Board of Directors, Australian College of Optometry
Member: Board of Administration, National Vision Research Institute (NVRI)
Member: NHMRC Assigners Academy

Dr Claudio Mastronardi
Member: Society for Neuroscience USA
Member: The Endocrine Society
Organising Committee Member: Clinical Research Suites Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT

Professor Klaus I Matthaei
Deputy Chair: ANU Institutional Recombinant DNA Biosafety Committee
Reviewer: Rowan Institute International Research Awards
Reviewer: National Health & Medical Research Council
Reviewer: AUSReader Australian Research Council
Affiliate Member: Centre for the Molecular Genetics of Development
Member: Australian Physiological Society
Member: ANZ Microcirculation Society

Dr Peter Milburn
Member: The Association of Biomolecular Resource Facilities (ABRF) (USA)

Dr Teresa Neeman
Member: Safety monitoring committee: Otsuka clinical trial in patients with COPD
Member: Safety monitoring committee for Immunotherapeutics clinical trial of monoclonal antibody in patients with multiple myeloma
Statistical reviewer: Cochrane Collaborative Acute Respiratory Infections Group
Statistical reviewer: Cochrane Collaborative Breast Cancer Group
Statistical consultant: MS Australia

Dr Maxim Nekrasov
Workshop host and Presenter: Chromatin techniques in Plants, Monash University, Melbourne, VIC

Ms Stephanie Palmer
Member: The Australasian Genomics Technologies Association (AMATA)

Professor Christopher R Parish
Medical Research Advisory Committee Member: The Australian Cancer Research Foundation
Committee Member: Melbourne International Congress of Immunology 2016 Bid
Founding Member: World AllergOncology Task Force (Vienna-based)

Dr Ian Parish
Member: Australasian Society for Immunology
News and Commentary Editor: Immunology and Cell Biology

Dr Hardip Patel
Member: The Australasian Genomics Technologies Association (AMATA)
Member: Genetics Society of Australasia

Dr Gilberto Paz-Filho
Editorial Board Member: Brazilian Archives of Endocrinology and Metabolism
Member: Latin American Thyroid Society
Member: Brazilian Society of Endocrinology and Metabolism
Member: The Endocrine Society
Committee Member: The Endocrine Society’s International Endocrine Scholars Program Task Force
Committee Member: The Endocrine Society’s Trainee & Career Development Core Committee
Committee Member: The Endocrine Society’s Awards Review Committee
External Assessor: National Health and Medical Research Council Project Grants
Organising Committee Member: The 3rd Bootes Course on Translational Medicine: The Pathway from Discovery to Healthcare, The John Curtin School of Medical Research, The Australian National University, Canberra, ACT
Co-convenor: Masters of Translational Medicine program at The Australian National University, Canberra, ACT
Organising Committee Member and Host: Clinical Research Suites Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT

Dr Kaiman Peng
Member: The Australasian Genomics Technologies Association (AMATA)

Ms Eva Pillai
Equity Officer: ANU Postgraduate and Research Student Association (PARSA)
PARSA Representative: ANU College of Medicine, Biology and the Environment on the Postgraduate Representative Council
Postgraduate Representative: ANU Education Committee, HDR Subcommittee
Member: ANU Access and Equity Committee
Senior Residential Scholar: Toad Hall, Postgraduate Residence

Dr Jason Potas
Member: Australasian Neuroscience Society
Member: Brazilian Society of Neuroscience and Behaviour SBNeC
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Presenter and Participant: Australian Brain Bee Challenge, ACT Regional Finals, JCSMR, Canberra, ACT
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Member: Year 1 and Year 2 Examination Committees, ANU Medical School, The Australian National University, Canberra, ACT
Member: Phase 1 Curriculum Committee, ANU Medical School, The Australian National University, Canberra, ACT
Member: Phase 1 Assessment Committee, ANU Medical School, The Australian National University, Canberra, ACT

Professor Thomas Preiss
Member: Australian Society for Biochemistry and Molecular Biology
Chair: RNA network Australasia, an ASBMB SIG
Member: Australasian Microarray & Associated Technologies Association
Member: German Society for Biochemistry and Molecular Biology
Board Member: Lorne Genome Inc
Member: Australian Genome Conference Organising Committee 2012, Lorne, VIC
Symposium co-chair: ComBio Conference 2012, Adelaide, SA
ANU Representative: University round table of Research Australia
Deputy Chair: Research Committee CMBE/ANU
Member: ANU Major Equipment Committee
Member: JCSMR External Relations Committee
Member: JCSMR Internal Grant Review Committee
Member: JCSMR Group Leaders’ Forum
Grant-Assessor: NHMRC, ARC, National Heart Foundation, Clive and Vera Ramaciotti Foundation, Sylvia and Charles Viertel Foundation, Cure Cancer Australia Foundation, Children’s, Youth and Women’s Health Service, South Australia, Marsden Fund (NZ), Université de Liège Concerted Research Actions (Belgium), Swiss National Science Foundation, Austrian Science Fund (FWF), Cancer Research UK, Wellcome Trust UK, NSF (USA), Foundation for Polish Science, French National Research Agency (ANR), and European Research Council
CAP committee/ (PhD) thesis examiner: UNSW, University of Sydney, University of Newcastle, UQ, UWA, University of Adelaide, Swiss Federal Institute of Technology Zurich, Centre de Regulació Genòmica Barcelona (Spain)
Editorial Board Member: *PLoS ONE*
Reviewer: *Cell; Science; Nat Cell Biol; PLoS Biol; EMBO J; TIBS; Genome Biol; NAR; RNA*

Mrs Anne Prins
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter and Host: JCSMR Outreach Program, Canberra, ACT
Presenter and Co-organiser: Surgical Cut Up Workshops, CIT, Bruce, ACT
Presenter and Co-organiser: Surgical Cut Up Workshops, Launceston, TAS
Demonstrator: Anatomical Pathology, CIT and University of Canberra, Bruce, ACT

Professor Jan Provis
Member: Scientific Advisory of the Ophthalmic Research Institute of Australia (ORIA)
Chair: Research Grants Advisory Group, Retina Australia
Associate Director: ARC Centre of Excellence in Vision Science
Member: Scientific Review of Progress – ClemCell Project, Bond University
Member: Bendigo Bank Scholarship Advisory Group, Braidwood-Bungendore District. These scholarships are for students entering tertiary education and are in need of and eligible for financial support.

Mr Roy Ramiscal
Member: Australasian Society for Immunology
Member: JCSMR Education Committee
Member: JCSMR Social Committee
Dr Charani Ranasinghe
Member and Volunteer worker: Belconnen Arts Centre
Member and Volunteer worker: AIDS Action Council ACT
Member: Australasian Society for Immunology
Member: Society for Mucosal Immunology
ACT representative: ASI Mucosal Immunology Special Interest Group
Editorial Board: Journal of Sexually Transmitted Diseases
Organising Committee: Australian Society for HIV Medicine (ASHM) Conference, Melbourne, VIC

Dr Danny Rangasamy
Grant Assessor: NHMRC
Associate Editor: Biotechnology Letters
Member: Australian Society for Biochemistry and Molecular Biology (ASBMB)

Ms Belinda Ryan
Member: ASBMB

Ms Tennille Sibbritt
Member: Australian Epigenetic Alliance
Member: Australian Society for Biochemistry and Molecular Biology (ASBMB)
Member: Golden Key International Honour Society
Member: The RNA Society

Dr Charmaine Simeonovic
Editorial Board Member: Cell Transplantation
Member: The Australasian Society for Immunology
Member: The Transplantation Society of Australia and New Zealand.
Member: The Transplantation Society (International)
Member: The International Pancreas and Islet Transplant Association
Member: The Immunology of Diabetes Society (International)
Member: The International Xenotransplantation Association
Member: The Cell Transplantation Society
Member: The Australian Diabetes Society

Mr Geoff Sjollema
Workshop Presentation: Missense Mutation Project, a gene driven approach for generating mouse models for cancer research, Lorne Cancer Conference, Lorne, VIC

Dr Tanya Soboleva
Participant: Scientists in Schools program, in association with Telopea Park School, Barton, ACT
Member: Society of Reproductive Biology

Dr Zan-Ming Song
Editorial: Journal of Community Medicine and Health Education
Editorial: Scientific World Journal

Associate Professor Christian Stricker
Chair: Medical Science Committee, ANU Medical School, ANU, Canberra, ACT
Chair: Year 2 Examination Committee, ANU Medical School, ANU, Canberra, ACT
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Presenter and Participant: Indigenous Day, ANU Medical School, ANU, Canberra, ACT
Reference Group Member: Independent Management Group, National Baboon Colony, Camperdown, NSW
Member: ANU Neuroscience Management Committee
Member: Australasian Neuroscience Society
Member: Society for Neuroscience USA

Professor Greg J Stuart
Instructor and presenter: Australian Course in Advanced Neuroscience (ACAN), North Stradbroke Island, QLD
Convenor: Australian Brain Bee Challenge, ACT Regional Finals, JCSMR, Canberra, ACT
Organiser: Kioloa Neuroscience Colloquium, ANU Coastal Campus, Kioloa, NSW
Associate Editor: Frontiers in Cellular Neuroscience
Advisory Editorial Board: Trends in Neurosciences
Member of Council: Sydney Chapter of the US Society of Neuroscience
Member: Australasian Neuroscience Society
Member: Australian Academy of Science
Member: Society for Neuroscience USA
Member: Australian Neuroscience Society Symposium Programming and Advisory Group (SPAG)
Dr Norimitsu Suzuki
Presenter and Participant: National Youth Science Forum, JCSMR, ANU, Canberra, ACT
Member: Australasian Neuroscience Society
Member: Society for Neuroscience USA

Dr Rebecca Sweet
Presenter and Participant: JCSMR Open Day, The John Curtin School of Medical Research, ANU, Canberra, ACT
Member: Australasian Society for Immunology

Professor David Tremethick
Committee Member: ACT branch of the Australian Society for Medical Research
ACT representative: The Australian Society of Biochemistry and Molecular Biology
Editorial Board Member: Chromosoma; Epigenetics; Epigenetics & Chromatin; Open Biology
Member: Lorne Genome society
Member: Australian Society for Biochemistry & Molecular Biology
Member: American Society for Microbiology
Session Chair: ComBio Conference, Adelaide, SA

Mr Jorge Vélez
Member: Grupo de Neurociencias, University of Antioquia, Medellín, Colombia

Professor Carola Vinuesa
Member: MHMRC Women in Science Working Committee
Member: Australasian Society for Immunology
Member: American Association of Immunologists
Member: JCSMR Executive Committee

Professor Bruce Walmsley
Editorial Board Member: Biology Image Library
Presenter: Hearing Awareness Week ACT Expo, Canberra, ACT
Member: Australasian Neuroscience Society
Member: Society for Neuroscience USA

Professor Ma-Li Wong
Associate Editor: Molecular Psychiatry
Editorial Board Member: The Pharmacogenomics Journal; Clinical Pharmacology, Advances and Applications; Journal of Experimental Pharmacology
Reviewer: Melbourne Health, Royal Melbourne Hospital, Melbourne, VIC
Fellow: The Royal Australian and New Zealand College of Psychiatrists
Member: PhD Scholarship Committee, JCSMR

Dr Kerong Zhang
Member: The Australasian Genomics Technologies Association (AMATA)

Yicheng Zhu
Member: The Australian Society for Medical Research (ASMR)
Member: Genetics Society of Australasia (GSA)
Support to the School

Grants
Financial Overview
Donors
Corporate Sponsorship
## GRANTS

<table>
<thead>
<tr>
<th>Agency for Science Technology and Research (A* Star) – Singapore</th>
</tr>
</thead>
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| **Dr A Tan**  
Post-Doctoral Support  
$20,839 |

<table>
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<tr>
<th>American Australian Association</th>
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| **Dr R Sweet**  
US to Australia Fellowship  
$30,000 |

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<tr>
<th>Australian Centre for HIV and Hepatitis Virology Research Grant</th>
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</table>
| **Dr C Ranasinghe and Dr R Jackson**  
Design an effective poxvirus based vaccine for HIV-1 by modulating immune cell milieu using an IL-10 antagonist  
$136,000 |

<table>
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<tr>
<th>ANU Discovery Translation Fund</th>
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| **Professor M-L Wong and Professor J Licinio**  
Evaluating a novel pharmacological treatment for obesity and metabolic syndrome  
$81,836 |

<table>
<thead>
<tr>
<th>ANU Major Equipment Committee</th>
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</table>
| **Professor T Preiss**  
Understanding transcriptome dynamics: quantitating changes in cellular RNA  
$100,000 |
| **Professor D Tremethick**  
A high-capacity high-throughput superspeed centrifuge  
$49,000 |

<table>
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<tr>
<th>Australian Research Council Centre of Excellence in Vision Science</th>
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</table>
| **Professor T Maddess and Dr A James**  
Advanced multifocal analysis of blinding diseases  
$273,000 |
| **Dr J Paris and Dr K Valter-Kocsi**  
Structure and function of primate macula  
$168,000 |

<table>
<thead>
<tr>
<th>Australian Research Council Discovery Project Grants</th>
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</table>
| **Dr NA Beard, Professor AF Dulhunty and Professor R Dirksen**  
How triadin and junctin communicate with ryanodine receptors deep within a calcium store to determine skeletal muscle contraction  
$100,000 |
| **Dr VR Daria, Associate Professor C Stricker, Professor S Redman, Professor H Bachor and Professor G Stuart**  
Using light to probe brain activity in 3D  
$143,000 |
| **Professor S Easteal, Dr R Williams, Dr LS Jermin and Dr DG MacArthur**  
The role of short tandem repeat DNA variation in the evolution of human psychological diversity  
$82,000 |
| **Associate Professor G Huttley and Dr VB Yap**  
Improving the accuracy of phylogenetic reconstruction by improving models of sequence divergence  
$80,000 |
| **Professor T Lamb, Professor I Potter, Associate Professor N Hart, Professor S Collin and Professor D Hunt**  
The evolution of light detection and its impact on early vertebrate evolution  
$10,000 |

<table>
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<tr>
<th>Australian Research Council LIEF Grant</th>
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</table>
| **Professor T Preiss and Dr T Beilharz**  
Role of mRNA polyadenylation control in gene expression  
$35,000 |
| **Professor CG Vinuesa**  
The role of Roquin in microRNA function and decay  
$170,000 |

<table>
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<tr>
<th>Bayer Bioscience Research Co-operative Grant</th>
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| **Professor J Gready**  
Design of variant Ribulose-1 5-bisphosphate caboxylase/oxygenase proteins with improved catalytic efficiency and substrate specificity  
$415,092 |

<table>
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<tr>
<th>Beta Therapeutics Pty Ltd Discovery Translation Fund Project Grant</th>
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| **Professor C Parish and Dr C Simeonovic**  
$114,669 |

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<tr>
<th>Bioplatforms Australia Ltd/ Education Investment Fund</th>
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| **Professor S Easteal**  
$200,000 |
<table>
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<tr>
<th><strong>Cancer Australia</strong></th>
<th><strong>Garnett Passe and Rodney Williams Memorial Foundation</strong></th>
<th><strong>National Health &amp; Medical Research Council Australia Fellowship</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr A Blackburn and Professor P Board</td>
<td>Professor B Walmsley</td>
<td>Professor CC Goodnow</td>
</tr>
<tr>
<td>Targeting of two aspects of metabolism (TOTAM) for cancer therapy</td>
<td>How does sound-induced quantal neurochemical release in the cochlea generate impulses in the auditory nerve?</td>
<td>New strategies to reveal the genetic and cellular basis of immunological disease</td>
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<tr>
<td>$20,000</td>
<td>$96,246</td>
<td>$800,000</td>
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<tr>
<td><strong>Commonwealth Department of Regional Australia Local Government Arts and Sport Anti-Doping Research Program</strong></td>
<td><strong>Grains Research and Development Corporation</strong></td>
<td><strong>National Health &amp; Medical Research Council Career Development Fellowships</strong></td>
</tr>
<tr>
<td>Professor S Eastal, Dr J Henderson, Dr R Williams, Ms S Tan, Dr C Gore and Dr M Ashenden</td>
<td>Professor J Gready</td>
<td>Dr N Beard</td>
</tr>
<tr>
<td>Novel high throughput c-DNA sequencing to identify a genomic signature for autologous blood transfusion</td>
<td>Identifying Wheat Germplasm with Superior Rubiscos for Breeding for Increased Drought Tolerance</td>
<td>Control of cardiac and skeletal contractility by luminal calcium store load in health and disease</td>
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<td>$17,016</td>
<td>$349,990</td>
<td>$96,040</td>
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<tr>
<td><strong>Department of Industry, Innovation, Climate Change Science Research and Tertiary Education (DIICCSRTE) Australia-India Strategic Research Fund</strong></td>
<td><strong>Human Frontier Science Program</strong></td>
<td><strong>Dr A Enders</strong></td>
</tr>
<tr>
<td>Dr D Rangasamy, Professor P Board and Dr N Lenka</td>
<td>Dr R Sweet</td>
<td>Investigating B cell development maintenance and high-affinity antibody production by ENU mutagenesis</td>
</tr>
<tr>
<td>An insertional mutagenesis approach to identify epigenetic factors that control embryonic stem cell differentiation</td>
<td>The role of T cell derived interferon gamma in lupus associated anxiety and depression</td>
<td>$97,769</td>
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<td>$90,000</td>
<td>$36,150</td>
<td><strong>National Health &amp; Medical Research Council Development Grant</strong></td>
</tr>
<tr>
<td><strong>Department of Industry, Innovation, Climate Change Science Research and Tertiary Education (DIICCSRTE) National Collaborative Research Infrastructure Strategy</strong></td>
<td><strong>Juvenile Diabetes Research Foundation – National Health and Medical Research Council Special Program Grant</strong></td>
<td>Dr C Ranasinghe and Professor I Ramshaw</td>
</tr>
<tr>
<td>Dr S Winslade, Professor C Goodnow and Ms A McKenzie</td>
<td>Professor C Parish, Dr C Simeonovic, Dr C Freeman and Dr G Hoyne</td>
<td>A novel strategy to enhance T cell-mediated immunity to vaccine antigens</td>
</tr>
<tr>
<td>Australian Phenomics Network Super Science Project</td>
<td>Role of heparan sulfate, heparanase and heparanase inhibitors in the development and prevention of Type I diabetes</td>
<td>$76,834</td>
</tr>
<tr>
<td>$4,000,000</td>
<td>$600,000</td>
<td><strong>National Health &amp; Medical Research Council Early Career Fellowship</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Medical Advances Without Animals Trust</strong></td>
<td>Dr D Ryan</td>
</tr>
<tr>
<td></td>
<td>Associate Professor B Lidbury</td>
<td>Investigations into the mechanism and function of the chromatin remodelling complex SWI-SNF</td>
</tr>
<tr>
<td></td>
<td>Sponsorship ANU Hosted Fellowship Program</td>
<td>$68,723</td>
</tr>
</tbody>
</table>
National Health & Medical Research Council Equipment Grant

Dr A Cook
Countess cell counter
$7,199

Professor A Dulhunty
Prep Cell Pump and Fraction Collector
$20,725

Professor S Easteal
MultiNA MCE-202 microchip electrophoresis system for DNA/RNA analysis
$6,515

Professor C Goodnow
ELISA Plate Reader
$42,780

Dr D Ryan
Infors MultiTron2 Temperature Controlled Shaking Incubator
$25,130

Professor D Tremethick
New “HyD” high sensitivity detector for Leica confocal microscope
$27,681

National Health & Medical Research Council Program Grant

Professor C MacKay, Professor J Sprent, Professor CC Goodnow, Dr F MacKay, Professor CG Vinuesa, Professor A Basten, Professor B Fazekas de St Groth, Dr S Tangye and Dr R Brink
Molecular and cellular studies of the adaptive immune response in health and disease
$1,086,841

National Health & Medical Research Council Project Grants

Dr NA Beard, Professor AF Dulhunty and Professor S Gyorke
Unique isoform-specific regulation of cardiac ryanodine receptors by calcium store proteins
$135,375

Associate Professor JM Bekkers and Dr M Larkum
Neural circuits for odour-processing in the rodent piriform cortex in vitro
$173,902

Associate Professor JM Bekkers and Professor S Nelson
Excitability and hypereexcitability of neural circuits in the rodent piriform cortex
$113,250

Professor PG Board, Professor AF Dulhunty, Dr MG Casarotto and Professor L Arnolda
New cardiac ryanodine receptor inhibitors for the treatment of heart failure
$197,244

Professor AF Dulhunty, Professor L Arnolda, Dr A Blackburn and Dr N Beard
Anthracyclines disrupt Ca2+ signalling in cardiomyocytes: a contribution to cardiac toxicity
$143,775

Professor AF Dulhunty, Dr NA Beard and Dr DR Laver
Regulation of calcium release channels (RyR2) in healthy and failing hearts
$108,525

Professor AF Dulhunty, Dr MG Casarotto and Professor PG Board
DHPR β subunit binding to a variably spliced region of RyR1: A role in EC coupling and myotonic dystrophy
$178,902

Dr A Enders and Professor C Goodnow
Understanding the pathogenesis and heterogeneity of autoimmunity as failure of multiple steps
$162,209

Associate Professor G Huttley and Dr W Meyer
Uncovering the genetic basis of fungal virulence
$82,893

Associate Professor G Karupiah and Dr G Chaudhri
Understanding the key attributes of CD8 T cell receptor transfer as an antiviral strategy and harnessing the process to combat persistent viral infections
$197,244

Associate Professor G Karupiah and Dr T Newsome
Actin-based motility as a virulence mechanism and potential as an antiviral target
$75,000

Professor T Maddess, Dr A James, Dr C Carle, Professor C Nolan and Dr R Essex
Novel functional testing for early diabetic retinopathy
$232,761

Professor C Parish and Dr B Quah
Analysis of antigen receptor sharing by T and B lymphocytes
$173,902
Professor T Preiss and Dr J Clancy
Exploring the role of miRNA and target processing variability in cardiac hypertrophy
$194,895

Professor T Preiss and Dr J Mackay
Designer RNA-binding proteins for research and therapeutic purposes
$25,000

Professor T Preiss and Dr N McMillian
RNA interference and the immune system
$36,750

Dr C Ranasinghe
Enhancement of mucosal immunity and CTL avidity against HIV-1
$82,951

Dr K Randall
Investigation of cellular abnormalities and synapse formation in DOCK8 immunodeficiency
$102,500

Professor GJ Stuart
Properties of dendritic spines and their role in synaptic plasticity
$108,250

Professor GJ Stuart
Cortical mechanisms underlying binocular vision
$119,736

Professor GJ Stuart
Regulation of cortical excitability by GABAB receptors
$109,736

Professor DJ Tremethick
How chromatin compaction is regulated and its link with disease
$158,902

Professor DJ Tremethick
Mechanisms underpinning the epigenetic code and the role of histone variants
$181,130

Professor CG Vinuesa, Dr D Yu and Associate Professor A Liston
Specialised subsets of T follicular helper cells in the control of infection and immune pathology
$166,130

Professor I Young and Professor P Foster
Targeting miRNA to inhibit leukocyte differentiation: a novel anti-inflammatory approach for the treatment of asthma
$96,835

Professor I Young, Professor D Ollis and Dr J Murphy
Cytokine-driven allergic inflammation: characterization of two isoform-specific modes of IL-3 receptor activation and investigation of new receptor-associated signalling partners
$199,895

Professor C Goodnow, Associate Professor G Karupiah, Dr R Bertram and Professor R Ulevitch
Control systems governing short vs long term humoral and cellular immunity
$802,954 (in conjunction with The Scripps Research Institute, USA)

Professor C Goodnow, Professor R Ulevitch and Professor B Beutler
Systems approach to immunity and inflammation
$630,442 (in conjunction with The Scripps Research Institute, USA)

Professor C Goodnow, Professor R Ulevitch and Professor B Beutler
Systems approach to immunity and inflammation - Annotation
$128,418 (in conjunction with The Scripps Research Institute, USA)

Clive and Vera Ramaciotti Foundation Major Research Award

Professor CC Goodnow and Dr A Enders
Ramaciotti Immunization Genomics Laboratory
$200,000
FINANCIAL OVERVIEW

<table>
<thead>
<tr>
<th>Staff numbers</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic staff *</td>
<td>77.66</td>
<td>75.1</td>
</tr>
<tr>
<td>General staff — administration, technical &amp; support **</td>
<td>139.73</td>
<td>140.45</td>
</tr>
<tr>
<td>HDR students (EFTSL)</td>
<td>80.5</td>
<td>81.0</td>
</tr>
<tr>
<td>Postgraduate coursework students (EFTSL)</td>
<td>1.0</td>
<td>11.1</td>
</tr>
<tr>
<td>Undergraduate Students</td>
<td></td>
<td>23.9</td>
</tr>
</tbody>
</table>

* The figures are for Full Time Equivalents, as at 31 December, and exclude casuals
** Includes Animal Service Facility staff

### Recurrent and Special Purpose Funds $

<table>
<thead>
<tr>
<th>Total Income</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Fees</td>
<td>256,498</td>
<td>464,760</td>
</tr>
<tr>
<td>Other Income</td>
<td>22,539,733</td>
<td>23,595,143</td>
</tr>
<tr>
<td>Internal Sales</td>
<td>4,824,596</td>
<td>3,986,467</td>
</tr>
<tr>
<td>Transfer from other</td>
<td>13,609,314</td>
<td>6,419,273</td>
</tr>
<tr>
<td>Internal Allocations</td>
<td>374,239</td>
<td>2,495,286</td>
</tr>
<tr>
<td>Operating Grant</td>
<td>17,754,231</td>
<td>17,930,737</td>
</tr>
<tr>
<td>Investment Income</td>
<td>167,841</td>
<td>59,501</td>
</tr>
<tr>
<td>Total Income</td>
<td>59,190,771</td>
<td>54,951,167</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Expenditure</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries &amp; Related Costs</td>
<td>25,904,582</td>
<td>24,999,564</td>
</tr>
<tr>
<td>Equipment - Capital</td>
<td>1,585,596</td>
<td>4,309,383</td>
</tr>
<tr>
<td>Equipment - Non-Capital</td>
<td>633,287</td>
<td>533,048</td>
</tr>
<tr>
<td>Scholars Expenses</td>
<td>931,822</td>
<td>902,531</td>
</tr>
<tr>
<td>Utilities &amp; Maintenance</td>
<td>2,080,295</td>
<td>2,766,480</td>
</tr>
<tr>
<td>Travel Field &amp; Survey Expenses</td>
<td>900,232</td>
<td>789,586</td>
</tr>
<tr>
<td>Expendable Research Materials</td>
<td>10,434,045</td>
<td>8,788,626</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>8,526,002</td>
<td>8,238,979</td>
</tr>
<tr>
<td>Transfer to other</td>
<td>9,100,251</td>
<td>7,661,040</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>60,096,112</td>
<td>58,989,238</td>
</tr>
</tbody>
</table>

| Net Current Year Operating Result | 905,342   | 4,038,070 |
| Prior Year Cash Result          | 19,674,634 | 21,225,223 |
| Net Operating Position          | 18,769,292 | 17,187,153 |
The Director, staff and students of JCSMR are extremely grateful for the continued generosity and support of our friends and donors.

Gifts and bequests to the School are used to fund vital medical research projects as well as providing scholarships and purchasing specialised equipment. Your support can be provided in a number of ways including a gift or bequest that may assist in funding a particular area of research, or a scholarship or prize.

If you would like to discuss options for supporting JCSMR, please contact:

**Dr Madeleine Nicol**

T  02 6125 2577  
E  madeleine.nicol@anu.edu.au

Our thanks go to those who have so generously supported The John Curtin Medical Research Foundation at ANU during 2013.

Details can be found on their website: jcmrf.anu.edu.au
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