

Annual Report

2013

“STEM CELL SCIENCE IS AN
EXTREMELY FAST MOVING FIELD WITH
NEW APPLICATIONS BEING REPORTED
WORLDWIDE ON A DAILY BASIS”

Professor David de Kretser
Chairman

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Cover image: Neuronal precursor cells (Lincon Stamp, 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.

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*Pei Er and Xiaoli Chen networking
at the Annual Retreat*

Chairman's Report

Stem Cells Australia is a Special Research Initiative in Stem Cell Science launched in 2011 and funded by the Australian Research Council that brings together expert researchers in this field from across the country and encourages international collaboration.



This collaboration includes scientists from The University of Melbourne, The University of Queensland, University of New South Wales, Victor Chang Cardiac Research Institute, Walter and Eliza Hall Institute of Medical Research, Florey Institute of Neuroscience and Mental Health, Monash University, and the CSIRO Material Science and Engineering Division.

During 2013, our interdisciplinary research into stem cell science developed an understanding of the potential roles of stem cells in a range of diseases arising from cell damage. These included Multiple Sclerosis, (damage of insulating covers of nerve cells in the brain and spinal cord); heart attack (death of cardiac muscle cells), and Down Syndrome as well as a host of other very real and debilitating diseases such as bone marrow and blood disorders. Our results have also contributed to the understanding of how an artificial scaffold may be used to grow a new kidney.

To promote interactions and information sharing between

researchers and participating members, Stem Cells Australia has established a website and quarterly newsletter, facilitating access to the most recent findings and upcoming conferences and workshops.

2013 also saw the establishment of our core facilities, providing support to the scientific research community. These include:

- **Stemformatics** - a collaboration between the stem cell and bioinformatics communities based at the University of Queensland. Stemformatics provides a fast way for biologists to find and visualise interesting genes.
- **StemCore laboratories** - based at the University of Queensland and The University of Melbourne, provides support for pluripotent stem cell culture for our Queensland, NSW and Victorian-based researchers.
- **Flow Cytometry** - the Melbourne Brain Centre at The University of Melbourne - provides purpose-built core facilities for use by our members and other interested researchers.

Stem Cells Australia core researchers are building international collaboration supported by:

- a Department of Foreign Affairs and Trade grant to foster collaborative workshops with Kyoto University's Institute for Integrated Cell-Material Sciences (iCeMS), and
- the *Fondation Leducq Transatlantic Networks of Excellence* grant was awarded for research into adult cardiac stem cells

In 2013, Stem Cells Australia established a strategic fund to foster further collaboration between partners and provide the opportunity to bring in new collaborators to join our research community. The first round of strategic funding was awarded to four new projects that fit within our existing research themes. Further information can be found on our website.

In 2013 we announced four new affiliate memberships, and we look forward to announcing new affiliate memberships over the coming year, as well as welcoming more visiting international fellows.

Stem cell science is an extremely fast moving field of research with new applications being reported on an almost daily basis increasing the likelihood of therapeutic developments. Our 2013 research publications have provided impact to the broader community through knowledge transfer in a number of key areas as we gain further understanding of cell differentiation. The collaborative effort of scientists in Stem Cells Australia places the Australian scientific community at the world's leading edge of research in this important field. I commend the work of Stem Cells Australia to you.

Professor David de Kretser

Program Leader's Report

Stem cell research and regenerative medicine is a rapidly growing field that is now reaching application in the clinic, as new cell therapies enter early stage trials.

Human stem cells are also coming into wide use as a key research platform for disease modeling, functional genomics, and drug discovery. Stem Cells Australia aims to keep Australian science on the forefront of this revolution in biomedicine.

Research in the Stem Cells Australia consortium focuses on four areas of stem cell biology:

- pluripotent stem cells, or stem cells that can turn into any tissue in the body
- regeneration and repair in the brain
- regeneration and repair in the heart
- the hematopoietic system, which generates the cells of the blood

Interwoven throughout these four biological themes are platform technologies in bioengineering, nanotechnology and material sciences, and bioinformatics. This multidisciplinary capability provides our researchers with powerful new tools to tackle both the fundamental and practical challenges that we face in this field. We are now expanding our network of scientists through the appointment of Affiliate Members, renowned experts who are currently collaborating with our investigators, or working in closely related fields. This year we established a Strategic Fund to promote collaborative interdisciplinary work on highly innovative new projects throughout the network.

During our first years of operation, our researchers have contributed to major scientific studies published in *Cell*, *Cell Stem Cell*, *Nature Biotechnology*, *Immunity*, *Nature Cell Biology*, and the *Journal of Cell Biology*. Some of the key advances include the characterisation of genetic and epigenetic stability of human pluripotent stem cells, molecular mechanisms of cell reprogramming, efficient methodology for differentiation of human pluripotent stem cells into neural cells, discovery of stem cells in the heart, novel pathways for regulation of blood cell formation, and production of kidney cells from embryonic stem cells. Inside this annual report you will find more detailed information on our publications in peer-reviewed journals, and presentations at international meetings.

In addition to research, we have organised and sponsored workshops to promote education and collaboration, including theme workshops within our consortium. We have established a formal collaboration with iCeMS at the University of Kyoto and have held scientific exchanges with scientists there. Our Annual Retreat in 2013 highlighted the excellent science across the network, and our outstanding Scientific Advisory Committee members attended to present talks and to provide us with important feedback on our activities. Along with industry and academic partners, we have sponsored a number of key scientific international meetings, including The Abcam Conference on *Cancer and Stem Cells*, and the Bio21 cluster/ SCA conference on the *Therapeutic Potential of Stem Cells*, both held in Melbourne.



Public outreach is also a significant part of Stem Cells Australia's work. In 2013, Stem Cells Australia has increased its activities in analysing and commenting on regulatory policy related to the operation of clinics offering unproven stem cell therapies, a major area of concern for the field. We have developed resources on stem cell therapies for Medical Practitioners, and worked with the National Health and Medical Research Council (NHMRC) in their production of informational material on stem cell treatments.

Although stem cell research and regenerative medicine is more competitive than ever, our network of interdisciplinary researchers is well placed to make the breakthroughs that will raise Australia's profile to one of international leaders in the field. We are looking forward to a very exciting year in stem cell science.

Professor Martin Pera

Highlights

During 2013 members of Stem Cells Australia continued to make a substantial contribution to stem cell science.



Research Performance

Research Outputs

Members contributed to over 130 publications including book chapters, conference proceedings and articles in peer-reviewed journals including:

- *Cell Stem Cell*
- *Developmental Cell*
- *Journal of Cell Biology*
- *Nature Communications*
- *Nature Cell Biology*
- *Nature Genetics*
- *Proceedings of the National Academy of Sciences.*

International Exposure

Members were invited speakers at numerous international meetings including:

- *Cardiac Biology: From Development to Regenerative Medicine* conference at EMBL Heidelberg, Germany,
- *Gordon Conference on Megakaryocyte and Platelet Biology*, Galveston, USA,
- *Quantitative Single Cell Biology In Stem Cell Biology*, Munich, Germany,
- *Stem Cells in Science and Medicine* - ISSCR regional forum series, Suzhou, China,
- *IORMC Indian Ocean Rim Muscle Colloquium*, Singapore and
- *Single Cell Genomics and Transcriptomics Asia Congress*, Singapore.

Other highlights

Members were part of research teams awarded NHMRC Project grants; ARC Discovery Grants and funding to establish a High Throughput Cell Genomics Centre.

Researchers also received prestigious awards including:

- Gustav Nossal Postgraduate Scholarship - Duncan Crombie
- ARC Future Fellowship - Mirella Dottori
- NHMRC Senior Principal Research Fellowship - Warren Alexander
- Viertel Charitable Foundation Senior Medical Research Fellowship - Jose Polo
- NSW 2013 Ministerial Award for Cardiovascular Research Excellence - Richard Harvey



Claire Cuddy in the lab

Training And Capacity Building

- In a new initiative, we established a Strategic Research Fund to support junior investigators and further extend Stem Cells Australia research collaborations. Funding was provided for four new projects to explore topics ranging from the role of stem cells in the brain following injury, to new ways to track stem cell growth in the laboratory and identify factors which influence reprogramming.
- A delegation of researchers from the Cardiac Regeneration and Repair theme visited the Institute for Integrated Cell-Material iCeMS

at Kyoto University to exchange ideas on cardiac differentiation and explore future collaborations.

- Stem Cells Australia provided support for undergraduate students to gain work experience in medical research through the Bio21 Cluster's Undergraduate Research Opportunity Program.
- Networking forum - Stem Cell Conversations - was established for PhD students and early career investigators in Melbourne.

Networking

- Members secured international research funding (\$1.2M) including the *Fondation Leducq Transatlantic Networks of Excellence* awarded to Professors Nadia Rosenthal and Richard Harvey to better understand the role of adult cardiac stem cells in heart function and repair.
- Links were forged with EuroStemCell to share outreach resources and policy ideas following a visit by The University of Edinburgh's Professor Clare Blackburn.
- We partnered with industry to co-host two symposia featuring national and international invited speakers - *Stem Cells and Cancer* with Abcam and Sapphire Bioscience, and *Therapeutic Potential of Stem Cells: Prospects & Pitfalls* with the Bio21 Cluster.
- Over 120 researchers and members of our Scientific Advisory Committee and Governance Committee attended the 2013 Annual Retreat. Additional meetings of each of the four research themes were also held throughout the year.
- The initiation of a relationship with Canada's Centre for Commercialisation of Regenerative Medicine (CCRM) via a Translation of Regenerative Medicine & Stem Cell Science Roundtable, co-hosted by Stem Cells Australia and the Canadian Trade Commission.
- Support was provided for annual meetings of Cell Reprogramming Australia and the Australian Network of Cardiac and Vascular Developmental Biologists, with agreement reached to co-host an inaugural joint meeting with the Australasian Society for Stem Cell Research and regional chapter of the International Society for Cellular Therapy in 2014.
- Visiting Californian scientist Shelley Hough introduced new cutting-edge technology -



single cell genomics - which will enable SCA researchers to have greater insight into how stem cells grow and differentiate.

- Other leading international scientists visiting Stem Cells Australia in 2013 included: Fiona Watt - Kings College London; Allan Robins - Viacyte USA; Chris Mason - University College London and Peter Zandstra - University of Toronto.

Knowledge Transfer and Outreach

School Outreach

- Over 450 high school students and their teachers attended screenings of an award-winning stem cell documentary in Melbourne, Brisbane and Sydney and had their questions about stem cells and careers in science answered directly by Australian researchers. Our events were co-supported by the National Stem Cell Foundation of Australia and EuroStemCell.

Publications and Policy

- Published the *Australian Stem Cell Handbook* to raise awareness about stem cells and how they are currently used in research and in the clinic. This new resource, developed in partnership with the

National Stem Cell Foundation of Australia, also highlighted concerns about unproven stem cell treatments being offered in Australia and overseas and continue to call for reforms to curb sale of unproven stem cell treatments in Australia.

- Contributed to the new NHMRC resources for GPs and public on stem cell treatments.

Community Engagement

- Provided a series of free workshops and public lectures across Australia to discuss recent developments in stem cell science. Events featured local and visiting international experts and were co-hosted by key patient support groups including

JDRF, Cerebral Palsy Alliance and the Spinal Cord Injury Network.

- Information was provided about latest stem cell research through regular posting on our website, quarterly newsletters, and contributions to local media coverage. Stories attracting significant media interest during 2013 included the breakthrough made by Melissa Little and her colleagues on growing a 'mini-kidney', new ways to grow stem cells, and warnings about risks of unproven stem cell treatments.
- Linking art and science, PhD student Lulu Xing won The Node photography competition with her image of a mouse hippocampus entitled *The Garden of Memory*.

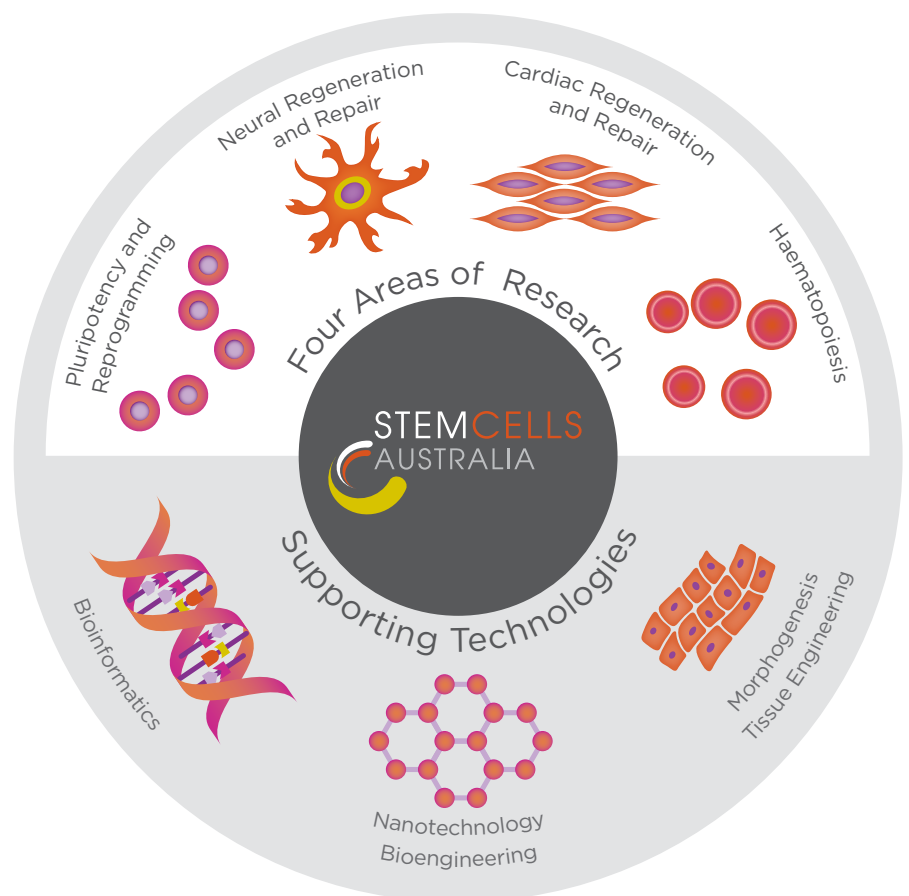
Research Programs

The Stem Cells Australia research program brings together a collaborative community of stem cell experts engaged in basic studies of the regulation of cell fate within four biological theme areas: Pluripotency and Reprogramming, Neural Regeneration and Repair, Cardiac Regeneration and Repair, and Haematopoiesis.

These biological themes are integrated with our discovery and technology platforms in bioinformatics, nanotechnology, bioengineering, and tissue engineering and morphogenesis. Our research will advance the National Research Priority Goal of promoting and maintaining good health, and will help to build frontier technologies for building and transforming Australian industries.

SCA discoveries in basic science are contributing to the development of cell transplantation therapy, by facilitating the large-scale production of healthy human tissues from stem cells for use in treating disease. Through a better understanding of the body's own repair mechanisms, our research is identifying new targets for regenerative medicine pharmaceuticals, including small molecules, recombinant growth factors and antibodies.

Finally pluripotent stem cells provide a discovery platform for functional human genetics, disease modelling, and drug development and toxicology. This powerful portfolio of research tools will impact across all areas of Australian biomedical science.



“OUR RESEARCH WILL CONTRIBUTE TO THE NATIONAL RESEARCH PRIORITY GOAL OF PROMOTING AND MAINTAINING GOOD HEALTH AND CONTRIBUTING TO FRONTIER TECHNOLOGIES...”

Pluripotency and Reprogramming

Theme Leaders: Professor Martin Pera and Professor Peter Gray

Human Embryonic Stem Cells (hESC) and more recently, adult somatic cells reprogrammed to a stem cell state have transformed our capacity to probe developmental and disease mechanisms, and have revolutionized prospects for regenerative medicine and cell replacement in the body.

This research program aims to define new platforms for large-scale culture of human hESC and induced pluripotent stem cells (iPSC). It has two main interrelated goals:

1. Propagation and maintenance of pluripotent stem cells
2. Reprogramming and stabilizing pluripotent stem cells

Since the establishment of Stem Cells Australia, basic and applied research on human pluripotent stem cells (PSC) has made amazing strides. The first cell therapeutics derived on embryonic stem cells have entered clinical trials, and it will not be long before products based on iPSC that are also undergoing assessment in the clinic. At the same time, the application of PSC as tools in functional genomics, disease modeling, and drug development is poised to revolutionise our understanding of human biology in the post-genome era.

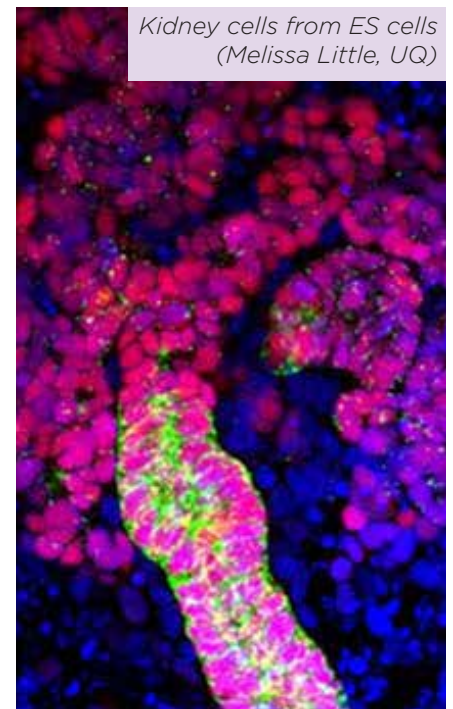
Our scientists remain at the forefront of these efforts. Some of the highlights of publications from the consortium this year illustrate our contributions to this rapidly moving and highly competitive field. Understanding the control of self-renewal in pluripotent stem cells is essential to efforts to propagate these cells on a large scale without producing genetic abnormalities, to efficient differentiation into pure populations of lineages of interest, and to efforts to reprogram adult cells to yield iPSC. Basic studies of pluripotent stem cell transcriptional regulation (Polo) and signaling pathways (Pera) have advanced our understanding of intrinsic and extrinsic control of stem cells. In a world first, Gray and Monteiro have developed a scalable method for culturing hESC without the need

for added enzymes or chemical inhibitors. Using thermoresponsive 'nano-bridges' decorated with extracellular matrix fragments, stem cells can be grown in large numbers requiring only a temperature decrease to facilitate sub-culturing. Stem cell bioinformatics (Wells) provides new insight into the systems biology of PSC regulation. Reporter cell line technology developed by the Elefanty and Stanley laboratory enables the facile isolation of key intermediates in stem cell differentiation. In collaborative studies, these reporter cell lines have been used in studies of the generation of human cortical neurons, and in groundbreaking studies of the differentiation of stem cells into kidney (collaboration with Little).

Novel technologies for propagation of PSC in microbioreactors are enabling rapid high throughput analysis of key factors involved in their growth and differentiation, and in cell reprogramming (Cooper-White), our scientists have also pioneered studies of stem cell differentiation into novel lineages such as skeletal muscle and lens (Barberi) and kidney (Little). The combination of the application of iPSC to the modeling of disease with new techniques for precise genetic modification of stem cells provides us with powerful tools to study devastating conditions such as Down Syndrome (Wolvetang). Finally understanding of the genetic stability of PSC (Laslett, Pera) is essential to their applications in therapy.

Scientists in the pluripotency program also contribute to outreach and education efforts. Cell Reprogramming Australia is a new organization promoting the study of iPSC and related technologies

in Australia, and its leaders include many of our scientists. We continue to contribute to the ongoing discussions around the use of embryos in stem cell research and cloning. A joint meeting organized with Bio21 cluster highlighted the progress towards clinical trial of PSC based therapies for diabetes.



*Kidney cells from ES cells
(Melissa Little, UQ)*

As we look forward to 2014, we will be investigating ways of achieving even greater integration of the pluripotency team with our themes in cardiac and neural regeneration and repair and hematopoiesis, and at exploiting and disseminating novel technologies in PSC research throughout the biomedical community in Australia. We especially welcome the input of our new Chief Investigators Jose Polo and Robin Hobbs, along with our Associate and Affiliate Investigators, postdoctorals and students who are the heart of our research program.

Neural Regeneration and Repair

Theme Leaders: Professor Perry Bartlett and Professor Trevor Kilpatrick

It is becoming increasingly clear that the production of new neurons and oligodendrocytes in both the immature and mature nervous system plays a major role in how the mammalian nervous system learns and adapts to a changing environment, and how it responds to disease or damage.

This theme examines the molecular and cellular processes that regulate cell regeneration and repair within the central nervous system (CNS). A major focus is to clarify the origins and hierarchical relationships between various populations of neural stem and progenitor cells in the nervous system and how each population contributes to the production of new neural cells, both in health and in disease.

The theme has three main foci that involve the study of:

1. Endogenous stem cells in the CNS
2. Oligodendrocyte precursors
3. Early CNS progenitors from pluripotent stem cells

The research is based on the hypothesis that neurogenesis supports the formation of new synapses, which is important for optimal brain function throughout life, and that it also provides a mechanism to repair and regenerate damaged and dysfunctional brains. The projects examine the effect of conditional deletion of particular cell populations in combination with cell-specific reporter lines to increase our understanding of how neural cell integration is effected.

The theme is also developing models by which to test how disease influences regenerative capacity and how this might be optimized in conditions such as multiple sclerosis (MS) and dementia. The use of these disease models will also provide the capacity to interrogate similarities and differences in the capacity of different subtypes of precursor cells to respond to either direct insult or the demand for a regenerative response.

Multiple Hippocampal Precursors have different functions.

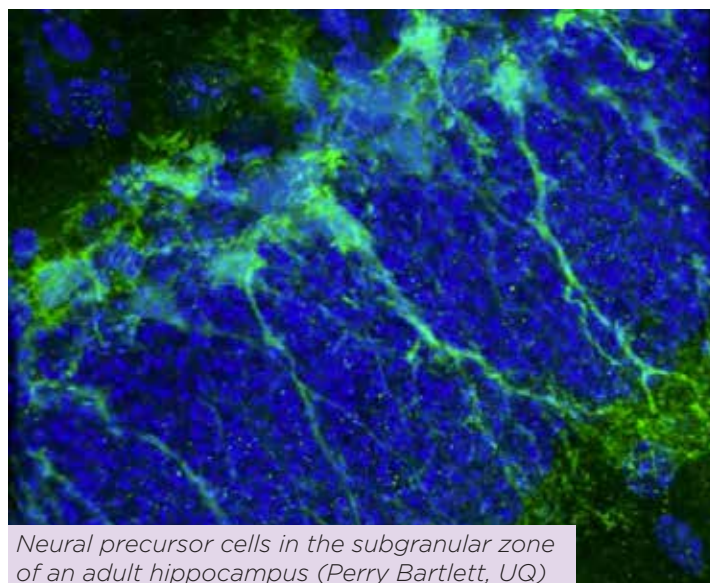
Recent discoveries have shown that there are several separate neuronal precursor populations in the hippocampus, which are regulated by different molecular mechanisms and may play different roles in hippocampal functions like learning and memory and mood. This may provide separate and unique approaches to ameliorate the effects of cognitive decline or mood disorders, like depression, by stimulating discrete populations of precursors to produce new neurons in parts of the hippocampus associated with only one of the functions.

Oligodendrogenesis from Subventricular zone progenitors

Investigation of the mechanisms that regulate the production of oligodendrocytes after demyelination have revealed that neural precursor cells, which are normally involved in the production of neurons in the adult brain can be recruited in large number into demyelinated white matter.

These findings could have important implications for regenerative strategies targeting demyelinating diseases such as multiple sclerosis by providing insight into maximising the regenerative response.

“THE THEME IS ALSO DEVELOPING MODELS BY WHICH TO TEST HOW DISEASE INFLUENCES REGENERATIVE CAPACITY AND HOW THIS MIGHT BE OPTIMIZED IN CONDITIONS SUCH AS MULTIPLE SCLEROSIS (MS) AND DEMENTIA”



Neural precursor cells in the subgranular zone of an adult hippocampus (Perry Bartlett, UQ)

Cardiac Regeneration and Repair

Theme Leaders: Professor Nadia Rosenthal and Professor Richard Harvey

The long-held dogma that adult mammal hearts have no ability to regenerate in response to disease or injury has been challenged with reports of stem-like cells present in the adult heart and capacity for cardiomyocyte proliferation. However, how to harness the potential of these stem cells - which are rare in adults and compromised by aging - or enhance the inherent proliferative capacity of cardiomyocytes, remains a significant challenge and a key aim of this theme.

The objectives of this theme are to characterise and exploit the cardiac multipotential stem cells that reside in the heart and retain the capacity to grow in the laboratory culture dish and to enhance the innate, albeit minimal, capacity of cardiomyocytes of the adult heart to expand by proliferation. We will build cell and animal models to understand the mechanisms that regulate cardiac stem cell function and cardiomyocyte divisions and use this knowledge to enhance the ability of the heart to repair and regenerate.

These studies will provide the basis for the development of new therapeutic approaches to address common conditions affecting large segments of the population. The objectives of this theme are being met by novel collaborative research projects and joint publications, and by coordination of research activities through dedicated workshops and special meetings.

Paper highlight: The Rosenthal group has published a collaborative paper with the Harvey and Graham groups in *Circulation Cardiovascular Genetics* describing the identification and detailed biochemical characterization of a novel mutation that is closely associated with the development of adult-onset cardiomyopathy in a human family. The unique genetic lesion affects the gene *Nkx2-5*, a master regulator of cardiogenesis, mutations in which are one of the most common causes of congenital heart disease.

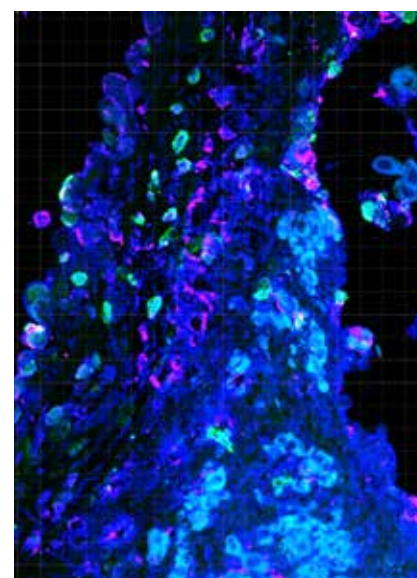
The collaborative work also demonstrates for the first time that *Nkx2-5* is a target of the ubiquitin-proteasome system,

which is relevant since several other previously identified human mutations located in the homeodomain region also affect *Nkx2-5* protein stability. These changes in *Nkx2-5* structure and function are likely to be intrinsically associated with the dilated cardiomyopathy phenotype observed in this family. The work provides the basis for further studies on the progress of the disease and the effects of the mutation in animal models.

Paper highlight: The Harvey group has recently published a collaborative study with Caroline and Geoffrey Burns at the Cardiovascular Research Centre, Massachusetts General Hospital, Boston. This team effort established a heart field origin for endothelial progenitor cells of the pharyngeal arch arteries, and the role for the cardiac transcription factor, *Nkx2-5*, in their development. The work was published recently in *Nature Cell Biology*.

Interruptions to the aorta, the major arterial vessel of the body, cause severely obstructed systemic blood flow that manifests clinically as a spectrum of conditions including aortic stenosis, interrupted aortic arch (IAA) or co-arcuation of the aorta (COA). These congenital disorders often require surgery as well as lifetime follow-up and counselling. While affecting only ~1.5% of infants with congenital heart disease, the outcomes can be traumatic for both patients and parents.

The homeodomain transcription factor *Nkx2-5*, discovered by the Harvey and Izumo groups in the early 1990s, has been extensively



Regenerating salamander heart
(Nadia Rosenthal, Monash)

studied in the context of heart development.

It is also one of the most commonly mutated single genes in humans with familial congenital heart disease including IAA and COA. The present study used zebrafish and mouse models to establish a conserved and indispensable role for *Nkx2-5* in the differentiation of endothelial layer of blood vessel progenitors in pharyngeal arch arteries, which are transient embryonic vessels needed to form the carotid arteries and great vessels of the heart, including the aorta and pulmonary arteries.

The study has provided a broader perspective on *Nkx2-5* function in progenitor populations in the embryo and in congenital heart disease, and a new avenue for understanding the genetic regulation of vasculogenesis.

Haematopoiesis

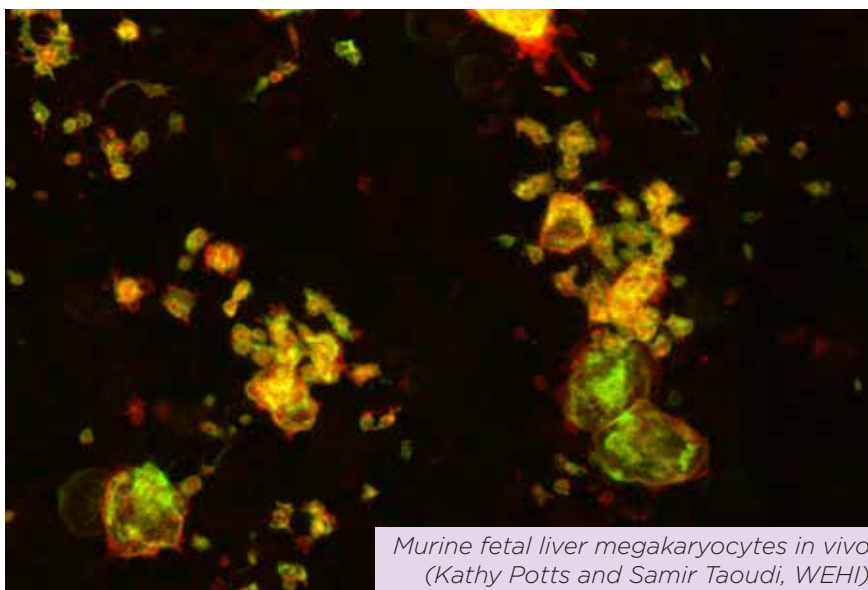
Theme Leaders: Professor Doug Hilton and Professor David Haylock

Stem cells from blood or bone marrow represents one of only a few examples of the successful application of stem cells to regenerative medicine. However, the rarity of these cells in the body limits their more extensive application. This theme aims to define cellular pathways and other factors that influence the conversion of human pluripotent stem cells into specific blood cells.

The translational and therapeutic utility of stem cells is dependent on their reliable and efficient differentiation into specific cell lineages. Techniques for directed differentiation of stem cells into specific cell types are currently based on recreating in the culture dish the signals that control blood formation during normal embryonic development.

The use of haemopoietic stem cells (HSC) represents one example of the successful application of stem cells to regenerative medicine; however, the paucity of HSC limits their more extensive use. This theme aims to define parameters for the effective conversion of human pluripotent stem cells into select blood tissue lineages and differentiated cell subtypes. An original translational extension of this theme was the generation of megakaryocytic cells from hESC and their culture in novel bioreactor systems designed to produce platelets for transfusion. However, for strategic reasons this project was withdrawn from the theme and replaced with a new project (CSIRO lead by Laslett, Haylock and Nilsson) to define conditions for effective reprogramming of mature blood cells back to HSC.

The last year has seen strong progress on all projects with a total of 12 manuscripts published from investigators within the theme. Of particular note are the outcomes arising from the Hilton and Taoudi (WEHI) project that aims to address the question in developmental haemopoiesis of when do stem and progenitor cells first begin to produce mature blood cells.



Murine fetal liver megakaryocytes in vivo
(Kathy Potts and Samir Taoudi, WEHI)

Taoudi has begun to dissect the developmental pathway of primitive megakaryopoiesis in the yolk sac and determine when progenitor cell megakaryopoiesis begins. Key outcomes to date include the discovery that the first phase of megakaryopoiesis is via a primitive, progenitor-independent, pathway and secondly, that platelet production does not occur via formation of megakaryocyte proplatelet extensions, as in adult thrombogenesis, but rather by a process of direct budding from megakaryocytes in the yolk sac, placenta and the liver.

A further series of studies to investigate the molecular regulation of these events in primitive megakaryopoiesis have been formulated and involve use of gene knockdown strategies using shRNA. The shRNA vectors for target genes have been constructed and tested for gene expression knockdown, a morula infection methodology

has been established and an in vivo representation screen using the developed shRNA vectors is underway.

The project lead by Lars Nielsen (University of Queensland) aims to evaluate the compatibility of their recent protocols for HSC expansion with protocols for expansion and differentiation along the neutrophil lineage. It also aims to engineer cells capable of multi-lineage differentiation for use in the manufacture of transfusable blood products.

Nielsen has confirmed that their patented scale-up protocol is compatible with the early expansion protocols developed by the Canadian Centre for Commercialization of Regenerative Medicine. CCRM has taken out options on two patents arising from the Nielsen laboratory and are in the process of doing a pre-clinical evaluation of the process in Toronto.

Education, Ethics, Law and Community Awareness Unit

Our Education, Ethics, Law and Community Awareness Unit aims to inform the Australian community 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.

Through partnering with key national and international patient advocacy groups, teacher associations, academics, industry and professional bodies in 2013, we have delivered a suite of educational activities and facilitated our research and policy work, making a substantial contribution to enhancing understanding and awareness of stem cells and their therapeutic potential in Australia.

Outreach and Communication Activities

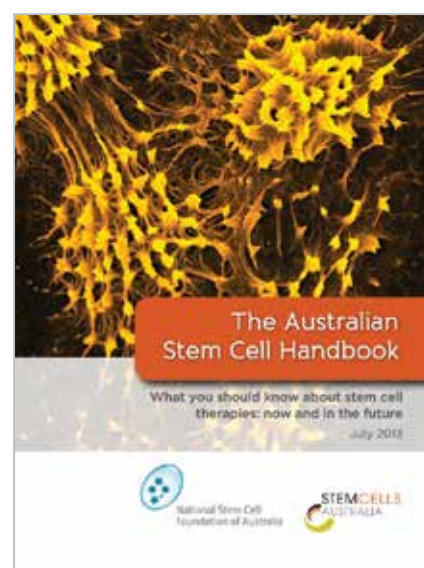
During 2013, Stem Cells Australia held a series of workshops and public lectures that focused on highlighting developments in stem cell science. Each event focused on a specific condition - including spinal cord injury, diabetes and cerebral palsy - and featured local experts, as well as visiting international scientists, who were able to assist the audience distinguish between the reality of where stem cell research is and the hype promulgated in media reports and on the Internet. Patients, their family, friends, carers and interested medical and allied healthcare professionals attended the events, which were either broadcast live or the footage available online for those unable to attend.

Events were held in Brisbane, Sydney, Perth and Melbourne with key patient support groups co-hosting each event. The *Diabetes and Stem Cells: Hype, Hope and Progress* forum featured US-based researcher Dr Allan Robins

who was visiting Australia to present at our *Therapeutic Potential of Stem Cells: Prospects & Pitfalls* symposium. At the invitation of MS Australia, Spine and Limb Foundation WA and the Cerebral Palsy Alliance, we also contributed to publications for their members.

Recognising that for many it is often difficult to find reliable information about whether stem cells can really help them, their friend or family member, Stem Cells Australia and the National Stem Cell Foundation of Australia developed and published *The Australian Stem Cell Handbook* in 2013.

The Handbook discusses the basics about stem cells: what makes stem cells so special, how they are currently used in research and in the clinic, as well as raising concerns about unproven stem cell treatments that are currently being offered in Australia and overseas. Included is a guide on how to determine if a proposed stem cell treatment is an accepted medical practice or should be considered an experimental or unproven therapy. The Handbook was developed to assist interested Australians in their quest for more information on possible stem cell treatments, and encourages the reader to discuss the information they gather with their treating doctor.



The Handbook is available online, and was cited by the NHMRC in their 2013 guides for doctors and patients on stem cell treatments.

To further assist Australians to find out more about the stem cell clinical trials, Stem Cells Australia also created a new web-based resource in 2013 with support from the then Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education.

Our outreach activities in 2013 also focused on high school students and their teachers. With the support of the National Stem Cell Foundation of Australia

TO QUOTE ONE OF THE TEACHERS ATTENDING THE BRISBANE EVENT... "THE STUDENTS RETURNED TO SCHOOL WITH A MUCH DEEPER KNOWLEDGE, APPRECIATION AND UNDERSTANDING OF THE ROLE OF RESEARCH, IN PARTICULAR STEM CELL RESEARCH".

and EuroStemCell, five full-day workshops were attended by over 450 students in Melbourne, Brisbane and Sydney. At each screening, students watched the award-winning documentary *Stem Cell Revolutions* and had the opportunity to have their questions answered by co-producer of the film, The University of Edinburgh's Professor Clare Blackburn, and a panel of local stem cell experts. Inspired by the film, the students surprised the panel - and many of their teachers - with their thought provoking questions.

In fascinating exchanges, students grilled the panelists about issues such as how to control differentiation, the moral and ethical issues associated with using stem cells, and where the line between reality and science fiction lies - now and in the future. Scientists also shared careers tips and some fascinating insights on life in the lab.

To quote one of the teachers attending the Brisbane event, which took place alongside the annual scientific conference of the Australasian Society for Stem Cell Research, "The students returned to school with a much deeper knowledge, appreciation and understanding of the role of research, in particular stem cell research".



Playing 'Start as a Stem Cell' game



At the screening of 'Stem Cell Revolutions'

We also held an evening screening in Melbourne just for teachers, where alongside the screening and a Q&A with scientists, we had the chance to showcase other stem cell teaching resources.

Stem Cells Australia members were also invited to present at numerous public forums including presentations to AUSiMED, U3A, Inner Wheel, schools and as part of Melbourne Neuroscience Institute Public Seminar Series and the Mathison University of Melbourne Public Lecture. We also screened the *Stem Cell Revolutions* documentary and held an information session for interested members of the general public.

Members of Stem Cells Australia are regularly called upon to provide expert commentary on developments in stem cell science and our activities continue to feature prominently in local and national print media, as well as radio and television programs such as ABC, SBS and commercial TV News broadcasts, Lateline, The Project, ABC Radio Breakfast and The World Today. Stories featuring our researchers were also included in *Australian BioTechnology*, *Australian Optometry*, *Australian Life Scientist* and the e-book released by the Chief Scientist of Australia - *The Curious Country*. A full listing of our

media coverage is included on page 50.

Core to our outreach and communication activities was the Stem Cells Australia website and social media. During 2013 we have responded to more than 350 patient enquiries, and had over 50,000 visitor to our website - more than double the interest in the previous twelve months - where we posted over 50 news items about our members and their activities. To keep in touch with our 1,400 subscribers we also publish quarterly e-newsletters and promote all activities via Facebook and our @StemCellAus Twitter handle.

Research & Policy

The growing practice of selling unproven stem cell 'treatments' to Australians continues to be a significant concern to Stem Cells Australia. Such treatments - which effectively by-pass the clinical trials framework - are often promoted as being safe and providing 'improvements', but have little pre-clinical or clinical evidence to support such claims. Indeed the experimental nature of these treatments, which often cost many thousands of dollars, is rarely acknowledged.



For patients and their loved ones desperate for any option, the clinics offering these treatments - overseas and in Australia - are understandably attractive. To better understand the decision to pursue such unproven treatments, Stem Cell Australia is part of an ongoing international multi-disciplinary research project - *High hopes, high risk? A sociological study of stem cell tourism* - to capture and

examine the experience of Australians who have travelled abroad or in Australia for such therapy, or have contemplated doing so. During 2013, Jane Kotey, the PhD student associated with this project - received a highly competitive grant to attend the C9-Go8 *Sustainable Health Futures*

Forum in Shanghai ahead of her planned field work, where she will explore the socio-cultural dynamics underpinning the growth of the 'stem cell' market in China.

Initial findings from our study, published in *Sociology Health and Illness* and presented at national and international meetings, highlight and explore the role of hope in shaping this issue.

On the specific issue of autologous stem cell treatments being sold in Australia, during 2013 we provided briefings to the Therapeutic Goods

Administration, the NHMRC, the Australian Health Practitioners Regulation Agency (AHPRA), the International Society for Stem Cell Research (ISSCR), we also connected with members of the Australian cellular therapy biotechnology communities through presentations at the *Australian Professional Development in Therapeutics* conference, and at the *Therapeutic Potential of Stem Cells: Prospects & Pitfalls* scientific symposium, co-hosted by Stem Cells Australia and The Bio21 Cluster. Our concerns raised with NHMRC were reflected in their December 2013 *Stem Cell Treatments - A Quick Guide for Medical Practitioners* and *Stem Cell Treatments - Frequently Asked Questions* for patients and interested members of the general public.

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

Call for tighter regulations to curb sale of unproven stem cell treatments in Australia

In 2011 the Australian Government introduced new regulations to provide greater guidance and oversight on products made from cells and tissues.

Consistent with regulations in other jurisdictions around the world, these new regulations set out standards to ensure that benefits to consumers outweighed any risks.

Potential risk was characterised by how closely the intended use of the product matched the original biological function, and on how far removed the cells or tissue were from their naturally occurring state. The greater the degree of manipulation in manufacturing, or the greater the difference between the proposed use and what the cells or tissue usually do in the body, the more stringent the requirement, to demonstrate safety and efficacy via clinical trials prior to any treatment being approved.

However, all autologous cell and tissue-based therapies (where the cells are taken from the patient for their own use) were excluded from having to comply with these stringent standards.

Concerned by this development, Stem Cells Australia has called for the regulations to be tightened.

Simple modifications to the current regulations such as incorporating recognition of the inherent risks in non-homologous use of autologous cells, and making it a requirement that all cell manufacturing occurs in accredited laboratories, should curb exploitative practices without impeding medical innovation.

As recently highlighted by the ISSCR, it should be considered unethical to market unproven cell-based interventions outside of clinical trials - even when the patient's own cells are used.

Although it is possible to report the conduct of individual medical and health practitioners to AHPRA for investigation, or lodge a complaint to Australian Competition and Consumer Commission, we believe the issue of unproven autologous stem cell treatments would be best addressed by tightening the wording of the current exemption.

We need, and must insist on, a strong evidence base as we translate stem cell science to the clinic.

Research Support

Stem Cell Core Facilities

Stem Cell Core facilities are based at the Melbourne Brain Centre, The University of Melbourne and the AIBN, the University of Queensland. The core's services are available to scientists of the two universities as well as other institutions.

Expertise

- culture and expansion of cell lines
- validation of pluripotency
- cryopreservation
- neuronal induction of pluripotent stem cells

Services

- hESC lines ready for experiments
- custom generation of iPSC lines
- sorting and plating of stem cells for experimental analysis
- feeder cells and conditioned media
- stem cell differentiation to neurospheres
- cryopreservation by slow freezing and vitrification
- biobanking of a wide range of cell lines
- hands-on training in stem cell culture techniques for hES cells and iPSC.

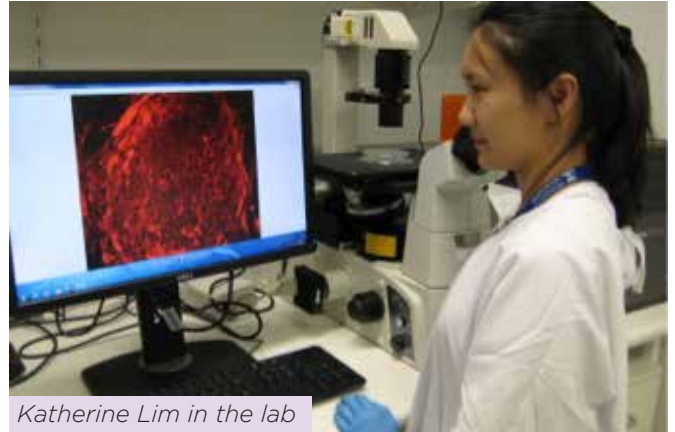
For more information



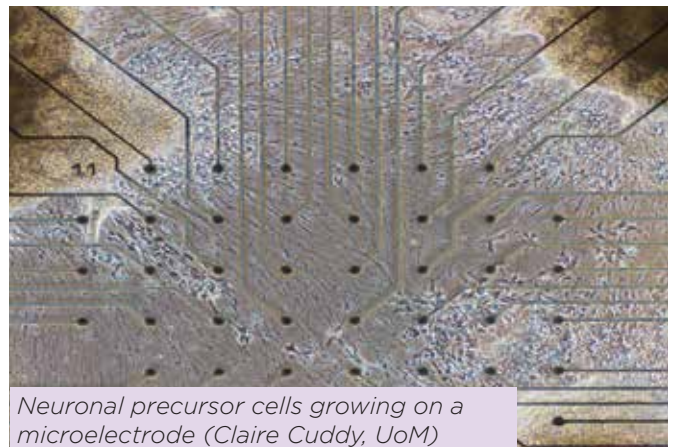
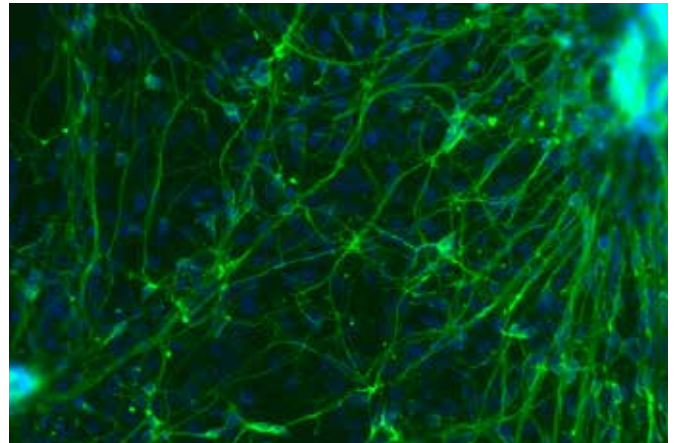
Dr Anna Michalska
StemCore Manager (UoM)
anna.michalska@unimelb.edu.au



Ms Victoria Turner
StemCore Manager (UQ)
info@stemcore.com.au



Katherine Lim in the lab



Neuronal precursor cells growing on a microelectrode (Claire Cuddy, UoM)

Flow Cytometry Facility

Based at the Melbourne Brain Centre, the University of Melbourne, Parkville, SCA provides a purpose-built core facility in Flow Cytometry for use by interested researchers.

The Flow Cytometry Facility has a technician-operated 5-laser Becton Dickinson FACSria III sorter and a DIY 3-laser Beckman Coulter CyAn ADP analyser. A high-throughput, 2-laser Beckman Coulter HyperCyt is available off-site at the Royal Melbourne Hospital. Also available are an epMotion liquid handling robot and a ViiA7 QRT PCR machine.

Daniel Blashki operating the FACSria III



For more information

mbc-flowlab@unimelb.edu.au
or on 03 9035 8536



Dr Vanta Jameson
Manager



Mr Daniel Blashki
Operator



Mr Joshua Kie
Operator

Stemformatics

Based at the University of Queensland, Stemformatics is a collaboration between the stem cell and bioinformatics communities.



Stemformatics, accessed at www.stemformatics.org, provides the Australian stem cell community with a collaborative platform that enables the interrogation of stem cell datasets without formal bioinformatics training. It hosts a curated, genome-scale database and a bioinformatics environment to address three questions: what are the molecular signatures of stem cells; which gene networks correlate with desirable stem cell phenotypes; and, transcriptionally, what constitutes cells of high therapeutic value.

It also translates data into the right format for researchers wishing to drive more complex statistical approaches.

For more information

info@stemformatics.org



A/Prof Christine Wells
Project Leader



Mr Rowland Mosbergen
Developer



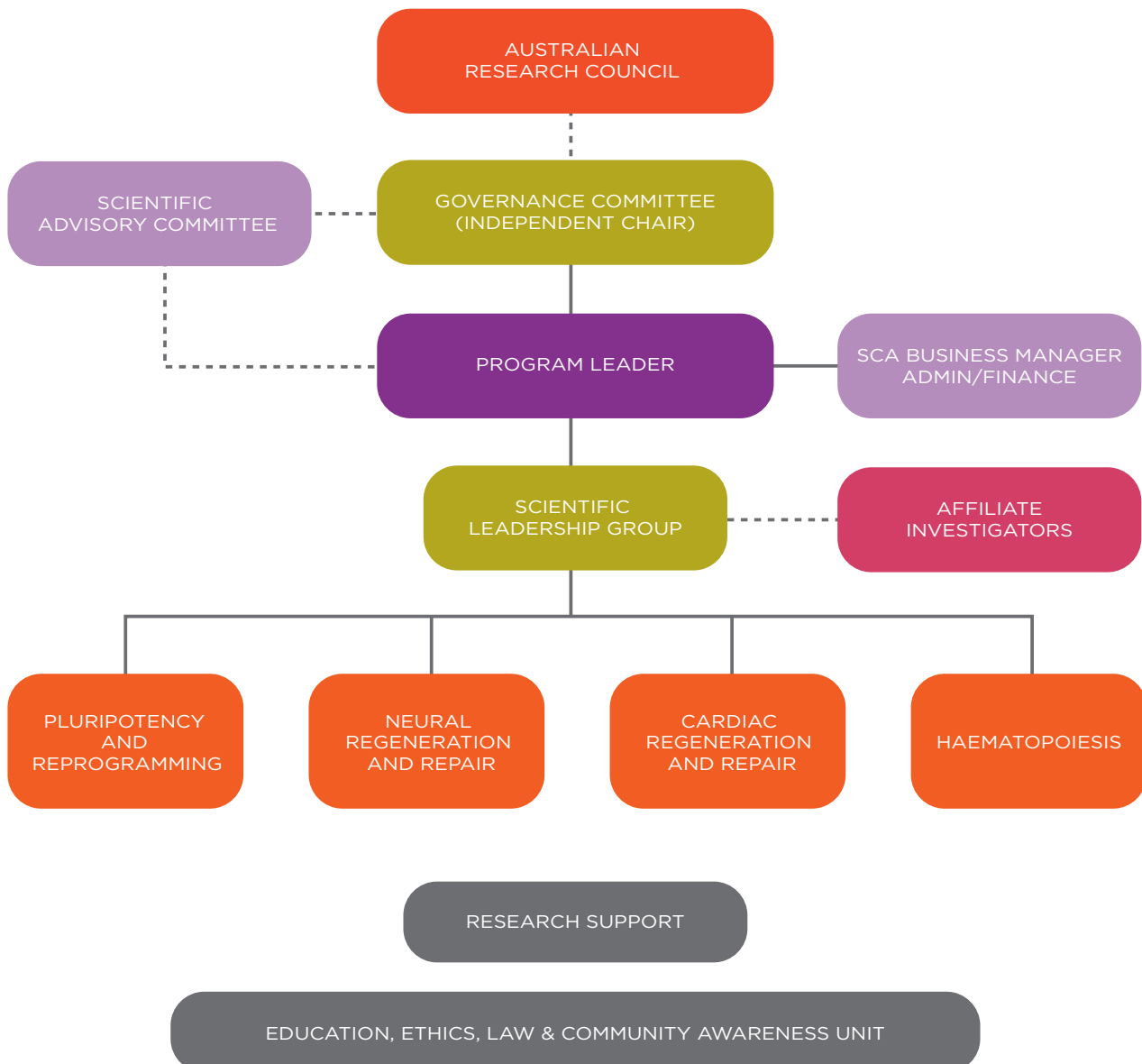
Mr Othmar Korn
Bioinformatician

Leadership and Governance

Stem Cells Australia operates under an agreement between the Australian Research Council, with the University of Melbourne as the administering organisation and its partners.

The Initiative is an unincorporated joint venture of The University of Melbourne, Monash University, University of Queensland, University of New South Wales, Walter and Eliza Hall Institute of Medical Research, Victor Chang Cardiac Research Institute*, Florey Institute of Neuroscience and Mental Health and the Commonwealth Scientific and Industrial Research Organisation.

**VCCRI does not participate in hESC research*



Governance Committee

The Governance Committee is essentially a representative Board which ensures the Initiative is well managed with a particular focus on the research program and budget. It also provides strategic advice to the Program Leader.



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)



Professor Max Lu
University of Queensland
(UQ)



Dr Keith McLean
Commonwealth Scientific
and Industrial Research
Organisation (CSIRO)



**Associate Professor Laurent
Rivory**
University of New South
Wales (UNSW)

Scientific Advisory Committee

Our Committee are internationally recognised experts in the field of stem cell science.



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

Professor Mummery pioneered studies on cardiomyocytes differentiated from human embryonic stem cells and was among the first to inject them in mouse heart after myocardial infarction. Her research studies are directed to differentiation of cardiomyocytes (heart), vascular endothelial cells (veins) and vascular smooth muscle cells (muscle). Her team fluorescently tag specific cell lineages, and as they differentiate they can select the desired population of cells. Growth in each step of the differentiation process is optimised so that more than 50% of the cells are either beating heart cells, endothelial cells or smooth muscle cells.



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

Professor Nagy's lab was the first in Canada to establish hESC in 2005. Later they discovered a new method to create pluripotent stem cells without the risk of disrupting healthy genes. Professor Nagy has developed a broad spectrum of genomic technologies now used around the world. These technologies assist the study of gene function in development and disease, and are important tools in the development of stem cell based therapies. Future clinical use of induced pluripotent stem cells is still problematic as the existence of mutant cells still introduces a significant risk of unexpected behaviour after cell transplantation, including the possibility of cancer formation. Nagy's lab is currently trying to protect the integrity of the genomic DNA of iPSC during the reprogramming process.



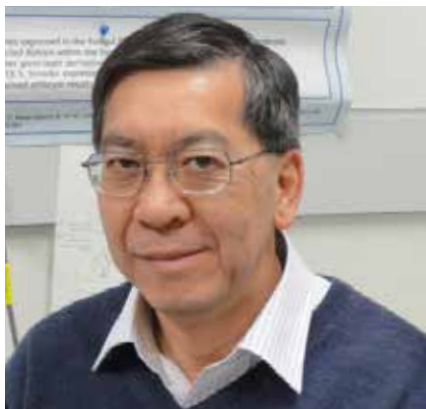
Professor Shin-Ichi Nishikawa
RIKEN Kobe Institute, Japan *Deputy
Director of the Riken Centre*

Professor Nishikawa is a world leader in the field, who has made enormous contributions to the identification and characterisation of melanocyte stem cells. He used an antibody to explore the physiological role of c-Kit signalling in melanocytes and he discovered melanocyte stem cells within the mouse hair follicle region. His work has impacted the field of pigment cell biology. He has played major roles both in advancing this important field of research and in training a future generation of scientists who have extended his legacy through their own discoveries. His research focus is on bridging basic understanding of stem cell biology to its clinical applications within regenerative medicine.



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

Professor Rudnicki's laboratory team works to understand the molecular mechanism that regulate the determination, proliferation, and differentiation of stem cells during embryonic development and during tissue regeneration. Professor Rudnicki has conducted extensive studies into both embryonic myogenesis and the function of stem cells in adult regenerative myogenesis. His work is focussed on molecular genetic and genomic approaches to determine the function and roles played by regulatory factors.



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

Professor Tam pioneered the application of micromanipulation and embryo culture specifically for examining the development of the head and embryonic gut. His research focusses on the cellular and molecular mechanisms of body patterning during mouse development and the biology of stem cells. The embryological analysis undertaken by his team has enabled the construction of a series of fate-maps revealing the organisation of the basic body plan of the early embryo. This work forms part of the foundation in understanding the differentiation of stem cells into clinically useful cell types in regenerative medicine.



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

Professor Zandstra combines biological and engineering approaches for the growth and differentiation of adult and embryonic stem cell and the development of clinically and industrially relevant technologies for these bioprocesses. Although stem cells may serve as a renewable source of cells for regenerative medicine, we need to understand how to translate the demonstrated biological properties of stem cells into robust and efficacious therapies. Professor Zandstra is working on a strategy to control and predict stem cell responses to changes in molecular, cellular and microenvironmental conditions. His vision is to develop a mechanistic-based platform for stem cell bioprocess development.

Our People

Scientific Leadership Group

The Scientific Leadership Group is an advisory and co-ordination body. It is there to assist the Program Leader to:

- develop the annual research program;
- monitor and review research activities;
- co-ordinate SCA activities in the broader community.



Professor Martin Pera
Program Leader UoM, WEHI, The Florey



Professor Perry Bartlett
Queensland Brain Institute
(QBI) UQ



Professor Peter Gray
Australian Institute for
Bioengineering and
Nanotechnology (AIBN), UQ



Professor Richard Harvey
UNSW, VCCRI



Professor David Haylock
CSIRO



Professor Doug Hilton
UoM, WEHI



Professor Trevor Kilpatrick
UoM



Professor Melissa Little
Institute of Molecular
Biology (IMB) UQ



Professor Nadia Rosenthal
Australian Regenerative
Medicine Institute (ARMI),
Monash

Chief and Partner Investigators



Professor Warren Alexander
Partner Investigator
WEHI



Associate Professor Tiziano Barberi
Chief Investigator
ARMI, Monash



Professor Perry Bartlett
Chief Investigator
QBI, UQ



Professor Justin Cooper-White
Chief Investigator
AIBN, UQ



Professor Andrew Elefanty
Chief Investigator
MISCL, Monash



Professor David Gardner
Chief Investigator
UoM



Professor Robert Graham AO
Chief Investigator
UNSW, VCCRI



Professor Peter Gray
Chief Investigator
AIBN, UQ



Professor Sean Grimmond
Chief Investigator
IMB, UQ



Professor Richard Harvey
Chief Investigator
UNSW, VCCRI



Professor David Haylock
Partner Investigator
CSIRO



Professor Doug Hilton
Chief Investigator,
UoM, WEHI



Professor Trevor Kilpatrick
Chief Investigator, UoM



Associate Professor Andrew Laslett
Partner Investigator,
CSIRO



Professor Melissa Little
Chief Investigator, IMB,
UQ



Professor Lars Nielsen
Chief Investigator,
AIBN, UQ



Associate Professor Susie Nilsson
Partner Investigator,
CSIRO



Professor Martin Pera
Chief Investigator
UoM, The Florey, WEHI



Professor Nadia Rosenthal
Chief Investigator,
ARMI, Monash



Professor Ed Stanley
Chief Investigator,
MISCL, Monash



Associate Professor Christine Wells
Chief Investigator,
AIBN, UQ



Associate Professor Ernst Wolvetang
Chief Investigator,
AIBN, UQ

Associate Investigators



**Associate Professor
James Bourne**
ARMI, Monash



**Professor Robert
Capon**
UQ



Dr Mirella Dottori
UoM



Dr David Elliott
MISCL, Monash



**Professor Michael
Monteiro**
AIBN, UQ



Dr Trent Munro
AIBN, UQ



**Associate Professor
Megan Munsie**
UoM



**Professor Robert
Nordon**
UNSW



Dr Claire Parish
The Florey



Dr Alice Pébay
Centre for Eye
Research Australia
(CERA)



Dr Joy Rathjen
UoM



Professor Pankaj Sah
UQ



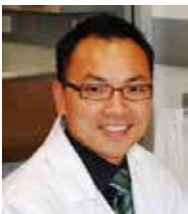
Dr Lachlan Thomson
The Florey



**Associate Professor
Ann Turnley**
UoM

Affiliate Investigators

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



**Dr James
Chong**
University of
Sydney



**Dr Robin
Hobbs**
Monash/ARMI



**Dr Kazu
Kikuchi**
VCCRI



Dr Jose Polo
Monash/ARMI



**Dr Enzo
Porrello**
UQ



**Professor
Jane Visvader**
WEHI

Management



Professor Martin Pera
Program Leader

The Program Leader is responsible for the overall direction, strategy and operation of SCA. This role encompasses research leadership, management and communication, liaison and development responsibilities.



Ms Barbara Power
Business Manager

The Business Manager, also the committee secretary in SCA, provides administrative leadership across the eight nodes of the SCA initiative. She is the Business Manager responsible for: financial management, tender preparation, grant and contract management, compliance and program management.



Associate Professor Megan Munsie Head,
Education, Ethics,
Legal and 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 within the Leader's portfolio and the Faculty research context. Office management, HR and student coordination and assistance with event management, marketing and communication activities.



Stem Cells Australia hosted a two-day workshop to link researchers from Kyoto University's iCeMS with SCA members. The workshop was supported by the Australian Department of Foreign Affairs and Trade through the Australia-Japan Foundation.

Post-Doctoral Researchers



Dr Christelle Adolphe
IMB, UQ



Dr Naisana Asli
VCCRI



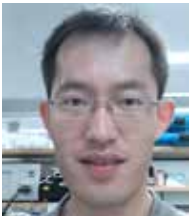
Dr Daniel Blackmore
QBI, UQ



Dr Alexis Bosman
VCCRI



Dr Sebastian Carotta
WEHI



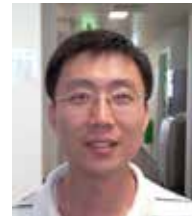
Dr Huaying Chen
AIBN, UQ



Dr Jarny Choi
WEHI



Dr Kim Christie
UoM



Dr Tung-Liang (Tom) Chung
CSIRO



Dr Mauro da Costa
ARMI, Monash



Dr Mark Denham
UoM



Dr Alison Farley
UoM



Dr Jane Fitzpatrick
AIBN, UQ



Dr Jessica Frith
AIBN, UQ



Dr Milena Furtado
ARMI, Monash



Dr James Godwin
ARMI, Monash



Dr Kylie Greig
WEHI



Dr Alexandra Harvey
UoM



Dr Celena Heazelwood
AIBN, UQ



Dr Chad Heazlewood
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Dr Claire Hirst
ARMI, Monash



Dr Jihane Homman-Ludiye
ARMI, Monash



Dr Siiri Iismaa
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Dr Vaibhao Janbandhu
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Dr Andrew Jarratt
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Dr Dhanisha Jhaveri
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Dr Joly Kwek
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Dr Ming Li
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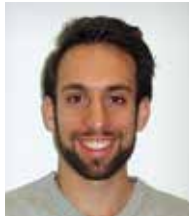
Dr Sue Lim
ARMI, Monash



Dr Juho Makela
ARMI, Monash



Dr Tobias Merson
The Florey



Dr Jonathan Niclis
The Florey



Dr Hieu Nim
ARMI, Monash



Dr Carmel O'Brien
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Dr Elizabeth Ng
MISCL, Monash

Postgraduate Researchers



Ms Stacey Andersen
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Ms Lisa Azzola
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Mr Cheang Ly Be
CSIRO



Ms Penelope Buntine
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Ms Kellie Cartledge
CSIRO



Mr Joseph Chen
ARMI, Monash



Ms Claire Cuddy
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Mr Issac Englert
AIBN, UQ



Ms Pei Er
IMB, UQ



Ms Maely Gauthier
IMB, UQ



Ms Ivon Harliwong
IMB, UQ



Mr Othmar Korn
AIBN, UQ



Ms Jessie Leung
UoM



Ms Jing Jing (Jane) Li
UNSW



Ms Flavia Marturana
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**Mr Rowland
Mosbergen**
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Mr Nick Seidenman
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Ms Alejandra Vitale
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Students



**Ms Deevina
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MISCL, Monash



Ms Harleen Basrai
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**Ms Stephanie
Bellmaine**
Bio21



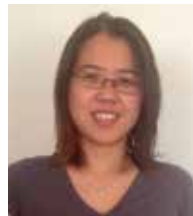
Ms Bianca Borchin
ARMI, Monash



Ms Marion Brunck
AIBN, UQ



Ms Freya Bruveris
MISCL, Monash



Ms Xiaoli Chen
AIBN, UQ



Ms Laura Corfield
ARMI, Monash



Mr James Cornwell
UNSW



Mr Duncan Crombie
CERA



Mr Caleb Dawson
WEHI



Mr Siavash Foroughi
UoM



Ms Frisca Frisca
CERA



**Ms Gency
Gunasinghe**
AIBN, UQ



Mr Amir Hayati
AIBN, UQ



**Ms Rachael
Henderson**
CERA (UROP
student)



**Mr Alejandro
Hidalgo-Gonzalez**
AIBN, UQ



Mr Joshua Kie
CSIRO (Honors
Student)



Ms Jane Kotey
Monash



Mr Jack Lamshead
CSIRO



Mr Kevin Lau
UoM



Mr Jarmon Lees
UoM



Ms Barbara Maier
IMB, UQ



Ms Elizabeth Mason
AIBN, UQ



Ms Amy Nicks
VCCRI



Mr Harish Padmanabhan
AIBN, UQ



Ms Kathy Potts
WEHI



Ms Jessica Schwaber
AIBN, UQ



Mr Nicholas Tan
UoM



Ms Liyuan Wang
UNSW



Ms Li-Yen Wong
AIBN, UQ



Mr David Wood
IMB, UQ



Ms Lulu Xing
UoM



Ms Cissy Yu
MISCL, Monash



Ms Lucy Hersey
ARMI, Monash
(UROP student)

Ms Dhanushi Abeygunawardena
UNSW

Ms Sara Alei Shehni
Monash

Mr Walaá Alsanie
The Florey

Mr Ryan Debuque
ARMI, Monash

Ms Ksenia Finogenova
visiting MSc student from
Munich, Germany

Mr Jaber Firas
Monash

Ms Hananeh Fonoudi
UNSW

Ms Katherine Gill
CERA

Ms Alexei Ilinkykh
Monash

Mr Rhys Skelton
MISCL, Monash

All students are enrolled in a PhD unless otherwise stated.

Management Report

Building Human Capital

The Future of Regenerative Medicine

One of Stem Cells Australia's Key Performance Indicator (KPI) endeavours is to build human capital. Our aim is to work in a collaborative manner, to build a critical mass of people to maintain Australia's competitiveness in stem cell science and regenerative medicine. One of our charters is to inspire enthusiastic new PhD students, to provide them with training opportunities and for them to receive mentoring, which will enable a new generation to tackle the challenges of translating stem cell science into new treatments for disease.

Provide education opportunities for students

Stem Cells Australia brings together Australia's leading scientists in the field to create a new consortium which is gaining international recognition. We provide interdisciplinary educational opportunities for PhD students and to facilitate their exposure to the latest advances in science and technology. For example, on a recent trip to iCeMS Kyoto, Japan, four young researchers were given the opportunity to learn a more efficient technique of transforming stem cells into heart cells, an opportunity made possible by our international linkages.

Continue to recruit the best

We are currently two years into the seven year grant and we have started with some smart and capable talent. The difficulty now is how to attract more talent through collaboration, while nurturing and continuing to educate the human capital we already have. This year we have many PhD students working in different laboratories

across Australia. It is expected that they will submit high-standard thesis and journal publications this year a result of their work. The networks they have built up through their participation at conferences, our theme workshops and our annual retreats will help greatly as they move forward in their careers.



Kevin Lau (Student) and Andras Nagy (Scientific Advisory Committee) at Annual Retreat

Networking is key

Networking is an key aspect of success in research in this rapidly moving field. This year we established a Strategic Research Fund which provided financial support for four new projects. The call for proposals was specifically targeted to support multidisciplinary and cross-institutional projects with new collaborative teams.

Human Capital Flight

Human capital flight refers to the loss of key personnel. Inevitably Australian scientists will sometimes pursue new opportunities abroad, but this can actually be highly beneficial if managed properly, to support ongoing links with teams here. For example Dr Mark Denham has accepted the position of group leader for the Danish Institute of Translational Neuroscience but

still retains an appointment with the University of Melbourne and continues to collaborate with our scientists. This enhances our capabilities and networks at no cost to the initiative

Building Human Capital

Regenerative medicine is the most rapidly growing sector of the biotechnology industry. Moreover, stem cell technology is becoming a critical part of functional genomics, disease modelling and drug development in the post genome era. Australian competitiveness in regenerative medicine and indeed in all of biomedical science will depend critically on our ability to train and support the future leaders in stem cell research. In a sense, this is one of our most important missions, and one that will remain a key focus of activities.

“AUSTRALIAN COMPETITIVENESS IN REGENERATIVE MEDICINE... WILL DEPEND CRITICALLY ON OUR ABILITY TO TRAIN AND SUPPORT THE FUTURE LEADERS IN STEM CELL RESEARCH.”

Performance

Key Result Area 1: Research Performance	2011 KPI		2012 KPI		2013 KPI	
	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
Number of Conference proceedings	4	3	20	8	20	9
Quality of research outputs High quality						
50% of publications will be in peer reviewed, international journals with an Impact Factor >5	50%	50% (14)	50%	54% (55)	50%	45% (46)
15% of publications will be in journals with Impact Factor >10.	15%	20% (6)	15%	12% (12)	15%	17% (17)
Number of invited talks/papers/keynote lectures given at major international meetings	3	16	15	46	15	28
Patent applications lodged	0	0	0	0	2	1

Key Result Area 2: Research Training and Capacity Building	2011 KPI		2012 KPI		2013 KPI	
	Target	Actual	Target	Actual	Target	Actual
Number of new postgraduate students working on core research and supervised by Stem Cells Australia members						
Annual	8	14	10	8	9	20
Cumulative	8	14	18	22	27	42
Number of postdoctoral researchers working on core research	9	11	20	40	20	60
Number of postgraduate completions by students working on core research and supervised by SCA members cumulative	0	0	4	2	9	4
Qualitative measures of capacity building						
Number of Competitive postdoctoral Fellowships awarded	0	1	1	3	2	4
Other awards, short term fellowships, recognitions, appointments, promotions	0	1	9	10	11	17

Key Result Area 3: International, national links and networks	2011 KPI		2012 KPI		2013 KPI	
	Target	Actual	Target	Actual	Target	Actual
International Collaboration						
Researchers, fellows attend and present at international conferences	4	16	30	39	35	48
Students attending international research conferences	1	1	13	2	14	4
Research collaborations with international centres	2	10	3	22	5	16
International research funding received	0	\$470K	\$500K	\$1.5M	\$750K	\$1.2M
National Collaboration						
Cross-institutional collaboration defined as across research institutions (i.e. collaborating and partner organisations) within Stem Cells Australia						
Annual retreat attended by researchers, fellows, students	N/A	N/A	80%	85%	80%	81%
% publications including cross-institutional authorship	N/A	18% (5)	50%	12% (12)	60%	3%
Number of international visitors and visiting fellows funded with SCA funds staying between 1-2 months (approx)	0	0	2	2	2	2
Number of workshops held/organised by Stem Cells Australia						
National	1	1	1	4	1	7
International	0	0	1	1	0	1

Key Result Area 4: Knowledge Transfer, Outreach and Communication	2011 KPI		2012 KPI		2013 KPI	
	Target	Actual	Target	Actual	Target	Actual
Number and nature of commentaries about the Stem Cells Australia's achievements						
Media releases	2	3	5	4	5	6
Articles	1	7	3	21	3	20+
Number of government, industry and business community briefings						
	1	1	4	7	4	6+
Number and nature of public awareness programs						
Provide tailored resources to community and professional organisations	2	2	4	6	4	11
Members participating in community or patient advocacy meetings	3	3	5	16	5	12
Engagements with science teachers' associations	1	1	3	2	3	3
Website						
Currency of information on Stem Cells Australia's website		website launched Nov 2011		Posted 27 news items		New sections added. Posted 51 news items
Number of website hits (launched 2011)	2,000	2,559	15,000	22,207	20,000	53,038

Awards and Scholarships

Scholarships

Duncan Crombie Gustav Nossal
Postgraduate Scholarship



Duncan Crombie in the lab

Grants

Professor Nadia Rosenthal and **Professor Richard Harvey** received a six-year US\$6 million grant from the France-based *Fondation Leduc Transatlantic Networks of Excellence* to investigate the role of cardiac stem cells in heart function and repair.

SCA members were part of research teams awarded **NHMRC Project grants**, **ARC Discovery Grants** and funding to establish a high throughput cell genomics centre.

Fellowships

Warren Alexander NHMRC
Research Fellowship

Mirella Dottori ARC Future
Fellowship

Juho-Antti Mäkelä Sigrid Jusélius
Fellowship (Finland)

Jose Polo Sylvia and Charles Viertel
Charitable Foundation Senior
Medical Research Fellowship

Awards and Promotions

Jarny Choi WEHI Postdoc Travel
Award

Kim Christie Australian
Neurotrauma Symposium Early
Career Researcher Award

David De Kretser Elected to the
Council of the Australian Academy
of Science

Alejandro Hidalgo Gonzalez
Conference Award for BCVS 2013

Peter Gray Elected as Vice-
President to the Board of
the Australian Academy of
Technological Sciences and
Engineering

Richard Harvey NSW 2013
Ministerial Award for Cardiovascular
Research Excellence

Siiri Iismaa First prize for
Outstanding Oral and Poster
Presentation at the 21st St Vincents
& Mater Health Sydney Research
Symposium, Sydney, Australia 2013.
Title: Myocardial response to injury
is augmented by preservation
of postnatal cardiomyocyte
proliferative competence

Jane Kotey Travel award to attend
the Go8-C9 Sustainable Health
Futures HDR forum, Jiao Tong
University, Shanghai, China.

Jarmon Lees Travel award, Society
for Reproductive Biology

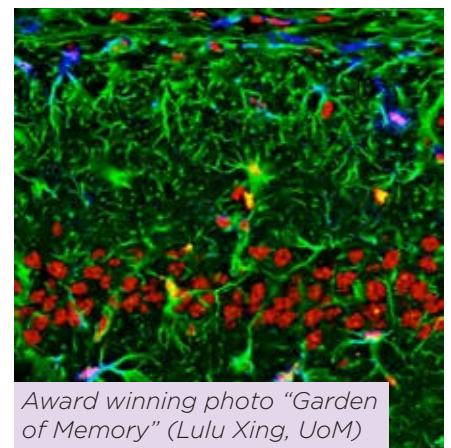
Tobias Merson Promotion to Florey
Research Fellow

Nicholas Tan National Stem Cell
Foundation of Australia Conference
Education Award

Lulu Xing won **The Node**
photography competition for her
image titled *The Garden of Memory*



Richard Harvey receiving award



Award winning photo "Garden of Memory" (Lulu Xing, UoM)

Publications

Journal Articles with Impact Factor greater than 10

2013

Note: researchers in bold are from Stem Cells Australia: Chief Investigators, Partner Investigators or Associate Investigators.

- Apostolou, E., Ferrari, F., Walsh, R. M., Bar-Nur, O., Stadtfeld, M., Cheloufi, S., Stuart, H. T., **Polo, J. M.**, Ohsumi, T. K., Borowsky, M. L., Kharchenko, P. V., Park, P. J., & Hochedlinger, K. (2013). **Genome-wide chromatin interactions of the Nanog locus in pluripotency, differentiation, and reprogramming.** *Cell Stem Cell*, 12(6), 699-712. **IF 25.315**
- Boyd, R. L., Soh, C. L., Boyd, N. R., **Stanley, E. G.**, & Chidgey, A. P. (2013). **Rewiring immunity: generating a functional thymus from hESCs... are we there yet?** *Cell Stem Cell*, 13(2), 135-136. **IF 25.315**
- Castagnaro, L., Lenti, E., Maruzzelli, S., Spinardi, L., Migliori, E., Farinello, D., Sitia, G., Harrelson, Z., Evans, S. M., Guidotti, L. G., **Harvey, R. P.**, & Brendolan, A. (2013). **Nkx2-5(+)islet1(+) mesenchymal precursors generate distinct spleen stromal cell subsets and participate in restoring stromal network integrity.** *Immunity*, 38(4), 782-791. **IF 19.795**
- Cerruti, B., Puliafito, A., Shewan, A. M., Yu, W., Combes, A. N., **Little, M. H.**, Chianale, F., Primo, L., Serini, G., Mostov, K. E., Celani, A., & Gamba, A. (2013). **Polarity, cell division, and out-of-equilibrium dynamics control the growth of epithelial structures.** *J Cell Biol*, 203(2), 359-372. **IF 10.822**
- Guan, J. L., Simon, A. K., Prescott, M., Menendez, J. A., Liu, F., Wang, F., Wang, C., **Wolvetang, E.**, Vazquez-Martin, A., & Zhang, J. (2013). **Autophagy in stem cells.** *Autophagy*, 9(6), 830-849. **IF 12.042**
- Hansen, N., Agerstam, H., Wahlestedt, M., Landberg, N., Askmyr, M., Ehinger, M., Rissler, M., Lilljebjorn, H., Johnels, P., Ishiko, J., Melo, J. V., **Alexander, W. S.**, Bryder, D., Jaras, M., & Fioretos, T. (2013). **SOCS2 is dispensable for BCR/ABL1-induced chronic myeloid leukemia-like disease and for normal hematopoietic stem cell function.** *Leukemia*, 27(1), 130-5. **IF 10.164**
- Kaur, G., Costa, M. W., Nefzger, C. M., Silva, J., Fierro-Gonzalez, J. C., **Polo, J. M.**, Bell, T. D., & Plachta, N. (2013). **Probing transcription factor diffusion dynamics in the living mammalian embryo with photoactivatable fluorescence correlation spectroscopy.** *Nat Commun*, 4, 1637. **IF 10.015**
- Kim, H., Wu, J., Ye, S., Tai, C. I., Zhou, X., Yan, H., Li, P., **Pera, M.**, & Ying, Q. L. (2013). **Modulation of beta-catenin function maintains mouse epiblast stem cell and human embryonic stem cell self-renewal.** *Nat Commun*, 4, 2403. **IF 10.015**
- Maroof, A. M., Keros, S., Tyson, J. A., Ying, S. W., Ganat, Y. M., Merkle, F. T., Liu, B., Goulburn, A., **Stanley, E. G.**, **Elefanty, A. G.**, Widmer, H. R., Eggan, K., Goldstein, P. A., Anderson, S. A., & Studer, L. (2013). **Directed differentiation and functional maturation of cortical interneurons from human embryonic stem cells.** *Cell Stem Cell*, 12(5), 559-572. **IF 25.315**
- Nakano, H., Liu, X., Arshi, A., Nakashima, Y., van Handel, B., Sasidharan, R., Harmon, A. W., Shin, J. H., Schwartz, R. J., Conway, S. J., **Harvey, R. P.**, Pashmforoush, M., Mikkola, H. K., & Nakano, A. (2013). **Haemogenic endocardium contributes to transient definitive haematopoiesis.** *Nat Commun*, 4, 1564. **IF 10.015**
- Nicholas, C. R., Chen, J., Tang, Y., Southwell, D. G., Chalmers, N., Vogt, D., Arnold, C. M., Chen, Y. J., **Stanley, E. G.**, **Elefanty, A. G.**, Sasai, Y., Alvarez-Buylla, A., Rubenstein, J. L., & Kriegstein, A. R. (2013). **Functional maturation of hPSC-derived forebrain interneurons requires an extended timeline and mimics human neural development.** *Cell Stem Cell*, 12(5), 573-586. **IF 25.315**
- Packard, A., Georgas, K., Michos, O., Riccio, P., Cebrian, C., Combes, A. N., Ju, A., Ferrer-Vaquer, A., Hadjantonakis, A. K., Zong, H., **Little, M. H.**, & Costantini, F. (2013). **Luminal mitosis drives epithelial cell dispersal within the branching ureteric bud.** *Dev Cell*, 27(3), 319-30. **IF 12.861**
- Paffett-Lugassy, N., Singh, R., Nevis, K. R., Guner-Ataman, B., O'Loughlin, E., Jahangiri, L., **Harvey, R. P.**, Burns, C. G., & Burns, C. E. (2013). **Heart field origin of great vessel precursors relies on nkx2.5-mediated vasculogenesis.** *Nat Cell Biol*, 15(11), 1362-1369. **IF 20.961**
- Pera, M. F.** **Epigenetics, vitamin supplements and cellular reprogramming.** (2013). *Nature Genetics* 45(12), 1412-3. **IF 35.209**
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- Takasato, M., Er, P. X., Becroft, M., Vanslambrouck, J. M., **Stanley, E. G.**, **Elefanty, A. G.**, & **Little, M. H.** (2013). **Directing human embryonic stem cell differentiation towards a renal lineage generates a self-organizing kidney.** *Nat Cell Biol*, 16(1) DOI: 10.1038/ncb2894 **IF 20.761**
- Xu, Y., Liu, L., **Laslett, A. L.**, & Esteban, M. A. (2013). **Cell reprogramming: Into the groove.** *Nat Mater*, 12(12), 1082-1084. **IF 35.749**

2013 – Published Research Output (130)

Note: researchers in bold are from Stem Cells Australia: Chief Investigators, Partner Investigators or Associate Investigators.

Journal Articles (116)

- Apostolou, E., Ferrari, F., Walsh, R. M., Bar-Nur, O., Stadtfeld, M., Cheloufi, S., Stuart, H. T., **Polo, J. M.**, Ohsumi, T. K., Borowsky, M. L., Kharchenko, P. V., Park, P. J., & Hochedlinger, K. (2013). **Genome-wide chromatin interactions of the Nanog locus in pluripotency, differentiation, and reprogramming.** *Cell Stem Cell*, 12(6), 699-712. **IF 25.315**
- Asli, N. S., & **Harvey, R. P.** (2013). **Epithelial to mesenchymal transition as a portal to stem cell characters embedded in gene networks.** *Bioessays*, 35(3), 191-200. **IF 5.423**
- Avery, S., Hirst, A. J., Baker, D., Lim, C. Y., Alagaratnam, S., Skotheim, R. I., Lothe, R. A., **Pera, M. F.**, Colman, A., Robson, P., Andrews, P. W., & Knowles, B. B. (2013). **BCL-XL Mediates the Strong Selective Advantage of a 20q11.21 Amplification Commonly Found in Human Embryonic Stem Cell Cultures.** *Stem Cell Reports*, 1(5), 379-86. **IF not available**
- Babur, B. K., Ghanavi, P., Levett, P., Lott, W. B., Klein, T., **Cooper-White, J. J.**, Crawford, R., & Doran, M. R. (2013). **The interplay between chondrocyte redifferentiation pellet size and oxygen concentration.** *PLoS One*, 8(3), e58865. **IF 3.730**
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- Borchin, B., Chen, J., & **Barberi, T.** (2013). **Derivation and FACS-mediated purification of PAX3+/PAX7+ skeletal muscle precursors from human pluripotent stem cells.** *Stem Cell Reports*, 1(6), 620-31. **IF not available**
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- Bosman, A., Sartiani, L., Spinelli, V., Del Lungo, M., Stillitano, F., Nosi, D., Mugelli, A., Cerbai, E., & Jaconi, M. (2013). **Molecular and functional evidence of HCN4 and caveolin-3 interaction during cardiomyocyte differentiation from human embryonic stem cells.** *Stem Cells and Development*, 22(11), 1717-1727. **IF 4.70**
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- Briggs, J. A., Sun, J., Shepherd, J., Ovchinnikov, D. A., Chung, T. L., Nayler, S. P., Kao, L. P., Morrow, C. A., Thakar, N. Y., Soo, S. Y., Peura, T., **Grimmond, S.**, & **Wolvetang, E. J.** (2013). **Integration-free induced pluripotent stem cells model genetic and neural developmental features of down syndrome etiology.** *Stem Cells*, 31(3), 467-478. **IF 7.701**
- Cao, H. M., Oteiza, A., & **Nilsson, S. K.** (2013). **Understanding the role of the microenvironment during definitive hemopoietic development.** *Experimental Hematology*, 41(9), 761-768. **IF 2.907**
- Cao, J., Ng, E. S., McNaughton, D., **Stanley, E. G.**, **Elefanty, A. G.**, Tobin, M. J., & Heraud, P. (2013a). **The characterisation of pluripotent and multipotent stem cells using Fourier transform infrared microspectroscopy.** *International Journal of Molecular Sciences*, 14(9), 17453-17476. **IF 2.464**
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- Castagnaro, L., Lenti, E., Maruzzelli, S., Spinardi, L., Migliori, E., Farinello, D., Sitia, G., Harrelson, Z., Evans, S. M., Guidotti, L. G., **Harvey, R. P.**, & Brendolan, A. (2013). **Nkx2-5(+)/islet1(+)** mesenchymal precursors generate distinct spleen stromal cell subsets and participate in restoring stromal network integrity. *Immunity*, 38(4), 782-791. **IF 19.795**
- Cerruti, B., Puliafito, A., Shewan, A. M., Yu, W., Combes, A. N., **Little, M. H.**, Chianale, F., Primo, L., Serini, G., Mostov, K. E., Celani, A., & Gamba, A. (2013). **Polarity, cell division, and out-of-equilibrium dynamics control the growth of epithelial structures.** *The Journal of Cell Biology*, 203(2), 359-372. **IF 10.822**
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- Dargaville, B. L., Vaquette, C., Rasoul, F., **Cooper-White, J. J.**, Campbell, J. H., & Whittaker, A. K. (2013). **Electrospinning and crosslinking of low-molecular-weight poly(trimethylene carbonate-co-(L)-lactide) as an elastomeric scaffold for vascular engineering.** *Acta Biomater*, 9(6), 6885-6897. **IF 5.093**
- Ellis, S. L., Heazlewood, S. Y., Williams, B., Reitsma, A. J., Grassinger, J., Borg, J., Heazlewood, C. K., Chidgey, A. P., & **Nilsson, S. K.** (2013). **The role of Tenascin C in the lymphoid progenitor cell niche.** *Experimental Hematology*, 41(12), 1050-61. **IF 2.907**
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- Farley, A. M.**, Morris, L. X., Vroegindeweij, E., Depreter, M. L., Vaidya, H., Stenhouse, F. H., Tomlinson, S. R., Anderson, R. A., Cupedo, T., Cornelissen, J. J., & Blackburn, C. C. (2013). **Dynamics of thymus organogenesis and colonization in early human development.** *Development*, 140(9), 2015-2026. **IF 6.208**
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- Godwin, J. W., Pinto, A. R., & **Rosenthal, N. A.** (2013). **Macrophages are required for adult salamander limb regeneration.** Proceedings of the National Academy of Sciences of the United States of America, 110(23), 9415-9420. **IF 9.737**
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- Heazlewood, S. Y., Neaves, R. J., Williams, B., **Haylock, D. N.**, Adams, T. E., & **Nilsson, S. K.** (2013). **Megakaryocytes co-localise with hemopoietic stem cells and release cytokines that up-regulate stem cell proliferation.** Stem Cell Research, 11(2), 782-792. **IF 4.467**
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Conference Proceedings (9)

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- Hidalgo-Gonzalez, A. Ovchinnikov, D.A. **A separable upstream promoter of the Slc8a1 (NCX1) gene efficiently marks cardiac cell populations derived from human pluripotent stem cells.** *Circulation Research*, 113, A010.
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- Lawrenz, A., Nason, F., **Cooper-White, J.** **Microfluidic-based microarrays for rapid, efficient single-cell capture of mammalian stem cells and algal cells.** Abstracts of Papers of the American Chemical Society, 245.
- Nordon, R. E.,** Cornwell, J., Li, J., **Harvey, R.P.,** & Schroeder, T. **Mapping and modelling ex vivo cell culture processes directly from cell tracking data.** 19th Annual International Society for Cellular Therapy Auckland, New Zealand Elsevier.
- Pera, M. F.** **Stem cells and regenerative medicine: The future is now.** *Journal of Gene Medicine* 15(8-9), 314-315.
- Radford, J., Wang, L., Li, J., Coad, B. R., McFarland, C.D., & **Nordon, R. E.** **A novel flash detection algorithm for single molecule counting with TIRF microscopy.** *Biomedical Imaging (ISBI)*, 2013 IEEE 10th International Symposium on. San Francisco, California, USA, Pgs 1066-1069.

Book Chapters (5)

Impact factors not available.

- Basrai, H. S., Christie, K.L., & **Turnley, A.M.** . **Regulation of basal and injury-induced fate decisions of adult neural precursor cells : focus on SOCS2 and related signalling pathways.** In S. W.-G. (Ed) (Ed.), *Trends in Cell Signalling Pathways in Neuronal fate Decision* (pp. 241-269). open access: In Tech.
- Chen, H., & **Nordon, R.E.** **Application of Microfluidics to Study Stem Cell Dynamics.** In M. K. D. R. I. Mahato (Ed.), *Emerging Trends in Cell and Gene Therapy* (435-470): Humana Press.
- Gill, K., & **Pébay, A.** **Spotlight: a brain perspective.** In M. S. TM Shaarawy, RA Hitchings, JG Crowston (Ed.), *Glaucoma*, Second Edition. In PRESS: Elsevier Publishers.
- Harvey, A.J., **Rathjen, J.,** & **Gardner, D.K.** **The metabolic framework of pluripotent stem cells and potential mechanisms of regulation.** In A. Pellicer, C. Simon, and R. Reijo-Pera, (Ed.), *Stem Cells in Reproductive Medicine* (3rd ed., pp. 164-179). Cambridge: Cambridge University Press, Cambridge.
- Nostro, M. C., Sarangi, F., Ogawa, S., Holtzinger, A., Corneo, B., Li, X., Micallef, S.J., Park, I.H., Basford, C., Wheeler, M.B., Daley, G.Q., **Elefanty, A.G., Stanley, E.G.,** Keller, G. **Pancreatic Differentiation.** Cambridge (MA): StemBook; Harvard Stem Cell Institute.



Cosmos Editor Elizabeth Finkel interviewing visiting scientist Chris Mason at our Therapeutic Potential of Stem Cells meeting.

Conference Participation 2013

Note: Presenters are first authors, unless highlighted in bold.

Invited Speakers (28)

- Bartlett, P. **Activation of different neurogenic precursor populations in the hippocampus: potential for restoring function in diseases like dementia.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Cooper-White, J. **Accelerating development of stem cell therapies using multiplex microbioreactor arrays.** Australasian Society for Stem Cell Research, Brisbane, Australia.
- Cooper-White, J. **Deterministic biomaterial platforms for the control of stem cell fate.** ABMC4, Hong Kong.
- Cooper-White, J. **Accelerated development of stem cell derived therapies using multiplexed microbioreactor arrays.** TERMIS Singapore.
- Cooper-White, J. **Deterministic material platforms for the biophysical manipulation of stem cell fate.** AERC, Leuven, Belgium.
- Gardiner, J., Lee, E-J., Riches, A., Winkler, D., Fehr, F., & Haylock, D. **Mimicking key cytokines TPO and SCF in the production of mature blood cells from haemopoietic stem cells.** Australian Peptide Conference, Penang, Malaysia.
- Harvey, R. **Cardiac gene regulatory networks in health and disease.** 17th International Congress of Developmental Biology, Cancun, Mexico.
- Harvey, R. **Cardiac transcription factor networks-targeting the kernel.** EMBO/EMBL Symposium Cardiac Biology: From Development to Regenerative Medicine, Heidelberg, Germany.
- Harvey, R. **Defining the Cardiac Gene Regulatory Network.** IORMC Indian Ocean Rim Muscle Colloquium, Singapore.
- Harvey, R. **Origins and Biology of Cardiac Mesenchymal Stem and Progenitor Cells.** University of Western Sydney School of Medicine, Sydney, Australia.
- Harvey, R., Aslie, N., Xaymardan, M., Chandrakanthan, V., Cornwell, J., Nordon, R., Waardenberg, A., Forte, E., Janbandhu, V., & Abeygunawardena, D. **Restoration of Self-Renewal and Potency in Mesenchymal Stem and Stromal Cells Derived from Aged and Injured Hearts.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Haylock, D. **Technology for manufacture of human platelets.** Gordon conference on megakaryocyte and platelet biology, Galveston, USA.
- Heazlewood, C. F. **Detection of markers that distinguish human fetal and maternal derived Mesenchymal Stem/Stromal cells (mScS).** Amata Gold Coast, Australia.
- Hough, S. R. **Application of single cell gene expression profiling to dissect the molecular heirarchy of cell states within pluripotent stem cell cultures.** Single Cell Genomics & Transcriptomics Asia Congress. Singapore.
- Munsie, M. **Impact of the Excluded Goods Order: Facilitating unproven SCTs in our own backyard.** ARCS Scientific Congress, Sydney, Australia.
- Nordon, R. **Application of competing risks regression to quantify the influence of microenvironment and kinship relationships on mutually exclusive stem cell fate outcomes.** Quantitative Single Cell Biology in Stem Cell Biology, Munich, Germany.
- Pera, M. **Modern technologies: the future of child health.** International Congress of Pediatrics, Australia.
- Pera, M. **Embryos, Chimeras, and Liposuction Clinics: "A Young Scientist's Guide to Stem Cell Ethics and Science Policy.** The Walter and Eliza Hall Institute of Medical Research Student Conference, Melbourne, Australia.
- Pera, M. **The Future is Now.** Australian Veterinary Association Annual Conference, Australia.
- Pera, M. **Stem Cells Gene Therapy and Regenerative Medicine: The Future is Now.** 8th Australian Gene Therapy Scientific Conference, Australia.
- Pera, M. **Stem Cells and Regenerative Medicine: The Future is Now.** GPCME Rotorua, New Zealand.
- Pera, M. **Ethics of human embryonic stem cells.** The 4th Bootes course on translational medicine, ANU, Australia.

- Polo, J. **Unveiling the reprogramming pathway**. Stem Cells in Science & Medicine- ISSCR Regional Forum Series. Suzhou, China.
- Rosenthal, N. **Immune regulation of muscle regeneration**. IORMC Indian Ocean Rim Muscle Colloquium. Singapore.
- Stanley, E. **Cell fate Control and Conversion**. Stem Cells in Science & Medicine- ISSCR Regional Forum Series Suzhou, China.
- Titmarsh, D., Frith, J., Hudson, J., Padmanabhan, H., Ovchinnikov, D., Wolvetang, E., & Cooper-White, J. **Accelerating development of stem cell-derived therapies using multiplexed microbio reactor arrays**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Turnley, A. **Targeting neurogenesis and newborn neuron survival to promote repair of neural injury**. 4th Australian Neurotrauma Symposium, Hobart, Australia.
- Wolvetang, E., Ovchinnikov, D.A., Briggs, J.A., Nayler, S.P., Grimmond, S., Lavin, M., & Wells, C.A. **Gene regulatory networks in iPSC from neurodegenerative diseases identify novel disease mechanisms and therapeutic targets**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.

Members of Conference Organising Committees (19)

- Bourne, J. **ANS Chair, Organising committee**. Australian Neuroscience Society 33rd Meeting, Melbourne, Australia.
- Elefanty, A. **Conference organising committee**. Stem Cells in Science & Medicine- ISSCR Regional Forum Series, Suzhou, China.
- Graham, R. **Symposium Co-Chair**. Cardiac Biology - From Development to Regenerative Medicine, Heidelberg, Germany.
- Harvey, R. **Conference Committee Member**. 2013 International Society for Stem Cell Research (ISSCR), Boston MA, USA.
- Harvey, R. National Centre for Cardiovascular Research (CNIC) (**Conference Organiser**). Cardiovascular Development, Disease and Repair, Madrid, Spain.
- Kilpatrick, T. **Theo Murphy High Flyers Think Tank Steering Committee member**, Inspiring Smarter Brain Research in Australia, Melbourne, Australia.
- Munsie, M. **Symposium Organising Committee**. Stem Cells and Cancer, Melbourne, Australia.
- Munsie, M. **Theo Murphy High Flyers Think Tank Steering Committee member**, Inspiring Smarter Brain Research in Australia, Melbourne, Australia.
- Neilsen, L. **Co-Chair of Conference**. ECI Scale-Up and Manufacturing of Cell-based Therapies, San Diego USA.
- Pera, M., Haylock, D., & Munsie, M. **Conference Organising Committee**. Therapeutic Potential of Stem Cells: Prospects & Pitfalls, Melbourne, Australia.
- Pera, M. **Symposium Chair**. Stem Cells and Cancer, Melbourne, Australia.
- Pera, M. **Panel Member**. The International Society for Stem Cell Research Annual Meeting, United States.
- Pera, M. **Stem Cells Session Chair**. 2013 Hunter Cellular Biology Meeting, Australia.
- Pera, M. **Panel Chair**. ISSCR 11th Annual Meeting, Boston, United States.
- Pera, M. **Session Chair**. New Zealand General Practitioners Annual Conference, New Zealand.
- Pera, M. **Conference Convenor**. Japan Integrated Cell-Material Sciences (iCeMS) Joint Symposium, Australia.
- Pera, M. **Conference Convenor**. Stem Cells Australia 2013 Annual Retreat, Australia.
- Rosenthal, N. **Symposium Chair**. Cardiac Biology - From Development to Regenerative Medicine, Heidelberg, Germany.
- Wolvetang, E. **Conference Organiser/ Chair**. CRA's Inaugural Annual Collaborative Conference - Frontiers in Cell Programming, Brisbane.

Oral Presentations (31)

- Christie, K. J., Turbic, A., & Turnley, A. M. Adult hippocampal neurogenesis, Rho kinase inhibition and enhancement of neuronal survival. Journal Name: Proceedings of the Australian Neuroscience Society, Melbourne, Australia.
- Cooper-White, J. **Diagnostic microbio reactor arrays for screening of pluripotent stem cell expansion, maintenance and differentiation**. Hybrid materials Conference, Sorrento, Italy.
- Godara, P., Berry, J., Cartledge, K., **Haylock, D.** **Development of a 2-chamber bioreactor for megakaryocyte culture**. Australasian Society for Biomaterials and Tissue Engineering, Melbourne, Australia

- Hidalgo- Gonzalez, A. **A separable upstream promoter of the Slc8a1 (NCX1) gene effeciently marks cardiac cell populations derived from human pluripotent stem cells.** Basic Cardiovascular Science 2013, Las Vegas, USA.
- Hobbs, R. **The Tsc2-mTORC1 signaling axis controls germline stem cell fate.** ISSCR 11th Annual Meeting, Boston MA, USA.
- Iismaa, S. **Myocardial response to injury is augmented by preservation of postnatal cardiomyocyte proliferative competence.** 21st St Vincents & Mater Health Sydney Research Symposium, Sydney, Australia.
- Kotey, J. **Australian stem cell tourism to China: benefit or burden to Chinese health care?** Sustainable Health Futures HDR forum, Jiao Tong University, Shanghai, China.
- Kotey, J. **Negotiating hope: stem cell tourism to China.** From Suffering to Hope: Sociology of Health Beyond Medicalisation Workshop, Prato, Italy.
- Kowalczyk, W., Sanchez, J., Kraaz, P., Meagher, L., Haylock, D., Hutt, O., & Duggan, P. **Peptide-boronic Acid Libraries for Saccharide Recognition.** 23rd American Peptide Symposium, 2013., Hawaii, Big Island, Prompt Scientific Publishing San Diego, USA.
- Laslett, A. L. **iPS Reversion.** CRA's Inaugural Annual Collaborative Conference - Frontiers in Cell Programming, Brisbane, Australia.
- Lee, E.-J., Riches, A.G., Gardiner, J., Fehr, A., Vinson, A.R., Be, C.L., McKinstry, B., Adams, T., & Haylock, D. **Haemopoietic stem cell culture on cytokine-immobilised substrates.** Australasian Society for Biomaterials and Tissue Engineering, Melbourne, Australia.
- Lees, J. G., Gardner, D.K., & Harvey, A.J. **Oxygen regulates human embryonic stem cell mitochondrial biogenesis.** Proceedings of the Society for Reproductive Biology Annual Conference, Sydney, Australia.
- Little, M. H. **Organ Reprogramming.** CRA's Inaugural Annual Collaborative Conference - Frontiers in Cell Programming, Brisbane, Australia.
- Mason, E. A. **Gene expression variability as a unifying element of the pluripotency network.** SCA 2013 Retreat, Australia.
- Merson, T. D., Xing, Y.L., Roth, P., & Kilpatrick, T.J. **Spatiotemporal and genetic fate-mapping of oligodendrogenesis during normal development and following demyelination.** XI European Meeting on Glial Cells in Health and Disease, Berlin, Germany.
- Munsie, M. **Managing hope. From Suffering to Hope: Sociology of Health Beyond Medicalisation Workshop,** Prato, Italy.
- Nordon, R. **A novel flash detection algorithm for single molecule counting with TIRF microscopy.** 2013 IEEE 10th International Symposium on Biomedical Imaging (ISBI), San Francisco, CA, USA.
- Nordon, R. E., Cornwell, J., Draper, J.S., Hallet, R., Auf der Mauer, S., Motazedian, A., Schroeder, T., & Harvey, R.P. **Quantifying the influence of microenvironment and cell kinship relationships on the competing fates of multipotent cells.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Nordon, R. E., Cornwell, J., Li, J., Harvey, R.P., & Schroeder, T. **Mapping and modelling ex vivo cell culture processes directly from cell tracking data.** 19th Annual International Society for Cellular Therapy Auckland, New Zealand Elsevier.
- Pébay, A., Frisca, F., Crack, P.J., Crombie, D., Sabbadini, R., & Goldshmit, Y. **Lysophosphatidic acid signalling in neural stem/progenitor cells and in neurotrauma.** 24th International Society for Neurochemistry Biennale Meeting. Cancun, Mexico.
- Pera, M. F. **Stem cells and regenerative medicine: The future is now.** 8th Meeting of the Australasian-Gene-Therapy-Society. University of Technology, Sydney, Australia.
- Petersen, A., Tanner, C., Munsie, M. **When hopes cash - patient optimism confronts scientific evidence.** From Suffering to Hope: Sociology of Health Beyond Medicalisation Workshop, Prato, Italy.
- Petersen, A., Tanner, C., Munsie, M. **When hopes cash - patient optimism confronts scientific evidence.** Australian Sociology Association Annual Conference, Melbourne, Australia.
- Radford, J., Wang, L., Li, J., Coad, B. R., McFarland, C.D., & Nordon, R. E. **A novel flash detection algorithm for single molecule counting with TIRF microscopy.** Biomedical Imaging (ISBI), 2013 IEEE 10th International Symposium on. San Francisco, California, USA.
- Takasato, M., Becroft, M., Er, P., Vanslambrouck, J.M., Stanley, E., Elefanty, A., & Little, M.H. **Directing the differentiation of human ES cells towards a renal fate.** 6th Annual Meeting for Australasian Society for Stem Cell Research Brisbane, Australia.
- Turnley, A. **EphA4 and neural regeneration following spinal cord injury and neuroinflammation.** U.S Society for Neuroscience Annual Meeting, San Diego, USA.
- Wells, C. **Stemformatics: biology-centric approaches for visualising and navigating stem cell datasets.** Centre for regenerative medicine, Edinburgh.

- Wells, C. **Systems biology of infection**. U Copenhagen, Copenhagen, Denmark.
- Wells, C. **Systems biology of stem cells**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Wolvetang, E., & Verma, P. **Human iPS**. CRA's Inaugural Annual Collaborative Conference - Frontiers in Cell Programming, Brisbane, Australia.
- Yap, C., Goh, H.M., Familiar, M., Rathjen, P., & Rathjen, J. **Definitive endoderm formation from pluripotent cells in culture: A role for p38 MAPK**. 6th Annual Meeting for Australasian Society for Stem Cell Research Brisbane, Australia.

Poster Presentations (35)

- Basrai, H. **Regulation of newborn neuron survival in the adult brain by Suppressor of Cytokine Signalling 2 (SOCS2)**. 4th Australian Neurotrauma Symposium, Hobart, Australia.
- Bellmaine, S. **Dual-specificity Tyrosine Phosphorylation-regulated Kinase (DYRK) Action in Stem Cell Differentiation and Self-renewal**. International Chemical Biology Society 2nd Annual Conference, Kyoto, Japan.
- Bellmaine, S. F., Williams, S.J., & Pera, M.F. **The role of dual-specificity tyrosine phosphorylation-regulated kinases (DYRKs) in human embryonic stem cell differentiation and self-renewal**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Christie, K. J., & Turnley, A.M. **Adult hippocampal neurogenesis, Rho kinase inhibition and enhancement of neuronal survival**. U.S. Society for Neuroscience Annual Meeting, San Diego, USA.
- Denham, M., Hasagawa, K., Zhang, D., Hough S.R., Menheniott, T., Leung, J., Rollo, B., Newgreen, D., Pera, M., & Dottori, M. **Induction of human pluripotent stem cells to a pre-neuroepithelial state to generate floor plate and roof plate progenitors**. Annual meetings of the International Society for Stem Cell Research, Boston MA, USA.
- Denham, M., Hasagawa, K., Zhang, D., Hough S.R., Menheniott, T., Leung, J., Rollo, B., Newgreen, D., Pera, M., & Dottori, M. **Modeling human neural crest development with pluripotent stem cells**. Annual meetings of the International Society for Stem Cell Research (ISSCR), Boston MA, USA.
- Denham, M., Hasagawa, K., Zhang, D., Hough S.R., Menheniott, T., Leung, J., Rollo, B., Newgreen, D., Pera, M., & Dottori, M. **Dorso-ventral axis specification in human pluripotent stem cells derived neural progenitors to generate floor plate and roof plate lineages**. EMBO workshop, Morphogen Gradients, Oxford, UK.
- Farley, A. M., Braxton, D.R., Hasegawa, K., & Pera, M. **The GCTM-5 Epitope Associated with the Mucin-like Glycoprotein FCGBP Maris Ductal Progenitor Cells in Liver, Esophagus and Pancreas**. ISSCR 11th Annual Meeting, Boston, USA.
- Fernando, C. V., Niclis, J., Blakey, B.D., Bye, C.R., Turner, B.J., Kele, J., Stenman, J., Arenas, E., & Parish, C.L. **Diverse roles for Wnt7a in midbrain neurogenesis and dopaminergic axon morphogenesis**. 6th Annual Meeting for Australasian Society for Stem Cell Research Brisbane, Australia.
- Firas, J., Nefzger, C.M., Lim, S.M., & Polo, J.M. **Optimised derivation of induced pluripotent stem cells from human and mouse granulocytes**. ISSCR, Boston MA, USA.
- Frisca, F., Kaslin, J., Goldshmit, Y., Crombie, D.E., Dottori, M., & Pébay, A. **Role of LPA in the neural maintenance and differentiation of human pluripotent stem cells**. Australian Neuroscience Society Meeting, Melbourne, Australia.
- Gel, M., Kandasamy, S., Cartledge, K., & Haylock, D. **Fabrication of micro pore arrays in free standing COC membranes and it's application for on-chip model of bone marrow micro vascular niche**. IMEMS 2013 IEEE 26th International conference, Taipei, Taiwan.
- Harvey, A. J., Lees, J.G., Rathjen, J., Yu, L.J., Sheedy, J.R., & Gardner, D.K. **Regulation of human embryonic stem cell metabolism by oxygen**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Heazlewood, C. F., Rohart, F., Mason, E., Fisk, N., Wells, C., & Atkinson, K. **The identification of markers that distinguish human fetal and maternal MSC derived from the term placenta**. 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Henderson, T. M. A., Ladewig, K., Haylock, D., McLean, K., & O'Connor, A.J. **Macro-porous hydrogels for soft tissue engineering and cell culture**. Australian Society for Biomaterials and Tissue Engineering (ASBTE), Melbourne, Australia.
- Hidalgo- Gonzalez, A. **A separable upstream promoter of the Slc8a1 (NCX1) gene efficiently marks cardiac cell populations derived from human pluripotent stem cells**. ASSCR, Brisbane, Australia.
- Hobbs, R. M., & Pandolfi, P.P. **The Tsc2-mTORC1 signaling axis controls germline stem cell fate**. 10th International Congress of Andrology, Melbourne, Australia.

- Iismaa, S. **Myocardial response to injury is augmented by preservation of postnatal cardiomyocyte proliferative competence.** 21st St Vincents & Mater Health Sydney Research Symposium, Sydney, Australia.
- Iismaa, S. **Preserved cardiomyocyte proliferative competence augments myocardial response to injury.** EMBO/EMBL Symposium: Cardiac Biology, from development to regenerative medicine, Heidelberg, Germany.
- Lamshead, J., O'Brien, C., Meagher, L., & Laslett, A. **Characterisation of human pluripotent stem cells adapted to distinct culture surfaces.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Lau, K. X., Lackovic, K., Gardner, D.K., Rathjen, P.D., & Rathjen, J. **Novel inducers of Primitive streak intermediates formation.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Li, J., Suhaimi, N., Ariunbold, U., Takasato, M., Sunn, N., & Little, M. **MSC-like cells derived from renal epithelial origin demonstrate specific differentiation and integration capacity.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Loi, T. H., Tan, A.J.H., Tao, H., Wolvetang, E., & Ma, D. **Gene expression changes associated with an increased erythro-megakaryocytic lineage and clonogenic potential of Trisomy 21 iPSCs.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Mason, E. A., Mar, J.C., Laslett, A., Pera, M., Quackenbush, J., Wolvetang, E., & Wells, C.A. **Gene expression variability as a unifying element of the pluripotency network.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Mosbergen, R., Korn, O., Choi, J., Seidenman, N., Matigian, N., & Wells, C. **Stemformatics: stem cell gene expression.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Nefzger, C., Horvay, K., Firas, J., Abud, H. E., & Polo, J.M. **Transcriptional and Functional Decline of the Intestinal Stem Cell Niche during the Ageing Process.** ISSCR, Boston MA, USA.
- Nefzger, C. M., Horvay, K., Jardé, T., Firas, J., Abud, H.E., & Polo, J.M. **Transcriptional and functional decline of the intestinal stem cell niche during ageing.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Ovchinnikov, D., Hidalgo, A., Yang, S., Zhang, X., Hudson, J., Cooper-White, J., & Wolvetang, E. **A separable upstream promoter of the human SLC8A1 (NCX1) gene efficiently marks a contractile cardiomyocyte population in human pluripotent stem cell-derived cardiomyogenic cultures.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Padmanabhan, H., Frith, J.E., Titmarsh, D.M., & Cooper-White, J.J. **High Throughput Screening of Wnt Modulators for Osteogenesis.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Tan, B. S. N., Gardner, D.K., Rathjen, P.D., & Rathjen, J. **Amino acids and the regulation of ES cell differentiation.** Cell Reprogramming Australia Conference, Brisbane Australia.
- Tan, B. S. N., Gardner, D.K., Rathjen, P.D., & Rathjen, J. **Amino acids and the regulation of ES cell differentiation and the embryo.** Melbourne Cell and Developmental Biology Meeting, Melbourne, Australia.
- Tan, N., Gardner, D.K., Rathjen, P.D., & Rathjen, J. **System A amino acid transporters in pluripotent ES cells and the embryo.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Thakar, N., Ovchinnikov, D., Hastie, M., Gorman, J., & Wolvetang, J. **RELB forms a tri-partite complex with LIN28A and IMP3, co-localizes in stress granules, regulates expression of IGF2 and cell cycle genes, and arbitrates between proliferation and differentiation of human pluripotent stem cells.** 6th Annual Meeting for Australasian Society for Stem Cell Research, Brisbane, Australia.
- Xing, Y. L., Kilpatrick, T.J., & Merson, T.D. **Spatiotemporal mapping of oligodendrogenesis by neural precursor cells following cuprizone-induced demyelination.** 33rd Annual Meeting of the Australian Neuroscience Society, Melbourne, Australia.
- Xing, Y. L., Röth, R.T., Chuang, B.H.A., Kilpatrick, T.J., & Merson, T.D. **Adult neural precursor cells are major contributors to oligodendrocyte regeneration and CNS remyelination following cuprizone-induced demyelination.** 43rd Annual Meeting of the Society for Neuroscience, San Diego, USA.

Participation in Community Events

Community or Patient Advocacy Meetings

We would like to acknowledge and thank our partners and participants for their support of our 2013 community outreach activities. Stem Cells Australia members are highlighted in bold:

Stem Cells: Hope, Hype and Progress in Perth. In association with Spinal Cord Injury Network, Stem Cells Australia and Spine & Limb Foundation. Participants included Alan Mackay-Sim, **Megan Munsie** and Sarah Dunlop

Diabetes and Stem Cells: Hype, Hope and Progress in Melbourne and Sydney. In association with the National Stem Cell Foundation of Australia, JDRF, Bio21 cluster, NSW Stem Cell Network and Australian Diabetes Council. Participants included **Ed Stanley, Megan Munsie, Mark Ross, Allan Robins, Maria Craig, Nicola Stokes** and Bernie Tuch.

Stem Cells & Cerebral Palsy: The Promise & The Progress in Sydney. In association with Cerebral Palsy Alliance Research Foundation and NSW Stem Cell Network. Participants included Iona Nowak, **Megan Munsie, Euan Wallace, Stephen Archer** and Andrew Buchanan.

Stem Cell Revolutions – Special event for students in Melbourne, Sydney and Brisbane. In association with the National Stem Cell Foundation of Australia, EuroStemCell, Melbourne Neuroscience Institute, Quantum Victoria, NSW Stem Cell Network and the Australasian Society for Stem Cell Research. Participants included Clare Blackburn, Kate Doherty, **Megan Munsie, Kathy Davidson, Toby Merson, Alison Farley, Alex Pinto, Tim Hendersen, Ernst Wolvetang, Jatin Patel, Caitlin Bridges, Michael Morris, Nick Di**

Girolamo, Uli Schmidt, Heather Main, **Alexis Bosman** and Chris Juttner. Special thanks to the state teachers associations, Gene and Technology Access Centre and student recruitment at The University of Melbourne and The University of Queensland for their help in promoting the events, and we would also like to thank the 18 schools who participated.

Stem Cell Revolutions – Special event for teachers in Melbourne. In association with the National Stem Cell Foundation of Australia, EuroStemCell and Melbourne Neuroscience Institute. Participants included Clare Blackburn, Kate Doherty, **Megan Munsie, Mirella Dottori** and **David Elliott**.

Stem Cell Revolutions – Special event for general public in Melbourne. In association with Melbourne Neuroscience Institute and EuroStemCell. Participants included **Lachlan Thompson, Megan Munsie, Mario D’Cruz** and Elizabeth Finkel.

Megan Munsie and Adam Johnston at the CP Alliance Forum



Outreach Activities

Mathison Lecture The University of Melbourne, Victoria – **Doug Hilton**

The Promise of Regenerative Medicine - Can the body use stem cell to repair itself? AUSIMED public event, Melbourne, Victoria – **Nadia Rosenthal**

Brain Bee Victorian Final The University of Melbourne, Victoria – **Megan Munsie**

Mornington Inner Wheel Club Frankston, Victoria – **Megan Munsie**

Seymour and District University of the Third Age Seymour, Victoria – **Megan Munsie**

Science, Technology and the Future conference Melbourne, Victoria – **Megan Munsie**

Work experience programs for high school students **Daniel Blashki, Claire Cuddy, Mirella Dottori, Alison Farley, Shelley Hough, Toby Merson, Anna Michalska, Megan Munsie** and **Nic Tan**

Media Coverage

Press Releases

Available on our website

Includes those related to Stem Cells Australia research released by partners

Petri dish lens' gives hope for new eye treatments (Monash) 31 January 2013.

Japan-Australia collaboration to accelerate stem cell research (SCA & iCeMS) 12 February 2013.

Understanding cancer - what stem cells can teach us about what goes wrong in cancer (SCA) 15 April 2013.

Bringing together stem cell researchers to accelerate translation to the clinic (SCA and Bio21 Cluster) 13 May 2013.

Public forum to demystify stem cell treatment for cerebral palsy and urge caution about overseas 'stem cell tourism' (SCA, NSW Stem Cell Network and the Cerebral Palsy Alliance) 21 May 2013.

CSIRO develops test to improve stem cell safety (CSIRO) 4 June 2013.

Research reprograms future of kidney health (University of Queensland) 14 June 2013.

Australian researchers part of international team to combat heart disease (SCA, Monash University, ARMI and VCCRI) 17 June 2013.

UQ researchers grow kidney from stem cells (University of Queensland) 13 December 2013.

NHMRC places unproven stem cell treatments on the agenda for Australian doctors and patients (SCA) 19 December 2013.

Media Coverage

Stories which directly related to SCA activities

Stem cell face-lift caused bone growth. The Advertiser. 8 January 2013.

Embedded dangers of unproven stem cell treatments. Drive Program at Radio 6PR in Perth, WA. 8 January 2013.

What's the stem cell regulatory scenario like in APAC? BioSpectrum. 30 January 2013.

Eye-opener as scientists grow lens cells. The Age. 31 January 2013.

The potential of stem cell therapies. Australian BioTechnology. 1 March 2013.

Stem Cells Australia. Australian BioTechnology. 1 March 2013.

Pioneering stem cell research shows promising treatment for AMD. Australian Optometry. 1 March 2013.

Stem cell tourism. Mornings on 720, Perth. 22 April 2013.

Lost in Science. 3CR Melbourne and throughout Australia. 25 April 2013.

Footballers being used 'as stem cell lab rats'. The Weekend Australian. 4 May 2013.

Boots, guts and biochemistry. The Weekend Australian Magazine. 4 May 2013.

Breakthrough: stem cells from a cloned embryo [Over 450 mentions including The Age, The Canberra Times, Sunday Age, Sydney Morning Herald; all of the capital city News Ltd websites and all of the major Fairfax websites. Related stories also aired on ABC1, ABC News 24, Lateline, SBS World News, Channel 10 News, The Project ABC, NewsRadio Breakfast, ABC The World Today and on over 350 online news websites]. 16-19 May 2013.

Warnings about overseas treatments for cerebral palsy. ABC The World Today. 22 May 2013.

CSIRO scientists develop safety test for induced pluripotent stem cells. ABC News. 4 June 2013.

The rise of stem cell tourism. Courier Mail and Herald Sun. 6 July 2013.

Scientists hope 3D fake brain will help research. ABC Radio AM. 29 August 2013.

Dr Mirella Dottori discusses growing brain fragments from stem cells. ABCNEWS 24 29 August 2013.

Cutting Edge Cures - Rebuilding with stem cells. Women's Health and Fitness. 1 September 2013.

Sunshine Coast mum flies to Beijing for unproven stem cell treatment for autistic daughter. Courier Mail. 12 October 2013.

Immortal Science. Australian Life Scientist. 1 November 2013.

Stem-cell prize helps target cure. The Australian. 14 November 2013.

Stem Cells: Hype or Hope. 'The Curious Country' (Edited by Leigh Dayton) p128-132.

Scientist muscles in on stem cell therapy. Herald Sun 10 December 2013.

Miniature kidney grown in a dish. [612 mentions including The Courier Mail, The Age, the Herald Sun, The Canberra Times, the Adelaide Advertiser and the Hobart Mercury; The Australian, ABC Science, all of the capital city News Ltd websites and all of the major Fairfax websites. It was also aired on ABC News TV and radio nationally, Channels 7, 9 and 10 nationally]. 16 December 2013.

Stem cell warning: experts fear experimental treatments will lead to serious injury. ABC News Radio and TV (national coverage). 19 December 2013.

Financial Statement

Financial Statement For Calendar Year January To December 2013				
STEM CELLS AUSTRALIA	2011	2012	2013	Total
ARC Funds	1,500,000.00	3,164,498.00	3,286,248.00	7,950,746.00
Other Contributions	826,800.00	1,703,433.00	1,630,893.70	4,161,126.70
Total Income	2,326,800.00	4,867,931.00	4,917,141.70	12,111,872.70
Salaries and oncosts	561,770.89	3,172,172.63	3,223,925.04	6,957,868.56
Consumables and other costs	184,495.07	1,584,533.52	2,076,697.00	3,845,725.59
Total Expenses	746,265.96	4,756,706.15	5,300,622.04	10,803,594.15
Net Activity for the year	1,580,534.04	111,224.85	(383,480.34)	1,308,278.55
Carry over balance	-	1,580,534.04	1,399,154.42	
Balance at 31 Dec	1,580,534.04	1,691,758.89	1,015,674.08	1,308,278.55

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.


 Jay Solanki CPA
 Research Accountant
 Finance & Planning Group

02/04/2014
 Date

Finance and Planning

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