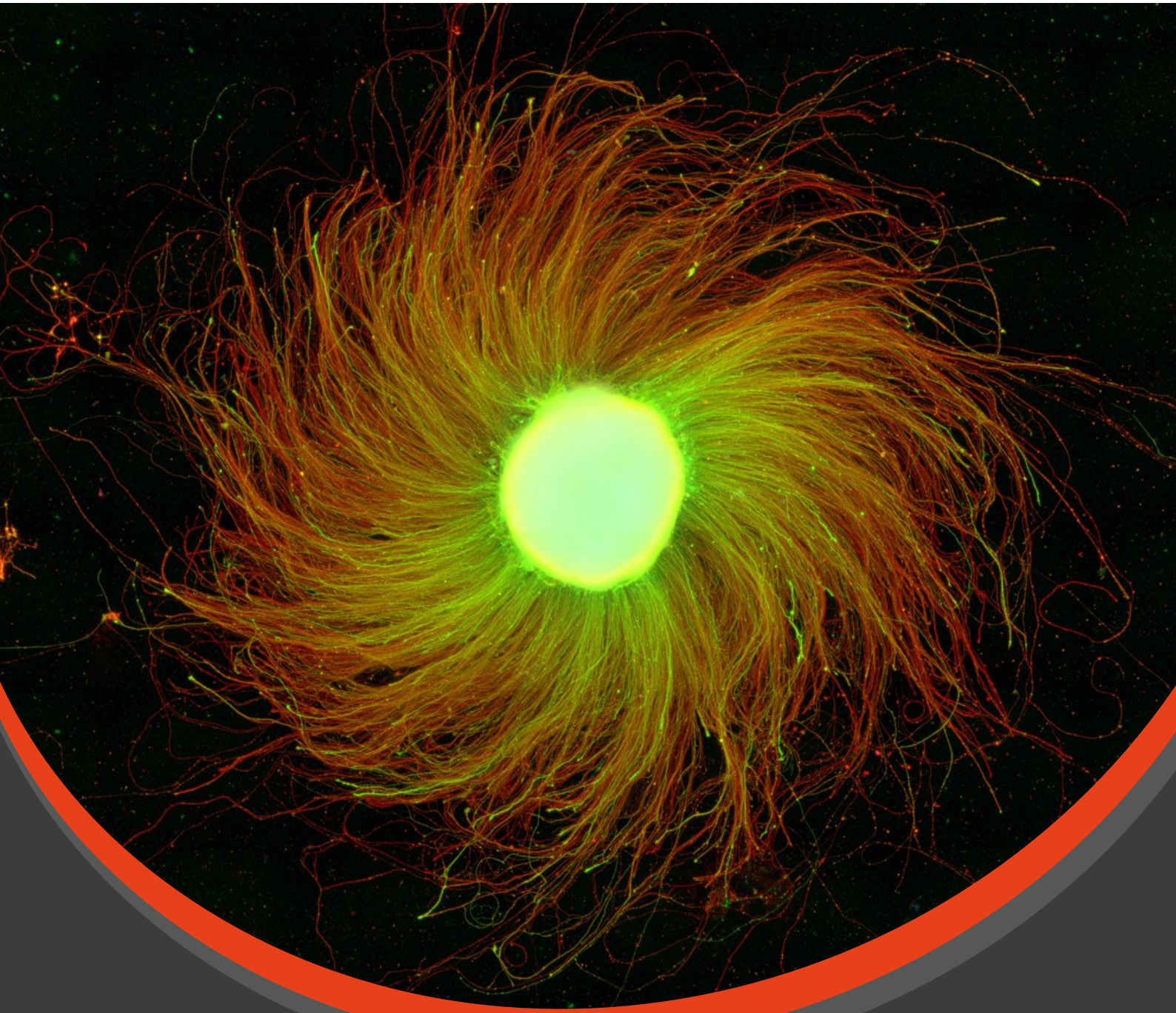
STEMCELLS® AUSTRALIA



Annual Report

2016

stemcellsaustralia.edu.au

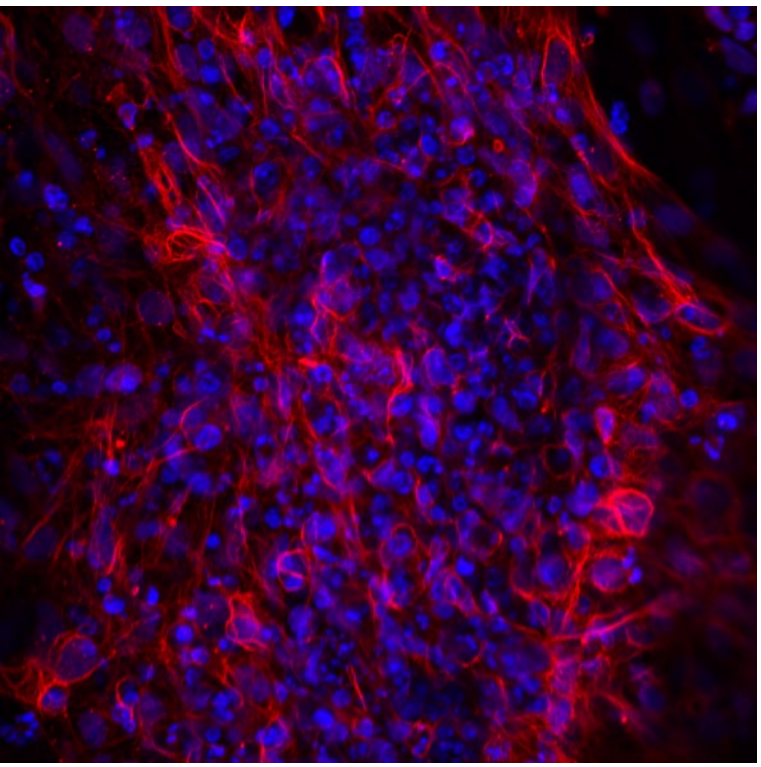
Abbreviations used throughout this document

AIBN	Australian Institute for Bioengineering and Nanotechnology
ARC	Australian Research Council
ARMI	Australian Regenerative Medicine Institute
ASSCR	Australasian Society for Stem Cell Research
BPA	Bioplatforms Australia
CCRM	Centre for Commercialization of Regenerative Medicine
CM	Cardiomyocyte
CNS	Central Nervous System
CSIRO	Commonwealth Scientific and Industrial Research Organisation
GTAC	Gene Technology Access Centre
IMB	Institute of Molecular Biosciences
ISSCR	International Society for Stem Cell Research
MCRI	Murdoch Childrens Research Institute
MSC	Mesenchymal stromal cells
NHMRC	National Health and Medical Research Council
QBI	Queensland Brain Institute
SCA	Stem Cells Australia
STEMM	Science, Technology, Engineering, Mathematics and Medicine
TGA	Therapeutic Goods Administration
UNSW	University of New South Wales
UoM	University of Melbourne
UQ	University of Queensland
VCCRI	Victor Chang Cardiac Research Institute
WEHI	Walter and Eliza Hall Institute of Medical Research

Supported by: Australian Government Australian Research Council

Our Partners: The University of Melbourne, Monash University, The University of Queensland, UNSW The University of New South Wales, Walter+Eliza Hall Institute of Medical Research, The Florey, Victor Chang Cardiac Research Institute, Murdoch Childrens Research Institute

Cover Image: Human embryonic stem cells differentiated into ventral midbrain progenitors and maintained in culture as neurospheres. The sphere is stained for TUJ (green) to identify all neurons, and tyrosine hydroxylase (red) to more specifically identify dopamine neurons. Courtesy of Dr Jonathan Niclis (The Florey Institute of Neuroscience and Mental Health).



Stem Cell Derived Neural Cultures Positive For Oligodendrocyte Marker. Courtesy of Ms Claire Cuddy (UoM).

Vision Statement

To discover how to regulate stem cells in order to harness their potential for therapeutic purposes and to generate economically valuable biotechnologies.

Contents

Message from the Chairman

2016 has seen another year of substantial scientific discoveries from the researchers in Stem Cells Australia (SCA), an Australian Research Council (ARC) Special Research Initiative in Stem Cell Science.

These advances have had substantial impact on stem cell research at both the national and international level. With over 120 members from four leading Australian universities and four premier medical research institutes, the focus of our interdisciplinary and cross-institutional research has remained on enhancing our understanding of the fundamental mechanisms involved in stem cell regulation and differentiation.

Our laboratory research interests span the use of stem cells in disease modelling, computational science, blood formation and maintenance of pluripotency, to potential applications of stem cells in memory retention, repair of damaged cells following heart attack and cellular solutions for neurological conditions such as multiple sclerosis.

In addition to our excellence in research, SCA has also sought to lead public debate and discussion about the ethical, legal and societal impact of stem cell research – crucial considerations as we advance the biological and therapeutic applications of our science.

During 2016, the contributions of our researchers have been recognised by prestigious awards, fellowships and invitations to present at numerous international and national meetings. Publications have appeared in leading peer-reviewed journals and we have been delighted to see 13 of our PhD students complete their studies and embark on the next stage of their careers.

Throughout the year, we have created opportunities to foster collaborations, and importantly to share reports of progress in our research and discuss challenges encountered. We held an Annual Retreat for all research members and three theme-specific workshops. We greatly appreciated members of our Scientific Advisory Committee taking the time to attend and actively participate in our Annual Retreat - especially our international members who travelled a vast distance to join us.

This year has also seen a change in Partner Organisations. With the formal completion of partnership with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) at the end of 2015, we were pleased welcome the Murdoch Childrens Research Institute (MCRI) as a Partner Organisation in 2016.

This change also saw Professor Melissa Little appointed to the Governance Committee as MCRI's representative. I would like to take this opportunity to thank Dr Keith McLean, who stepped down from the Governance Committee at the completion of CSIRO's term, for his strident support for the SCA initiative from its inception. We also thank Professor Robyn Ward from the University of Queensland (UQ) for her contribution and welcome the new representative for UQ Mr Ian Harris onto the Governance Committee.

Although CSIRO formally retired, we were pleased that senior CSIRO researchers, Professor Susie Nilsson, Professor David Haylock and Associate Professor Andrew Laslett have continued their links to the SCA initiative by joining as Affiliate Investigators. Within the Haematopoiesis theme we also welcomed Professor Andrew Elefanty and Dr Samir Taoudi as new leaders and thank Professors Doug Hilton and David Haylock for their leadership of this theme since inception of SCA.

Towards the end of 2016 we also learnt that Professor Martin Pera, inaugural Program Leader of the SCA initiative, would be returning to the USA to take-up a position at the Jackson Laboratory in Bar Harbour, Maine where he will continue his research into the mechanisms that control the growth and fate of pluripotent stem cells.

I would like to take this opportunity to thank Martin. Under his leadership, and with the ongoing support of the ARC, SCA has been able to establish an environment that has enabled excellence in stem cell research to thrive. Martin has also championed training and mentoring opportunities for young researchers and has been a powerful advocate for stem cell science in the broader community. We wish him the best as he pursues his new role in the USA and look forward to ongoing engagement particularly through the International Society for Stem Cell Research (ISSCR) where he serves as Clerk.

It remains a privilege to be associated with the exciting field of stem cell science and in particular this stellar group of interdisciplinary researchers. I would like to congratulate all members of SCA for their contribution, dedication and ongoing success.

Professor David de Kretser
Chairman, Governance Committee

Message from the Program Leader

In 2016, the fifth year of operation of SCA, our research teams continued to expand their outstanding record of contributions to both basic and applied stem cell biology.

The 2016 SCA research publications portfolio encompasses a remarkable diversity of topics, ranging from novel methodology for mobilisation of hematopoietic stem cells (Susie Nilsson), to modelling of an important form of inherited cardiomyopathy (David Elliott), computational analysis of cellular reprogramming (Jose Polo), and multimedia approaches to obtaining patient consent for donation of tissue for producing induced pluripotent stem cells (Alice Pébay and Megan Munsie).

Dissertations from SCA students successfully completing their doctoral studies reflected the breadth of the consortium's interests, with exciting new findings in analysis of time lapse imaging of stem cells, (James Cornwell), early stages of blood cell formation (Kathy Potts), chemical genomic analysis of early steps in human brain development (Stephanie Bellmaine), and modelling of stem cell lineage commitment (Jessica Schwaber). This year SCA scientists authored over 150 publications, almost half in journals with impact factors greater than five, and nearly twenty percent in journal with impact factors greater than 10.

In 2016 we embarked on a major collaborative initiative with Bioplatforms Australia (BPA), with the goal of producing an atlas of stem cell identity using genomics, proteomics and metabolomics information. This SCA effort is being led by Christine Wells and will focus on in depth analysis of defined stem cell populations that have been extensively characterised in previous studies from our laboratories. BPA support of this collaboration, in the form of analytical services, is worth $1 million.

This year our researchers attained some very significant recognitions and honours. Richard Harvey was elected as a Fellow of the Royal Society, Andrew Elefanty was awarded a National Health and Medical Research Council (NHMRC) Senior Research Fellowship, and Christine Wells and Toby Merson received ARC Future Fellowship Awards. Melissa Little, Minoru Takasato, Ernst Wolvetang and Christine Wells all received honours at the 2016 Australia Museum Eureka Awards.

Our program in Education, Ethics Law and Community Awareness continued its campaign against the marketing of unproven stem cell treatments in Australia, attracting coverage in a number of high profile media reports, and Megan Munsie contributed to the new ISSCR guidelines on Stem Cell Research and Translation.

As we head towards our sixth year of funding, we can begin to shape our vision of the future. Australian stem cell research continues to maintain a high international profile, particularly in basic stem cell biology. While maintaining this momentum, we must ensure that translational research programs enable our discoveries to proceed to application in the clinic. In this respect, it is timely to reflect on some of our scientific breakthroughs over the past several years.

Amongst the highlights are Robert Graham's discovery of the ability of the adult heart to undergo regeneration, Lars Nielsen's development of a cell culture platform to produce white blood cells for treatment of cancer patients, Melissa Little's striking demonstration of how to grow a human kidney from pluripotent stem cells in the laboratory, and the report from the team of Elizabeth Ng, Ed Stanley and Andrew Elefanty describing the generation of blood stem cells from human pluripotent stem cells.

These are all seminal observations published in internationally recognised, high impact, peer-reviewed journals, all with profound implications for the understanding and treatment of human disease. These successes all reflect long term commitment on the part of the research teams, and they are all the products of longstanding collaborations amongst outstanding Australian stem cell researchers and their international colleagues.

Critically, all of these studies were supported and nurtured over many years through the vision of the ARC, via the Australian Stem Cell Centre and more latterly SCA. It is clear that long term programmatic funding of innovative and visionary research in stem cell biology and translational research is essential if the field is to achieve its great promise.

Advances in functional genomics and disease modelling with stem cells, the increasing number of clinical trials using stem cell based therapeutics, and the powerful combination of stem cell and gene therapies, all herald a new era in biomedicine. Going forward, we envision that our network will form the basis of a broader national effort to ensure that Australian patients and their families will not be left behind in the stem cell revolution.

Professor Martin Pera
Program Leader

Program Highlights

SCA researchers and students continue to advance knowledge in the area of stem cell science, through world leading research and collaborations, presentations at international meetings, publications in high impact journals and securing external funding.

Throughout 2016 our researchers contributed to important scientific breakthroughs that have received international attention. Many of these achievements are the culmination of years of work, made possible through their drive and vision as well as long term continuous support from the ARC, first through the Australian Stem Cell Centre and more latterly through SCA.

These achievements were also realised through inter-institutional collaborative networks built up as a direct result of this ARC support. These great success stories highlight the importance of stable research funding that encourages high risk, high payoff science, and that fosters the growth of a fertile collaborative environment.

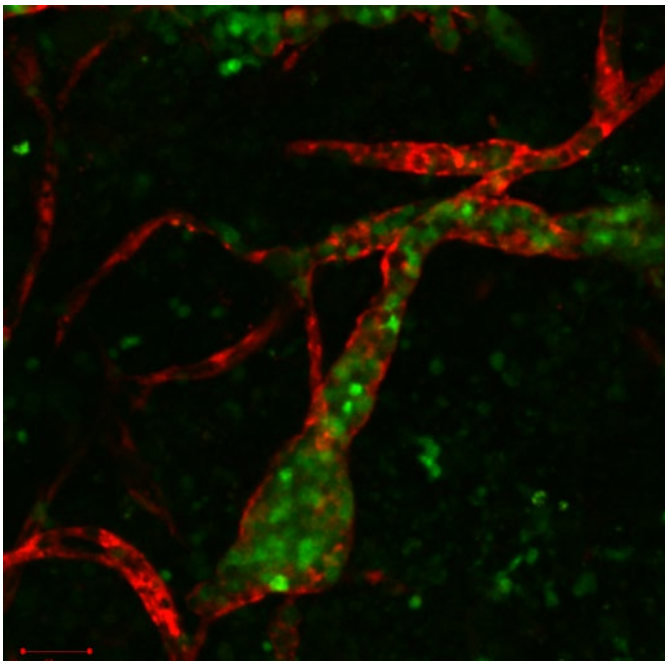
Highlighted below are some of the achievements of the initiative with more details provided from page 38.

Research Performance

During 2016 our researchers continued to build and strengthen their reputation and that of stem cell research in Australia. More than 150 articles were published in peer-reviewed journals including 18% in high impact journals such as *Blood, Cell Stem Cell, Nature Biotechnology, Nature Communications, Nature Genetics* and *Nature Immunology*. Over 70% of the published articles demonstrated cross-institutional collaboration, exceeding our key performance indicators for research performance and national collaboration.

Creating blood from stem cells

The Murdoch Childrens Research Institute (MCRI) team are one step closer to understanding how to create blood stem cells in the laboratory. Published in the journal *Nature Biotechnology,* and led by Dr Elizabeth Ng, Professor Andrew Elefanty and Professor Ed Stanley, the researchers were able to more closely mimic how blood cells form during early development. Through turning on the right genes, they made pluripotent stem cells turn into blood stem cells. While the blood cells will still need some degree of maturation in the laboratory before they would be ready for transplantation to treat blood disorders and childhood cancers like leukaemia, the team has made an invaluable contribution towards this goal.



Creating blood from stem cells. Courtesy of Professor Andrew Elefanty (MCRI).

Taking the stem out of stem cells

Associate Professor Jose Polo from Biomedicine Discovery Institute and the Australian Regenerative Medicine Institute (ARMI) at Monash University joined forces with biologists and mathematicians from across Australia, Britain, Japan and Singapore to effectively develop a computerised recipe book - dubbed 'Mogrify' - to predict what factors need to be added to convert one type of cell into another – without having to first make a stem cell. The study published in *Nature Genetics* can predict in minutes what might take months or years to discover in the laboratory. The researchers have created a spin-off biotech company, Cell Mogrify, which now tests the approach for drug and toxicity testing.

Unlocking treatments for heart disease

Heart muscle diseases are a leading cause of disability and death in children and adults but the causes remain poorly understood. Researchers at MCRI have identified changes in a particular gene, ALPK3, that results in a disease known as hypertrophic cardiomyopathy.

The research, published in the *European Heart Journal,* increases our understanding of how heart muscle functions and identifies potential targets for the development of treatments for heart disease, particularly in children.

New way to harvest blood stem cells

Discovery by CSIRO researcher Professor Susie Nilsson and her team, who are also part of ARMI at Monash, may make harvesting stem cells from donors more efficient and avoid unpleasant side effects associated with current approaches.

Findings published in *Nature Communications* showed that a procedure that once took days could be reduced to around an hour. This approach will now be evaluated in clinical trials to see if the success observed in pre-clinical animal studies can also benefit patients.

Deal brings new treatment closer for chemo patients

Chemotherapy patients could benefit from a new cell-based treatment developed from University of Queensland (UQ) research. In the weeks following chemotherapy, a patient is vulnerable to potentially fatal infections as the white blood cells in their immune system are depleted.

Professor Lars Nielsen and his team at UQ's Australian Institute for Bioengineering and Nanotechnology (AIBN) have developed a method of producing a transfusion-ready therapeutic dose of replacement white blood cells from cord blood that can be administered to patients immediately after chemotherapy.

A licensing deal with the Centre for Commercialization of Regenerative Medicine (CCRM) - a Canadian leader in developing and commercialising regenerative medicine technologies and cell and gene therapies – will now see this discovery progress towards the clinic.

Presenters at VCCRI International Symposium.

Participation

During 2016 SCA members were invited to present at 50 international conferences including CiRA/ISSCR 2016 International Symposium, International Conference on Biomedical Engineering, International Congress of Neuroimmunology, International Society for Cellular Therapy and Keystone Symposia.

In addition, another 50 oral or poster presentations were delivered to national and internationals meetings. SCA members organised conferences and participated on numerous advisory boards and committees.

Patents

Four new patents being filed by SCA members:

- Mills RM, Titmarsh DM, **Porrello ER, Hudson JE** (UQ) related to screening device, conditions for tissue fabrication, and medium for induction of human cardiac organoid maturation [PAT-02238].
- **Ng E, Stanley, E** and **Elefanty A** (MCRI) related to haematopoietic stem/progenitor cells [P103021. AU].
- Quaife-Ryan, GA, **Hudson JE, Porrello ER** (UQ) related to a novel therapy for cardiac regeneration through activation of b-catenin [PAT-02255].
- Teo L and **Bourne JA** (Monash) related to methods and compositions for treating CNS injury [US Provisional (62/250, 380)].

Research training and capacity building

During 2016 SCA has maintained our commitment to developing and supporting the growth of Australian stem cell research. A total of 15 new post-doctoral researchers joined the initiative during this year. We also welcomed 19 new postgraduate students and celebrated with 13 of our postgraduate students as they completed their PhD studies.

In his role as SCA Education Officer, Dr Toby Merson was tasked with the role of increasing interaction between the student and post-doctoral researchers within the SCA consortium.

At the SCA Retreat post-doctoral researchers were provided the opportunity to co-chair the oral sessions and judge talks presented by PhD students.

In December 2016 SCA-supported a series of seminars and workshop on Tissue Clearing and Lightsheet Microscopy. Participants gained hands-on experience from Dr Alain Chédotal (Institut de la Vision, Paris) and Dr Nicolas Renier (Rockefeller, USA) in preparing tissue samples for clearing, whole-mount immunohistochemistry, light-sheet and confocal microscopy and analysis of large 3D datasets.

The calibre of our members was recognised by over 25 prestigious fellowships, awards and appointments including:

Professor Richard Harvey being admitted to Royal Society.

Inductions and fellowships

Justin Cooper-White (UQ) - Elected as Fellow and Vice President (Medical and Health) of Queensland Academy of Arts and Sciences.

Andrew Elefanty (MCRI) - NHMRC Research Fellowship.

Richard Harvey (VCCRI) - Inducted as a Fellow of the Royal Society of London and a Fellow of the Academy of Health and Medical Sciences.

Toby Merson (The Florey/ Monash): ARC Future Fellowship (Medical and Health Sciences).

Enzo Porrello (UQ) - National Heart Foundation (NHF) Future Leader Fellowship.

Christine Wells (UoM) - ARC Future Fellowship (Medical and Health Sciences).

Awards and appointments

Justin Cooper-White (UQ): NHMRC Marshall and Warren Award (Research Excellence Award, awarded to the "most highly innovative and potentially transformational grant" in 2015 project grants round (across over 3500 grants nationally) –'Direct reprogramming of adult cardiac fibroblasts to functional cardiomyocytes through targeted delivery'.

Justin Cooper-White (UQ): 2015 AON Insurance and Life Sciences Queensland Annual Regenerative Medicine Award.

Justin Cooper-White (UQ): Editor in Chief - Applied Physics Letters (APL) Bioengineering, American Institute of Physics Publishing.

Robert Graham (VCCRI): Member - Board of Scientific Governors, MacTel Study, Lowy Medical Research Institute, New York, USA.

Peter Gray (UQ): Board Member - Engineering Conferences International Inc., New York, USA.

Richard Harvey (VCCRI): President - Australian Network of Cardiac and Vascular Developmental Biologists.

Doug Hilton (WEHI): The Curtin Medal for Excellence In Medical Research for 'Molecular Regulation of Blood Cell Production', John Curtin School of Medical Research, ANU.

Trevor Kilpatrick (UoM): 'TAMS in progressive MS', Genzyme - MOA Global Advisory Board, Boston, USA.

Melissa Little and **Minoru Takasato** (MCRI): 2016 UNSW Eureka Prize for Scientific Research.

Christine Wells (UoM) and **Ernst Wolvetang** (AIBN, UQ): FANTOM5 Team - 2016 Scopus Eureka Prize for Excellence in International Scientific Collaboration.

Recognition at 2016 Australian Museum Eureka Awards

Professor Melissa Little and Dr Minoru Takasato from the MCRI were awarded the *UNSW Eureka Prize for Scientific Research* for their work on recreating human kidney tissue from stem cells - Kidney in a Dish.

This research opens the door to disease modelling, drug screening, and ultimately development of replacement organs.

Professors Christine Wells (UoM) and Ernst Wolvetang (UQ) continue their excellence in international scientific collaboration with FANTOM 5.

This collaboration of 260 specialists from 20 countries, including 22 Australian researchers, is developing a comprehensive map of the genes expressed in each of our cell types. The map is being used to understand genetic diseases and engineer new cells for therapeutic use. Scientists involved in the FANTOM5 consortium are based at Harry Perkins Institute of Medical Research; UoM; UQ; Translational Research Institute; Telethon Kids Institute; and RIKEN Japan. FANTOM5 was awarded the *2016 Scopus Eureka Prize for Excellence in International Scientific Collaboration.*

Professor Melissa Little and Dr Minoru Takasato from the MCRI.

FANTOM5 was awarded the *2016 Scopus Eureka Prize for Excellence in International Scientific Collaboration. (Courtesy of Australian Museum).*

Extending the network

SCA members continued to forge national and international collaborations. SCA researchers have been successful in securing over 40 new grants totalling over $27 million to begin in 2016, of which around $7 million was available to support research in 2016.

New initiatives

SCA member Dr. Nathan Palpant (UQ, IMB), with colleague Professor John Fraser, head of the Critical Care Research Group at The Prince Charles Hospital, were successful in attracting $1.3 million in cash funding from the Queensland State Government and significant in-kind support from industry for cardio-respiratory translational research. The BIONIC Project brings together expertise in stem cell biology and disease modelling in the Palpant lab with expertise in mechanical assist devices and large animal models of heart disease and heart transplant at the CCRG.

The University of Queensland also launched a new $7 million regenerative medicine research centre to improve older Australians' quality of life and increase their participation and productivity. The Centre in Stem Cell Ageing and Regenerative Engineering (UQ-StemCARE) at UQ's AIBN will focus on unravelling the key cellular and molecular mechanisms of stem cell ageing, and investigate engineering clinical solutions in regenerative medicine for prolonging the human health span. The centre will be co-directed by AIBN professors Alan Rowan, Ernst Wolvetang and Justin Cooper-White.

Queensland Premier Annastacia Palaszczuk launching StemCARE with SCA members Professors Ernst Wolvetang and Justin Cooper-White (Courtesy of AIBN).

Workshops and visitors

This year's SCA Retreat was held at Werribee Park, just outside of Melbourne, where our talented students and early career researchers shone with best student presentations awarded to Duncan Crombie, Jarmon Lees and Carlos Gantner.

The 124 delegates also heard Prof David de Kretser AOM reflect on how you never know where research will take you and Doug Sipp from the RIKEN Center for Developmental Biology, Kobe, Japan explore the complexities and pitfalls around communicating the promise, risk and uncertainty in stem cell research. We were also delighted to have three members of our Scientific Advisory Committee join us for the Retreat.

Delegates at VCCRI Symposium. (Courtesy of VCCRI).

During 2016 we also supported three theme workshops. This year the SCA cardiac theme meeting was incorporated into the program for *Victor Chang Cardiac Research Institute (VCCRI) 17th International Symposium and Princesses' Lecture* which attracted close to 130 delegates including nine invited keynote international speakers, many of who are part of the Fondation Leducq Transatlantic Networks of Excellence Program.

The symposium covered topics ranging from cardiac developmental biology, cardiogenomic and epigenetics to the potential of stem cell and regenerative medicine to treat cardiac diseases and featured many presentations from SCA members. The Chair of the Symposium Organising Committee was Professor Richard Harvey.

Outside these formal meetings, we also welcomed visits by international experts including:

- Professor Jeremy Sugarman, Deputy Director, Johns Hopkins Berman Institute of Bioethics, Baltimore, Maryland, USA
- Professor Nissim Benvenisty, Director of The Azrieli Center for Stem Cells and Genetic Research, The Hebrew University, Israel
- Professor Pierre Savatier, Research Director from the National Institute for Health and Medical Research, Lyon, France
- Associate Professor Fredrick Lanner, Karolinska University Hospital, Sweden
- Dr Alice Chen, Organova, San Diego, California, USA
- Professor Brigid Hogan, Chair Department of Cell Biology, Duke University Medical Center, USA.

Knowledge transfer and outreach

Throughout 2016 we remained committed to taking our research out of the laboratory and into the broader community.

We worked closely with partners to promote our achievements resulting in over 35 media stories. We extended our web presence attracting over 100,000 visitors and responded directly to over 400 public enquires.

Over 35 of our members discussed their work in community forums including dedicated workshops for high school students and their teachers keen to learn more about stem cell research and possible careers in STEMM (Science, Technology, Engineering, Mathematics and Medicine).

SCA members meeting students at STEMM workshop in Melbourne (Courtesy of Casamento Photography).

High school students attend STEMM workshop at Gene Technology Access Centre (Courtesy of Casamento Photography).

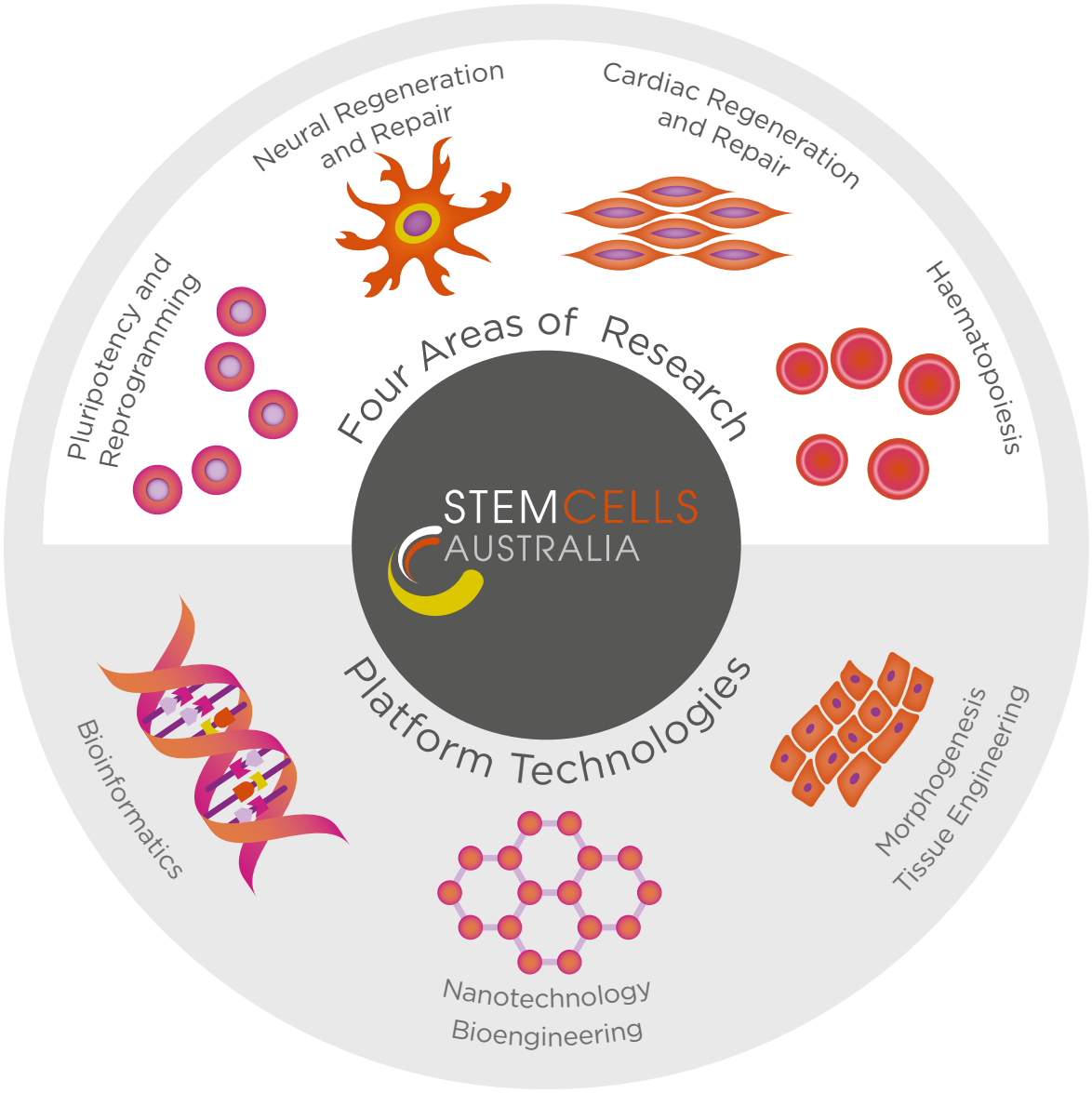
SCA members remained outspoken critics of commercial clinics offering unproven 'stem cell' treatments here and overseas, contributing several submissions to the 2016 Therapeutic Goods Administration (TGA) public consultation on regulation of autologous cell therapies.

We have continued to liaise with key patient advocacy groups as well as the Australian Health Practitioner Regulatory, Royal Australasian College of Physicians, the Australasian College of Sports and Exercise Physicians, AusBiotech and other peak bodies to further enhance professional understanding and awareness about these unproven, and in many cases unfounded, practices.

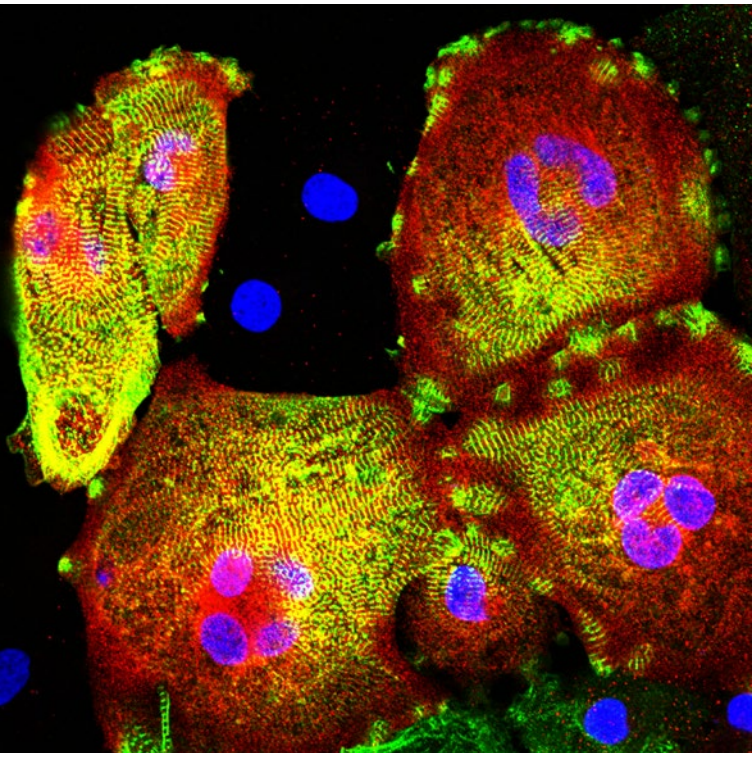
Research Program

Stem cells have the capability to self-renew (to divide to produce more stem cells) or to undergo differentiation into specialised cell types. Thus stem cells can provide a renewable source for replacement of senescent, dead or damaged cells in tissues.

SCA scientists study both pluripotent stem cells and tissue stem cells. Pluripotent stem cells, like cells of the early embryo, can turn into any type of tissue cell. Understanding how pluripotent stem cells chose between self-renewal and a specific direction or differentiation is a key focus of SCA research, because this information is critical to our ability to form specialised tissues from pluripotent cells. SCA scientists also study stem cells in the heart, brain and in the blood forming system. Here the goal is to understand the role of these stem cells in tissue maintenance and regeneration and to exploit the findings to enhance the innate ability of our organs to undergo repair after injury or during disease. These biological discovery themes are supported by platform technologies in bioinformatics, nanotechnology, bioengineering and tissue morphogenesis.



Key biological questions for each theme



Human pluripotent stem cell-derived cardiomyocytes with tdTomato reporter expression (red) driven from the endogenous HOPX locus and co-stained for a-actinin (green) and DAPI (blue). Courtesy of Dr Nathan Palpant (IMB, UQ).

Pluripotency and Reprogramming

1. Understand how to assess and ensure the quality of cellular reprogramming; the process of converting adult cells back to the embryonic state.

2. Discover novel networks controlling pluripotency and self-renewal.

3. Generate functional specialised cells from pluripotent stem cells (cardiac, neural and blood lineages).

Neural Regeneration and Repair

1. Determine the factors regulating endogenous neural precursor maintenance and differentiation in health and disease.

2. Define how to produce specific neural phenotypes from in-vitro-generated stem cells.

3. Understand the function of neural precursor progeny in the central nervous system (CNS).

Cardiac Regeneration and Repair

1. Investigate how capacity for regeneration is maintained in the heart, and how can it be rejuvenated in aging and disease.

2. Define the molecular underpinnings of cardiac repair.

3. Determine whether molecular switches underlie cell cycle re-entry of adult cardiomyocyte (CM) in mammals vs more regenerative vertebrates.

Haematopoiesis

1. Understand the molecular mechanisms controlling specification of haematopoietic stem cells (HSC) during development.

2. Determine the molecular interventions required to generate a new source of HSC from either pluripotent cells or mature blood cells.

3. Investigate whether mathematical models adequately define cell differentiation and transcriptional regulatory networks.

4. Determine whether HSC derived by cell reprogramming strategies exhibit identical functionality to their adult counterparts.

Theme: Pluripotency and Reprogramming

Professor Martin Pera and **Professor Peter Gray**

Revolutionised Prospects for Regenerative Medicine and Cell Replacement in the Body

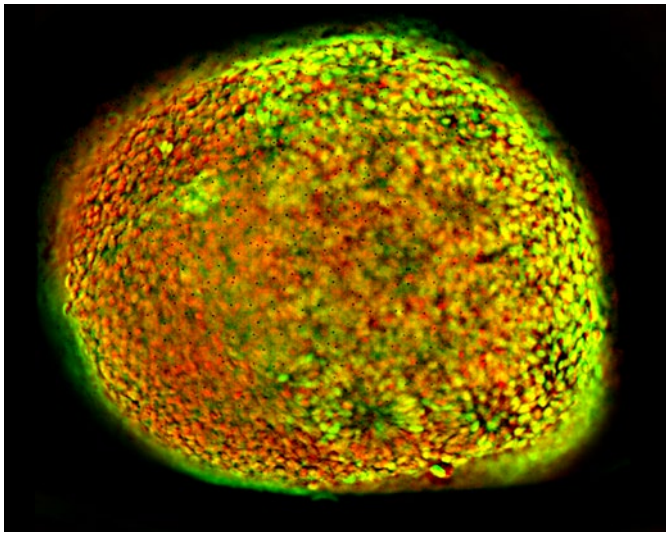
Human pluripotent stem cells are now an established discovery platform for human functional genomics, disease modelling, and drug development, and products derived from these cells are now undergoing clinical trials for spinal cord injury, Type I diabetes, macular degeneration, cardiac failure, and Parkinson's Disease.

The SCA program in Pluripotency comprises basic studies into the cellular and molecular biology of pluripotency, metabolomic and bioengineering research aimed at enhancing our ability to use pluripotent stem cell technology in research and medicine, and research applying pluripotent stem cells to disease modelling.

Several SCA teams are dissecting the mechanisms underlying the regulation of pluripotent stem cells. Jose Polo and his colleagues study the process of cellular reprogramming, in which cells from adult tissues can be converted to pluripotent stem cells. This year they have made important progress analysing the networks of transcription factors that are involved in this multistep process, and in deciphering how changes in transcription factor expression impact on the structure of chromatin.

Robin Hobbs studies a particularly interesting model of reprogramming, the conversion of spermatogonial stem cells to pluripotent cells, and his team have recently produced in depth studies of this stem cell population and how it changes on the pathway to reprogramming. Martin Pera's group, working within the BPA collaboration alongside the Christine Wells and Stemformatics teams, continues their analysis of subsets of human pluripotent stem cells, and is making progress in understanding how these cells fit into the context of early primate embryonic development.

SCA biologists and bioengineers are working together to better understand and improve the culture environment of human pluripotent stem cells. David Gardner and Alexandra Harvey are studying how basic nutrients in the culture media affect the metabolic profile of pluripotent stem cells, an area of great current interest owing to the increasing appreciation of the impact of metabolism on the cell's epigenetic status. Justin Cooper- White is employing microbioreactor technology developed in his laboratory to work out how paracrine factors and the extracellular matrix can enhance the efficiency of cellular reprogramming. The microbioreactor technology allows for high throughput multivariable analysis of the impact of various factors on conversion to pluripotency.



Single slice from a 3D hESC 'Nanobridge' aggregate (diameter ~650microns) undergoing neuronal differentiation at d10 of induction. Stained for PAX6/488 and nuclear marker DRAQ5/647. Imaged on the InCell Analyzer 2200. Courtesy of Dr Linda Harkness (AIBN UQ).

Peter Gray, along with the Pera laboratory, is studying a new cell culture platform for neural progenitors, based on cell growth in aggregates nucleated by a modified thermosensitive polymer. The Gray laboratory has produced proof of concept studies showing how this approach can be incorporated into scale up of culture systems using stirred suspension bioreactors.

Ernst Wolvetang's team are applying a combination of induced pluripotent stem cell and gene editing technology to analyse the pathogenesis of central nervous system disorders found in Down Syndrome patients, including Alzheimer's Disease. Their new results challenge some existing concepts concerning the role of beta amyloid in the latter condition. With the Pera laboratory, the Wolvetang group have completed a chemical genomics study of the role of Dyrk1A, a gene in the Down Syndrome critical region on Chromosome 21, in early human nervous system development, and they are working in the BPA collaborative project to study the critical steps in the formation of neural crest from human pluripotent stem cells.

Theme: Neural Regeneration and Repair

Professor Perry Bartlett and **Professor Trevor Kilpatrick**

Brain Cell Regeneration and Repair

This theme has three principal goals

- To understand the factors regulating endogenous neural precursor maintenance and differentiation in health and disease.
- To understand how to produce specific neural phenotypes from in-vitro-generated stem cells.
- To understand the function and use of neural precursor progeny in the CNS

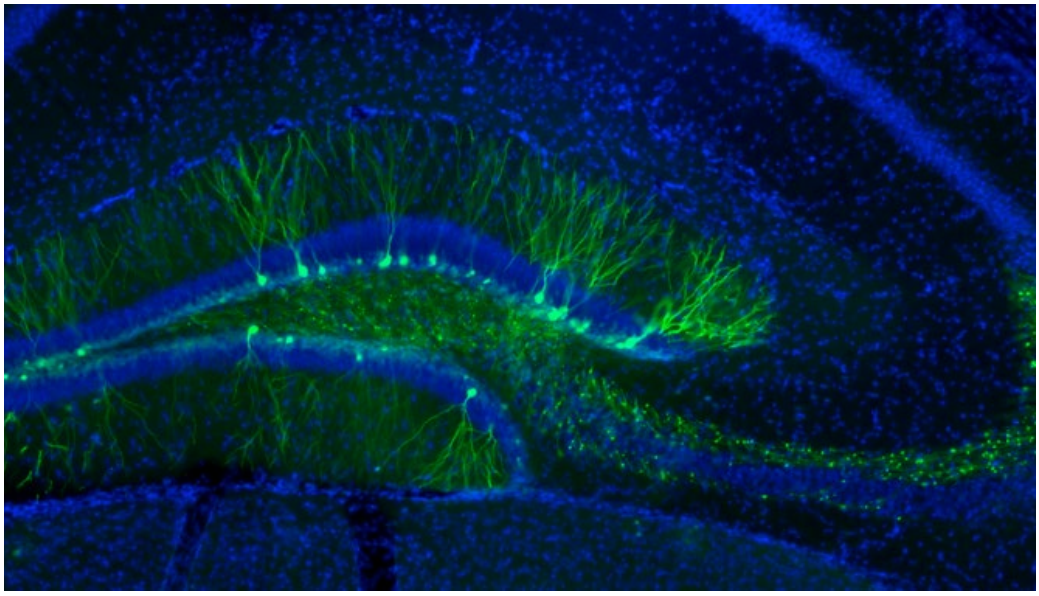
During 2016 significant progress has been made in each of these areas. For example, we have established the importance of maintenance of a population of oligodendrocyte progenitors in the healthy adult brain demonstrating that the ablation of this population leads to behavioural effects. This suggests one of two tantalising possibilities: either this population directly contributes to CNS homeostasis or, alternatively, the differentiation of these cells in the adult contributes in a novel way to neuroplasticity.

By understanding how the damaged brain is repopulated by precursor cells after insults of this nature we also have been able to compare and contrast the responses of the various precursor populations known to reside within the brain to these insults.

Significant advances have been made in generating human neural crest lines from iPSC utilising Sox10 reporter/CRISPR constructs. Functional assays utilising microfluidics are being developed to assess influences upon neural crest migration. The functional characteristics of neuronal derivatives generated from these precursors are also being assessed which should prove useful in future studies directed to disease modelling and drug screening.

In terms of understanding neural precursor function there has been continuing investigation into the roles of key growth factors in regulating hippocampal precursor cell activity and neurogenesis. The work has demonstrated that the adult hippocampus harbors distinct populations of quiescent stem cells that can be activated by different stimuli to generate new neurons. By selectively ablating new neurons in the adult hippocampus using a novel genetic mouse model, we have shown that new neurons are important for regulating spatial learning.

Inexorably, the work within the theme is laying important foundations for subsequent clinical application. This includes work focused on the generation of dopaminergic neurons in vitro, the characterisation of nonhuman primate models and work that has recently commenced which aims to understand how the innate immune system influences the capacity of the central nervous system to regenerate.



New neurons generated in the hippocampal dentate gyrus of adult mice identified by labelling the dividing precursors with a GFP-retrovirus 6 weeks earlier. Note the extensive dendritic arborization and axonal processes (seen as dots) extending into CA3. The program has identified two types of precursors that give rise to these new neurons. Courtesy of Dr Dhanisha Jhaveri and Professor Perry Bartlett (QBI, UQ).

Theme: Cardiac Regeneration and Repair

Professor Richard Harvey and **Professor Nadia Rosenthal**

Regeneration and Repair of Diseased or Injured Heart Tissue

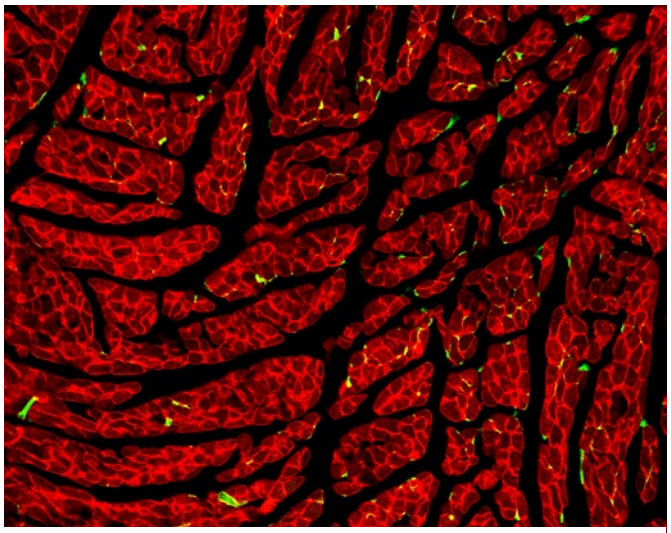
This SCA Theme aims to develop a broad picture of the cellular and molecular basis of stem and stromal cell populations in the adult heart in health and disease, including their origins, lineage hierarchies, paracrine effects and regenerative potentials.

Furthermore, it seeks to understand the biochemical and epigenetic basis of cardiomyocyte (CM) proliferation and cell cycle withdrawal as crucial additional targets of regeneration therapies.

Characterisation of cardiac regeneration in permissive models such as the zebrafish and mammalian neonate, as well as in models of augmented cardiovascular repair, will be critical to a full understanding of the potential for, and limitations of, heart regeneration in humans.

The objectives of this theme are being met by novel collaborative research projects across the Cardiac Theme. Recent work has identified endogenous molecules that influence innate cardiac repair mechanisms such as c-KIT, TBX20, FOXP3, HOPX, PDGF, thyroid hormone, IGF-1 and NRG 1, and these are informing the design of therapeutic interventions.

The Rosenthal laboratory has undertaken a detailed characterisation of cardiac stromal cells and an abundant population of resident pro-regenerative cardiac macrophages.



The image shows a section of the left ventricle of the heart with cardiomyocytes highlighted in red and lineage traced PDGFRalpha+ stromal cells in green. Here we have used the tamoxifen-dependent Pdgfra-merCremer mouse crossed to the mTmG Cre reporter mouse to genetically tag the immature stromal fraction of the heart and this reagent is currently being used to study its lineage descendants in health and disease. Courtesy of Dr Vaibhao Janbandhu and Dr Elvira Forte (VCCRI).

They have contributed to CARFMAP, an initiative aimed at discovering and collating signalling and genome-wide data relevant to fibroblast biology.

Nadia Rosenthal has recently moved her laboratory to the Jackson Laboratories in Bar Harbor, Maine, USA, although keeps an Affiliate position at Monash and assuredly her collaborations across SCA will continue.

The Harvey laboratory, in collaboration with the Nordon laboratory at UNSW, continues to use single cell imaging, lineage tracing and transcriptomics approaches to understand cardiac stem and stromal cell biology. This work has led to an exploration of a PDGF ligand therapy, now being trialled in pigs.

The Graham and Harvey laboratories have recently shown how adolescent and mature mammalian CMs can be stimulated to divide, overturning the long-held paradigm that these cells terminally withdraw from the cell cycle in neonates. Division can be induced by hormones, growth factor pathways, or after inhibition of a stem cell-associated tyrosine kinase receptor.

Robert Graham's team has discovered the molecular mechanism for the significant, thyroid hormone-stimulated spike in CM proliferation in adolescents, as well as the influence of nutrition on this process. System biology approaches are now being used to unravel the molecular basis underlying these remarkable shifts in CM proliferative capacity.

Nathan Palpant, heads a group at the IMB, UQ. His work focuses on functional genomics and disease modelling to elucidate cardiovascular lineage specification, identity and fate (e.g. HOPX lineage) using pluripotency stem cell models, chromatin dynamics and single cell transcriptional profiling.

Christophe Marcelle has recently joined the Cardiac Theme. He works between the ARMI at Monash, and the NeuroMyoGene Institute at Lyon University, France. Together with Nadia Rosenthal and other SCA collaborators, he is developing an innovative approach to deliver regenerative payloads, such as CRISPR/Cas9 reagents, to injured muscles via macrophages programmed to express a muscle membrane protein that renders them highly fusogenic with damage muscle cells.

Human heart regeneration is the ultimate goal of these parallel lines of investigation. These studies of the Cardiac Theme are identifying the key nodes in this process for intervention.

Theme: Haematopoiesis

Professor Andrew Elefanty and **Dr Samir Taoudi**

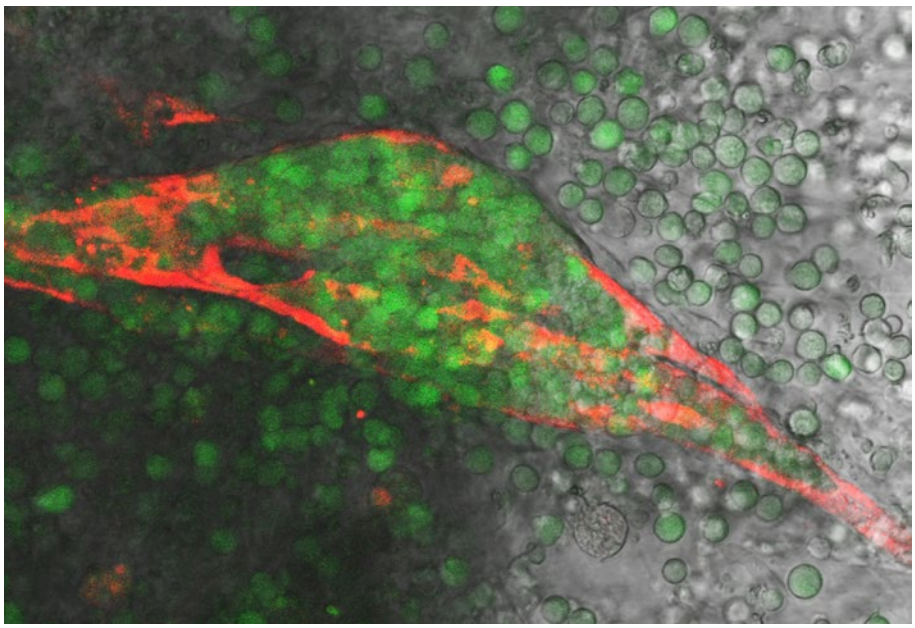
Stem Cells Converting into Blood Cells

A main aim for this theme is to define parameters for the generation of new sources of Haematopoietic Stem Cells by differentiation of human pluripotent stem cells, using protocols informed from mouse and human developmental haematopoiesis.

The last year has seen strong progress. Notably, studies performed in the laboratories of Andrew Elefanty (MCRI) and Ed Stanley (MCRI) using human embryonic stem cell reporter lines, have identified conditions that support the in vitro development of haemogenic vascular structures that give rise to haematopoietic cells, similar to the human AGM. This hypothesis is supported by transcriptional profiling studies showing similarity between stem cell derived and primary human AGM samples. These researchers have also generated and validated a range of constitutive and inducible reporters in the GAPTrap vector system. Manuscripts describing these results have been published in Nature Biotechnology and in Stem Cell Reports.

The project led by Lars Nielsen (UQ) aims to develop protocols for sustainable mature blood cell manufacturing, focusing on the neutrophil lineage. The successful completion of technical and economic feasibility assessments has led to the CCRM, Canada, taking up options on two of the Nielsen group patents. UQ and CCRM have agreed on licensing terms for CCRM to commercialize patents on mature blood cell production. Development of tools and collection of experimental data required to develop conditionally immortalised human haematopoietic progenitor cells capable of multilineage differentiation have been completed. Analysis of data is currently underway.

The projects led by Samir Taoudi and Doug Hilton (WEHI) relating to prenatal blood formation continue to develop strongly. In the past year their teams have discovered a novel regulator of stem/progenitor cell regulation, and have completed the hypothesis-building stage of their single-cell expression atlas of early blood commitment project. The single-cell analysis of adult stem cell fate project led by Shalin Naik and Doug Hilton (WEHI) has also moved from data analysis stage to hypothesis testing.



Confocal image of d20 differentiated SOX17mCherry/w RUNX1C GFP/w human embryonic stem cells showing the emergence of RUNX1C+ haematopoietic cells (GFP) from a SOX17+ vessel (mCherry), similar to the AGM. Courtesy of Dr Elizabeth Ng and Professor Andrew Elefanty.

Education, Ethics, Law and Community Awareness Unit

Our Education, Ethics, Law and Community Awareness Unit aims to provide the Australian community with reliable and authoritative information about developments in stem cell science, and in particular the promise of innovative therapies, as well as address the possible ethical and societal impact of such discoveries.

Stem cell science remains a cornerstone of medical research. From using stem cells to better understand how we develop, what occurs during disease and injury, to the development of possible new cell-based therapies. Cutting edge research such as induced pluripotent stem cells – where cells can be created directly from a patient – now means it is possible to screen for new pharmaceuticals or biologics, making the prospect of precision medicine a step closer. However, for many in the community excitement about the progress and possibilities that stem cell research may offer, coupled with compelling direct-to-consumer advertising, has fostered a 'stem cell' industry where so-called treatments appear to be available now but without any credible scientific evidence to support the marketing claims.

Throughout 2016 SCA has partnered with key national and international research organisations, patient advocacy groups, teacher associations, academics, industry and professional bodies to deliver a suite of educational activities. We have also continued to raise awareness about the policy implications of stem cell research, especially related to the sale of unproven stem cell 'treatments' in Australia and abroad.

Outreach and Communication Activities

During 2016, our outreach program focused on creating opportunities for members of the community to meet researchers and discuss the facts about stem cell science.

We continued to work closely with high school teachers, and specialty life sciences education initiatives such as Gene Technology Access Centre (GTAC), in an effort to take our research out of the lab and into the classroom.

Keen to raise awareness about careers in STEMM for girls, we co-hosted a full day program for high school students in years 8 and 9. Students worked in the laboratory alongside scientists from the UoM, MCRI, Centre for Eye Research, Florey Institute and GTAC to explore the world of stem cell research, ethics and communications. They heard fascinating and personal insights from three keynote speakers: Christine Wells, Director, Centre for Stem Cell Systems, UoM; Maja Divjak, Scientific Animator, GTAC and Mirella Dottori, Centre for Neural Engineering, UoM.

The Women in Stem Cell Science program was a unique and exceptional experience for students, teachers and the 20 scientists involved.

http://www.stemcellsaustralia.edu.au/News---Events/News/Women-in-Stem-Cell-Science.aspx

In November we also held our annual StemCells@UQ event, where 80 high school students and their teachers made their way to AIBN at the UQ to meet researchers from across the campus and learn how they are using stem cells to advance their research. Key topics of discussion where how stem cell science has developed – especially how you can now make stem cells from skin - and how this research may affect people's lives, in particular the realities behind the hopes and fears associated with stem cell science. Feedback received from teachers highlighted that the program was invaluable as students were able to "talk with actual researchers" to not only see what research entails but to "also see the passion that drives scientists to do what they do".

To further support teachers, SCA worked with the GTAC and a group of Victorian teachers to develop new resources for teachers and students as part of ReMSTEP, a Victorian initiative to reconceptualise mathematics and science teacher education.

http://remstep.org.au/exemplars/stem-cells/

We were also involved in a number public events that provided an opportunity for patients, their family and friends, as well as interested members of the public to have their questions answered about what's happening in stem cell research, and where we are in terms of taking stem cell science from bench to the clinic. Specifically, SCA sought to raise awareness about non-evidence based marketing claims around 'miraculous' stem cell treatments.

We held a public forum – 'Stem Cells on the Scientific Frontier: Hopes for Cures and Scientific Realities'– featuring Australian experts in stem cell science, law and medicine with a keynote provided by Professor Jeremy Sugarman, visiting the UoM from the US John Hopkins Berman Institute of Bioethics. The forum explored the complexities involved in advancing stem cell science and in particular the hopes and dreams of patients seeking urgent cures to alleviate their suffering.

Dr Jennifer Durnall (The Florey) with a student at a Women in STEMM event. (Courtesy of Casamento Photography.)

In Sydney, SCA was also part of a public lecture held in conjunction with the VCCRI 17th International Symposium. Members of the general public heard from various experts on the topic of 'Stem Cells – Hype and Hope', including updates on tissue regeneration, role of stem cells and bioengineering for heart disease, clinical trials, patient expectation and some of the issues and traps for potential patients seeking stem cell therapies.

Martin Pera and Joy Rathjen were also part of a debate – 'The Stem Cell Revolution: More hype than hope?' - held at the University of Tasmania's Menzies Institute for Medical Research where experts from research and medicine argued for and against the potential of stem cell science

https://youtu.be/nYHB0LTRnO8

Core to our outreach and communication activities was the SCA website and social media activities. During 2016 we have responded to more than 430 public enquiries (increase of 55% from previous year), and had over 105,000 visitors to our website where we posted 39 news items about our members and their activities. Our @StemCellAus twitter feed now attracts over 2,200 followers.

Research and Policy

For many years SCA has been an outspoken critic of commercial clinics offering 'stem cell' treatments without first showing that their service is safe and effective. Such clinics are effectively by-pass the clinical trials framework and place patients and the emerging stem cell industry at risk.

During 2016, we joined colleagues from around the world to update the ISSCR 'Guidelines for Clinical Translation of Stem Cells' to set clear standards on how stem cell science should move from the laboratory to the clinic. Here to mark the launch of the revised guidelines was guidelines co-author and longtime critic of these clinics, Doug Sipp. While visiting from Japan to attend the SCA Retreat, Doug also spoke on the need to communicate the promise, risk and uncertainty in stem cell research at a public forum held at VCCRI.

Martin Pera and Megan Munsie also provided a submission on behalf of SCA to the TGA in response to their 2016 consultation on the current Australian regulations that govern autologous cell therapies – where the patient's own cells are used. Australian clinics and businesses continue to offer unproven, costly, and potentially hazardous medical treatments that claim to use stem cells. SCA believes there is an urgent need for more stringent regulatory oversight to protect the Australian public and overseas visitors from harm, and to ensure genuine efforts to translate promising stem cell research into clinical benefit are not stymied. Several other members of SCA also submitted submissions to the TGA consultation as representatives of their research institute, ASSCR or the Australian Academy of Science.

http://www.stemcellsaustralia.edu.au/News---Events/News/Call-for-regulatory-change-to-curb-unethical--exploitative-.aspx.

In addition, we have continued to liaise with the Australian Health Practitioner Regulatory, Royal Australasian College of Physicians, the Australasian College of Sports and Exercise Physicians, AusBiotech and other peak bodies to further enhance professional understanding and awareness about these unproven, and in many cases unfounded, practices.

A key focus of our research program remains capturing the experience of Australians who have sought unproven stem cell treatment here, overseas or have contemplated doing so. Since 2012 SCA has been part of an international multi-disciplinary research project, 'High hopes, high risk? A sociological study of stem cell tourism'. Our work was presented at numerous national and international conferences, including the 2016 International Society for Cellular Therapy Conference in Singapore, with a book 'Stem Cell Tourism and the Political Economy of Hope' accepted for publication by Palgrave Macmillan. The domestic stem cell industry and its regulation is also a core interest with Megan Munsie an investigator on an ARC Linkage grant to develop an ethical and regulatory framework for the use of autologous therapies with colleagues at The University of Sydney, Australian National University and the University of Singapore.

The Education, Ethics, Law and Community Awareness Unit was supported by The University of Melbourne and Monash University.

Stemformatics

Stemformatics: facilitating insight from complex high-dimensional data.

Stemformatics is a web based pocket dictionary for busy biologists who lack bioinformatics training. It allows researchers to host and visualise their own private datasets and benchmark them against high quality public datasets. All of the data on Stemformatics has been hand-picked, curated and checked for experimental reproducibility and design quality, and normalised in-house.

Stemformatics was established in 2011 at the UQ, and is now based at the UoM with a UQ node. We have been supported by SCA since 2012.

During 2016 Stemformatics has continued to curate and make public stem cell datasets. To date we have:

- over 300 transcriptome datasets, encompassing 8000+ samples of stem cells and related cell types;
- released a new classification tool to assist the Mesenchymal stromal cells (MSC) community benchmark new MSC source, isolation method or growth conditions;
- joined the EU PluriMes consortium as the data collaboration partner;
- facilitated the publication of several stem cell transcryptome papers for collaborators in Australia, Japan, the UK and elsewhere;
- developed the new workflows for ChIP-seq, RNA-seq and small RNA-seq datasets, and;
- trained students and staff on the Stemformatics ecosystem.

Postgraduate Completions

We would like to congratulate the following postgraduate students who completed their studies in 2016.

Sara Alaei (PhD) supervised by Jose Polo (ARMI, Monash). Thesis: *Dynamics of transcription factor targeting and chromatin states during reprogramming*

Abdullah Alshawaf (PhD) supervised by Mirella Dottori (UoM). Thesis: *Functional in vitro modelling of the nervous system using human pluripotent stem cells; a platfrom to study brain disorders*

Jane Brophy (PhD) supervised by Megan Munsie (Monash, UoM). Thesis: *Stem Cell Tourism in China: The Dynamics of a Moral Economy*

James Cornwell (PhD) supervised by Richard Harvey & Robert Nordon (VCCRI, UNSW). Thesis: *Application of time-lapse imaging, single-cell tracking, and competing risks analysis to characterise cardiac stem cell growth dynamics*

Katherine Gill (PhD) supervised by Alice Pébay (UoM). Thesis: *Modelling POAG with patient specific iPSCs*

Jack Lambshead (PhD) supervised by Andrew Laslett, Carmel O'Brien (CSIRO) etal. Thesis: *Synthetic surfaces for long-term maintenance of hPSC cultures*

Barbara Maier (PhD) supervised by Melissa Little (UQ). Thesis: *Analysis of the recreation, maintenance and differentiation of nephron progenitors for use in disease modelling*

Riley McMahon (MSc) superivsed by David Gardner and Alexandra Harvey (UoM). Thesis: *The malate-aspartate shuttle regulates metabolism and pluripotency in human embryonic stem cells*

Amy Nicks (PhD) supervised by Robert Graham (VCCRI). Thesis: *Developmental Signals in Murine Postnatal Cardiac Growth*

Jessica Schwaber (PhD) supervised by Lars Nielsen (UQ) & Christine Wells (UoM). Thesis: *Order from Noise: Modeling the Stochasticity of Lineage Commitment*

Kathy Potts (PhD) supervised by Samir Taoudi (WEHI). Thesis: *Early haematopoietic specification and platelet-forming lineage development in the mouse embryo*

Li-Yen Wong (PhD) supervised by Justin Cooper-White & Ernst Wolvetang (UQ). Thesis: *A Self-Assembling, Targeted Biomaterial Delivery System for Cardiac Regeneration*

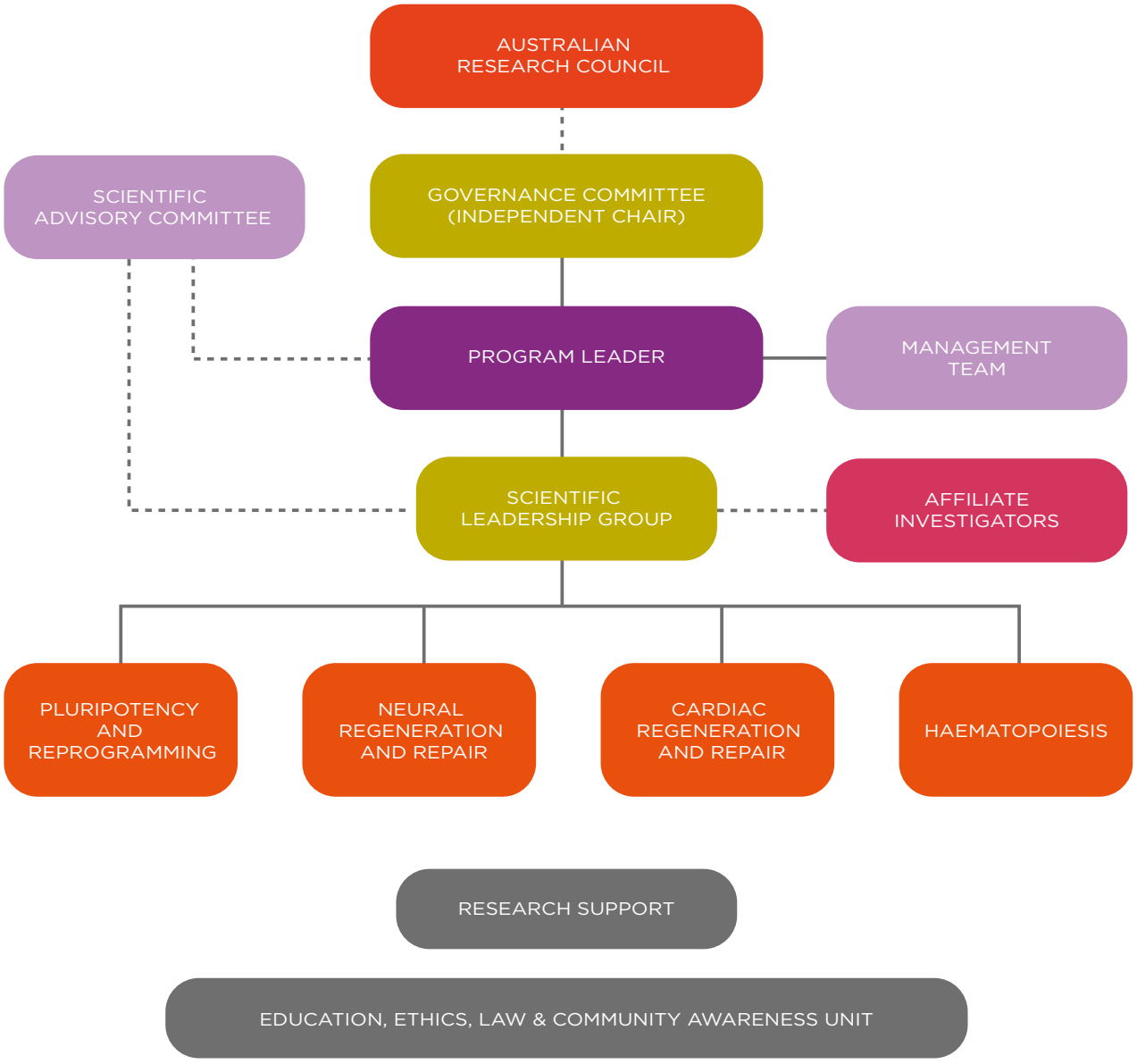
Kerstin Zoidl (PhD) supervised by Brandon Wainwright (IMB, UQ). Thesis: *The Relationship between Patched and Sox9 in Regulating Skin Stem Cells, Wound Response and Skin Tumorigenesis*

Leadership and Governance

Stem Cells Australia, an Australian Research Council Special Research Initiative, was awarded $21 million, over a seven year period, to bring together Australia's premier life scientists to address the big questions in stem cell science.

Stem Cells Australia was established in 2011 by The University of Melbourne, University of Queensland, Monash University, University of NSW, Walter and Eliza Hall Institute for Medical Research, Victor Chang Cardiac Research Institute*, The Florey Institute of Neuroscience and Mental Health, and Commonwealth Scientific and Industrial Research Organisation with Murdoch Childrens Research Institute joining in 2016.

**VCCRI does not participate in hESC research*



Governance Committee

The GC has representatives from each of the partner organisations and an independent Chair. The Committee ensures that the initiative is well managed with a particular focus on endorsement of the research program and the budget. The GC provides strategic advice to the Program Leader. The Research Program and Individual Projects require approval by this Committee. The Committee meets twice per year.

Professor David de Kretser
Independent Chair

Dr Julian Clark
Walter & Eliza Hall Institute of Medical Research (WEHI)

Professor Ross Coppel
Monash University (Monash)

Dr Henry de Aizpurua
The Florey Institute of Neuroscience and Mental Health (The Florey)

Ms Britt Granath
Victor Chang Cardiac Research Institute (VCCRI)

Professor Mark Hargreaves
The University of Melbourne (UoM)

Mr Ian Harris
University of Queensland (UQ)

Professor Melissa Little
Murdoch Childrens Research Institute (MCRI)

Professor Peter Gunning
University of New South Wales (UNSW)

Scientific Advisory Committee

Consisting of internationally renowned national and international experts in the field of stem cell science, the SAC provides strategic advice to the scientific leader on the research direction of the initiative and will provide independent evaluation and feedback on the research performance and science. The committee members meet once a year at the annual retreat.

Professor Christine Mummery
Leiden University Medical Centre, The Netherlands *Head of pluripotent stem cells and differentiation to cardiovascular cells*

Professor and Chair of Developmental Biology at Leiden University Medical Centre, Professor Mummery pioneered studies on heart muscle cells (cardiomyocytes) made from human embryonic stem cells and was among the first to inject them into a mouse heart after a heart attack. Her present interests are focussed on using stem cell derived cardiomyocytes and vascular cells as disease models for drug discovery.

Professor Andras Nagy
Lunenfeld-Tanenbaum Research Institute, Canada *Canadian Research Chair in Stem Cells and Regenerative Medicine*

Canadian Research Chair in stem cells and regenerative medicine, Professor Nagy heads a team of 50 researchers on project Grandiose which studies the process of creating stem cells and have demonstrated advances in stem cell creation which are expected to lead to improved treatments for a number of diseases. In 2005, Professor Nagy was the first to create new stem cell lines in Canada and in 2009, he demonstrated how cells could be changed into stem cells without the introduction of potentially damaging viruses and was included that year in Scientific American's Top 10 Honor Role. Professor Nagy and his research group have discovered a new type of stem cell, called the F-Class iPS cell. Nagy holds an Adjunct Professorship at Monash University.

Professor Hideyuki Okano
Keio University, Japan *Dean of Keio University Graduate School of Medicine*

Professor Okano conducts basic research in the field of stem cells including adult neurogenesis, neural stem cells, neural crest stem cells, and RNA binding proteins and translational research; in particular, the development of cell replacement strategies for injured spinal cord using somatic neural stem cells from induced pluripotent stem (iPS) cells.

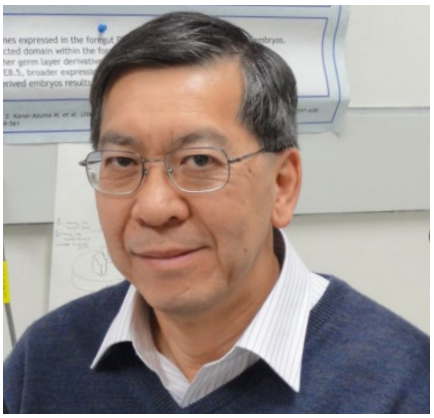
His group first achieved functional recovery of spinal cord injury in model animals including non-human primates by the transplantation of iPS cell-derived neural stem cells and succeeded in generating transgenic non-human primates with germline transmission using common marmoset.

He aims to establish and provide genetically modified non-human primate models for neurodegenerative disorders. He has received several awards and honors including the Medal of Honor with Purple Ribbon in 2009.

Professor Michael Rudnicki
Ottawa Hospital Research Institute, Canada *Director of the Regenerative Medicine Program and the Sprott Centre*

An Officer of the Order of Canada (2013), and the recipient of the prestigious 2014 Till & McCulloch Award for his ongoing work in stem cell and regenerative medicine research, Professor Rudnicki holds the Canada Research Chair in Molecular Genetics and works to understand the molecular mechanisms that regulate the determination, proliferation, and differentiation of stem cells during embryonic development and during tissue regeneration.

The lab has conducted leading studies into both embryonic myogenesis and the function of muscle stem cells in adult regenerative myogenesis, in particular to understand the molecular mechanisms that regulate the function of satellite cells in skeletal muscle. They identified Pax7 as a transcription factor required for the specification of satellite cells, and identified Wnt7a signaling as playing an important role in muscle stem cell function.



Professor Patrick Tam
Childrens Medical Research Institute *Deputy Director, NSW Australia*

The Scientific Advisory Committee Chair, Professor Tam's research focuses on the cellular and molecular mechanisms of body patterning during mouse development and the biology of stem cells. He is internationally recognised for pioneering the application of micromanipulation and embryo culture, for analysing the development of mouse embryos, and fate mapping of the mouse germ layers and embryonic gut. His other current research also covers the genetic models of X-linked diseases and the molecular controls of eye development. In recognition of his research achievement, Professor Tam was awarded the President's Medal of the Australia and New Zealand Society of Cell and Developmental Biology in 2007.

Professor Peter Zandstra
University of Toronto, Canada *Canadian Research Chair in Stem Cell Bioengineering*

Professor Zandstra's research – motivated by the hypothesis that the appropriate engineering of the cellular microenvironment will enable robust and efficient manipulation of stem cell self-renewal and differentiation – is focused on understanding the interface between microenvironmental control and the endogenous and intracellular networks that underlie stem cell fate decisions.

Areas of work include quantitative spatial and temporal control of embryonic stem cell self-renewal, bioprocesses for the generation of blood and cardiac cells from embryonic stem cells, and control of intercellular signaling networks to grow human blood stem cells. Ultimately, the goal is to enable stem cell based therapies and technologies to be developed for health and welfare.

Our People

Scientific Leadership Group

Chaired by the Program Leader, the Scientific Leadership Group is a group of senior scientists consisting of theme leaders of each of the four themes. This core group is the scientific powerhouse of SCA and are responsible for the delivery of the scientific research programs. They are the regular referral point for the Scientific Leader and assist in the development of the annual research work plan and budget for the initiative. In 2016 we welcomed Alternate members to the SLG (indicated by *).

Meeting bi-monthly, the Scientific Leadership Group assist the Scientific Leader in monitoring the operations and activities of the initiative and are the liaison and co-ordination points for the activities of the initiative within the broader SCA community.

Professor Martin Pera
Program Leader UoM, WEHI, The Florey

Professor Perry Bartlett
Queensland Brain Institute (QBI) UQ

Professor Andrew Elefanty
MCRI

Professor Robert Graham*
VCCRI, UNSW

Professor Peter Gray
AIBN, UQ

Professor Richard Harvey
UNSW, VCCRI

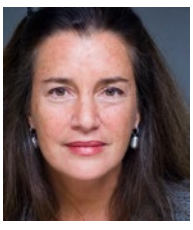
Professor Doug Hilton
UoM, WEHI

Dr Dhanisha Jahveri*
QBI, UQ

Professor Trevor Kilpatrick
UoM, The Florey

Dr Tobias Merson*
The Florey

Associate Professor Jose Polo*
ARMI, Monash



Professor Nadia Rosenthal
ARMI, Monash

Professor Ed Stanley*
MCRI

Dr Samir Taoudi*
WEHI

Professor Ernst Wolvetang*
AIBN, UQ

Chief and Partner Investigators

The Chief and Partner Investigators are the senior researchers of the initiative and the project leaders of SCA funded projects.

Professor Warren Alexander
Partner Investigator
WEHI

Professor Perry Bartlett
Chief Investigator
QBI, UQ

Associate Professor James Bourne
Chief Investigator
ARMI, Monash

Professor Justin Cooper-White
Chief Investigator
AIBN, UQ

Professor Andrew Elefanty
Partner Investigator
MCRI

Professor David Gardner
Chief Investigator
UoM

Professor Robert Graham AO
Chief Investigator
UNSW, VCCRI

Professor Peter Gray
Chief Investigator
AIBN, UQ

Professor Richard Harvey
Chief Investigator
UNSW, VCCRI

Professor Doug Hilton
Chief Investigator,
UoM, WEHI

Dr Robin Hobbs
Chief Investigator
ARMI, Monash

Professor Trevor Kilpatrick
Chief Investigator
UoM, The Florey

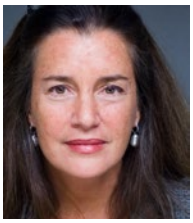
Professor Christophe Marcelle
Chief Investigator
ARMI, Monash

Professor Lars Nielsen
Chief Investigator, AIBN, UQ

Dr Nathan Palpant
Chief Investigator
IMB, UQ

Professor Martin Pera
Chief Investigator
UoM

Associate Professor Jose Polo
Chief Investigator
ARMI, Monash



Professor Nadia Rosenthal
Chief Investigator, ARMI, Monash

Professor Ed Stanley
Partner Investigator
MCRI

Professor Brandon Wainwright
Chief Investigator,
IMB, UQ

Professor Christine Wells
Chief Investigator
UoM

Professor Ernst Wolvetang
Chief Investigator,
AIBN, UQ

Associate Investigators

These roles are generally involved in SCA funded projects through a Chief Investigator, and are not usually directly supported financially.

Professor Robert Capon
UQ

Dr Mirella Dottori
UoM

Dr David Elliott
MCRI

Dr Tobias Merson
The Florey

Professor Michael Monteiro
AIBN, UQ

Associate Professor Megan Munsie
UoM

Professor Robert Nordon
UNSW

Dr Clare Parish
The Florey

Associate Professor Alice Pébay
CERA, UoM

Dr Joy Rathjen
UoM

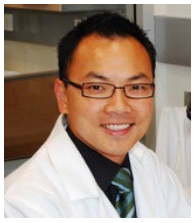
Professor Pankaj Sah
UQ

Dr Lachlan Thomson
The Florey

Associate Professor Ann Turnley
UoM

Affiliate Investigators

SCA's Affiliate Investigators are leading Australian and International stem cell researchers from outside our direct network whose vision and leadership further strengthen our initiative.



Associate Professor James Chong
University of Sydney

Professor Peter Currie
ARMI, Monash

Professor David Haylock
CSIRO

Dr James Hudson
UQ

Dr Kazu Kikuchi
VCCRI

Dr Jason Kovacic
Mount Sinai Hospital and the Cardiovascular Research Centre, New York

Associate Professor Andrew Laslett
CSIRO

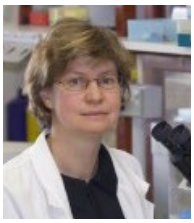
Professor Ryan Lister
University of Western Australia (UWA)

Dr Shalin Naik
WEHI

Professor Susie Nilsson
CSIRO

Dr Enzo Porrello
UQ

Dr Mirana Ramialison
ARMI, Monash



Professor Jane Visvader
WEHI

Management Team

The UoM is the Administering Organisation for the initiative and hosts the core management team. The Management Team is responsible for all aspects of reporting, administration, finance, committee meetings, events and workshops, and communication activities of the initiative.

Professor Martin Pera
Program Leader

Responsible for the overall direction and operation of the initiative. This role encompasses research leadership, management and communication, liaison and development responsibilities

Ms Barbara Power
Business Manager

Provides administrative leadership across the eight nodes of the initiative whilst managing all the financial dealings including grant and contract management, compliance and program management. Also the committee secretary responsible for all the committee meetings.

Associate Professor Megan Munsie
Head - Education, Ethics, Law & Community Awareness Unit

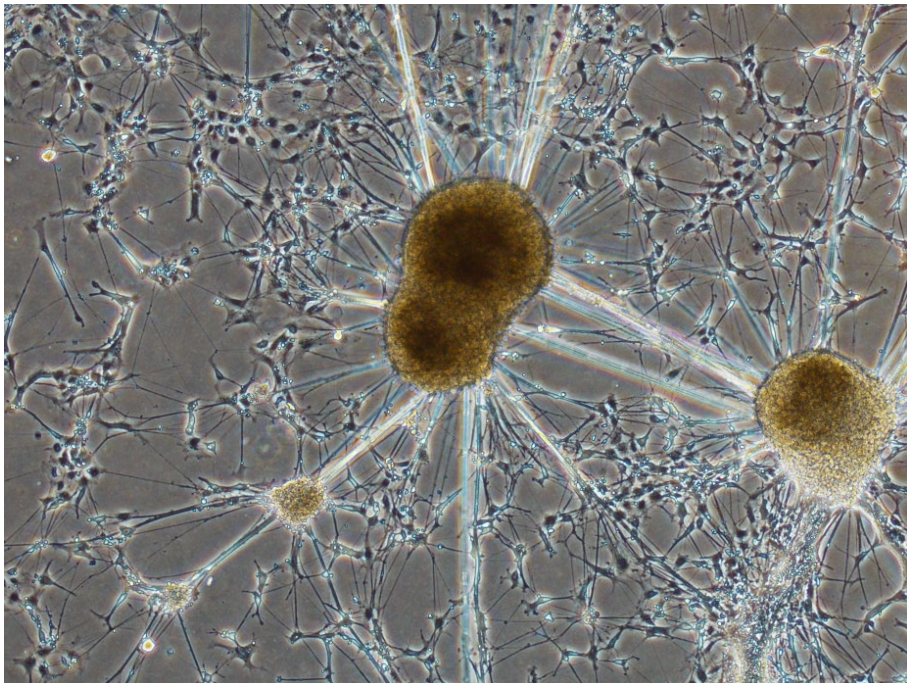
Responsible for SCA's communication, outreach and policy activities, and leads research into ethical and societal issues associated with stem cell science and its clinical applications.

Ms Jennifer Kendall
Executive Assistant to Program Leader

Provides executive administrative support to the program leader. Responsible for office management, HR and student coordination and assistance with event management, marketing and communication activities.

Dr Sandani Udabage
Assistant to Business Manager

Provides general administrative support including; annual retreat logistics, preparation of the annual report and KPI data collection.



Stem Cell Derived Neurons. Courtesy of Ms Claire Cuddy (UoM).

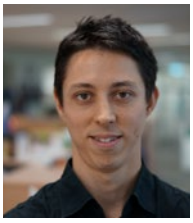
Platform Technologies Facilities Teams

Stemformatics Group

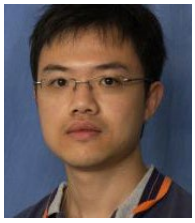
Based at UoM and UQ, Stemformatics is a collaboration between the stem cell and bioinformatics communities. It provides the Australian stem cell community with a collaborative platform that enables the interrogation of stem cell datasets without formal bioinformatics training.

Professor Christine Wells
Project Leader
UoM

Mr Rowland Mosbergen
Developer
UoM



Mr Othmar Korn
Bioinformatician
UQ

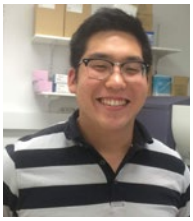


Mr Tyrone Chen
Research Assistant
UoM

Flow Cytometry Facility

Based at the Melbourne Brain Centre at UoM, the Flow Cytometry Facility is a purpose-built core facility in Flow Cytometry for use by interested researchers.

Dr Vanta Jameson
Manager
UoM



Mr Joshua Kie
Operator
UoM

Stem Cell Core Facilities

Stem Cell Core facilities are based at the Melbourne Brain Centre at UoM and AIBN at UQ. The cores' services are available to the scientists of the two universities as well as other institutions.

Dr Anna Michalska
StemCore Manager
UoM

Ms Katherine Lim
Technical Assistant
UoM

Dr Eva Thoma
Stem Cells Ltd Manager
UQ

Dr Nilay Thakar
Stem Cells Ltd Manager
UQ

Ms Set Yen Soo
Senior Research Officer
UQ

Ms Nishta Ramnoruth
Senior Research Officer
UQ

Early Career Researchers and Students

Invited for SCA annual retreat, post-doctoral researchers, research assistants and students listed in this report are either directly working in our core stem cells projects or active team members working on other stem cells projects of our senior investigators, thereby part of our broader stem cell network.

Post-Doctoral Researchers

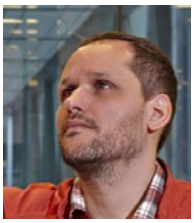
Dr Christelle Adolphe
IMB, UQ

Dr David Anderson
MCRI

Dr Poornima Balaji
VCCRI

Dr Daniel Blackmore
QBI, UQ

Dr Alexis Bosman
VCCRI

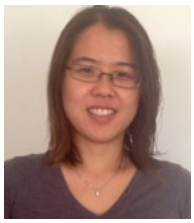


Dr Frederico Calhabeu
ARMI, Monash

Dr Ben Cao
CSIRO

Dr Huimin Cao
CSIRO

Dr Ai-Leen Chan
ARMI, Monash



Dr Xaoli Chen
AIBN, UQ

Dr Jarny Choi
WEHI

Dr James Cornwell
VCCRI

Dr Duncan Crombie
UoM

Dr Giovanna Marisa D'Abaco
UoM

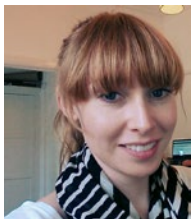
Dr Mauro da Costa
ARMI, Monash

Dr Kathryn Davidson
ARMI, Monash

Dr Carolyn de Graaf
WEHI

Dr Gonzalo Del Monte Nieto
VCCRI

Dr Melanie Domingues
CSIRO



Dr Jennifer Durnell
The Florey

Dr Alison Farley
UoM

Dr Jane Fitzpatrick
AIBN, UQ

Dr Elvira Forte
VCCRI

Dr Milena Furtado
ARMI, Monash

Dr Laura Genovesi
IMB, UQ

Dr Nick Glass
AIBN, UQ

Dr James Godwin
ARMI, Monash

Dr Natalie Groves
QBI, UQ

Dr Lorna Hale
MCRI

Dr Linda Harkness
AIBN, UQ

Dr Alexandra Harvey
UoM

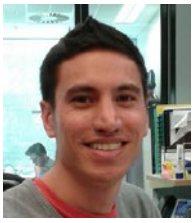
Dr Shen Heazlewood
CSIRO

Dr Damian Hernandez
UoM

Dr Melissa Holmes
ARMI, Monash

Dr Jihane Homman-Ludiye
ARMI, Monash

Dr Sara Howden
MCRI



Dr Lieven Huang
ARMI, Monash

Dr Sandy Hung
UoM

Dr Siiri Iismaa
VCCRI

Dr Vaibhao Janbandhu
VCCRI

Dr Dhanisha Jhaveri
QBI, UQ

Dr Jessica Kauhausen
The Florey

Dr Anja Knaupp
ARMI, Monash

Dr Alex Koon
IMB, UQ

Dr Kevin Lau
UoM

Dr Julien Legrand
ARMI, Monash

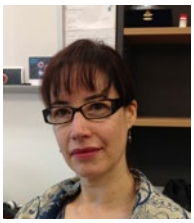
Dr Ming Li
VCCRI

Dr Sue Lim
ARMI, Monash

Dr Denise Miles
WEHI

Dr Stan Mitew
UoM

Dr Christian Nefzger
ARMI, Monash



Dr Elizabeth Ng
MCRI

Dr Jonathan Niclis
The Florey

Dr Hieu Nim
ARMI, Monash

Dr Carmel O'Brien
CSIRO

Dr Dmitry Ovchinnikov
AIBN, UQ

Dr Ralph Patrick
VCCRI

Dr Alex Pinto
ARMI, Monash

Dr Kathy Potts
WEHI

Dr Fernando Rossello
ARMI, Monash

Dr Jessica Schwaber
AIBN, UQ

Dr Ilaria Stefani
AIBN, UQ

Dr Minoru Takasato
IMB, UQ

Dr Claire Tanner
UoM

Dr Samir Taoudi
WEHI

Dr Jessica Vanslambrouck
MCRI

Dr Jana Vukovic
QBI, UQ

Dr George Wang
UoM

Dr Lina Wang
ARMI, Monash

Dr Munira Xaymardan
VCCRI

Dr Daniela Zalcenstein
WEHI

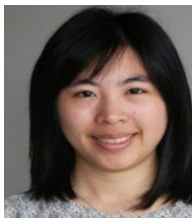
Dr Jing Zhao
QBI, UQ

Research Assistants

Ms Stacey Andersen
AIBN, UQ

Ms Amandine Carmagnac
WEHI

Ms Kellie Cartledge
CSIRO



Ms Andrea Chan
VCCRI

Mr Joseph Chen
ARMI, Monash

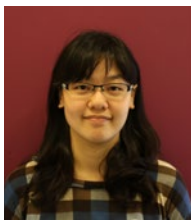
Mr Han Chiu
IMB, UQ

Mr Hun Chy
CSIRO

Ms Alison Conquest
UoM

Ms Claire Cuddy
UoM

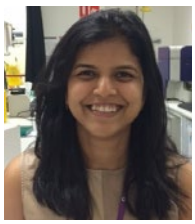
Mr Mitchell de Souza
ARMI, Monash



Ms Pei Er
IMB, UQ

Ms Jeannette Hallab
ARMI, Monash

Ms Sara Holman
VCCRI



Ms Tejal Kulkarni
UoM

Ms Mai La
ARMI, Monash

Ms Tanya Labonne
MCRI

Ms Jane Sun
AIBN, UQ

Mr Qi Zhou
CSIRO

Students

Ms Dhanushi Abeygunawardena
VCCRI

Mr Walaá Alsanie
The Florey

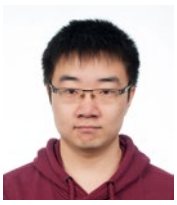
Mr Abdullah Alshawaf
UoM

Ms Deevina Arasartnam
MCRI

Ms Anushree Balachandran
AIBN, UQ

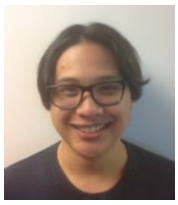
Ms Jane Brophy
Monash

Ms Freya Bruveris
MCRI



Mr Yuyang Cong (MSc)
WEHI

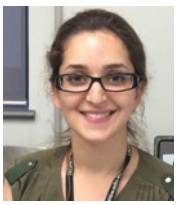
Mr Maciej Daniszewski
UoM



Mr Ryan Debuque
ARMI, Monash

Ms Isabelle Rose De Luzy
The Florey

Ms Georgia Dempster
UoM



Ms Nona Farbehi
UNSW

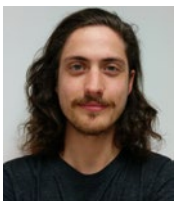
Mr Jaber Firas
ARMI, Monash

Ms Hananeh Fonoudi
VCCRI

Dr Tom Forbes
MCRI

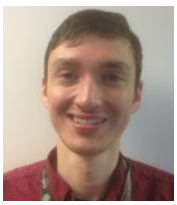
Mr Patrick Fortuna
AIBN, UQ

Mr Clayton Friedman
IMB, UQ



Mr Carlos Gantner
The Florey

Ms Katherine Gill
UoM



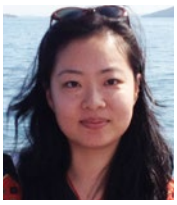
Mr Alexei Ilinkykh
ARMI, Monash

Mr Brett Kagan
The Florey

Mr Tim Kao
MCRI

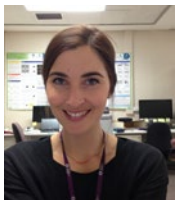
Dr Marcelo Leal
UoM

Mr Jarmon Lees
UoM



Ms Jing Jing (Jane) Li
UNSW

Ms Juan Li
AIBN, UQ



Ms Grace Lidgerwood
UoM

Mr Xiaodong (Ethan) Liu
ARMI, Monash

Ms Elizabeth Mason
AIBN, UQ

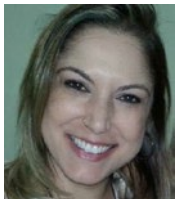
Mr Nicholas Matigian
AIBN, UQ

Ms Cristiana Mattei
UoM

Mr Ali Motazedian
MCRI

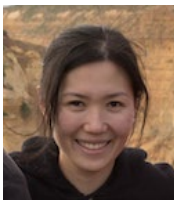
Ms Amy Nicks
VCCRI

Mr Harish Padmanabhan
AIBN, UQ



Ms Vanessa Penna
The Florey

Mr Dean Phelan
MCRI



Ms Elizabeth Qian
MCRI

Ms Amber Rucinski (Honours)
ARMI, Monash

Ms Terri-Ann Scanlon
UoM

Mr Woo Jun Shim
IMB, UQ

Mr Rhys Skelton
MCRI

Ms Ying-Chen Soo
MCRI

Mr Marcos Soto
AIBN, UQ

Mr James Spyrou (MSc)
UoM

Mr Julian Stolper
ARMI, Monash

Ms Olivia Stonehouse (Honours)
WEHI

Ms Gemma Tan (MSc)
MCRI

Mr Leon Teo
ARMI, Monash

Ms Kanupriya Tiwari
AIBN, UQ

Ms Laura Galvis Vargas
ARMI, Monash

Ms Serena Viventi
UoM

Ms Liyuan Wang
UNSW

Ms Kerstin Zoidl
IMB, UQ

Ms Mei Zhou
QBI, UQ

All students enrolled in PhD unless otherwise stated.

Performance Tables

Key Result Area 1: Research Performance	2011 KPI		2012 KPI		2013 KPI		2014 KPI		2015 KPI		2016 KPI	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Innovative, internationally, competitive research strategically focussed on fundamental stem cell science												
Number of research outputs: Journal Publications	15	29	70	102	80	116	90	141	90	113	90	160
Number of Conference proceedings	4	3	20	8	20	9	30	1	30	1	35	0
Quality of research outputs												
50% of publications will be in peer reviewed, international journals with an Impact Factor >5	50%	50% (14)	50%	54% (55)	50%	45% (46)	50%	43% (50)	50%	61% (61)	50%	48% (73)
15% of publications will be in journals with Impact Factor >10.	15%	20% (6)	15%	12% (12)	15%	17% (17)	15%	20% (23)	15%	20% (20)	15%	18% (27)
Number of invited talks/ papers/keynote lectures given at major international meetings	3	16	15	46	15	28	15	97	20	67	25	50
Patent applications lodged	0	0	0	1	2	2	2	0	2	1	2	4

Key Result Area 2: Research Training and Capacity Building	2011 KPI		2012 KPI		2013 KPI		2014 KPI		2015 KPI		2016 KPI	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Number of postgraduate students working on core SRI research and supervised by SRI members												
Annual	8	14	10	8	12	20	26	18	8	8	11	19
Cumulative	8	14	18	22	30	42	56	60	64	68	75	87
Number of postdoctoral researchers appointed to the SRI working on core SRI research												
Annual	9	11	20	40	20	9	20	10	20	14	20	15
Cumulative	9	11	29	51	49	60	69	70	89	84	109	99
Number of postgraduate completions by students working on core SRI research and supervised by SRI members												
Annual	0	0	2	2	2	2	6	7	7	9	16	13
Cumulative	0	0	2	2	4	4	10	11	17	20	33	33
Qualitative measures of capacity building												
Number of Competitive postdoctoral Fellowships awarded	0	1	1	3	2	4	3	5	2	8	3	5
Other awards, short term fellowships, recognitions, appointments, promotions	0	1	9	10	11	17	9	7	10	11	9	20+

Key Result Area 3: International, national links and networks	2011 KPI		2012 KPI		2013 KPI		2014 KPI		2015 KPI		2016 KPI	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
International Collaboration												
Researchers, fellows attend and present at international conferences (annual)	4	16	30	39	35	48	35	28	35	59	35	65
Students attending international research conferences (annual)	1	1	13	2	14	4	19	22	23	7	21	12
Research collaborations with international centres	2	10	3	22	5	16	5	50	5	47	5	45+
International research funding received annually	0	$470K	$500K	$1.5M	$750K	$1.2M	$750K	$325K	$750K	$1.2M	$1M	$640K
National Collaboration: Cross-institutional/ collaboration defined as across research institutions (i.e. collaborating and partner organisations) within SCA												
Annual retreat attended by x% of researchers, fellows, students	N/A	N/A	80%	85%	80%	81%	80%	91%	80%	91%	80%	87%
% publications including cross-institutional authorship annually	25%	18%	50%	12%	60%	3%	65%	60%	65%	73%	65%	73%
Number of international visitors and visiting fellows funded with SRI funds staying between 1-2 months (approx)	0	0	2	2	2	4	2	5	2	3	2	2
Number of workshops held/organised by the SRI												
Nationally	1	1	1	4	1	7	1	8	1	5	1	4
Internationally	0	0	1	1	0	1	1	1	0	1	0	0

Key Result Area 4: Knowledge transfer, outreach and communication	2011 KPI		2012 KPI		2013 KPI		2014 KPI		2015 KPI		2016 KPI	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Number and nature of commentaries about the SRI's achievements												
Media releases	2	3	5	4	5	6	5	5	6	6	6	11
Articles	1	7	3	21	3	20+	4	35+	4	35+	4	35+
Number of government, industry and business community briefings	1	1	4	7	4	6+	4	4+	4	4	4	8
Number and nature of public awareness programs												
Provide tailored resources to community and professional organisations	2	2	4	6	4	11	4	10	4	5	4	6
SRI members participating in community or patient advocacy meetings	3	3	5	16	5	12	10	15	10	13	10	36
Engagements with science teachers' associations	1	1	3	2	3	3	3	3	3	4	3	3
Currency of information on the SRI's website (number of news items posted)	Website launched Nov 2011			27		51		37		30		39
Online												
Number of website hits	2,000	2,559	15,000	22,207	20,000	53,038	20,000	99,570	20,000	90,205	20,000	105,638

Publications

Journal Articles with Impact Factor greater than 10

Note: Names in bold are Chief, Partner, Associate, or Affiliate Investigators from SCA consortium

Behrens, K., Triviai, I., Schwieger, M., Tekin, N., Alawi, M., Spohn, M., Indenbirken, D., Ziegler, M., Muller, U., **Alexander, W. S.**, & Stocking, C. (2016). Runx1 downregulates stem cell and megakaryocytic transcription programs that support niche interactions. *Blood, 127*(26), 3369-3381. doi:10.1182/blood-2015-09-668129. **IF 11.84**

Cao, B., Zhang, Z., Grassinger, J., Williams, B., Heazlewood, C. K., Churches, Q. I., James, S. A., Li, S., Papayannopoulou, T., & **Nilsson, S. K.** (2016). Therapeutic targeting and rapid mobilization of endosteal HSC using a small molecule integrin antagonist. *Nature Communications, 7*, 11007. doi:10.1038/ncomms11007. **IF 11.33**

Delconte, R. B., Kolesnik, T. B., Dagley, L. F., Rautela, J., Shi, W., Putz, E. M., Stannard, K., Zhang, J. G., Teh, C., Firth, M., Ushiki, T., Andoniou, C. E., Degli-Esposti, M. A., Sharp, P. P., Sanvitale, C. E., Infusini, G., Liau, N. P., Linossi, E. M., Burns, C. J., Carotta, S., Gray, D. H., Seillet, C., Hutchinson, D. S., Belz, G. T., Webb, A. I., **Alexander, W. S.**, Li, S. S., Bullock, A. N., Babon, J. J., Smyth, M. J., Nicholson, S. E., & Huntington, N. D. (2016). CIS is a potent checkpoint in NK cell-mediated tumor immunity. *Nature Immunology, 17*(7), 816-824. doi:10.1038/ni.3470. **IF 19.38**

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Grants

List of grants secured by SCA researchers in 2016.

Grants	2016	Total $	$ for 2016
ARC	Richard Harvey (VCCRI): ARC Discovery Grant - "Sprouting Angiogenesis and its Role in Formation of Chamber Myocardium" ($467,400, 2016-2018)	467,400	155,800
	Tobias Merson (The Florey/Monash): ARC Future Fellowship -"Assessing the mechanisms and dynamics of myelination in the brain" ($694,085, 2016-2019)	694,085	173,521
	Robert Nordon (UNSW) et al: ARC Linkage Scheme - "Scaling microfluidics for cell manufacture" ($240,000, 2016-2018)	240,000	80,000
	Christine Wells (UoM): ARC Future Fellowship (Medical and Health Sciences), ($931,552, 2016-2019)	931,552	232,888
NHMRC	Perry Bartlett (UQ): NHMRC Project Grant - "Exercise reverses cognitive decline in aged animals by growth hormone stimulation of neurogenesis in the hippocampus" ($706158, 2016-2019)	706,158	176,540
	James Chong (USyd): NHMRC Project Grant - "Investigation of Cardiac Stem Cell Regenerative Capabilities and their Enhancement by Manipulation of Telomerase Reverse Transcriptase" ($491,462, 2016-2018)	491,462	163,821
	Justin Cooper-White and Enzo Porrello (UQ): NHMRC Project Grant - "Targeted direct reprogramming of adult cardiac fibroblasts to functional cardiomyocytes" ($618,493, 2016-2018)	618,493	206,164
	Peter Currie (Monash): NHMRC Project Grant - "Mechanisms of muscle stem cell action in injury and disease" ($812,600, 2016-2019)	812,600	203,150
	Peter Currie, Mirana Ramialison, Toby Merson, Robin Hobbs (Monash) et al: NHMRC Equipment Grant - "Fluorescent Fish: Installation of fluorescence microscopes for screening of fluorescent transgenic animals Fish/Aqua" ($34,690, 2016)	34,690	34,690
	David Elliott (MCRI), Mirella Dottori (UoM) et al.: NHMRC Project Grant - "Personalised Medicine for Mitochondrial Disorders: Targeting Pathogenic Mechanisms" ($1,770,213, 2016-2020)	1,770,213	354,043
	Andrew Elefanty (MCRI): NHMRC Research Fellowship - "Making haematopoietic stem cells and modeling blood disease using human pluripotent stem cells" ($124,531, 2016)	124,531	124,531
	Toby Merson (Monash) et al: NHMRC Equipment grant - "Ultramicroscope II: 3D Fluorescence Light-Sheet Microscopy from Macro Structure to Cellular Resolution" ($100,000, 2016)	100,000	100,000
	Shalin Naik (WEHI): NHMRC Project Grant - "The precise steps in dendritic cell development" ($330,998, 2016-2018)	330,998	110,333
	Clare Parish (The Florey)" NHMRC Project Grant - "Standardising protocols for the differentiation and integration of human pluripotent stem cell-derived neural transplants in Parkinson's disease" ($987,664, 2016-2019)	987,664	246,916
	Jose Polo (Monash) & Andrew Laslett (CSIRO): NHMRC Project Grant - "Unveiling the human reprogramming pathway" ($965,807, 2016-2019)	965,807	241,452
	Jose Polo (Monash): NHMRC Project Grant - "Using direct reprogramming to generate and rejuvenate haematopoietic stem cells" ($1,026,313, 2016-2019)	1,026,313	256,578
	Enzo Porrello (UQ): NHMRC Career Development Award & NHF Future Leader Fellowship ($599,000. 2016-2019)	599,000	149,750
	Pankaj Sah (UQ): NHMRC Project Grant - "Auditory processing in the amygdala" ($1,009,956, 2016-2019)	1,009,956	252,489
	Lachlan Thompson (The Florey): NHMRC Project Grant - "Protecting and repairing the brain early in life" ($468,167, 2016-2018)	468,167	156,056
	Jane Visvader (WEHI): NHMRC Research Fellowship - "Deciphering breast cancer heterogeneity to improve breast cancer outcomes" ($851,980, 2016-2020)	851,980	170,396
Other	Perry Bartlett (UQ): Stafford Fox Medical Research Foundation - "Optimising exercise for cognitive function in older adults" $2.1M, 2016-2019)	2,100,000	525,000
	James Chong (Usyd): China Studies Centre - "Project seed funding" ($10,000, 2016)	10,000	10,000

Other (cont.)	Justin Cooper-White (UQ): CSIRO OCE (Office of the Chief Executive) Science Leader Grant	30,000	30,000
	Justin Cooper-White, Ernst Wolvetang (UQ): University of Queensland - StemCARE	7,000,000	
	Mirella Dottori (UoM) & Lachlan Thompson (The Florey): Friedreich Ataxia Research Association (USA and Australasia) - "Transplantation studies of sensory neurons derived from Friedreich Ataxia induced pluripotent stem cells into the dorsal root ganglia" (USD$270,277, 2016-2017)	351,009	175,505
	Andrew Elefanty, Ed Stanley (MCRI) et al: Childrens Cancer Foundation - " Modelling childhood leukaemia using human pluripotent stem cells" ($462,000, 2016-2018)	462,000	154,000
	David Elliott (MCRI): QNRF (Qatar) - "Modeling vascular complications of type 2 diabetes using in vitro derived endothelial-cardiomyocytes" (US$240,000, 2016-2018).	311,688	103,896
	David Gardner, Alexander Harvey, Trevor Kilpatrick (UoM) et al.: Melbourne Neuroscience Institute Interdisciplinary Seed Grant - "The idiosyncratic function and metabolism of the oligodendrocyte" ($30,000, 2016)	30,000	30,000
	David Gardner (UoM): Research Initiatives Fund at Uni Melbourne - Confocal Imaging ($149634, 2016)	149,634	149,634
	Richard Harvey and Robert Graham (VCCRI) et al.: Foundation Leducq – Transatlantic Networks of Excellence in Cardiovascular Research - "Eliciting Heart Regeneration through Cardiomyocyte Division" (US$ 6,000,000, 2016-20). Total funds to VCCRI - $USD577,775	750,357	150,071
	Richard Harvey (VCCRI): St Vincent's Clinic Foundation Adult Stem Cell Research Grant - "Combinatorial therapies targeting endogenous cardiac stem cells after ischaemic injury" ($100,000, 2016-2017)	100,000	50,000
	Kilpatrick T (UoM): Bethlehem Griffiths Research Foundation, Project Grant - "Developing a treatment for repairing the damage in Multiple Sclerosis", ($35,632, 2016)	35,632	35,632
	Kilpatrick T (UoM): RMH Neuroscience Foundation, MS research project grant - "Are the levels of soluble CD40 protein altered in people with Multiple Sclerosis?" ($10,000, 2016)	10,000	10,000
	Kilpatrick T (UoM): MNI, University of Melbourne, ID Seed Funding Grant - "Discovery of selective ligands for the tyrosine kinase MERTK as development candidates for radiolabeled diagnostics for use in multiple sclerosis" ($35,000, 2016)	35,000	35,000
	Kilpatrick T (UoM): National MS Society, USA, Pilot Research Grant - "Targeting Tyro3 to Promote Remyelination in Multiple Sclerosis" ($49,000, 2016)	49,000	49,000
	Robert Nordon (UNSW) et al: Industry contribution for ARC Linkage - "Scaling microfluidics for cell manufacture" ($180,000, 2016-2018)	180,000	60,000
	Robert Nordon (UNSW) et al: Department of Industry, Innovation and Science and Romar Engineering Pty Ltd - "Scaling manufacture of microneedle patch arrays for point -of-care diagnostics and transdermal drug delivery" ($47,000, 2016)	47,000	47,000
	Nathan Palpant (UQ) et al: The Prince Charles Hospital Foundation, Experienced Researcher Grant - "Combining extracorporeal life support and cell therapy in critical illness (The CELTIC Project): A controlled trial of human mesenchymal stromal cells to reduce inflammation in an ex-vivo model of veno-venous extracorporeal membrane oxygenation" ($100,000, 2016)	100,000	100,000
	Nathan Palpant (UQ) et al: Queensland Health (one time cash contribution) - "BIONICS: integrating stem cell biologics with critical care research" ($1,300,000, 2016)	1,300,000	1,300,000
	Alice Pébay (CERA, UoM): DHB Foundation ($450,000, 2016-2018)	450,000	150,000
	Alice Pébay (CERA, UoM): Yulgilbar Alzheimer's Research Program ($610,000, 2016-2018)	610,000	203,333
	Total	27,342,390	6,957,188

Awards and Appointments

Perry Bartlett (UQ): Panel Member - Centre for Brain Research & Neurological Foundation of New Zealand Panel Discussion, Auckland, New Zealand.

Xiaoli Chen (UQ): The Ian Potter Foundation - "Perspectives for the scale-up of production of pluripotent human embryonic stem cells", Travel grant for SCSS 2016 Symposium.

James Chong (Westmead Institute for Medical Research): The NSCFA Metcalf prizes in recognition of his leadership in stem cell research, translating and applying stem cell science to medical practice.

Justin Cooper-White (UQ): NHMRC Marshall and Warren Award (Research Excellence Award, awarded to the "most highly innovative and potentially transformational grant" in 2015 project grants round (across over 3500 grants nationally)), "Direct reprogramming of adult cardiac fibroblasts to functional cardiomyocytes through targeted delivery".

2015 AON Insurance and Life Sciences Queensland Annual Regenerative Medicine Award.

Editor in Chief - Applied Physics Letters (APL) Bioengineering, American Institute of Physics Publishing.

Elected as Fellow, Queensland Academy of Arts and Sciences (QAAS), August 2016.

Elected as Vice President (Medical and Health), QAAS, 2016-current.

Professor Justin Cooper-White (far left) and colleagues at 2016 NHMRC Research Excellence Award ceremony (Image courtesy NHMRC).

Peter Currie (ARMI, Monash): NHMRC Project grant (Research Excellence Award'; The award is given to the highest ranked applicant in NHMRC's Project Grant scheme), "Mechanisms of muscle stem cell action in injury and disease".

Nona Farbehi (VCCRI): 19th Australian Society for Stem Cell Research annual meeting, Student travel grant.

Hananeh Fonoudi (VCCRI): National Stem Cell Foundation of Australia, Student travel grant.

The 24th Annual St Vincent's Campus Research Symposium, The Gilead Prize for outstanding oral presentation.

National Stem Cells and Regenerative Medicine Conference, Tehran, Iran, Best paper award.

Robert Graham (VCCRI): Member - Board of Scientific Governors, MacTel Study, Lowy Medical Research Institute, New York, USA.

Peter Gray (UQ): Board Member - Engineering Conferences International Inc., New York, USA.

Richard Harvey (VCCRI): President - Australian Network of Cardiac and Vascular Developmental Biologists.

Inducted as a Fellow of the Royal Society of London.

Inducted as a Fellow of the Academy of Health and Medical Sciences.

Chair - (inaugural) Australian Academy of Science, National Science Committee: Cell and Developmental Biology.

Doug Hilton (WEHI): The Curtin Medal for Excellence In Medical Research for "Molecular Regulation of Blood Cell Production", John Curtin School of Medical Research, ANU.

Jihane Homman-Ludiye (ARMI, Monash): ARMI Director's award for Excellence in Post-doctoral research for 2016, "Ephrin-A2 regulates migration and proliferation in the developing brain".

Trevor Kilpatrick (UoM, The Florey): "TAMS in progressive MS", Genzyme - MOA Global Advisory Board, Boston, USA.

Melissa Little and **Minoru Takasato** (MCRI): 2016 UNSW Eureka Prize for Scientific Research.

Megan Munsie (UoM): Member - ISSCR Ethics committee.

Member - ISCT Presidential Task Force.

Member - AusBiotech Regenerative Medicine Advisory Group.

Member - Praxis Australia Research Training Advisory Committee.

Chair - ASSCR Policy, Ethics and Translational Sub-Committee.

Amy Nicks (VCCRI): Basic Cardiovascular Sciences (BCVS) International Travel Grant ($1000 USD).

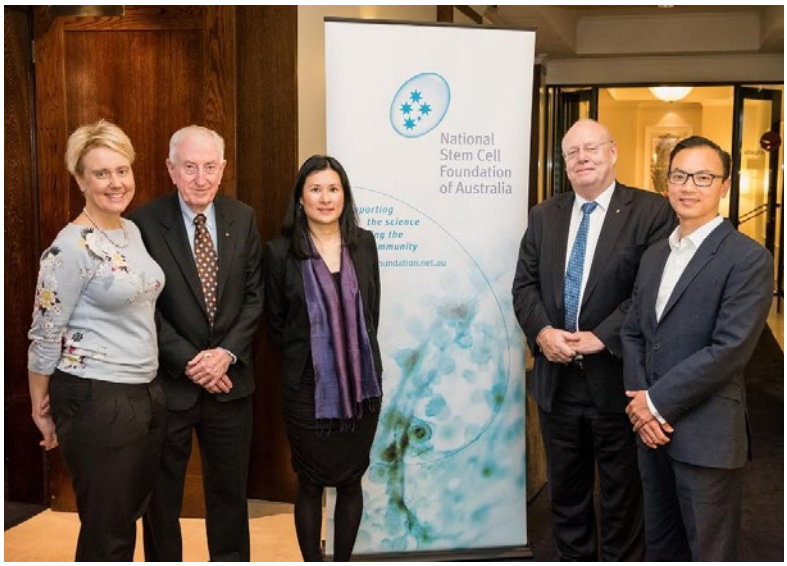
Enzo Porrello (UQ): NHMRC/NHF Career Development Award - "An RNA-based strategy for heart regeneration"($599,180, 2016-2019).

Enzo Porrello (UQ): NHF Paul Korner Innovation Award ($20,000, 2016).

Mirana Ramialison (ARMI, Monash): Thinkable inaugural "Peer Prize for Women in Science".

Jane Visvader (WEHI): 2016 Ramaciotti Medal for Excellence in Biomedical Research.

Christine Wells (U0M) and **Ernst Wolvetang** (AIBN, UQ): FANTOM5 Team: 2016 Scopus Eureka Prize for Excellence in International Scientific Collaboration.



National Stem Cell Foundation of Australia (NSCFA) Executive Officer Ms Julia Mason, Professor Peter Doherty, Dr Tracy Heng, Chairman of the Foundation Dr Graeme Blackman, with one of 2016 Metcalf prize winners Associate Professor James Chong (Courtesy of NSCFA).

Conference and Meeting Participation

Invited Speakers

Bartlett P Invited Speaker *Neurogenic restoration of cognitive function*, Joint Workshop on Neuroscience and Engineering, Shenzhen, China.

Bartlett P Invited Speaker *Pursuing Michael Edidin's fascination into the brain and finding stem cells*, John Hopkins University Memorial Ceremony, Baltimore, USA.

Bartlett P Keynote Speaker *Protecting memories,* Prince Charles Hospital Annual Research Forum, Brisbane, Australia.

Bartlett P Keynote Speaker *CSL Florey National Youth Science Forum*, Melbourne, Australia.

Chen X Invited Speaker *Perspectives for the scale-up of production of pluripotent human embryonic stem cells through the incorporation of thermoresponsive polymer components*, Bioprocessing Technology Institute, A*Star, Singapore.

Chong J Invited Speaker *Combining Cellular Therapies and Cardiac Bioengineering*, Stanford Bio-X , Stanford University, California, USA.

Chong J Invited Speaker *Stem Cell Strategies for Cardiac Regeneration*, The Victor Chang Cardiac Research Institute 17 th International Symposium, Sydney, Australia.

Chong J Invited Speaker *Stem Cells in Cardiac Regeneration*, Cardiac Society of Australia and New Zealand Annual Scientific Meeting, Adelaide, Australia.

Cooper-White J Invited Speaker Oral, *Chondro-inductive injectable hydrogels for stem cell-based intervertebraldisc tissue engineering*, 10th World Biomaterials Conference, Montreal, Canada.

Cooper-White J Invited Speaker *Microfluidic-Enabled Screening of Kidney Organogenesis*, 5th Micro and Nano Flows Conference, Milan, Italy.

Cooper-White J Invited Speaker *Modulation of focal adhesion dynamics and maturation by nanospaced adhesive peptide domains regulates Rho/Rac signalling in mesenchymal stem cells*, ComBio 2016, Brisbane, Australia.

Cooper-White J Keynote Speaker *Biomacromolecule Addition Substantially Changes the Flow Behaviour and Injectability of Concentrated Mesenchymal Cell Suspensions*, 17th International Congress on Rheology 2016, Kyoto, Japan.

Cooper-White J Keynote Speaker *Human Kidney Organogenesis from Pluripotent Stem Cells on a Chip, 16th International Conference on Biomedical Engineering*, Singapore.

Cooper-White J Keynote Speaker *Mimicking developmental drivers of tissue-specific commitment in perivascular stem cells for musculoskeletal tissue generation*, Regenerative Medicine and Stem Cells Satellite symposia, QRW 2016, Nelson, New Zealand.

Cooper-White J Keynote Speaker *Next generation microdevices for applications in developmental biology and regenerative medicine*, 7th Australia and New Zealand Nano-Microfluidics Symposium, Brisbane, Australia.

Cooper-White J Keynote Speaker *Release the Wolverine Target - Reprogramming*, ASSCR, Margaret River, Western Australia.

Cooper-White J Plenary Speaker *Directing stem cell fates for regenerative medicine applications*, 6th Malaysian Tissue Engineering and Regenerative Medicine Scientific Meeting (MTERMS) 2016, Penang, Malaysia.

Cooper-White J Plenary Speaker *Driving stem cell behaviours using directive biomaterials for controlled delivery and tissue genesis*, 20th Anniversary International Symposium of the Korean Society for Biomaterials 2016, Seoul, Korea.

Cooper-White J Invited Speaker *Targeted direct reprogramming for improved function post AMI*, VCCRI 17th International Symposium and Princesses' Lecture - From Cardiovascular Development to Regenerative Medicine, Sydney, Australia.

Dottori M Invited Speaker *Stem cells and Neurological Injuries Workshop*, NSW StemCell Network, Sydney, Australia.

Elefanty A Invited Speaker *Generation of definitive haematopoietic cells from in vitro differentiated human pluripotent stem cells,* 24th Stem Cell Network Workshop Stem cells and cancer, Sydney, Australia.

Elefanty A Invited Speaker *HOXA-Patterend hemogenic endothelium differentiated from human pluripotent stem cells resembles AGM and generates fetal Hematopoietic cells,* CiRA/ISSCR 2016 International Symposium. Pluripotency: from basic science to therapeutic applications, Kyoto, Japan.

Elefanty A Invited Speaker *Use of reporter cell lines to monitor directed differentiation to mesodermal endpoints,* RBK All Hands Meeting 2016, Ellicot City, MD, USA.

Elliott D Invited Speaker *Human Pluripotent stem cells models of heart development and disease,* Keystone Symposia, Cardiac Development Regeneration and Repair, Snowbird, USA.

Elliott D Invited Speaker *Role of BMPRII signalling in pulmonary arterial hypertension*, Victor Chang 17th Annual Symposium/Australian Network of Cardiovascular Developmental Biologists, Sydney, Australia.

Gardner D Invited Speaker *Dialgoue between embryos and their environment,* National Society of Embryology, Istanbul, Turkey.

Gardner D Invited Speaker *Metabolism in signalling and determination of viability,* The 3rd Biomarkers Meeting in Reproductive Medicine, Valencia, Spain.

Gardner D Invited Speaker *Culture media: What's in them and why*, Alpha, 11th Biennial Conference, Copenhagen, Denmark.

Gardner D Invited Speaker *Non-invasive profiling of embryos*, Alpha Symposium, Singapore.

Gardner D Invited Speaker *The media we use,* The 18th Chongqing ART Conference, China.

Gardner D Invited Speaker *The road to single embryo transfer,* Controversies in Obstetrics and Gynaecology, Melbourne, Australia.

Gray P Invited Speaker *Characterisation and optimisation of the Nanobridge System for hESC suspension cultures, Scale-up and manufacturing for cell based therapies V*, San Diego, CA, USA.

Harevey R Invited Speaker Transdifferentiation and Tissue Plasticity in Cardiovascular Rejuvenation, Company of Biologists Meeting Series Wiston House, Sussex, UK.

Harkness L Invited Speaker *Methods and analysis of Pluripotency markers and cell viability in hESC as 3D aggregates,* Cell and Gene Therapy Catapult, London, UK.

Harvey R Invited Speaker *Heart Development,* 8th Australian Developmental Biology Workshop Mornington Peninsula, Australia.

Harvey R Invited Speaker *Regulation and Therapeutic Targeting of Mesenchymal Stem Cells in the Adult Mammalian Heart,* Harry Perkins Institute of Medical Research, Perth, Western Australia.

Harvey R Invited Speaker *Regulation and Therapeutic Targeting of Mesenchymal Stem/Stromal Cells in the Adult,* 8th Australian Developmental Biology Workshop, Mornington Peninsula, Australia.

Harvey R Invited Speaker *Stem Cells in Biology and Medicine,* Society of Medical Innovation Healthcare of the Future Conference, University of New South Wales, Sydney, Australia.

Hudson J Invited Speaker *Bioengineering cardiac organoid models,* VCCRI 17th International Symposium and Princesses' Lecture - From Cardiovascular Development to Regenerative Medicine, Sydney, Australia.

Iismaa SE Invited Speaker *Repair of the adult heart after a heart attack by reactivation of cardiomyocyte proiiferation,* College of Biomedical and Life Sciences, Cardiff University, UK.

Janbandhu V Invited Speaker *Role of hypoxia signalling in adult cardiac CFU-Fs,* VCCRI 17th International Symposium and Princesses' Lecture - From Cardiovascular Development to Regenerative Medicine, Sydney, Australia.

Jhaveri D Invited Speaker *Activation of neural stem cells in the adult brain: Novel strategies for treating depression,* Neurosciences Research Collaborative Expo, Brisbane, Australia.

Kilpatrick T Invited Speaker *Microglial function and dysfunction in MS*, 13th International Congress of Neuroimmunology - ISNI, Jerusalem, Israel.

Laslett A Invited Speaker *Harnessing pluripotency novel tools for human stem cell biology,* Chinese Academy of Sciences-CSIRO Health and Biotech Workshop, Shanghai, China.

Laslett A Invited Speaker *Stem Cells,* Monash University IDEATOR Hackathon Life Sciences Stream, Melbourne, Australia.

Laslett A Invited Speaker *Harnessing pluripotency novel antibodies for human stem cell biology*, Emerging Therapeutics Summit, Melbourne, Australia.

Laslett A Invited Speaker *Novel tools for human pluripotent stem cell biology,* Chinese University of Hong Kong, Monash University strategic workshop, Melbourne Australia.

Marcelle C Invited Speaker *Cytoplasmic NOTCH and membranal b-catenin link cell fate choice to EMT during myogenesis,* The Batsheva de Rothschild Seminar on Skeletal and Cardiac Myogenesis, Rehovot, Israel.

Marcelle C Invited Speaker *Cytoplasmic NOTCH and membranal b-catenin link cell fate choice to EMT during myogenesis*, The Hunter Cell Biology Meeting, Hunter Valley, NSW, Australia.

Marcelle C Invited Speaker *CRISPR-Mediated Somatic Cell Genome Engineering In The Chicken,* GDR Avian Models, Toulouse, France.

Marcelle C Keynote Speaker *Cytoplasmic NOTCH and membranal b-catenin link cell fate choice to EMT during myogenesis*, Myology 2016, Lyon, France.

Munsie M Invited Speaker *Cashing in on hope the business of selling stem cell treatment downunder,* 2016 Conference for International Society for Cellular Therapy (Australia and New Zealand region), Melbourne, Australia.

Munsie M Invited Speaker *Clash of hopes balancing optimism and scientific evidence,* 2016 Conference for the International Society for Cellular Therapy, Singapore.

Munsie M Invited Speaker *The Big Business of Selling Stem Cells*, 2016 Conference for the Sydney University Network for Bodies, Organs and Tissues, Sydney, Australia.

Nielsen L Invited Speaker *A sampling toolbox for unravelling dynamic behaviour of metabolic reactions and networks,* ICMS 2016, Shanghai, China.

Nielsen L Invited Speaker *Bits, Bugs and Bucks – in silico Biotechnology,* ESIB, Graz, Austria.

Nielsen L Invited Speaker *CHO2020 Will systems biology deliver future production lines?*, CHO Modelling Workshop, Singapore.

Nielsen L Invited Speaker *Multi-Omics Approach for Comparative Studies of Monoclonal Antibody-Producing CHO Cells,* Pep Talk, San Diego, USA.

Nielsen L Invited Speaker *Opening Pandora's box – Life beyond the model organisms,* GIM2016, Wuhan, China.

Palpant N Invited Speaker *Cell fate manipulation in cardiovascular biology Can endothelial cells convert to cardiomyocytes?,* Cardiac Society of Australia & New Zealand and the International Society for Heart Research, Adelaide, Australia.

Palpant N Invited Speaker *Epigenetic and transcriptional analysis of mesoderm progenitors identifies HOPX as a novel regulator of hemogenic endothelium,* Australasian Society for Stem Cell Research, Western Australia, Australia.

Palpant N Invited Speaker *HOPX a novel regulator of hemogenic endothelium identified by chromatin dynamics*, ComBio, Brisbane, Australia.

Palpant N Invited Speaker *Using chromatin dynamics to identify genes regulating cell identity and fate,* Victor Chang Cardiac Research Institute 17th Annual International Symposium, Sydney, Australia.

Palpant N Invited Speaker *Using genomics to elucidate developmental cell lineage decisions,* Society for Reproductive Biology, Gold Coast, Australia.

Pébay A Invited Speaker *Human induced pluripotent stem cells to model retinal diseases,* Doctor of Optometry Student Conference, Melbourne, Australia.

Pébay A Invited Speaker *Human pluripotent stem cells for retinal disease,* Optic Nerve Conference, Obergurgl, Austria.

Pébay A Invited Speaker *Retinal Cell Differentiation of Human Pluripotent Stem Cells for Large–Scale Disease Modeling,* International Society for Cellular Therapy, Singapore.

Pébay A Invited Speaker *Stem Cell Treatment: Never underestimate the potential of a single cell,* Australian College of Optometry Annual Conference, Melbourne, Australia.

Pébay A Invited Speaker *Stem cells in reparing optic nerve damage,* European Association for Vision and Eye Research, Nice, France.

Pébay A Invited Speaker *Human induced pluripotent stem cells to model retinal diseases,* RANZCO Tasmanian Branch meeting, Hobart, Australia.

Polo J Invited Speaker *Creating specific cell types by transcription factor-mediated reprogramming,* Victor Chang Cardiac Research Institute 17th International Symposium, Sydney, Australia.

Polo J Invited Speaker *Exploring the boundaries of nuclear reprogramming,* MCRI external Seminar series, Melbourne, Australia.

Polo J Invited Speaker *Exploring the boundaries of nuclear reprogramming,* New Castle University-Monash Stem Cell symposium, New Castle, Australia.

Polo J Invited Speaker *Exploring the boundaries of nuclear reprogramming,* UOW external Seminar series, NSW, Australia.

Polo J Invited Speaker *Exploring the boundaries of transcription factor-mediated reprogramming,* ASSCR, WA, Australia.

Polo J Invited Speaker *Many roads lead to Rome - cell type specific routes to pluripotency,* CiRA/ISSCR 2016 International Symposium, Kyoto, Japan.

Porrello E Invited Speaker *Are stem cells the future of cardiovascular research? ,* Cardiac Society of Australia and New Zealand and International Society for Heart Research, Adelaide, Australia.

Porrello E Invited Speaker *Molecular mechanisms of postnatal versus adult regeneration,* International Society for Heart Research World Congress, Buenos Aires, Argentina.

Porrello E Invited Speaker *Multicellular transcriptome analysis of mammalian heart regeneration,* Company of Biologists Workshop on Transdifferentiation and Tissue Plasticity in Cardiovascular Rejuvenation, Wiston House, West Sussex, UK.

Porrello E Invited Speaker *Role of methylation in cardiac regeneration,* Cardiac Society of Australia and New Zealand and International Society for Heart Research, Adelaide, Australia.

Porrello E Invited Speaker *Transcriptional analysis of mammalian heart regeneration,* COMBIO, Brisbane, Australia.

Porrello E Invited Speaker *Transcriptional control of mammalian heart regeneration,* Victor Chang Cardiac Research Institute 17th International Symposium, Sydney, Australia.

Porrello E Invited Speaker *Multicellular transcriptome analysis of mammalian heart regeneration,* Company of Biologists Workshop on Tissue Plasticity and Cardiovascular Rejuvenation, UK.

Ramialison M Invited Speaker *Exploring the cardiac regulatory genome,* VCCRI 17th International Symposium and Princesses' Lecture - From Cardiovascular Development to Regenerative Medicine, Sydney, Australia.

Stanley E Invited Speaker *Approaches to the generation of new reporter lines using CRISPR gene editing,* RBK All Hands Meeting 2016, Ellicot City, MD, USA.

Stanley E Invited Speaker *Differentiation and genetic modification of human pluripotent stem cells,* Joint Sixth Margaret River Forum, 9th ASSCR Annual Scientific Meeting. Stem Cells Fundamental Biology and Clinical Translation, Western Autralia, Australia.

Stanley E Invited Speaker Induced Pluripotent Stem Cells – Implications for Research and Treatment, Australian Pediatric Endocrine Group, Alice Springs, Australia.

Stefani I Keynote Speaker *Rapid optimization of lineage commitment and media formulation using microfluidic bioreactors,* The Emerging Therapeutics Summit 2016, Melbourne, Australia.

Taoudi S Invited Speaker *Investigating the ancestry of early blood cells,* VCCRI 17th International Symposium and Princesses' Lecture - From Cardiovascular Development to Regenerative Medicine, Sydney, Australia.

Wells C Invited Speaker *A Molecular Atlas of Stem Cells,* Australasian Society for Stem Cell Research, Western Australia, Australia.

Wells C Keynote Speaker *Exploring the many Stem Cell identities in the Stemformatics atlas,* Endocrine Society, Gold Coast, Australia.

Wells C Plenary Speaker *Exploring the many Stem Cell identities in the Stemformatics atlas,* Australasian Genome and Associated Technologies Association AGTA, Auckland, New Zealand.

Wolvetang E Invited Speaker *Functional genomics with human induced pluripotent stem cell models,* 2016 Australia-China Science, Technology, Commercialisation and Innovation Forum, Brisbane, Australia.

Wolvetang E Invited Speaker *Stem cell based functional genomics of human neurological disease,* QRW Stem Cells & Regenerative Medicine Satellite, Nelson, New Zealand.

Conference Presentations - Oral

Chan AL *The role of Sall4 in germline stem cell maintenance and fertility* ANZSCDB Cell/Developmental Biology Meeting Melbourne, Australia.

Conquest A, Davidson KC, Lidgerwood GE, Mountford S, Liang HH, Cain M, Kie J, Hernandez HD, Wong RCB, Crombie DE, Pera MF, Thompson P, Hewitt AW, Guymer RH & Pébay A. *Modelling AMD pathogenesis using human induced pluripotent stem cells.* 9th ASSCR Annual Meeting Western Autralia, Australia.

Cooper-White J *Chondro-inductive injectable hydrogels for stem cell-based intervertebraldisc tissue engineering* 10th World Biomaterials Conference Montreal, Canada.

Crombie DE, Kulkarni T, Curl C, Sivakumaran P, Wong RCB, Minami I, Lim S, Evans-Galea M, Bird MJ, Van Bergen N, Corben LA, Dottori M, Hewitt AW, Delbridge L, Nakatsuji N, Trounce IA, Delatycki MB, Pera MF & Pébay A. *Friedreich ataxia-induced pluripotent stem cell-derived cardiomyocytes; phenotypes and therapy* 9th ASSCR Annual Meeting Western Australia.

Emery B, **Mitew S, Merson TD**. *Pharmacogenetic stimulation of neuronal activity increases myelination in an axon-specific manner.* Cold Spring Harbor Meeting on Glia in Health & Disease, New York, USA.

Farbehi N *Analysis of Adult Cardiac CFU-F Heterogeneity by Single Cell Transcriptomics*. Joint 6th Margaret River Region, Forum and 9th ASSCR Annual Scientific Meeting Margaret River, Western Australia.

Fonoudi H *Using Induced Pluripotent Stem Cells.* The 24th Annual St Vincent's Campus Research Symposium Sydney, Australia.

Fonoudi H *Genetics of Hypoplastic Left Heart* Cardiology Ground Rounds, St Vincent's Hospital Sydney, Australia.

Fonoudi H *Unraveling Genetic Causation of Hypoplastic Left Heart Using Induced Pluripotent Stem Cells* Joint 6th Margaret River Region, Forum and 9th ASSCR Annual Scientific Meeting Margaret River, Western Australia.

Glass N *Next Generation Biomicrodevices for HTP Screening Applications in Developmental Biology and Regenerative Medicine,* Functional High Throughput Technologies Australia Melbourne, Australia.

Hernández D, Sivakumaran P, Millard R, Burns O, Wong RCB, Hewitt AW, Liang H, Hung SSC, Pébay A, Shepherd RK, Lim SY & Dusting GJ *Benefits of electrical stimulation on cardiac tissue growth from human induced pluripotent stem cells. 9th ASSCR Annual Meeting,* 9th ASSCR Annual Meeting Western Australia.

Hobbs R *Heterogeneity and dynamics of the undifferentiated spermatogonial pool.* Abcam Germline Stem Cell Conference, San Francisco, USA.

Hollands J *Development of a human iPS DREADD-line* Neuroscience School of Advanced Studies, Florence, Italy.

Homman-Ludiye J *Ephrin-A2 regulates migration and proliferation in the developing brain.* Melbourne Cell and Development Symposium Victoria, Australia.

Iismaa SE LeDucq Transatlantic Cardiovascular Research Foundation Grant Meeting, Duke University, North Carolina, USA.

Korn O *Bash: The glue-ware of Data Science.* ResBaz Brisbane 2016 Brisbane, Australia.

Kao T *GAPTrap: a simple expression system for pluripotent stem cells and their derivatives.* Joint Sixth Margaret River Forum / 9th ASSCR Annual Scientific Meeting. Stem Cells: Fundamental Biology and Clinical Translation Bunker Bay, Western Australia.

Lidgerwood GE, Lim SY, Morris A, Conquest A, Hewitt A & Pébay A. *Lysophosphatidic acid signalling in human pluripotent stem cell-derived retinal pigment epithelial (RPE) cells.* 9th ASSCR Annual Meeting, Western Australia.

Mosbergen R *I'm a software carpentry graduate - now what?* ResBaz Brisbane 2016, Australia.

Mosbergen R *Stemformatics: Promoting peace between biologists and bioinformaticians since 2010.* Molecular Medicine Division seminar series at WEHI Melbourne, Australia.

Mosbergen R *Stemformatics: Promoting peace between biologists and bioinformaticians since 2010.* Special Seminar, Universidad Peruana Cayetano Heredia Peru.

Mosbergen R *Stemformatics Backend: How we handle sequencing data.* Special Seminar, Instituto Nacional de Salud del Niño Peru.

Ng E *Differentiation of human embryonic stem cells to HOXA+ hemogenic vasculature that resembles the aorta-gonad-mesonephros.* Joint Sixth Margaret River Forum / 9th ASSCR Annual Scientific Meeting. Stem Cells: Fundamental Biology and Clinical Translation Bunker Bay, Western Australia.

Nordon R *Scaling manufacture of open channel microneedles with integrated microfludics by 3D laser lithography and soft embossing.* Microneedles GSK House, London, UK.

Nordon R *Evaluation of Blended Learning Strategies from Exam Outcomes.* 27th Australasian Association of Engineering Education Coffs Harbour, Australia.

Pébay A, Gill G, Needham K, van Bernen N, Lim S, Hernandez D, Liang H, Hung S, Hewitt A, Mackey D, Trounce I & Wong R *Modelling Leber's Hereditary Optic neuropathy using human induced pluripotent stem cells.* European Association for Vision and Eye Research 2016 Congress, Nice, France.

Janbandhu V *Metabolic Heterogeneity in CMSCs.* Fondation Leducq Preliminary Project Meeting San Diego, USA.

Janbandhu V *Role of Hypoxia Signaling in Adult Cardiac CFU-Fs.* VCCRI 17th International Symposium Sydney, Australia.

Wong LY *Targeted nanoparticle based direct cardiac reprogramming.* Centre for Cardiovascular and Vascular Biology (CCVB) conference Stradbroke Island Moreton Research Station.

Wong RCB, Hung SC, Van Bergen N, Lim SY, Hernandez D, Mackey D, Liang H, Kearns L, Hewitt A, Trounce I & Pébay A. *Genetic correction of hiPSC model for mitochondrial disease.* 14th ISSCR Annual Meeting San Fransisco, USA.

Xing YL, Chuang BHA, **Mitew S**, **Kilpatrick TJ**, **Merson TD** *Highly efficient conditional ablation of oligodendrocyte progenitor cells (NG2 glia) induces anxiety-like behaviour in adult mice.* 36th Annual Meeting of the Australiasian Neuroscience Society, Hobart, Australia.

Conference Presentations - Poster

Abeygunawardena D *Cell Fate Decisions of Cardiac CFU-Fs.* VCCRI 17th International Symposium Sydney, Australia.

Chen X *Perspectives for the scale-up production of pluripotent human embryonic stem cells through the incorporation of thermoresponsive polymer components.* The International Society for Stem Cell Research Annual Meeting San Francisco, USA.

Chen X *Perspectives for the scale-up of production of pluripotent human embryonic stem cells through the incorporation of thermoresponsive polymer components.* SCCS Symposium 2016 Biopolis, Singapore.

Cook AL, Koilkandadai S, Wong RCB, Liang HH, Ward DD, Dittmann J, **Crombie DE**, King AE, **Pébay A**, Hewitt AW & Vickers JC *Functional analysis of the BDNF VAL66MET polymorphism in donor0-specific neurons.* Australian Neuroscience Society Hobart, Australia.

Dottori M *Comparative analyses of network activities in neuronal populations derived from human pluripotent stem cells.* ISSCR 2016 Annual Meeting San Francisco, USA.

Farbehi N *Design, Microfabrication and Implementation of Micro-Nozzle for Analysing the Adult Heart Mesenchymal Stem Cell-Like Differentiation Pedigree.* 7th Australia and New Zealand, Nano-Microfluids Symposium Brisbane, Australia.

Farbehi N *Analysing Molecular Pathways Underlying the Activation of Quiescent Cardiac MSC Precursors Using Factorial Design and RNA-seq.* Keystone Symposia - Heart Regeneration and Repair Snowbird, Utah, USA.

Farbehi N *Unravelling Heterogeneity of Cardiac MSCs by Single Cell RNA seq.* VCCRI 17th International Symposium Sydney, Australia.

Fonoudi H *Unraveling Genetic Causation of Hypoplastic Left Heart Using Induced Pluripotent Stem Cells.* NSW and ACT Cell and Developmental Biology Meeting Sydney, Australia.

Fonoudi H *Unraveling Genetic Causation of Hypoplastic Left Heart Using Induced Pluripotent Stem Cells.* VCCRI 17th International Symposium Sydney, Australia.

Forte E *Chase and Trace Cardiac CFU-Fs functions.* 5th Annual PostDoc Symposium Sydney, Australia.

Forte E *Chase and Trace Cardiac CFU-Fs functions.* VCCRI 17th International Symposium Sydney, Australia.

Harkness L *Methods and analysis of pluripotency markers and cell viability in hESC cultured as 3D aggregates.* The International Society for Stem Cell Research Annual Meeting San Francisco, USA.

Harkness L *3D neuronal differentiation: using a thermo-responsive polymer for expansion and release of differentiated hESC* EMBO/EMBL Heidelberg, Germany.

Harkness L *3D neuronal differentiation: using a thermo-responsive polymer for expansion and release of differentiated hESC.* European society for gene and cell therapy (ESGCT)/ISSCR Florence, Italy.

Hewitt AW, **Crombie DE**, **Davidson K**, Liang H, Wong R, Hung SS, Chung S & **Pébay A**. *Assessment of pluripotent stem cell clonality and virtual karyotype, of cells from patients with eye disease, using low-density SNP arrays.* ARVO annual meeting, Seattle, USA.

Homman-Ludiye J *A pulvinar connection to schizophrenia.* ANS 2016,Tasmania, Australia.

Jamieson R, Greenlees R, Sabri A, **Pébay A**, Wong R, Hewitt A, Mackey D, Grigg J, Alexander I & Tam P. *Discovery and a functional genomics pipeline aimed towards treatment in genetic eye disease.* HGSA 40th annual meeting Hobart, Australia.

Kilpatrick T *Understanding the genesis of linear arrays of glial cells and their role in coordinating myelination within the central nervous system.* Myelin Gordon Research Conference Lucca, Italy.

Lidgerwood GE, Lim SY, Morris A, Conquest A, Hewitt A & **Pébay A**. *Lysophosphatidic acid signalling in human pluripotent stem cell-derived retinal pigment epithelial (RPE) cells.* 9th ASSCR Annual Meeting, Western Australia.

Wojciak J, Sabbadini N, Morris AJ, Morganti-Kossmann C, **Pébay A**, Deutschman D & Sabbadini RS. *Validation of lysophosphatidic acid as a target for patients with traumatic brain injury.* 45th Annual Meeting of the Society for Neuroscience, USA.

Mitew S, Young KM, Emery B, **Merson TD**. *Understanding the Dynamics of Oligodendrocyte Turnover in Health and Disease.* 36th Annual Meeting of the Australiasian Neuroscience Society, Hobart, Australia.

Mitew S, Gobius I, Fenlon L, McDougall S, Hawkes D, **Xing YL**, Bujalka H, 6, Gundlach A, Richards LJ, **Kilpatrick TJ**, Emery B, **Merson TD**. *Pharmacogenetic stimulation of neuronal activity increases myelination in an axon-specific manner.* 36th Annual Meeting of the Australiasian Neuroscience Society, Hobart, Australia.

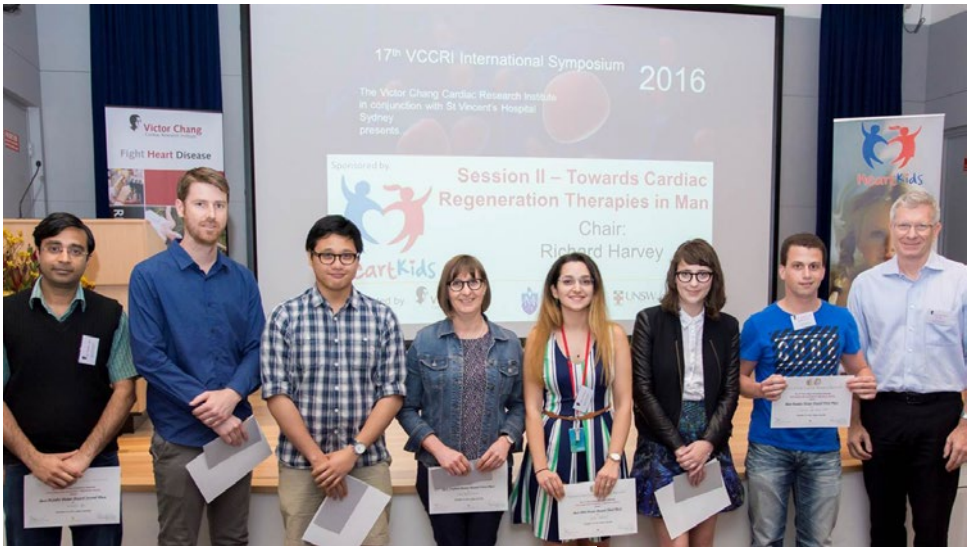
Nicks A *Distinct Transcriptomic Signatures Across Postnatal Cardiomyocyte Development.* The American Heart Association conference New Orleans, USA.

Nordon R *Scaling manufacture of open channel microneedles with integrated microfludics by 3D laser lithography and soft embossing.* Microneedles GSK House, London, UK.

Patrick R *Exploring the Transcriptional Landscape of an Adult Cardiac Stromal Cell Population.* VCCRI 17th International Symposium Sydney, Australia

Viventi S, Ng W, Frausin S, Alshawaf A, Ivanusic J, D'Abaco GM, Bird M, Thompson L, Skafidas S & Dottori M. *Transplantation of sensory neurons derived from Friedreich Ataxia induced pluripotent stem cells into the dorsal root ganglia regions.* The 10th FENS Forum of Neuroscience, Copenhagen, Denmark.

Viventi S, Ng W, Frausin S, Alshawaf A, Ivanusic J, D'Abaco GM, Bird M, Thompson L, Skafidas S & Dottori M. *Transplantation of sensory neurons derived from Friedreich Ataxia induced pluripotent stem cells into the dorsal root ganglia regions.* Women in Stem Cell Science, Melbourne, Australia.



Students at the VCCRI International Symposium.

Contributions to Meetings

Chong J Panellist and Session Chair Cardiac Society of Australia and New Zealand Annual Scientific Meeting.

Chong J Local Organising Committee National Heart Foundation, New South Wales Cardiovascular Research Network, Annual Scientific Showcase.

Dottori M Chairperson for Neurodevelopment Session Australiasian Neuroscience Society 36th Annual Scientific Meeting, Hobart, Australia.

Elefanty A Organising Committee & Session Chair CiRA/ISSCR 2016 International Symposium. Pluripotency: from basic science to therapeutic applications, Kyoto, Japan.

Elefanty A Organising Committee & Session Chair Joint Sixth Margaret River Forum / 9th ASSCR Annual Scientific Meeting. Stem Cells: Fundamental Biology and Clinical Translation, Western Australia.

Elefanty A Organising Committee CRTD/ISSCR International Symposium 2016.Stem Cell Models of Neural Degeneration and Disease, Dresden, Germany.

Elefanty A Organising committee ESGCT/ISSCR International Symposium 2016. Changing the face of modern medicine. Stem Cells & Gene Therapy, Florence, Italy.

Gardner D Co-ChairThe 3rd Biomarkers Meeting in Reproductive Medicine, Valencia, Spain.

Gardner D Program Chair 11th Biennial Conference of the Alpha, Copenhagen, Denmark.

Gray P Organising Committee, the ECI Confernce Series Scale-up and manufacturing for Cell-based.

Harvey R Convenor Victor Chang Cardiac Research Institute 17th International symposium: Cardiac Development and Regeneration; incorporating annual cardiac theme meeting of Stem Cells Australia and annual meeting of the Australian Network of Cardiac and Vascular Developmental Biologists, Sydney, Australia.

Harvey R Convenor Australian Academy of Science Theo Murphy Think Tank: *The Stem Cell Revolution – Lessons and Imperatives for Australia*; Sydney, Australia; Launch of Think Tank Report: 21.03.16, Parliament of New South Wales, Sydney. Press ABC AM, The Australian, The Conversation, Business Insider Australia, iCampus Review.

Hobbs R Symposium Co-Chair Combio2016 (Brisbane) on Stem cells and regeneration.

Jhaveri D Organising Committee and Chair Neurosciences Research Collaborative Expo, Translational Research Institute, Brisbane, Australia.

Merson T Organiser and Chair Symposium 2:"Neuron-glial interactions and gliogenesis in the CNS", 36th Annual Meeting of the Australasian Neursocience Society, Tasmania, Australia.

Mitew S Co-chair Symposium 2:"Neuron-glial interactions and gliogenesis in the CNS", 36th Annual Meeting of the Australasian Neursocience Society, Tasmania, Australia.

Munsie M Organiser and Session Chair The future of the Australian regenerative medicine sector, 2016 AusBiotech conference, Melbourne, Australia.

Palpant N Session Chair International Society for Heart Research, early investigator panel discussion, Adelaide, Australia.

Pébay A Conference Chair Optic nerve Conference, Obergurgl, Austria.

Pébay A Conference Chair European Association for Vision and Eye Research, Nice, France.

Polo J Chair and Program Co-organiserMargaret River Regional Forum/ASSCR.

Porrello E Organiser and Symposium Chair*Cardiovascular and lymphatic development,* COMBIO 2016.

Porrello E Organiser and Symposium Chair *Stem Cells and Tissue Engineering:New Tools for Experimental Physiology and Regenerative Medicine,* Australian Physiological Society.

Stefani I Organising Committee (treasurer) Brisbane Life Science Symposium 2016.

Community Activities

We would like to acknowledge and thank our partners and participants for their support of our 2016 community outreach activities.

StemCells@UQ, Brisbane - **Christelle Adolphe, Anushree Balachandran, Xiaoli Chen, Dmitry Ovchinnikov , Harish Padmanabhan, Eva Thomas, Jana Vukovic** and **Ernst Wolvetang**.

CSL Florey National Youth Science Forum, Melbourne - **Perry F Bartlett.**

IQ2 Debate: Animal Rights Should Trump Human Interest - **James Bourne.**

Women in STEMM, Melbourne - **Freya Bruveris, Mirella Dottori, Alison Farley, Alexandra Harvey, Jennifer Hollands, Sara Howden, Rita Leitoguinho, Kathryn Lim, Elizabeth Mason, Christiana Mattei, Anna Michalska, Megan Munsie, Serena Viventi** and **Christine Wells.**

VCCRI Symposium Public Lecture: Stem Cells – Hype and Hope, Sydney - **James Chong**, **Robert Graham** and **Megan Munsie**.

Launch of Think Tank Report, Parliament of New South Wales, Sydney - **Richard Harvey.**

Lunch and Learn at Mater, Mater Hill, Brisbane - **Dhanisha Jhaveri.**

Probus Tour, QBI, Brisbane - **Dhanisha Jhaveri.**

CharityWorks for MS, Grand Hyatt, Melbourne - **Trevor Kilpatrick.**

Stem Cells on the Scientific Frontier: Hopes for Cures and Scientific Realities PUBLIC FORUM - **Trevor Kilpatrick.**

Hacky Hour for Winter School, The University of Queensland, Institute of Molecular Bioscience - **Othmar Korn.**

Moorabin Rotary Club Dinner, Kew Golf Club, East Kew, Victoria - **Stan Mitew.**

Rotarian Action Group of Multiple Sclerosis - MS Global Dinner, Fredricks Restaurant, Essendon, Victoria - **Stan Mitew.**

MND Connect 2016, Brisbane - **Megan Munsie.**

Victorian Skeptics, Melbourne - **Megan Munsie.**

Invited Conference, Sacred Heart College, Geelong - **Alice Pébay.**

Invited Conference, *Stem Cells and novel technologies for fighting Blindness.* Bastille Day French Festival, Melbourne - **Alice Pébay.**

2016 Menzie's Debate at the University of Tasmania - The stem cell revolution offers more hype than hope, Tasmania - **Martin Pera and Joy Rathjen.**

Stem Cells on the Scientific Frontier: Hopes for Cures and Scientific Realities PUBLIC FORUM, Melbourne - **Martin Pera.**

GTAC Teacher Symposium GTAC, Melbourne - **Jose Polo.**

National Heart Foundation (lab tour and discussions about stem cell research and regenerative medicine with donors), The University of Queensland, School of Biomedical Sciences - **Enzo Porrello.**

UQ tedXtalk Big questions for stem cell derived minibrains, Brisbane - **Ernst Wolvetang.**

Media Coverage

Press Releases

Scientists grow billions of heart cells 6 January 2016.

New way to harvest stem cells better for donors 16 March 2016.

Early career researchers build roadmap for Australian stem cell science 21 March 2016.

Stem cell industry must tread a fine line 1 May 2016.

Professor Richard Harvey Elected Fellow of Royal Society 5 May 2016.

The Stem Cell "Sell" 1 July 2016.

MCRI researcher wins prestigious science prize for kidney-in-a-dish 1 September 2016.

Call for regulatory change to curb unethical, exploitative and potentially hazardous practices 7 October 2016.

Ageing centre launched at AIBN 17 October 2016.

Stem cell breakthrough towards treating childhood cancers 18 October 2016.

Monash researchers start company to reprogram human cells 14 November 2016.

Brain research leader is Queensland's Senior Australian of the Year 28 November 2016.

UQ: International deal brings new treatment for chemotherapy patients closer to the clinic 6 December 2016.

Media Stories

Australian doctors urge caution on stem cell therapy for MS SBS 18 January 2016.

New program takes stem out of stem cells The Australian 19 January 2016.

Recipe for tissue repair a skin cell breakthrough Herald Sun 19 January 2016.

Government scientists defend medical research experiments on primates Sydney Morning Herald 4 February 2016.

Stem cell therapy may soon repair damaged hearts SBS 13 February 2016.

Scientists defend use of animals in research ABC Online 16 February 2016.

Proposed ban re-ignites primate research debate Cosmos 24 February 2016.

Scientists correct defective gene in stem cells in fight against rare and deadly ataxia telangiectasia or AT Courier Mail 27 February 2016.

You might find my research using monkeys abhorrent, but it could save your life The Guardian 1 March 2016.

Stem cell therapies are advancing, but will Australian patients be left behind? The Conversation 21 March 2016.

Cross-species organ production report sparks debate about ethical concerns of stem cell science ABC News 21 March 2016.

Personal testimonials lure desperate patients into stem-cell tourism Australian Financial Review 29 March 2016.

UNSW scientists say they have developed tissue 'repair system' from human fat cells Sydney Morning Herald 5 April 2016.

Gene-editing poses ethical questions The Saturday Paper 16 April 2016.

Medical research on animals should only occur within regulated ethical framework, writes Assoc Prof James Bourne Herald Sun 4 May 2016.

Sydney biologist Richard Harvey joins Einstein, Newton and Hawking as a Fellow of The Royal Society, London Daily Telegraph 10 May 2016.

Animal rights: an IQ debate ABC Local 11 May 2016.

Murdoch Childrens Research Institute celbrates 30 years of saving our children Herald Sun 14 May 2016.

Grandmother triggers Australian-first study into deadly SCAD heart disorder ABC Online 1 June 2016.

Human organs grown in pigs The Advertiser 7 June 2016.

Finding a cure for quadraplegia Woman's Weekly 1 July 2016.

Stem cell and genetic editing may unlock treatments for heart disease Medical Xpress 5 July 2016.

Selling the stem cell promise - Background Briefing ABC Radio National 17 July 2016.

Stem cells could be used to heal heart attack damage 9News 24 July 2016.

Animal testing: Could it ever be banned completely? ABC Online 19 August 2016.

Gene editing made simple ABC Catalyst 30 August 2016.

The 2016 Eureka Prizes showcases the best in Australian Science The Conversation 31 August 2016.

Growing Mini-Brains To Solve Big Problems YouTube TEDxUQ 2 September 2016.

Getting the facts on stem cells RRR 4 September 2016.

Stem cells grow heart tissue in breakthrough research Brisbane Times 20 September 2016.

Stem cell marketer Mikael Wolfe referred to police over 'predatory approaches to MS, cancer patients ABC Online, 730 Report 20 September 2016.

The hard sell of stem cells: we need a better way to protect patients from harm The Conversation 22 September 2016.

Melbourne researchers successfully grow blood cells in the laboratory Herald Sun 17 October 2016.

Australian stem cell breakthrough provides fresh hope for treating blood cancers NEWS.com.au 17 October 2016.

Making blood ABC Radio National Health Report 24 October 2016.

Stem cell therapy Choice 28 October 2016.

Monash biomed institute clocks swift result with 'Mogrify' The Australian 16 November 2016.

The world's favourite lab animal has been found wanting, but there are new twists in the mouse's tale The Economist 24 December 2016.

Financial Statement

THE UNIVERSITY OF MELBOURNE

STEM CELLS AUSTRALIA
FINANCIAL STATEMENT FOR CALENDAR YEAR JANUARY 2016 TO DECEMBER 2016

	2016	Project to Date
ARC Funds	3,504,776.76	18,287,270.68
Other Contributions	1,851,748.68	10,230,967.60
Total Income	**5,356,525.44**	**28,518,238.28**
Salaries and oncosts	2,507,702.41	15,458,803.07
Consumables and other costs	2,337,934.24	10,810,992.85
Total Expenses	**4,845,636.65**	**26,269,795.92**
Net Activity for the year	$510,888.79	**2,248,442.36**
Carry over balance	1,737,553.57	
Balance as at Dec 2016	2,248,442.36	**2,248,442.36**

I certify that:
a) The figures reported above are true and correct in every particular to the best of my knowledge and having made all due enquiries.

Mike Pham
Research Accountant
Research Accounting Services

19/04/2017
Date

Finance and Employee Services
The University of Melbourne, Victoria 3010 Australia
T: +61 3 8344 4000

STEMCELLS AUSTRALIA

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