



Bringing research to life

for the heart of Australia...





OUR MISSION

“The relief of pain and suffering and the promotion of well-being, through an understanding of the fundamental mechanisms of cardiovascular biology in health and disease.”

Victor Chang Cardiac Research Institute
2013 Annual Report

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Trustee's Foreword



The Trustees are privileged to meet many dedicated and committed people as we visit the facilities among the health, health research, education and welfare works initiated by Sisters of Charity. This year particularly as we celebrate the 175th anniversary of the arrival in Sydney of the first five Sisters from Ireland.

The Sisters recognised the importance of research as fundamental to better health outcomes and this a vital component of the Sisters', and now our, commitment of service of the poor and marginalised in our community. The additional legacy of the skills and passionate care of Dr Victor Chang is continued through this Institute by the research undertaken and the translation of research into high quality care and outcomes.

The Trustees take this opportunity of expressing our immense gratitude to Mr Steven Lowy AM for his almost twenty years of service to the Institute as Board member and Chairman. His contribution as leader is immeasurable. We welcome the new Chairman Mr Matthew Grounds. We also thank Professor Bob Graham, the Board, staff and supporters for your continuing contribution and success.

On behalf of the Trustees of Mary Aikenhead Ministries, I am pleased to commend to you the 2013 Annual Report of Victor Chang Cardiac Research Institute.

David Robinson

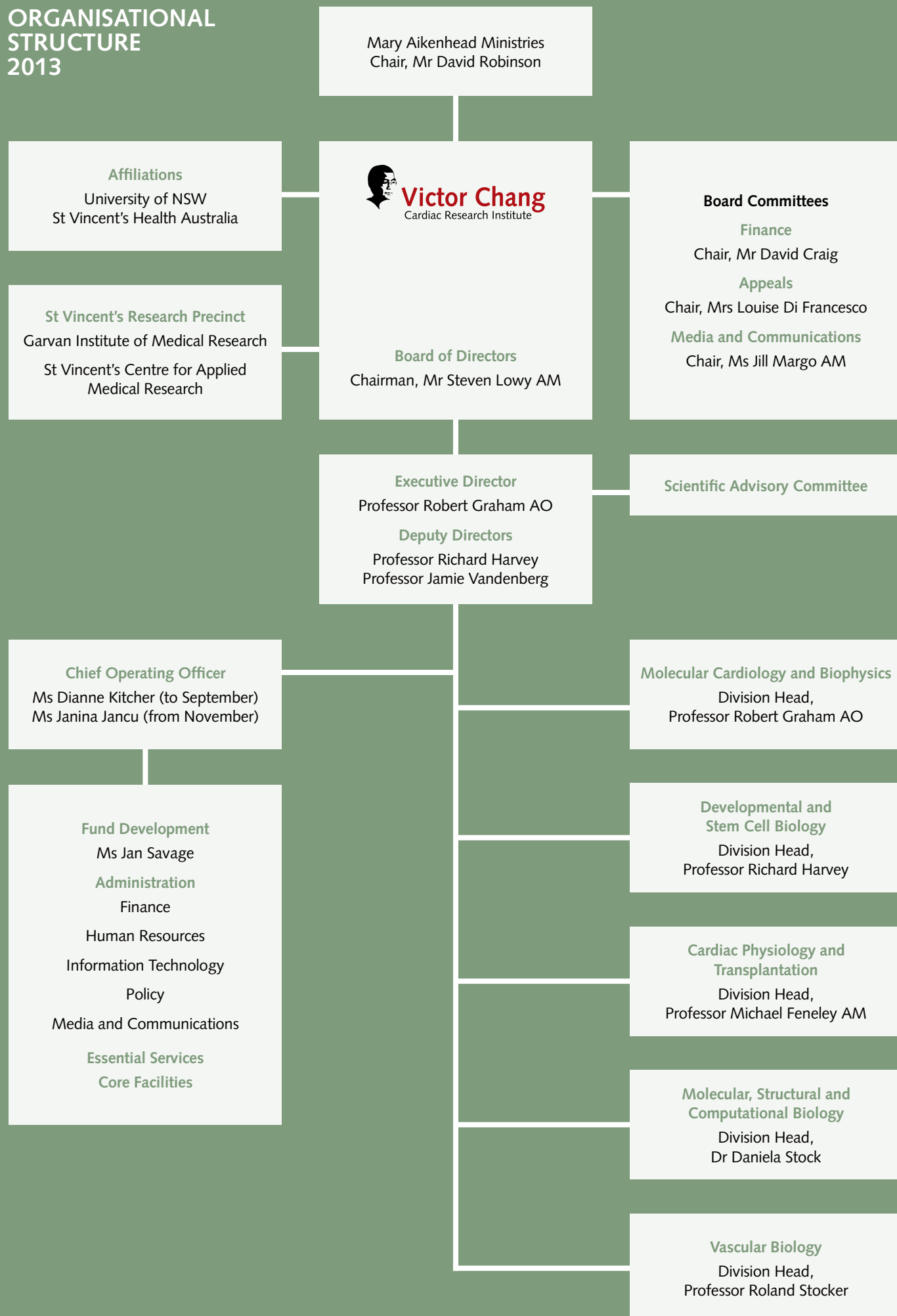
Chairman,
Trustees of Mary Aikenhead Ministries



Mary Aikenhead Ministries was established by the Holy See as a Public Juridical Person at the request of the Congregation of the Religious Sisters of Charity of Australia to succeed to, and to carry on and expand, various health and aged care, education and welfare ministries conducted by the Sisters of Charity.

The Victor Chang Cardiac Research Institute Limited is a Research Ministry within Mary Aikenhead Ministries, which operates in accordance with the Canonical Statutes approved by the Holy See in Rome. Mary Aikenhead Ministries also assumes an Australian civil identity under Australian law as the Trustees of Mary Aikenhead Ministries. The Trustees operate pursuant to the Constitution of Trustees of Mary Aikenhead Ministries. In 2013, the Trustees are Mr David Robinson, Sr Helen Clarke, Professor Gabrielle McMullen, Ms Rowena McNally, Dr Tessa Ho and Mr Jim Russell.

ORGANISATIONAL STRUCTURE 2013



About Us

WHO WE ARE

Founded in 1994, originally under the auspices of the Sisters of Charity and St Vincent's Hospital, the Victor Chang Cardiac Research Institute became an independent research facility in 1995. It is committed to excellence in research, training and the rapid translation of discoveries into new diagnostic, preventative and therapeutic regimens for people with or at risk of heart disease. The Institute is dedicated to the memory of cardiac surgeon Victor Chang and his passionate belief in the power of discovery.

Our team of over 150 full-time staff work across five research divisions – Cardiac Physiology and Transplantation, Developmental and Stem Cell Biology, Molecular Cardiology and Biophysics, Molecular, Structural and Computational Biology, and Vascular Biology.

OUR INSPIRATION

A pioneering surgeon, researcher and humanitarian, Dr Victor Chang AC founded the National Heart Transplant Program at St Vincent's Hospital in 1984, and in 1990 spearheaded the Heart of St Vincent's Appeal.

This Appeal raised much-needed funds for a Cardiac Transplant Ward and Cardiac Diagnostic Unit at St Vincent's – and created the impetus for establishing the Victor Chang Cardiac Research Institute after his untimely death in 1991.

ESTABLISHMENT

The new Institute was opened on 14th February 1994, thanks to generous donations from the late Mr Kerry Packer, AC, the Federal Government, and the Australian public. The Institute was incorporated as an independent research facility on 27th February 1995. In 1996, the Institute's temporary premises in the Garvan Building were opened by the late Diana, Princess of Wales.

INDEPENDENCE

Through contributions from the NSW and Australian Federal Governments, the Lowy and Packer families, the Atlantic Philanthropies, the National Australia Bank, ANZ Bank, Citigroup and many others, the \$80 million Lowy Packer Building was constructed and formally opened by Her Royal Highness Crown Princess Mary of Denmark on September 3, 2008.

WORKING FOR A BETTER FUTURE

In Australia, more than 45,000 people die of cardiovascular disease each year. It kills one Australian every 12 minutes. Heart failure also remains the most common cause of hospital admissions for people aged over 65, although it can affect anyone regardless of age or gender. Through heart surgery, Dr Victor Chang was able to save hundreds of lives, but he knew that research could save thousands.

In his memory, the five research divisions and 17 laboratories of the Institute work with a single vision – to reduce the incidence, severity and impact of heart diseases, particularly those causing heart muscle diseases, which directly affect the heart's ability to pump sufficient blood for the body's needs and can result in the most severe forms of heart failure.

These research programs address vital contemporary issues – including heart development and congenital heart disease, inherited heart diseases, the potential application of adult stem cell technologies in cardiovascular care, cardiac arrhythmias, and how heart function is regulated in response to stresses like high blood pressure and ageing.

“In Australia, more than 45,000 people die of cardiovascular disease each year – one every 12 minutes.”

Our Inspiration: Dr Victor Chang

VICTOR CHANG, AC (1936 – 1991)

A highly accomplished surgeon, humanitarian and skilled campaigner, Dr Victor Chang was a pioneer in the modern era of heart transplantation.

His achievements include the development of Australia's National Heart Transplant Program at St Vincent's Hospital, which has performed thousands of successful heart, heart-lung, and single lung transplants since 1984. He also

saw the incredible value of research – playing a key role in the development of an artificial heart valve and, in later years, an artificial heart assist device.

Victor Chang (Yam Him) was born in Shanghai to Australian-born Chinese parents in 1936. He came to Australia in 1953 as a student at the Christian Brothers College, Lewisham. In 1962 he graduated from Sydney University with a Bachelor of Medicine, Bachelor of Surgery, becoming an intern and, later, a registrar in cardiothoracic surgery at St Vincent's Hospital.

Travelling overseas to extend his skills, Dr Chang attained a Fellowship in Surgery from the English and American College of Surgeons and returned to St Vincent's Hospital in 1972, where he worked with the renowned Dr Harry Windsor and Dr Mark Shanahan, who had performed Australia's first heart transplant at St Vincent's Hospital in 1968.

During the 1980's Dr Chang lectured extensively in China, Hong Kong, Indonesia, Singapore and Malaysia. He also founded the Australasian-China Medical Education and Scientific Research Foundation, which sponsored South-East Asian doctors, nurses and students to work in Australia to develop improved skills and quality-of-care to take back to their home countries.

At the same time, he helped teams from St Vincent's travel to China, Singapore and Indonesia where they shared their medical, surgical, nursing, hospital administration and audiovisual expertise.

In 1986 Dr Chang was awarded Australia's highest recognition, a Companion of the Order of Australia (AC), while the University of New South Wales awarded him its highest degree of MD (Honoris Causa) for "scholarly achievement and humanitarian endeavour".

Victor Chang died in tragic circumstances in Sydney on 4 July 1991.

He was an honorary Professor of Surgery to the Chinese Academy of Medical Science in Peking; an honorary Professor of Surgery to Shanghai Medical School; official adviser on cardiac surgery development in Indonesia; and a member of the Australia China Council.

In 2000, Dr Victor Chang was named Australian of the Century by the people of Australia.

“**In 2000, Dr Victor Chang AC was named Australian of the Century by the people of Australia.**”



Chairman's Report

Dr Victor Chang was a truly remarkable Australian, a pioneering cardiothoracic surgeon and humanitarian with a passionate belief in the power of discovery. Victor knew that through surgery, hundreds of lives would be saved, but that medical research would save many thousands more.

It is this belief that has sustained and inspired the work of all involved with the Victor Chang Cardiac Research Institute since it was established in 1994 to honour Victor Chang's memory and continue his work.

This is my final report as Chairman, having decided to retire after nearly 20 years' service on the board, seven as Chairman, and it presents an opportunity to reflect on the role of the Institute in our society.

I believe the Institute has made, and continues to make, an enormous contribution not just to our current lives and to the life of Sydney, but to the ongoing story of human development.

That sounds like a grand statement, but it's true.

Throughout history, and especially over the past 100 years or so, the human race has taken great strides forward in all areas of human endeavour, and especially in the field of medical research.

The impact has been immense.

It has meant we live longer and more fulfilling lives. It has reduced the burden of misery and disease and early death for millions around the world.

But we have become conditioned to this progress.

We take it for granted, as though it occurs naturally and that progress will somehow continue to be made.

As our researchers at the Institute know all too well, it doesn't work like that.

Progress comes from painstaking work, week after week, year after year, until finally a breakthrough is made.

It's a constant challenge to remind ourselves that the huge advances are made with tiny steps, and each tiny step has to be supported, and encouraged and funded. And that is what the Institute and its many supporters have done so well over the years.

While I'm proud of the achievements of the Institute in advancing the cause of medical science, I'm also proud of the role it plays in our city.

I have long believed that what makes a city great is what its citizens themselves create and not what is bequeathed by nature.

In this context, the Institute is an outstanding example of an investment in the intellectual foundation of our city.

Thousands of people and many companies have helped make that investment, including the loyal supporters who attend our events and help promote our work in the community.

I am pleased to report that my final year as Chairman was another successful year for the Institute and in this report you'll find many excellent examples of groundbreaking research into cardiovascular disease, a condition that claims the lives of more than 40,000 Australians each year and is our nation's biggest killer.

The task at hand for our scientists, to reduce the impact, severity and suffering caused by heart disease, remains as urgent and important as ever.

Throughout the past year, the Institute has continued to contribute significantly to the knowledge of the international scientific community, and we can be proud that this year we have recruited, and continue to support, some of the brightest minds in scientific research.

In 2013, the Institute published an impressive 80 papers, nine editorials, six reviews and two book chapters. These spanned some of the world's leading medical journals, including Nature, Circulation and the Lancet.

You can read in more detail about the year's scientific highlights, including the pioneering work of the Macdonald Laboratory in the field of heart transplantation, within the 'Science in the Spotlight' sections of this report.

Prudent management of our budget and success in grant outcomes and fundraising has maintained the Institute's sound financial position. For 2013, the Institute budgeted for a deficit of \$2.0 million, but I am pleased to report a strong result with a surplus of \$1.3 million, being \$3.3 million better than budgeted.

In 2012, the unrealised gain on revaluation of financial assets was \$983,000, which improved further in 2013 to an unrealised gain of \$1.5 million. This was due to a better performance of the financial markets, and stringent management by the Finance Committee.

Direct research grant income increased by \$1.6m, from \$8.4million in 2012 to \$10million in 2013.

Fundraising activities generated \$6.0 million in revenue during the year, including \$2.0 million from bequests.

“Progress comes from painstaking work, week after week, year after year, until finally a breakthrough is made.”

Fundraising continues to be an essential element in bridging the gap between grant income and our operating costs. It plays an important role in extending our network of supporters, and raising our profile in the wider community.

2013 saw some terrific fundraising and community outreach initiatives and these are outlined in more detail in this report.

However gaining grants for future years has been more challenging in terms of peer-reviewed grant income.

We received \$5.5 million in new grant and fellowship funding, which along with essential donations from the public, is used to directly fund our research work.

This included \$2.08 million from the National Health & Medical Research Council (NHMRC), \$785,000 from the Australian Research Council (ARC), and \$2.6 million from the National Heart Foundation and other foundations and trusts.

In my final year I continued to benefit from the support of my fellow Board members, including Mr David Craig, who chairs the board's Finance Committee; Mrs Louise Di Francesco, who chairs the Appeals Committee, and Ms Jill Margo, who chairs the Media and Communications Committee.

We welcomed Professor Terry Campbell, Head of the Department of Medicine at St Vincent's Hospital to our Board of Directors, and farewelled Mr Ryan Stokes. Ryan made a major impact in expanding the reach of the Institute to Western Australia and we are very grateful to him for providing us with his considerable corporate experience and expertise.

Thanks also to Professor Les Field who continued to provide valuable input, particularly in terms of academic issues, in his capacity as Deputy Vice Chancellor (Research) at the University of New South Wales.

I would also like to thank the Trustees of the Mary Aikenhead Ministries, board member, Sr Anthea Groves, Appeals Committee Member, Sr Clare Nolan, and all of the Sisters of Charity.

Most of the individuals I have just mentioned have become close friends through our work together at the Institute and there have been many others, both board members and Institute staff, past and present, too numerous to mention here.

But in this, my final report, I would like to acknowledge the enormous contribution made by the Packer family. Kerry Packer was instrumental in establishing the Institute. His wife Ros served on the board for many years and their son James has continued that support and close involvement.

The enormous financial contribution of Atlantic Philanthropies via Mr Chuck Feeney is also gratefully acknowledged. Chuck's very generous contribution was critical for our move into the new building, as well as for ongoing research.

I would also like to recognise my predecessor, the Honourable Neville Wran. Neville was an inspired leader of the Institute and we could not have wished for a more ideal founding Chairman.

Nor could we have had a more ideal founding Executive Director than Professor Bob Graham.

He has been the driving force of the core business of the Institute – our research – and he thoroughly deserves the respect and admiration he enjoys throughout the medical research community internationally.

Bob's team, again too numerous to mention individually, are an outstanding group of individuals and it has been a humbling experience for me to have helped them continue their important work.

I am sad that my formal ties with the Institute will end with this report, but I do so in the knowledge that I will remain a lifelong friend of the Institute and maintain an interest in its progress.

I welcome my successor, Mr Matthew Grounds, who is an outstanding individual and who, together with the board, Bob Graham and the research team, will lead the Institute into its next phase of growth and success.

Finally, thank you to everyone who has been associated with the Victor Chang Cardiac Research Institute during my involvement. It has been very personally rewarding and I am proud to have been able to play a role, along with so many others, in its success.

Steven Lowy AM
Chairman



Executive Director's Report

Discovery begins with individuals, and at the Victor Chang Cardiac Research Institute, we recognise those individuals and create extraordinary teams.

Our teams are making discoveries that will shape the future of human health and, building on Victor Chang's powerful vision, will reach beyond the laboratory to benefit all Australians.

Although we understand more now than ever before about cardiovascular disease, it remains the nation's leading cause of death and so our vitally important mission continues unabated.

In 2013, a number of our teams made important breakthroughs.

Firstly, Professor Peter Macdonald's Laboratory continued their outstanding work in the field of heart transplantation.

At an international conference on organ donation held in Sydney, the team announced they have found a way to protect hearts that have stopped beating, in what is known as circulatory death, and bring them 'back to life' outside the body, for subsequent use as donor organs for people needing a heart transplant.

As many will know, there are simply not enough hearts available for all those who need one, and a significant number of people die on the donor waiting list each year. This exciting work could prove pivotal in increasing the desperate shortage of donor hearts by 15 – 20 per cent, possibly more.

Professor Richard Harvey's team also made a major finding in the field of Developmental Biology, showing, for the first time, the importance of a single gene, Nkx2-5, in forming the large vessels of the heart.

In the absence of the gene, they showed that the large vessels leading out of the heart, including the aorta, which supplies the entire body with oxygenated blood, did not form properly.

This year, Richard also received the Ministerial Award for Cardiovascular Research Excellence from the Hon. Jillian Skinner, an accolade he richly deserves as one of Australia's most talented scientists.

Research into how our genes 'behave', and how heart disease is developed and passed through generations, will help us develop preventative treatments that can break the cycle of an inherited family health legacy.

Associate Professor Cath Suter and her team, publishing in the journal Epigenetics, demonstrated that while obesity and type 2 diabetes in mothers can program children to develop metabolic conditions later in life, this can be overturned if the children are careful about what they eat.

One of the Institute's most affable characters and Head of our Mechanobiology Laboratory, Professor Boris Martinac, was elected to the Fellowship of the Australian Academy of Science. This is truly one of the highest levels of recognition of academic achievement and excellence and is thoroughly deserved, given Boris's pioneering work leading to the discovery of mechanosensitive ion channels.

Another faculty member who had an outstanding year in 2013 was Diane Fatkin, who was promoted to Professor of Medicine by the University of New South Wales, and awarded the Royal Australasian College of Physician's 'Eric Susman' prize for her outstanding contributions to internal medicine.

“

Although we understand more now than ever before about cardiovascular disease, it remains the nation's leading cause of death, and so our vitally important mission continues unabated. ”

We also warmly welcomed Dr Joshua Ho this year, who joined the Institute after completing his PhD in bioinformatics at Sydney University and then undertook very successful postdoctoral studies at Harvard Medical School. At just 28, Joshua is our youngest faculty member who is already providing important leadership and enhanced capacity in the increasingly important discipline of bioinformatics.

Our scientific research is supported by our exceptional Board, and their passionate belief in the work we do.

I would like to take this opportunity to thank Mr Steven Lowy, who is standing down after almost twenty years on the board, including the last seven as Chairman.

Steven's contributions to the Institute have been immeasurable, both financially and in terms of his time and expertise.

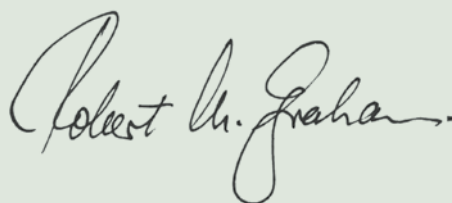
He was instrumental in helping us to deliver the world-class research facility we now call home, and has helped us to build a Board of colossal stature and experience.

Steven's leadership has also helped us to develop an international reputation for excellence in cardiovascular research and training. Quite simply, his contributions have been outstanding.

I would like to thank our staff, and our Friends, for your ongoing contribution and commitment to the Institute. Thanks to your efforts, 2013 was another successful year in our fight against cardiovascular disease.

Finally, I would like to acknowledge the leadership of The Mary Aikenhead Ministries, so ably Chaired by David Robinson, and importantly the Sisters of Charity, who continued to inspire us—31 December 2013 marking their 175th year of vital health and education service to the people of Australia.

We now look forward to the year ahead with energy, enthusiasm and vigour, as we continue to honour Victor Chang's great legacy.



Professor Robert M. Graham AO
Executive Director



Board of Directors

The successful operations of the Victor Chang Cardiac Research Institute are heavily reliant on the loyalty, drive and vision provided by the Board of Directors, led by Mr Steven Lowy AM, and subsidiary committees.



Mr Steven Lowy
AM, BCom (Hons) (Chairman)

Mr Lowy joined the Victor Chang Board as an inaugural member in 1995 and became Chairman in 2008. He currently serves as Co-Chief Executive Officer of the Westfield Group. Mr Lowy holds a Bachelor of Commerce (Honours) degree from the University of NSW. Prior to joining Westfield in 1987, he worked in investment banking in the United States. Mr Lowy is President of the Board of Trustees of the Art Gallery of New South Wales. He is a director of the Lowy Institute for International Policy, and a member of the Prime Minister's Business-Government Advisory Group on National Security. Mr Lowy is a Life Governor of the Victor Chang Cardiac Research Institute. In addition to his role as Chairman of the Board, he is a member of its Finance Committee.



Professor Robert M Graham
AO, FAA, MBBS (Hons), MD, FRACP, FACP, FAHA

Professor Graham is Executive Director of the Victor Chang Cardiac Research Institute, and a member of its Finance, Appeals, Intellectual Property and Commercialisation and Media and Communications Committees. He is the Des Renford Professor of Medicine, and Professor of Biotechnology and Biomolecular Science, University of NSW, and Professor (adjunct) of Physiology and Biophysics, Case Western Reserve University School of Medicine, Cleveland, Ohio. He is a Fellow, Australian Academy of Science (AAS) and foreign member, Royal Danish Academy of Sciences and Letters. He is a member of the American Association for Clinical Research, the American Society of Clinical Investigation and the American Heart Association, and a Life Member, Heart Foundation of Australia.



Professor Terry Campbell
AM, MD, DPhil, FRACP

Professor Campbell joined the Victor Chang Board in 2013. He is the Head of the Department of Medicine at St Vincent's Hospital, and Deputy Dean of Medicine, University of NSW. From 2003 to 2009, he served as Deputy Director of the Institute alongside Professor Richard Harvey. He also served as President of the Cardiac Society of Australia and New Zealand from 2000 to 2002.

Professor Campbell's research work has encompassed both basic laboratory research and clinical cardiology. He has published over 100 peer-reviewed papers in international journals, and has held competitive research funding from both the National Health & Medical Research Council and National Heart Foundation.

In 2003, he was appointed as a Member of the Order of Australia (AM).



Mr David Craig
BEc, FCA, CTFP

Mr Craig joined the Victor Chang Board in 2007 and took over as Chair of the Institute's Finance Committee in 2012. Since 2006 he has been the Chief Financial Officer of the Commonwealth Bank of Australia. Mr Craig has over 30 years of experience in financial management, strategy, mergers and acquisitions. His previous roles included: Chief Financial Officer for Australand; Global Transition Finance Leader for IBM Business Consulting Service; Global Chief Financial Officer of PwC Consulting, and Chief Operations Officer and for 15 years Senior Audit Partner of PricewaterhouseCoopers Australasia.

Mr Craig is a director of the Financial Executives Institute of Australia and has also served as a director of Australian Gas Light Company.

“Dedication, commitment, vision.”



Mr Chum Darvall
BA, F Fin, FAICD

Mr Darvall joined the Victor Chang Board in 2008, and is a member of its Finance Committee. He was Chief Executive Officer, Deutsche Bank Australia and New Zealand, from July 2002 to March 2011. He is now non-executive Vice Chairman of Deutsche Bank. Prior to this he worked in a variety of roles across the banking industry including: Director of Treasury and Head of Global Markets at Deutsche Bank and positions in the financial markets division of Westpac. Mr Darvall's current Board memberships include: TransGrid, Wilson HTM, Pinnacle Investment Management Ltd, Metrics Credit Partners Pty Ltd, Palisade Investment Partners Limited, the Financial Markets Foundation for Children, Macquarie University Council, Major Performing Arts Panel of the Australia Council and the Australian Cricketers' Association Player Hardship Fund.



Mrs Louise Di Francesco

Mrs Di Francesco joined the Victor Chang Board in 2010 and is the Chair of its Appeals Committee. Mrs Di Francesco has worked in the media industry for more than 30 years, initially as a journalist, and for the past 22 years, in media and corporate communications.

She is a specialist in all areas of corporate media management, public relations, issues management and crisis management, and has worked on campaigns for AAPT, CeBIT, Mercedes Australian Fashion Week, Alterian, Carbon Planet, Australand, Lend Lease, Multiplex, Colliers, Landcom and James Fairfax. Mrs Di Francesco is a board member of National not-for-profit organisation, Fitted for Work.



Mrs Barbara Ell

Mrs Ell has been a Victor Chang Board member since 2001 and is a Life Governor of the Institute. She is a member of the Institute's Appeals Committee and is the Chair of the Victor Chang Day Organising Committee. Mrs Ell was born in Auckland, New Zealand and educated at St Mary's College prior to her nursing training at Auckland Hospital. She then continued her nursing career at Merriwa District Hospital. After marrying, Barbara moved to Sydney, where she raised her three children, Justine, Sara and Robert. In addition to serving on the Victor Chang Appeals Committee, Barbara is widely recognised for her leadership in philanthropy and charity work.



Professor Leslie Field
AM, FAA, DSc, PhD, BSc

Professor Field joined the Victor Chang Board in 2009. He was appointed to his current position as Vice-President and Deputy Vice-Chancellor (Research) at the University of NSW in 2005. His main areas of research are organometallic chemistry, catalysis and NMR spectroscopy. He is the author of more than 200 scientific papers and 4 text books. He is the recipient of the Rennie Medal (1983); The Edgeworth David Medal (1986); The Organic Chemistry Medal (1992); the Centenary of Federation Medal (2003) and the RACI Leighton Medal (2010). He was elected as a Fellow of the Australian Academy of Science (AAS) in 1996 and appointed as a Member of the Order of Australia in 2011 for his services to Chemistry and to Higher Education. In 2013, he was appointed Secretary for Science Policy with the AAS and is a member of the Council of the AAS.



Mr Angelos Frangopoulos
BA(Comm), MAICD, JP

Mr Frangopoulos joined the Victor Chang Board in 2009 and is a member of its Media and Communications Committee. He is the CEO of Australian News Channel Pty Ltd, the owner and operator of Sky News Australia and Sky News

New Zealand. Before joining Australian News Channel, he held positions at British Sky Broadcasting, the Nine Network and Prime Television. Mr Frangopoulos is the Chairman of the Australia Day Council of NSW, a member of the Charles Sturt University Council, a member of the Advisory Board of Macquarie University's Centre for Media History, and a Director of the Australian Subscription Television and Radio Association and a Board Member of the Walkley Foundation.



Mr Matthew Grounds
BCom, LLB (Hons)

Matthew is currently Chief Executive Officer of UBS Australasia (since May 2008) and Head of Corporate Client Solutions, Asia Pacific. Prior to being appointed as Head of Corporate Client Solutions in November 2012, Matthew held the position of Joint Global Head of Investment Banking.

Matthew is a member of the UBS Asia Pacific Management Committee, the UBS Investment Bank Global Executive Committee and a Group Managing Director. With more than 20 years investment banking experience, Matthew is one of Australia's leading corporate advisers and has been responsible for a number of landmark transactions for major Australian and international companies.

Matthew is also a member of the University of New South Wales Council, a Director of the Australian Business and Community Network Council and Director of the UBS Foundation. Matthew graduated from the University of New South Wales and holds a degree in Commerce (Finance Major) and Law.

Board of Directors



Sr Anthea Groves

RSC, OAM, RN LHA Dip. of Nursing Administration

Sr Anthea Groves has been a member of the Victor Chang Board since 2003. She is a member of the congregation of the Sisters of Charity and is Patient Liaison Officer at St Vincent's Hospital Sydney. Sr Anthea is a Director of the Sisters of Charity Foundation.

various businesses involved in marketing, finance, trade, primary production, property and healthcare. In addition to serving as a director of the Victor Chang Institute, he was an inaugural member of its Appeals Committee.



Ms Jill Margo
AM, BA (Hons)

Ms Margo joined the Victor Chang Board in 2008 and is the Chair of the Institute's Media and Communications Committee. She is the health editor of The Australian Financial Review. She has won numerous international and national media awards, including two Walkleys and a Churchill Fellowship. In 2006, Ms Margo was awarded an Order of Australia for services to journalism and cancer. She holds a BA (Hons) in English literature, and is a best-selling author and biographer.



Mr Ryan Stokes
BCom

Mr Stokes joined the Victor Chang Board in 2011. He is CEO of Australian Capital Equity Ltd (ACE) and Chief Operating Officer of Seven Group Holdings (SGH). Mr Stokes is also a Director of WesTrac, Seven West Media and Iron Ore Holdings. He is the Chairman of The National Library of Australia and a Director of the Australian Strategic Policy Institute Council.



Dr Gary Weiss
LLB (Hons), LLM, JSD

Dr Weiss joined the Victor Chang Board in 2009 and is a member of its Finance Committee. He holds the degrees of LLB (Hons) and LLM (with dist.), as well as a Doctor of Juridical Science (JSD) degree from Cornell University, New York. Dr Weiss is Chairman of Clearview Wealth Ltd and Secure Parking Pty Ltd, an Executive Director of Ariadne Australia Limited and a Director of several other organisations, including Premier Investments Limited, Ridley Corporation Ltd, Pro-Pac Packaging Ltd and The Centre for Independent Studies.



Mr John Kean
OAM, FCA, FAICD

Mr Kean has been a member of the Victor Chang Board since 2003, is a Life Member of the Institute and was the Chair of the Institute's Finance Committee until retiring from this position in 2012. He is Executive Chairman of Pinpoint Pty Limited. He also acts as an Independent Business Advisor and holds directorships in

Our Committees

APPEALS COMMITTEE

The Appeals Committee consists of a group of volunteers and staff who are responsible for the Institute's fundraising events, aimed at raising the vital funds needed by the Institute to conduct its groundbreaking research.

Members

Mrs Louise Di Francesco (Chair), Mrs Ann Chang, Mr Marcus Chang, Mr Alan Crouch, Mrs Barbara Ell, Mr Errol Goldberg, Professor Robert Graham, Mr Cameron Irving, Sr Clare Nolan, Mrs Antoinette Ogilvie, Mr Michael Renford, Mr Robert Ryan, Ms Jan Savage, Mr Alex Schuman, Mr John Shim, Ms Ruth Zukerman.

YOUNG APPEALS COMMITTEE

The Young Appeals Committee was established in 2013 to help engage younger audiences with the Institute and its work. Chaired by Mr Marcus Chang, the committee consists of a group of dedicated volunteers and staff, committed to raising funds to support research.

Members

Mr Marcus Chang (Chair), Ms Sally Buist, Ms Keren Weiss, Mr Julian Cook, Ms Catherine Dearnley, Ms Jenna Klug, Mr Adam Buist, Mr Anthony Collins, Ms Daniela Elser, Ms Lauren Palmer, Mr Alistair Booth, Mrs Michele Parker, Mr Ashley Parker, Ms Noura Cheded, Ms Hayley Dodman, Ms Eliana De Sousa.

FINANCE COMMITTEE

The Finance Committee is responsible for the oversight of finances for the Board of Directors. The Committee oversees the audit of the Institute's accounts, investment management, management remuneration, and also sets finance policy for management to follow.

Members

Mr David Craig (Chair), Professor Robert Graham, Mr John Kean, Mr Chum Darvall, Dr Gary Weiss, Ms Jan Savage, Ms Janina Jancu and Mr Kiran Narsey.

MEDIA AND COMMUNICATIONS COMMITTEE

The Media & Communications committee is responsible for the overall strategic direction of marketing and communications activities at the Institute. The Committee meets bi-monthly and seeks to bring new ideas in traditional and emerging media platforms to promote the work of the Institute.

Members

Ms Jill Margo (Chair), Mrs Louise Di Francesco, Mr Angelos Frangopoulos, Professor Robert Graham, Ms Hayley Dodman, Ms Janina Jancu, Ms Jan Savage.

VICTOR CHANG DAY ORGANISING COMMITTEE

This committee is responsible for organising the Institute's major annual fundraising event, the Victor Chang Day Gala Ball.

Members

Mrs Barbara Ell (Chair), Mrs Ann Chang, Mr Cameron Irving, Mr Ken Laing, Ms Emma Quick, Mrs Michele Parker, Mrs Diana Ritchie, Ms Ruth Zukerman, Professor Robert Graham, Ms Jan Savage, Ms Eliana De Sousa.

SCIENTIFIC ADVISORY BOARD

The Scientific Advisory Board comprises six internationally-renowned scientists, who carry out an exhaustive evaluation of the Institute's research programs every five years, to ensure the Institute remains at the cutting edge of cardiovascular knowledge generation and continues to produce research of a world-class standard.

Members

- Professor Doug Hilton (Chair) – Director Walter and Eliza Hall Institute, Australia
- Emeritus Professor John Chalmers – Senior Director and Head, Professorial Unit, The George Institute for International Health and University of Sydney, Australia.
- Professor Witold Filipowicz – Professor of Biochemistry, Friedrich Miescher Institute for Biomedical Research (FMI), Switzerland.
- Professor Lily Jan – Jack and DeLoris Lange Professor of Physiology and Biophysics, University of California, USA.
- Professor Janet Rossant – Chief of Research, The Hospital for Sick Children, Canada.
- Professor Stephen Vatner – Chairman, Department of Cell Biology and Molecular Medicine, New Jersey Medical School, USA.

FACULTY REVIEW COMMITTEE

The Faculty Review Committee comprises eminent scientists from local research organisations who evaluate individual faculty members every five years in order to evaluate their productivity, promote the development of goals and expectations, foster and support faculty development and mentorship, and guide junior faculty in career advancement.

Members

- Professor John Shine (Chair) – Professor of Medicine and Professor of Molecular Biology, The University of New South Wales, Group Leader Neural Stem Cells, Garvan Institute of Medical Research.
- Professor Peter Gunning – Head, Oncology Research Unit in the School of Medical Sciences, The University of New South Wales.
- Professor John Rasko – Professor of Medicine, Central Clinical School, The University of Sydney and Centenary Institute of Cancer Medicine & Cell Biology.
- Professor Phil Robinson – Head, Cell Signalling Unit, Children's Medical Research Institute, Westmead.

Our Committees (continued)

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

The Committee on Appointments and Promotions meets on an ad hoc basis to evaluate potential candidates for faculty positions within the Institute.

Members

- Professor Robert Graham (Chair) – Executive Director, Victor Chang Cardiac Research Institute.
- Professor Terry Campbell – Senior Associate Dean, The University of New South Wales.
- Professor David Celermajer – Scandrett Professor of Cardiology, Central Clinical School, The University of Sydney and Heart Research Institute
- Professor Richard Harvey – Co-Deputy Director, Victor Chang Cardiac Research Institute.
- Professor Doug Hilton – Director, The Walter and Eliza Hall Institute
- Professor Levon Khachigian – Centre for Vascular Research, The University of New South Wales.
- Professor Charles Mackay – Department of Immunology, Monash University, Melbourne.
- Professor John Mattick – Executive Director, The Garvan Institute of Medical Research
- Professor Jamie Vandenberg – Co-Deputy Director, Victor Chang Cardiac Research Institute.
- Ms Maria Voukenas – Human Resources Manager, Victor Chang Cardiac Research Institute

INTELLECTUAL PROPERTY AND COMMERCIALISATION COMMITTEE

The Intellectual Property and Commercialisation Committee (IPCC) is responsible for advising the Institute on its research commercialisation activities. The Institute has also appointed consultants TM Ventures to assist with linking our research to industry and forming new collaborations.

Members

- Professor Robert Graham (Chair) – Executive Director, Victor Chang Cardiac Research Institute.
- Professor Roland Stocker – Head, Vascular Biology Division, Victor Chang Cardiac Research Institute
- Dr Trevor Davies – Partner, Allens Arthur Robinson
- Professor Joan Dawes – Senior Consultant, Pestat Ltd; and Innovation Dynamics consulting group
- Ms Hannah Brown – Senior Associate, Baker McKenzie
- Ms Elisabeth White – Senior Associate, Baker Mckenzie
- Ms Janina Jancu – Chief Operating Officer, Victor Chang Cardiac Research Institute
- Ms Britt Granath – Senior Policy Officer, Victor Chang Cardiac Research Institute



The Institute's major annual fundraising event – The Victor Chang Gala Ball is organised by the Victor Chang Day Organising Committee.

Research Divisions: Overview



CARDIAC PHYSIOLOGY AND TRANSPLANTATION DIVISION

Feneley Laboratory
Macdonald Laboratory
O'Rourke Laboratory
Keogh Laboratory
Muller Laboratory

1



DEVELOPMENTAL AND STEM CELL BIOLOGY DIVISION

Harvey Laboratory
Dunwoodie Laboratory
Kikuchi Laboratory

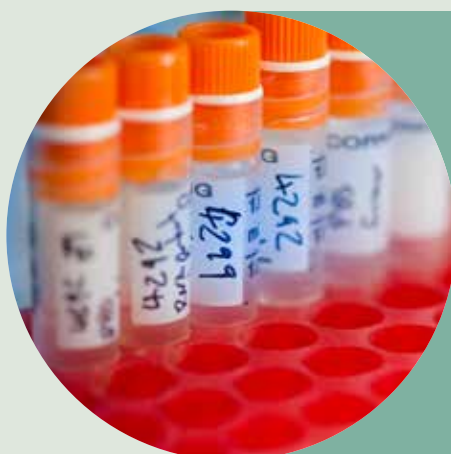
2



MOLECULAR CARDIOLOGY AND BIOPHYSICS DIVISION

Graham Laboratory
Vandenberg/Hill Laboratories
Fatkin Laboratory
Martinac Laboratory

3



MOLECULAR, STRUCTURAL AND COMPUTATIONAL BIOLOGY DIVISION

Stock/Lee Laboratories
Suter Laboratory
Ho Laboratory

4



VASCULAR BIOLOGY DIVISION

Stocker Laboratory

5

Cardiac Physiology and Transplantation Division

FENELEY LABORATORY

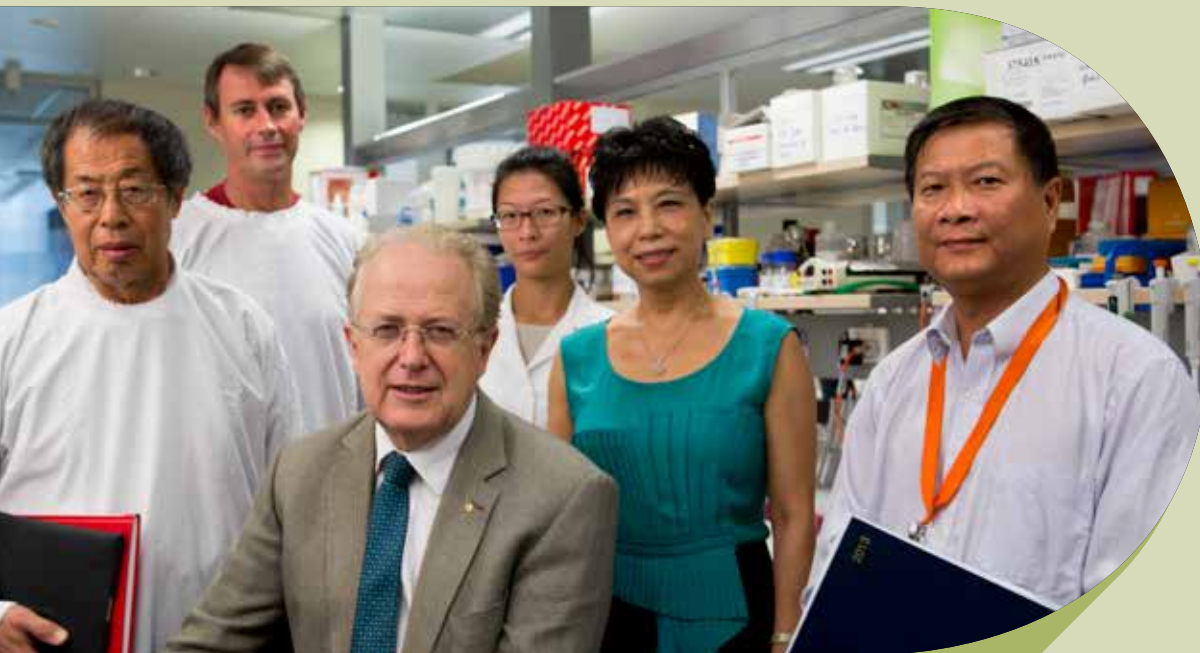
Professor Michael Feneley AM heads up the Institute's Cardiac Physiology & Transplantation Division, in addition to leading his own laboratory, the Cardiovascular Mechanics Laboratory.

The Cardiovascular Mechanics Laboratory investigates the contractile properties of the heart, and how these properties change in different disease states based on investigations in animal models of a variety of cardiac diseases.

The major research focus of the laboratory is the molecular signalling pathways that trigger growth of heart muscle cells (hypertrophy) in response to increased heart workload.

Another research focus has been the role of a class of molecules, called alpha receptors, in modulating cardiac performance and hypertrophy. A large part of this work has been done in collaboration with the Institute's Graham Laboratory.

Many other collaborative projects with researchers inside and outside the Institute are based on the Feneley Laboratory's methods to assess cardiac physiology in the whole organism, in the heart isolated from the circulation, and in individual cardiac cells.



“Improving heart failure survival, better heart transplants – saving more lives.”



MACDONALD LABORATORY

The miracle of heart transplantation sees the generosity of organ donors providing recipients with the gift of life.

And while transplantation is by far the most effective treatment option for patients with severe heart failure, a chronic shortage of donated organs means it is available to just a small percentage of the people who could benefit.

Tragically in Australia, and other countries around the world, many of those who need a new heart will die on the donor waiting list.

Throughout 2013, Professor Peter Macdonald's research team continued their groundbreaking work on novel methods of donor management and donor heart preservation, with the aim of being able to extend this life-saving treatment to a larger number of Australians.

More information on their work is featured in Science in the Spotlight (p.23).



Cardiac Physiology and Transplantation Division

O'ROURKE LABORATORY

Secrets of the Arterial Pulse

Michael O'Rourke, with collaborator Professor Alberto Avolio and three Macquarie University PhD students, analyse, and interpret, pressure and flow waveforms obtained in clinical practice at:

1. University of Cambridge and Addenbrooke's Hospital, Neurosurgical Intensive Care (Dr Marek Czosnyka, Professor of Brain Physics). Aortic pressure waves, intracranial pressure waves, and intracranial artery flow waves are obtained in unconscious patients at high risk of secondary stroke and death following closed head trauma. Aim is to improve monitoring and treatment.
2. Oslo University Hospital, Department of Neurosurgery (Dr P.K. Eide). Aim is similar, but includes treatment of patients with hydrocephalus, subarachnoid haemorrhage and major stroke, with emphasis on secondary events attributable to pulsatile phenomena.
3. Hopital George Pompidou, Paris, Dept of Cardiology/MRI Imaging (Prof Eli Mousseaux). Aim is to improve measurement of ascending aortic flow from the heart through use of MRI, and to study effects of aortic aging on the heart, brain, kidney in time and frequency domains.
4. Wels General Hospital, Dept. of Cardiology, Austria (A/Prof T. Weber). Aim is to characterise LV-vascular interaction using ultrasonography, and to compare results with MRI and central aortic pressure techniques.
5. Continuing work begun in the 1970s by Victor Chang, studies at Ruijin Hospital, Shanghai, Hypertension Department (Drs J. Wang, L. Yan). A study of flow waves in cerebral arteries with central aortic pressures has been completed in 1020 subjects, This has provided unique new information on changes with age that are relevant to mechanisms of small arterial disease and dementia.
6. Massachusetts Institute of Technology, Harvard Medical School, Boston (Dr E. Edelman). Aim is to explore the relationship between aortic stiffening (and de-stiffening) on pulsatile flow in the human brain, and cerebral vascular disease. This embraces possibility of treating extreme aortic stiffening through application of an elastic wrap to the aorta.
7. Sydney University, Brain and Retinal Biology (Prof J. Stone). Aim is to explain pathological changes in the brain of older humans on the basis of aortic stiffening and high pulsatile flow in small arteries.



KEOGH LABORATORY

Professor Anne Keogh runs a research program at the Institute that focuses on pulmonary arterial hypertension, heart transplantation, immunosuppression and left heart failure.

This is in addition to her role as a Senior Heart Transplant Cardiologist in the Heart Transplant Unit of St Vincent's Hospital.

Professor Keogh's research aims to find the best-tailored therapy for individual patients with Class-I-IV heart failure, including drug therapy, synchronised pacing and ventricular assist devices.

Professor Keogh was recently awarded an Order of Australia (OA) for her services to cardiac transplantation, heart failure, pulmonary hypertension and animal welfare.



MULLER LABORATORY

Under the leadership of Associate Professor David Muller, the Muller Laboratory investigates new treatments to prevent, treat and reverse coronary artery disease, and to understand inciting factors that trigger heart attacks, including shear stress related changes in platelet function.

A recent focus of the team has been novel approaches to management of valvular heart disease, and evaluating the impact of therapies on shear stress, platelet function and clotting parameters.



CLINICAL FACULTY

- > Dr Kumud Kumar Dhital
- > Associate Professor Chris Hayward
- > Dr Andrew Jabbour
- > Associate Professor Jane McCrohon
- > Dr Phillip Spratt
- > Associate Professor Rajesh Subbiah
- > Associate Professor Jacob Sevastos
- > Associate Professor Cameron Holloway

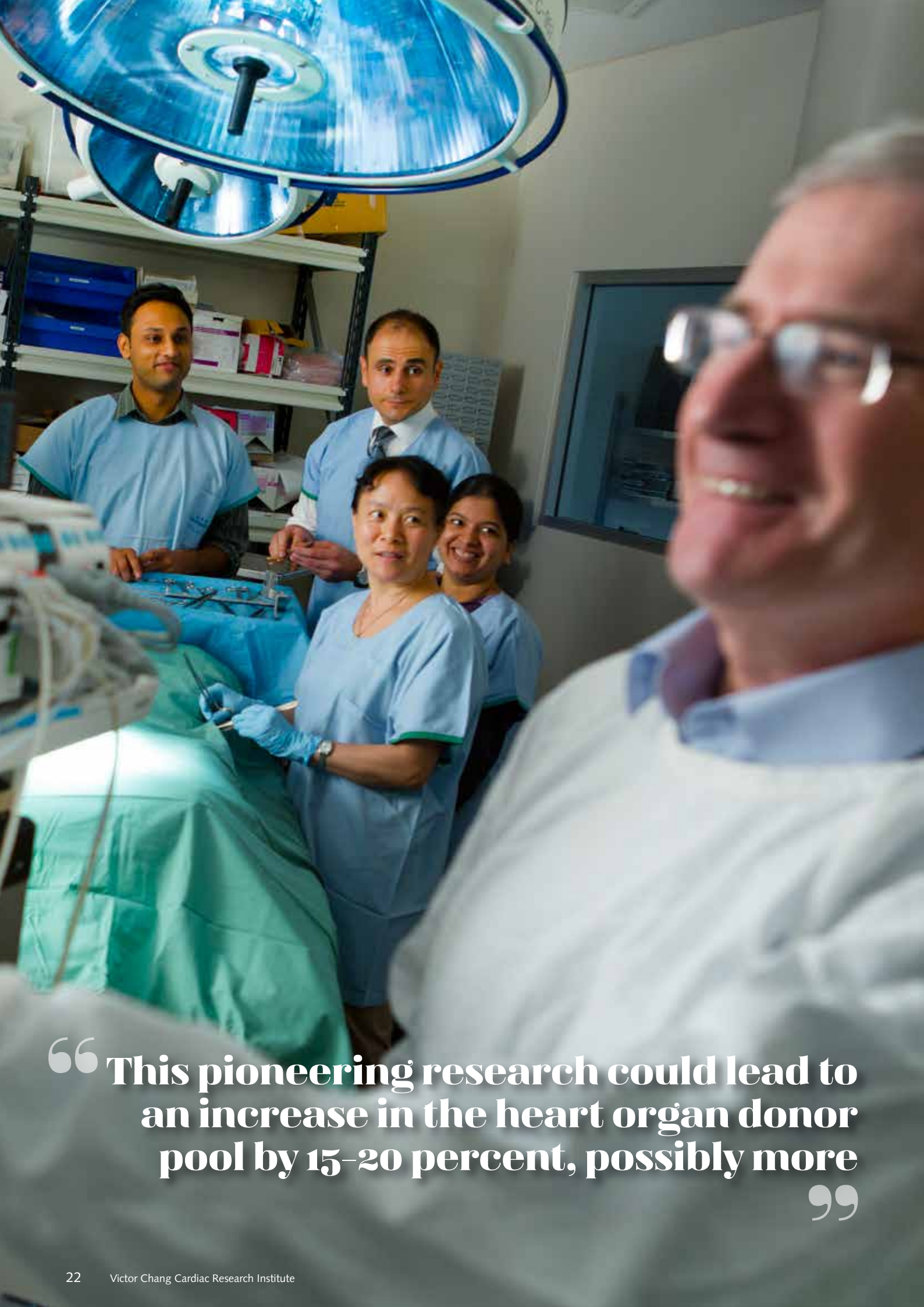
HONORARY FACULTY

- > Dr Ahsan Husain
- > Dr Andrew Owens
- > Dr David Martin
- > Professor Matthias Hentze
- > Professor Soren-Peter Olsen
- > Associate Professor David Winlaw
- > Dr Andras Nagy
- > Professor Thomas Preiss

FACULTY-AT-LARGE

- > Professor Livia Hool





“This pioneering research could lead to an increase in the heart organ donor pool by 15–20 percent, possibly more”

Science in the Spotlight

RESEARCH HELPS DONOR HEARTS TO BEAT AGAIN

In November 2013, Professor Peter Macdonald, co-head of the Cardiac Transplantation Laboratory, reported that his team of researchers have found a way to protect hearts that have stopped beating, in what is known as circulatory death, and bring them back to life outside the body.

Presenting at the congress of the International Society of Organ Donation and Procurement in Sydney, Professor Macdonald revealed this pioneering research could lead to an increase in the heart organ donor pool by 15 – 20 per cent, possibly more.

“Until now, we were not able to use the hearts from people who donated their organs after withdrawal of life support. Once you withdraw life support, there is no oxygen going into the body and all the organs suffer, but especially the heart which has much higher oxygen requirements than other organs used for transplantation such as the kidney, liver or lungs.

“While Australia’s organ donation rate has been going up, the increase has really been in the types of donors who aren’t really suitable for heart transplantation, so there’s only been a very small increase in heart transplants”, Professor Macdonald said.

The team has developed a special solution, which prevents the donor heart cells from dying. They then take the heart and attach it to a machine that pumps the donor’s own blood into it, which enables it to start working outside the body before it’s implanted into the recipient.

Dr Arjun Iyer, research fellow, commented: “It’s very important for people to understand there’s no attempt to reanimate the heart in the donor, this is all done outside the body.

“It’s affectionately known as the ‘heart in the box’. To date, we have successfully reanimated two human hearts, and carried out the full transplant on a dozen animals. This process adds a whole level of complexity to resuscitating these organs, but it is one we are happy to take on board.”

For more information on organ donation visit www.donatelife.gov.au



Developmental and Stem Cell Biology Division

HARVEY LABORATORY

The Harvey Laboratory, led by Deputy Director Professor Richard Harvey, studies how the heart forms in the embryo and how it repairs itself in the adult.

The heart begins to function after only a few weeks of embryonic life, when it is still a simple muscular tube. As heart structure develops further through the addition of valves, specialised chambers and a more sophisticated electrical system, its function also becomes more adapted to the needs of the growing embryo.

The forming heart seems especially vulnerable to defects in the genes that control its formation, and this is why structural malformations of the heart (congenital heart disease) are relatively common in newborn children.

The Harvey Laboratory is looking to understand how gene defects cause heart defects, and how this information can be used to help families with congenital heart disease.

In 2013, they made a major advance in proving a vital role for the gene *Nkx2-5* in formation of the large outflow vessels of the heart (see Science in the Spotlight, p.26).

In the adult, heart attack is common, claiming the lives of more than 20,000 Australians each year. The death of large segments of heart muscle is not easily repaired naturally, but there is hope that if we can understand how other types of tissues regenerate, we can encourage this to occur in the injured heart.

Thus, another challenge in the Harvey Laboratory is to address how stem cells (a type of unspecialised cell with a 'blank slate', that can be turned into any cell type in the body) could be used to repair the heart after insult or injury.

DUNWOODIE LABORATORY

Three percent of all babies born have some form of birth defect. In some instances they are not life threatening, but they do cause disability and distress. In others, they are life threatening and surgery, often many times over, is required.

In only about 20 per cent of cases is the cause of the defect understood, leaving thousands of families each year in Australia wondering why they have been affected.

Research in the Embryology Laboratory, led by Professor Sally Dunwoodie, is focused on embryonic development, as birth defects arise if developmental processes are disrupted.

The Dunwoodie Laboratory seeks to understand what factors are likely to disrupt the developmental process, whether it is the genetic code of the embryo, environmental factors during gestation, or a combination of both.

The team is identifying genes that are required for the normal development of the heart or vertebral column, and looking at whether they are altered in babies born with defects. The Laboratory is also exploring how environmental insults during gestation, such as low oxygen (hypoxia), impact on embryo development.



KIKUCHI LABORATORY

After insult or injury, can damaged heart tissue get its function back?

The main aim of the Cardiac Regeneration Laboratory, led by Dr Kazu Kikuchi, is to understand the mechanisms of heart regeneration.

In mammals (including humans), the heart does not regenerate after damage from an insult such as a heart attack. Instead, the damaged tissue is replaced by fibrotic scar tissue, which provides quick repair from the damage, but fails to restore cardiac function and increases susceptibility to heart failure.

In contrast, some vertebrates such as salamander and fish are known to naturally regenerate heart muscle with little scar formation after injury.

The Kikuchi Laboratory uses zebrafish, a small tropical freshwater fish which is highly amenable to genetic manipulations, to study the molecular and cellular regulations of heart muscle regeneration.

The group has a long-term objective of finding out how this type of regeneration might be used to repair damaged human hearts.



Science in the Spotlight

GENE VITAL TO FORM HEARTS 'LARGE VESSELS'

Publishing in the prestigious journal *Nature Cell Biology* in October 2013, Professor Richard Harvey and his team reported for the first time the vital role played by a single gene in forming the hearts 'large vessels'.

In collaboration with colleagues at Massachusetts General Hospital and Harvard Medical School, the Harvey team explored the role of the heart regulatory gene *Nkx2-5* in both zebrafish and mouse embryo models, and discovered that in the absence of this gene the large vessels leading out of the heart did not form properly.

This included the aorta, the major vessel that supplies the upper body and head with oxygenated blood.

In babies, sections of these large vessels are sometimes constricted or missing, which can be life threatening. In Australia, congenital heart disease is the biggest killer of children under five years of age.

While the primitive blood vessel-forming cells were created and located normally in embryos lacking *Nkx2-5*, they could not express genes reflecting a specialised vessel lining or join together to form a network of functional vessels.

The *Nkx2-5* gene acts much like an orchestra conductor, telling heart cells with precise timing when they should specialise, grow and divide. In fruit flies, mutations in the equivalent of the *Nkx2-5* gene stop the heart from forming altogether, resulting in it being dubbed the 'Tinman' gene (after the Wizard of Oz character, who had no heart).

Professor Harvey, Head of the Developmental and Stem Cell Biology Laboratory commented:

"In this study we were looking at the arteries of the pharyngeal region, a complex network of vessels which are laid down during embryonic life. These go on to be remodeled in response to the emerging blood flow to form part of the aorta, the largest vessel in the body, and arteries of the head and neck that are fed directly by the heart.

"In the absence of this particular gene, we showed these important arteries simply could not form, and so our work may shed new light on how faults in certain gene pathways lead to vascular defects in babies.

"To make progress in managing congenital heart disease, we need to understand how such conditions arise and progress. Our ultimate goal is to help prevent its potentially devastating onset, and the significant pain and suffering these conditions can bring to both affected babies and their families."



“
**To make progress
in managing
congenital heart
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arise and progress**
”



Molecular Cardiology and Biophysics Division

GRAHAM LABORATORY

What switches the heart on during times of 'flight or fight'?
Can we mend a broken heart?

There are two key focuses of work in the Graham Laboratory, which has Institute Executive Director Professor Bob Graham at the helm.

The first looks at the key which switches the heart 'on'.

We have all experienced a pounding heart when we are angry, or during times of heightened anxiety. This is caused by the hormone adrenaline being released by the body, causing an adrenaline rush.

The adrenaline acts as a key to unlocking specific switches (adrenergic receptors) on the surface of heart cells, telling them to beat faster.

The Graham Laboratory studies the structure and function of these switches, which during times of 'fight or flight' response are critical to our survival, but when over-activated can cause abnormal heart rhythms, high blood pressure and thickening of the heart muscle.

The team is also carrying out research aimed at improving the very limited capacity of heart muscle cells to divide.

This important work could benefit patients who have suffered a heart attack, by allowing their broken hearts to be repaired properly, rather than merely through the development of scar tissue, which impairs the pumping function of the heart resulting in heart failure or death.

VANDENBERG/HILL LABORATORIES

Can we predict a person's risk of sudden cardiac death, and personalise a treatment plan to prevent it?

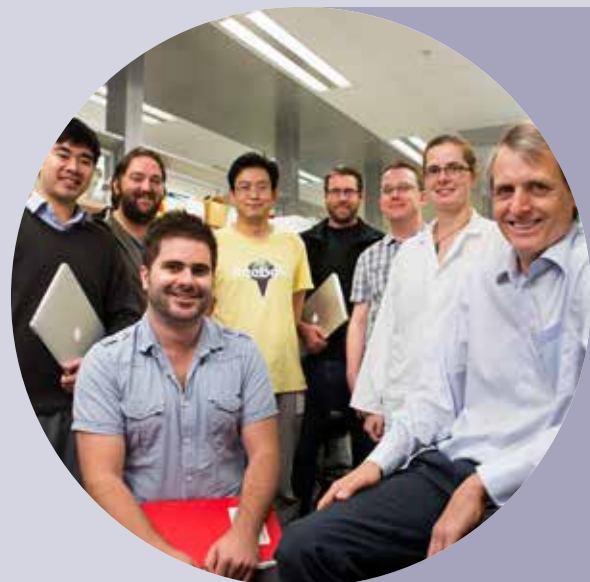
In March 2012, 23-year-old Bolton Wanderers footballer Fabrice Muamba suffered a cardiac arrest on the pitch. His case captured the attention of the world, and he was later diagnosed with an arrhythmia (when the heart beats in an irregular fashion), which places an individual at risk of sudden cardiac death. In August that year, he retired from football aged just 24.

The Cardiac Electrophysiology Laboratory, led by Deputy Director, Professor Jamie Vandenberg and Group Leader, Dr Adam Hill, focuses on how disturbances in the electrical activity of the heart can result in arrhythmia.

Arrhythmia is one of the most common causes of death, and for many people at risk of sudden arrhythmic death, the only effective treatment option is an implantable defibrillator. These devices are expensive, and come with significant side effects.

In understanding whether the potential benefit of the defibrillator outweighs the risk, it is important to be able to assess the odds of sudden cardiac death in the individual. This is currently very difficult to do, and is a major area of focus for the team.

Using a range of techniques (including a 3D computerised model of the heart), they are investigating the molecular mechanisms that control the electrical activity in the heart. The team seeks to understand how these mechanisms might be disordered in patients with inherited heart diseases and how environmental factors may increase the risk of arrhythmia. They are also investigating whether there are biomarkers on patients' ECGs that may help improve stratification of risk in patients with heart disease.



“Cutting-edge technologies to uncover the genetic variants in families with inherited heart diseases”

FATKIN LABORATORY

Inherited gene variants are recognised as increasingly important causes of heart disease, but very little is known about what these genetic factors are, and how they affect heart function.

The Fatkin Laboratory focuses on two of the most common heart disorders, dilated cardiomyopathy (where the chambers of the heart enlarge and the pumping action becomes weak) and atrial fibrillation (when the heart beats in an irregular fashion, also known as an arrhythmia).

The team is using cutting-edge sequencing technologies to 'read' the genetic code contained in each person's DNA. They are looking for the 'spelling mistakes' contained in the code, which alter the proteins in the heart.

These studies are only possible with family participation, and many hundreds of enthusiastic family members have been enrolled into this area of research.

One of the biggest challenges in genetics research is working out which of the thousands of genetic variants that each person carries are causative of heart disease.

To address this need, the Fatkin Laboratory uses zebrafish as models. A key achievement in the last 12 months has been the generation of the first transgenic zebrafish model of a human arrhythmia mutation.

The overall aim of these studies is to better understand the mechanisms of heart disease, in order to find new, personalised, approaches to patient care.

Building on a highly successful year in 2012, 2013 saw Diane Fatkin promoted to Professor of Medicine by the University of New South Wales and scoop the Eric Susman Prize. Awarded by the Royal Australian College of Physicians, it honours 'the best contribution to the knowledge of any branch of internal medicine'.

MARTINAC LABORATORY

How does the heart respond to stress?

Humans and animals are able to perceive vibrations when they hear something, or something touches their skin. Even our heart cells can tell when something is touching them.

When the heart is beating and pumping blood, its cells feel the motion and respond by sending an electrical current throughout the heart.

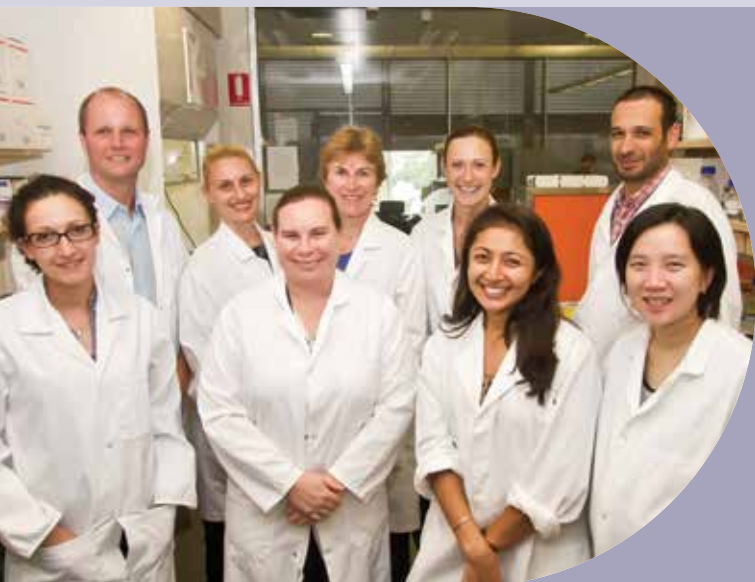
This current is made possible by a type of protein known as an 'ion channel', which pokes through the membrane of the cell. It acts much like a tap on a hose, opening to let ions flow through the cell membrane, and closing to shut off the electrical current.

In bacteria these ion channels act as 'safety valves' protecting the bacteria from drastic changes in the salt concentration of its environment.

The Martinac Laboratory studies bacterial mechanosensitive ion channels as they function in roughly the same way as human ion channels.

2013 was an outstanding year for the Laboratory's leader, the illustrious Professor Boris Martinac, as he was elected as a Fellow to the Australian Academy of Science.

Representing Australia's leading research scientists, the Australian Academy of Science hosts an annual celebration for a small number of scientists, where their outstanding contribution to the field is officially recognised by election to the Academy.



Science in the Spotlight

NEW ERA MEDICINE: REVERSAL OF AN ENTIRE FAMILY'S HEART RHYTHM DISORDER

In a world first, a team of researchers led by Professors Diane Fatkin and Jamie Vandenberg used gene-based therapy to successfully reverse an inherited heart rhythm disorder in members of an entire family.

Some of the family members had previously been told they had only months to live, and this therapy, heralded as part of the new era of personalised medicine, achieved remarkable results.

The findings were published in the *Journal of the American College of Cardiology*.

Rather than using conventional heart failure medicine, the researchers identified and treated the gene mutation that caused the family's heart rhythm disorder, dilated cardiomyopathy.

Dilated cardiomyopathy is a condition where the heart cannot pump enough blood to the body, making it a major risk factor for stroke and heart failure.

Affected family members received a drug shown in laboratory tests to target the gene mutation.

Professor Fatkin said the results were outstanding, with many patients with severe disease returning to full health within six months.

"This was game-changing research.

"Whilst we can only claim to have treated one particular mutation that causes cardiac dysfunction, and there is still much more to do to find the genetic causes of heart disease in every family, this is a huge step in the right direction.

"Throughout 2013 we have continued the clinical follow-up of the family members with this particular mutation, and they are making good progress. We also progressed in genetic testing of the younger family members, with at least one extra person starting on the therapy.

"In addition, we've been working hard to recruit other families with both dilated cardiomyopathy and arrhythmias to our research studies, so that we can continue to find new disease-causing gene variants, and novel approaches to treatment."

“

This was game-changing research. An example of what can be achieved if we know the what, where and why about the underlying gene mutation.”



Molecular, Structural and Computational Biology Division

STOCK LABORATORY

Mitochondria are the 'powerhouses' of the body's cells, converting food and oxygen into the biological fuel which the body needs to survive, as well as to thrive.

The Structural Biology Laboratory, headed by Dr Daniela Stock, uses X-ray crystallography to determine the structure of proteins involved in this process at near atomic resolution.

Crystallography is a vital scientific method for understanding the properties of matter. It underpins many fields of study from inorganic minerals to biological material and yet remains relatively unknown to the public.

X-ray crystallography is used to determine the atomic structure of crystalline material. The unique spots of X-rays diffracted by the crystal reveal the arrangement of atoms within the crystal.

As Nobel laureate Max Perutz used to say it shows "why blood is red, grass is green, why diamond is hard and wax is soft, why graphite writes on paper and silk is strong."

The work of the Stock Laboratory visualises proteins at extremely high resolution, which is essential in understanding their function in health and disease, and how they interact with other proteins and with drugs.

SUTER LABORATORY

Epigenetic marks are laid down in our cells as we develop in the womb. Sometimes these marks are placed incorrectly, leading to genes being switched on or off inappropriately.

Each of us has a single unique genome, a set of instructions made of DNA that creates all the different tissues and cell types in our bodies.

Epigenetic 'marks' sit on top of our DNA and dictate which genes are switched 'on' or 'off' in a given cell. This allows our DNA to generate the diversity of cell types we need from just a single set of instructions.

The Epigenetics Laboratory, led by Associate Professor Cath Suter, is interested in understanding how this incorrect setting occurs.

The team has focused on how a mother's diet during pregnancy can influence the setting of epigenetic marks that may in turn influence the health of her children, and even grandchildren or beyond, in their adult life.

In 2013, they also turned their attention to diet and health of fathers. Their early data shows that a father's health also impacts on the health of his offspring (ruling out genetic effects), and that again there is an 'epigenetic memory' of the father's exposure that influences health in his children, and possibly grandchildren too.



“ Visualising molecular power generators at atomic resolution ”

LEE LABORATORY

The human body is made up of hundreds of billions of cells.

What happens inside our cells is responsible for the function of our tissues, organs and bodies in health and disease.

Inside each cell there are tens of thousands of sophisticated biological machines that operate efficiently to keep our bodies functioning normally.

The Molecular Motors Laboratory, led by Dr Lawrence Lee, seeks to understand how these machines look and function at an atomic scale.

The Laboratory is taking a fundamentally new approach to the study of the biological sciences at the molecular level: to study biological machines by constructing them from the bottom up.

Using a new tool, DNA self-assembly, the Lee Laboratory is building atomically precise ‘nanoscale’ structures to scaffold the assembly of some of nature’s largest biological machines.

This includes the production of the bacterial flagellar motor, a highly efficient rotary motor that rotates five times faster than a Formula One engine, and bacteria’s molecular syringe, the type III secretion system, which injects virulence factors directly into the cells of infected patients.

This may lead to the development of new antibacterial vaccines that are less susceptible to antibiotic resistance.

HO LABORATORY

The Bioinformatics and Systems Medicine Laboratory, headed by one of Australia’s rising scientific stars, Dr Joshua Ho, was established in July 2013.

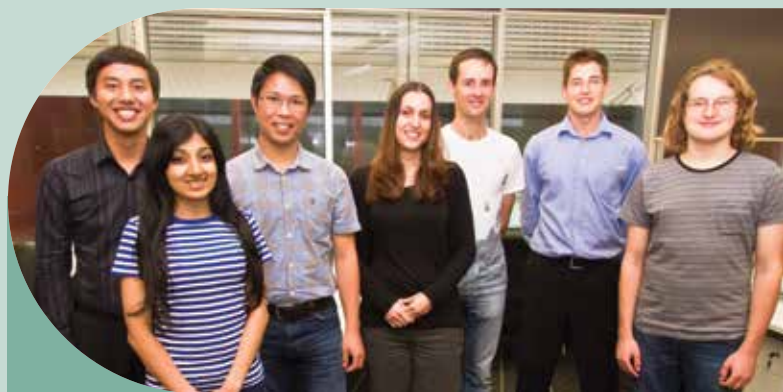
The Laboratory has expanded the Institute’s capacity in the cutting edge field of Bioinformatics, the application of computer science, mathematics and statistics to understand how complex biological systems work, and how genetic or molecular defects in these systems lead to diseases.

In many cases, determining whether a heart disease patient and their family members carry specific gene mutations in the DNA is critical for genetic counselling and informing the best course of treatment.

Using state-of-the-art sequencing technology, we can now routinely generate a large volume of DNA sequencing data. However, the real challenge lies in sifting through this to pinpoint the disease-causing mutations – akin to searching for a needle in a haystack.

The Ho Laboratory employs innovative computational approaches to significantly speed up the pace of discovering disease genes, as well as deciphering how genetic and non-genetic factors act together to cause heart diseases.

Dr Ho, at age 28, is the youngest faculty member the Institute has ever had. He undertook his postdoctoral training at the world-renowned Harvard Medical School in the United States, has published many peer-reviewed journal papers and is currently a conjoint senior lecturer at the University of New South Wales.



Science in the Spotlight

WHILE MUM'S PROGRAM THEIR CHILDREN TO BE FAT, THE LEGACY CAN BE OVERTURNED

Study published in Epigenetics

Scientists in the Epigenetics Laboratory discovered that obesity and type 2 diabetes in pregnancy can program children to develop metabolic problems later in life.

However, this legacy is not set in stone, and if the children of obese mothers are careful about what they eat, it can be overturned.

The study was carried out by leading researchers Associate Professor Cath Suter and Dr Jennifer Cropley, and published in the journal Epigenetics in June 2013.

Lead author on the study, Associate Professor Suter, says little has been understood until now about how being overweight in pregnancy impacts on the future health of children.

By using genetically identical mice as a model, the team investigated the effects of having a mother with obesity and type 2 diabetes.

The research team found that the offspring of obese and diabetic mothers were predisposed to developing metabolic disease, and that males were particularly affected.

These offspring were heavier than the offspring of lean mothers – even as babies, and when weaned onto a Western-style 'junk food' diet, they developed the hallmarks of type 2 diabetes within a few weeks.

After two months, they had developed severe fatty liver disease. The offspring of lean mothers remained normal on the same Western diet.

But the news isn't all bad. The offspring of obese mothers, while heavier and fatter, could be protected from overt metabolic disease and fatty liver by sticking to a low-fat diet.





Vascular Biology Division

STOCKER LABORATORY

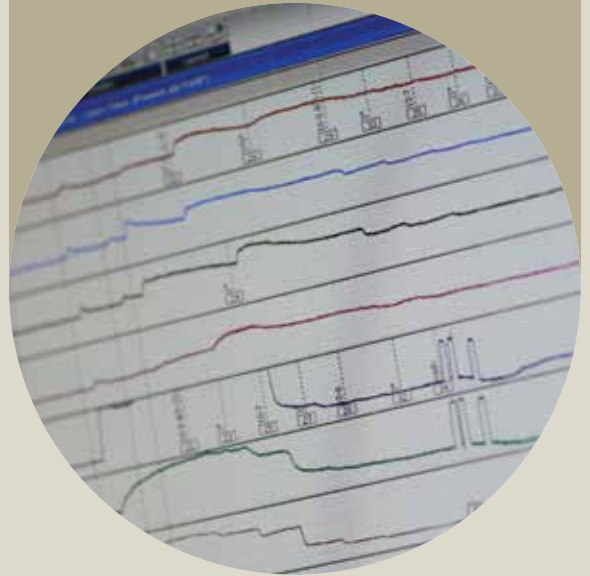
The Stocker Laboratory, headed by Professor Roland Stocker, aims to better understand atherosclerosis, which is the hardening and narrowing of the arteries, the blood vessels that carry blood from the heart through the body.

The arteries are lined by a thin layer of cells called the endothelium, which works to keep the inside of the arteries toned and smooth, and therefore keeps blood flowing.

Atherosclerosis starts when high blood pressure, smoking, or high cholesterol damage the endothelium, at which point cholesterol plaque formation begins, entering the wall of the artery.

This progressive process silently and slowly blocks the arteries, putting blood flow at risk. It is the most common cause of heart attacks, strokes and peripheral vascular disease, known collectively as 'cardiovascular disease'.

The Stocker Laboratory is part of the Vascular Biology Division, which formed in late 2012 and brought a completely new dimension of research to the Institute.



“ How do our arteries
harden and narrow?
”



VASCULAR BIOLOGY COMES TO THE CHANG

In 2012, highly acclaimed Vascular Biologist Professor Roland Stocker joined the Institute to head up the new Vascular Biology Division.

Over the last year, the Vascular Biology Program has brought a completely new dimension to the Institute's work, looking at the body's blood vessels, or 'pipes', where other divisions focus on the heart, or 'pump'.

The team is made up of 12 researchers who are addressing three key areas - what goes wrong in the blood vessels, how they become diseased, and how that process can be halted.

Professor Stocker said: "Most cardiovascular disease is caused by a fault in the pipes. To do its job effectively in pumping blood around the body, the heart needs the blood vessels to be in good condition too.

"It makes perfect sense to be carrying out this work here because it aligns so closely with the cardiac research already going on, especially within the Cardiac Physiology & Transplantation Division.

"Understanding the processes involved in diseased blood vessels is vital in helping us establish whether we can reverse the process through the development of new drug therapies, or medical devices."

It was the Institute's very strong focus on research-based outcomes that proved pivotal in attracting Professor Stocker, who has published over 250 papers internationally.

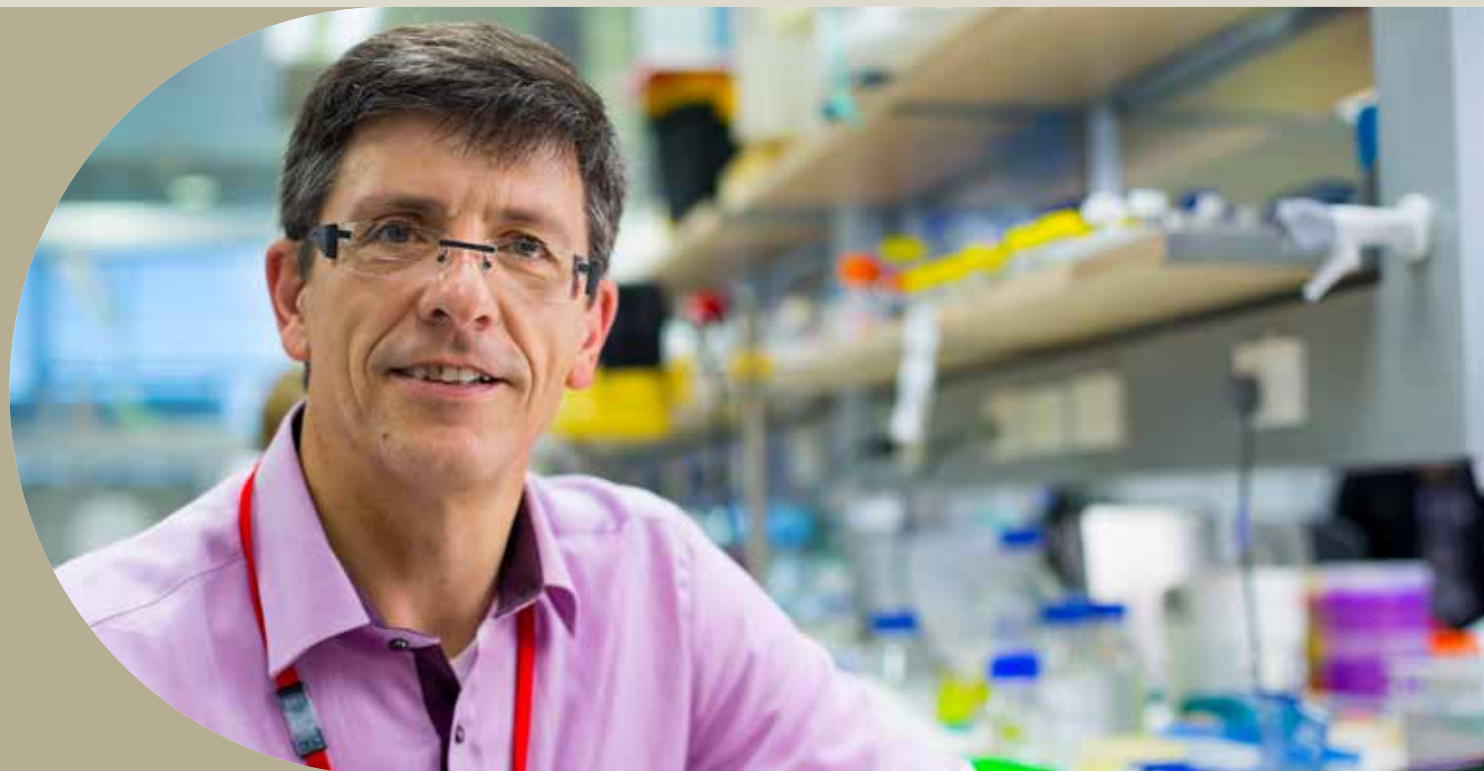
"There are many benefits to working, and leading a team of scientists, here. First and foremost is the incredibly strong culture, unwavering in its outcome-focused approach.

"As a career scientist, that gives me a great joy and a buzz every day that is more important than any pay cheque. The Institute also has an incredible leadership team with Bob Graham at the helm", he said.

It's a busy life too for Professor Stocker outside of the Laboratory.

In the 1970's he participated on behalf of his home country, Switzerland, in the rowing world championships in New Zealand, and it was his passion for the outdoor lifestyle led him to migrate permanently to Australia in 1988.

He and his wife Maree are also keen skiers, and recently became grandparents for the first time.



Awards and Achievements 2013

ACCOLADES

Professor Boris Martinac, Head of the Mechanobiology Laboratory, was elected to Fellowship of the Australian Academy of Science.

Co-Deputy Director of the Institute, **Professor Richard Harvey**, received the 2013 Ministerial Award for Cardiovascular Research.

Professor Diane Fatkin, Head of the Sr. Bernice Inherited Heart Diseases Laboratory, was promoted to Professor of Medicine, University of New South Wales. She also received the Royal Australasian College of Physician's 'Eric Susman' prize for her outstanding contribution to internal medicine,

Dr Andy Ng (Vandenberg Laboratory) received the young biophysicist award at the 37th annual conference of the Australian Society for Biophysics

DEGREES AWARDED

Five people were awarded PhD degrees in 2013 from the University of New South Wales. **Sara Ballouz** and **Dhakshinari Hulugalle** (Stock Laboratory), **Juliane Heide** (Vandenberg Laboratory), **Alex James** (Dunwoodie Laboratory) and **Christiana Leimena** (Fatkin Laboratory).

LIFE GOVERNORS AND AMBASSADORS

In 2013, we welcomed five new Ambassadors, one new Young Ambassador, and a new Life Governor to the Institute, for their dedication, commitment and encouragement to our research. Their support has been unwavering, their loyalty unsurpassed.

PATRONS

Mrs Ann Chang (2004)

The Hon Neville Wran,
AC, QC (2008)

PAST PATRON

The Late Mr Kerry Packer,
AC (1994)

HONORARY LIFE GOVERNOR

Her Royal Highness Crown Princess Mary of Denmark
(2005)

LIFE GOVERNORS

Mrs. Barbara Ell (2000)

The late Lady Finley (2000)

Mr John David (2000)

Mr Frank Lowy, AC (2000)

Strathfield Car Radios (2000)

The Freshest Group (2000)

Abigroup (2000)

Freedman Foundation (2000)

National Australia Bank (2000)

Mr Robert Oatley, AO (2001)

Mr Steven Lowy, AM (2001)

Telstra Corporation (2001)

Mrs Jennie Thomas (2002)

Lady Mary Fairfax, AM,OBE
(2003)

Mr Ziggy Switkowski (2003)

Mr Sam Chisholm (2003)

ANZ Bank (2004)

Citigroup (2005)

Mr James Packer (2005)

Mr Mark Johnson (2006)

Mr Lance Rosenberg (2006)

Mr Ken Lee (2007)

The Atlantic Philanthropies
(2007)

Mr & Mrs David & Diana Ritchie (2007)

John T Reid Charitable Trusts
(2008)

Inghams Enterprises (2008)

Mrs Roslyn Packer, AO (2009)

Mr Lionel Lee (2010)

Mr and Mrs Gerry & Wendy Commerford (2010)

Chain Reaction (2012)

De Groot Industries (2013)

AMBASSADORS

Mr John Laws, CBE (2001)

The late **Ms Amana Finley**
(2001)

Mr Ken Laing, AM (2001)

The late **Mr Alan David** (2002)

Crane Group Limited (2002)

Steve Costi Seafoods (2003)

Crestbrook Mountain Springs
(2003)

Baker & McKenzie (2004)

Schute Bell Badgery Lumby
(2005)

Mr and Mrs David & Diana Ritchie (2005)

Mr and Mrs Scott & Rhonda Gibbons (2006)

Mr and Mrs Russell & Julieanne Cooper (2007)

Mr and Mrs John & Margaret Ingram (2007)

Mr and Mrs Ralph & Lorraine Keyes (2008)

Guinness Peat Pty Ltd (2008)

Mr Cameron Irving (2009)

Deutsche Bank (2009)

Club Marconi (2009)

LK Jewellery (2009)

Mr Steve Quinn (2011)

Cobram Estate (2011)

Ms Anne-Marie Allgrove
(2011)

United Airlines (2011)

Virgin Airlines (2012)

Mr Terry McCabe (2012)

Mr Mark Ryan (2012)

HCF (2012)

Ms Michelle Parker & Ms Emma Quick (2012)

Randwick City Council (2013)

Kia Motors (2013)

Ryan Stokes (2013)

Craig Marshall (2013)

Sharlene Melville (2013)

HONORARY LIFE MEMBERS

Ms Fiona Coote, AM (2001)

Mr Kerry James, AM (2004)

Mr John Kean (2010)

Mr John McGuigan (2010)

YOUNG AMBASSADOR

Mr Mark Vincent (2009)

Ms Kate Ritchie (2013)

“Discovery begins with individuals.
Many of ours received accolades
of the highest honour in 2013.”



Clockwise from top left:

- > Ryan Stokes
- > Bob Graham, Craig Marshall and Steven Lowy
- > Alan Crouch (Kia Motors)
- > Randwick Mayor, Councillor Scott Nash and Sharlene Melville (Randwick City Council)
- > Kate Ritchie
- > Gary Wong (De Groot Industries)



Paul Korner Seminar Series



2013 Paul Korner winner
Stefan Mann

The Paul Korner Seminar Series is presented weekly, providing our young scientists the opportunity to present an update of their research progress and achievements.

The Series was established in 1998 to recognise the outstanding contributions of Professor Paul Korner, a pioneer of cardiovascular research in Australia. Professor Korner sadly passed away in October 2012.

Louise Dunn	<i>"A novel role for heme oxygenase-1 in peripheral vascular disease"</i>
David Humphreys	<i>"Analysing transcriptome complexity with high throughput sequencing"</i>
Maryrose Constantine	<i>"TRPping out in the membrane - structural and mechanobiological investigations of TRPM4"</i>
Inken Martin	<i>"Zebrafish models of heart failure and arrhythmia"</i>
Duncan Sparrow	<i>"Genetic and environmental causes of vertebral and heart defects"</i>
Charles Cranfield	<i>"Antimicrobial Peptide Insertion Into Lipid Membranes"</i>
Romarc Bouveret	<i>"Congenital heart diseases and macarons"</i>
Gavin Chapman	<i>"Ligand-induced trafficking of the Notch1 receptor"</i>
David Langley	<i>"Antibodies – formats, evolution and utility"</i>
Elise Laming	<i>"Investigating the proton channel of the A-type rotary ATPase"</i>
Sally Eaton	<i>"Multi-generational metabolic programming by parental obesity"</i>
Nicole Schonrock	<i>The Transcriptional Landscape Surrounding Nkx2-5: Finding a forest among the trees...</i>
Siiri Iismaa	<i>"Cardiomyocyte proliferation during preadolescent growth and after myocardial injury"</i>
Callum Smits	<i>"Towards structural characterisation of the MS-ring of the bacterial flagellar motor"</i>
Jane Yu	<i>"Critical role of RHOA/ROCK signalling in cardiac contractility"</i>
Alexis Bosman	<i>"Identifying the Genetic Cause of Hypoplastic Left Heart using iPSC"</i>
Mirana Ramialison	<i>"Decoding heart development"</i>
Arjun Iyer	<i>"Donation after circulatory death (DCD) donors in cardiac transplantation - Back to the future?"</i>
Gayathri Kumarasinghe	<i>"Enhancing preservation of hearts from brain-dead donors: "turning bad into good"</i>
James Cornwall	<i>"Quantifying Cardiac Stem Cell Growth Dynamics using Time-Lapse Imaging and Single-Cell Tracking"</i>
Hafizah Hamid	<i>"A role for heme oxygenase-1 in embryonic development?"</i>
Ghassan Maghzal	<i>"Bleach in atherosclerosis: Does it matter and how do we detect it?"</i>
Ali McCorkindale	<i>"Investigating expression and function of a Piwi protein in stem cells and cancer"</i>
Naisana Seyed Asli	<i>"Cell Cycle and Metabolism at the Heart of Stem Cells"</i>
Stefan Mann	<i>"A Tale of Tails: insights into hERG channel gating"</i>
Vesna Nikolova-Krstevi	<i>"Evaluation of Mechanical Stretch Responses in the Atrial Endocardium"</i>
Roberta Davies	<i>"Detection of Conformational Flexibility in the Thermus thermophilus A-ATPase using Mass Spectrometry"</i>
ChuKong Liew	<i>"Engineering lower-hanging fruit: the bumpy road to GPCR structures"</i>
1st Year PhD Candidates	Amy Nicks, Tony Ngo, Lorraine Ganelas, Navid Bavi, Dhanushi Abeygunawardena

WINNER:

Stefan Mann
(Vandenberg Lab)

STUDENT WINNER:

Maryrose Constantine
(Martinac Lab)

PEOPLE'S CHOICE:

David Langley
(Stock Lab)

Barbara Ell Seminar Series

“
A rare
treat”

This Seminar Series is named after Mrs Barbara Ell, a life governor, avid supporter of the Institute and a hard working member of both the Board and Appeals Committee.

The Institute invites a renowned Australian scientist to present a lecture as a part of the Barbara Ell Seminar Series.

Dr Manuel Ferreira	Genetic Epidemiology Unit, Queensland Institute of Medical Research <i>“Back to humans: how genetic research can point to new drugs for asthma”</i>
Dr Sandro F. Ataide	Lecturer in Structural Biology, School of Molecular Bioscience, University of Sydney <i>“The Signal Recognition Particle RNA and its multi functions”</i>
Professor Simon Foote	Dean of ASAM, Macquarie University <i>“Host-parasite interactions and the development of resistance-proof antimalarials”</i>
Professor Henry Krum	PhD FRACP, Director, CCRC Therapeutics, Monash University <i>“Heart-kidney interactions in heart failure”</i>
Professor David Craik	Group leader for NMR Spectroscopy research, IMB <i>“Discovery and applications of naturally occurring cyclic peptides in drug design”</i>
Professor David James	Leader, Diabetes & Obesity Research Program, Garvan Institute of Medical Research; NHMRC Principal Research Fellow; Professor (Adjunct), School of Biotechnology & Biomolecular Sciences, Faculty of Science, University of New South Wales <i>“New insights into insulin action using proteomics”</i>
Professor Aleksandra Filipovska	ARC Future Fellow, Western Australian Institute for Medical Research <i>“Regulation of mitochondrial gene expression in health and disease”</i>
Dr Till Boecking	Leader of the Molecular Machines Unit, Centre for Vascular Research <i>“Watching chaperones play molecular jenga”</i>

LEADING INTERNATIONAL KIDNEY DISEASE SCIENTIST GIVES 2013 PRINCESSES LECTURE

One of the world's leading scientists in the field of kidney disease, Dr. Susan Quaggin, delivered the 2013 Princesses Lecture at the 14th Victor Chang Cardiac Research Institute International Symposium in December.

The theme of the symposium, held in conjunction with St Vincent's Hospital, was 'Vascular Biology: from basic science to renal denervation'.

Quaggin, Professor and Head of the Feinberg Cardiovascular Research Institute and Division of Nephrology at Northwestern University in Chicago, is currently spearheading work to discover ways to halt the progression of kidney disease through a better understanding of kidney development and function.

Her work has already led to the discovery of a gene critical for kidney, lung and heart development, which is now being used to study the evolution of microscopic kidney filters, whose role is to remove waste and excess fluids from the blood.

Other presenters at the three-day event included Professor Michael Simons, Director of the Cardiovascular Research Centre at Yale University, Newhaven, Connecticut. Early in 2013, he was part of a team who uncovered the molecular pathway by which new arteries may form after heart attacks, stroke and other acute illnesses, bypassing arteries that are blocked.



Dr Susan Quaggin delivered the 2013 Princesses Lecture at the 14th Victor Chang Cardiac Research Institute International Symposium.

The discovery opens up new therapeutic opportunities for developing drugs that either stimulate, or inhibit, blood vessel formation, important goals in both cardiovascular and anti-cancer therapies.

Professor Bob Graham, Executive Director, said: “We were honoured to have such an outstanding group of experts, which includes some of the world's leading scientists and clinicians, taking part in our 2013 symposium.

“Susan Quaggin's Princesses' Lecture was a highlight of three days discussion spanning the latest in basic science, right through to application of innovations and discoveries to patients.

‘It was an exciting gathering of some brilliant minds, and a terrific example of how researchers can collaborate on problems to strengthen the future of biomedical research and clinical care across the globe.’

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Statement of Income and Expenditure

	2013	2012
	\$	\$
Income		
Grants	13,572,060	13,546,412
Fundraising	3,995,479	2,576,593
Bequests	2,004,861	1,586,377
Investment income	1,356,661	1,198,745
Other	129,383	68,968
Total Income	21,058,444	18,977,095
Operating Expenses		
Salaries and related expenses	13,141,468	11,603,611
Research consumables	2,665,947	1,812,570
Depreciation	2,068,310	2,003,352
Other operational expenses	1,017,218	933,595
Administration expenses	1,910,374	1,900,909
Fundraising expenses ⁽¹⁾	474,918	489,475
Total Expenses	21,278,235	18,743,512
(Deficit)/Surplus before non operating income	(219,791)	233,583
Non Operating income		
Unrealised gain on investment revaluation to market	1,520,276	983,357
Net Surplus for the year	1,300,485	1,216,940

⁽¹⁾ Fundraising expenses are funded from investment income, so that 100% of donations are used for research

FUNDRAISING 2013

“

To all of our wonderful friends and supporters, we say thank you.

The Institute exists because of your unwavering support, loyalty and generosity. The last 19 years have been possible thanks to your faith in our work.”

Clockwise from below:

- > Heart to Heart Ball and Media Awards
- > Chairman, Mr Steven Lowy
- > Mr Simon McKeon
- > Today Tonight Perth's Mark Gibson (centre)



DIAMONDS ARE FOREVER – THE VICTOR CHANG HEART TO HEART BALL & MEDIA AWARDS

On Saturday, 3 August, the annual Victor Chang Heart to Heart Ball raised almost half a million dollars for cardiac research. The theme for the flagship gala dinner, held at The Star Event Centre in Sydney, was 'Diamonds are Forever'.

More than 660 guests in attendance paid tribute to the highly skilled surgeon and humanitarian Dr Victor Chang, whose work has inspired hundreds of researchers.

Guests were treated to a throng of colour and entertainment, including a keynote speech from the 2011 Australian of the Year, Mr Simon McKeon AO, silent and live auctions, dinner and dancing.

Mr McKeon spoke in depth about his role in chairing the Federal Government's independent strategic review of health and medical research in Australia, which has now recommended a ten-year plan for the nation.

For the fourth successive year, the Victor Chang Media Awards were also incorporated into the evening's events.

Hotly contested in 2013, Today Tonight Perth reporter Mark Gibson was awarded the Victor Chang Award for Excellence in Cardiovascular Journalism (Metropolitan Category). This was the second time Mark has won this award, having won the inaugural award in 2010.

The winner of The Victor Chang Award for Excellence in Cardiovascular Journalism (Regional Category) went to Boel Eriksson of the Manly Daily, for her front-page article about celebrity chef Alessandro Pavoni, who has a complex medical history and has suffered two heart attacks. Judges felt the piece both raised general awareness about heart failure, and encouraged direct action from readers in urging them to donate to cardiac research.

The Highly Commended Award was won by the Brisbane Courier Mail's Science & Medical Reporter Janelle Miles, for her story on 40 year-old lawyer Peter Betros who, after falling sick with a flu-like illness that attacked his heart, defied the odds and was kept alive by a mechanical pump until he was able to have a heart transplant.



MONICA O'LOUGHLIN WOMEN AGAINST HEART DISEASE LUNCH

In 2012, the Victor Chang Cardiac Research Institute held its inaugural lunch in honour of our former finance manager and friend, the late Monica O'Loughlin, who died from a heart attack aged just 51.

The event aims to increase awareness of heart disease amongst women, with the disease killing four times as many women in Australia than breast cancer every year.

The keynote speaker at 2013's event was Dr Noel Bairey Merz, Director of the Barbra Streisand Women's Heart Centre and Cedars Sinai Heart Institute in the United States.

Dr Merz has an extensive publication record of over 180 scientific publications, 200 abstracts and numerous book chapters. She explained to the 400 female attendees that as a society we have been programmed to think of heart disease in a 'typically male way'. This is despite the fact that only one third of women will experience the same symptoms as a male when suffering a heart attack.

Our sincere thanks go to Dr Merz, Commonwealth Bank Women in Focus for co-hosting, producer Ken Laing, and emcee Janine Perrett.



Top right: Dr Bairey Merz with Bob Graham

Right: Dr Noel Bairey Merz



CHAIN REACTION – THE ULTIMATE CORPORATE CYCLING CHALLENGE

In 2007, Berrick Wilson, a Partner at Korda Mentha and National Head of Real Estate Advisory, founded Chain Reaction.

The non-mass participation cycling event was established as an act of gratitude for the care and attention Berrick's family received when his two-year-old daughter Milla was rushed to hospital with a brain haemorrhage. His experience over the weeks he and his wife spent at Monash Medical Centre made him realise that more could be done to help sick children.

Chain Reaction invites individuals who want a physical challenge to participate in a gruelling 1000 km plus ride over seven days. In return, participants benefit from both valuable networking opportunities, and the immense satisfaction of directly helping sick children in need.

Chain Reaction also challenges riders to use their standing in the business community to draw on the support of their networks, to raise a pre-determined amount in personal donations. The riders participate in the spirit of camaraderie, teamwork and fun, with each event completed as a group and not as a race.

The 2013 New South Wales leg of Chain Reaction raised money for the Institute's Embryology Laboratory, headed by Professor Sally Dunwoodie, and covered a staggering 1175km from Melbourne to Sydney.

29-intrepid riders passed through towns including Beechworth, Corryong, Cooma, Canberra and Moss Vale, as well as covering the picturesque and challenging Snowy Mountains with a visit to Cabramurra, Australia's highest town.

The 2013 event sponsors were Westpac, Gadens Lawyers, Ernst & Young, Westfield, Brookfield Multiplex, National Australia Bank and Colonial First State.



YOUNG APPEALS COMMITTEE LAUNCHED

In September, the 'Young at Heart' launch event marked the establishment of the Young Appeals Committee.

Chaired by Marcus Chang, Dr Victor Chang's youngest son, the Committee formed to help engage younger audiences with the Institute's work.

Around 200 guests were invited to have their heart health checked in the Victor Chang Health Check Booth, talk face to face with scientists, and speak with fitness experts about their exercise regime.

Prue Macsween, star of 2013's *Celebrity Apprentice*, emceed the event and guest speaker was 17-year-old Joel Seeto who has hypertrophic cardiomyopathy (a disease of the heart muscle where the wall becomes thickened making it harder for the heart to pump blood around the body).

'Young at Heart' raised over \$10,000, which will be used to help fund a new 'Victor Chang PhD scholarship' being offered in 2014.

Below: Joel Seeto (left) with Marcus Chang



OUR HEARTFELT THANKS ALSO TO:

- > Richard Becker, and the Becker Film Group for supporting the Institute through the Australian release of the movie 'Diana'
- > Prue Macsween, who competed fiercely on behalf of the Institute in *Celebrity Apprentice*
- > Michael Renford and Randwick City Council, for hosting the annual Des Renford Gala Day fundraiser, and for working with Sydney Airport Corporation to enable the Institute to sell pens in the departure lounge – a new initiative in 2013
- > Kate & Diana Ritchie, for their phenomenal feat in swimming the Dardanelle Straight
- > Club Marconi for hosting another successful 'Heart of the West' ball in Western Sydney;
- > Cameron Irving for hosting 'Crabfest' – the fun and fast paced crab eating competition
- > The Westfield Group for hosting the 2013 Golf Day at St Michaels Golf Course, Little Bay
- > The supporters of our annual 'Trivia at the Chang' quiz night
- > Our many other very generous friends and supporters throughout 2013.

Below: Professor Sally Dunwoodie gave a speech at the Australian premiere of 'Diana' in September 2013



Community Outreach 2013

KEEPING AUSTRALIAN HEARTS PUMPING: THE VICTOR CHANG HEALTH CHECK BOOTH

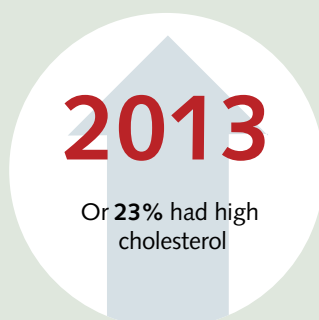
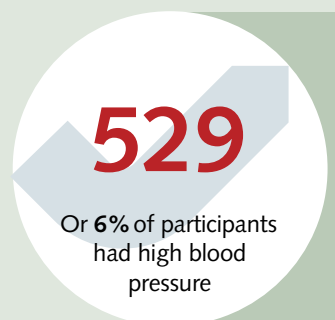
The Victor Chang Health Check Booth travels the length and breadth of the nation, testing Australians for key heart disease risk factors by checking their blood pressure, blood cholesterol and blood glucose levels.

Staffed by New South Wales-trained nurses, 2013 was a milestone year for the Booth, which tested its 15,000th participant in Parramatta, Western Sydney, and visited almost 70 other locations across four states.

The Health Check Booth is generously supported by HCF, Kia Motors, IMB Community Foundation and Sydney Markets Foundation.

To book the Victor Chang Health Check Booth for your next corporate or public event, please contact Jayne Baric on (02) 9295 8760 or j.baric@victorchang.edu.au.

THE BOOTH BY NUMBERS IN 2013



SCHOOL SCIENCE AWARDS HONOUR SCIENTIFIC BRIGHT SPARKS

This year officially marked the tenth anniversary of the Victor Chang School Science Awards, which were developed to encourage a passion for science amongst secondary school students, and inspire them to consider a career in the field.

More than 200 awards were handed out to Year 11 students at ceremonies across the Greater Sydney region, in Campbelltown, Penrith, Blacktown and Wollongong.

The award winners are nominated by their schools for demonstrating an outstanding commitment to their scientific studies throughout the year. They are presented with a framed certificate, and invited to visit the Institute.

The young winners are bucking trends, with a 2011 report from the Department of Education, Employment and Workplace Relations showing that 94 per cent of Year 11 and 12 students were enrolled in science subjects 20 years ago, compared with just 51 per cent in 2010.

Below: Wollongong School Science Award recipient Kalidevi Samuels-Connell (centre) with Bob Graham and Mrs Ann Chang



VANESSA CHANG INDUCTS STUDENTS TO 'CHANG HOUSE'

In December, Vanessa Chang was invited to speak about her father's life and launch 'Chang House' at Sydenham Catholic Regional College in West Melbourne.

Vanessa welcomed incoming year 11 students, and inducted them into the new school house set up in honour of Dr Victor Chang, with the core values of dignity, compassion and endeavour.

Victor was selected by students to sit amongst other eminent Australians as a house patron. Vanessa said she was delighted to address the large group of assembled students, and to give them a very personal introduction.

Below: Vanessa Chang (9th left) with members of 'Chang House' at Sydenham Catholic Regional College



“ The tonality, light and composition are tender, and perfectly fit the theme of the heart. ”

ART OF THE HEART 2013: VICTOR CHANG SCIENCE IMAGE COMPETITION

In 2013, the Institute held the 'Art of the Heart' science image competition, which encouraged research staff to submit pictures of their work that they believe demonstrate the beauty of science.

The competition was judged by professional Sydney-based artist Giles Alexander, who trained at the world-renowned Central St. Martins College of Art & Design in London and displays his work at the Martin Browne Contemporary Gallery in Paddington.

A plethora of talented scientists from across the Institute submitted their images – with two runners up and an overall winner's prize awarded.

WINNER:

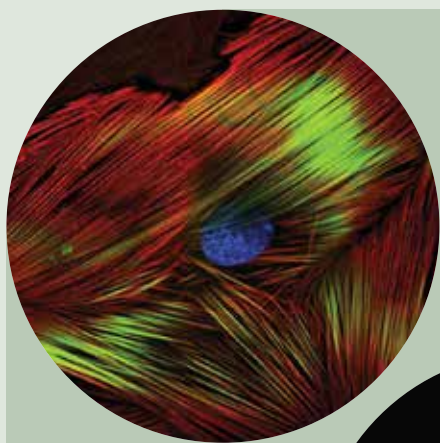
Alexis Bosman
(Harvey Laboratory)

From humble cell beginnings come hearty complexities:

This heart shaped cluster of microscopic cells 400x magnified was created using induced pluripotent stem cells – a specialised type of stem cell which originally began as skin cells. After the process of reprogramming, the cells acquire the capability of forming any cell type in the body, including cells of the heart. Under special conditions, these cells can be coaxed into producing cardiomyocytes – heart muscle cells – which beat like native heart tissue.

Judge comments: *The beautiful clarity of the shot captured the familiarity of the heart, and the image crosses the line between the human and the scientific. The tonality, light and composition are tender, and perfectly fit the theme of the heart.*

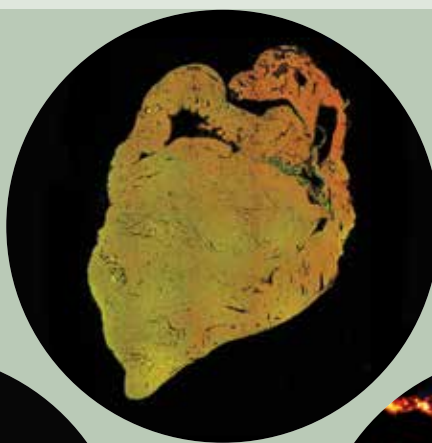




RUNNER UP:
Elvira Forte and
Vaibhao Janbandhu
(Harvey Laboratory)

Brush strokes: Adult cardiac stem cells differentiate into smooth muscle cell lineage when cultured in hypoxia and exposed to transforming growth factor. Confocal images show differentiated cardiac stem cells, which stained show muscle action (red), calponin (green) and DNA (blue).

Judge comments: *There is a great use of colour in this image, which captures a sense of realism and abstraction. The very high magnification represents the 'other worldliness' of technology, and the window technology affords us. The blue centre is suggestive of an eye – and a real life or entity.*



RUNNER UP:
Nasim Mohammadi
(Lee Laboratory)

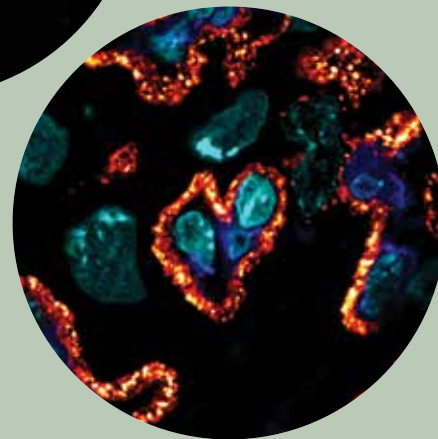
The white heart: An edited microscopic visualisation, 72 hours post fertilisation of a zebrafish's embryo.

Judge comments: *This is a cool, objective and bold image, the zebrafish can be made out perfectly and it truly describes the creature, particularly the heart. The choice of title is wonderful.*

HIGHLY COMMENDED:
Maryrose Constantine
(Martinac Laboratory)

The last sunset heart: As a control for an experiment, the heart of a sham surgery mouse was harvested. The heart was then cryosectioned, fixed and stained for proteins, which play a role in cardiac conduction disease. Lastly, the image of the whole heart was pieced together by tiling multiple z-stack images acquired at 10x magnification using a confocal microscope. The gradient distribution of the fluorophores across the heart bears a striking resemblance to a sunset.

Judge comments: *This is a very strong image, which seems to go on forever. It would have great animation potential.*



HIGHLY COMMENDED:
Julie Moreau
(Dunwoodie Laboratory)

Heart of the placenta: A mother gives more than just love to her child during pregnancy. Through the placenta, she also provides food and oxygen to help her child grow. If the placenta does not form properly, then the embryo will not grow properly, and may even die before birth. This 4000x magnified image shows a mouse placenta that has not formed correctly. The blood vessels of the embryo are shown in bright red, with supporting cells shown in blue and cyan.

Judge comments: *Love this image. Has a strong familial element to it, which will resonate with many.*

Corporate Supporters

Our thanks go to the following organisations who continue to support our work each year.

You too can help us in our fight against heart disease. Support the Victor Chang Cardiac Research Institute by calling 1300 VICTOR (842867), or visit www.victorchang.edu.au



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Design: Pro Bono Publico

Photography: Peter Morris, Karl Schwerdtfeger & Djordje Djordjevic

ART OF THE HEART 2013

From humble cell beginnings come hearty complexities – winning entry from Alexis Bosman, Developmental & Stem Cell Biology Division

This heart shaped cluster of cells 400x magnified was created using induced pluripotent stem cells, a specialised type of stem cell which originally began as skin cells. After 'reprogramming', the cells have the ability to form any cell type of the body, including cells of the heart. Under special conditions, these cells can be coaxed into producing heart muscle cells (cardiomyocytes).

