Garvan’s mission is to make significant contributions to medical research that will change the directions of science and medicine and have major impacts on human health. Garvan strives to enhance and develop research programs that combine fundamental science with strong clinical interactions.
The Garvan Institute of Medical Research is a world leader in its field, pioneering study into some of the most widespread diseases affecting our community today. Research at Garvan is focused upon understanding the role of genes and molecular and cellular processes in health and disease as the basis for developing future preventions, treatments and cures.

Significant breakthroughs have been achieved by Garvan scientists in the understanding and treatment of diseases such as:

- Cancer
- Diabetes and obesity
- Neurological diseases such as Alzheimer’s, Parkinson’s, hearing loss, mental illnesses and eating disorders
- Osteoporosis
- Immunological diseases such as asthma, rheumatoid arthritis, multiple sclerosis and Sjogren’s syndrome

Garvan’s ultimate goal is prevention and cure of these major diseases.
In 1957, the centenary of the founding of St Vincent's Hospital by the Sisters of Charity, the hospital launched a Centenary Appeal. In 1960 it decided to spend much of the money raised to establish a medical research facility.

Construction of the new building began in January 1962 on the corner of Victoria, Burton and Chaplin Streets. It consisted of a basement and three floors and allowed for the eventual development of a six-floor building.

In 1961, St Vincent's received a particularly generous donation of £100,000 from the daughters of James Patrick Garvan (1843-1896), a distinguished parliamentarian and business leader. The family stipulated that the donation be anonymous and “for the purpose of research”, but eventually agreed that the Institute be named in memory of James Patrick Garvan, his wife and their son, Sir John Garvan, first Chairman of the Commonwealth Bank.

On 17 February 1963, the Garvan Institute of Medical Research was officially opened by Bernard Marmaduke Fitzalan-Howard KG, GCVO GBE, 16th Duke of Norfolk. The ceremony was attended by 1,500 supporters and dignitaries.

Over the following two years, a few research projects were initiated, lab workers appointed, and a Management Committee established. Between 1966 and 1969, three active academic members of the hospital – Associate Professors John Hickie and Gerry Milton and Dr Les Lazarus – acted as Co-Directors. In 1969, Dr Lazarus became the first sole Director of the Institute.

Over the next two decades, Garvan developed a strong focus on hormonal research, partly because Dr Lazarus was himself an endocrinologist. He established a hormone radioimmunoassay service at Garvan in 1964–1965, which was a significant component of the research activity and provided a steady source of funds, an important consideration before regular research grants were available. In the 1970s Drs Cres Eastman, John Carter and others provided an additional important thrust into thyroid hormone assays and related research.

Dr Lazarus was particularly interested in pituitary hormones and disease, and with the assistance of Drs Margaret Stuart, Steve Judd and later Ken Ho (who headed the group from 1991), the Institute became very prominent in this area. In 1978, a computerised gas chromatograph / mass spectrometer was installed, under the management of Dr George Smythe, allowing researchers to measure effects of various hormones and metabolic manipulations on the brains of experimental animals. In 1980–81, a team led by Dr Margaret Stuart started a collaborative project with CSIRO’s Molecular and Cell Biology Unit to produce monoclonal antibodies to human protein hormones.

Several other researchers also set up labs during these first three decades. In the late 1960s, Drs Don Chisholm and Ted Kraegen, with Les Lazarus, studied the effect of gut hormones (known as ‘incretins’) on insulin secretion. Dr Kraegen started developing a computer model to study the action of insulin in humans, a project that became progressively more sophisticated throughout the 1970s and led to life-saving improvements in the treatment of Diabetic Ketoacidosis. Dr Chisholm went overseas in 1969, but returned in 1978 when he, Dr Kraegen and Dr Lesley Campbell further developed the Diabetes Research Program. They were awarded a National Health and Medical Research Council (NHMRC) Program Grant in 1982 and concentrated on insulin resistance, obesity and pathogenesis of type 2 diabetes. Drs Trevor Biden and Greg Cooney were important later additions to the Program. In 2002, Professor David James, an ex-Garvan PhD student with an international reputation in cell biology, returned to the Institute as Director of the Program, adding new impetus to its success.

In August 1984, Dr John Eisman, a recognized leader in calcium, vitamin D and bone disease, transferred his lab from the University of Melbourne, extending a theme that Garvan had developed in diseases of ageing. Assisted by Drs Phillip Sambrook and Nick Pocock, he established the Bone and Calcium Research Program and hospital Clinic related to the treatment and prevention of osteoporosis, and measurement of...
bone density. The program gained strength in the 1980s, establishing international collaborations with the Mayo Clinic and University of South Carolina. Further strength in the clinical and epidemiological area was added by recruitment of Drs Tuan Nguyen and Jackie Center, and the Dubbo Osteoporosis Epidemiology Study was established in the 1990s. The Dubbo study is still running today, the longest running project of its kind anywhere in the world. In 2011 Professor Peter Croucher succeeded Professor Esman as head of the Program and reactivated a major thrust into bone cell, osteoporosis and cancer–bone biology.

In April 1985, a new Cancer Cell Biology Group was established when Dr Robert Sutherland and his research team transferred from the Ludwig Institute for Cancer Research at the University of Sydney to study hormone antagonists and cancer, particularly breast cancer. These beginnings led to substantial growth of the Cancer Research Program at Garvan, which increased to around 120 researchers by 2013 and expanded its activity to prostate, ovarian, pancreatic and bowel cancers, with prominent contributions over the years from Professors Andrew Biankin, Susan Clark, Roger Daly, Liz Musgrove and Chris Ormandy.

An Act of Parliament established Garvan’s independence in 1984. At the time, its make up still revealed its origins within the endocrine department of St Vincent’s Hospital. The Institute remained an amalgam of NHMRC funded research groups and scientists working for the NSW Reference Laboratory for Hormone Assays throughout the 1980s.

Professor John Shine — world-renowned for a series of discoveries made between 1975 and 1985 that ultimately led to gene cloning — was appointed Executive Director of Garvan in 1990. He recognised that the two streams of activity were at this stage confusing the organisation’s vision and purpose, so the assay service was transferred to SydPath, the pathology service of St Vincent’s Hospital, where Professor Lazarus became Director after his retirement from Garvan.

Professor Shine’s appointment reflected the fact that by 1990 recombinant DNA and gene cloning were starting to make a big impact across all fields of research, with scientists mutating genes to see what would happen in specific disease models.

Professor Shine’s interest in the neuropeptide receptor families helped spawn Garvan’s Neuroscience Program, which is now headed by Professor Herbert Herzog who joined the lab as a young postdoctoral fellow in 1991.

In 1986, Garvan became one of only five ‘centres of research excellence’ in Australia to receive NHMRC ‘block funding’. That, along with subsequent infrastructure funding from the NSW Government, allowed Garvan to expand into a world-class facility. A new building, built on the old site and capable of accommodating over 500 scientists, was officially opened in April 1997 by Prime Minister John Howard OAM AC FASSA and NSW Premier Bob Carr.

During the 1990s, Garvan scientists were the first to pinpoint a gene involved in susceptibility to osteoporosis; the first to clone several neuropeptide receptor genes, including NPY, adenosine and galanin; the first to decipher certain signalling pathways underlying insulin resistance; and the first to recognise the role of different cell cycle genes in the development of breast cancer.

After the molecular biology developments of the 1990s came the ‘big’ science of our current century. The launch in 2000 of the first draft of the human genome led to huge sequence databases and gene arrays — no more painstaking testing of individual gene activity. Gene chips allowed researchers to look at 40,000 genes at once — to determine how gene expression is changed in disease. Garvan embraced this new research paradigm quickly and was the first in Australia to install the new Affymetrix arrays. In a similar way, it recently embraced proteomics, epigenetics and bioinformatics.

In 2000, Garvan started to grow what has become an outstanding Immunology Program — by attracting Professors Charles and Fabienne Mackay from the United States, and then Professor Tony Basten AO FASSA FTSE and other leading immunologists from the Centenary Institute. These distinguished researchers formed a critical mass in the discipline, which permeates all other Garvan research areas. Associate Professor Robert Brink took over leadership of this Program from Professor Mackay in early 2010.

Today the gap between a research discovery and its clinical application is smaller than ever. In 2012, Garvan and St Vincent’s Hospital opened The Kinghorn Cancer Centre, a state-of-the-art translational cancer research centre described later in this report; our Dubbo Osteoporosis Epidemiology Study is informing treatment decisions the world over, and our diabetes research is seamlessly integrated with the St Vincent’s Diabetes Centre.

In January 2012, Professor John Mattick succeeded Professor Shine as Executive Director. Professor Mattick has made a significant contribution to genetics and genomics through his farsighted theories on large sections of the genome that previously were considered functionally irrelevant.

Professor Mattick’s arrival coincides with increasingly rapid and affordable genome sequencing and the concomitant promise of ‘personalised medicine’ — both set to revolutionise medicine over the next 50 years.
2012

2012 was a year of consolidation but also a time for fresh inspection of priorities and opportunities following the appointment of Professor John Mattick as Executive Director.

The successful opening of The Kinghorn Cancer Centre in August 2012 by the Prime Minister was a milestone achievement in our commitment to accelerating the translation of Garvan research into clinical outcomes. The project partners, Garvan and St Vincent’s, completed this exciting Centre on time and on budget. We record our heartfelt thanks to the many private donors who, together with the Federal Government’s Health and Hospital Fund, made this vital project possible.

Our ability to integrate teaching, research and clinical translation on our expanding Darlinghurst campus has never been stronger, and the links with and support from our key stakeholders, St Vincents and Mater Health and University of NSW, will be increasingly important to these ambitions.

Financial Performance

Garvan’s operating income grew to approximately $56m in 2012 from $51m the previous year. Philanthropic support through the Garvan Research Foundation, essential for providing critical equipment and facilitating new initiatives, continued to be strong, with over $7.1m in general and specific grants contributed to research programs and approximately another $2.0m to the long term endowment fund of the Institute.

Looking Ahead

For the past 18 months I have participated in a panel review (the McKeon Review) regarding the future of health and medical research. This panel completed its report to the Federal Government in February 2013 and makes 21 specific recommendations for optimising the health and quality of life for all Australians. Embedding research in all parts of the health system is core to these recommendations.

Along with 350 other contributors, Garvan made a submission to the panel during 2012. I believe it is very important for all participants in the health sector to now encourage the Federal Government to respond promptly and wisely to this review since a healthier Australia will be a happier and more productive nation.

I have been privileged to chair Garvan for the past 12 years and I thank all of the Garvan stakeholders for placing their trust in me and in my fellow board members of the Institute and the Foundation.

I am very pleased indeed to welcome and congratulate Mr John Schubert AO as the new Chairman of the Garvan Institute. From his successful time as Chief Executive of the Pioneer group, as Chairman of the Commonwealth Bank, as a Director of BHP Billiton and Chair of the Great Barrier Reef Research Foundation, John now brings a wealth of experience and wisdom to the Garvan boardroom.

In this, Garvan’s 50th anniversary year, I see that we have a wonderful opportunity and obligation to build on the achievements and reputation of this wonderful place of discovery.

I remain confident in Garvan’s continuing role as a leading and pioneering player in the future of health and medical research in this country and beyond.

Bill Ferris AC
Chairman
Garvan Institute of Medical Research
2012 has been a year of significant developments and changes at the Garvan Institute, some unexpected. In taking up the directorship in early January, I arrived with an intention and mandate to build on the great strengths of the Institute, and the pioneering work of the preceding Director John Shine, by introducing and promoting the application of advanced genomic technologies and bioinformatics to the understanding and treatment of the complex diseases – cancer, diabetes, osteoporosis, immunological diseases and neurological diseases – which are the focus of the Institute’s mission.

There have been three great revolutions in molecular biology. The first was the double helix in 1953, encapsulated in the central staircase of our institute, which provided the basis for understanding gene structure and expression. The second was the gene cloning revolution in the 1970s and 80s, which connected genetics with biochemistry, and thereby identified many of the genes and proteins that control human development and physiology, as well as those – like oncogenes and tumour suppressors – that are dysfunctional in complex diseases like cancer. Indeed, the identification of these aberrant genes was the basis for a whole new generation of targeted anti-cancer drugs that are now entering the clinic.

The third revolution, and a major step change, is the genomics revolution, which is enabling medical scientists to look comprehensively and holistically at the complex changes that occur in human development, in brain function, and in the aetiology of the complex diseases that comprise the major health burden of our population. Just a decade ago it cost $1 billion to sequence the first human genome, but that has since plummeted to a few thousand dollars today and will likely be a few hundred dollars in the near future. This is resulting in an explosion in the amount of information that medical science is gathering about human genetic variation, including the range of mutations that underpin cancer.

The Garvan Institute, along with the Institute for Molecular Bioscience at the University of Queensland, led one of these projects as part of the International Cancer Genome Consortium, focusing on pancreatic cancer. The results, published in October 2012 in the leading international journal *Nature*, not only showed that pancreatic cancer had links with molecules involved in nerve guidance pathways, which explained some of its behaviour, but also that this, like many cancers, is a heterogeneous disease, with a variety of underlying mutations that are not discernable from the cellular pathology. Most importantly, many of these mutations occur in other cancers, and some already have effective drugs available to treat them, resulting in life-saving outcomes.

During the year, we were delighted to be joined by the Prime Minister, the Federal and State Ministers of Health, His Eminence Cardinal Pell, and many other friends at the opening of The Kinghorn Cancer Centre, a joint venture between the Garvan and St Vincent’s Hospital to bring leading translational research to cancer care. Sadly, we lost the inaugural Director, Professor Rob Sutherland AO FAA, to pancreatic cancer shortly afterwards. A towering figure at Garvan, internationally renowned for his pioneering research on the oestrogen receptor in breast cancer and for his leadership in translational cancer research, Rob will be sorely missed.
It is clear that genome sequencing will soon become routine in cancer research – identifying new mutations that can be targets for diagnostic and therapeutic development – and the standard in clinical care. To this end we are establishing the nation’s first Centre for Clinical Genomics in The Kinghorn Cancer Centre, which will provide access to state-of-the-art clinical genomic services and analyses. Moreover, the same infrastructure can be deployed to investigating other diseases, and form the platform for the development of genomic medicine over the next decade and beyond.

During 2012 we continued to re-build the Division of Osteoporosis & Bone Biology, notably by appointing Professor Mike Rogers from the University of Aberdeen, internationally renowned for his work in anti-osteoporotic drugs. A member of the Division, Dr Jackie Center, was awarded one of the inaugural John Shine Research Fellowships to continue her work on the outcome of bone fractures in the elderly and identification of people at risk.

The Shine Translational Research Fellowships are jointly funded by the Garvan Institute and St Vincent’s Hospital, and aim to support clinicians in undertaking translational research at Garvan. Two additional awardees were Dr Alex Viardot for his research on the management of obesity and diabetes and Dr Ann McCormack for studies on pituitary tumours.

Garvan’s researchers in all of our divisions had a very successful year, making significant advances that were published in high impact journals. Space precludes listing them here but they are highlighted in the relevant sections of this annual report.

I look forward to strengthening the Institute over the coming year, with a substantial emphasis on mentoring our younger researchers and recruiting others to join us. Informed by our annual retreat and discussions with our staff, students and stakeholders, we have developed a strategic plan to guide our development over the next quinquennium.

I thank my colleagues, members of the Garvan Board, Garvan Research Foundation and Business Development Advisory Committee for their warm reception, generous support and sage advice. Finally, on behalf of the entire Garvan community, I would like to thank our outgoing Chairman Bill Ferris AC for his outstanding contributions to the Institute and the precinct over the past 12 years, and to warmly welcome our incoming Chairman, John Schubert AO.

John Mattick AO FAA FRCPA
Executive Director
Garvan Institute of Medical Research
In Australia today, there are an increasing number of worthy charitable causes seeking vital support from the community. Despite this challenging environment, the Garvan Research Foundation had another very successful year in 2012.

We received wonderful financial and moral support from a wide cross-section of the Australian community – from passionate individuals, government and established charitable foundations.

There was strong ongoing support from the Ernest Heine Family Foundation, Mrs Janice Gibson, The Ross Trust, Mrs Jane Hemstritch, Lady (Mary) Fairfax Foundation and our ongoing partnership with MLC Community Foundation. Corporate support of Garvan also grew in 2012 in particular through a new partnership with Ridley AgriProducts.

Donations from our direct marketing campaigns increased again, as did donations from people who asked for gifts to be sent to Garvan in lieu of flowers at funerals, or gifts at celebrations.

Donations from bequests also continued and remain a very important source of income. These gifts are used to develop our core research areas and to strengthen our strategic reserves, with a view to establishing a long-term endowment and ensuring that the Institute is better positioned to meet future challenges.

We also enjoyed a significant increase in people assisting Garvan through fundraising at general community events such as the City to Surf in Sydney and the Melbourne Marathon, and special one-off events organised by supportive individuals.

The Young Garvan Committee continued to work tirelessly to raise the profile of the Institute amongst a younger demographic and also to raise funds for Young Garvan Fellowships. Along with three well-attended forums, the Committee also held its successful All Ribbons Ball, attracting 400 guests and contributing to three more Fellowships.

The year also saw an important initiative for the Institute's future – the establishment of a major new fund to focus on the recruitment of further world class researchers. Named the "Breakthrough Fund", it will have an initial target of raising $50 million, in line with the Institute's 50th anniversary in 2013. The Fund has had an auspicious start, with the Trustees of The Alan Elder Trust contributing $2 million.
The Kinghorn Cancer Centre was a major focus of the Foundation’s work during 2012. In close collaboration with our partners at St Vincent's Hospital, the Foundation team co-ordinated a series of events for the Visionary Donors who helped to make the Centre a reality.

The Foundation co-ordinated the official opening of the Centre on 28 August by the Prime Minister The Hon Julia Gillard MP and his Eminence Cardinal George Pell AC. Within the Centre, the team also co-ordinated the opening of the Australian Cancer Research Foundation Molecular Genetics Facility by Her Excellency the Governor of NSW, Professor Marie Bashir AC CVO, and the opening of the Nelune Centre by her Excellency the Governor General of Australia, Ms Quentin Bryce AC.

A highlight of the year was our second Gala Dinner attended by around 300 people, welcoming Professor John Mattick AO FAA as the new Executive Director of Garvan, and raising more than $400,000 for our research.

The success of the dinner owes much to the Master of Ceremonies, journalist and commentator Ms Annabel Crabb; our menu designer Mr Neil Perry, and our incomparable vocalist Ms Greta Bradman.

I would particularly like to thank and praise the staff of the Foundation for their dedication, enthusiasm and unmatched expertise. Our Chief Executive Andrew Giles was supported by a small but professional team of full-time staff: Mara-Jean Tilley, Kylie Ironside, Mimy Long, Leigh Metham, Kylie Sherwood-Kelly, Maria Garcia-Cepillo, and part-time staff: Gabriella Lang, Dimity Raftos, Dianne Lavender, Pip Margan, Janice Lam and Carol O’Carroll.

Finally, I thank my fellow board members for their diligent and engaged contribution throughout the year.

Geoff Dixon
Chairman
Garvan Research Foundation
It is with mixed feelings that I write this report. While sharing in the excitement of the opening and initial functioning of the centre, I am acutely aware that I am writing this in the capacity of Acting Director, as a direct result of the untimely passing of Professor Robert Sutherland, our inaugural Director. Rob and I worked closely to develop and deliver on the vision of The Kinghorn Cancer Centre, and it was pleasing to see him acknowledged by name for his major contribution to cancer research by Prime Minister Julia Gillard at the official opening of the Centre in August 2012.

Tribute was also paid at the opening to our extremely generous and numerous donors, including the Australian Government, the Kinghorn Foundation, the Australian Cancer Research Foundation (ACRF) and the Nelune Foundation. The St Vincent’s Trustees were also acknowledged, in view of their very generous provision of the land on which the Centre was built, with due recognition at the opening ceremony of the traditional custodians of the land. The bond with St Vincent’s was further demonstrated by the blessing of the Centre by His Eminence Cardinal George Pell AC, Archbishop of Sydney. Subsequent to the opening, Her Excellency Professor Marie Bashir AC CVO, Governor of NSW, opened the ACRF (Australian Cancer Research Foundation) Molecular Genetics Facility. The Centre was also graced by a visit of the Governor General, Ms Quentin Bryce AC CVO, Patron of the Nelune Foundation, late in 2012.

Much has happened since that time. The cancer clinical services moved across from St Vincent’s Hospital as planned by the end of February 2013. These entail delivery of chemotherapy on an outpatient basis, a modern suite of consulting and interview rooms, blood collection services linked to the main hospital laboratory by a pneumatic tube, state-of-the-art multidisciplinary meeting rooms, a procedure room for head and neck endoscopy, an education alcove, and spacious accommodation for clinical trial staff. As a change management process, this was no mean feat. Feedback from our patients and staff has been extremely positive. The clinical services continue to function under the mission and values of St Vincent’s, as established by the Sisters of Charity, whose influence permeates the building. The Wellness Centre will open as a focal point for integrative medicine approaches to patient care later in 2013.

On the research side, there has been significant change also, with highly achieving members of staff such as Professor Andrew Biankin, Professor Roger Daly and Associate Professor Liz Musgrove all moving on to excellent positions, largely made possible by their achievements obtained while working at Garvan. The Centre is optimising this opportunity to recruit new staff, while at the same time augmenting its bioinformatic analytic capacity and purchasing next generation, state-of-the-art, gene sequencing equipment, so as to be at the forefront of the era of genomic medicine. Moreover, the translational research agenda entails much closer integration between the researchers, clinicians and patients. A focal point for this will be the tumour stream multidisciplinary team meetings, where for the first time there will be formal integration of these parties. Our basic science researchers work in modern facilities, with access to a suite of laboratory facilities and plentiful workstations. Neither clinical or research staff work in isolation from other experts – with strong links to the University of NSW and the University of Sydney – the latter partly by virtue of our membership of Sydney Catalyst. This is one of seven accredited cancer translational research centres. Both clinicians and researchers have significant collaborations in train with leading Australian and overseas institutions.

It is early days – however, the foundations are now in place for the implementation of an advanced, rapid bench-to-bedside and bedside-to-bench model of care. The challenge for the staff within the Centre is “to realise the promise of personalised innovative medicine for people affected with cancer”, as is written in the atrium of our beautiful centre, and present for the world to see at tkcc.org.au.

Allan Spigelman
Acting Director
The Kinghorn Cancer Centre
Carvan
AT A GLANCE
### Garvan Institute of Medical Research

**Board of Directors**
- **Chairman**: Mr Bill Ferris AC
- **Executive Director**: Prof John Mattick AO FAA

### Development & Support Group
- **Chief Operating Officer**: Mr John Dakin

#### Australian BioResources
- **Director**: Dr Jenny Kingham

#### Business Development & Legal Affairs
- **Manager**: Ms Christina Hardy

#### Corporate Services
- **Manager**: Ms Cate Smith

#### Finance and Accounting
- **Manager**: Ms Cherry Dutton

#### Human Resources
- **Manager**: Ms Belinda Christie

#### Information Technology
- **Manager**: Mr Jim McBride

#### Operations
- **Manager**: Mr David Keenan

#### Science Communications
- **Manager**: Ms Alison Heather

### Cancer & The Kinghorn Cancer Centre

#### Head
- **Prof Rob Sutherland AO FAA (until October)**

#### Acting Head
- **Prof Roger Daly (from October)**

#### Senior Scientists
- Prof Andrew Biankin
- Prof Sue Clark
- Prof Roger Daly
- A/Prof Maja Kohonen-Corsh
- Prof Liz Musgrove
- A/Prof Chris Ormandy
- Dr Alex Swarbrick
- Dr Charlie Watts

**The Kinghorn Cancer Centre**
- **Director**: Prof Rob Sutherland AO FAA (until October)
- **Acting Director**: Prof Allan Spigelman (SVH; from October)

### Metabolic Diseases

#### Head
- **Prof David James FAA**

#### Senior Scientists
- Prof Trevor Biden
- Prof Lesley Campbell AM
- Prof Don Chisholm AO
- A/Prof Greg Cooney
- A/Prof Antonio Cooper
- A/Prof Jerry Greenfield
- Dr Will Hughes
- Prof Ted Krägen
- Dr Ross Laybutt
- Prof Katherine Samaras
- Dr Carsten Schmitz-Peiffer

### Immunological Diseases

#### Head
- **A/Prof Robert Brink**

#### Senior Scientists
- Prof Antony Basten AO FAA FTSE
- Dr Daniel Christ
- A/Prof Shane Grey
- A/Prof Jenny Gunton
- Dr Cecile King
- Prof Jonathan Sprent FRS FAA
- A/Prof Stuart Tangye

### Neurological Diseases

#### Head
- **Prof Herbert Herzog**

#### Senior Scientists
- Dr Paul Baldock
- Dr Greg Neely
- Prof David Ryugo
- A/Prof Amanda Sainsbury-Salis
- Prof John Shine AO FAA
- Dr Bryce Vissel

### Osteoporosis & Bone Biology

#### Head
- **Prof Peter Croucher**

#### Senior Scientists
- A/Prof Jackie Centre
- Prof John Eisman AO
- Prof Tuan Nguyen
- Prof Mike Rogers

---

**Diabetes Vaccine Development Centre**
- **Chief Exec Officer**: Ms Rowena Tucker

**Research Facilities**
- **Antibody Development**
- **Australian BioResources**
- **Australian Cancer Research Foundation**
- **Unit for the Molecular Genetics of Cancer**
- **Biological Testing Facility**
- **Centre for Clinical Genomics**
- **Clinical Research Facility**
- **MLC Community Foundation Flow Facility**
- **Molecular Imaging Unit**
- **Peter Wills Bioinformatics Centre**

**Board Committees**
- **Business Development Advisory**
- **Finance & Audit**
- **Investment**
- **Remuneration**

**Institute Committees**
- **Appointments & Promotions**
- **Equipment**
- **Executive Management**
- **Higher Degrees**
- **Operations Advisory**
- **Postdoc Development**
- **Scientific Advisory Council**
- **Seminar Program**
- **WHS Consultation**

**Australian BioResources**
- **Board**
- **Advisory**

**Diabetes Vaccine Development Centre**
- **Board**
- **Scientific Advisory**

**St Vincent’s Research Precinct (SVRP)**
- **Animal Ethics**
- **Human Research Ethics**
- **Institutional Biosafety**
- **SVRP Management**
- **SVRP WHS**

Garvan is a partner in the CRCs for Asthma and Biomedical Imaging Development.
Garvan is a shareholder in the spin-out company G2 Therapies Ltd.
The Garvan patent portfolio currently comprises 23 patent families covering novel treatments, diagnostics and platform technologies in cancer, diabetes metabolism, neurosciences and immunology.

Scientific Publications

Impact factor of scientific publications
Each paper published constitutes a new piece of knowledge, and scientists aim to publish in the most highly regarded journal in their area of research. Each journal has an “impact factor” which is a common measure of its relative importance within a specific discipline. Research organisations use “average impact factor” measurements to determine the overall significance of their research output. For example, in 2012 Garvan achieved and “average impact factor” greater than 8 for the top 80% of its publications.

Philanthropic Support

Donations are particularly important in two respects:
- They provide seed funding for novel work, which may not attract other support for several years
- They fund core items of equipment that are typically not covered by research grants

* Excluding bequests and contributions to the construction cost of The Kinghorn Cancer Centre
2012 Staff Profile

<table>
<thead>
<tr>
<th>Staff Breakdown</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researchers</td>
<td>329</td>
<td>338</td>
</tr>
<tr>
<td>Students</td>
<td>106</td>
<td>94</td>
</tr>
<tr>
<td>Scientific facility staff</td>
<td>83</td>
<td>87</td>
</tr>
<tr>
<td>Secretarial &amp; admin</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>Foundation</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>DVDC</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>575</td>
<td>582</td>
</tr>
</tbody>
</table>

Demographics
- Average age 36 years 6 months
- Researchers from over 63 countries
- Research staff 46% male, 54% female

Operating Income

2012 $56 Million*

- Peer reviewed grants 55%
- Donations 13%
- NSW Government 11%
- Industry partners 0.4%
- Other income 20.6%

One of the major challenges facing successful research institutes around Australia remains the “gap” between the total costs of doing research and the funding provided by competitive research grants. For every dollar of research funding awarded, another 70 cents is required to carry out the research.

* Excludes donations for construction of The Kinghorn Cancer Centre.

Peer Reviewed Grant Income

<table>
<thead>
<tr>
<th>Year</th>
<th>$000 NHMRC</th>
<th>$000 Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>16,682</td>
<td>8,530</td>
</tr>
<tr>
<td>2008</td>
<td>18,695</td>
<td>9,159</td>
</tr>
<tr>
<td>2009</td>
<td>19,094</td>
<td>11,061</td>
</tr>
<tr>
<td>2010</td>
<td>16,637</td>
<td>10,232</td>
</tr>
<tr>
<td>2011</td>
<td>18,574</td>
<td>10,896</td>
</tr>
<tr>
<td>2012</td>
<td>20,640</td>
<td>10,213</td>
</tr>
</tbody>
</table>
Research Collaborations

Opposite: Dr Liz Caldon, breast cancer researcher, who collaborates with colleagues in Scotland and New Zealand.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>Developed a life-saving insulin infusion technique to treat ketoacidosis – a complication of diabetes</td>
</tr>
<tr>
<td>1973</td>
<td>Identified the role of brain serotonin and melatonin in regulating pituitary hormone secretion</td>
</tr>
<tr>
<td>1975</td>
<td>Developed one of the first experimental versions of an “artificial pancreas”</td>
</tr>
<tr>
<td>1976</td>
<td>Recognised for the first time that patients with diabetes may be unable to produce hormones to prevent low blood glucose levels</td>
</tr>
<tr>
<td>1983–87</td>
<td>Discovered that taking fish oil helps to combat insulin resistance</td>
</tr>
<tr>
<td>1984</td>
<td>Discovered a connection between brain noradrenalin metabolism (a stress response) and blood glucose levels</td>
</tr>
<tr>
<td>1985</td>
<td>Used novel techniques (clamp + tracers) to reveal differential effects of insulin among its target tissues such as muscle, heart, liver and fat</td>
</tr>
<tr>
<td>1985–89</td>
<td>Successfully applied artificial intelligence techniques to laboratory-based clinical diagnosis</td>
</tr>
<tr>
<td>1986</td>
<td>Produced Australia's first genetically engineered human therapeutic growth hormone</td>
</tr>
<tr>
<td>1986</td>
<td>Demonstrated the effect of tamoxifen on breast cancer growth</td>
</tr>
<tr>
<td>1987</td>
<td>Demonstrated the strong heritability of bone density and so osteoporosis risk</td>
</tr>
<tr>
<td>1987–91</td>
<td>Identified fat accumulation in muscle and liver cells as a major cause of defective insulin action, leading to diabetes</td>
</tr>
<tr>
<td>1989</td>
<td>Established the Dubbo Osteoporosis Epidemiology Study</td>
</tr>
<tr>
<td>1989</td>
<td>Identified the gene region that responds to the active form of vitamin D</td>
</tr>
<tr>
<td>1990</td>
<td>Cloned human galanin, a brain chemical that regulates appetite, anxiety and depression</td>
</tr>
<tr>
<td>1991</td>
<td>Cloned the neuropeptide Y (NPY) receptor, leading to greater understanding of how this potent brain molecule controls important functions such as the immune system and appetite</td>
</tr>
<tr>
<td>1991–94</td>
<td>Revealed a major benefit of transdermal versus oral oestrogen - reduction of fat accumulation in menopausal women</td>
</tr>
<tr>
<td>1991</td>
<td>Established the role of retinoic acid in progesterone receptor action in breast cancer</td>
</tr>
<tr>
<td>1992</td>
<td>Demonstrated that the variation in the vitamin D receptor gene contributes to differences in bone density and susceptibility for osteoporosis</td>
</tr>
<tr>
<td>1992–93</td>
<td>Elucidated the control of the prolactin receptor in breast cancer</td>
</tr>
<tr>
<td>1993</td>
<td>Reported the first randomised control trial of prevention of corticosteroid-use related bone loss</td>
</tr>
<tr>
<td>1993–04</td>
<td>Discovered the role of cell cycle genes (cyclins) in breast cancer</td>
</tr>
<tr>
<td>1995–00</td>
<td>Showed that abdominal fat is genetically influenced, and that it determines the risk of type 2 diabetes and influences insulin resistance</td>
</tr>
<tr>
<td>1995</td>
<td>Demonstrated the role of the GRB2 gene in breast cancer</td>
</tr>
<tr>
<td>1997</td>
<td>Discovered the importance of the enzyme Protein Kinase C in the development of insulin resistance</td>
</tr>
<tr>
<td>1997–06</td>
<td>Defined many of the physiological roles of the hormone prolactin including its role in mammary development and carcinogenesis</td>
</tr>
<tr>
<td>1998</td>
<td>Identified the chromosomal region responsible for susceptibility to bipolar disorder</td>
</tr>
<tr>
<td>1998</td>
<td>Produced the first report describing HIV lipodystrophy syndrome (with the National HIV Centre)</td>
</tr>
</tbody>
</table>
1998  Established the role of key oncogene c-myc in breast cancer
1999  Showed that accumulation of ceramides (fat derived molecules) in muscle cells reduces the effectiveness of insulin
1999  Reported the increased risk of premature death after all types of osteoporotic fractures
1999-05 Developed methods of culturing adult nerve stem cells capable of generating new brain cells
2000  Developed the largest prostate cancer tissue bank in the world (in collaboration with St Vincent's Hospital)
2000-02 Showed that the hormone BAFF (B cell activating factor) controls the survival of B lymphocytes and can trigger autoimmune disease
2000-06 Made significant advances in identifying the exact role of gene mutations in cancers through the use of large human tissue banks and patient databases
2001  Identified prognostic markers of prostate cancer progression
2002  Discovered that Neuropeptide Y (NPY) regulates bone synthesis
2002  Identified the gut hormone PYY as a major satiety factor
2002  Identified prognostic markers of pancreatic cancer progression
2003  Identified the role of several genes in asthma development using microarray technology
2004-12 Collaborated with the Shanghai Institute of Materia Medica to identify and determine mechanisms of action of molecules derived from Chinese traditional medicines, such as berberine and triterpenoids
2005  Identified a pathway that reveals how a stress hormone in the brain can suppress the immune system
2006  Identified novel epigenetic markers for colorectal cancer detection
2006-10 Developed and commercialised an antibody treatment for inflammatory diseases such as rheumatoid arthritis
2006-10 Recognised Grb proteins as novel regulators of insulin signalling and muscle size
2006  Discovered that the NPY system links the nervous and immune systems, suggesting novel treatments for stress related disorders
2006  Collaborated with St Vincent's Hospital in determining the function of MIC-1, a molecule responsible for the extreme weight loss common in late stage cancer
2007  Demonstrated that the death of insulin producing cells, which occurs during type 2 diabetes, is associated with a cellular stress response known as endoplasmic reticulum stress
2007  Discovered that NPY through its Y2 receptor controls stress induced obesity
2007  Developed a web-based tool to predict an individual’s risk of bone fracture – since widely used by doctors and patients worldwide
2008  Joined the American Association for Cancer Research Human Epigenome Taskforce and played a key role in the establishment of the International Human Epigenome Consortium
2008-12 Showed that transcription factor ELF5 is a master regulator of mammary development during pregnancy and that levels of ELF5 determine the molecular subtype of breast cancer and the sensitivity of a tumour to anti-oestrogen treatment
2008-13 Played a key role in international multi-centre studies identifying novel genes involved in osteoporosis

2009 Successfully tested a method, in experimental mice, of adjusting the immune system for just long enough to receive a tissue transplant and accept it as ‘self’, without the need for toxic immunosuppressive drugs

2009 Identified the links between diet, gut bacteria and the immune system, highlighting the importance of dietary fibre in keeping many diseases at bay

2009 Reported the high frequency of vitamin D deficiency in critically ill patients

2009 Used phosphoproteomics (large scale studies of proteins expressed in cells) to map out new actions of insulin and its signalling events

2010 Showed that the gene STAT3 is critically required for the generation of memory cells in the immune system, explaining why patients with mutations are susceptible to recurrent infection

2010 Showed for the first time that even modest weight loss of 6kgs reverses many of the damaging changes often seen in the immune cells of obese people

2010 Demonstrated a signalling network in basal breast cancer cells based on tyrosine phosphorylation

2010-11 Discovered the cells that make IL-21 (a key regulatory molecule of the immune system) which, if blocked, protects transplanted insulin-producing pancreatic cells and reverses type 1 diabetes in mice

2010 Developed an iron-chelating technique with the potential to enhance function of transplanted insulin-producing cells in people with type 1 diabetes

2010 Identified the links between diet, gut bacteria and the immune system, highlighting the importance of dietary fibre in keeping many diseases at bay

2010 Identified why patients with the rare immunodeficiency known as X-linked lymphoproliferative disease (XLP), who lack the SAP gene, become critically ill when exposed to Epstein Barr virus

2010 Showed that the main effective treatment for osteoporosis extends survival by up to five years

2010 Identified a panel of ovarian epigenetic biomarkers for early detection of ovarian cancer

2012 Identified how the production of autoantibodies (antibodies that attack the ‘self’) is prevented during normal immune responses

2012 Sequenced the pancreatic cancer genome as part of Australia’s participation in the International Cancer Genome Consortium

2012 Discovered how brain NPY controls temperature regulation in brown fat and how this affects weight loss in obese people

2013 Discovered that remodelling of the Cancer Epigenome causes large regions of the genome to become activated and genetically unstable
DNA sequencing technology has changed dramatically since 2000. You used to have to make large, but incredibly delicate, polyacrylamide gels to run samples on. Running the samples would take several hours, and then you had to transfer the very thin gel onto blotting paper, manually dry it, and then expose it to X-ray film.

When you were transferring the gel onto blotting paper, it often fell to pieces or got tangled up, so your whole day’s work could literally fall apart in seconds.

The end product, called an ‘autoradiograph’, would give you information about a few hundred base pairs of DNA – or letters of the DNA code. You’d manually decode it, going up the film and writing out the sequence - G, AA, TT, CCC, for example.

Today’s machines sequence millions of base pairs at a time, so the advancement is awe inspiring. These machines can sequence someone’s genome in a week. Eventually they’ll be doing genomes in a day.

Professor
Roger Daly
Cancer Research Division

Overview
Cancer cells exhibit certain hallmarks that distinguish them from normal cells, including increased capacity to divide and then spread throughout the body. The overall goal of the Cancer Research Division is to understand the molecular mechanisms that underpin cancer development. By identifying these mechanisms, we help speed the development of new therapeutic strategies and biomarkers to help individual patients.

The Cancer Division is organised into a series of independent yet collaborative research groups. These span major areas of basic cancer research, including cancer genomics, epigenetics, cell biology and signalling, and translational cancer research, with groups focusing on breast, prostate, colorectal, ovarian and pancreatic cancer, as well as cancer therapeutics.

The recent opening of The Kinghorn Cancer Centre (TKCC), which houses many of the research groups from this Division, will align research activity with best practice cancer services at St Vincent’s Hospital, thereby facilitating rapid research translation to the clinic, the development of innovative approaches in personalised medicine, and ultimately improved outcomes for cancer patients.

Research Highlights
Cancer genomics applied to pancreatic cancer
There were many notable achievements in the Cancer Research Division in 2012, including a major breakthrough in the field of cancer genomics. A decade after the sequencing of the first human genome, the development of new DNA sequencing technologies has provided the capability to sequence hundreds of cancer genomes, providing unprecedented insights into the genetic changes that underlie cancer development, the degree of variation that exists from patient to patient, and the likelihood that a given patient will respond to a specific therapy.

Professor Andrew Biankin and his team in the Cancer Research Division have been at the forefront of international research in this area, with a landmark study that was published in the elite scientific journal Nature. As part of the International Cancer Genome Consortium (ICGC), which aims to identify the genetic drivers behind 50 major human cancers, his team, in association with the Australian Pancreatic Cancer Genome Initiative (APGI), sequenced the genome of 142 cases of pancreatic cancer.

The study identified more than 2000 genes involved in the cancer, adding to a few already linked to the disease. While four genes were mutated in 50 per cent of pancreatic tumours, most mutations were found in less than 2 per cent, and no two cancers were the same. It also showed that several genes involved in a normal developmental process known as ‘axon guidance’ – which orchestrates neuronal migration and positioning in an embryo – are also significant in pancreatic cancer. The important take-home message from this study is that pancreatic cancer is not one disease, and each cancer should be treated differently, based on its mutational spectrum, with life-saving potential.

The APGI is now running a clinical trial in which the specific treatment for pancreatic cancer patients is matched to their genetic profile.

Regions activated by epignetics in prostate cancer
A second major breakthrough involved ‘epigenetic’ changes that occur in cancer. Epigenetics examines modifications to the DNA and associated proteins that alter gene expression without altering the DNA sequence.

Most studies to date have focused on epigenetic gene-silencing events and so the mechanism promoting gene-activation in carcinogenesis is still poorly appreciated. This year, using new genome-wide sequencing technologies, Professor Susan Clark and her team identified a novel mechanism of gene deregulation in prostate cancer that involves activation of multiple adjacent genes in large domains across the cancer genome.

The activated regions commonly contain key oncogenes and other tumour-associated genes, most notably the prostate cancer biomarker gene encoding prostate specific antigen (PSA). This study, published in the elite scientific journal Cancer Cell, reveals a new paradigm in epigenetic cancer gene deregulation that promotes widespread oncogenic gene-activation in tumorigenesis; a result that will have wide ramifications for cancer diagnosis, progression and epigenetic-based gene therapies.
Molecular changes underpinning breast cancer subtypes

During 2012, major progress was also made in our understanding of the molecular changes that underpin the different subtypes of breast cancer. It is now well-established that breast cancer is not one disease but instead encompasses several different disease subtypes, each with characteristic prognoses and responses to specific therapy.

For example, ‘luminal A’ breast cancer usually responds well to therapies, such as tamoxifen, that block oestrogen production or action, while the ‘HER2 subgroup’ is characterised by sensitivity to trastuzumab. While we can see and understand these effects, the molecular events that drive the patterns of gene expression within these breast cancer subgroups are poorly understood.

Importantly, Associate Professor Chris Ormandy’s group demonstrated that the transcription factor – molecules that switch genes on or off – known as ‘ELF5’, is responsible for much of the patterning of gene expression that distinguishes the breast cancer subtypes. Additionally, their data indicated that ELF5 may also be involved in the development of resistance to therapies designed to stop oestrogen stimulation of breast cancer.

These findings highlight ELF5 as a potential predictive marker and therapeutic target for anti-oestrogen resistant disease, recently published in *PLoS Biology*.

This year also saw the sad passing of the Cancer Division’s founder and long-serving Director, Professor Rob Sutherland. As the Cancer Division enters into a new phase of its development in close association with TKCC, a major recruitment drive was initiated in 2012 and is continuing in 2013.

**Group Leaders**

Professor Andrew Biankin, Pancreatic Cancer Research Group

Dr Andrew Burgess, Mitotic Control Group

Professor Susan Clark, Epigenetics Research Group

Professor Roger Daly, Signal Transduction Group

A/Professor Maija Kohonen-Corish, Colon and Lung Cancer Group

Professor Liz Musgrove, Cell Cycle Group

A/Professor Chris Ormandy, Mammary Development Group

Dr Ilse Rooman, Pancreatic Carcinogenesis Group

Dr Goli Samimi, Ovarian Cancer Research Group

Dr Darren Saunders, Ubiquitin Signalling Group

Professor Rob Sutherland AO FAA, Breast Cancer Group

Prostate Cancer Group

Steroid Hormone Action Group

Dr Alex Swarbrick, Tumour Progression Group

Dr Charlie Watts, Cancer Therapeutics Development Group

Dr Jianmin Wu, Cancer Bioinformatics Group
White Water Falls
by Richard Long CBE
The Kinghorn Cancer Centre (TKCC) was officially opened by Prime Minister, The Hon Julia Gillard MP, on 28 August 2012. The 15,000 m$^2$ Centre, now fully operational, is a joint venture between Garvan and St Vincent's Hospital, combining scientific and medical expertise to provide a personalised medicine approach to the treatment and care of cancer patients.

The original brief to architects BVN was to create “a non-hospital environment that encourages a sense of hope and wellness”. They fulfilled this brief in many ways, one of which was to create a chemotherapy suite that opens on one side onto a bamboo garden, and on the other to a ‘climbing garden’ of bougainvillea. The bougainvillea, trained to grow up a glass partition between the clinic and Victoria Street, will protect patients’ privacy from passers by, and at the same time will filter light, casting a blue glow.

A towering 8-by-34-metre work by Turner Prize winning English painter Richard Long CBE – using china clay from Geelong applied onto a black painted background– dominates the spacious pre-cast concrete atrium, creating a soothing and serene environment.

The building is the first in Australia to use ‘Aircuity' energy saving air conditioning technology, which allows it to react to the presence or absence of users. The building’s energy management system also turns off lights when it stops sensing movement, rather than leaving them on all the time. Other green measures include retention and use of rain water, LED lighting throughout and installation of non-PVC cabling.

Nine floors of the 13-floor building are dedicated to research and treatment, while the four basement levels provide plenty of parking for patients and visitors.

Teams of researchers and clinicians working in this purpose-built cancer centre will ensure that clinical challenges drive laboratory research, and that research findings are applied quickly to clinical care. As well as state-of-the-art clinical and consulting rooms and laboratories, the centre provides workspaces and meeting rooms so that researchers and clinicians can come together into multidisciplinary teams to exchange information and ideas about the diagnosis, treatment and care of cancers. A Wellness Centre is also planned for this facility.

The nation's first Centre for Clinical Genomics is being established in TKCC, allowing us to sequence genomes on-site and identify potential targets for diagnostic and therapeutic development. Genome sequencing will soon become routine in cancer research, and the standard in clinical care. Ultimately, we hope to develop a genetic sequencing service that will form the platform for the development of genomic medicine over the coming years.
Back in 1969, when Jon Sprent and I were young immunologists at Melbourne’s Walter and Eliza Hall Institute, our lab leader and discoverer of the thymus gland, Jacques Miller had only just shown that lymphocytes, a particular type of white blood cell, comprised two broad subsets of cells.

The first were called ‘T cells’ as they come from the thymus, and the second were called ‘B cells’ since they are derived from bone marrow.

Studying B and T cells was tricky at first, because we had no way of readily distinguishing between them. Then over time, we were able to identify just a few of the many molecules that each group expressed on the cell surface, allowing us to target them with antibodies.

This involved culturing our cells, along with the relevant antibody made in rabbits, in a 96 well plate - each well containing a different concentration of antibody. To detect binding of the antibody, we added a second protein called 'complement' which enabled the antibody to kill the cells it was bound to. We then counted the dead cells manually, under a microscope. Reasonably accurate, but very time consuming!

These days FACS machines sort and then count subsets of cells at the rate of 10,000 cells a second - using highly specific monoclonal antibodies to identify the cell surface molecules that now distinguish the many subtypes of B and T cells. These machines are so accurate that they can detect cells that are present at frequencies of 0.1% or less.

Emeritus Professor
Antony Basten AO FAA FTSE
Overview
The goal of the Immunological Diseases Division is to determine how the immune system functions to protect the body and how this goes wrong when disease occurs. Our researchers collaborate with clinicians at various major hospitals to devise treatments for immunological diseases.

The latest technologies are used to manipulate and analyse the behaviour of immune cells, both in the body and in the laboratory. This includes sophisticated gene manipulation and analysis techniques, precise and detailed approaches for analysing the rare cell populations that initiate immune responses, and the capability to visualise individual cells – through powerful microscopes – as they function within the body.

The immune system protects the body from dangerous attacks, whether they come from outside as infections, or inside as cancer. It must also differentiate between actual threats to the body and the healthy cells and molecules that make up the body itself. When this process of discrimination fails, it results in autoimmune diseases such as rheumatoid arthritis and type 1 diabetes, and the body proceeds to attack its own tissue. Our Division looks at the wide range of different immune responses that can occur, and the processes that underpin them.

Research Highlights
Spontaneous reversal of gene mutation in rare disease XLP
Some of our most useful work comes from investigating rare diseases, as they often provide insight into the normal functioning of the body. A good example this year was research undertaken by Associate Professor Stuart Tancyle's laboratory, which provided a great advance in our understanding of the inherited immunodeficiency X-linked lymphoproliferative disease (XLP). The results were published in the prestigious Journal of Experimental Medicine.

XLP patients typically present with severe and often fatal Epstein–Barr virus (EBV) infections due to their inability to combat this virus. Surprisingly, some patients carrying the XLP mutation (in the SH2D1A gene) mount strong immune responses against EBV and remain largely asymptomatic when infected.

Our researchers showed that these fortunate XLP patients contained large numbers of T cells (the immune cells responsible for killing virally infected cells) in which the mutation in the SH2D1A gene had spontaneously reversed. Although the emergence of such cells is an extraordinarily rare event, strong selective pressure in the face of a potentially fatal EBV infection causes the now-normal T cells to multiply and protect patients from the virus. These findings indicate that gene therapy may ultimately provide an effective treatment for patients with XLP.

How infection can trigger autoimmune disease
Another important breakthrough came when researchers in Associate Professor Robert Brink's laboratory were able to explain why certain autoimmune diseases often occur after specific infections.

While the phenomenon has been well recognised for decades, no one has been able to explain the exact mechanism behind it until now. To do that, the group examined what happens to immune system cells with the ability to make “cross-reactive autoantibodies” – antibodies that can attack the body itself as well as the invader.

They found that although the immune system could often prevent the production of these rogue autoantibodies, it was less able to perform its normal protective role when the autoantibodies targeted a particular organ such as the liver or kidney.

This finding, published in the top-ranking journal Immunity, explains how “organ-specific” autoimmune diseases such as rheumatic fever and Guillain–Barré syndrome (where the body makes antibodies that attack the heart and peripheral nerves respectively) can occur following certain infections.

The finding also suggests that if you know enough about an infectious trigger and the autoimmune disease it can cause, it may be possible in future to alter the way the body produces antibodies in that instance.
Making biologically active yet stable antibodies

Monoclonal antibodies represent almost half of all drugs entering clinical studies, with more than $30 billion sales worldwide in 2010. Unfortunately, between 30-50% of the antibody-based drugs being developed have to be put on hold because they do not meet quality tests that the companies or regulatory agencies require.

As a result, one of the most pressing problems facing the pharmaceutical industry is how to create antibodies that are stable enough to meet stringent requirements necessary for production in large quantities, injection into patients and long-term storage.

Members of Garvan’s Antibody Engineering Laboratory, led by Dr Daniel Christ, have made a major contribution towards solving this problem by developing specific mutations that universally increase the stability of antibody molecules. Their results were published in the Proceedings of the National Academy of Science of the United States of America (PNAS).

The approach developed by the team involves the introduction of specific mutations into antibodies that do not change their effectiveness but greatly improve their stability. This approach has the potential not only to rescue many potentially valuable therapeutic antibodies from being abandoned, but also to increase production efficiency and so reduce the cost of therapeutic antibody drug treatments to patients.

The next step for the team will be to work with colleagues in the pharmaceutical industry to improve the stability of antibody therapeutics for the treatment of cancer and inflammatory conditions.

Group Leaders

Dr Marcel Batten, Immunobiology of Cytokines Group
A/Professor Robert Brink, B Cell Biology Group
Dr Daniel Christ, Antibody Engineering Group
Dr Tatyana Chtanova, Immunobiology of Cancer Group
A/Professor Shane Grey, Gene Therapy and Autoimmunity Group
A/Professor Jenny Gunton, Diabetes and Transcription Factors Group
Dr Cecile King, Mucosal Autoimmunity Group
Dr Tri Giang Phan, Intravital Microscopy Group
Professor Jonathon Sprent FAA FRS, Cellular Immunity Group
A/Professor Stuart Tanyge, Immunology and Immunodeficiency Group

Top: Associate Professors Fabienne Mackay and Herbert Herzog in 2005, collaborating on a project about stress and the immune system.


Opposite: Dr Tyani Chan from the B Cell Biology Group creating a protein complex (comprising an antigen and sheep red blood cells) capable of inducing an immune response.

The lab has pioneered a highly sensitive experimental mouse model that is capable of studying protective immune responses as well as autoimmune diseases.
Ted Krögen was one of the first people in the world to develop a fully closed loop system to deliver insulin to patients with diabetes. It was an early prototype “artificial pancreas” and used a set of equipment about half the size of a room.

I became involved a little later, when he further developed a device for hospital use, making insulin delivery respond to blood glucose levels measured at short intervals of time.

One of the valuable things we showed in those early days was that although the closed loop system works very well, it doesn’t work ideally for a meal. For a meal, you need to give a pre-planned amount of insulin according to the amount of food eaten, not according to what blood sugars do.

The concept has now been translated – with modern miniaturising technology – into small pumps that can be worn by people with diabetes. A subcutaneous sensor device measures blood glucose continuously, and the pump infuses insulin accordingly.

While the latest insulin pumps are very effective, they are not sophisticated enough to deliver the optimal dosage of insulin for a meal without manually programming the amount of food or carbohydrate to be eaten – in fact I doubt they ever will.

Professor Don Chisholm AO
Overview

The most recent figures indicate that obesity costs the Australian economy over $58b each year, largely because it is a major contributor to most diseases that compromise human health including diabetes, cardiovascular disease, cancer, Alzheimer’s Disease and asthma. Our goal is to establish, at a biological level, the link between the environment, obesity and disease and to identify a clear path for early diagnosis and prevention. To achieve this we study emergent properties of metabolism in cells, different tissues, mice and humans by collecting large data sets over time. This establishes a more accurate picture to describe the behaviour of the system during the development of disease. By constructing metabolic network maps we hope to devise better treatments and early diagnostic markers that can be taken into the clinic.

Research Highlights

During 2012, researchers in the Metabolic Diseases Division made significant progress in many areas including the understanding of pancreatic beta cell function and survival, how insulin resistance develops in liver and muscle, and fat cell metabolism in people and model systems of obesity.

Using the latest technologies to study whole body processes

We made excellent progress by combining mathematics, computer science and biology to study whole body processes, or ‘systems biology’. Introduction of new technology and analysis tools allowed us to improve our measurement and interpretation of the multitude of changes that take place, moment by moment, in cells and tissues when they are exposed to a stimulus – such as the hormone insulin.

The establishment of a Mass Spectrometry facility at Garvan enables the identification of the hundreds of thousands of protein fragments produced when cells or tissues are ‘digested’ into a kind of peptide soup before analysis. Until recently, reassembling these fragments (in a virtual sense) to identify changes in specific proteins has been limited because many of the 89,486 proteins recorded in the International Protein Index are made up of similar, or the same, peptide fragments.

Bio-informaticians working with Professor David James developed an algorithm last year that now allows scientists to identify specific proteins. This enables analysis of the vast quantity of data produced by an exquisitely sensitive new generation of mass spectrometers. The new software even allows the re-processing of older data run in the lab, identifying at least 25% more proteins than have been identified in the past.

Details of the software were published in the Journal of Proteome Research. Through its enhancement of protein identification, the new software improves the ability of scientists to investigate complex diseases such as type 2 diabetes as they operate through time.

Taking a muscular approach towards diabetes

In other important work from the Metabolic Diseases Division, members of Associate Professor Greg Cooney’s lab, in collaboration with the Cancer Division’s Professor Roger Daly, observed that a particular strain of genetically modified mice, lacking the gene Grb10, had larger muscles throughout life. The results were published in The Federation of American Societies for Experimental Biology (FASEB) Journal, and indicate that Grb10 plays a role in regulating the size of muscles during embryonic development, mainly by controlling the number of muscle fibres in a muscle.

Apart from the implications for muscle regeneration during healing, the findings are important for diabetes research because muscles are the biggest users of glucose in the body. A drug able to reduce levels of the Grb10 protein may have the potential to increase muscle mass, and so increase the capacity to transport glucose from the blood stream into cells, a major goal for any diabetes therapy.
Showing that weight loss reduces artery stiffness
Research relevant to human disease is a key factor in all studies carried out in the Division, and in 2012 members of the clinical research program made significant observations about the way obesity relates to diabetes and other manifestations of metabolic disease.

Notably, Associate Professor Katharine Samaras collaborated with Associate Professor Christopher Hayward from St Vincent’s Hospital to show that losing 6 kg reduces artery stiffness by 20% in obese people with type 2 diabetes.

Diabetes carries a six-fold greater risk of heart disease due to atherosclerosis, or hardening of the arteries, with cardiovascular disease being the commonest cause of death in people with diabetes – accounting for 68% of all deaths.

The new research demonstrated that arterial stiffness is directly associated with inflammation – that is, activation of white blood cells and genes that regulate inflammation. Weight loss reduces immune cell activation and inflammation in fat tissue, which in turn allows the arteries to relax.

This study, published in *Diabetes and Vascular Disease Research*, was the first study to link weight loss with fat tissue inflammation and arterial stiffness.

Group Leaders
- Professor Trevor Biden, Beta Cell Signalling Group
- Professor Lesley Campbell AM, Appetite and Adiposity in Type 2 Diabetes and Prader Willi Syndrome Group
- Professor Don Chisholm AO, Fat, infection and Insulin Resistance Group
- A/Professor Greg Cooney, Molecular Metabolism Group
- A/Professor Antony Cooper, Stress and Protein Misfolding Group
- A/Professor Jerry Greenfield, Clinical Diabetes and Metabolism Group
- Dr Daniel Hesselson, Beta cell regeneration Group
- Dr Will Hughes, Phospholipid and Cell Biology Group
- Professor David James FAA, Cellular Systems Biology Group
- Professor Ted Kraegen, Diabetes and Metabolism Group
- Dr Ross Laybutt, Islet Biology Group
- Professor Katherine Samaras, Adipose Tissue Biology in Diabetes Group
- Dr Carsten Schmitz-Peiffer, Insulin Signalling Group

Top: Dr Lesley Campbell AM, Director of the St Vincent’s Diabetes Centre, and Dr Arthur Jenkins, Deputy Head of the Diabetes Research Group, examining the data from studies of dietary manipulation in people with type 2 diabetes in 1992.

Below: Dr Trevor Biden, Head of the Cell Signalling Group, adjusting chromatographic equipment used in his studies of insulin producing cells in 1992.

Opposite: Dr Carsten Schmitz-Peiffer purifying Protein Kinase C – an enzyme he has shown to cause defects in insulin action.

Insect cells are harnessed to make large amounts of the enzyme, but these cells contain many other proteins. The enzyme protein is ‘tagged’ to make it stick to the pink affinity resin, while all the others flow through.

Once large quantities of the enzyme are purified, the Garvan team and their collaborators plan to test various compounds against it, looking for a specific inhibitor.
Overview
The Diabetes Vaccine Development Centre (DVDC) was established in 2003 through a major joint initiative of the National Health and Medical Research Council (NHMRC) and Juvenile Diabetes Research Foundation (JDRF).

With the assistance of a grant from the NSW Government, DVDC relocated from Melbourne to Garvan in 2007. It became a company limited by guarantee with Garvan as the sole member in 2008.

DVDC is governed by a board representing its major stakeholders (Garvan, JDRF and NHMRC), as well as internationally recognised scientists and biotechnology executives with expertise in the fields of diabetes and vaccine development.

The Centre’s mission is to provide a platform to translate Type 1 diabetes research into improved clinical outcomes – prevention and therapy.

With in-house expertise for the conduct of clinical trials, DVDC currently manages clinical research projects (see below) and coordinates a network of ten trial sites across Australia and New Zealand. The network has focused on children and young adults, and is now expanding to include more of the adult Type 1 diabetic population.

Scientific Program
Type 1 Diabetes Prevention Study, INIT II
This is a Phase 2, multi-centre, randomised, double blind, placebo-controlled trial of intranasal insulin (440IU) in children and young adults at risk of Type 1 diabetes. The aim of this project is to determine whether the administration of insulin via an intranasal route will result in a protective immune response.

Study of Proinsulin Peptide Immunotherapy in New-onset Type 1 Diabetes (MonoPepT1De Study)
Peptide immunotherapy represents a novel approach to preventing loss of insulin production from the pancreas in Type 1 diabetes. The MonoPepT1De Study, which is being conducted in the UK, aims to address the safety of P1 peptide administration in newly-diagnosed T1D preparatory to a larger study to determine whether this intervention promotes the survival of residual insulin-producing beta cells.

Rowena Tucker
CEO, DVDC Limited
Membership of the DVDC Board

Professor Don Chisholm AO FRACP (Chair)
Senior Principal Research Fellow
Metabolic Diseases Division
Garvan

Emeritus Professor Antony Basten AO FAA FTSE
(from 21 August 2012)
Senior Principal Research Fellow
B Cell Biology, Immunological Diseases Division
Garvan

Mr John Dakin
Chief Operating Officer
Garvan

Mr Paul Eisen
Director
APAC Medical Device Consultants

Dr Carla Greenbaum
(from 22 February 2012)
Director Diabetes Clinical Research
Benaroya Research Institute
Virginia Mason, Seattle, USA

Ms Christina Hardy
Director Business Development & Legal Affairs
Garvan

Mr Stephen Higgs
Chair of the Board of Directors
JDRF Australia

Professor Chris Goodnow FAA FRS
Director Immunogenomics Laboratory &
Director Australian Phenomics Facility
John Curtin School of Medical Research &
The Australian National University

Professor Leonard C Harrison
Head Diabetes Laboratory
Walter and Eliza Hall Institute of Medical Research

A/Professor Paul Hofman
Liggins Institute
New Zealand

Dr Dorota Pawlak
Head of Research & Development
JDRF Australia

Dr Teo Staeva
Director Immune Therapies
JDRFi, New York, USA

Dr Roland Tisch
Department of Microbiology & Immunology
University of North Carolina at Chapel Hill USA

Membership of the DVDC Scientific Advisory Committee

Dr Carla Greenbaum (Chair)
Director Diabetes Clinical Research
Benaroya Research Institute
Virginia Mason, Seattle, USA

Professor Peter Colman
(alternate to Professor Harrison)
Department of Diabetes and Endocrinology,
Royal Melbourne Hospital

Professor John Mattick AO FAA FRCPA
(22 February – 21 August 2012)
Executive Director
Garvan

Membership of the DVDC Finance Committee

Mr John Dakin (Chair)
Chief Operating Officer
Garvan

Professor Don Chisholm AO FRACP
Chair DVDC Board

Mr Stephen Higgs
Chair JDRF Australia

Mr Ron McNeilly
A/g Director Research Administration
National Health and Medical Research Council

Ms Rowena Tucker
CEO DVDC

Mr Mike Wilson
CEO JDRF Australia
I am a mathematician by training, and for the last twenty years I have been using electrophysiology and calcium image readouts to calculate the activity of the nervous system.

Calcium ions trigger the release of neurotransmitters from nerve endings, allowing a chemical signal to pass between one neuron and the next. We couldn't witness this process in the past, but the two-photon microscope now shows us it in detail.

My colleague Shu Lin has been using other technologies to study appetite and energy balance in mice. This new technology will allow him to refine conclusions he has already drawn, as well as test new hypotheses.

Dr Willie Lin

Two-photon microscopes are allowing us to understand the connectivity of neural networks with a precision that has been impossible until now - letting us visualise the activity, structure and 3D placement of neurons well below the surface of a living mouse brain in a non-invasive way.

In combination with older technologies, such as confocal microscopes and electrophysiology equipment, the two-photon microscope allows us to decode exactly what is happening at nerve endings, where nerve communications occur.

We can activate a specific neuron, track its activity within a neuronal network, and measure its impact upon an animal’s body or behaviour.

If you activate a network that controls appetite, for example, and the mouse is sleeping when you activate it, the mouse will get hungry, wake up and go and feed.

“Two-photon microscopes are allowing us to understand the connectivity of neural networks with a precision that has been impossible until now – letting us visualise the activity, structure and 3D placement of neurons well below the surface of a living mouse brain in a non-invasive way. In combination with older technologies, such as confocal microscopes and electrophysiology equipment, the two-photon microscope allows us to decode exactly what is happening at nerve endings, where nerve communications occur.

We can activate a specific neuron, track its activity within a neuronal network, and measure its impact upon an animal’s body or behaviour.

If you activate a network that controls appetite, for example, and the mouse is sleeping when you activate it, the mouse will get hungry, wake up and go and feed.”
Overview

The Neurological Diseases Division addresses perhaps the most challenging of all human traits, the complex nature and function of the brain and nervous system.

We aim to increase the understanding of the molecular mechanisms that underpin the capacity of the human brain to learn and to think, and the neuronal systems involved in disorders such as Parkinson's disease, Alzheimer's disease, schizophrenia, eating disorders, hearing loss and pain, as well as the general understanding of brain-to-organ interactions including the control of metabolism and bone development.

We use this understanding to identify potential new therapeutic approaches in these areas, with a particular interest in finding ways of regenerating the nervous system and to improve the regulation of energy balance (intake and expenditure), which affects fertility, mood, weight gain and physical fitness.

Research Highlights

Valuable tool for predicting pain genes in people

Of the many advances made within the Division during 2012, one of the most critical was the identification of a "network map" of genes involved in pain perception, showing remarkable similarity from fruitflies to people. This map is now allowing prediction and testing of new analgesic drugs.

Fifty percent of our population will experience some form of chronic pain within their life, especially those who suffer from arthritis, cancer, diabetes, migraine, or nerve injuries. Despite the astonishing prevalence, there are few effective therapeutic options for these people.

The new study was carried out by Dr Greg Neely in collaboration with colleagues from Austria. The group had previously screened the 14,000 genes in the fruitfly genome and identified 580 genes involved in perception of heat pain. In last year's study, using a database from the US National Centre for Biotechnology Information, they noted that there are roughly 400 equivalent genes in people, many of which were independently linked to pain.

Comparing fly with human data, Neely and colleagues could also see that a particular kind of molecular signalling appeared in the pain network they identified, and then validated this pathway using genetically modified mice. They published their groundbreaking study in the international journal *PLOS Genetics*.

Fly data were also used to identify candidate genes in other aspects of the Division's research, including appetite, obesity, motor neuron disease, neurodegeneration and neural death.

Impact of brain signals on energy balance and bone formation

There is an intricate and delicate interplay of neural signalling between the brain and the body, affected by various hormones including the fat-derived hormones leptin and adiponectin, gut-derived hormones such as peptide YY (PYY), and the hypothalamic regulator of energy balance, neuropeptide Y (NPY). During the course of the year, we advanced our understanding about specific pathways that affect the body's overall energy balance, as well as the influence of brain signals on bone formation and strength.

Of particular significance was a seminal study by Dr Paul Baldock that elucidated the mechanism involved in the bone loss associated with starvation, and in particular, the respective roles of NPY and leptin. Specifically, he showed that when leptin signals to the brain indicate that there are insufficient fat reserves, the body inhibits the production of bone, and that NPY is solely responsible for the loss of bone.

The findings revealed the critical nature of NPY signalling to bone strength. When mice were genetically engineered to lack the leptin signal to the brain, and therefore have constant activation of the starvation signal, they had tiny bones. The brains of these mice perceived that they were skinny and starving, so did not make bone. In a second model, where NPY was also removed from the "starving" mice, the bone defect was completely corrected.

While NPY plays a powerful role in controlling weight, many other factors can also contribute or compensate. The recent findings demonstrate that this is not the case in bone formation, where NPY is the key link between energy balance and bone formation and strength. These breakthrough findings were published in the prestigious *Journal of Bone and Mineral Research*. 
Dr Baldock also contributed to a review of literature investigating the association between bariatric (weight loss) surgery and bone mass, carried out by Garvan’s Osteoporosis & Bone Biology Division and published in the journal *Obesity Reviews*. In particular, the review noted that the more radical the surgery, the greater the likelihood of bone loss, and urged increased awareness of surgery-induced changes in hormones that can affect the central regulation of appetite and bone strength.

In addition, the initial analysis of a clinical study investigating the effects of bariatric surgery on bone mass identified that some forms of surgery produce 6 times the bone loss of others per kilogram of weight lost, a critical issue to be considered prior to these surgical procedures.

Advances in our understanding of neurosignalling and neuroplasticity

Neuroplasticity is the ability of the brain to change and refine itself in response to different experiences and circumstances. This is especially important for higher order functions, such as learning and memory.

Defects in function of certain enzymes (such as GSK3 and Cdk5) are implicated in the development of several neurological disorders, including Alzheimer’s disease, Bipolar disorder and schizophrenia. In order to understand how GSK3 and Cdk5 regulate neuroplasticity in healthy and diseased brains, Dr Adam Cole’s lab focuses on discovering novel targets of these enzymes. Last year, Dr Cole discovered a cluster of GSK3 targets in the brain that are important for trafficking proteins to synapses. His challenge will now be to define the individual roles of these molecules in Bipolar disorder and schizophrenia, with a goal to define new therapeutics for treatment of these serious diseases.

Dr Cole recently established important collaborations with world leading neuroscientists to investigate the functions of these GSK3 targets in regulating neuroplasticity, namely Professor Graham Collingridge, University of Bristol, England and Professor Mike Cousin, University of Edinburgh, Scotland.

**Group Leaders**

Dr Paul Baldock,
Skeletal Neurobiology Research Group

Dr Adam Cole,
Neurosignalling Research Group

Professor Herbert Herzog,
Eating Disorders Research Group

Professor John Mattick AO FAA,
RNA Biology & Plasticity Research Group

Dr Greg Neely,
The Functional Genomics Research Group

Professor David Ryugo,
Hearing Research Group

Professor John Shine AO FAA,
Adult Stem Cell Research Group

Dr Bryce Vissel,
Neurodegenerative Disorders - Repair and Regeneration Research Group

**Advances in our understanding of human gene expression**

The human genome produces an extraordinary range of both protein-coding and regulatory RNAs in different cells at different stages of development, especially in the brain, most of which have not yet been characterised. Last year, Professor Mattick’s group integrated large-scale protein and RNA sequencing data to identify hundreds of new protein-coding genes, many of which appear to produce previously unknown hormones. His group also developed a new method detecting changes in RNA sequence by RNA editing, which is particularly active in the brain, and a new method for targeted high resolution gene expression analysis, called RNA CaptureSeq, in conjunction with Dr Marcel Dinger at the University of Queensland and Dr John Rinn at Harvard University, which was published in the prestigious journal *Nature Biotechnology*.
Bisphosphonates are now the blockbuster drugs for treating various bone diseases, including osteoporosis, and although they were first used 40 years ago, it took us over 30 years to understand how they actually work.

Until recently, the only way we could detect the action of these drugs was to label them with a radioactive isotope, and track where they went in a mouse. This process was very slow because we used tritium – a very weak isotope that produces a very clear signal. Unfortunately, this meant we had to expose tissue samples to x-ray film for several months before we could see the result.

These days we label the drugs with fluorescent tags and use the very latest technologies – sophisticated CT scanners, microscopes and 3D fluorescence imagers – to watch the process unfold in real time, literally like watching a movie.

Not only do we see the bisphosphonate drugs adhere to the bone surface – which is where they are known to act on bone cells – we can see where they go and what they do in other parts of the body.

The reason we’re so interested in finding out which cells can take up bisphosphonates in tissues outside the skeleton is because these drugs have recently been shown to prolong the survival of cancer patients, and we would like to understand how drugs that target the skeleton also appear to have anti-tumour activity in other tissues.

Professor Mike Rogers
Overview

The Osteoporosis and Bone Biology Division is dedicated to achieving major improvements in diagnosis, treatment and quality of life for people affected by skeletal disorders through fundamental discoveries and innovative applications in laboratory and clinical research. There is a particular emphasis on osteoporosis and cancers that grow in bone, including multiple myeloma, and breast and prostate cancer bone metastasis.

Our researchers use the latest technologies to understand the basis for common skeletal disorders. This includes new screening techniques, advanced genetic approaches, the latest methods for working with the critical cells that maintain our skeletons, novel high-resolution microscopy techniques to study individual bone cells in living tissues and sophisticated animal models of disease. This understanding is being used to develop new approaches to treatment in our model systems, before translating this into studies in the clinic. There is an emphasis on utilising our large clinical cohorts, established over many decades, to develop new approaches to predicting those who will suffer from fragility fractures in the future, understanding why this causes premature death and seeking to identify who will most benefit from treatment. Importantly, we are focused on seeing our new understanding result in changes in policy and practice in order to benefit the maximum number of individuals with these disorders.

Research Highlights

New screening methods discovered nine new genes that determine bone strength

An important breakthrough came this year through collaboration between Professor Peter Croucher's laboratory, Professor Graham Williams and Dr. Duncan Bassett from Imperial College, London and colleagues at the Wellcome Trust Sanger Institute, in Cambridge. They used micro-CT and digital x-ray microradiography and load bearing experiments to develop a new screening method to identify the genes that lead to osteoporosis. Their results were published in *PLoS Genetics*.

The group used this new technique to screen the first 100 ‘knockout mice’ from the Sanger Institute’s pipeline, which is part of a global effort to examine the function of every gene in the genome one by one. They found that 10 of these genes either weaken or strengthen bone, 9 of which had not been discovered before.

This suggests that a large percentage of our genes, perhaps 8–10% of all our genes, affect bone strength and may explain why we have such a limited understanding of the genes that control our skeleton.

The systematic screening of knockout mice in this way also produced the scale of data that allowed the group to describe, for the first time, four functional classifications of bone. Normal bone is strong and flexible, whereas abnormal bone can be strong but brittle, or weak and brittle, or weak but flexible.

This new understanding not only points to the importance of individual genes, but also now allows us to focus on the critical molecular pathways that control our skeleton. This will be a critical step in developing new treatments for bone diseases such as osteoporosis.

Developing an international consensus on ‘secondary fracture prevention’

A major advance in 2012 was the development of an international consensus for managing secondary bone fractures, an initiative led by Professor John Eisman AO.

Fragility fractures caused by osteoporosis are common, affecting almost one in two older women and one in three older men. Every fracture signals increased risk of future fractures, as well as risk of premature death. However, 80% of women and 90% of men who sustain a fracture do not receive treatment to reduce their risk of having a further fracture. Preventing these ‘secondary fractures’ requires capturing the people who suffer from a fragility fracture and implementing a preventative treatment plan.
Professor Eisman led an international Task Force examining ‘Secondary Fracture Prevention’ supported by the American Society for Bone and Mineral Research. The report was published in the prestigious *Journal of Bone and Mineral Research*.

The Task Force included 63 clinical care opinion leaders from 36 countries across the world and developed a toolkit for reducing secondary fracture. This makes it a requirement to have in place a systematic approach to identifying people who have had fragility fractures and to introduce approaches to preventative treatments to prevent further fractures.

This consensus report will have major implications for individuals that suffer fragility fractures by ensuring they are seen while still in hospital, or at the clinic, and preventative treatment measures put in place. This change in policy will bring direct benefit to individual patients by reducing the numbers of individuals that suffer secondary fractures and also impacting on the healthcare budget by reducing the need to treat secondary fractures.

**International consortium expands genetic knowledge about osteoporosis**

Professors John Eisman and Tuan Nguyen have been working as part of an international consortium collaborating with Icelandic genetics company, deCode, in an effort to find the genes linked to osteoporosis and fracture. Using the latest gene sequencing technologies, deCode has examined the genes of 1500 women from Garvan’s Dubbo Osteoporosis Epidemiology Study as well as more than 12,000 women from Iceland and Denmark.

In 2012, the consortium made a significant breakthrough by identifying 56 genes associated with bone density and/or fracture risk. The Garvan team plans to incorporate this finding into its predictive model – accessible on the web at www.fractureriskcalculator.com – a tool that helps assess the risk of fracture for each individual.

The fracture risk calculator is the world’s first personalised predictive model of fracture. By incorporating genetic information into its underlying algorithm, the Garvan group is pioneering the translation of genetic findings into clinical application for assessment of osteoporosis.

**Group Leaders**

Dr Paul Baldock,  
Bone Metabolism Group

A/Professor Jackie Center,  
Clinical Epidemiology Group

Professor Peter Croucher,  
Bone Biology Group

Professor John Eisman AO,  
Clinical Translation & Advanced Education

Professor Tuan Nguyen,  
Genetics & Epidemiology Group

Professor Mike Rogers,  
Bone Therapeutics Group

---

Above: Dr John Eisman (right), leader of the newly established Bone and Calcium Research Program, in 1984. Pictured with Mr Gilles de Weck of Sandoz Australia.

Opposite: A member of the Bone Biology group, Jenny Down uses a microCT scanner to take high-resolution X-ray images of a mouse tibia as it is rotated through 360 degrees, allowing her to construct a 3D model of the bone.

The lab looks at the destruction of bone caused by various diseases, including osteoporosis and cancer, and investigates ways of stopping or preventing that destruction.
Cancer

Awards and Prizes
- Dr David Chang and the Pancreatic Cancer Research Group: Cancer Institute NSW Wildfire Award, which recognises a highly-cited publication where the research results have significantly influenced how cancer is treated.
- Professor Susan Clark: Rotary Award for Vocational Excellence, 2012.
- Dr David Gallego-Ortega: Post-Doctoral Award for Excellence in Medical Research at the ASMR NSW Scientific Meeting 2012.
- Dr Brian Gloss: Best Student Poster prize at the Lorne Cancer Conference 2012.
- Rae-Anne Hardie: 2012 Beth Yarrow Memorial Scholarship from UNSW & Seahorse Bioscience Travel Award.
- Simon Junankar: Poster Prize at the Lorne Cancer Conference 2012.
- Dr Samantha Oakes: University of Sydney Medal for Excellence in Medical Research for the Best Overall Presentation at the ASMR NSW Scientific Meeting 2012; The National Breast Cancer Foundation Patrons’ Award for 'Excellence in Science and Science Communication Award'.
- Mary Iconomou: Best Student Poster at the ASMR NSW Scientific Meeting, 2012.
- Dr Catherine Piggin: Harvey Carey Memorial Scholarship from UNSW.
- Dr Andrea V. Pinho: Young Garvan Award and the Australasian Pancreatic Club/Abbott Travel Award.
- Dr Dessislava Mladenova: Best Early Career Oral Presentation at the Sydney Cancer Conference 2012.
- Dr Darren Saunders: Australian Leadership Award from ADC Future Forum 2012; Supervisor Award from UNSW Postgraduate Council.
- Dr Alex Swarbrick: Novartis Pharmaceuticals Award for Preclinical evaluation of smoothened inhibitors for the treatment of triple-negative breast cancer.'
- Wee Siang Teo: European Association for Cancer Research Travel Scholarship to attend the 22nd Biennial Congress of EACR in Barcelona, Spain; European Molecular Biology Laboratory travel grant to attend the 14th EMBL PhD Symposium Conference in Heidelberg, Germany.
- Dr Fatima Valdes-Mora: 2012 Fresh Science State Finalist & European Molecular Biology Laboratory (EMBL) Travel Fellowship to attend the 10th EMBL Conference 'Transcription and Chromatin' in Heidelberg, Germany.
- Luxi Zhang: Castle Harlan award for most outstanding early career PhD student at the Garvan Institute in 2012.

Major Fellowships and Funding
- Dr Ling Liu: Australia-Chinese Exchange Early Career Development Fellowship from the National Health and Medical Research Council.
- A/Professor Chris Ormandy: Research Fellowship from the National Health and Medical Research Council.
- Dr Alex Swarbrick: RD Wright Biomedical Career Development Fellowship from the National Health and Medical Research Council.
- Dr Phillippa Tablerlay: Cancer Institute NSW Career Development and Research Fellowship.
- Dr Paul Timpson: Future Fellowship from the Australian Research Council.
- Dr Fatima Valdes-Mora: National Breast Cancer Foundation / Cure Cancer Australia Foundation Postdoctoral Training Fellowship.

National and International Meetings
- Professor Andrew Bankit: Invited Speaker Lorne Cancer Conference, Victoria; American Association for Cancer Research (AACR) Pancreatic Cancer Meeting, Tahoe Nevada, USA; Human Genome Meeting (HuGO), Sydney; International Symposium on Pancreatic Cancer, Kyto Meeting, Japan; Novel Tools for the Early Detection of Pancreatic Cancer, Bonn, Germany; and the TRX Translational Cancer Research Symposium, Brisbane. Invited Speaker Opening Session Australian Health and Medical Research Council, Adelaide, Appointed to the NHMRC Human Genome Advisory Committee.
- Professor Susan Clark: Invited Keynote Speaker at The 3rd Shanghai International Conference of Epigenetics in Development and Diseases, Shanghai, China; Second IMPC Annual Conference, Barcelona, Spain; Epigenomics in the Capital, Canberra; Cancer Epigenetics, Australian Epigenetic Alliance Annual Victorian Meeting, Murdoch Institute, Nov, 2012, Melbourne; and the Gene Expression and Regulation session, Illumina Scientific Summit, Gold Coast. Invited Speaker at the First BLUEPRINT-European Union IHEC (International Human Epigenome consortium) meeting, Barcelona, Spain; and the Australia and New Zealand Breast Cancer Trials Group (ANZBCTG) Annual General meeting, Hobart; and Human Genome Meeting (HUGO), Sydney. Conference Organiser and Invited Speaker, Wellcome Trust Conference on Epigenomics of Common Disease, Baltimore, USA.
- Prof Roger Daly: Invited Speaker, EMBO Conference “Cellular Signalling and Molecular Medicine", Croatia, May 2012.
A/Professor Chris Ormandy: Invited Speaker at the FASEB Summer Research Conference, Colorado, USA; and the IABCR/Breakthrough Breast Cancer Conference, Manchester, UK.

Dr Clare Strzaker: Invited Keynote Speaker at the Gene Expression and Regulation session, Illumina SE Asia Scientific Summit, Gold Coast.

Dr Alex Swarbrick: Invited Speaker at Combio 2012, Adelaide; Endocrine Society of Australia Annual conference, Gold Coast; Novartis Oncology Forum, Melbourne; and the Hunter Cellular Biology meeting, Pokolbin, NSW. Conference committee and Invited Speaker The Lorne Cancer Conference, Lorne Victoria.

Immunological Diseases

Awards and Prizes
- Dr Marcel Batten: Young Garvan Award.
- A/Professor Shane Grey: The “Ian McKenzie Prize for outstanding contributions in Transplantation” by the Transplantation Society of Australia and New Zealand.
- A/Professor Shane Grey, Ms Jeanette Villanueva and Mr Nathan Zammit: Mentor/Mentee Awards from the International Transplantation Society.
- Dr Cecile King: Diabetes Australia Type-1 Diabetes Millennium Award; 2012 Juvenile Diabetes Research Foundation (JDRF) / Macquarie Group Foundation Diabetes Research Innovation Award.
- Dr Daniel Suan: National Health and Medical Research Council Postgraduate Scholarship.
- Ms Jeanette Villanueva and Mr Nathan Zammit: New Investigator Awards at the Annual Meeting of the Transplantation Society of Australia and New Zealand.

Major Fellowships and Funding
- Dr Tyani Chan: National Health and Medical Research Council Early Career Fellowship.
- Dr Daniel Christ: National Health and Medical Research Council Career Development Fellowship, Level 2.
- Dr Nike Krautler: Advanced Researcher Fellowship from the Swiss National Science Foundation.
- Dr Sue Liu: Postdoctoral Fellowship from Multiple Sclerosis Research Australia.
- Dr Helen McGuire: National Health and Medical Research Council Early Career Fellowship.
- Dr Mainthan Palendira: Career Development Fellowship by Cancer Institute NSW.
- A/Professor Stuart Tangye: National Health and Medical Research Council Principal Research Fellowship.

National and International Meetings
- Drs Tatyana Chitanova, Nike Krautler and Mainthan Palendira: Invited Speakers at the Gordon Research Conference on Immunochemistry and Immunobiology in Les Diablerets, Switzerland.
- Dr Elissa Deenick: Invited Speaker at the Annual Meeting of the Federation of Clinical Immunology Societies (FOCIS) in Vancouver, Canada.
- A/Professor Jenny Gunton: Plenary Speaker at the Keystone Symposium, Advances in Hypoxic Signaling in Banff, Canada.
- Dr Cecile King: Plenary Speaker at the Keystone Symposium, The Biology of Cytokines in Keystone Colorado, USA.
- Dr Cindy Ma and Prof Jonathan Sprent: Invited Lecturers at the Congress of the Federation of Immunological Societies of Asia-Oceania (FIMSA) in New Delhi, India.
- A/Professor Stuart Tangye: Invited Speaker at the European Society of Immunodeficiency Meeting in Florence, Italy; The X-linked Proliferative Disease (XLP) Symposium in London, England; and the Gordon Research Conference on Antibody Biology and Engineering in Galveston, Texas, USA.

Metabolic Diseases

Awards and Prizes
- Dr Daniel Fazakerley: Young Garvan Award.
- Professor Katherine Samaras: Australian Diabetes Society / National Diabetes Services Scheme Award (Federal Department of Health).

Major Fellowships and Funding
- Mohammed Bensellam: European Fellowship from Alfediam (French Language Association for the Study of Diabetes and Metabolic Diseases).
- A/Professor Antony Cooper: Michael J Fox Foundation ‘Target Validation Program’ funding.
- Professor David James, Dr Daniel Hesselson and Dr Dorit Samocha-Bonet: Diabetes Australia (DART) general grants.
- Dr Daniel Hesselson: Packer Family Fellowship, and a JDRF Transitional Fellowship.
- Dr Will Hughes: UNSW MRE II Grant with VCCRI.
- Dr Ross Laybutt: Australian Research Council Future Fellowship.
- Dr Anne McCormack and Associate Professor Jerry Greenfield: St. Vincent’s Clinic Foundation Tancred Research Grant.
- Nigel Turner: Australian Research Council Future Fellowship.
- Dr Alexander Viardot: John Shine Translational Research Fellowship.
National and International Meetings

- A/Professor Greg Cooney and Dr Jerry Greenfield: Invited Speakers at ANZOS, Auckland.
- Professor David James: Invited Speaker or chair: Novo Nordisk Prize Symposium, Copenhagen; ADA 72nd Scientific Sessions, Philadelphia, Pennsylvania, USA; APDO Meeting/KES meeting, Korea.
- Professor Ted Kraegen: Invited Speaker at the AMPK FASEB conference, California.

Neurological Diseases

Awards and Prizes

- Professor John Mattick: Chen Award 2012 for Distinguished Academic Achievement in Human Genetic and Genomic Research, Human Genome Organisation (HUGO).

Major Fellowships and Funding

- Dr Raymond Lau: Cancer Institute NSW Career Development and Research Fellowship.

National and International Meetings

- Dr Paul Baldock: Invited Speaker at the Conferences on Orthodontic Advances in Science and Technology, North Carolina USA; the Endocrine Society of Australia Annual Meeting, Gold Coast; and the Australian Health and Medical Research Council, Annual Meeting, Adelaide.
- Dr Adam Cole: Invited Speaker at the Australian Neuroscience Society Annual Conference in Melbourne.
- Professor Herbert Herzog: Plenary Speaker at the 3rd Meeting of the Japan Branch of International Neuropeptide Society Japan; the Scandinavian Physiological Society Annual Meeting, Helsinki, Finland - where he also gave a State of the Art Lecture; the Japanese Society of Psychosomatic Medicine, Kagoshima, Japan, Australian and New Zealand Obesity Society Annual Scientific (ANZOS) Meeting, Auckland, New Zealand; and the 15th Congress of the European NeuroEndocrine Association, Vienna, Austria. Conference and Symposium Organiser as well as Invited Speaker at the 10th International NPY PYY PP meeting, Montreal, Canada; and Invited Speaker at the 2nd Asia Pacific Prader–Willi Syndrome Conference, Sydney, Australia.
- Professor John Mattick: Plenary Speaker at The Royal Australasian College of Physicians Annual Congress, Brisbane, Australia (Arthur E Mills Oration); XLI Annual Meeting of the Brazilian Biochemistry and Molecular Society (SBBq), Foz do Iguacu, Brazil; INSERM Atelier de Formation 215: Diversity of the non-coding transcriptome revealed by RNAseq, Bordeaux, France; Non-coding Genome, Institut Curie, Paris, France; 2012 Merck Millipore Asia Bioforums, Singapore, Guangzhou and Taipai; Endocrinology and Diabetes Forum: Advances and Future Directions, Sydney, 2012 Human Genome Meeting, Human Genome Organisation (HUGO), Sydney (President’s Oration), 2012 SGI (Society for Gynaecological Investigation) Summit, Brisbane, Australia; Philanthropy in Health and Medical Research Conference 2012, Melbourne, Australia; QMB Non-coding RNA, Queenstown, New Zealand; Sydney Cancer Conference, Sydney, Australia; Frontiers in Cancer Science, Singapore; Biology 2012 and Beyond, 25th Anniversary Symposium, CSIR Centre for Cellular and Molecular Biology, Hyderabad, India; and the Private Healthcare Australia Conference 2012, Melbourne, Australia.
- Dr Greg Neely: Invited Speaker at the Lorne Genome Conference in Australia; and The European Academy of Bozen/Bolzano Institute in Italy.
- Professor David Ryugo: Plenary Speaker at Frontiers 2012: The Arts, Science and Future of Otorhinolaryngology, Melbourne; and the Conference of the College of American Veterinary Pathology, Seattle, USA.

Osteoporosis and Bone Biology

Major Fellowships and Funding

- A/Professor Jackie Center: Shine Translational Research Fellowship 2013.
- Dr Michelle McDonald: IBMS Greg Mundy Fellowship.

National and International meetings

- Professor Peter Croucher: Invited Speaker at the 1st Asia-Pacific Bone and Mineral Research Meeting; the ANZBMS 22nd Annual Scientific Meeting, Perth; the Australian Society for Medical Research, Sydney; and at the 4th Sydney Tissue Engineering Symposium.
- Professor Tuan Nguyen: Invited Speaker at the Strong Bone Asia Forum, Bangkok, Thailand.
- Professor Mike Rogers: Plenary Speaker at the Annual Conference on Cancer-Induced Bone Disease, Lyon, France.
Overview

Business Development undertakes four core functions for the Institute – it ensures that breakthrough discoveries are patented, commercialises the patents to increase the likelihood of clinical use, and assists researchers with focussed development projects. In addition, Garvan’s Business Development Unit provides commercialisation services to St Vincent’s Hospital Sydney Limited which enhances the precinct relationship.

Business Development maintains a global network of contacts in the biotech/pharmaceutical sector to ensure that the Institute is across diagnostic/therapeutic market needs and trends. The team works with researchers to identify potential biotech/pharmaceutical industry partners for commercially-focused development and funding opportunities. This is important as Garvan’s research sits at the first, vital, stage of the development pipeline for new therapeutics and diagnostic tests.

The Business Development team also looks at how capabilities of the Institute can be leveraged to enter into relationships with industry, and to use the depth of expertise in all of the Research Divisions. The Garvan patent portfolio currently comprises 23 patent families covering novel treatments, diagnostics and platform technologies in cancer, diabetes metabolism, neurosciences and immunology.

Special Projects

Business Development undertakes special projects which require commercial, legal and strategic planning expertise from time to time. In 2012 Business Development:

- provided business planning services in the lead up to the establishment of the Centre for Clinical Genomics, and
- worked with Garvan researchers and clinicians to identify core capabilities relevant to the needs of industry and government that can be leveraged to generate income;

G2 Therapies

Development of Garvan’s most clinically advanced program was progressed through the spin-out company G2 Therapies, a private company chaired by Dr John Schubert AO. Its anti-C5aR antibody is currently in clinical development at Novo Nordisk, in patients with rheumatoid arthritis.

Business Development Advisory Council

The Business Development Advisory Council (BDAC) provides strategic advice to Business Development and formally reviews initiatives that require Garvan Board approval. BDAC comprises representatives with a wealth of experience from the biotech and pharma sector, venture capital & corporate finance and Garvan faculty. In 2012 membership comprised:

Dr Lisa McIntyre (Chair)
Director, L.E.K. Consulting and Non-executive Director, Garvan

Professor John Mattick AO FAA
Executive Director, Garvan

Mr Daniel Petre (from August 2012)
Non-executive Director, Garvan

Dr George Moore
External Director

Dr Merilyn Sleigh
Biotechnology Advisor and Company Director

Mr Manoj Santiago
Partner, PricewaterhouseCoopers

Professor Trevor Biden
Metabolic Diseases Division, Garvan

Professor Peter Croucher
Chair, Osteoporosis and Bone Biology Division, Garvan

Mr John Dakin
Chief Operating Officer, Garvan

Ms Christina Hardy
Director, Business Development & Legal Affairs, Garvan
Justice Barry O'Keefe (ret), Chairman of Lady Mary Fairfax's attorneys, with hearing loss researchers Catherine Connelly and Kirupa Suthakar celebrating Lady Mary’s generous gift of $1,000,000 to Garvan’s Hearing Loss Program.
Mrs Cynthia Southwell
Mrs Liese-Lore Spring
Mr Rick Stevens
Mr & Mrs Peter and Diane Sturrock
Mr Leonard Towers
Mr & Mrs Eric and Pauline Vail
Mrs Maya Van Rol
Mrs Judith Wheeldon
Dr Yvonne White
Dr Eva Wicki
Ms Barbara Williams
Ms Faye Margaret Williams
In Memory of the Late Kathrin Nell A Wilshire
Miss Vivienne Windsor
Ms Roberta Withnall

Volunteers
Mrs Janet Barkell
Mrs Deirdre Blakemore
Mrs Leona C Blanco
Ms Susie Curtis
Ms Margarita Field
Miss Lyndie Hemery
Mr Howard Houlston
Mrs Lynne Jones
Mrs Juliet Kirkpatrick
Mr Anthony Lam
Mr John McInerney
Mr & Mrs Bob & Joan Neilson
Mrs Jean Pushong
Mrs Julie Reid
Mrs Ellen Singleton
Mr Anthony Sun
Mr Bill Upton

2012 Supporters
A I Topper & Co
Abey Family Foundation
Abrams Turner Whelan Family Lawyers
Accenture
Mrs Rae Adams
Mrs Lenore Adamson
Mr Harold Adolphe
Mr Michael Ahrens
Mr Len Ainsworth
Ake Ake Fund
Mr & Mrs A & J Alderton
Ms Jane Allen
Dr Lyn Allen
Mr Murray Allen
Ampgen
Mr & Mrs DF & KA Anderson
Mr Neil Anderson
Mr George Andrews
Mr Murray Andrews
ANZ Trustees Foundation - The Dalrymple Family Endowment
Aon Charitable Foundation
Arcadian Quilters Inc
Mr Ian A N Armstrong
Ronald Geoffrey Arnott Foundation
Asthma Foundation NSW
Association for International Cancer Research
The Australian Ladies Variety Association Inc
Australian Cancer Research Foundation
Australian Diabetes Society
Australian New Zealand Breast Cancer Trials Group
Australian Pituitary Foundation
Australian Research Council
Australian Rotary Health Research Fund
Avner Nahmani Pancreatic Cancer Foundation
Bain & Company
The Honourable Bruce Baird AM
Dr & Mrs Anthony Balston
Mr Michael Barker
Mr Sean Barry
Doug & Alison Battersby
Baxter Charitable Foundation
Dr Paul Beath
Mrs Angela Belgiorno-Zegna
Dr Cameron Bell
Mr & Mrs Geoffrey & Marie Bennett
Mr Alex Berlee
Bill Burcher Foundation
Mrs Kaye Blaklock
Mr Simon Blair
The Bluesand Foundation
BNP Paribas
Bondi Junction Waverley RSL Sub Branch
Mrs Dorothy Bonser
Boston Medical Centre
Mr Peter Bower
Braemac Pty Ltd
Drs Ruth & Des Bright
Ms W Brook
Mr & Mrs Ken and Betty Brown
Mr Norman Brunsdon
Mrs Kate Buchanan
Mr Lothar Bulla
Burwood RSL Club Ltd
BUPA Health Foundation
The Michael & Andrew Buxton Foundation
Mr William Bylhouwer
Mr Ian Cairns
Mr & Mrs Alan & Cecilia Calder
Mr Bruce Cameron
Mr Rod Cameron
Cancer Australia
Cancer Council NSW
Cancer Institute NSW
Carlton Family Foundation
Carnegie Foundation Trust
Mr Alex Cartel
Mr & Mrs Graeme R Carter
Mr Angelo Casella
Dr John H Casey
Ms Pauline Cash Cumming
Castle Harlan Inc
Mr Blair Cavill
Say Center
Centric Wealth Limited
CHAMP Private Equity
Mr Robert Chapman
Mr & Mrs Stephen & Mary Charlesworth
Mr David Cheng
Mr Denis Cleary AM
Club Cronulla
Ms Kylie Coates
Coca-Cola Amatil
Mr Timothy Cohen
Mr Ian Cole
Colin Biggers & Paisley
Commonwealth Department of Health and Ageing
Commonwealth Department of Industry, Innovation, Science, Research and Tertiary Education
Ms Melinda Conrad and Mr David Jones
The Corio Foundation
Dr Joan Cosgrove
Mr Stanley Costigan
Mr Geoff Cottle
Dr & Mrs Brett and Susan Courtenay
Craig Mostyn & Co Pty Ltd
Mr David Craig
Mrs Prue Crookes
Mrs Edith M Cuming
Mr John Cuples
Cure Cancer Australia Foundation
Mr Charles P Curran AC
The Curtis Family
Mr & Mrs Robert & Beryl Cusick
Mrs Margaret Daly
Mr Rodney F Darke
Mr & Mrs Kamlesh and Swati Dave
Professor & Dr Jeremy and Jessica Davis
Hon Mrs Ashley Dawson-Damer
Mrs P De Sauty
Mr & Mrs Tony and Coleen De Saxe
Mr Ken Dean
Mr & Mrs John & Kylie Delano
Mr Jonathan Denovan
Deutsche Group Services Pty Ltd
Diabetes Australia Research Trust
Mr & Mrs Geoff and Dawn Dixon
Mr Leonard Dixon
Mrs Bette Dolman
Mrs Patricia Donovan
Downer EDI Limited
Mrs Joan Doyle
Duchen Family Foundation
Dunstan Family Foundation
Mr Phil Dunney
Mr Gordon Edington
Mr Brian Eggert
Elaine Haworth Charitable Endowment
The Late Mr Alan Elder
European Commission FP7
Eventide Homes NSW
Lady (Mary) Fairfax, AC OBE
Mr W R Farley
Merck Sharp & Dohme
Mr John Mesley
Metromix Pty Ltd
Michael J Fox Foundation for Parkinson’s Research
Ms Jocelyn Millet
Ms Joyce Minary
MLC Community Foundation
Mr & Mrs David and Renata Money
Mrs Catherine Moroney
Fr Alexander Morozow
Dr Kenneth Moss
Mostyn Family Foundation
Ms Karyn Mottershead
Mr Tony Mouatt
Mrs Catherine Moxham
MS Research Australia
Miss Joan Murphy
Mr Peter Murphy
Murrays Coaches
Mrs Bhagavathi Naidoo
Frances and Ian Narev
National Australia Bank
National Breast Cancer Foundation
National Health and Medical Research Council
Mrs Laura Margaret Neal
Mr Paul Neumeier
Mr Warren Nicholl
Mr Robert Nixon
Mr lan Norman
Mr & Mrs Leigh & Binne Norman
Novartis Pharmaceuticals Australia Pty Ltd
Novartis Pharmaceuticals Global
NSW Ministry of Health
NSW Office for Health and Medical Research
NSW Women’s Bowl For Others Club
Mrs Lee O’Connor
Mr Peter J O’Connor
Mr Michael O’Dea KESG AM and
Mrs Marianne O’Dea
Mr & Mrs John O’Farrell
Ognis Pty Ltd
Dr Geoffrey S Oldfield
Onadas Holdings Pty Ltd
Janette Mary O’Neil
The Rodney & Judith O’Neil Foundation
Dr Graham O’Neill
Orange & District Breast Cancer Support Group
Dr Harry Orenstein
Osteoporosis Australia
Mrs Maria O’Sullivan
Oticon Foundation
Pacific Equity Partners
Mrs Roslyn Packer AO
Miss Winnie Pang
The Paranor Family
Mr Craig Parker
Dr Michael Pasfield
Dr Dinesh Patel
Patricia Dukes Foundation
Mr Ian Paul
Rob Pedersen
Perceptor Recruitment
Perpetual Foundation
Perpetual Trustee Company Limited
Doug Perry
Petersen Family Foundation
Pfizer Australia
Dr Sang G Phan
Philosophy Pty Ltd
M. John Phillips AO
Phoenix Masonic Association
Ms Suzannah Plowman
Mrs Doris E Pollock
Mr John C Porter and
Mrs Susan M Mougey
Premier Media Group
Prostate Cancer Foundation of Australia
The Lady Proud Foundation
PT. Freeport Indonesia & PT. Eksplorasi
Nusa Jaya
Qantas Flight Hostess Club
RAAF Association St George Branch
Incorporated
Mrs Elizabeth Ramsden
Mr Roy Randall
Rebecca L Cooper Medical Research Foundation
Mrs Jean Redman
Mr Rodger Reed
Mr & Mrs Brad and Lisa Rees
Regenesus
Josef Reisinger Foundation Pty Ltd
Renee Pollack Foundation
ReitreEase Financial Planning
Mr Rory Rhodes
Ms Jane Rich
Richard Crookes Construction Pty Limited
Mr John Richards
Mr Andrew Richardson
Ridley AgriProducts
Mrs Judy Roach
Roche Products Pty Ltd
Mr A G Rockliff
Ms Annie T. Rose
Mrs Margaret Ross AM
Rosemary Pryor Foundation
Mr Bruce Rosenberg
Mr Lance Rosenberg
The Ross Trust
Roth Charitable Foundation
Mrs Nora Rowe
Mr Peter Rowe
RT Hall Estate
Mr Chris Rumore
Sachdev Foundation
Sanbambance Pty Ltd
Mrs Barbara A Sanders
Mr D & Mrs A Saul
The SBA Foundation
Mr Daniel Schriner
Science and Industry Endowment Fund
Mr Warren Scott
Ms Jennifer Scott-Gray
Mr Colin Scouler
Mr Laurie W Seaman
Mr Graham See
Mr Julian Segeal
Mrs J Shanahan
Mrs Daniela Shannon
Ms Lindsey Shaw
Mr Grant Sheldon
Mr & Mrs Robin and Jacqui Shnier
Mrs Lorna Simpson
SKILLED Group
Skipper-Jacobs Charitable Trust
Joseph Skrzynski AO & Roslyn Horin
Mrs Pamela Sleeman
Mrs Jean Sloss
Mrs Jennifer M Smith
Mrs Marie Smith
Societe Francophone du Diabetes
Mrs Athlene Somers
Mr Karl Somers
Southern Cross Catholic School Community
Mr Paul Spackman
Spinal Cure Australia
Spinite Pty Ltd
St Vincent’s Clinic Foundation
Steadfast Foundation
Miss Alison Stephen
Mrs Wendy Stewart
Mr Christopher Still
Mr Brian Strange
Mr & Mrs Peter and Diane Sturrock
Ms Grace Sugden
Mr Laurie Sutton
Mr Jim Sweeney
Swiss National Science Foundation
Sydney Catalyst
Tabcorp Holdings Limited
Mr Nick Tait OBE and Mrs Mimi Tait
Mr Harry Tarnawekas
Ms Paula Tardy
Mrs Rosemary Taylor
Ms Victoria Taylor
Terranovate
Estate of the Late Joan Hope Thomas
Thomas Hare Investments Limited
Mr Garry Tieck
Mr Sean Tieck
Mr Jamie Tomlinson
Mr Walter Turnbull
Mr David Turner
Tusa Pty Ltd
Mr James Udy
University of New South Wales
Mr Peter Unwin
Mr Ian Vale
Mrs Maya Van Rol
Mr Bruce Vaughan
Kay Vernon
Victory Supermarkets Pty Ltd
Mrs Sarina Vignaduzzo
Mr Christian Vignes
Mr Leonard Harlan, Ms Luxi Zhang and Mrs Fleur Harlan celebrate the presentation of the 2012 Castle Harlan Award, presented to the most outstanding early career PhD student at Garvan in 2012. Castle Harlan Inc is a US-based private equity firm that supports medical research, and Mr Harlan is the Chairman of its Executive Committee.

Lindt & Sprungli
Lindwall & Ward Printing
The London Lakes Partnership
Mr Justin Miller
Mr Harley Medcalf
Mr Simon Mordant AM and
Mrs Catriona Mordant
Movenpick Ice Cream
The Only Group
Opera Australia
Pages Hire
Paspaley
Park Hyatt Sydney
Mr Neil Perry
Prime Audio Visual
Qantas Airways Limited
Mr Leo Robba
Riversdale Group
RM Williams
SEL & Ghost Elite Charters
Mr John Singleton
Starwood Hotels and Resorts
Stringspace
Sydney Theatre Company
Taronga Conservation Society Australia
Wild Bush Luxury

Gala Supporters
Accor
Accolade Wines
ANZ Stadium
Austar
Australian Brandenburg Orchestra
Bailie Lodges
Bright Red Oranges
Mr Guillaume Brahimi
Ms Greta Bradman
Mr David Coe
Ms Annabel Crabb
Mr Serge Dansereau
Dinosaur Designs
Mr & Mrs Geoff and Dawn Dixon
Mr Bill Ferns AC and Mrs Lea Ferns
Fresh Catering
Grandiflora by Saskia Havekes
Hayman
Hutchings Pianos
Jetstar

Bequests
Estate of the Late Gloria M Backhus
Estate of the Late Ian F Bruce
Estate of the Late Margaret Darbyshire
Estate of the Late Anna Gonda
Estate of the Late Alan Hellicar
Estate of the Late Ken Hooton
Estate of the Late Francis W Jones
Estate of the Late John E Mayall
Estate of the Late Francis Smith
Estate of the Late Vera Zukerman
Garvan Institute Board

William D Ferris AC  
Chairman  
Nominated by the Trustees of St Vincent’s Hospital  
Mr Bill Ferris is Executive Chairman of the CHAMP Private Equity Group, one of Australia’s leading private capital groups, providing venture capital, expansion capital and management buyout funding in Australasia. Former directorships include: Chairman, Health and Hospitals Fund Advisory Board as part of the Federal Government’s Nation-Building Funds initiative, Australian Trade Commission (Austrade), Austar United Communications Limited, and Bradken Resources Pty Ltd. Mr Ferris joined the expert panel for the Federal Government’s Strategic Review of Medical Research in Australia in October 2011. He is also a director of the Garvan Research Foundation and member of the Harvard Business School Asia Pacific Advisory Council. Mr Ferris was made an Officer in the Order of Australia in 1990 for services to the export industry and in 2008 was made Companion in the Order of Australia for his philanthropic activities and his role in the establishment of the private equity sector in Australia.

Warren Scott  
Treasurer  
Nominated by the NSW Minister for Health  
Mr Warren Scott is the General Counsel of the Australian Prudential Regulation Authority and a former managing director and the General Counsel of Citigroup in Australia. Prior to that he was a partner in an international law firm. He was formerly the Chairman of the Woolcock Institute of Medical Research, as well as a delegate to the Australian American Leadership Dialogue. He is a member of the Law Society of New South Wales, the American Bar Association, the New York Bar Association, the Australian Law Council, and the California Bar Association. Mr Scott is admitted as a solicitor in New South Wales and as a lawyer in New York and California.

Jonathan Anderson  
(From September)  
Nominated by the Sisters of Charity  
Mr Jonathan Anderson is the Chief Executive Officer of St Vincent’s Health Network, Sydney. Mr Anderson brings to the role an extensive and successful career in public healthcare. He has held leadership positions across a broad range of facilities and service types including tertiary referral teaching hospitals, district hospitals, sub-acute and aged care facilities. Mr Anderson recently spent three years as Executive Director of St Vincent’s Public Health Services and prior to this position was the Executive Director of St Joseph’s Hospital and St Joseph’s Village and Executive Director of the Lottie Stewart Hospital. He has held other senior positions including General Manager Rachel Forster Hospital, Director of Finance and Administration at Rozelle Hospital, Director of St Vincent’s Hospital Toowoomba; and other senior positions at Central Sydney Area Health Service. Mr Anderson has also had responsibility for specialised corporate roles such as the Sisters of Charity Health Service National Risk Manager and National Aged Care Coordinator. Mr Anderson has a Bachelor of Economics from Sydney University and a Masters of Management from MGSM.

Annette Cunliffe RSC  
Nominated by the Sisters of Charity  
Sister Annette attended St Vincent’s College Potts Point before becoming a Sister of Charity. She completed a BSc (UNSW), Diploma of Education (UNE), Master of Education (Hons) (UNSW) and PhD (Griffith), meanwhile teaching in secondary colleges in various states, then holding the position of Senior Lecturer at the Australian Catholic University. From 1996-2002 and since 2002 Sister Annette has been Leader of the Sisters of Charity of Australia. She has held the positions of President of Conference of Leaders of Religious Institutes (CLRI; NSW) and Inaugural Chair of the Stewardship Board of Catholic Health Australia and served on a number of incorporated boards. She is currently President of Catholic Religious Australia.

Geoff Dixon  
Nominated by the Garvan Research Foundation  
Mr Geoff Dixon is Chairman of the Australian Government’s major tourism marketing organisation Tourism Australia, and Chairman of the Garvan Medical Research Foundation. He sits on the boards of publicly listed Australian companies Crown Limited and Facilitate Digital. He is on the boards of Voyages Indigenous Tourism Australia and the Museum of Contemporary Art and is an Ambassador for the Australian Indigenous Education Foundation. Mr Dixon has also worked in the media, mining and government sectors. He was Managing Director and Chief Executive Officer of Qantas Airways Limited from 2001–2008. He joined Qantas in 1994 and was also Chief Commercial Officer and, for two years, Deputy Chief Executive.
John Horvath AO
Nominated by the Federal Minister for Health
Professor John Horvath was the Australian Government Chief Medical Officer from 2003–2009. He currently has advisory roles to the CEO of the NHMRC, the Department of Health & Ageing and the School of Medicine, University of Sydney. Professor Horvath holds the position of Honorary Professor of Medicine at the University of Sydney, is a Health Workforce Australia Director and chairs the Prosthesis Listing Advisory Committee of the Australian Government. He is also an independent non-executive director of Crown Ltd and Crown Melbourne Ltd. Professor Horvath is a fellow of the Royal Australasian College of Physicians and is a distinguished practitioner, researcher and teacher. Until mid 2012 Professor Horvath was a member of the NHMRC Council and was Chairman of the Healthcare Committee. He was previously a clinical professor of medicine at University of Sydney, a specialist renal physician at Royal Prince Alfred Hospital (RPA), and the Area Director of Renal Services for the PPA and Concord Repatriation General hospitals. He is also known as a leader in a range of medical training and workforce organisations. He is also a former president of the Australian Medical Council and the NSW Medical Board.

Anne Keating
Nominated by the NSW Minister for Health
Ms Anne Keating is a company director and holds board directorships of companies in a range of industries including financial services, property and life sciences. She is on the boards of the Goodman Group Ltd, Ardent Leisure Ltd, REVA Medical Inc and GI Dynamics Inc. Ms Keating is also a member of CIMB Securities International (Australia) Pty Ltd Advisory Council and a governor of the Cerebral Palsy Foundation. Her former boards include Insurance Australia Group Limited, NRMA Limited, STW Communications Group, ClearView Wealth Limited, the WorkCover Authority of NSW, the Tourism Task Force. She was a trustee of the Centennial Parklands and Moore Park Trust and was an inaugural director at the Victor Chang Cardiac Research Institute. Ms Keating was the General Manager, Australia for United Airlines from 1993–2001.

John Mattick AO FAA
Nominated by the Garvan Board of Directors
Professor John Mattick is the Executive Director of the Garvan Institute of Medical Research, and Conjoint Professor in the St Vincent’s Hospital Clinical School, Faculty of Medicine, University of NSW. Most recently he was the Professor of Molecular Biology and NHMRC Australia Fellow at the Institute for Molecular Bioscience, University of Queensland. He was educated at St Patrick’s College Strathfield, the University of Sydney and Monash University, where he obtained his PhD. He subsequently worked at Baylor College of Medicine in Houston, the CSIRO Division of Molecular Biology in Sydney, and the University of Queensland, where he was based from 1988–2011. He also spent research periods at the Universities of Cambridge, Oxford, Cologne and Strasbourg. He was Foundation Director of the Australian Genome Research Facility and the Institute for Molecular Bioscience. His honours include Honorary Fellowship of the Royal College of Pathologists of Australasia, the inaugural Gutenberg Professorship at the University of Strasbourg, the 2011 IUBMB (International Union of Biochemistry and Molecular Biology Medal, the 2012 HUGO (Human Genome Organisation) Chen Medal, membership of the European Molecular Biology Organisation and Fellowship of the Australian Academy of Science. He was appointed an Officer in the Order of Australia in 2001.

Lisa McIntyre
Nominated by the Federal Minister for Health
Dr Lisa McIntyre is a non-executive director of the HCF Group, Silex Ltd and I-MED Australia. Dr McIntyre was formally a senior partner with LEK Consulting in Boston and Sydney where she led the firm’s Asia Pacific Life Science and Health Care practice. She has spent the majority of her career as a strategy consultant advising companies and organisations in the health and life sciences sector on growth strategies and performance improvement. Dr McIntyre continues to serve as a senior advisor to LEK Consulting in Australia.

Annette Pantle
Nominated by the Sisters of Charity
Dr Annette Pantle completed her MBBS at the University of Sydney before pursuing a career in rural general practice and then metropolitan medical administration. Dr Pantle also holds a Masters of Public Health, a Graduate Diploma from the Australian Institute of Company Directors and Fellowship of the Royal Australasian College of Medical Administrators. She holds a Fellowship of the Australasian Association for Quality in Health Care and is the current president of that organisation. Dr Pantle most recently served as the Director Clinical Practice Improvement for the NSW Clinical Excellence Commission – a statutory health corporation with responsibility for building capacity for quality and safety improvement and reporting to the NSW Minister for Health. Dr Pantle was responsible for the development and implementation of clinical quality improvement projects and programs across NSW Health, incorporating evidence into practice and instituting change management and project management processes. Dr Pantle joined St Vincent’s Health Australia in 2010 as Group General Manager Clinical Governance and Medial Officer.
Greg Paramor
Nominated by the Garvan Research Foundation
Mr Greg Paramor has been involved in the real estate and funds management industry for more than 35 years, and was the co-founder of Growth Equities Mutual, Paladin Australia and the James Fielding Group. During this time Mr Paramor was involved in more than $30 billion of real estate transactions. Mr Paramor was the CEO of Mirvac Group between 2004 and 2008 after the company acquired the James Fielding Group. He is a past president of the Property Council of Australia and past president of Investment Funds Association, a fellow of the Australian Property Institute and The Royal Institute of Chartered Surveyors. Mr Paramor is a director of a number of not-for-profit organisations including the National Breast Cancer Foundation. Mr Paramor is also a board member of the Sydney Swans, an Adjunct Professor of Bond University and the Chairman of LJ Hooker.

Daniel Petre AO
Nominated by the Trustees of St Vincent's Hospital
Mr Daniel Petre has been at the forefront of the technology industry in Australia for more than 25 years. Currently he is Chairman of netus (a technology investment company recently acquired by Fairfax Media) and prior to this role he founded Australia’s largest internet investment company, ecorp, (a subsidiary of PBL; Publishing and Broadcasting Limited). Mr Petre spent nine years with Microsoft where he held a range of roles both in Australia and the US. He was Managing Director of the Australia subsidiary for three years before moving to the US as Vice President in the Development Group then returning to run the Asia-Pacific region for Microsoft. Mr Petre has served in many corporate and not-for-profit boards and the advisory boards for the Private Ancillary Fund Service at SVA (Social Ventures Australia), CSI (Centre for Social Impact) at the University of NSW. Mr Petre is also an adjunct professor at the Business School at the University of Sydney.

Steven Rubic
(unti April)
Nominated by the Sisters of Charity
Mr Steven Rubic was appointed CEO of the I-MED Network in May 2012. Prior to this he was CEO of St Vincent’s & Mater Health Sydney, a position he held since 2008 following a number of hospital CEO roles within St Vincent’s Health Australia. He is currently a board member of Health Industry Superannuation, Macquarie University Council, Monte Sant’ Angelo College and is a past chairman of the NSW Private Hospitals Association. Mr Rubic is a fellow of AICD and AIIST.

Jillian Segal AM
Nominated by the University of NSW
Ms Jillian Segal is a director of the National Australia Bank and ASX Limited. She is also Deputy Chancellor of the University of NSW and involved with a number of other community not-for-profit organisations, including as Chairman of the General Sir John Monash Foundation. Ms Segal is also a member of the Federal Government’s Remuneration Tribunal. Ms Segal has had a career in law, regulation, governance and policy development. Formally she was President of the Administrative Review Council and Chair of the Banking and Financial Services Ombudsman Board. From 1997-2002, Ms Segal was a commissioner of the Australian Securities and Investments Commission (ASIC), being Deputy Chair from 2000-2002. Prior to joining ASIC, Ms Segal was a corporate lawyer specialising in corporate and environmental law, having been a partner at Allen Allen & Hemsley.

Peter Smith
Nominated by the University of NSW
Professor Peter Smith is Dean of Medicine at the University of NSW. He specialised in cancer medicine and research following study in Australia, USA and Germany. Peter has held senior hospital management posts in Brisbane and Melbourne and senior academic appointments at the universities of Queensland, Melbourne and Auckland. Professor Smith is currently a board director of St Vincent’s Health Australia, Neuroscience Research Australia, Ingham Medical Research Institute, the Sax institute for Health Research and the Arts and Health Foundation.

Bernadette Tobin
Nominated by the Trustees of St Vincent's Hospital
Associate Professor Bernadette Tobin is the Director of the Plunkett Centre for Ethics at St Vincent’s Hospital, Sydney, and Reader in Philosophy at the Australian Catholic University. A/Prof Tobin is Honorary Ethicist at the Children’s Hospital at Westmead, an honorary associate professor in the Faculty of Medicine at the University of Sydney, and a conjoint associate professor in the School of Medicine at the University of NSW. She served for three triennia on the Australian Health Ethics Committee, a principal committee of the NHMRC. She also chaired the drafting group which prepared the First Code of Ethics for Catholic Health and Aged Care Services in Australia.
Mr. J. P. Garvan,
First Managing Director & Founder.
Opposite: James Patrick Garvan (1843–96), a distinguished parliamentarian and business leader. The embedded caption in the photo recognises his position as Managing Director and founder of the Citizens’ Life Assurance Company Ltd in 1886, which later became MLC. Garvan’s daughter, Mrs Helen Mills, gave £100,000 to St Vincent’s Hospital “for the purpose of research” in 1961.
William D Ferris AC
Mr Bill Ferris is Executive Chairman of the CHAMP Private Equity Group, one of Australia’s leading private capital groups, providing venture capital, expansion capital and management buyout funding in Australasia. Former directorships include: Chairman, Health and Hospitals Fund Advisory Board as part of the Federal Government’s Nation-Building Funds initiative, Australian Trade Commission (Austrade), Astar United Communications Limited, and Bradken Resources Pty Ltd. Mr Ferris joined the expert panel for the Federal Government’s Strategic Review of Medical Research in Australia in October 2011. Mr Ferris is the Chairman of the Garvan Institute and member of the Harvard Business School Asia Pacific Advisory Council. Mr Ferris was made an Officer in the Order of Australia in 1990 for services to the export industry and in 2008 was made Companion in the Order of Australia for his philanthropic activities and his role in the establishment of the private equity sector in Australia. Mr Ferris joined the Foundation Board in 2001.

Lyn Gearing
Ms Lyn Gearing was appointed to the Garvan Foundation Board as a representative of the Sisters of Charity. Ms Gearing is currently a director of Queensland Investment Corporation Limited and the Commonwealth Superannuation Corporation. Until late 2012 Ms Gearing was a director of both IMB Limited and Global Mining Investments Limited. Ms Gearing has substantial experience in superannuation, funds management, corporate finance and management consulting. Ms Gearing joined the Foundation Board in 2005.

Loftus Harris AM
Mr Loftus Harris is a non-executive director on various boards, the immediate-past National Chair of the Australian Institute of Export, and Special Trade Representative to the Middle East and India for the Queensland Government. He previously held chief executive positions in the NSW and Queensland public sectors with responsibility for whole-of-government activities including international trade, investment, innovation, business, and regional development. He also served extensively overseas as an Australian Trade Commissioner. Mr Harris joined the Foundation Board in 2008.

Wal King AO
Mr Wal King has worked in the construction industry for over 40 years and was the Chief Executive Officer of Leighton Holdings Limited, a company with substantial operations in Australia, Asia and the Middle East, from 1987 until his retirement on 31 December 2010. He remains as a consultant. Mr King is Deputy Chairman of Ausdrill Limited and the University of NSW Foundation Limited, a director of Coca-Cola Amatil Limited and Kimberley Foundation Australia Limited, and a council member of the University of NSW (to June 2012). Mr King is an honorary fellow of the Institution of Engineers Australia; a foundation fellow of the Australian Institute of Company Directors, and a fellow of the Australian Institute of Management, the Australian Institute of Building and the Australian Academy of Technological Sciences and Engineering. Mr King joined the Foundation Board in 2010.

John Landerer CBE AM
Mr John Landerer is a solicitor specialising in corporate advisory work and is also a professional company director. He is currently Chair of Goldsearch Limited and other private companies. He has served as the Chair of the Home Purchase Assistance Authority and is on the board of Life Education Australia and the Royal Institute for Deaf and Blind Children as well as on the boards of various charitable institutions. Mr Landerer holds an honorary doctorate from Macquarie University in business and commercial law. He is also a fellow of the University of Sydney. Mr Landerer is a Member of the Order of Australia and a Commander of the Most Excellent Order of the British Empire. He is also a Commander in the Order of the Star of Italian Solidarity. He joined the Foundation Board in 2007.
Jeanne-Claude Strong

Dr Jeanne-Claude Strong is a qualified medical practitioner with a post-graduate diploma in applied finance and investment and a Bachelor of Arts in Literature and Philosophy. Dr Strong established and ran three medical clinics in Melbourne and Sydney, focusing on occupational, sports and preventative medicine and stressing the importance of lifestyle management. She was a member of the Advisory Board of Bluearth for 10 years, a not for profit organisation which promotes greater physical activity to reduce the incidence of disease and increase wellbeing. She is a pilot with a command multi-engine instrument rating and has flown her own plane from California to Australia. Dr Strong has a passion for yacht racing with an occasional foray in international regattas. She illustrates that a successful life must be balanced, and the success of her full professional and personal life is testimony to her principles. Dr Strong joined the Foundation Board in 2011.

John Mattick AO FAA

Professor John Mattick is the Executive Director of the Garvan Institute of Medical Research, and Conjoint Professor in the St Vincent's Hospital Clinical School, Faculty of Medicine, University of NSW. Most recently he was the Professor of Molecular Biology and NHMRC Australia Fellow at the Institute for Molecular Bioscience, University of Queensland. He was educated at St Patrick’s College Strathfield, the University of Sydney and Monash University, where he obtained his PhD. He subsequently worked at Baylor College of Medicine in Houston, the CSIRO Division of Molecular Biology in Sydney, and the University of Queensland, where he was based from 1988-2011. He also spent research periods at the Universities of Cambridge, Oxford, Cologne and Strasbourg. He was Foundation Director of the Australian Genome Research Facility and the Institute for Molecular Bioscience. His honours include Honorary Fellowship of the Royal College of Pathologists of Australasia, the inaugural Gutenberg Professorship at the University of Strasbourg, the 2011 IUBMB (International Union of Biochemistry and Molecular Biology Medal, the 2012 HUGO (Human Genome Organisation) Chen Medal, membership of the European Molecular Biology Organisation and Fellowship of the Australian Academy of Science. He was appointed an Officer in the Order of Australia in 2001. Professor Mattick joined the Foundation Board in 2012.

Brad Rees

Mr Brad Rees is involved in a number of charitable, arts and educational interests and is a director of a private investment company. Until 2007, he was a managing director and equity partner of the investment banking firm Goldman Sachs JBWere. Mr Rees was with the firm for 23 years and worked in the Melbourne, Sydney and London offices providing financial and investment banking advice to corporations and governments in Australia and overseas. Mr Rees joined the Foundation Board in 2008.

Clare Nolan RSC

Sister Clare entered the Sisters of Charity following nurse training at the Mater Hospital in Brisbane. She has over 45 years experience in health and research services. Her ministry experience includes health, welfare, governance and administration, serving on boards within the Sisters of Charity Health Service and other Church bodies. Her present Ministry is one of hospitality. Hospitality to women who have loved ones in hospital within the St Vincent’s campus, to patients who come from the Solomon Islands for health care within the St Vincent’s campus, to women and men who suffer with mental health issues. Sister Clare joined the Foundation Board in 2010.

Simon Mordant AM

Mr Simon Mordant is Vice Chairman and Managing Director of Greenhill & Co Inc, a leading independent corporate advisory firm. Mr Mordant specialises in advising local and multinational companies and government on their capital markets strategy and merger and acquisitions. Mr Mordant trained as a chartered accountant in London, is Chairman of the Museum of Contemporary Art Australia, a director of the Australian Broadcasting Corporation, is Australian Commissioner for the 2013 Venice Biennale, a member of the International Leadership Council of the New Museum and a member of the International Council of The Museum of Modern Art in New York, a member of the Executive Committee of the Tate International Council, a director of the Sydney Theatre Company, and a member of the Wharton Executive Board for Asia. Mr Mordant was awarded an AM being made a Member in the General Division of the Order of Australia for ‘Services to the Arts and to the cultural environment of Australia through philanthropic and executive roles, and to the community’. Mr Mordant joined the Foundation Board in 2009.


Birznie V, Sutanto S, Ho KK. Gender difference in the neuroendocrine regulation of growth hormone axis by selective estrogen receptor modulators.


74


European Journal of Clinical Nutrition
2012; 66:75-82.


X


Y


Z


Bert SA, Robinson MD, Strbenac D, Statham AL, Song JZ, Hulf T, Sutherland RL, Coolen MW, Stirzaker C, Clark SJ. Regional activation of the cancer genome by long-range epigenetic remodeling. *Cancer Cell* Epub 2012/12/19.


Chan MY, Nguyen ND, Center JR, Eisman JA, Nguyen TV. Quantitative ultrasound and fracture risk prediction in non-osteoporotic men and women as defined by WHO criteria. *Osteoporosis International* Epub 2012/08/11.


Muniak MA, Rivas A, Montey KL, May BJ, Francis HW, Ryugo DK. A 3-dimensional model of frequency representation in the cochlear nucleus of the CBA/J mouse. The Journal of Comparative Neurology Epub 2012/10/11.


## Garvan Institute of Medical Research

### Income Statement

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHMRC Grants</td>
<td>18,695</td>
<td>19,094</td>
<td>16,637</td>
<td>18,574</td>
<td>20,640</td>
</tr>
<tr>
<td>Other Peer Reviewed Grants</td>
<td>9,159</td>
<td>11,061</td>
<td>10,232</td>
<td>10,896</td>
<td>10,213</td>
</tr>
<tr>
<td>Other Grants</td>
<td>4,811</td>
<td>1,624</td>
<td>-</td>
<td>1,869</td>
<td>452</td>
</tr>
<tr>
<td>NSW Government Grant</td>
<td>4,026</td>
<td>3,797</td>
<td>2,600</td>
<td>4,135</td>
<td>6325</td>
</tr>
<tr>
<td>Commercial Collaborations</td>
<td>1,289</td>
<td>737</td>
<td>202</td>
<td>347</td>
<td>226</td>
</tr>
<tr>
<td>Garvan Research Foundation</td>
<td>4,689</td>
<td>4,120</td>
<td>5,174</td>
<td>6,113</td>
<td>7,110</td>
</tr>
<tr>
<td>Other Income</td>
<td>4,050</td>
<td>7,470</td>
<td>6,872</td>
<td>9,167</td>
<td>11,098</td>
</tr>
<tr>
<td>Other Income (Insurance Claim Facade)</td>
<td>-</td>
<td>-</td>
<td>2,750</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Operating Income</strong></td>
<td><strong>46,719</strong></td>
<td><strong>47,903</strong></td>
<td><strong>44,467</strong></td>
<td><strong>51,101</strong></td>
<td><strong>56,064</strong></td>
</tr>
<tr>
<td>Commonwealth Government Grant (TKCC* Construction)</td>
<td>-</td>
<td>14,900</td>
<td>7,567</td>
<td>10,173</td>
<td>3,935</td>
</tr>
<tr>
<td>Garvan Research Foundation (TKCC* Construction)</td>
<td>-</td>
<td>1,170</td>
<td>3,528</td>
<td>4,723</td>
<td>8,630</td>
</tr>
<tr>
<td>Other Income (TKCC* Construction)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,750</td>
<td>250</td>
</tr>
<tr>
<td><strong>Total Income for TKCC Construction</strong></td>
<td><strong>-</strong></td>
<td><strong>16,070</strong></td>
<td><strong>11,095</strong></td>
<td><strong>17,646</strong></td>
<td><strong>12,815</strong></td>
</tr>
</tbody>
</table>

### Operating Expenses

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remuneration Costs</td>
<td>27,337</td>
<td>28,322</td>
<td>29,196</td>
<td>32,215</td>
<td>35,134</td>
</tr>
<tr>
<td>Research Expenditure</td>
<td>9,377</td>
<td>7,883</td>
<td>7,517</td>
<td>6,828</td>
<td>8,747</td>
</tr>
<tr>
<td>Administration and Information Technology</td>
<td>5,331</td>
<td>4,822</td>
<td>3,989</td>
<td>5,115</td>
<td>5,507</td>
</tr>
<tr>
<td>Building and Scientific Operations</td>
<td>2,753</td>
<td>3,324</td>
<td>6,272</td>
<td>4,743</td>
<td>4,057</td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td><strong>44,798</strong></td>
<td><strong>44,351</strong></td>
<td><strong>46,974</strong></td>
<td><strong>48,901</strong></td>
<td><strong>53,445</strong></td>
</tr>
</tbody>
</table>

### Accounting Adjustments

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Asset Amortisation</td>
<td>(1,189)</td>
<td>(1,657)</td>
<td>(1,659)</td>
<td>(1,723)</td>
<td>(2,456)</td>
</tr>
<tr>
<td>Property, Plant and Equipment Depreciation</td>
<td>(2,390)</td>
<td>(2,597)</td>
<td>(2,670)</td>
<td>(3,939)</td>
<td>(4,945)</td>
</tr>
<tr>
<td>Transfer from Building Reserve</td>
<td>1,047</td>
<td>1,047</td>
<td>1,047</td>
<td>1,047</td>
<td>1,047</td>
</tr>
<tr>
<td>Endowment Grants from Garvan Research Foundation</td>
<td>3,953</td>
<td>6,388</td>
<td>1,604</td>
<td>3,586</td>
<td>2,000</td>
</tr>
<tr>
<td>Endowment Earnings</td>
<td>1,700</td>
<td>958</td>
<td>1,192</td>
<td>1,665</td>
<td>1,368</td>
</tr>
<tr>
<td>Donations &amp; Bequests direct to/(from) Endowment Fund</td>
<td>5,393</td>
<td>(5,000)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unrealised gain/(loss) on investment</td>
<td>(7,407)</td>
<td>1,922</td>
<td>(142)</td>
<td>(2,504)</td>
<td>2,264</td>
</tr>
</tbody>
</table>

### Net Income

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Income</td>
<td>3,028</td>
<td>20,683</td>
<td>7,960</td>
<td>17,978</td>
<td>14,712</td>
</tr>
</tbody>
</table>

### Accumulated Surplus

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated Surplus Brought Forward</td>
<td>11,109</td>
<td>16,571</td>
<td>32,512</td>
<td>43,128</td>
<td>62,509</td>
</tr>
<tr>
<td>Transfer from/(to) Research Program Reserve</td>
<td>380</td>
<td>(2,189)</td>
<td>1,133</td>
<td>(2,090)</td>
<td>(951)</td>
</tr>
<tr>
<td>Transfer from/(to) Endowment Reserve</td>
<td>1,847</td>
<td>(2,530)</td>
<td>1,190</td>
<td>3,493</td>
<td>(706)</td>
</tr>
<tr>
<td>Transfer from/(to) Infrastructure Expense Reserve</td>
<td>207</td>
<td>(23)</td>
<td>333</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Accumulated Surplus Carried Forward</strong>*</td>
<td><strong>16,571</strong></td>
<td><strong>32,512</strong></td>
<td><strong>43,128</strong></td>
<td><strong>62,509</strong></td>
<td><strong>75,564</strong></td>
</tr>
</tbody>
</table>

* The Kinghorn Cancer Centre (TKCC).
** The costs for TKCC construction are capitalised (refer balance sheet - Asset Under Construction (TKCC)).
*** Prior year included funds for the construction of TKCC. TKCC is completed in 2012 and shown as a fixed asset.

Opposite: Nina Ostlund using the newly installed (1982) Fast Protein Liquid Chromatography system to examine the purity of a human growth hormone preparation.
Garvan Institute of Medical Research

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
</tr>
<tr>
<td>Current Assets</td>
<td>21,114</td>
<td>52,136</td>
<td>59,765</td>
<td>62,379</td>
<td>33,604</td>
</tr>
<tr>
<td>Property, Plant and Equipment</td>
<td>60,085</td>
<td>60,325</td>
<td>57,060</td>
<td>58,369</td>
<td>64,834</td>
</tr>
<tr>
<td>Property, Plant and Equipment (TKCC*)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>45,980</td>
</tr>
<tr>
<td>Asset Under Constuction (TKCC*)</td>
<td>-</td>
<td>1,731</td>
<td>8,399</td>
<td>29,660</td>
<td>-</td>
</tr>
<tr>
<td>Endowment Fund**</td>
<td>25,255</td>
<td>27,786</td>
<td>26,597</td>
<td>23,103</td>
<td>22,833</td>
</tr>
<tr>
<td>Investment in associates</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>Total Assets</td>
<td>106,538</td>
<td>142,062</td>
<td>151,905</td>
<td>173,595</td>
<td>167,335</td>
</tr>
<tr>
<td>Payables</td>
<td>7,860</td>
<td>23,372</td>
<td>26,187</td>
<td>30,087</td>
<td>10,142</td>
</tr>
<tr>
<td>Provisions</td>
<td>3,545</td>
<td>3,986</td>
<td>4,125</td>
<td>5,010</td>
<td>5,049</td>
</tr>
<tr>
<td>Borrowings</td>
<td>18,144</td>
<td>18,078</td>
<td>18,054</td>
<td>18,028</td>
<td>18,010</td>
</tr>
<tr>
<td>Total Liabilities</td>
<td>29,549</td>
<td>45,436</td>
<td>48,366</td>
<td>53,125</td>
<td>33,201</td>
</tr>
<tr>
<td>Accumulated Surplus***</td>
<td>16,571</td>
<td>32,512</td>
<td>43,128</td>
<td>62,509</td>
<td>75,564</td>
</tr>
<tr>
<td>Reserves</td>
<td>60,419</td>
<td>64,114</td>
<td>60,411</td>
<td>57,961</td>
<td>58,570</td>
</tr>
<tr>
<td>Total Net Funds</td>
<td>76,990</td>
<td>96,626</td>
<td>103,539</td>
<td>120,470</td>
<td>134,134</td>
</tr>
</tbody>
</table>

* The Kinghorn Cancer Centre (TKCC).
** Including cash and investments at market value.
*** Prior year included funds for the construction of TKCC. TKCC is completed in 2012 and shown as a fixed asset.
## Garvan Research Foundation

### Statement of Funds

<table>
<thead>
<tr>
<th>Description</th>
<th>2008 $'000</th>
<th>2009 $'000</th>
<th>2010 $'000</th>
<th>2011 $'000</th>
<th>2012 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donations &amp; Pledges</td>
<td>6,277</td>
<td>4,026</td>
<td>5,231</td>
<td>4,696</td>
<td>9,476</td>
</tr>
<tr>
<td>Donations &amp; Pledges (for TKCC*)</td>
<td>584</td>
<td>1,742</td>
<td>7,126</td>
<td>9,390</td>
<td>8,638</td>
</tr>
<tr>
<td>Events</td>
<td>105</td>
<td>38</td>
<td>215</td>
<td>1,273</td>
<td>890</td>
</tr>
<tr>
<td>Bequests</td>
<td>3,132</td>
<td>7,764</td>
<td>2,981</td>
<td>6,356</td>
<td>712</td>
</tr>
<tr>
<td>Interest and Other Income</td>
<td>55</td>
<td>19</td>
<td>44</td>
<td>37</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td><strong>10,153</strong></td>
<td><strong>13,589</strong></td>
<td><strong>15,597</strong></td>
<td><strong>21,752</strong></td>
<td><strong>19,747</strong></td>
</tr>
<tr>
<td>Fundraising Expenses</td>
<td>(1,114)</td>
<td>(1,268)</td>
<td>(1,496)</td>
<td>(2,152)</td>
<td>(2,607)</td>
</tr>
<tr>
<td>Grants to TKCC Joint Venture Partner</td>
<td>-</td>
<td>(1,170)</td>
<td>(3,528)</td>
<td>(4,723)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Net Funds Raised</strong></td>
<td><strong>9,039</strong></td>
<td><strong>11,151</strong></td>
<td><strong>10,573</strong></td>
<td><strong>14,877</strong></td>
<td><strong>17,140</strong></td>
</tr>
<tr>
<td>Accumulated Funds Prior Years</td>
<td>109</td>
<td>507</td>
<td>(20)</td>
<td>248</td>
<td>701</td>
</tr>
<tr>
<td><strong>Funds Available for Grants to Institute:</strong></td>
<td><strong>9,148</strong></td>
<td><strong>11,658</strong></td>
<td><strong>10,553</strong></td>
<td><strong>15,125</strong></td>
<td><strong>17,841</strong></td>
</tr>
<tr>
<td>General Research</td>
<td>926</td>
<td>1,010</td>
<td>1,200</td>
<td>1,200</td>
<td>1,400</td>
</tr>
<tr>
<td>Specific Research</td>
<td>3,762</td>
<td>4,280</td>
<td>7,501</td>
<td>9,638</td>
<td>14,340</td>
</tr>
<tr>
<td>Endowment Funds</td>
<td>3,953</td>
<td>6,388</td>
<td>1,604</td>
<td>3,586</td>
<td>2,000</td>
</tr>
<tr>
<td><strong>Total Grants</strong></td>
<td><strong>8,641</strong></td>
<td><strong>11,678</strong></td>
<td><strong>10,305</strong></td>
<td><strong>14,424</strong></td>
<td><strong>17,740</strong></td>
</tr>
<tr>
<td>Accumulated Funds Carried Forward</td>
<td>507</td>
<td>(20)</td>
<td>248</td>
<td>701</td>
<td>101</td>
</tr>
<tr>
<td>Represented By</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assets</td>
<td>1,391</td>
<td>164</td>
<td>401</td>
<td>907</td>
<td>354</td>
</tr>
<tr>
<td>Less: Liabilities</td>
<td>(884)</td>
<td>(184)</td>
<td>(153)</td>
<td>(206)</td>
<td>(253)</td>
</tr>
<tr>
<td><strong>Net Assets</strong></td>
<td><strong>507</strong></td>
<td>(20)</td>
<td>248</td>
<td>701</td>
<td>101</td>
</tr>
</tbody>
</table>

* The Kinghorn Cancer Centre (TKCC).