The Garvan’s mission is to make significant contributions to medical science 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.

More information about our research and our staff can be found on Garvan’s website: www.garvan.org.au

During 2007, further website changes will be made to reflect the more efficient and increased use of the online medium.
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The Garvan Institute of Medical Research is a world leader in its field, pioneering study into many of the widespread diseases affecting our community today. Research at Garvan is focused on understanding the role of genes in health and disease as the basis for developing future cures.

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

- Cancer
- Diabetes and obesity
- Alzheimer’s and mental illness
- Osteoporosis
- Arthritis and asthma
- Autoimmune diseases
- Pituitary tumours and disorders

Garvan’s ultimate goal is prevention and cure of these major diseases.
The Garvan Institute of Medical Research is a world leader in its field, pioneering study into many of the widespread diseases affecting our community today. Research at Garvan is focused on understanding the role of genes in health and disease as the basis for developing future cures.

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- Arthritis and asthma
- Autoimmune diseases
- Pituitary tumours and disorders

**Making Connections:**
Scientific collaboration between our metabolism, diabetes, and cancer researchers is shedding new light on the associations between seemingly unconnected conditions.

*Left to right: Dr Greg Cooney, Professor Roger Daly, Dr Bronwyn Hegarty, A/Professor Chris Ormandy*
Formulating a new concept for how cancer cells can escape normal growth controls: they switch off large regions of genes that normally function to prevent tumour development

Determining that a novel plant toxin can dramatically enhance the ability of tamoxifen to kill breast cancer cells

Finding increased expression of ‘metabolically harmful’ genes in abdominal fat which may be one of the missing links between increased abdominal fat and type 2 diabetes

Awarding of the Australian Diabetes Society’s highest award, the Kellion Award, to Professor David James

Providing scientific evidence that a traditional Chinese medicine has beneficial effects for people suffering from type 2 diabetes

Identifying that cortactin represents a marker of drug resistance in head and neck cancer

Dr Sanda Biankin receiving the 2007 Gus Nossal Medical and Dental Postgraduate Research Scholarship given annually to the highest ranked NHMRC medical and dental postgraduate research applicant

Publishing over 140 papers with an average impact factor of 6.7 ( > 8.0 for the top 75%)

Finding that one of the earliest steps in immune system activation relies on a fatty acid binding molecule, which implicates diet in the functioning of the immune system

Identifying novel methylated genes/regions in ovarian cancer with potential diagnostic significance

Raising $1.13 million from a fundraising evening held by CRI in late September for Garvan’s Peter Wills Centre for Bioinformatics, which models and predicts diseases by applying information science to biology

Showing that peptide YY ablation in mice leads to the development of hyperinsulinaemia and obesity and discovering that low levels of PYY in humans may contribute to subsequent weight gain and type 2 diabetes
Identifying a new prostate cancer marker that if found in low levels at the time of surgery, means the chances of cancer spreading are very high.

Discovering that the fatty acid binding molecule aP2 controls inflammatory responses in the airways of asthmatics.

Dr Stuart Tangye receiving a Young Tall Poppy Award from the Australian Institute of Policy and Science and the NSW Office of Science and Medical Research.

Describing the role of the neuropeptide Y1 receptor in regulating osteoblast function, thereby identifying a novel mechanism linking central brain activity and bone mass.

Awarding of a $15 million five year NHMRC Program Grant to our Immunology & Inflammation Research Program.

Demonstrating how changing specific genes in particular cell populations involved in presenting beta cell proteins to T cells protects animal models from developing type 1 diabetes.

Dr Jenny Gunton receiving the prestigious DART/NHMRC Career Development Award for being the highest scoring applicant in the field of diabetes.

Discovering that in human diabetes an underlying cause of beta cell death is endoplasmic reticulum stress.

Unearthing a newly recognised effect of insulin on inflammatory cells – resistance to which could contribute to cardiovascular disease, which often goes hand in hand with type 2 diabetes.

Discovering that adult olfactory stem cells can give rise to new hearing-like nerve cells that are lost in acquired deafness.

Showing that MCC gene silencing in a subset of bowel cancer and in precancerous colon tumours called ‘serrated polyps’ may have important implications for understanding the early development of this cancer.

Lowenna Holt winning the ‘University of Sydney Medal for Excellence in Medical Research’ given for the best overall presentation at the annual Australian Society for Medical Research scientific meeting.

Completing a major study in over 100 recreational athletes that will help the design of a test for growth hormone doping.

Determining that there is a high risk of further osteoporotic fractures in women and especially in men who have had just one osteoporotic fracture.
2006

2006 was another highly successful year for the Garvan Institute. We continued our excellent record of research success as measured by achievements such as grants, papers and international awards. We also finalised plans for a major breeding and holding facility for experimental mouse models in the Southern Highlands; agreed to develop a new Cancer Research Centre with St Vincent’s Hospital; and committed to a Cancer Development Unit to lead commercial validation of the many ‘targets’ identified in our cancer research projects.

The cornerstone of any leading research institute is its level of success in competition for peer-reviewed grants. While very pleased with our success in this area, it creates a further funding difficulty for the Institute in that the infrastructure funding necessary to provide the critical support services cannot keep pace with the growth in research. Garvan continues to lead efforts within the medical research sector to convince governments of the importance and value of investment in this area to underpin the nation’s research enterprise.

Financial Performance

Garvan’s operating income in 2006 was $49.1 million, including a capital grant from the federal government, an additional $2 million from the NSW Government (to be spread across three years) and bequests of $10 million. Putting aside these one-off items, our operating income grew to $36.9 million from $30 million the previous year (adjusted for a number of one-off grants). This increase acknowledges the impressive progress of Garvan research over the past decade and reflects growth in the research activities of existing groups, together with the addition of new groups in our major research areas. Philanthropic support through the Garvan Research Foundation, essential in providing critical equipment and facilitating new initiatives, continued to be strong with over $2.5 million in general and specific grants contributed to Garvan research programs. A further $11 million was added to the Institute’s long term endowment fund.

The Board

One of the many strengths of the Garvan is its talented and highly committed Board – a cohesive group of individuals dedicated to the continuing success of the Institute. The only changes to the composition of the Board during the year related to the University of New South Wales nominees. Professor Peter Smith took up his appointment as Dean of Medicine at UNSW and joined the Board mid-year. Professor Mark Wainwright as Acting Vice Chancellor and Professor Richard Henry, as Acting Dean of Medicine, completed their short tenure on the Board, during which they helped ensure that our important relationship with the University remained strong.

It was particularly pleasing to see that the excellence and dedication of Garvan staff were also recognised again in 2006 with record numbers of prestigious Fellowships, Scholarships and Awards to the faculty and our outstanding more junior researchers.
Campus Developments

The Garvan Institute is an active member of the St Vincent’s Campus and continues its close association with St Vincent’s Hospital and its commitment to the values of the Sisters of Charity.

After several years of planning and fundraising, construction was started on the new research building to house the Victor Chang Institute, St Vincent’s research groups and several shared scientific facilities. One of the most important tasks in development of the Precinct is to optimise the sharing of core scientific facilities, such as the state-of-the-art microscopy, gene chip, and cell sorting facilities. Other important functions to be catered for include information technology, service operations and maintenance. Significant progress has been made over the past twelve months to integrate various needs into the design of the new building.

Following completion of the new building in early 2008, and relocation of St Vincent’s and Victor Chang research groups from the Garvan building, space will become available for more than 80 Garvan researchers in our main building. This will help relieve the space pressures we are now experiencing.

The first step in another exciting initiative for the Campus occurred in late 2006 with a formal agreement between Garvan and St Vincent’s to develop a Cancer Research Centre on Victoria Street, adjacent to the current Garvan building. The Centre will help integrate Garvan’s internationally recognised cancer research with the renowned clinical care of St Vincent’s, one of Sydney’s leading teaching hospitals.

Development of the Centre is in response to:

1) Recognition of the explosion of genetic and biomarker information about subtypes of cancer and the concomitant opportunities for personalised approaches to the prevention and treatment of cancer

2) Australia’s well-developed public health system with extensive databases and clinical tissue banks available for research use, together with strong government and public support for cancer research

This initiative allows us to build upon our existing strength as one of the leading cancer research programs in the country. Our vision is to create a facility of international standing and global best practice by bringing together the highest quality clinicians, clinical researchers and biomedical scientists. The objective of our research is to improve patient outcomes in the detection, diagnosis and treatment of cancer.

Business Development

Garvan’s success in our basic research programs is increasingly being matched by progress in translating research discoveries into real outcomes for improved health care. 2006 was characterised by strong growth in our patent portfolio and ongoing success in industry relationships. In particular, through the partnership between Garvan spin-off company G2 Therapies and Novo Nordisk, the development of a key anti-inflammatory antibody has progressed very well over the past 12 months and is on target for clinical trials in 2008. As a direct result of this success, the Board has resolved to establish specific ‘development units’, initially in the Cancer Program, to lead commercial validation of promising findings emanating from our core research.

The Business Development Advisory Committee, established in 2004 to help guide the Institute through the complexities of the rapidly changing biotechnology–pharmaceutical landscape, was particularly active. Success in this area helps ensure that our research breakthroughs are effectively translated into improvements in patient care and disease prevention. It also helps attract future funding streams for our research. We are indebted to the expertise and efforts of Paul Bell, Peter Carre and Board member Dr Lisa McIntyre who provided valuable insight into commercialisation of our research. I am delighted to confirm that Dr Lisa McIntyre has now agreed to take over the role as Chair of the Advisory Committee.

Ongoing relationships with a range of pharmaceutical and biotechnology groups during 2006 continued to provide an important avenue to further develop our research for the economic and social benefit of Australia.

Endowments for the Future

The growth of the Institute’s research programs and the constant challenge of securing matching infrastructure has highlighted the importance of establishing endowed research positions to attract and retain the top international talent. In recent years we have made significant progress through the generosity of major donors and establishment of the Petre Chair in Breast Cancer Research and the Bill Ritchie Fellowship. During 2006, this initiative was enhanced by creation of the Curran Foundation Chair in Neuroscience and secured early commitments towards establishing the Don Chisholm Diabetes Research Fellowship.

Such initiatives are key to Garvan’s future and form a priority for the Garvan Research Foundation, in addition to its critical ongoing fundraising activities.
International Initiatives

As one of Australia’s leading medical research institutes, we recognise the importance of being significantly involved in international activities. Collaboration with overseas groups provides both research and financial opportunities often facilitating our access to emerging technologies and complementary expertise. A very promising example of this international reach is our ongoing alliance with the Shanghai Institutes of Biological Sciences focused on Traditional Chinese Medicines (TCMs). Following signing of the formal Agreement in mid-2004, the past two years have witnessed exciting progress in our finding of substantial anti-diabetic action in a specific TCM and elucidation of its mechanism of action. This success has resulted in an expansion of our collaboration to examine other TCMs with reported therapeutic properties.

All of Garvan’s programs continue to have significant international collaborations, reflecting the status and relevance of our research.

Funding

One of the major challenges facing successful research institutes around Australia is the gap between the total cost of doing research and the funding provided by competitive research grants. For every dollar of research funding awarded, up to another 70 cents is required to carry out the research. I have previously referred to this funding gap as the ‘riddle of success’; that is, the more successful our research, the harder it is for us to stay afloat. To address this fundamental issue and to formulate a solution, we joined with the other major NSW institutes in a joint proposal to the NSW Government for an expanded and structured approach to the provision of research support.

As a direct result of this initiative, an additional $10 million was provided in the 2006 NSW State Government budget. This was only a ‘one-off’ commitment, providing some temporary relief but leaving the core issue unresolved. Garvan, together with the other major NSW institutes, will continue to press for an equitable program of research support to ensure that we remain able to deliver the benefits of our research to the community.

2007

The year ahead will undoubtedly be both an exciting and challenging one for Garvan as our infrastructure is placed under ever-increasing pressure arising from our success and growth. Several important new initiatives, particularly the Cancer Research Centre, offer enormous potential to integrate our research more closely with health care delivery but will require a major increase in both financial and human resources.

Nevertheless, with the ongoing commitment of Garvan researchers, the Board and the growing number of our corporate and community supporters, I am confident that 2007 will deliver continuing success.

Bill Ferris AO
Chairman
Garvan Institute of Medical Research
2006

In 2006, we recruited many leading scientists in their fields, most with cross-disciplinary knowledge to help us stimulate collaboration across our programs. A particular highlight of our growth to over 400 staff was the addition of leading immunology groups transferring from the Centenary Institute. This has allowed us to form an impressive critical mass of expertise to tackle important questions in diabetes, arthritis, asthma and other autoimmune disorders. New momentum was similarly added to our Diabetes & Obesity Program with the recruitment of a major new group from the USA researching the fundamental basis of cellular protein trafficking. This work has implications for many Garvan projects, ranging from diabetes to Parkinson’s. These new initiatives, together with expansion of existing projects, resulted in a very successful year for the Institute. This was evidenced by an impressive grant application result (almost double the national average) to the National Health and Medical Research Council (NHMRC) ensuring a solid base for 2007, with over $14 million of NHMRC funding to complement our international and other national competitive funding.

We also finished the year with a record for both the number (146) and significance (impact factor of >8 for the top 75%) of our international publications. Although research outcomes are difficult to measure due to the inherent long time frame between research discoveries and real advances in health care, these results demonstrate that our research is benchmarked at the forefront of international advances and continues to play an important role in our quest to improve quality of life.
Research Outcomes

2006 witnessed several outstanding research achievements. These included: significant contributions to our understanding of the genetics and epigenetics of cancer; the identification of a new molecular marker of prostate cancer progression; scientific evidence that a particular traditional Chinese medicine has beneficial effects in type 2 diabetes; the discovery that loss of a particular neuropeptide leads to obesity; a finding that strongly implicates diet in effective functioning of the immune system; and ongoing data from the Dubbo Osteoporosis Study – now one of the longest running osteoporosis epidemiology studies in the world. These and the many other research achievements are described in detail in the Research Program Reports.

Although 2006 was largely characterised by impressive success in competitive grant applications, our request for ongoing funding of the Dubbo Osteoporosis Study was a disappointing exception, placing our 5-year commitment in this area at risk. Grant funding for such very long-term studies are notoriously difficult to attract. Fortunately, we have now been able to secure other sources of funding (commercial and philanthropic) to ensure the future of this important project, which continues to provide unique insights into the causes and debilitating effects of osteoporosis.

In addition to the funding attracted by larger programs and more established scientists, we were heartened by the success of many of our new recruits and younger investigators in attaining grants, scholarships and awards.

New initiatives

Several other important milestones attained during 2006 will help us reach the scientific and clinical research outcomes that lie at the core of Garvan’s activities. We agreed with St Vincent’s Hospital to development a new Cancer Research Centre on Victoria Street, a collaboration that will combine our research strength with St Vincent’s clinical knowhow. Also improving our potential impact in the cancer area, the Garvan Board approved the creation of a Cancer Development Unit to commercialise our most promising cancer research projects. Garvan as a whole will benefit from the new mouse breeding and holding facility in Moss Vale, which has received Wingecarribee shire Council Development Approval and is under construction.

Autoimmunity Research Unit

The rapid expansion of our immunology research as a consequence of the recruitment of several national and internationally leading groups over the past two years provided the opportunity to establish a separate Autoimmunity Research Unit. Under the leadership of Professor Fabienne Mackay, the Unit is elucidating the molecular mechanisms underlying the development of autoimmune disorders and determining the roles of different families of immune cells. Since its establishment in mid 2006, the Unit has already uncovered a new form of lupus, which is solely mediated by B cells. This work has important clinical implications with the 20-25% of patients who have elevated B cell Activating Factor (BAFF) levels in their serum. They may fall into a new category of B cell-dependent lupus patients. This work suggests there may be ways to target individual patients to the right clinical trials and/or treatment.
Core Scientific Facilities

Key to the success of any modern medical research program is access to state-of-the-art facilities for the visualisation, measurement, identification and quantification of molecules and cells involved in disease initiation and progression. Garvan places a priority on ensuring that such facilities are available to all our research programs and wherever possible to our collaborators on the St Vincent’s Campus and around Australia. These include sophisticated microscopy, bioinformatics, gene array, gene polymorphism, cell sorting, histology, clinical research and behavioural analysis facilities which are constantly upgraded as new technologies develop. During 2006, all facilities were widely used and received increasing support from fundraising efforts of the Garvan Research Foundation. Of particular note, was the amount raised at the CRI Anniversary Dinner (over $1.1 million) towards the ongoing operations of the Peter Wills Centre for Bioinformatics.

Collaborative Research

In today’s environment of rapid progress in medical research worldwide and highly competitive research grant processes, Garvan places considerable importance on effective national and international collaborations designed to bring together complementary expertise and resources to address the complex diseases of importance to Australia.

Our success in this endeavour is evidenced by both our research outputs (nearly 50% of Garvan papers involve overseas collaborators, 40% include researchers from other Australian institutions and some 20% involve St Vincent’s Hospital colleagues) and partnership in major collaborative studies. The latter include participation in three major Cooperative Research Centres (Asthma and Airways, Bioimaging and Dairy CRCs), national consortia in breast and prostate cancer, genetic epidemiology in osteoporosis and joint ventures in ovarian cancer, traditional Chinese medicines and growth hormone doping.

We have also initiated an exciting collaboration with Harvard Medical School to screen for compounds that improve insulin action.

2007

The coming years should be exciting and challenging for the Garvan as we build upon the considerable momentum generated from the successes of 2006. Our expanding activities will involve pressure on existing resources and careful prioritisation of our research directions.

While Garvan remains clearly focused on elucidating the fundamental basis of disease, we will work to take full opportunity of our position in the Australian and international research enterprise to ensure that we most effectively translate research breakthroughs into improved health and quality of life.

Our ongoing success in medical research depends primarily on the excellence and dedication of the people involved. Garvan is particularly fortunate that we have an abundance of such individuals – the staff, the Boards of the Institute and Foundation and our many corporate and individual supporters.

Professor John Shine AO FAA
Executive Director
Garvan Institute of Medical Research
On behalf of the Board, I am very pleased to report that the Garvan Research Foundation’s 2006 results well exceeded our expectations in terms of both the support we have received from our donors and the progress we have made under the leadership of our new Director.

In 2006, 3084 individual donors chose to make a gift to Garvan including 119 individuals who made gifts of $1000 or more. We thank all our donors without whom Garvan could not fulfil its mission to achieve breakthrough medical research.

We are proud to report that the number of organisations giving to Garvan also increased from 177 to 197. Most notably, there was an increase in companies providing support through payroll giving programs, a highly effective form of support from businesses and their employees. BNP Paribas, for example, in its 150th anniversary year in Australia, contributed a grand total of over $42,000 through staff donations and generous matching gifts from the bank. CSR also matched donations made by its employees with a total gift of over $36,000 during the year.

The Foundation’s total income for 2006 was over $14.5 million. Typically in past years, the Foundation has raised between $3 million and $5 million so this year we have been very fortunate. A major gift of $1 million from the Curran Foundation to establish a Chair in Neuroscience, plus major bequests of $10 million made up the bulk of the income.

On this basis we have been able to make our annual grant to the Institute of $870,833 and specific program contributions of $1.7 million and, most importantly, grow our endowment fund by an additional $11 million.

Bequests

2006 has been an excellent year in terms of the growth of our endowment fund. In particular, we were the beneficiary of a very significant bequest of over $9 million from the late Drs James and Josephine Ryan.

Building up the endowment fund is critical to the future sustainability of Garvan’s operations. It allows us to make large leaps forward in our programs. Without the endowment fund, Garvan could not have contemplated such future-oriented initiatives as our state-of-the-art mouse holding and breeding facility in the Southern Highlands of New South Wales, or our proposed joint venture with St Vincent’s and Mater Health to establish a Cancer Research Centre so that patients can receive the benefits of researchers and clinicians working closer together. We are, therefore, enormously grateful to our generous donors who have left legacies to Garvan in their wills.
Community Information Services

We thank Nestlé Australia for enabling us to take our very popular public seminars – previously run only on-site at Garvan – ‘on the road’ within Sydney and its outskirts in 2006. Covering such topics as Healthy Eating, Healthy Ageing, and Autoimmune Diseases, our seminar team visited numerous locations, including Gosford, Liverpool and Castle Hill. Community feedback on local delivery of our high quality information and education was very positive. The Foundation also delivered our on-site seminar series, sponsored by the Public Trustee of NSW. Taken together, both initiatives attracted around 1700 members of the community.

In the course of 2006, our Public Education and Community Awareness Program hosted about 1000 participants on our now regular program of Garvan tours, and delivered 30 presentations to schools and community groups.

Attracting International Support

One of the Foundation’s medium-to-long-term goals is to attract support from US-based foundations. While proudly Australian, Garvan is also a truly world-class enterprise. We have many international collaborations and wide brand recognition in our fields of research.

The US philanthropic environment, with its strong commitment to medical research, offers opportunities which we believe could prove significant over a three-to-five year commitment of time and effort. Garvan has previously attracted funding from such US-based funding bodies as JP Morgan Chase, the US Army and the Juvenile Diabetes Research Trust International. A fundraising initiative targeting the US was launched in 2006.

Improving our service to donors

Garvan prides itself on our stewardship of relations with donors who support us. In 2006, the Foundation team worked hard to lift our service performance – implementing new tools, procedures and systems to get to know our supporters, to maintain high quality donor records, and to tailor our service to individual donor needs as much as possible. We still have some way to go, but we are pleased to report good progress, culminating with our donor survey issued in December 2006 that provided valuable feedback on how we can do an even better job in this area.

Acknowledging long-term loyalty

I would like to take this opportunity to express our particular appreciation to the Foundation’s wonderful volunteers and Partners for the Future (those who plan to make a gift to Garvan in their will). We acknowledged the efforts of these loyal community members at a dinner at the Park Hyatt in May, which the hotel very generously supported.

Similarly, the Garvan’s relationship with long-standing corporate supporters such as MLC and ASX is most deserving of mention. CRI chose to make Garvan the beneficiary of funds raised at its 25th anniversary dinner. They included a $1 million Federal Government grant to support the Peter Wills Bioinformatics Centre.

I would like to express Garvan’s gratitude to three of our longest-serving Directors who finished their terms on the Board in early 2007: Mr Tim Sims, Mr Nick Tait, and Mr Russell Scrimshaw. Mr Sims, in particular, has served as a Foundation Board member for twelve years and has made an enormous contribution to our endeavours over that period. Mr Tait and Mr Scrimshaw have both ably supported the Foundation over a six-year period. We thank them all most sincerely.

Communicating with our supporters

Given Garvan’s continued strong growth and future opportunities, it is important for the Foundation to identify and engage with potential new supporters. In 2006 we were fortunate to have Dimity Raftos, formerly Direct Marketing Manager at The Smith Family, join our small team, bringing highly professional expertise to the task of reaching more people who might care to assist Garvan to find the answers to disease. In 2006, 1950 new donors became part of our Garvan community and began to share in the excitement of discoveries that can change the face of science and medicine.

Existing supporters will no doubt have noticed the enhancement of our regular letters highlighting developments in our research in need of funds. We are grateful for the positive response, yielding our best results ever for both our May/June and end of year appeals. Taken together, these appeals brought in over $277 000 for Garvan research. As a benefit to supporters, we also reviewed our former newsletters and launched breakthrough as a tri-annual communication to keep everyone across the progress we are achieving.
**Young Garvan**

Young Garvan, our network of 25-35 year old Sydney professionals, enjoyed another successful year in 2006, raising over $325,000 towards the Young Garvan Fellowship. The YG Committee organised three educational forums focusing on doping in sport, stress and body image. These were very well attended, attracting 135 new participants to Garvan.

Our thanks go to the forum panellists, including Dr Dave Martin, Peter Beacroft, Jack Szczepina, Daniel Murphy, Professor Ken Ho, Dr Antony Kidman, Simon Reynolds, Professor Gordian Fulde, Professor Fabienne Mackay, Paula Joyce, Kathryn Eisman, Ashleigh Synnott and Professor Herbert Herzog. Thanks also to our MCs for the year, Andrew O’Keefe and Dr Darren Saunders.

There is movement on the Young Garvan Committee and our thanks go to Lauren Sutton, Cassie Lapointe and Darren Saunders for their contribution. We look forward to welcoming them back in the years to come.

Most significantly, 2006 saw Mr Ben Webb of the Webb Group of Companies throw his financial support behind Young Garvan. We are very grateful.

**Staffing**

During the course of 2006, Jerry Frenkel left us to go overseas and Danielle Fischer assumed the PACE Manager role full-time. Susan Sussems also moved onto a new position, and Rachael Stewart assumed the Supporter Services Manager role. We thank Jerry and Susan for their contributions to Garvan. We successfully recruited Dimity Raftos as Direct Marketing Manager. Our Foundation Director, Carole Renouf, continues to review the composition of the team to ensure that both our supporters’ and Garvan’s needs are best served.

Finally, let me thank every donor, each member of the Foundation team, and every member of the Foundation Board, for their valuable contribution to Garvan over the past year. I look forward to your continued support, and to even better results, in the year ahead.

Graham Bradley
Chairman
Garvan Research Foundation
Garvan Institute Organisational Chart

- **Sisters of Charity**
  - Trustees of St Vincent’s Hospital
  - University of NSW
  - Commonwealth & NSW Health Ministers

- **Garvan Institute of Medical Research**
  - Board of Directors
  - Chair: Mr Bill Ferris AO

- **Executive Director**
  - Professor John Shine AO FAA

- **Development & Support Group**
  - Chief Operating Officer
  - Mr John Dakin
    - Biological Testing Facility
    - Dr Jenny Kingham
    - Business Development & Legal Affairs
    - Ms Christina Hardy
    - Communications
    - Dr Branwen Morgan
    - Finance and Accounting
    - Ms Cherry Dutton
    - Grants Administration
    - Ms Cate Smith
    - Human Resources
    - Ms Magdalena Malota
    - Information Technology
    - Mr Jim McBride
    - Operations
    - Dr Jeff Freeman

- **Core Research Facilities**
  - ACRF Unit for Molecular Genetics of Cancer
  - Biological Testing
  - Clinical Research
  - Cytofluorometry
  - Gene Chip
  - Peter Wills Bioinformatics Centre
  - Pieter Huveneers Molecular Imaging

- **Garvan Research Foundation**
  - Board of Directors
  - Chair: Mr Graham Bradley

- **Garvan Research Foundation**
  - Chief Executive Officer
  - Ms Carole Renouf

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

- **Institute Committees**
  - Appointments & Promotions
  - BTF Policy Advisory
  - Building & Equipment
  - Director’s Executive
  - Higher Degrees
  - Information Technology
  - Publications
  - Occupational Health & Safety
  - Seminars
  - Senior Scientists

- **Campus Committees**
  - Animal Ethics & Experimentation
  - Human Research Ethics
  - Institutional Biosafety

Garvan is a partner in the CRCs for Asthma and Airways, Biomedical Imaging and Innovative Dairy Products.

Garvan is a shareholder in the spin-out companies AZA Research Pty Ltd and G2 Therapies Ltd.
Overview

The Business Development team, under the leadership of Christina Hardy, collaborates with the pharmaceutical and biotech sector and partners with other academic organisations to take Garvan’s research discoveries one step closer towards the development of new treatments and diagnostic tests.

Working closely with Garvan scientists, the Business Development team is responsible for all aspects of commercialisation from monitoring research activities to maximising early capture of intellectual property, identifying biotech market opportunities, and negotiating and managing commercial agreements. The team also assists the researchers with non-commercial activities such as setting up academic collaborations and transferring scientific material.

Patents have been filed in the treatment, diagnostics and screening categories.

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**G2 Therapies and Novo Nordisk**

G2 Therapies is a private company, chaired by Dr John Schubert, which develops and commercialises antibody-based therapeutics for inflammation. Founded at Garvan in 2002, major investors include AMWIN, and Baron Nominees.

In early 2006, G2 announced the signing of a major research, development and licensing agreement with Danish healthcare company Novo Nordisk. The terms of the agreement include an upfront payment, success-based payments to a potential total of around US$100 million (A$135 million), and royalties on commercialised therapeutics. The partnership will enable the new therapy to be taken through to human clinical trials. Development work for the first year progressed extremely well and will continue through 2007.
Business Development Advisory Council

The Business Development Advisory Council (BDAC), chaired by Garvan Institute Chairman Bill Ferris, includes several representatives from the biotech and pharmaceutical industry.

The current council members are:

Bill Ferris AO,
Garvan Institute of Medical Research Board Chairman,
Garvan Research Foundation Board Director

Professor John Shine AO FAA,
Executive Director, Garvan

Paul Bell,
External Director

Dr Lisa McIntyre,
Director, L.E.K. Consulting

Peter Carre,
CEO, Burrill Australia

Christina Hardy,
Director, Business Development & Legal Affairs, Garvan

John Dakin,
Chief Operating Officer, Garvan

Lisa Hilder,
IP Manager, Garvan

Dr Sue Henshall,
Group Leader, Cancer Research Program
Linking up:
Our Development & Support Groups take pride in providing a best practice framework and operating environment for our scientists. This involves sharing learnings with similar organisations around the globe.
Highlights

Reaching a staffing level of over 400

Gaining Wingecarribee Shire Council approval for an initiative to develop an offsite mouse breeding and holding facility in Moss Vale, NSW (to operate as Australian BioResources) that will also be a resource for other research institutes

Extending the capacity within the existing Garvan animal facility, as an interim measure to deal with space shortages, to accommodate an extra 500 cages, and to test new state-of-the-art equipment (biobubbles)

Remodelling and expanding laboratories on levels 5, 7, 8 & 10

Implementing a staff OH&S legislation awareness initiative

Upgrading the OH&S systems including the development of a new risk management software package ‘SafeG’

Completing plans for a new cafeteria on level 8

Commencing the new precinct (Victor Chang) building, which will join Garvan at levels 3, 4, & 7

Upgrading the security systems to include video surveillance for a safer and more secure working environment

Receiving approximately 16 000 different products and handling 8500 external purchase orders

Obtaining extensive news coverage of six major research stories and providing media training to key scientific spokespeople

Producing a 10 minute film, the Garvan virtual tour, that can be viewed on the website

Finalising new institute branding guidelines to give the institute a more recognisable and professional look

Implementing the GeneSpring WorkGroup server - a system that saves and stores gene-chip experiment results. This system has been made available to, and is in use by, researchers across NSW

Upgrading Garvan’s computer network and servers, and rolling out a new sophisticated file storage solution - saving Garvan real dollars in online disk storage

Implementing new mobile phone technology with phone plans that will reduce call costs between staff

Designing and releasing brand-new web-based grants administration and safety management information systems

Completing CanSto - a cancer clinical and lab information system - for Garvan’s pancreatic research

Licensing versions of CanSto to the Hanson Institute in Adelaide and Monash University in Melbourne

Installing an online donations page on Garvan’s website
The Development & Support Group’s goal is to enhance the scientific work at Garvan by providing services, facilities and infrastructure in an efficient and transparent manner. The needs of Garvan researchers are complex and we constantly strive to improve services delivery to them and to support the overall functioning of the organisation. DSG is comprised of seven groups: Business Development & Legal Affairs, Communications, Grants Administration, Finance & Accounting, Human Resources, Information Technology, Operations; and seven core facilities: ACRF Unit for the Molecular Genetics of Cancer, Affymetrix Gene Chip Facility, Biological Testing Facility, Clinical Research Facility, Cytofluorometry Facility, Pieter Huveneers Molecular Imaging Unit, and the Peter Wills Bioinformatics Centre.

**Staffing**

Garvan has now grown to 403 staff members (as at Dec, 2006): 307 Garvan staff, 44 associates, 52 students. Of the 307 Garvan staff, 242 are fulltime.

**Staff - breakdown by category**

Associates include the following categories of appointees: visiting scientists, honorary appointments (such as Doctors and Pathologists) and visiting students.
Core Research Facilities

Technology is an important component of being competitive in medical science. Garvan’s core research facilities contain state-of-the-art equipment that enables our scientists to perform the necessary experiments to better understand disease processes. A manager oversees the facilities used by internal scientists and external researchers, the latter on a pay per use basis.

**Australian Cancer Research Fund (ACRF) Unit for the Molecular Genetics of Cancer** houses equipment that can detect and analyse genetic sequence variations such as gene losses, mutations, expression, and methylation on a large scale. It is used by cancer researchers throughout the state.

Dr Vanessa Hayes e: v.hayes@garvan.org.au p: 9295 8345

**Gene Chip Facility** contains the Affymetrix Microarray System that is used to compare the levels of gene transcripts in tissue samples. It is used to find potential genes of interest, the subsets of which can then be further analysed in the ACRF Unit that can handle large numbers of samples. Garvan was the first in Australia to establish the system.

Professor Charles Mackay e: c.mackay@garvan.org.au p: 9295 8402

**Biological Testing Facility** holds the mouse production colonies and provides specialised zones to enable quality animal-based research.

Dr Jenny Kingham e: j.king@garvan.org.au p: 9295 8175

**Clinical Research Facility** runs Garvan clinical projects that look at the effect of hormones (e.g. growth hormone, sex steroid hormones, insulin) on different metabolic systems. Staff also monitor volunteers involved in pharmaceutical clinical trials, such as those for osteoporosis medications.

Angela Peris e: a.peris@garvan.org.au p: 9295 8232

**Cytofluorometry Facility** comprises high speed cell sorters to allow the separation of up to four populations of cell types from any body fluid or tissue suspension. The pure population of cells, separated on the basis of multiple phenotypic and functional characteristics, can then be grown as pure cultures, used to extract RNA or DNA for genetic analyses, or implanted into animal models.

Dr Jerome Darakdjian e: j.darakdjian@garvan.org.au p: 9295 8432

**Pieter Huveneers Molecular Imaging Unit** consists of 5 microscopes capable of imaging tissue, cells or intracellular organelles and molecules using a variety of transmitted light and fluorescence-based techniques. Our newest microscope, the first of its kind, allows scientists to image multiple intermolecular events at the surface of individual living cells at a resolution and speed previously not possible.

Dr Will Hughes e: w.hughes@garvan.org.au p: 9295 8232

**Peter Wills Bioinformatics Centre** applies techniques derived from disciplines such as applied mathematics, statistics and computer science to understand, organise and analyse biological data.

Mr Jim McBride e: j.mcbride@garvan.org.au p: 9295 8145
Genetic clues:
Early detection of cancer that allows timely and tailored treatment is one of the goals of Garvan’s cancer researchers. Professor Rob Sutherland and Dr Sandra Biankin share the excitement of discoveries in pancreatic and prostate cancer with supporters Tracey Spicer and The Hon Justice Peter Jacobson.
Left to right: Tracey Spicer, Dr Sandra Biankin, Professor Rob Sutherland, The Hon. Peter Jacobson

**Highlights**

**Our Work**

- Determining that a novel plant toxin can dramatically enhance the ability of tamoxifen to kill breast cancer cells
- Employing molecular markers to define a new subgroup of poor prognosis breast cancers
- Showing that overexpression of Wt1 can disrupt the endocrine response in breast cancer cells, and so possibly contribute to excess proliferation and failure to differentiate during the development of breast cancer
- Establishing that prolactin acts during the very early stages of mammary carcinogenesis to drive cell proliferation in pre-cancerous lesions, resulting in a faster progression to carcinoma
- Formulating a new concept for how cancer cells can escape normal growth controls: they switch off large regions of genes that normally function to prevent tumour development
- Showing that MCC gene silencing in a subset of bowel cancer and in precancerous colon tumours called ‘serrated polyps’ may have important implications for understanding the early development of this cancer
- Identifying novel methylated genes/regions in ovarian cancer with potential diagnostic significance
- Describing a novel technique for high-throughput testing of genetic markers of the human genome
- Identifying a new prostate cancer marker that if found in low levels at the time of surgery, means the chances of cancer spreading are very high
- Discovering that half of oestrogen-regulated genes are also regulated by c-Myc, indicating that Myc is likely to be particularly important in the loss of growth control as breast cancer develops
- Identifying that cortactin represents a marker of drug resistance in head and neck cancer

**Our People**

- Associate Professor Susan Clark was elected a Fellow of the World Technology Network for Biotechnology for her contribution to Epigenetics and was selected as one of five finalists for the 2006 World Technology Award that acknowledges the most innovative people in the science and technology world
- Roger Daly was promoted to Conjoint Professor at UNSW
- Dr Vanessa Hayes was nominated as a recipient of a research award from BNP Paribas to celebrate 125 years of banking in Australia
- Dr Sandra Biankin was awarded the 2007 Gustav Nossal Medical and Dental Postgraduate Research Scholarship given annually to the highest ranked NHMRC medical and dental postgraduate research applicant
- Our success with funding from the Cancer Institute NSW continued, with fellowships awarded to Drs Ewan Millar, Matthew Naylor, Krishan Rasiah, Christopher Scarlett and Jack Zhao; postgraduate scholarships to Luke Anderson, Dr Sandra Biankin, Emily Colvin, Maria Kalyuga, Rebecca Hinshelwood, and Johanna Susanto; a joint Translational Program Grant in Colorectal Cancer, which includes Garvan (Drs Maija Kohonen-Corish & Lisa Horvath) and major Sydney hospitals and research facilities
- Liz Tindall was awarded a PhD scholarship by the Australian Rotary Health Research Fund, Rotary International District 9680, and the University of New South Wales
- Lowenna Holt won the ‘University of Sydney Medal for Excellence in Medical Research’ given for the best overall presentation at the annual Australian Society for Medical Research scientific meeting

Director: Professor Rob Sutherland FAA
Although derived from normal cells, cancer cells have distinctive features that can be exploited to aid diagnosis, treatment, and prognosis. To do this, we need to know much more about the fundamental processes that govern cell behaviours: their division, their survival, and their differentiation into complex tissue structures. With this knowledge, we will be better able to stop the formation and early growth of cancers.

As well as basic research into cell and molecular biology, the Garvan’s Cancer Research Program has five translational research groups that study a number of the most commonly diagnosed types of cancer: breast, colorectal (bowel), lung, ovarian, pancreatic and prostate.

**BASIC CANCER RESEARCH**

**Apoptosis**  
**Group Leader:** Dr Alison Butt  
Oestrogen not only causes breast cancer cells to proliferate, but it also protects them from apoptosis (cell death). We are investigating how this occurs and identifying the genes that regulate this process. This will enable us to understand how these genes may influence the way anti-oestrogens such as tamoxifen can effectively kill breast tumour cells. Other projects include examining how novel compounds derived from plants induce apoptosis in breast cancer cells. This could lead to their development as new therapies for the treatment of breast and other cancers.

**Cell Cycle**  
**Group Leader:** Associate Professor Liz Musgrove  
Female steroid hormones like oestrogen and progesterone strongly influence cell reproduction in the breast. We are particularly interested in how these hormones act on the cell cycle machinery and how control over the cell cycle is lost in breast cancer cells. Since the cell cycle gene cyclin D1 is frequently overexpressed in breast cancer, we have been studying genes that act upstream of cyclin D1. In collaboration with the Steroid Hormone Action and Breast Cancer Translational Groups, we are also searching for new genes that might link oestrogen action with the cell cycle and so could be involved in resistance to the anti-oestrogen medication, tamoxifen, in the clinic.

**Cancer Genetics**  
**Group Leader:** Dr Vanessa Hayes  
Cancer genetics is the study of the genetic basis of human malignancies. We are concerned with the identification and characterisation of genetic variations (mutations) within the human genome sequence that influence not only cancer development and progression, but also individual cancer risk and individual response to therapies. Our group is particularly interested in the genes that control inflammation and regulate sex hormone action, with a view to discovering genetic variants that are associated with an increased risk of breast and/or prostate cancer. Our research is part of a nationwide project aimed at determining predisposition to these cancers in the Australian population. Our discoveries may be useful in identifying individuals at high-risk of developing these cancers prior to the onset of symptoms, and in development of better diagnostic and treatment strategies.

**Development**  
**Group Leader:** Associate Professor Chris Ormandy  
Development of the mammary gland occurs in defined stages that are governed by the hormones that regulate reproductive events. Our hypothesis is that the genes that control normal mammary development can become mutated or dysregulated in breast cancer, altering or subverting their normal function and so contributing to the disease process. We must understand how genes program normal development if we are to understand how the program goes awry in cancer. Key genes in these processes may provide targets for future therapies. Our current focus is on discovering the genes that respond to prolactin - a hormone that plays an important role in normal mammary cell proliferation, differentiation and lactation, but when in excess can increase the risk of developing breast cancer.
Cancer cells deactivate large regions of DNA by a biochemical process called methylation. Our research focuses on understanding the process that triggers abnormal methylation and deamination between normal and cancer cells. We have developed different methods to detect methylation changes during development and have noticed that these ‘epigenetic’ changes can take place across very large regions of DNA during cancer development. We are trying to work out the sequence of events so that we can try to reverse the process, as we believe these regions may contain genes that normally prevent the development of tumours.

**Epigenetics**

**Group Leader:** Associate Professor Sue Clark

**Signal Transduction**

**Group Leader:** Professor Roger Daly

Our research focuses on three proteins involved in either the transmission of signals within the cell or the regulation of these signalling events: Gab2, cortactin and Grb14. Overexpression of Gab2, which is found in a subset of breast cancers, increases not only the proliferation of cancer cells but also their invasive properties. The latter effect suggests that Gab2 may promote cancer cell spread throughout the body. High levels of cortactin are found in some breast and head and neck cancers, and we have identified that this protein increases resistance to a new drug currently in clinical development. Together with researchers in the Diabetes Program, we are studying how Grb14, and related proteins, regulate the metabolic and growth-promoting effects of insulin and insulin-like growth factors.

**Steroid Hormone Action**

**Group Leader:** Professor Rob Sutherland

Our research aims to determine and characterise the genes that mediate the actions of the sex steroid hormones oestrogen, progesterone, and androgens in steroid-responsive cancers, which constitute a third of all newly diagnosed cancers.

In collaboration with the Cell Cycle and Apoptosis Groups, we have identified and are characterising a number of steroid regulated genes involved in the control of cell proliferation and death in breast cancer. In partnership with the Breast and Prostate Cancer Groups, we have demonstrated that some of these genes are new markers of cancer progression and response to therapy.
TRANSLATIONAL CANCER RESEARCH

Breast Cancer

**Group Leader:** Professor Rob Sutherland

In association with clinicians at St Vincents and other hospitals we have developed large tissue banks and patient databases that are being used to identify markers of disease subtype, disease progression and response to particular therapies. A major joint project, with the Cell Cycle and Steroid Hormone Action Groups, aims to identify molecular markers of tamoxifen resistance, since loss of response to tamoxifen is a major reason for treatment failure. We are also conducting collaborative studies with other institutions to define the role of newly-discovered breast cancer genes in the disease process.

Lung and Colorectal Cancer

**Group Leader:** Dr Maija Kohonen-Corish

We examine the gene profiles of cancer specimens obtained from patients whose clinical outcomes are already known. The challenge is to work out which key gene alterations are the most useful for determining prognosis and treatment outcomes. We have identified new genes that are inactivated through methylation, a poorly understood molecular mechanism promoting cancer development. Methylation can be identified from surgically resected cancers or tumour biopsies in the research laboratory but this is not routinely carried out in clinical practice. Our aim is to develop genetic tests that can be applied at the hospital laboratories. We also want to understand the biological significance of the gene defects, which will enable development of new treatment strategies.

Ovarian Cancer

**Group Leader:** Dr Pip O’Brien

Our major research goal is to identify new ways to diagnose women with early stage curable ovarian cancer. To this end, we use a combination of genetic and epigenetic approaches to understand the molecular changes involved in the development of ovarian cancer. Together with the Epigenetics Group, our current primary focus is the identification of a panel of methylated genes that may have potential as diagnostic markers for early stage ovarian cancer. These markers will likely include genes that control the development of ovarian cancer, and therefore may also include potential novel therapeutic targets for treatment of advanced disease.

Prostate Cancer

**Group Leader:** Associate Professor Sue Henshall

Our group is concerned with the identification of markers for therapeutic responsiveness, prognostic markers, and new markers of early prostate disease. We take a multidisciplinary approach that utilises expertise from a number of cancer researchers within and outside the Garvan, as well as clinicians and pathologists.

Our research aims to identify genes and pathways whose expression changes can predict the development of aggressive life-threatening prostate cancer or resistance to chemotherapy used for the treatment of advanced stage prostate cancer.

Pancreatic Cancer

**Group Leader:** Dr Andrew Biankin

Pancreatic cancer is the fifth leading cause of cancer death in Western societies, with a five year survival rate of less than 10%. The treatment and survival of patients with pancreatic cancer has not changed for over thirty years because there has been little research into the molecular and cell biology associated with it. Our projects focus on understanding the role of retinoic acid signalling pathways in pancreatic cancer and defining new diagnostic and treatment strategies that may extend the successful use of retinoids seen in leukemia and skin cancer to pancreatic cancer.
**FUNDING**

The Cancer Research Program is grateful for support from the following organisations:

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<td>Australian Research Council</td>
<td>Royal Hospital for Women</td>
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<td>Australian Rotary Health Research Fund</td>
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<td>Boehringer Ingelheim</td>
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<td>Cancer Institute NSW</td>
<td>Susan G. Komen Breast Cancer Foundation</td>
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<td>CRC for Innovative Dairy Products</td>
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<td>Cure Cancer Australia</td>
<td>The Hillcrest Foundation</td>
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*For additional contributors please see pages 54-55*
Modern Alchemy:
Blending traditional Chinese medicinal knowledge with scientific rationale has captured the interest of scientists and supporters committed to finding new therapies for type 2 diabetes.
**Our Work**

- Developing novel technologies for watching the movement of blood sugar molecules into living muscle and fat cells, aiding our efforts to discover new molecules that participate in this process.
- Making inroads into the design of therapies to manage diseases, such as type 2 diabetes and cardiovascular disease, which have insulin resistance as their root cause.
- Identifying a new regulatory input controlling insulin-stimulated translocation of GLUT4 glucose transporter, a process that can be defective in diabetes.
- Discovering that in human diabetes an underlying cause of beta cell death is endoplasmic reticulum stress.
- Further validating that inhibitors of PKC epsilon are potential treatments for diabetes.
- Identifying a lipid derivative of phosphatidic acid that contributes to insulin resistance.
- Finding increased expression of ‘metabolically harmful’ genes in abdominal fat which may be one of the missing links between increased abdominal fat and type 2 diabetes.
- Discovering the reduced capacity of muscle to switch to oxidising or burning fat in the prediabetic state.
- Unearthing a newly recognised effect of insulin on inflammatory cells – resistance to which could contribute to cardiovascular disease, which often goes hand in hand with type 2 diabetes.
- Identifying the reduced production of a gut hormone (PYY) in prediabetes which may contribute to diabetes and obesity.
- Providing scientific evidence that a traditional Chinese medicine has beneficial effects for people suffering from type 2 diabetes.

**Our People**

- Professor David James was awarded the Australian Diabetes Society’s highest award - the Kellion Award.
- Dr Carsten Schmitz-Peiffer became a member of Garvan’s Senior Scientific Group.
- Dr Greg Cooney was appointed as a NHMRC Senior Research Fellow.
The incidence of type 2 diabetes is highly correlated with the incidence of obesity, both of which have increased in Australia and around the western world to the point where it is a significant health issue. Research in this program is focused on the molecular regulation of body weight and fuel metabolism, with an emphasis on insulin’s mode of action in normal and disease states. Research strengths include live cell microscopy, the use of mass spectrometry to analyse the proteome of cells and tissues affected by metabolic disease, RNA silencing technologies to suppress gene expression in cells and animals, in vivo gene manipulation, and clinical studies.

**Insulin Resistance – Molecular Studies**

**Group leader:** Professor David James

One of the major actions of insulin that becomes defective in type 2 diabetes is the regulated entry of nutrients into our muscle and fat cells. Our goal is to use our newly-developed molecular imaging methods to uncover the path that insulin takes from when it binds to muscle and fat cells to when it encounters its final target, and how it achieves its ultimate goal: allowing glucose to gain entry to a cell. Numerous proteins interact with insulin and glucose on this journey. We are also intrigued by the constant movement of proteins within cells, the direction and rate of which is precisely controlled and are investigating the mechanism for the regulation of protein trafficking.

**Insulin Action – Insulin Resistance**

**Group leaders:** Professor Ted Kraegen, Associate Professor Greg Cooney

Our major focus is to understand factors that control fat accumulation in muscle and to use this information to devise strategies to reduce it. When fat enters a muscle cell from blood there are two choices. It is either stored as an intracellular lipid or it is channelled into the mitochondria, where it is burned for energy. Much of our research is converging on an enzyme that seems to control the choice made by fat once it enters the muscle cell: whether it is used or stored. We have partnerships with a number of pharmaceutical companies to examine drugs that activate this enzyme and which could reduce fat accumulation.

We are also delving into traditional Chinese medicines with our collaborators in Shanghai to identify new insulin-sensitising agents that could be more useful than current therapeutics.

**Insulin Resistance – Clinical Studies**

**Group leaders:** Professor Don Chisholm AO, Professor Lesley Campbell

Why do people with increased abdominal fat develop type 2 diabetes and what metabolic changes predate the condition? To address the first of these questions, our researchers are conducting microarray analyses on fat tissue samples to find which proteins have significantly altered levels in subjects with insulin resistance. The metabolic studies involve people with anorexia because they convert fat stores to energy very quickly, unlike people who are overweight. They also involve people from St Vincent’s HIV Centre who are on HIV therapy as many of them develop insulin resistance and lipodystrophy. The study of these different populations and their findings should contribute to improved methods of prevention or therapy for type 2 diabetes and obesity.
### Phospholipid Biology

**Group leader:** Dr Will Hughes

Our recently-established research group is concerned with the lipid molecules (phospholipids) that are the building blocks of cell membranes. It is becoming clearer that the exact lipid composition of membranes is tightly regulated to affect the membrane’s properties such as its ability to regulate the movement and distribution of proteins into and out of a cell. We aim to identify where, when and why specific phospholipids are produced or destroyed, how they participate in signalling events that enable cell communication, and how these processes may be disrupted in disease, in particular, diabetes and cancer. Much of our work is done with the resources of the Institute’s Pieter Huveneers Molecular Imaging Facility.

### Cellular Stress

**Group leader:** Dr Antony Cooper

We want to understand how cells cope, or fail to cope, with the stress that can result from the over-production of proteins and misfolding of proteins within a cellular compartment called the endoplasmic reticulum (ER). ER stress is directly applicable to a growing number of diseases including diabetes, Huntington’s disease and Parkinson’s disease. Either the cell ‘burns out’, generates an excess of harmful products, or accumulates unmanageable amounts of unusable proteins, which ultimately lead to cell death. If we can elucidate how these stressors induce cell death, we may be able to identify potential points of intervention to help the cells deal with the extra demands.

### Diabetes Signalling

**Group leaders:**
- Associate Professor Trevor Biden
- Dr Carsten Schmitz-Peiffer
- Dr Ross Laybutt

Our work spans the major tissues implicated in whole body fuel use: the pancreatic beta-cells which make and secrete insulin in a co-ordinated response to food intake; skeletal muscle which is a key target of insulin and, as such, accounts for the bulk disposal of glucose following a meal; and liver, which releases glucose into the circulation and clears insulin from it.

As diabetes can be viewed in terms of a failure, or aberrant regulation, of specific intracellular signalling pathways in one or more of these tissues, our groups are probing the signal transduction pathways that have relevance to the condition i.e. insulin secretion, glucose homeostasis and those that are lipid-responsive.

### FUNDING

The Diabetes & Obesity Research Program is grateful for support from the following organisations:

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<td>Juvenile Diabetes Research Foundation International</td>
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<td>National Health and Medical Research Council</td>
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<td>National Institutes of Health (USA)</td>
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<td>Rebecca Cooper Medical Research Foundation</td>
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*For additional contributors please see pages 54-55*
New angles:
Our Immunology researchers are combining their unique perspectives on how the immune system can cause disease as well as protect us. Their fresh approach is changing how scientists around the world view and treat such problems.
Our Research

Discovering that the fatty acid binding molecule aP2 controls inflammatory responses in the airways of asthmatics

Publishing strategies for monoclonal antibody production, which highlighted our C5aR work - the subject of our major licensing deal with Novo Nordisk

Finding that one of the earliest steps in immune system activation relies on a fatty acid binding molecule, which implicates the diet in the functioning of the immune system

Revealing a novel signalling pathway that has implications for the pathogenesis of X-linked lymphoproliferative disease

Identifying a critical role for the cytokine IL-21 in regulating diverse subsets of human B cells. IL-21 and its receptor may be one of the important genetic elements for development of type 1 diabetes and other autoimmune diseases

Awarding of a $15 million five year NHMRC Program Grant

Our People

Dr Stuart Tangye received a Young Tall Poppy Award from the Australian Institute of Policy and Science and the NSW Office of Science and Medical Research

Professor Charles Mackay was promoted to NHMRC Principal Research Fellow

Dr Jenny Gunton received the DART / NHMRC Career Development Award, which is awarded to the highest scoring career development award applicant in the field of diabetes

Dr Shane Grey and Dr Jenny Gunton were part of the team to win a program grant from the Juvenile Diabetes Research Foundation (JDRF) for research into islet transplantation for the cure of type 1 diabetes

Our People

Dr Jenny Gunton was elected to the council of the Australian Diabetes Society

Postdoctoral Fellow Dr Cindy Ma was awarded a NHMRC Peter Doherty Postdoctoral Research Fellowship

Kim Good, a PhD student in the lab of Dr Tangye, was awarded a Postdoctoral Fellowship from Arthritis Australia to undertake postdoctoral training in the US

Dr Kate Jeffrey was awarded (jointly) the Garvan Thesis Prize 2006
Our researchers study aspects of immune function in normal and diseased situations. We hope to understand the basis for diseases such as rheumatoid arthritis, autoimmune diseases, diabetes and asthma, and also to develop new therapies to treat disease. We also collaborate with Garvan scientists in other programs on cross-discipline projects such as finding links between immunology and metabolic systems, cancer and the nervous system.

Arthritis and Inflammation

**Group leader:** Professor Charles Mackay

We are trying to better understand the process of pain, inflammation and joint damage in the development of rheumatoid arthritis. Our studies have led to development of antibodies that can intervene in the inflammatory process and these are being commercialised by Garvan spin-off G2 Therapies Ltd. Other projects are based on dissecting the immune cells’ signalling pathways, again with the express purpose of finding points of intervention that may help control inflammatory conditions, such as asthma, arthritis and multiple sclerosis.

Asthma*

**Group leader:** Dr Michael Rolph

We have three main lines of research:
1. Developing new therapeutic approaches for asthma, in particular, to develop monoclonal antibodies as therapeutic tools;
2. Studying the link between diet, fatty acid binding proteins and asthma;
3. Looking more broadly at the links between inflammatory and metabolic diseases because we now know that inflammatory cells release signalling molecules called cytokines that can affect various aspects of metabolism.

*Part of the CRC for Asthma and Airways

Cellular Immunity

**Group Leader:** Professor Jonathan Sprent

Our team is interested in the development and fate of T cells - white blood cells that participate in a variety of immune responses but are able to somehow distinguish between self and foreign antigens. One of the unknown questions that is central to maintaining the immune system’s homeostasis is how are these cells destroyed once their mission is complete and infections are overcome? We know that most self-destruct and a few live on to become memory T cells, which are activated by a re-infection, but we don’t know the factors that determine their destiny. Application of our work lies in harnessing the immune system to boost its attack on cancerous tumours and, conversely, dampening down the immune response to treat autoimmune diseases.

Diabetes and Transcription Factors

**Group leader:** Dr Jenny Gunton

The causes of beta-cell failure are not well understood, but we know there are changes in these cells’ gene expression that can yield clues about what is going wrong. Through the use of a variety of tissue-specific knockout and transgenic mice we hope to identify why beta cell failure occurs as well as ways to improve beta cell function and thereby treat human diabetes. We are currently focussing on a gene called ARNT, which is decreased by 90% in the beta cell containing islets of people with type 2 diabetes. It seems to be a master gene that controls other genes involved in beta-cell function, including glucose breakdown and insulin production. We are now looking at ways to control ARNT.
Gene Therapy & Autoimmunity

**Group leader:** Dr Shane Grey

Our laboratory is interested in the how and why of the immune system’s attack on the body’s tissues as it occurs during the rejection of organ grafts and in autoimmune disorders like type I diabetes where the insulin-producing beta cells are destroyed. Approaches include examining factors that regulate the immune attack on our own cells and investigating the molecular changes that occur in the tissue being attacked in the hope of, one day, being able to genetically engineer tissues that could withstand the assault. This strategy would alleviate the need for the toxic immunosuppressive drugs currently required to promote successful organ transplantation and, in the case of type I diabetes, enable creation of a ‘death-defying’ beta cell as a novel cure.

Immunobiology

**Group Leader:** Dr Stuart Tangye

Our focus is on understanding the development of B cells – the population of white blood cells responsible for the production of protective antibodies and the regulation of antibody responses. We are particularly interested in understanding how the immune system responds to infections or vaccinations, such that it can provide us with a ‘memory’ of the response so that following subsequent exposure to the same infectious agent, our immune systems will respond more rapidly. We are also studying an inherited X-linked lymphoproliferative disease that results in immunodeficiency. Overall, we hope to identify means to improve the immune response in individuals with immunodeficiencies and ways by which the immune system of patients with autoimmune diseases could be attenuated.

Mucosal Autoimmunity

**Group leader:** Dr Cecile King

In type 1 diabetes (T1D), the insulin-producing beta cells of the pancreas are destroyed by self-tissue-destructive T cells. These cells express markers that help us to determine, for example, their dependence upon growth factors and where they have been in the body. We are particularly interested in the relationship between the cells that cause T1D and other autoimmune diseases that develop at the mucosal interface between our bodies and the environment. Broad-based suppression is commonly used to treat autoimmune diseases and transplant recipients but it has an obvious drawback since we need a functioning immune system in order to thrive. The aim of our research is to identify target molecules for selective suppression of these self-tissue-destructive cells.

Multiple Sclerosis (MS)

**Group leader:** Dr Ian Sutton

MS is an inflammatory disease of the brain and spinal cord and an increasing body of evidence points to MS being a pathogen-driven disease. Our work has focused on understanding how inflammatory responses within the brain and spinal cord are regulated since they can both injure brain and spinal cord, and facilitate tissue repair. Studies have focused on how resident immune cells within the brain (microglia) modulate the activity of a recently defined population of immune cells, termed Th1L-17, which are thought to be responsible for mediating tissue injury in MS.

FUNDING

The Immunology & Inflammation Research Program is grateful for support from the following organisations:

- Cooperative Research Centre for Asthma and Airways
- Diabetes Australia Research Trust
- Juvenile Diabetes Research Foundation International
- Lupus Association of NSW
- Multiple Sclerosis Research Australia

National Health and Medical Research Council
NSW Ministry for Science and Medical Research
Pfizer
St Vincent’s Clinic Foundation

*For additional contributors please see pages 54-55*
Cracking research:
Garvan’s osteoporosis researchers are revealing who is most at risk of developing brittle bones and that, after a first fracture, elderly men and women are equally likely to refracture within just a few years. Dr Jackie Center demonstrates to Elizabeth Fyffe, and Michael and Joy Foulsham how our bone scaffolding is destroyed by osteoporosis.
Our Work

Determining the high risk of further osteoporotic fractures in women and especially in men who have had just one osteoporotic fracture

Developing the first algorithm to identify absolute risk of a hip fracture on an individual basis

Identifying the role of neuropeptide Y expression in the protection of the skeleton from chronic stress

Describing the role of the neuropeptide Y1 receptor in regulating osteoblast function, thereby identifying a novel mechanism linking central brain function and bone mass

Our People

The Dubbo Osteoporosis Epidemiology Study team was nominated for a Rhino Outstanding Business Award from The Dubbo Chamber of Commerce in two categories: Excellence in Customer Focus and the Barnson Award for Excellence Product and Service (Finalist)

Associate Professor Tuan Nguyen was invited to give lectures at the first Symposium on Osteoporosis in Vietnam August 2006 and received a prestigious award from the Vietnam Government “for his assistance and contributions to higher education and medical research in Vietnam”

Associate Professor Tuan Nguyen and Dr Nguyen Nguyen conducted a 3-day workshop in the design and analysis of clinical studies for researchers at the University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam

Professor John Eisman was invited by the Australian Government to be Co-chair of the Arthritis and Osteoporosis Expert Advisory Committee (AOEAC) and a member of the Expert Advisory Subcommittee of the Australian Population Health Developmental Principle Committee

Dr Paul Baldock was awarded a fellowship from the International Human Frontier Science Program Organisation to undertake studies in the University Hospital, Geneva

Dr Paul Baldock was invited to present a symposium topic at the 17th meeting of the International Bone and Mineral Society in Montreal, Canada

Dr Nguyen Nguyen was awarded a Young Investigator Award at The 33rd meeting of European Calcified Tissue Society (ECTS), Prague, Czech Republic

Dr Nguyen Nguyen was awarded (jointly) the Garvan Thesis Prize 2006

Postgraduate Scholar Dana Bliuc was awarded a Primary Health Care Scholarship from the NHMRC

Dr Paul Baldock received an International Young Investigator Award from the International Bone and Mineral Society to speak at the Frontiers of Skeletal Biology Conference in Davos, Switzerland

Dr Nguyen Nguyen was awarded a Young Investigator Award at The 33rd meeting of European Calcified Tissue Society (ECTS), Prague, Czech Republic

Postgraduate Scholar Dana Bliuc was awarded a Primary Health Care Scholarship from the NHMRC
Osteoporosis affects mostly elderly men and women and carries a large human and financial burden. As prevention is the best strategy for reducing this burden, we need to improve our knowledge of the risk factors for fractures; find ways to better assess treatments; increase our understanding of bone biology; and help identify new therapeutic pathways.
FUNDING
The Osteoporosis Research Program is grateful for support from the following organisations:

Amgen  Merck Sharpe & Dohme Limited
deCODE genetics  Sanofi Aventis
Organon  National Health and Medical Research Council
Eli Lilly and Company  Servier
Roche-GSK  Novartis

For additional contributors please see pages 54-55

Fracture Prevention - Clinical Studies

Group leader: Professor John Eisman AO

Our clinical studies group participates in multicentre international clinical trials evaluating potential treatments that are in the final stages of pharmaceutical development. We recruit patients and volunteers who have had a fracture or who have a family history of osteoporosis. Volunteer participants who meet specific risk criteria are randomly allocated to receive a new drug or various combinations of drugs.

Bone Mass – Brain Regulation

Group leader: Dr Paul Baldock

The hallmark of osteoporosis is a reduction in bone density and therefore strength. It is caused by an imbalance between bone formation and bone loss. At least 20-30 genes are involved in bone health, but because of the complexity of bone, they are likely to be regulated independently and interdependently.

Our group is, primarily, investigating the role of the brain hormones neuropeptide Y and leptin, which influence bone formation and strength. Much of work makes use of transgenic mouse models and is carried out in collaboration with researchers in the Neuroscience Program.

Bone protection & fracture risk – Genetic, Individual and Population Studies

Group leaders: Associate Professor Tuan Nguyen and Dr Jackie Center

Our research draws on the Dubbo Osteoporosis Epidemiology Study (DOES), which began in 1989 and is the world’s longest running large-scale epidemiological study of osteoporotic fractures in men and women. We are using the DOES data to develop predictive models, based on multiple risk factors, to identify men and women at high risk of fracture and to determine who would benefit most from preventative interventions.

We are also continuing to search for new osteoporosis genes that may predict those who are at low risk of osteoporosis and fractures – taking into account environmental factors such as physical activity, dietary habits, medication, fall-related and hormonal factors. Finding and understanding how these genes work and interact with other known genes will help identify targets for novel therapies.
Measuring appetite:
The urge to eat is controlled by the brain, with neuropeptide Y being a key player. Our Eating Disorders Research group brings together clinical and academic experts from outside the Institute - such as Sydney University’s Professor Janice Russell – to further understand the role of appetite regulation in conditions like anorexia.
**Highlights**

**Our Research**

Discovering adult olfactory stem cells can give rise to new hearing-like nerve cells that are lost in acquired deafness.

Showing that peptide YY ablation in mice leads to the development of hyperinsulinaemia and obesity.

Demonstrating that Y2Y4 receptor double knockout protects against obesity when fed a high-fat diet.

Discovering that low levels of PYY in humans are linked to insulin resistance and may contribute to subsequent weight gain and type 2 diabetes.

Showing that conditional deletion of hypothalamic Y2 receptors reverts gonadectomy-induced bone loss in adult mice.

Identifying a new molecule that regulates neurogenesis in the brain.

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**Our People**

Professor Herbert Herzog gave plenary lectures at the 10th International Congress on Obesity in Sydney, Australia and at the 2nd International Summit on Cardiometabolic Risk Associated With Intra-Abdominal Adiposity, Germany.

Garvan Neuroscience Program researchers and our collaborators made an impressive presence at the 8th International NPY Conference, Florida, USA, with invited presentations by Professor Herbert Herzog, Dr Amanda Sainsbury-Salis, and Dr Tim Karl, as well as symposia by PhD students Dana Boey, Susan Allison and Julie Wheway.

Professor Herbert Herzog was an invited speaker at a US Keystone symposia on: Gut Hormones and Other Regulators of Appetite, Satiety and Energy Expenditure.

Dr Sharon Oleskevich was an invited international speaker at the Calyx-of-Held Symposium, Max Planck Institute, Leipzig, Germany.

Dr Sarah McKay received a Training Fellowship from the Garnett Passe and Rodney Williams Foundation.

Dr Bryce Vissel received an award from the Ramaciotti Foundation.

We hosted the International Advances in Brain Function Symposium.
The Neuroscience Research Program aims to increase our understanding of the neuronal systems involved in disorders such as Parkinson’s disease, Alzheimer’s disease, schizophrenia, eating disorders, and hearing loss. A key focus is the better understanding of the brain’s control of energy homeostasis (balancing energy intake and expenditure), which affects fertility, mood, and weight gain.
FUNDING

The Neuroscience Research Program is grateful for support from the following organisations:

Alma Hazel Eddy Trust
Amadeus Energy Pty Ltd
Australian Deafness Research Foundation
BHP Billiton Community Program
Clive and Vera Ramaciotti Foundation
Foundation for Prader-Willi Research
Gallinus Pty Ltd
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Lang Walker via the Curran Foundation
Lady Mary Fairfax Foundation
Motor Neurone Disease Research Institute
NSW Ministry for Science and Medical Research
National Health and Medical Research Council
Perpetual/Baxter Charitable Foundation
Pfizer Global Research and Development
Australian Rotary Health Research Fund, District 9650
Sanofi-Aventis
St Vincent’s Clinic Foundation

For additional contributors please see pages 54-55

Adult Stem Cells

**Group leader:** Professor John Shine

Neural stem cells can be isolated from the adult olfactory neuroepithelium (situated in the nose) and grown in the laboratory in the form of olfactory neurospheres. These structures are three-dimensional aggregates of cells that are able to grow into neuronal and non-neuronal cells. The identity of the cell type within the olfactory neuroepithelium that gives rise to these neural stem cells remains elusive. Our group studies the basic biology of adult olfactory stem cells with the aim of identifying, isolating and propagating these cells, and of determining the conditions needed to transform them into the different types of nerve cells found in the brain; for example, those lost in Parkinson’s or Alzheimer’s disease.

Eating Disorders

**Group leaders:** Professor Herbert Herzog and Dr Amanda Sainsbury-Salis

One of our laboratory’s major goals is to understand how appetite and body weight are regulated. Defects in the brain pathways that regulate these processes may be responsible for causing wasting conditions such as anorexia nervosa and cancer cachexia as well as the metabolic resistance to weight loss occurring in overweight or obese people.

Our main focus is on neuropeptide Y (NPY) and its Y-receptors, since many of the molecules that regulate appetite and body weight do so via this system. Our research findings have implications for the treatment of obesity, infertility, poor lactation, dwarfism, and osteoporosis, as well as anorexia nervosa and cancer cachexia.

Hearing

**Group leader:** Dr Sharon Oleskevich

Our research aims to use adult stem cells to replace the cells lost from the inner ear repairing hearing loss. We have shown it is possible to turn olfactory stem cells into hearing (hair) cells and we are testing if these cells are functional using electrophysiological recording techniques.

Microsurgery was developed to transplant stem cells into the inner ear of deaf mice. Specialised hearing tests will determine if the transplants result in functional recovery of hearing.

Neurodegenerative Disorders – Repair & Regeneration

**Group leader:** Dr Bryce Vissel

Our ultimate goal is to understand how we can harness the brain’s own stem cells and/or modulate nerve cell’s connections (i.e. how we can harness neural plasticity) to help treat Parkinson’s disease, spinal cord injury and Alzheimer’s disease, all of which result from loss of nerve cells and their connections from specific regions of the nervous system. We study how abnormal signalling at nerve cell junctions contributes to these movement and memory disorders and we work to understand why the nervous system’s own repair systems, i.e. the formation of new nerve cells, is ineffective in these conditions. We hope to find novel stem cell treatments that will profoundly impact people with brain diseases.
Holistic approach:
Studying the behaviour of specific immune cells and how they impact on body systems is taking Garvan’s Autoimmunity Research Unit into undiscovered territory. Their valuable insights have led to fruitful collaborations inside and outside the Garvan community.
**Highlights**

**Our Research**

Identifying genetic regions containing diabetes susceptibility genes that contribute to the pathogenic action of B cells in an animal model of disease.

Performing whole genome expression arrays on B cells from diabetic mice and non-diabetic mice to aid identification of new genes that may contribute to the pathogenic activity of B cells causing type 1 diabetes.

Demonstrating how changing specific genes on particular cell populations involved in presenting beta cell proteins to T cells could protect animal models from developing type 1 diabetes.

Discovering basic mechanisms underlying antibody production and B cell selection.

Producing gene knockout mice that demonstrate the essential role of the TRAF3 protein in regulating B cell survival.

**Director:** Professor Fabienne Mackay

**Our People**

Fabienne Mackay was promoted to Conjoint Professor at UNSW.

Professor Fabienne Mackay was an invited keynote speaker at the 2006 Australasian Society of Immunology (ASI) meeting, Auckland, New Zealand.

Professor Fabienne Mackay was an invited plenary speaker at both the Gordon conference on chemokines, Les Aussois, France, and at a Keystone Chemokine conference, Utah, USA.

Dr Robert Brink was appointed NHMRC Senior Research Fellow.

Dr Pablo Silveira was an invited speaker at the annual Australasian Society of Immunology conference.
Autoimmune diseases affect approximately one in twenty people. For some unknown reason, they affect almost three times as many women as men. Almost all autoimmune diseases appear without warning and can have serious consequences on morbidity and quality of life. They are the result of our immune system mounting a response against our own body.

More than forty human diseases are defined as having autoimmunity as their definitive or probable cause and many treatments can be ineffective. Examples include type 1 diabetes, systemic lupus erythematosus (SLE), Sjögren’s syndrome, and Hashimoto’s disease - all of which our unit investigates.
FUNDING
The Autoimmunity Research Unit is grateful for support from the following organisations:

Dana Foundation
National Health and Medical Research Council
Rebecca Cooper foundation
St Vincent’s Clinic Foundation

For additional contributors please see pages 54-55

Autoimmune Disease Mechanisms

Group Leader: Professor Fabienne Mackay

We have two principal areas of study:

- the unappreciated role of B lymphocytes in autoimmune diseases - uncovered from our work on the B cell activating factor (BAFF) -
- and how immune responses are affected by stress.

When there is too much BAFF, harmful B cells live longer than they should and can damage healthy tissue. We want to know how the oversupply of BAFF corrupts immune defences to drive autoimmune disorders and why in other conditions it appears to be protective.

Our collaborative research on the link between stress, neuropeptide Y (NPY), and the immune system continues to work towards building a better understanding of the circumstances of NPY release and its effect on immune cells.

B Cell Immunobiology

Group Leader: Dr Robert Brink

Emeritus Professor: Antony Basten

Autoimmune diseases such as lupus, myasthenia gravis and hemolytic anemia can arise when B cells produce rogue antibodies that attack the body. Our investigations aim to enable us to identify the specific genes and signalling pathways that regulate B cell survival, proliferation, and differentiation; as well as the molecules and cells that drive antibody production against foreign structures and prevent antibody responses against ourselves. By understanding how B cells function we hope to reveal new strategies for improving vaccines, controlling autoimmune disease, and treating B cell malignancies.

B Cell Tolerance & Autoimmunity

Group Leader: Dr Pablo Silviera

Our ultimate goal is to prevent the immune system attacking the insulin producing beta cells of the pancreas, which leads to type 1 diabetes (T1D). Our research aims to identify the faulty mechanisms that allow the B cells that recognise beta cell proteins to persist and thus activate the destructive T cells. We also aim to identify novel genes that control the generation and function of this aberrant population of B cells, findings that could form the basis for new early stage therapies in T1D susceptible humans.
Performing hormones:
The pituitary gland produces a range of hormones, the levels of which determine health or harm. To understand their role in our bodies, we rely on volunteers like Dave Williamson and John Dobie to participate in our clinical research.
Our Work

Showing that hormones control lean body mass by varying how much protein is oxidised for energy production

Discovering that growth hormone prevents cortisone-induced protein loss

Finding synthetic oestrogen compounds called SERMs enhance the action of growth hormone in certain tissues

Completing a major study in over 100 recreational athletes that will help the design of a test for growth hormone doping

Our People

Heather Lee, PhD student, was awarded a Rising Star Postgraduate Award and the Harvey Carey Memorial Scholarship from the University of NSW

Dr Udo Meinhardt received the Poster Prize at the 3rd International GH IGF Symposium, Kobe

Professor Ken Ho was invited by the Journal of Endocrinology to write a speculatory commentary on Endocrinology covering the next 60 years to commemorate the founding of the Society for Endocrinology, UK, 60 years ago

Dr Anne Nelson was an invited speaker at an International Symposium on the Use and Abuse of Growth Hormone, Kobe

Dr Anne Nelson participated in a strategic planning meeting of the US Anti-Doping and World Anti-Doping Agencies in Austin, Texas, to critically review GH tests
The pituitary gland produces key hormones that control body growth, strength, appetite, metabolism, mood and reproduction. An over or under active pituitary gland can lead to a range of diseases from dwarfism in children to infertility, mood disorders, muscle wasting, obesity and diabetes in adults. A major focus is the physiology of growth hormones, in particular understanding how sex hormones interact with growth factors to control body fat, muscle and bone mass.
Hormones, Metabolism and Body Composition

**Project leader:** Professor Ken Ho

Growth hormone (GH) is a major regulator of body composition in adults. As oestrogens regulate GH and secretion of gonadotrophin (a hormone that regulates ovary and testes development), medicines called SERMs that modulate oestrogen’s action, for example tamoxifen, are likely to impart a number of differential effects within the body. Given the widespread and long term use of these compounds, we are studying their impact on body metabolism, composition and physical function. We also want to know whether GH and testosterone, which strengthens the secretion and metabolic action of GH, can be used (alone or together) to treat protein-wasting conditions such as kidney failure and major trauma.

Growth Hormone Doping

**Project leader:** Dr Anne Nelson

Testing for GH is difficult because the GH used in doping is indistinguishable by normal methods, from the GH made by the body itself. Although the use of GH is banned, there is anecdotal evidence that GH doping is widespread, so a reliable test is required to deter its abuse.

Our work is focused on identifying factors regulating the different forms of GH, called isoforms, and on proteins that respond to the growth hormone signal. We are investigating the biological interactions between testosterone and GH in recreational athletes. We are also using microarray gene profiling to identify novel markers of GH in peripheral blood cells. The aim is to develop a gene fingerprint test based on gene expression profiling of blood.

Growth Hormone Signalling

**Project leader:** Dr Kin Leung

Our major aim with this project is to dissect the cellular mechanisms for sex steroid regulation of GH action so we can provide the molecular basis for developing safer and more effective use of these agents in the treatment of diseases that arise because of GH imbalances. The effects of SERMs vary in different tissues, thus we are studying the potential use of these drugs in a selective, tissue-specific way. In addition, we have previously uncovered new effects of GH on fuel oxidation and protein metabolism in skeletal muscle and identified new GH-regulated genes and continue to conduct studies to investigate the physiological significance of GH regulation of these muscle genes.
Accelerating discoveries:
Garvan relies upon support provided by donors and volunteers to take our research into the future and to help provide us with the latest technologies. The speed and pace of our medical research is enhanced by their involvement.

Left to right: Geoff Moles, Deirdre Blakemore, Lyn Jones, Steve Tucker (CEO, MLC)
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Whether it’s running a putting competition at a golf day, registering members of the community for Garvan’s public health seminars, staffing an antiques exhibition or stuffing countless envelopes for our mailouts – we always know we can rely on our team of committed Garvan Volunteers.

At Garvan, we are lucky to have the assistance of almost twenty dedicated volunteers each working tirelessly behind the scenes to enhance, support and encourage our efforts.

As well as making a tremendous contribution to the running of the Foundation, the volunteer team have also assisted Garvan research by using their professional and administrative skills to help with clinical trials and research projects.

We are deeply grateful to our volunteers for all their help during this exciting and productive year and we look forward to working with them for many more years to come.

Barbara Allan
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Left to Right: Timothy J Sims, Ian Smith, Nick Tait, Peter Wade, Richard Warburton, Marvin Weinman
History

In 1857, the Sisters of Charity founded St Vincent’s Hospital. One hundred years later the hospital held its Centenary Appeal that funded the establishment of the Garvan Institute of Medical Research. It is named after James Patrick Garvan (1843-1896), distinguished NSW parliamentarian and business leader.

Garvan initially functioned as a department of St Vincent’s Hospital. In 1984, the New South Wales Parliament passed the Garvan Institute of Medical Research Act that incorporated Garvan as an autonomous, non-profit research institute. Garvan today has formal affiliations with the University of NSW and St Vincent’s Hospital.

In 1986, after an international review, Garvan was awarded a NHMRC Centre Block Grant. Only six medical research institutions have been accorded this block funding status within Australia and Garvan was the sole NSW recipient. Garvan’s NHMRC Block Grant was renewed and increased in 1992 and 1998. During the 1990s, Garvan achieved significant growth in size and funding and this has been reflected in the increasing volume and standard of its research outputs. In 1997, Garvan’s new medical research centre was completed. This world-class facility provides the Institute with the infrastructure and services required to accomplish its mission.

Structure

The Board is Garvan’s governing body, which is empowered under the Act to determine policy and control the affairs of the Institute as laid down in the Act. The Board approves and supervises the delegation of authority to committees. Garvan’s Board meets quarterly and comprises 15 members, nominated by Garvan’s various stakeholders and appointed by the Governor of New South Wales and the Executive Director of the Institute who is appointed by the Board.

Garvan Institute Board

Bill Ferris AO
Chairman

Nominated by Trustees of St Vincent’s Hospital

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.

Mr Ferris is currently Chairman of International Energy Services Pty Ltd and the Garvan Institute of Medical Research. Former directorships include: Chairman, Australian Trade Commission (Austrade) and Austar United Communications Limited; Director, Bradken Resources Pty Ltd, Tucker Seabrook (Aust) Limited, and Australian Pacific Paper Products Pty Ltd.

He is also a director of the Garvan Research Foundation.

Mark Wainwright AM (until October, 2006)
Deputy Chairman

Nominated by University of New South Wales

Professor Mark Wainwright was appointed Vice-Chancellor and President of the University of New South Wales on 1 July 2004. Professor Wainwright holds an Honours Degree in Applied Chemistry and a Master of Applied Science in Chemical Engineering from the University of Adelaide, a PhD from McMaster University in Canada and a DSc from the University of South Australia. In 1989, he was awarded a personal Chair at UNSW and in 1991 was appointed Dean of Australia’s largest Faculty of Engineering, a position he held until the end of 2000. He has served on the boards of several companies and research organisations.

Martin Hoffman
Treasurer

Nominated by Sisters of Charity

Martin Hoffman is Chief Executive Officer and Managing Director of Loop Wireless. Prior to that he was Chief Executive Officer of ninemsn, a 50:50 joint venture between Microsoft and Publishing & Broadcasting Limited (PBL). Before joining ninemsn in February 2003, Martin Hoffman held a number of senior roles with John Fairfax Holdings Ltd. Between 1996 and 1999 Mr Hoffman was COO of the Garvan Institute.

Graham J Bradley

Nominated by Garvan Research Foundation

Graham Bradley is a professional company director. Mr. Bradley is Chairman of Stockland Corporation Limited, HSBC Bank Australia Limited and Anglo American Australia Limited. From 1995 to 2003 he was Managing Director of Perpetual Trustees Australia. He is a former partner of McKinsey & Company, management consultants, and a former national managing partner of Blake Dawson Waldron. Mr. Bradley was appointed Chairman of Garvan Research Foundation in June 1999 and joined the Garvan Institute Board in November 1999.

Nicholas Curtis

Nominated by Trustees of St Vincent’s Hospital

Nicholas Curtis has a background in investment banking and the resources industry. He is Executive Chairman of Lynas Corporation Limited, an Australian public company specialising in rare earths. Mr Curtis was appointed as Chairman of the Board of St Vincent’s & Mater Health Sydney in August 2004 and also serves as a director of the Sisters of Charity Health Service.
Mary Foley
Nominated by Sisters of Charity
Mary Foley is Chief Executive Officer, St Vincent’s and Mater Health Sydney. Previous positions include Deputy Director-General, NSW Department of Health and Executive Director, NSW Office of Health Policy and senior executive management positions for Mayne Nickless private health care business. Ms Foley is a member of the Board of Trustees, University of Western Sydney and was NSW Telstra Businesswoman of the Year in 1998. She is also a director of the Victor Chang Cardiac Research Institute, the St Vincent’s Research & Biotechnology Precinct and Garvan Research Foundation.

Lisa McIntyre
Nominated by Federal Minister for Health
Dr Lisa McIntyre is a partner with the strategy consulting firm L.E.K. Consulting and head of L.E.K.’s Asia Pacific Life Sciences practice. She has over 14 years consulting for the biotechnology sector and has worked with over 80 different biotechnology clients primarily focusing on the challenges associated with commercialising innovation. Dr McIntyre relocated to Sydney in 2002 after nine years in the United States co-heading L.E.K.’s Life Sciences practice where she advised many of the world’s leading biotechnology companies. She is also a director of Biotech Capital Ltd and AtCor Medical Pty Ltd.

Greg Paramor
Nominated by Garvan Research Foundation
Greg Paramor has been involved in the real estate and property funds management industry for approximately 30 years. Mr Paramor was appointed Managing Director of the Mirvac Group following the acquisition of the James Fielding Group in January 2005. He is the immediate past President of the Property Council of Australia. He is currently a director of a number of companies, including the Property Council of Australia and is a Fellow of the Australian Property Institute.

Sister Carol Pedersen RSC
Nominated by the Sisters of Charity
Carol Pedersen graduated as a trained nurse at St Vincent’s Sydney in 1963 and is a Sister of Charity. She holds a PhD from UNSW and a BSW (Hons 1) from the same institution. She also holds an Advanced Diploma from the Sydney College of Homoeopathic Medicine, and recently completed postgraduate work, obtaining an Associate Diploma in Advanced Homoeopathic Medicine. For over 20 years Sr Carol was a member of various Human Research Ethics Committees, and was active at national, state and local levels in the development of Alcohol and Drug Services. Sr Carol lives and Works in Sydney’s South West, where she provides pro bono homoeopathic consultations for the poor.

Michael Reid
Nominated by NSW Minister for Health
Michael Reid’s most recent appointment was as Director General of the newly formed Ministry for Science and Medical Research in NSW from 2004 till its absorption into a super Ministry in 2006. Prior to this appointment he was Director of the Policy and Practice Program at the George Institute for International Health, University of Sydney. He holds Adjunct Professorships in the Faculty of Medicine at the University of Sydney and the Faculty of Public Administration at the University of Western Sydney. For the five years prior to this he held the position of Director General of NSW Health. Most recently he has re-established his consulting company and is currently engaged in a variety of health, science and academic contracts both in Australia and overseas, including mentoring individuals and organisations.

Warren Scott
Nominated by NSW Minister for Health
Warren Scott is a director of Citigroup and is General Counsel and Managing Director in Australia. He is Chairman, Woolcock Institute of Medical Research, as well as a delegate to the Australian American Leadership Dialogue, the Law Society of New South Wales, the American Bar Association, the New York Bar Association and the California Bar Association. Warren is admitted as a solicitor in New South Wales and as a lawyer in New York and California.
John Shine AO FAA  
Appointed by Garvan Institute Board  
Professor John Shine is Executive Director of the Garvan Institute of Medical Research and a board member of the Garvan Research Foundation. He is Professor of Molecular Biology and Professor of Medicine at the University of NSW, and a Director of many scientific, research and medical bodies throughout Australia, including the recent ex-Chairman of the National Health and Medical Research Council (NHMRC). Professor Shine is also a member of the Prime Minister’s Science, Engineering & Innovation Council (PMSEIC).

Peter J Smith  
Nominated by University of NSW  
Professor Smith is Dean, Faculty of Medicine, University of New South Wales. He is a graduate of the University of Queensland and specialised in paediatric oncology and cancer research following further study in the USA and Germany. He has held senior hospital management posts in Brisbane and Melbourne and senior academic appointments at the Universities of Queensland, Melbourne and Auckland. He has served as director on a number of boards in Australia and New Zealand. Professor Smith is currently a director on the boards of St Vincent’s and Mater Health, POWMRI and NEWSOUTH Innovations.

Bernadette Tobin  
Nominated by Trustees of St Vincent’s Hospital  
A/Professor Bernadette Tobin is Director of the Plunkett Centre for Ethics at St Vincent’s Hospital, Sydney, and Reader in Philosophy at Australian Catholic University. Dr Tobin is Honorary Ethicist at the Children’s Hospital at Westmead, Honorary Associate Professor in the Faculty of Medicine at the University of Sydney, and Conjoint Associate Professor in the School of Medicine at the University of New South Wales. 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.

Ronald Trent  
Nominated by Federal Minister for Health  
Ronald Trent is Professor of Molecular Genetics, University of Sydney and Head of the Department of Molecular and Clinical Genetics, Royal Prince Alfred Hospital. He has been a member of the NHMRC Research Committee since 1997 and is Chairman of the NHMRC Human Genetics Advisory Committee as well as a member of the NHMRC Council.
Garvan Research Foundation was established in 1981 to provide the Garvan Institute with an additional source of research funds by attracting financial support from companies and individuals. Over the years, the Foundation has evolved to become Garvan’s marketing and fundraising arm.

The Foundation’s Board is empowered as the governing body to determine the Foundation’s policy and control of affairs subject to the ultimate direction of the Garvan Institute Board.

Graham J Bradley (Chairman)

Graham Bradley is a professional company director. Mr. Bradley is Chairman of Stockland Corporation Limited, HSBC Bank Australia Limited and Anglo American Australia Limited. From 1995 to 2003 he was Managing Director of Perpetual Trustees Australia. He is a former partner of McKinsey & Company, management consultants, and a former national managing partner of Blake Dawson Waldron. Mr. Bradley was appointed Chairman of Garvan Research Foundation in June 1999 and joined the Garvan Institute Board in November 1999.

Melinda Conrad

Melinda Conrad is former Managing Director and Founder of the retail store chain, Conrads Warehouse. Prior to her establishment of Conrads, she held management roles at Harvard Business School and Colgate-Palmolive. Voluntary board memberships include Young Entrepreneurs Organisation -Sydney chapter, and the Harvard Club of Australia. Ms Conrad joined the Foundation Board in September 2003.

Bill Ferris AO

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. Mr Ferris is currently Chairman of International Energy Services Pty Ltd and the Garvan Institute of Medical Research. Former directorships include: Chairman, Australian Trade Commission (Austrade) and Austar United Communications Limited; Director, Bradken Resources Pty Ltd, Tucker Seabrook (Aust) Limited, and Australian Pacific Paper Products Pty Ltd.

Lyn Gearing

Lyn Gearing was appointed to the Garvan Foundation board in 2005 as a representative of the Sisters of Charity. Ms Gearing is a Director of Stockland Corporation Limited, Hancock Natural Resources Group Australia Pty Limited and IMB Limited and two other not for profit organisations. Ms Gearing was the Chief Executive of the NSW State Superannuation schemes from 1997 to 2002, and has over 30 years business experience in superannuation, funds management, corporate finance and management consulting.

Meredith Hellicar

Meredith Hellicar is a company director and consultant in strategy and change. She is Chairman of James Hardie Industries, HLA Envirosciences, and the Sydney Institute; and a director of AMP (and Chairman of AMP Life), Southern Cross Airports Group, and Amalgamated Holdings. Meredith is a member of the Takeovers Panel and was awarded a Centenary Medal for Business Leadership. Her former executive roles include Managing Director of InTech Financial Services, Chief Executive Officer of Corrs Chambers Westgarth and Managing Director of TNT Logistics Asia. Ms Hellicar joined the Foundation Board in March 2002.

Lauren Adlam, Young Garvan Chair, Ex-Officio

Alec Brennan

Alec Brennan is CEO and Managing Director of CSR Limited. Mr Brennan has served 37 years with CSR. His last 25 years have been spent in senior management, including running the diversified businesses that now make up CSR. He has played an important role in the shaping of the company’s way of thinking and doing business-the corporate culture that drives the company today. He is also Chairman of Gove Aluminium Ltd, a director of Emeco Limited, and a Fellow of the Senate of Sydney University. Mr Brennan joined the Foundation Board in 2000.

Philip Marcus Clark

Originally trained in law and management, Mr Clark has led the successful growth and development of Australia’s two largest law firms, Minter Ellison and Mallesons Stephen Jaques as Managing Partner and CEO. He has also held a variety of management roles within the petroleum and industrial packaging industries and in the retail sector. Mr Clark is a member of the JP Morgan Advisory Council and a director of ING Management Ltd, CRI Asset Management Limited, DJ Clark Pty Ltd, and St James Ethics Centre. He joined the Board in 2005.
Byram Johnston OAM
Byram Johnston is the Chief Executive Officer of MainstreamBPO, a company providing back office processing services to a number of industry sectors. He has over 30 years management consulting experience. He serves on the board of a number of companies. He joined the Foundation Board in 1997.

Ross King
Ross King has spent the last 15 years providing investment banking and financial advice with JBWere and Goldman Sachs JBWere. He has worked across numerous product lines including investment banking, equity sales and research and was made a Partner in 1994. He fulfilled senior roles in both the New York and London offices before returning to Sydney in 2001 as Executive Director and Co-Head of the Healthcare, Consumer and Industrial divisions of the Investment Banking department. Mr King joined the Foundation Board in 2005.

John Koch
John Koch is Chief Representative of the Hong Kong based Forma Group of Companies, a former board member of St Vincent’s Hospital and Chair of its Finance Committee. He is Chair, Woods Cottage Foundation which assists intellectually disabled young adults. He had a 32 year career with the Commonwealth Bank assuming a range of domestic and international responsibilities. Mr Koch joined the Foundation Board in 2000.

Sister Paulina Pilkington RSC AM
Sister Paulina has a broad background in health policy formation, having been a member of the Hospitals and Health Services Commission (Sax Commission) and Assistant Director General, Nursing Branch, Federal Department of Health. Sister Paulina resigned from the Garvan Institute Board in February 2000 and has been a member of the Foundation Board since 1994.

Carole Renouf
Carole Renouf has built her career in the not-for-profit sector. She is a marketing, communications and fundraising professional, who has also trained in management at the Australian Graduate School of Management. Initially, Carole worked in the fields of health and education, including a stint at NSW Health and setting up her own business producing print and audio-visual resources. Carole spent eight years at the Australian Consumers’ Association as a senior policy officer, consumer advocate and media spokesperson. She then spent four years as Director of Fundraising and Communications at WWF Australia. Just prior to taking up her position as Director of the Garvan Research Foundation, she was Director of Marketing and Development for the Faculty of Science at UNSW.

Russell Scrimshaw
Russell Scrimshaw is a board member of Fortescue Metals Group Limited. He was, until late 2002, the Group Executive of the Commonwealth Bank’s Technology, Operations and Procurement Business Unit. He has also previously held executive marketing, business operations and senior management positions with Optus Communications, Amdahl and IBM. In his role at the Commonwealth Bank, Mr Scrimshaw also held the positions of Chairman, Cyberlynx and Director of the Boards of EDS Australia and Telecom New Zealand Australia. Mr Scrimshaw joined the Foundation Board in 2000.
John Shine AO FAA
Professor John Shine is Executive Director of the Garvan Institute of Medical Research and a board member of the Garvan Research Foundation. He is Professor of Molecular Biology and Professor of Medicine at the University of NSW, and a Director of many scientific, research and medical bodies throughout Australia, including the recent ex-Chairman of the National Health and Medical Research Council (NHMRC). Professor Shine is also a member of the Prime Minister’s Science, Engineering & Innovation Council (PMSEIC).

Timothy J Sims
Tim Sims is Managing Director at Pacific Equity Partners. He is a Director of a number of portfolio companies. He was previously Chairman and Managing Partner at Bain International and before that Managing Partner of LEK Partnership Asia Pacific and a founder of the firm. He is a director and founder of the Australian Charities Fund and a Member of the Board of the Ravenswood School for Girls. Mr Sims joined the Foundation Board in 1994.

Ian Smith
Ian Smith is currently Chief Executive of Yahoo7. He has more than 20 years experience as a company director and advisor in the advertising, marketing communications and media industries. Prior to leading the management buyout of The Communications Group in 2003, Mr Smith spent five years in New York as President International of Bates Worldwide and director of the publicly listed Cordiant Communications PLC. He also led the development of Cordiant’s global e-business consultancy, which now operates in most major markets around the world. Mr Smith has served on a number of government and philanthropic advisory groups including the Whitney Museum in New York and the State Library of New South Wales.

Nick Tait OBE FAICD
Nick Tait is a director of Green Globe Asia Pacific and an amateur grazier. He is a former director of Qantas Airways, British Airways Holdings (Australia) and Concorde International Travel and was previously General Manager Investments and Joint Ventures for British Airways. Mr Tait joined the Foundation Board in 2000.

Peter Wade
Mr Wade is currently a private investor and company director. Peter previously spent over 25 years providing investment banking and financial advice with JBWere and its current form, Goldman Sachs JBWere; more recently he was with JPMorgan. He worked for nearly 15 years in Europe and the United States before returning to Australia. On his return Mr Wade held various senior roles at JBWere until its merger and at JPMorgan he was Managing Director and Head of its Global Australian Equities business.

Richard FE (Dick) Warburton AO
Dick Warburton is currently Chairman of Caltex Australia, the Board of Taxation, Magellan Flagship Fund, and Tandou Limited. He is a director of Note Printing Australia, Citibank and Nufarm. He holds various other positions on committees and advisory boards within Australia. Mr Warburton is a former Chairman and CEO of DuPont Australia and New Zealand, whom he has worked with for 30 years. Mr Warburton joined the Foundation Board in 1999.

Marvin Weinman
Marvin Weinman is a company director and business adviser. He is a director of Co Sport Pty Ltd and Proplanet Pty Ltd. His previous executive positions include Managing Director, George Weston Foods and Boral Building Products, and senior management roles at BTR Nylex Ltd and ACI Ltd. In addition to Garvan, his community interests include Chairman of Outcomes Australia and Share Life Australia. He is also a member of the Corporate Committee of the Intensive Care Foundation of Australia. Mr Weinman joined the Foundation Board in 2003.
In: BioMed Central; 2006. p. Published.


Garvan Institute Publications 2006


Garvan Institute Publications 2006


68

Publications


Garvan Institute Publications 2006


130. Sutherland AP, Mackay F, Mackay CR. Targeting BAFF: Immunomodulation for autoimmune diseases and lymphomas. Pharmacol Ther 2006; 112(3):774-86.


# Financial Highlights

## Garvan Institute of Medical Research

<table>
<thead>
<tr>
<th>Income Statement</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHMRC Grants</td>
<td>6,810</td>
<td>8,465</td>
<td>9,244</td>
<td>12,080</td>
<td>13,832</td>
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<tr>
<td>Other Peer Reviewed Grants</td>
<td>3,638</td>
<td>5,636</td>
<td>6,222</td>
<td>6,865</td>
<td>8,184</td>
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<tr>
<td>Other grants</td>
<td>241</td>
<td>751</td>
<td>481</td>
<td>200</td>
<td>655</td>
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<tr>
<td>NSW Government Grant</td>
<td>3,597</td>
<td>5,229</td>
<td>2,880</td>
<td>3,720</td>
<td>12,174</td>
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<tr>
<td>Commonwealth Government Grant</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4,700</td>
</tr>
<tr>
<td>Commercial Collaborations</td>
<td>1,938</td>
<td>2,141</td>
<td>1,269</td>
<td>2,043</td>
<td>4,091</td>
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<tr>
<td>Garvan Research Foundation</td>
<td>1,822</td>
<td>2,054</td>
<td>1,671</td>
<td>2,343</td>
<td>2,562</td>
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<tr>
<td>Other Income</td>
<td>2,770</td>
<td>2,800</td>
<td>2,579</td>
<td>2,774</td>
<td>2,916</td>
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<tr>
<td><strong>Total Operating Income</strong></td>
<td>20,816</td>
<td>27,076</td>
<td>24,346</td>
<td>30,025</td>
<td>49,114</td>
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<tr>
<td>Remuneration Costs</td>
<td>12,577</td>
<td>14,367</td>
<td>14,879</td>
<td>17,377</td>
<td>21,983</td>
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<tr>
<td>Research Expenditures</td>
<td>4,198</td>
<td>4,433</td>
<td>4,854</td>
<td>4,506</td>
<td>5,607</td>
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<tr>
<td>Capital Equipment</td>
<td>1,225</td>
<td>2,395</td>
<td>3,202</td>
<td>1,896</td>
<td>2,986</td>
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<tr>
<td>Administration and Information Technology</td>
<td>2,144</td>
<td>2,116</td>
<td>2,394</td>
<td>2,931</td>
<td>3,913</td>
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<tr>
<td>Building and Scientific Operations</td>
<td>2,181</td>
<td>2,016</td>
<td>1,891</td>
<td>2,378</td>
<td>2,438</td>
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<td><strong>Total Operating Expenses</strong></td>
<td>22,325</td>
<td>25,327</td>
<td>27,220</td>
<td>29,088</td>
<td>36,927</td>
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<td>Building Asset Amortisation</td>
<td>(1,171)</td>
<td>(1,171)</td>
<td>(1,171)</td>
<td>(1,171)</td>
<td>(1,171)</td>
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<tr>
<td>Transfer from/(to) Building Reserve</td>
<td>1,047</td>
<td>1,047</td>
<td>1,047</td>
<td>1,047</td>
<td>(1,353)</td>
</tr>
<tr>
<td>Transfer from Building Maintenance Reserve</td>
<td>473</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Endowment Grants</td>
<td>3,583</td>
<td>2,398</td>
<td>1,250</td>
<td>745</td>
<td>10,965</td>
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<tr>
<td>Endowment Earnings</td>
<td>1,146</td>
<td>394</td>
<td>463</td>
<td>1,011</td>
<td>2,181</td>
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<tr>
<td><strong>Net Income/(Loss)</strong></td>
<td>3,569</td>
<td>4,417</td>
<td>(1,285)</td>
<td>2,569</td>
<td>22,809</td>
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<tr>
<td>Accumulated Deficit Brought Forward</td>
<td>(4,247)</td>
<td>(3,602)</td>
<td>(797)</td>
<td>(3,247)</td>
<td>(3,514)</td>
</tr>
<tr>
<td>Transfer from/(to) Research Program Reserve</td>
<td>249</td>
<td>510</td>
<td>583</td>
<td>1,110</td>
<td>(107)</td>
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<tr>
<td>Transfer from/(to) Endowment Reserve</td>
<td>(3,173)</td>
<td>(2,122)</td>
<td>(582)</td>
<td>(1,726)</td>
<td>(11,809)</td>
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<tr>
<td>Transfer to Infrastructure Expense Reserve</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(1,552)</td>
</tr>
<tr>
<td><strong>Accumulated Surplus/(Deficit)</strong></td>
<td>(3,602)</td>
<td>(797)</td>
<td>(3,247)</td>
<td>(3,514)</td>
<td>5,827</td>
</tr>
</tbody>
</table>

The figures from 2003 onwards reflect the adjustments in respect of the adoption of the Australian Equivalents to International Financial Reporting Standards.
## Financial Highlights

Garvan Institute of Medical Research

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</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><strong>Current Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building and Land</td>
<td>3,038</td>
<td>5,118</td>
<td>3,672</td>
<td>5,632</td>
<td>18,236</td>
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<tr>
<td>Investments at Market Value</td>
<td>39,712</td>
<td>38,541</td>
<td>37,371</td>
<td>36,200</td>
<td>36,879</td>
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<tr>
<td><strong>Total Assets</strong></td>
<td>49,949</td>
<td>52,980</td>
<td>50,946</td>
<td>53,462</td>
<td>75,651</td>
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<tr>
<td><strong>Current Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,274</td>
<td>2,493</td>
<td>2,949</td>
<td>3,547</td>
<td>6,963</td>
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<tr>
<td><strong>Provisions</strong></td>
<td>1,778</td>
<td>2,220</td>
<td>2,061</td>
<td>2,457</td>
<td>3,069</td>
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<td><strong>Borrowings</strong></td>
<td>6,000</td>
<td>6,000</td>
<td>6,000</td>
<td>6,000</td>
<td>-</td>
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<tr>
<td><strong>Total Liabilities</strong></td>
<td>11,052</td>
<td>10,713</td>
<td>11,010</td>
<td>12,004</td>
<td>10,032</td>
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<tr>
<td><strong>Accumulated Deficit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3,602)</td>
<td>(797)</td>
<td>(3,247)</td>
<td>(3,514)</td>
<td>5,827</td>
<td></td>
</tr>
<tr>
<td><strong>Reserves</strong></td>
<td>42,499</td>
<td>43,064</td>
<td>43,183</td>
<td>44,972</td>
<td>59,793</td>
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<tr>
<td><strong>Total Net Funds</strong></td>
<td>38,897</td>
<td>42,267</td>
<td>39,936</td>
<td>41,458</td>
<td>65,620</td>
</tr>
</tbody>
</table>

The figures from 2003 onwards reflect the adjustments in respect of the adoption of the Australian Equivalents to International Financial Reporting Standards.
Financial Highlights
Garvan Research Foundation

<table>
<thead>
<tr>
<th>Statement of Funds</th>
<th>2002 $'000</th>
<th>2003 $'000</th>
<th>2004 $'000</th>
<th>2005 $'000</th>
<th>2006 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donations &amp; Pledges</td>
<td>2,224</td>
<td>3,313</td>
<td>3,276</td>
<td>2,524</td>
<td>3,826</td>
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<td>Events</td>
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<td>Interest and Other income</td>
<td>25</td>
<td>44</td>
<td>17</td>
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<tr>
<td><strong>Total Income</strong></td>
<td><strong>4,186</strong></td>
<td><strong>5,187</strong></td>
<td><strong>3,560</strong></td>
<td><strong>3,760</strong></td>
<td><strong>14,494</strong></td>
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<tr>
<td>Fundraising Expenses</td>
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<td>Public Awareness Program</td>
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<tr>
<td><strong>Net Funds Raised</strong></td>
<td><strong>3,700</strong></td>
<td><strong>4,405</strong></td>
<td><strong>2,862</strong></td>
<td><strong>3,087</strong></td>
<td><strong>13,476</strong></td>
</tr>
<tr>
<td>Accumulated Funds Prior Years</td>
<td>17</td>
<td>(159)</td>
<td>189</td>
<td>130</td>
<td>129</td>
</tr>
<tr>
<td>Funds Available for Grants to instute for:</td>
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<td>4,246</td>
<td>3,051</td>
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<td>Endowment Funds</td>
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<td>2,003</td>
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<td><strong>Total Grants</strong></td>
<td><strong>3,876</strong></td>
<td><strong>4,057</strong></td>
<td><strong>2,921</strong></td>
<td><strong>3,088</strong></td>
<td><strong>13,527</strong></td>
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<td>Accumulated Funds Carried Forward</td>
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<td>189</td>
<td>130</td>
<td>129</td>
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<td>Represented By:</td>
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<td>Less: Liabilities</td>
<td>429</td>
<td>70</td>
<td>67</td>
<td>53</td>
<td>173</td>
</tr>
<tr>
<td><strong>Net Assets</strong></td>
<td>(159)</td>
<td>189</td>
<td>130</td>
<td>129</td>
<td>78</td>
</tr>
</tbody>
</table>

The figures from 2003 onwards reflect the adjustments in respect of the adoption of the Australian Equivalents to International Financial Reporting Standards.
The Garvan’s mission is to make significant contributions to medical science 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.

More information about our research and our staff can be found on Garvan’s website: www.garvan.org.au

During 2007, further website changes will be made to reflect the more efficient and increased use of the online medium.