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Cooper James and Molly Louise Thatcher

Double but no trouble

Michelle and Andrew Thatcher are the proud parents of not one, but two healthy young babies. Molly Louise and Cooper James.

Only last year, the couple were grieving the loss of their first child, 11 month-old Claudia-Rose, who died from the debilitating spinal muscular atrophy, type 1.

The terrible experience inspired Michelle and Andrew to try and do something to spare other parents the same anguish.

They decided to support the work of the Children's Medical Research Institute through its Jeans for Genes Day® campaign and last year they paid the highest price at the jeans art auction for a David Boyd image of an angel on Nikki Webster's jeans – over \$22,000.

"The twins were conceived using IVF. We had learnt that there was a one in four chance that our future children would have the same disease so we opted for pre-implantation diagnosis," says Michelle.



Director's desk



In the August 2001 issue of "Under the Microscope" I summarised the issues central to the controversy

surrounding the use of human embryonic stem cells in biomedical research. More recently, there has been widespread discussion in the media, often misinformed, as a consequence of the proposed introduction of Federal legislation to control the use of these cells. In this issue, Patrick Tam provides a realistic appraisal of the current state of this research field, clearly outlining why, ethical issues to one side, the Institute confines its research to mouse embryonic stem cells.

The ethical issue, however, is a major one and the outcome for the proposed Federal legislation might be surprising to many if a "conscience vote" is permitted to members of Parliament. One has only to look at the extensive debates that have occurred in other democratic societies to appreciate the difficulties that have been encountered in attempting to resolve the issues.

Nevertheless, we live in a pluralistic, humanistic society and some stringent rules have to be applied to restrict the activities of individuals, often with doubtful scientific credentials, who will be seeking to gain commercial benefit from their work while claiming to pursue altruistic goals.

A great deal of research is ahead of us before we can realistically approach the possible replacement of human tissues, particularly those damaged by ongoing disease processes such as diabetes, Parkinson's and Alzheimer's disease.

Professor Peter Rowe



Highlighting the problem in cancer

Only nine months into his PhD studies, Jeremy Henson of the Cancer Research Unit is already making his mark. He presented his early results in poster form at the 14th Annual Lorne Cancer Conference held in Victoria in February and was awarded the BD Biosciences Excellence Award for his work.

Jeremy's poster described two new staining techniques developed for analysing cancer cells that will greatly help the laboratory's research, and should ultimately lead to improved diagnosis, prognosis and treatment options for cancer patients.

Jeremy is part of the CMRI team who are working to understand the 'ALT' mechanism that some cancer cells use to keep multiplying (see February 2001 issue). Other cancer cells use an enzyme called telomerase to do the same job. The new methods highlight a feature unique to ALT cancer cells, so that they can be seen under the microscope. "Pathologists usually preserve samples of tumours in paraffin wax blocks so the techniques are designed to work for these samples," says Jeremy, "but they also work in fresh tissue and are even sensitive enough to detect ALT in the very small biopsy samples sometimes used in cancer diagnosis."

"This means that we can now go back through many archived samples of tumours stored by pathologists and get much more information," Jeremy said. "We want to find out which kinds of cancers use the ALT mechanism and match that with the severity of the cancer and the outcome for the patient." When cancer drugs designed to block the ALT or telomerase mechanisms become available the new techniques will also help to identify the best treatment for the patient.

"Jeremy is one of several talented new arrivals in the Cancer Research Unit," said Unit head, Dr Roger Reddel, "Jeremy is a qualified medical doctor, who also has a double honours degree in pure mathematics and molecular biology. We have high hopes that Jeremy and the other members of the team will play a major part in making the discoveries that we urgently need for improving cancer treatment."

The Excellence Award came with a \$300 prize and Jeremy decided to share this with his co-workers to take them on a "team building" excursion. In March, they headed for Murrumbidgee National Park in NSW to go 'Rogaining' - "like Orienteering, but more fun," says Jeremy. With many new members joining the laboratory recently, getting lost in the bush together was the perfect way to break the ice!

The results of the staining technique can be seen in the 'O' on the front cover. A sample of a brain tumour was stained and examined under the microscope. The red blotches seen inside the blue-stained nuclei of the cells are unique to tumour cells that use the ALT mechanism.

Pictured Above: Jeremy Henson (kneeling in front) with colleagues from the Cancer Research Unit on their Rogaining excursion.

Scientists at the Children's Medical Research Institute are not pursuing human embryonic research. Instead they feel that there is much still to be learned from studies of animal embryos, and that these hold the key to finding less controversial ways to treat human disease.

Embryonic Stem Cells

What are they & what is CMRI's position?

Adult stem cells – an alternative?

Adult stem cells exist in our mature adult tissues. They are immature cells that are able to divide and then mature further to provide new tissue to repair and maintain our bodies. However, these cells are limited in that they will only turn into defined tissues, rather than being able to form ALL the tissues required to make a whole organism; only embryonic stem cells are capable of this. For example, bone marrow contains stem cells that will differentiate into the different types of blood cells that we need. Our skin contains stem cells that divide and mature to replace the skin cells that we shed every day. Muscle, liver and bone also contain their own stem cells. But in many of our tissues, particularly the brain and heart, the numbers of stem cells are limited and they are inefficient at repairing these tissues following injury or disease. As yet, there is no reliable way that we can re-programme adult stem cells to repair the damage to other types of tissues. However, there is some early, experimental evidence that a limited number of bone marrow cells may be more pliable and can actually differentiate into other cells, such as nerve and heart muscle, rather than only blood cells.

What are embryonic stem cells?

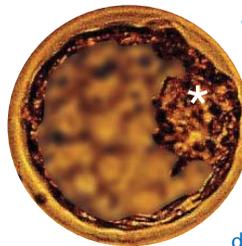
About four days after fertilisation, an embryo is comprised of a sphere of about 150 cells, the size of a full-stop (*see photo of mouse embryo, right*). The cells are distributed to two main types of tissues. The cells in the outer layer of the sphere will produce the placenta and other structures that will bring nutrients from mother to foetus. The bundle of cells inside the sphere (*marked with an asterisk in photo, right*) will develop into the foetus itself and it is these, as yet unspecialised, cells that are called embryonic stem (ES) cells.

Animal studies have shown that ES cells can be grown indefinitely in the laboratory culture dish and yet still retain the potential to turn, or 'differentiate', into all types of tissues. For this reason scientists are interested in stem cells derived from human embryos; they believe they hold the potential to repair the human body in diseases where it is unable to repair itself; for example, Alzheimer's and Parkinson's disease, spinal injuries or diabetes.

Embryology research at CMRI – of mice, not men

Mice are often used in studies of embryo development as they are genetically similar to humans and the embryo follows the same pattern of growth. "Mouse ES cells in particular are an invaluable tool for embryology research," says Dr Patrick Tam, head of CMRI's Embryology unit. "For example, when these stem cells are transplanted into another four-day old mouse embryo, they can contribute to the formation of practically every type of tissue."

Mouse ES cells have been used in this way to introduce changes to the genes of mice.



The impact of these genetic alterations on development can be assessed in the mice and their embryos.

In the last decade, a wealth of information on the function of more than 2000 genes has been collated from these so-called gene "knock-out" mice. And this brings us closer to understanding why human development can sometimes go wrong to cause congenital disorders.

ES cells can also be induced to turn into a multitude of tissues while they are still in the culture dish. This provides a useful situation in which to study the factors that trigger cells to differentiate to specific types of tissues. The ability to control the differentiation of stem cells provides insights into how such biological processes are regulated in living organisms. "But this also opens the possibility of applying this knowledge to human ES cells and then using the differentiated cells to replace unhealthy tissues for therapeutic purposes," says Dr Tam, "However, there are many ethical and technical problems with this line of research involving human embryos. So, for now, it remains unacceptable and unfeasible."

But Dr Tam believes that more research on the biology of animal embryonic stem cells will enable us to harness the potential of human adult stem cells (see panel to left). "It will give us vital clues of how to re-programme cells from adult tissues so that they can become stem cells with the potential to repair any organ or tissue. This way we would not be restricted to using embryo-derived stem cells as the only means of therapy for human diseases."

Science in the vineyards creates the perfect blend

Scientists from CMRI's Cell Signalling and Embryology Units have returned from several days in the beautiful Hunter Valley in NSW, not the worse for too much fine wine, but refreshed and brimming over with enthusiasm and new ideas for their research.

They were attending the second annual Hunter Cellular Biology Meeting. Around 100 international and Australian leaders in the fields of development and cell biology were gathered together for a frank and focussed exchange of ideas and data. Professor Keith Stanley of the Centre for Immunology at St Vincent's Hospital, Sydney, who convened the conference, had called for scientists to present works in progress and newly emerging concepts, rather than well-accepted, published results.

"That's what I really enjoyed about the meeting," says Cell Signalling Unit head Dr Phil Robinson, "lots of controversial and provocative new ideas. We were really questioning each other, both with excitement and scepticism, but that is really what helps us make progress. There was also a lot of interest in the success our group has had with using the Mass Spectrometer to identify proteins, everyone wants to know how we're doing it!" said Phil (see November 2001 issue).

Dr Patrick Tam, head of the Embryology Unit, organised and chaired the developmental biology part of the meeting and introduced breadth to the discussion by including scientists from diverse backgrounds. Young post-doctoral scientist in Dr Tam's laboratory, Dr Jacqueline Gad, really valued the chance to attend the conference, "The opportunity to integrate our ideas with scientists from overlapping fields, that we wouldn't normally meet was really exciting," says Dr Gad.

Win a week for 2 in Italy

The Thumbelina Committee of the CMRI offers you the chance to win a trip to one of the world's most popular holiday destinations in 'AN ITALIAN AFFAIR' Grand Raffle.

The prize has been generously donated by: Emirates, the award-winning airline, who will fly you to Italy; and The Leading Hotels of the World, who will provide an optional stopover in Al Bustan Rotana Hotel, Dubai and five star luxury accommodation in the Hotel Savoy, Florence and Aldrovandi Palace, Rome (*land transfers included*).

The Grand Raffle will be drawn at 'AN ITALIAN AFFAIR' dinner on Saturday 10 August at Un Momento Restaurant, Crows Nest. Tickets \$65 per head. Raffle tickets: \$5 each, 3 for \$10 or \$65 for a book of 20.

To purchase raffle tickets or attend the dinner please send a stamped addressed envelope to: Thumbelina Committee, PO BOX 328 Lindfield 2070



Property can be a gift too!

Most CMRI supporters generously donate in the traditional way via a gift of money, or by donating their time as a volunteer. And this is the lifeblood of our organisation. But did you know that you can also donate property? Some recent changes to the taxation laws mean that it is now possible to donate a property and gain a significant tax saving for yourself.

In 1999, the rules about gifting property to organisations, like the CMRI, were changed to allow property donations valued in excess of \$5000 to be tax deductible.

Also, from 1 July 2002, the rules will be further amended to allow a donor to apportion their gift over 5 years so that, for example, for a property worth \$200,000 a tax deduction of \$40,000 can be claimed per year for 5 years. That's a very real benefit if your taxable income were to be less than \$200,000 in the year in which the gift is made!

For further information you can contact the CMRI. We can also provide a copy of a fact sheet produced by The Centre of Philanthropy and Nonprofit Studies.



Lookin' good, baby!

Jeans for Genes®
Friday August 2

Invitations to become "genies" – the volunteers who generously donate their time to organise Jeans for Genes® Day in their office or school – have already been sent out across the country. If you haven't yet received your flyer, or would like to become a genie for the first time, please contact us on 1800 677 260 or email genie@cmri.com.au. You can also register on our website www.jeans4genes.com.au.

Our new badge designs we think will sell fast, so place your orders now!

Look out also for our TV and radio ads – we think you'll love them! As in past years, the creation of the ads has been generously donated by John Bevins Advertising agency and they appear on Radio and TV as Community Service Announcements.

Tickets to the Jeans for Genes® Art Auction on 4 July at the Art Gallery of New South Wales are already selling fast. The generosity of the 16 Australian artists who have donated artworks specially created for the CMRI in the theme of "Generations" for this year's auction cannot be underestimated. The artworks will also be toured to the Gold Coast, 19 – 21 June at the Sheraton Mirage, and Melbourne, 26 – 28 June at the Windsor Hotel. You can view the artworks on our website www.jeans4genes.com.au

For further details of these events please contact us on (02) 9687 2800 or email events@jeans4genes.com.au

A Wellcome success

CMRI's newest laboratory head, Dr Tracy Bryan, has beat stiff competition to win two prestigious research grants that will give the newly formed Cell Biology unit at CMRI the boost it needs for the laboratory's research to really take off.

Dr Bryan joined CMRI in October 2001 as head of the new Cell Biology Unit (see Nov. 2001 issue). In March this year, she travelled to South Africa to take part in a week-long interview and selection process with a group of other highly promising young researchers for the Wellcome Trust's International Senior Research Fellowship.

The Wellcome Trust is a British-based independent research charity and the largest of its kind in the world. It is renowned for providing funding for only the highest quality research scientists and projects. "Despite what was at stake, the atmosphere amongst the scientists competing for the grant alongside me was incredibly supportive and inspiring," says Dr Bryan.

Tracy came out on top and has been awarded \$1.3 million to support her research over the next five years. This will cover most research materials and allow Tracy to employ two more research assistants.



Dr Tracy Bryan (left) with current Lab members Dr Amanda Nouwens and Julie Jurczyk

CMRI will continue to add their financial backing to the group's research enabling them to fully maximise their potential.

"This fellowship was for investigators from Australia, New Zealand, South Africa and India and this is the last year Australia and New Zealand will be included in the group, so I'm really pleased I was able to bring this grant to Australia, and CMRI, for the last time," said Dr Bryan.

And in a further confirmation of Tracy's outstanding career record and future potential she has also been awarded the Amrad 2002 Postdoctoral Award. Amrad is an Australian pharmaceutical company and their award is "designed to assist in the career development of the best young scientists who are returning to Australia after a PhD or postdoctoral period overseas." It provides a one-off \$30,000 payment, for research materials and travel to conferences.



Prevention is better than cure...

And the key to prevention lies in research.
It's as simple as that!

There are over 10,000 known genetic disorders. To correct these and many other disorders research is needed to find the causes.

Here is my gift:

\$100 \$75 \$50 \$25

Other \$

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cardholder's name

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- Information on my nearest fundraising committee
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- Please update your records for my contact details

All donations are tax deductible



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Children's Medical Research Institute
Locked Bag 23, Wentworthville NSW 2145 Australia
Tel 02 9687 2800 Fax 02 9893 9166

Thanks for your help.



Clockwise from left:

Jeannie Little at the Griffith Rose Luncheon (photo courtesy of Griffith Area News);

Left to right, Ku-ring-gai President Sue Zicat with Cath Thompson, guest speaker Sally Loane and Alex Wileman;

Left to right, Diana Mahoney, Dr Reddel, sponsored students Clare Fasching and Thomas Kischlat, and Roma and Des Kennedy at a recent visit by the Judith Hyam Memorial Trust to CMRI;

Blacktown RSL Club member, Mr Hawell Giago, presenting Jennifer Philips with a cheque for CMRI.



Port Hacking

The annual Mother's Day Parade, this year 'Fun & Fashion' by "Covers" at Doltone House, proved to be another success story.

Judith Hyam Memorial Trust

Not one, but two researchers are now being supported by the Trust. Their invaluable contribution provides an added bonus for Dr Reddel in his Cancer Unit.

Committee Power

Dates for your Diary

Jeans for Genes Day

A date for all your diaries!
Friday August 2

Griffith

Denim Dazzlers Ball

Blacktown

Jeans for Genes Trivia Night
at Blacktown Civic Centre

Port Hacking

Denim Dinner Dance
at Doltone House

Strathfield

Quiz Night with Ross
Symonds is on 30 August

Contact Jennifer Philips for
details 02 9687 2800

WANTED: A Home

A permanent home
is needed in Sydney's
CBD for the Goodwill
Charity Card Shop.

Any ideas?

Blacktown

If you're in the area between 4 and 11 July, take this newsletter along to The Good Guys Blacktown store for their exclusive Fundraiser Sale Week for the CMRI.

Ku-ring-gai

Nearly 200 guests were fascinated to hear journalist and 2BL radio presenter, Sally Loane, out of her usual time slot at the luncheon at Killara Golf Club in March.

Griffith

Bubbly television celebrity Jeannie Little delighted a 330-strong, sell-out crowd with her lively address at the annual Rose Luncheon.

Pennant Hills Golf Day

Once again Pennant Hills Golf Club out-did themselves with the success of their annual Pro-Am golf day. Generous club members donated a signed portrait of Greg Norman and golf clubs for auction at the dinner, and CMRI's Dr Peter Jeffrey inspired guests with news of CMRI's latest achievements.

Jazz in the Mountains

Double the number of visitors came this year to enjoy a day filled with music, fun, food and relaxation, set in magnificent surroundings. The Rotary Club of Beecroft donated \$20,000 to CMRI. Many thanks to the Club, to the proud owners of 'Bisley' and to generous sponsors Autohaus Classic BMW of Parramatta.

Winners all round

On a regular basis there are lucky draws at Blacktown RSL and the lucky prizewinner also gets to choose the charity to receive \$2000 from the Club. This year alone, Fatima Kabbara, Hawell Giago and Ray Khan have delightedly chosen CMRI as their favourite charity.

Racquet

Over 200 keen card players gathered at St Ives Bowling Club for the annual card day – a delicious array of home made goodies sustained the players.