



Laboratory Head, Cryo-Electron Microscopy

Victor Chang Cardiac Research Institute

Information for prospective candidates



Victor Chang
Cardiac Research Institute

About Us

The Victor Chang Cardiac Research Institute is one of the most respected heart research facilities in the world and is dedicated to finding cures for cardiovascular disease. Renowned for the quality of its breakthroughs, the Victor Chang Institute uses innovative transplantation techniques, and conducts complex molecular and genetic analysis to make world class discoveries.

A global centre-of-excellence, it integrates advanced stem cell research, regenerative medicine, and bio-engineering using cutting edge technology. Our scientists rapidly translate our discoveries into new diagnostics, preventions and treatments of cardiovascular disease – reducing the incidence, severity and impact of heart disease.

Our Mission

The relief of pain and suffering, and the promotion of wellbeing, through an understanding of the fundamental mechanisms of cardiovascular biology in health and disease.

Our Values

- **Passion:** To encourage and share the excitement of scientific discovery
- **Courage:** To have the courage to pursue research that will enable us to imagine the unimaginable
- **Integrity:** To act with honesty and fairness at all times
- **Curiosity:** To create an environment that encourages and feeds curiosity
- **Teamwork:** To promote collegiality
- **Respect:** To respect the individual and their unique and diverse contributions

Victor Chang Institute at a glance 2016



230 staff and students



136 Journal
Publications



*46% of employees and
students are female*



5 Research Divisions and
21 Laboratories



Key Research Themes & Areas

- Developmental Biology
- Structural & Computational Biology
- Genomics & Precision Medicine
- Metabolomics
- Congenital heart disease
- Heart failure & cardiomyopathy
- Arrhythmias
- Heart transplantation
- Inherited heart diseases
- Ischemic heart disease
- Regenerative Medicine & Stem Cell Biology

Leadership

Executive Director

Professor Robert Graham, AO
FAA, MBBS, MD, FRACP, FACP,
FAHA, FCSANZ, FAHMS

Deputy Director

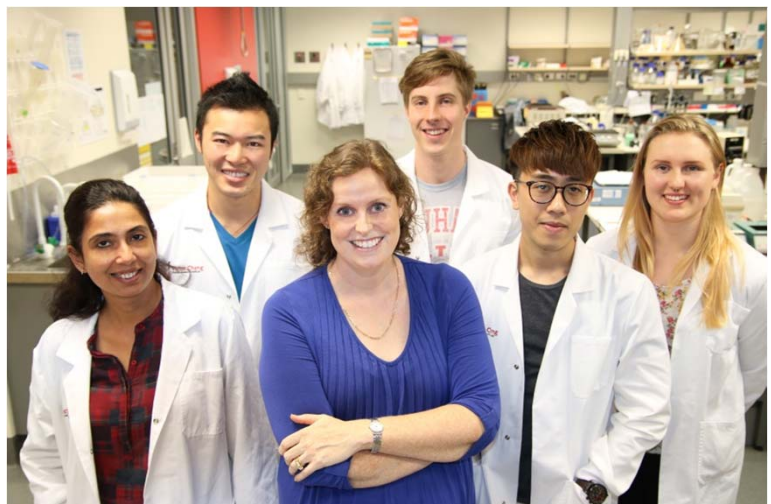
Professor Richard Harvey, AM
FAA, FAHMS, FRS

Deputy Director

Professor Jamie Vandenberg
FHRS, FAHMS

Our Strategic Goals

1. Undertake innovative and cutting edge research that provides fundamental insight into biology and improves understanding, prevention, diagnosis and treatment of cardiovascular disease
2. Enhance the impact of our research on cardiovascular health by translating our discoveries and commercialising them where possible
3. Educate and train the next generation of leaders in cardiovascular biology, medicine and research
4. Build a sustainable organisation that provides the necessary infrastructure and an ongoing funding base to support our recruitment activities and research agenda
5. Attract, support and nurture high calibre staff by providing them with the tools, infrastructure and environment needed to do world class research
6. Raise public awareness of our research activity and engage with our community and stakeholders so that we receive the support we need to undertake our work





Governance

The Institute is an independent research facility with its own Board of Directors and is a member of St Vincent's Health Australia. In addition, the Institute is affiliated with the University of New South Wales, is accredited by the National Health and Medical Research Council (NH&MRC) Australia as an independent biomedical research facility, and is a member of the Association of Australian Medical Research Institutes (AAMRI).

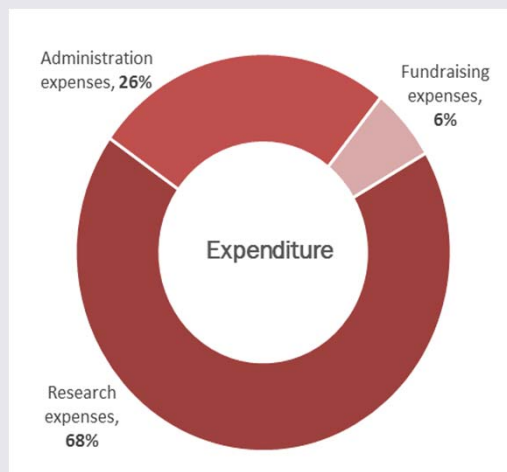
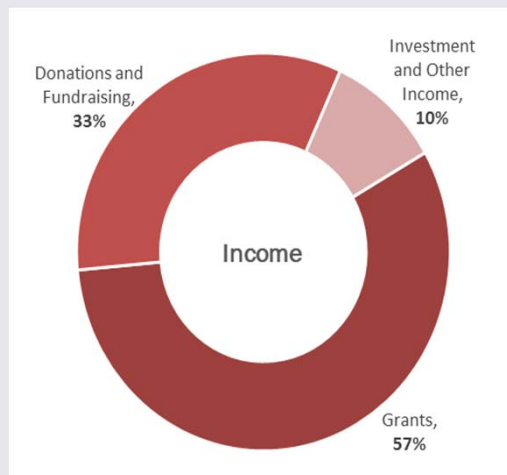
The business of the Institute is governed by the Board, which is responsible for the oversight of policies, strategic directions and management of the Institute. In turn, the Board delegates to the Institute's Executive Director the overall responsibility for the scientific program and management of the Institute. Board members are leaders in business, the professions and academia.

The Institute's research staff and students are assigned to theme-based research divisions, but collaborations across the Institute are fostered and encouraged. Researchers are supported by professional services and fund raising staff.

Our Five Research Divisions

- 1. Cardiac Physiology and Transplantation**
Division Head: Professor Peter MacDonald
- 2. Developmental and Stem Cell Biology**
Division Head: Professor Richard Harvey
- 3. Molecular Cardiology and Biophysics**
Division Head: Professor Bob Graham
- 4. Molecular Structural and Computational Biology**
Acting Division Head: Dr Joshua Ho
- 5. Vascular Biology**
Division Head: Professor Roland Stocker

Financial Overview 2016



FINANCIAL SUMMARY FOR 2016	
Income for operations	\$22,192,084
Expenditure in operations	\$22,223,893
(Deficit) before non-operating income	(\$31,809)
Unrealised gain/(loss) on investment revaluation to market	\$208,422
Net Surplus/(Deficit) for the year	\$176,613

The above is an extract from the 2016 audited Financial Statements. The extract does not include the information normally included in the financial statement. Accordingly, this extract is to be read in conjunction with the audited Financial Statements for the year ended 31 December 2016.

Structural and Computational Biology Division

Overview



The structural and computational laboratory uses x-ray crystallography and electron microscopy, complimented with biophysical and biochemical techniques, to determine the structure and function of proteins and protein complexes at high resolution.

These methods provide images of molecules that allow us to see the precise location of the atoms within a protein or protein complex. Structural biology has revolutionised both material sciences and the life sciences and forms the basis of what we now call “molecular biology”. It provides us with the detailed blueprints of the nano-scale machines that populate cells and that keep us alive.

The division was started by Dr Daniela Stock FAA in 2006 and over its 10 year history has published highly influential work on the structure and function of molecular motors essential for life on earth, in leading journals, *Nature*, *Science*, *Nature Structural Biology* and *Structure*. From understanding the switching of the flagella motor, to cellular energy synthesis and the folding of proteins, the division aims to the elucidate fundamental functions of important biological molecules.

Recently the focus of the laboratory has shifted toward the technique of cryo-electron microscopy, which is well suited to the large protein complexes being studied at the Institute. This has revolutionised structural biology, shedding light on targets once thought almost impossible to work on, including the hERG potassium ion channel, which is found in the heart and is responsible for 60% of drugs in development not making it to market, owing to deleterious off-target effects.

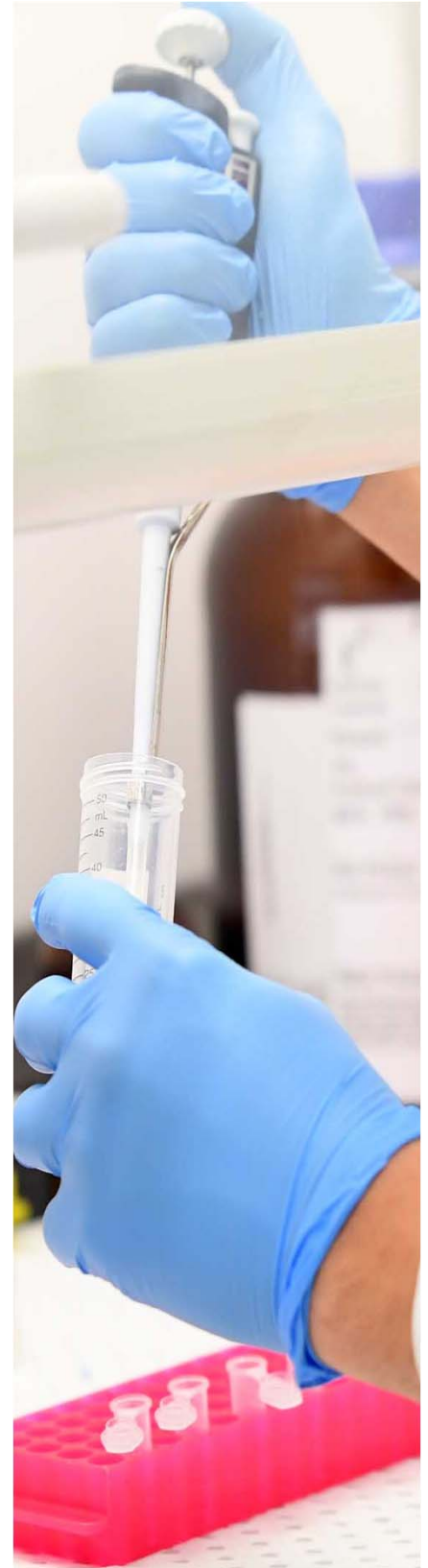
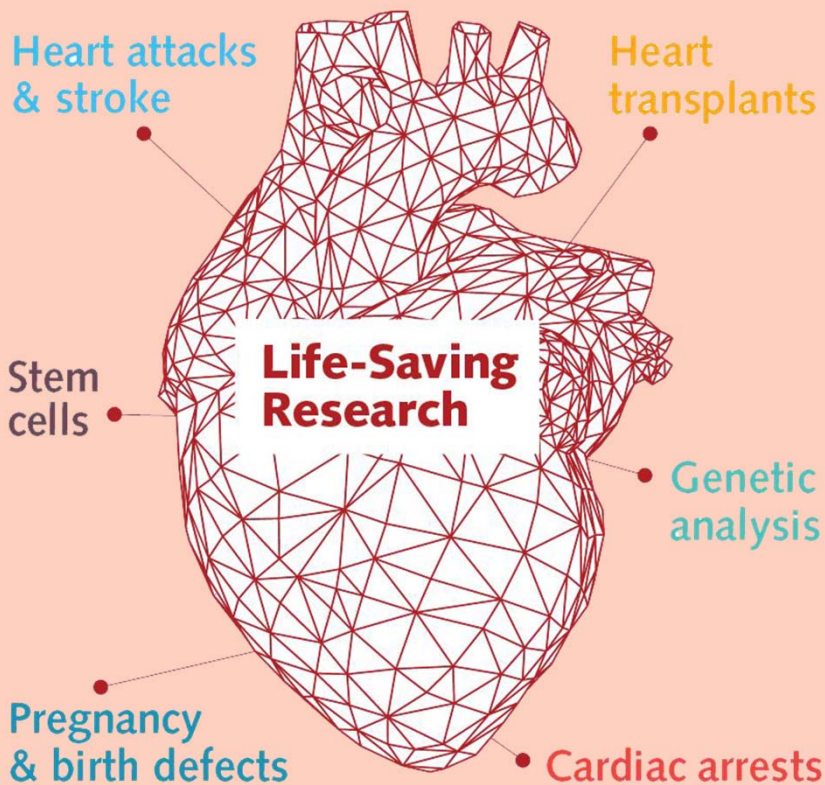
The Division has recently purchased a Talos Arctica cryo-electron microscope. This will be housed at the University of New South Wales and supported by the University’s Strong Imaging Core Facility. The Institute also enjoys a strong interaction with the University of Wollongong and its Molecular Horizons Facility that contains Talos Arctica and Titan Krios microscopes.

Staffing

The division currently consists of two groups led by Dr Tara Christie and Dr Alastair Stewart. These two early career researchers run small dynamic groups targeted at understanding fundamental biological processes related to disease.

Dr Christie's research interests include nucleocytoplasmic transport, mRNA degradation and antibody engineering. Understanding these pathways will facilitate the development of gene/ drug delivery technologies as well as targeted gene silencing therapeutics for various disorders including cardiovascular diseases.

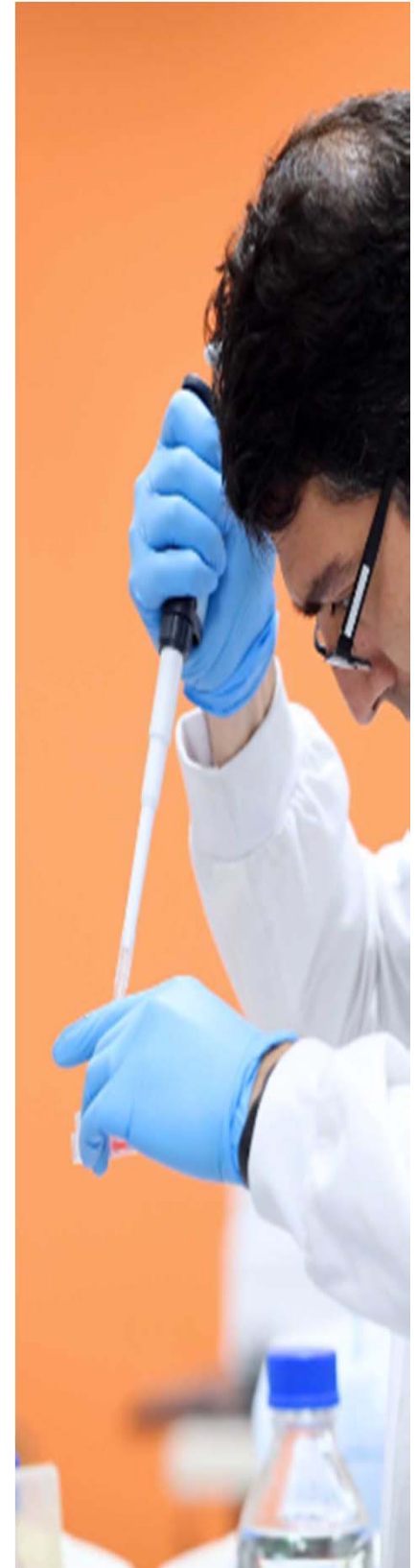
Dr Stewart's research aims to understand one of the most fundamental unanswered questions of Biology: "How do we convert energy from nutrients into a biologically useful form?".





Selected Publication Highlights

- Rouet R, Langley DB, Schofield P, Christie M, Roome B, Porebski BT, Buckle AM, Clifton BE, Jackson CJ, Stock D, Christ D. *Proc Natl Acad Sci U S A*. 2017; 114:3897-3902.
- Davies RB, Smits C, Wong ASW, Stock D, Christie M, Sandin S, Stewart AG. Cryo-EM analysis of a domain antibody bound rotary ATPase complex. *J Struct Biol*. 2017; 197:350-353.
- Chaston JJ, Smits C, Aragão D, Wong AS, Ahsan B, Sandin S, Molugu SK, Molugu SK, Bernal RA, Stock D, Stewart AG. Structural and functional insights into the evolution and stress adaptation of Type II chaperonins. *Structure*. 2016; 24:364-74.
- Sobti M, Smits C, Wong AS, Ishmukhametov R, Stock D, Sandin S, Stewart AG. Cryo-EM structures of the autoinhibited *E. coli* ATP synthase in three rotational states. *Elife*. 2016 Dec 21;5. pii: e21598.
- Baker MA, Hynson RM, Ganuelas LA, Mohammadi NS, Liew CW, Rey AA, Duff AP, Whitten AE, Jeffries CM, Delalez NJ, Morimoto YV, Stock D, Armitage JP, Turberfield AJ, Namba K, Berry RM, Lee LK. Domain-swap polymerization drives the self-assembly of the bacterial flagellar motor. *Nat Struct Mol Biol*. 2016; 23:197-203.
- Stewart AG, Lee LK, Donohoe M, Chaston JJ, Stock D. The dynamic stator stalk of rotary ATPases. *Nature Commun* 2012; 3:687.
- Zhou M, Morgner N, Barrera NP, Politis A, Isaacson SC, Matak-Vinković D, Murata T, Bernal RA, Stock D, Robinson CV. Mass spectrometry of intact V-type ATPases reveals bound lipids and the effects of nucleotide binding. *Science* 2012; 334:380-385.
- Lee LK, Stewart AG, Donohoe M, Bernal RA, Stock D. The structure of the peripheral stalk of *Thermus thermophilus* H⁺-ATPase/synthase. *Nature Struct Mol Biol* 2010; 3:373-8.
- Lee LK, Ginsburg M, Crovace C, Donohoe M, Stock D. The structure of the torque ring of the flagellar motor and the molecular basis for rotational switching. *Nature* 2010; 466:996-1000.



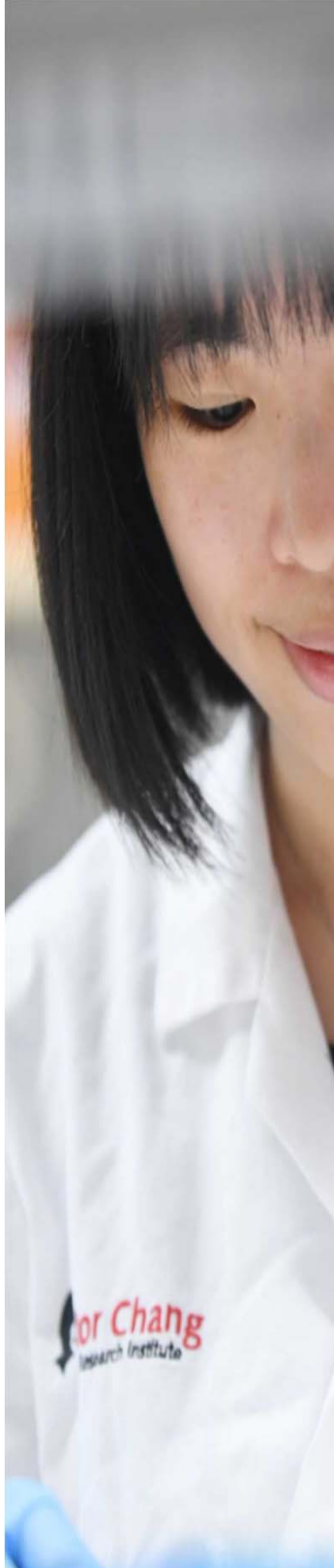
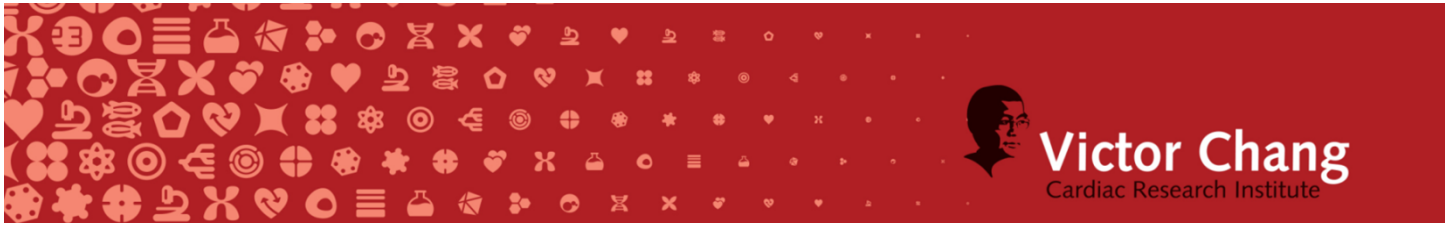


Key Selection Criteria

Essential Criteria:

- a PhD in the biological / biophysical sciences or related fields
- a research focus on structural biology with a strong track record or experience in cryo-electron microscopy
- a demonstrated record of outstanding research with a strong publication record in leading high-impact international journals
- a demonstrated record of attracting competitive research funds
- a demonstrated record of leading and managing a successful research program
- a demonstrated capability to drive the strategic development of new research initiatives
- strong experience in team building, leadership and mentoring staff and students
- an overall upward trajectory in research productivity and impact
- a demonstrated commitment to excellence in teaching and research training
- excellent communication skills

The successful candidate will be expected to achieve outcomes that contribute significantly to our understanding of cardiovascular biology at the molecular level.



Benefits & Conditions of employment

The Victor Chang Institute is ideally situated in Darlinghurst, an inner-city suburb only five minutes from Sydney's CBD and forms part of the St Vincent's Healthcare Campus.

We strive to ensure our staff and students enjoy a great working environment. We value and are committed to providing a working environment that embraces diversity and gender equity and promotes flexible working arrangements for staff to balance working requirements and personal needs.

Terms of Appointment

The Laboratory Head is appointed by the Institute for a period of five years, renewable and is accountable to the Executive Director.

Salary

The successful candidate will be offered an attractive remuneration package commensurate with the responsibilities of the position and the candidates skills, experience and qualifications.

Salary packaging options are also available to all staff at the Institute.

Research Budget

A research budget will be provided to the successful candidate to help support their research activities however it is expected that the candidate will enhance this internal resource through substantial national and international external funding.

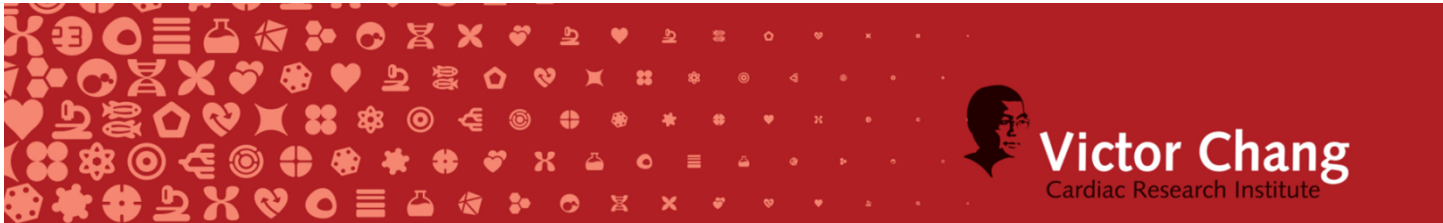
A competitive start up package will be part of an offer of appointment

Relocation

Where the successful candidate is required to move to Sydney from their current place of residence, the Institute will assist with a reasonable relocation assistance package.

Visa sponsorship will be available if required.

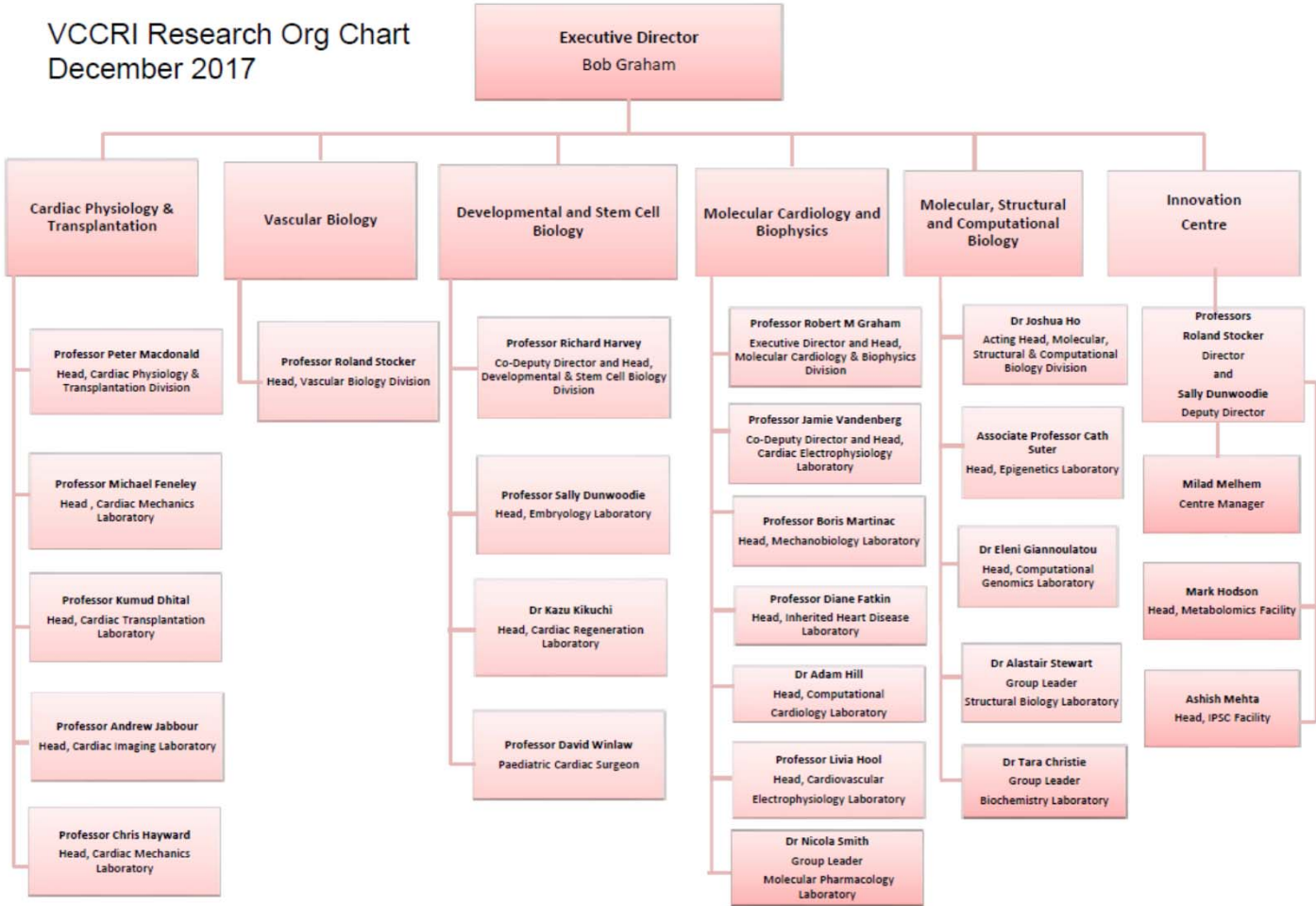
It is envisaged that the successful candidate will take up the position in 2018.

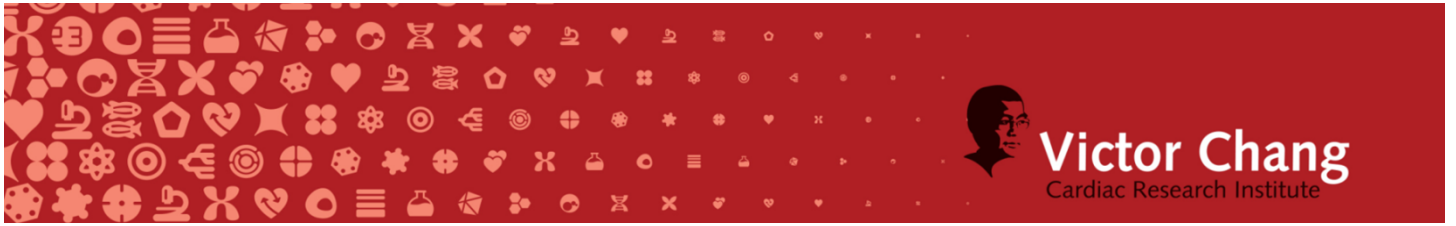


Victor Chang
Cardiac Research Institute

Organisation Structure

VCCRI Research Org Chart
December 2017





HOW TO APPLY

Expressions of interest, which should address the key selection criteria, and include a comprehensive curriculum vitae, an outline of your current and future research plans and contact details of three referee's should be sent to: Maria Voukenas, Head Human Resources at m.voukenas@victorchang.edu.au



CONTACT DETAILS

Ms Maria Voukenas
Head, Human Resources
Victor Chang Cardiac Research Institute
405 Liverpool Street, Darlinghurst, NSW, 2010
Australia

Email: m.voukenas@victorchang.edu.au

CLOSING DATE: 31 March 2018