



# breakthrough

GARVAN NEWSLETTER APRIL 2008 / ISSUE 07

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Bitter melon has therapeutic properties for treating Type 2 diabetes

Garvan has teamed with the Shanghai Institute of Materia Medica to uncover the therapeutic properties of bitter melon, a vegetable and traditional Chinese medicine, effective in treating Type 2 diabetes. Researchers pulped a tonne of fresh bitter melon to find four very promising bioactive components that activate the enzyme AMPK – a protein well known for regulating metabolism and enabling glucose uptake. We can now understand at a molecular level why bitter melon works as a treatment for diabetes. It will now be possible to investigate how these compounds work together in our cells.

Dianne Lavender, Editor

## Making News

■ Researchers in our Neuroscience Program have shown a hormone released naturally from the gut could be used to treat obesity and Type 2 diabetes. The hormone peptide YY (PYY) is released into the blood after a meal and acts on the brain contributing to a feeling of satiety and inhibiting the desire to continue eating.

■ A significant new finding by our Bone and Mineral Program indicates that low levels of testosterone in men double their risk of bone fracture. Thirty percent of the 110,000 osteoporotic fractures experienced in Australia each year occur in men. Researchers from the program have also developed a simple web-based tool which

allows anyone over 60 to predict their individual risk of bone fracture. The tool is accessible online at [www.fractureriskcalculator.com](http://www.fractureriskcalculator.com)

■ Bill Ferris, Garvan's Chairman, was recognised with an Australia Day Honour. Bill was appointed a Companion of the Order of Australia (AC) for his service to the community as a leader in support of medical research and for his range of philanthropic endeavours. Professor Lesley Campbell was awarded an AM in recognition of her outstanding contribution to medical research and diabetes care.

■ Professor David James and Dr Jerry Greenfield have been awarded a Diabetes

Australia Millenium Grant to progress new research to better understand the insulin action pathway in humans with insulin resistance and Type 2 diabetes. This research will bring us one step closer to understanding the mechanism of insulin resistance.

■ The team from Garvan's B cell Immunobiology research group, led by Dr Robert Brink, have taken a significant step towards demystifying a critical process within our immune system. The team has identified two proteins made inside B cells, TRAF2 and TRAF3, that are essential for controlling the important balance of B cells - a key part of our immune response.



## Opinion



2008 is promising to be another outstanding year for medical research as we witness exciting worldwide progress in many important areas. Garvan is playing its role in these developments

- all of our research programs and their extensive international collaborations are promising some important outcomes during the year. These include understanding the role of the brain hormone PYY in appetite, diabetes and anorexia; how certain genes regulate development of our immune cells; which growth factors regulate our own stem cells and how to use these to replace cells lost in degenerative disorders such as Alzheimer's and Parkinson's.

Although the excitement of discovery is a major driver for Garvan researchers, the opportunity to convert these research discoveries into improved ways to prevent and treat disease is more real today than ever before. This of course applies to all the major disorders that we work on, but none more so than cancer. Our collective insight into the gene mutations leading to the initiation and progression of different cancers is truly breathtaking and provides many opportunities to develop new and far more effective ways to prevent and treat different cancers. Against this background of rapid research progress, we have joined in close partnership with St Vincent's and Mater Health to establish the Garvan St Vincent's Campus Cancer Centre where the latest research discoveries can be closely integrated with the very best patient care in an 'individualised' approach.

While 2008 marks only the beginning of this exciting initiative, it is an integral part of the future of health care. Already we have similar very successful research/clinical relationships in both our diabetes and obesity program and osteoporosis and are working hard to develop similar initiatives in the other main areas of Garvan research. In this way, we hope that Garvan research in 2008 will be remembered as a year when the 'excitement of discovery' was closely linked to real improvements in quality of life.

**Professor John Shine AO FAA**  
Executive Director

## Did you know?

Nine out of ten women who develop breast cancer do not have a family history of the disease.

## Donor Profile: Support for Dubbo Study

Garvan is extremely grateful to the Ernest Heine Family Foundation and Mrs Janice Gibson, longstanding supporters of medical research in Australia. The Foundation chose to make a major three year philanthropic commitment at a time when the longevity of the Dubbo Osteoporosis Epidemiological Study (DOES) was endangered due to a shortfall in Federal Government grant funding. The Foundation is extremely strategic about its giving and aims to make a significant difference in supporting real outcomes for the community.



Glenys Hubbard is doing the 'Touch Test' on a patient in Dubbo to measure the sensation in the leg

Initiated in 1989, DOES first aimed to identify the scope of osteoporosis as a clinical problem and the parameters that indicate risk. Models and screening tools were then developed to predict absolute risk of osteoporosis. The next phase involves dissemination of some of these tools to general practitioners and the general community, such as the new online tool [www.fractureriskcalculator.com](http://www.fractureriskcalculator.com)

## Quiz

1. In what year did the German physician Dr Alois Alzheimer first describe the disease that bears his name?
2. Which neurotransmitter is depleted in Parkinson's disease patients?
3. What are the two most common types of arthritis?

Answers:  
1. 1906  
2. Dopamine  
3. Rheumatoid and osteoarthritis

## Researcher Profile: Tuan Nyugen

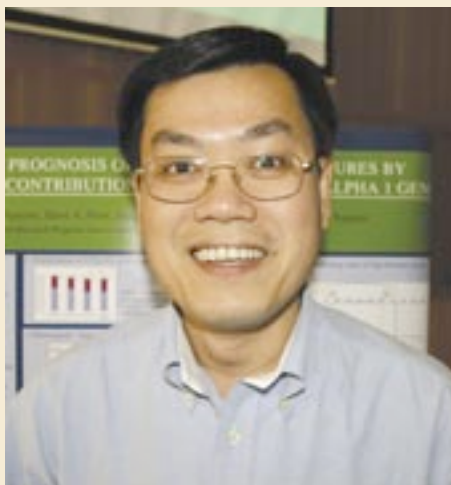
### What is the current focus of your research?

Our Epidemiology and Genetic research group is actively involved in two lines of work: applied and genetic research. In applied research, we are interested in the development of prognostic models for individualising the risk of bone fracture for anyone by using a genetic, clinical and lifestyle profile. In the discovery work, we are working on a number of projects to identify novel genes that are linked to or associated with the risk of osteoporotic fracture.

### What are some of the recent findings from your work?

We have developed and published a prognostic model for assessing the risk of hip fracture in an individual. This model makes use of simple data such as age, bone mineral density, history of fracture, and history of falls. The work has been well received in the osteoporosis field.

Many men and women die after breaking their bones, and it has been a mystery why they died. Our recent work indicates that more than 30% of fracture-related deaths are due to low bone mineral density, excessive bone loss, weight loss, and increased weight fluctuation.



### What is the biggest challenge in your area of research?

Coming up with new ideas is always a challenge because so many good ideas have been explored or investigated by previous scientists.

### What do you enjoy doing away from the research lab?

I enjoy reading the philosophy of science, history of medicine, and literature. My current readings are *Intellectual Impostures* by Alan Sokal and Jean Bricmont, and *Why We Get Sick* by Randolph Nesse and George Williams. Apart from work, I am a columnist for some science magazines in Vietnam.

## Ask Garvan...

### 1. What's inside Garvan's Imaging Unit?

Garvan strives to provide state-of-the-art facilities for our scientists to share, such as our Imaging Unit. The Unit houses the latest microscope equipment, reagents and expertise to further understand the biological aspects of disease at the cellular level. It holds five principal microscopes capable of imaging tissue, cells or intracellular organelles and molecules using a variety of transmitted light and fluorescence-based techniques. This means that researchers can study cell activity and reactions at the molecular level, over time and in real time – which is absolutely key to our ability to understand, treat and cure disease.

As part of our collaboration with the broader research and medical community, Garvan offers access to this facility across the St Vincent's Hospital precinct and to researchers from the University of Sydney and the University of NSW, the Kolling and Victor Chang Institutes and St George Hospital.

### 2. What does the Affymetrix MicroArray System do?

Garvan was the first in Australia to install this technology in 1999, which through miniaturization and advanced bioinformatics algorithms allows us to map the activity of genes in DNA from healthy versus ill patients and identify which genes are under- or over-expressed in a certain disease. For example, thanks to the Affymetrix we can measure the changes in the level or modification of every gene during the development of a specific cancer, or correlate the inheritance of a specific gene with susceptibility to disease or response to a potential new therapy.

Systems such as the Affymetrix are used by leading research labs around the world to uncover new pathways for regulation of cellular functions, confirm mechanisms of action, validate drug targets, classify diseases, analyse toxicological responses, and develop diagnostics. Thanks to a gift from the Macquarie Goodman Foundation, we were able to upgrade our Affymetrix suite in 2007.

Philanthropic donations to support the purchase and upgrading of critical shared equipment such as these microscopes and gene analysis tools are vital to Garvan's progress, as the Government grant funding that our scientists compete to secure does not usually cover such items.

If you are interested in helping Garvan provide state-of-the-art equipment and technology for our scientists contact Carole Renouf on (02) 9295 8114, or [c.renouf@garvan.org.au](mailto:c.renouf@garvan.org.au).

**If you have a question you'd like to ask Garvan, please send it to the editor at [d.lavender@garvan.org.au](mailto:d.lavender@garvan.org.au)**

## Thank you for making a difference in 2007

Through the generosity of 4,787 individuals and organisations Garvan received philanthropic gifts totalling **\$7.2 million** in 2007. This included \$1.8 million given as legacies to our community's future health through bequests.

Every single donation we received, large or small, made a very welcome and much needed contribution to our breakthrough medical research. Your help has enabled us to support our researchers – some of

the finest international scientific minds – and provide the essentials required for world-class research, from sophisticated microscopy and gene-chip equipment, expensive chemical antibodies, to the humble petrie dish and test tube.

If you would like further information about our work, or would like to make a suggestion or comment, please call Supporter Services on **1300 73 66 77** or email [foundation@garvan.org.au](mailto:foundation@garvan.org.au).



## Making Our Mark in 2007 – Our Major Breakthroughs

Garvan researchers made significant progress across all research groups in 2007, leading to better treatments for disease, greater understanding of what causes disease and risk factors. Here are some of our major breakthroughs from 2007.

### Neuroscience

Garvan's Director of Neuroscience Herbert Herzog was part of a breakthrough collaboration with researchers from St Vincent's Hospital and the University of New South Wales which uncovered the major role played by a particular molecule, MIC-1, in the control of appetite.

The research has given new hope to people in the later stages of cancer who suffer extreme weight loss which often speeds death. It may soon be possible to prevent this condition, giving people the strength to survive treatment and improve their chances of recovery. Similarly, this finding could have a significant impact on people with severe obesity by providing the basis for a treatment to reduce appetite.

The researchers have shown that most major cancers produce large amounts of a molecule known as MIC-1, which targets receptors in the brain that switch off appetite. The study revealed that if a human cancer making a lot of MIC 1 is grafted onto a mouse, that mouse lost weight dramatically. When the researchers injected the mouse

with an antibody that "mopped up" MIC-1, the weight loss was reversed. In effect, they rescued the mouse from the excessive influence of MIC-1.

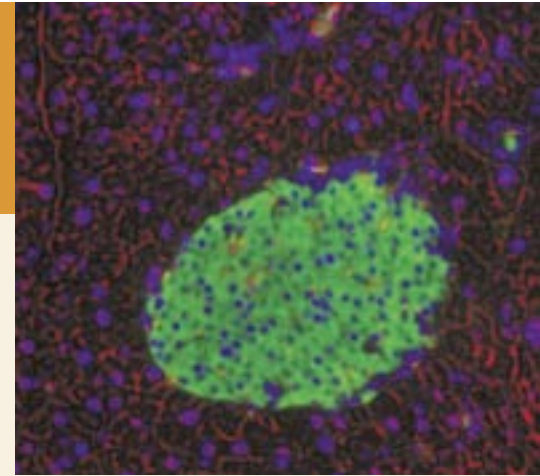
It is hoped that in the near future the MIC-1 findings will prevent a sizeable proportion of advanced cancer patients from literally wasting away. Researchers from St Vincent's Hospital hope to develop a human antibody against MIC-1 in the next few years.

Researchers in the Neuroscience Program have also made significant progress in the areas of neurological disease, hearing loss and appetite and weight regulation.

### Diabetes

Researchers in Garvan's Diabetes Signalling Unit identified a very important biological target that will help address one of the underlying causes of diabetes and pave the way for improved treatment.

People with Type 2 diabetes do not produce enough insulin, a hormone made in the pancreas that helps convert sugar in our blood into energy in our muscles. Associate Professor Trevor Biden and Dr Carsten Schmitz-Peiffer have identified an enzyme known as "PKCepsilon" (PKCe) that is active during diabetes and blocks the availability of insulin. Inhibiting this enzyme would allow the insulin producing cells of the pancreas to do their job.



Islet of Langerhans (containing insulin-producing beta cells)

While current therapies can force the body to produce more insulin, no existing drug does what a PKCe inhibitor would do, and that is to only act on the diabetic pancreas, allowing it to produce insulin when most needed, just as glucose levels rise after a meal. In other words, normal function would be restored.

### Osteoporosis

In early 2007 Garvan researchers in the Osteoporosis Program were advising men to watch their step when their latest research showed that men and women were equally at risk of developing osteoporosis after the age of 60. This finding debunks the common public perception that osteoporosis affects mainly elderly women.

The research found that once men over the age of 60 have had a fracture, around one in three will have another broken bone within a few years. So while women are initially twice as likely as men to have a fracture, once the first break occurs, the risk of a second substantially increases and the protective effects of being male disappear.

Based on these results leading study author, Dr Jacqueline Center is encouraging anyone, both men and women, over 50 years of age, with a fracture of any kind resulting from a minimal injury to investigate the fracture and get treatment for osteoporosis. By seeking proper treatment the likelihood of another fracture will be halved.

## Cancer

Garvan initiated the first trial of a biomarker for prostate cancer outcome in Australia. This follows the discovery in 2006 by Garvan researchers of a new marker for identifying aggressive prostate cancers.

Men with low levels of the marker called AZGP1 in the prostate at the time of surgery have a greatly increased risk of developing life-threatening metastatic cancer – where the cancer spreads to other parts of the body such as the bones. This new marker has made it possible to identify men who would benefit from a more aggressive treatment at the time of surgery when the cancer may be curable. Men at a lower risk of metastatic disease will also benefit by deferring treatments that have a negative impact on quality of life.

The new trials, if successful, will lead to the adoption of an AZGP1 test in clinical practice – representing a major advance in the treatment of prostate cancer sufferers.

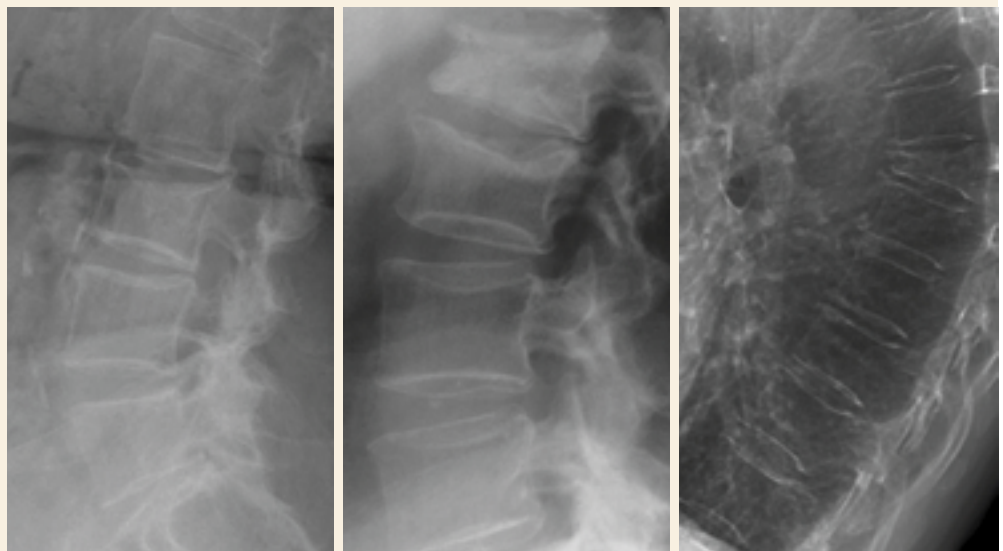
In addition, researchers in the cancer program made significant breakthroughs in breast, head and neck, lung, ovarian and pancreatic cancer.

## Immunology and Inflammation

Garvan researchers in the Asthma Program have made significant inroads in developing new therapeutic approaches for the disease. A new antibody to combat the actions of cytokine GM-CSF is ready for toxicology studies and pre-clinical development. The excessive activity of GM-CSF has been observed in asthma and many other inflammatory diseases. Researchers have shown that by removing or neutralizing its activity in mice asthma and arthritis can be suppressed or stopped. Garvan hopes to take this antibody into Phase 1 clinical trials in the next two years.

## Impact factor of scientific publications

Breakthrough research by Garvan scientists appeared in 153 publications in 2007. Each paper published constitutes a new piece of knowledge, and scientists aim to publish in the most highly regarded journal in their research field. Each journal has an 'impact factor' which is a common measure of its relative importance within a specific discipline. Research organisations use 'average impact factor' measurements to determine the overall significance of their research output. For example, in 2007 Garvan achieved an "average impact factor" of 8.2 for the top 80% of its publications. This is an excellent score, well above the international benchmark.



Fractured bone in the spine



## Witchery Fights Breast Cancer

Witchery and Garvan have been joining forces for over a decade to fight breast cancer with excellent results. Through their Australia-wide retail network Witchery, with NSW State Manager Gay Riley's assistance, has raised close to \$500,000 for breast cancer research by selling pink ribbons. The donations have enabled Garvan to purchase vital equipment and resources to continue its work.



L to R: Lisa Cary, Jodi French, Carole Renouf, Gay Riley and Nicki Makris

The research team at Garvan is focused on developing a deeper understanding of breast cancer at the genetic and molecular levels. Breast cancer remains the most commonly diagnosed cancer in women with a lifetime risk of approximately one woman in 10 developing the disease. However, research discoveries and improvements in treatment are having very significant impacts on survival. In 1980 only 75% of women were alive five years after a diagnosis of breast cancer. In 2004 this figure had increased to 88% and to a remarkable 97% if the cancer was localised to the breast. Garvan's researchers are developing new approaches to the diagnosis and treatment of breast cancer which will ensure even better outcomes for women in the future. Garvan thanks Witchery for its kind support and its ongoing commitment to the fight against breast cancer.

## Novartis Christmas Gift

Garvan's Bone and Mineral program received a wonderful Christmas present in December last year when Novartis executives presented a \$100,000 gift to support Garvan's epidemiological study based in Dubbo, NSW. Dr Martin Cross (Managing Director), Dr Victor Ferrari (Medical Advisor), Dr Christina Frenzel (Medical Scientific Liaison) and Matthew Cuming (Corporate Affairs) made the presentation to Professor John Eisman, Director of the Bone and Mineral Program.

## Staff Profile: Lynn Croft

### How long have you been working at Garvan and what were you doing before then?

I've been at Garvan for nearly 10 years - and I still love every minute of it! I started in a research role as the Diabetes Laboratory Manager. Seven years ago I moved into an operations support role. Currently I am the Building Services & Compliance Manager.

Before Garvan I spent 10 years at John Curtin School of Medical Research in Canberra working in genetics and diabetes research. I also spent five very exciting years in Papua New Guinea as a volunteer science teacher in a government high school.

### What do you enjoy about working at Garvan?

I take great pride in working at Garvan. It is a pleasure walking into the building each day. Architecturally it is a beautiful working environment. I think the majority of people working here feel the same and

this contributes to the excellent working atmosphere. I believe the great working environment contributes to the dedication of the scientists to the research here. I also think it is fabulous that our scientists have the best resources at hand to support their research work.

### Describe a typical day.

I wear two hats - as Building Services Manager I oversee building cleaning, security and reception, as well as the usage and maintenance of all non-scientific facilities such as the cafe, galleria, auditorium and meeting rooms. My typical day involves inducting new staff and students; meeting with staff regarding their needs, and then coordinating whatever is required to meet those needs. As Compliance Manager I advise scientists on what they need to do to comply with government regulations relevant to laboratories and other scientific facilities.



### What challenges are there working at Garvan?

Keeping up with the ever increasing need to support the rapid growth of the Institute.

### What do you enjoy doing away from Garvan?

I enjoy yoga, as well as spending time relaxing socially over a nice meal with friends. Every year I look forward to travelling to Scotland to visit my family.



Steve Rogers

## A Celebration of Two Lives

Rugby league legend Steve Rogers tragically passed away in January 2006. His legacy on the sporting field is well known by rugby league fans around the world, although many may not be aware of the important legacy he leaves off the field.

Throughout his successful sporting career Steve faced considerable personal tragedy losing both his parents to cancer and his first wife to breast cancer within a short period of time. In 2000 Steve set up an annual charity event which became the Carol Rogers Memorial Charity Golf Day in 2001 after his wife's death. He chose to donate funds raised from this event to the Garvan Institute's breast cancer program.

Since the inaugural event Steve and dedicated organisers Craig and Janine Pinn have continued to donate to Garvan and have raised over \$122,000 for breast cancer research. Last year's event, held in November, secured a further \$25,000.

Steve's son Mat Rogers, who has forged his own successful sporting career, plays a key role in the event alongside his brother Don to ensure his father's legacy lives on. The event is now the Carol and Steve Rogers Memorial Charity Day. "The event is a great celebration of two lives but even more so with their passing we have the opportunity to make a difference," says Mat.

## Young Garvan 2008

Young Garvan have been busily planning activities for 2008 to ensure it's an exciting and eventful year for all of our supporters. With three free forums, two evening VIP tours of Garvan, and an end of year event that is not to be missed, 2008 is the year to get on board and become a Young Garvan supporter!

Free forum dates and topics are:

**April 17th**

**East vs West: What has Western Medicine learnt from the East?**

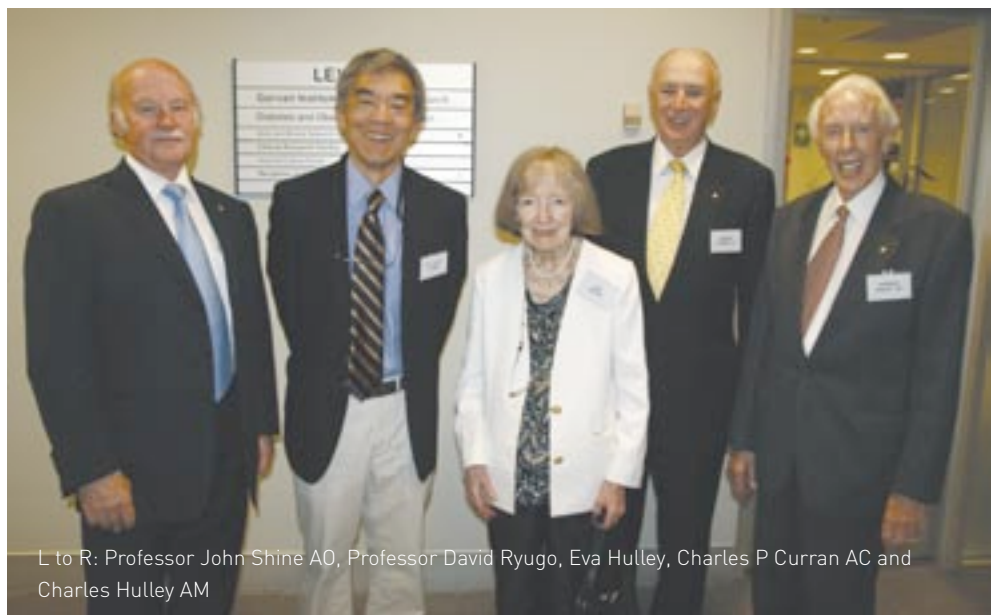
**July 10th**

**The Science of Having Babies: How late can I wait?**

**October 16th**

**A surprise!**

The VIP evening tours are to be held on **June 5th** and **August 21st**. Places are limited and booking is essential. Please contact Nikki on **(02) 9295 8108** or **email [n.alling@garvan.org.au](mailto:n.alling@garvan.org.au)**



L to R: Professor John Shine AO, Professor David Ryugo, Eva Hulley, Charles P Curran AC and Charles Hulley AM

## Curran Support for Hearing Loss

On Valentine's Day 180 Curran Foundation supporters gathered at the Garvan to learn more about Garvan research and specifically welcome the inaugural Curran Foundation Chair in Neuroscience, Professor David Ryugo. The Chair was established with a \$1 million gift from the Curran Foundation and Garvan was extremely fortunate to recruit Professor Ryugo who boasts a long and distinguished career at Johns Hopkins University. Professor Ryugo, who studies the fundamental processes of hearing, and its counterpart deafness, in the brain will collaborate closely with Garvan's existing hearing loss research program led by Dr Sharon Oleskevich.

## Volunteers Needed for Clinical Trials

Clinical trials are essential to progress our work and provide a more accurate method of understanding how things work in the human body. We are currently recruiting for trials, so if you meet the various prerequisites and if you are interested in helping with our research in this way, we would like to hear from you.

### RESEARCH INTO HORMONES AND BODY FAT:

Garvan and St Vincent's Hospital are looking for healthy men and postmenopausal women, aged 50-80 years, for research into hormones and body fat.

This study involves five relatively long visits to Garvan over a 10 week period, to undergo

investigations into the effects of two commonly used medications, Raloxifene and Tamoxifen, on the burning of fat and protein in the body.

If you are interested and would like more information please contact Clinical Research Nurse, **Jennifer Hansen** on **(02) 9295 8231**.

### DIABETES RISK FACTORS:

Men and women volunteers are required aged 40-70 years. We are looking for people without diabetes and with diabetes (but not if treated with insulin). You will be reimbursed for time and travel. If you are interested and would like more information contact **Katherine Tonks** on **(02) 9295 8218**, or email **k.tonks@garvan.org.au**

## Coming Up

Don't forget to mark the following free public seminars in your diaries:

### Wednesday 9th April

#### Healthy Ageing

10am – 12:30pm (doors open at 9am)

### Tuesday 6th May

#### Bowel and Prostate Cancer

10am – 12pm (doors open at 9am)

All seminars are held at 384 Victoria Street, Darlinghurst. Bookings are essential.

Please call **(02) 9295 8110** or register online at **www.garvan.org.au**

The 2008 Free Public Seminar Series is generously sponsored by the Alcoa Foundation.

## In memoriam November 07 - February 08

We gratefully acknowledge gifts received in memory of:

Ivy Byatt	Paul Gazey	Mrs Incherah Omar
Anna Costan	Helen Humphrey-Reeve	Greg Park
Bob Crofts	Marjorie Kent	Beth Phippen
Michael John Ditchburn	Alan Kneeshaw	Kim Snoeys
Jack Egan	Philipa Lillia	Christakis Soupidis
William Malcolm Ferris	Susan Lumsdon	Katie Speros
William Forsyth	Kevin Muston	Pamela Trotter

## Be part of progress

Please use this coupon if you would like to make a donation to Garvan's breakthrough medical research, or if you would like further information. We would love to hear from you.

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