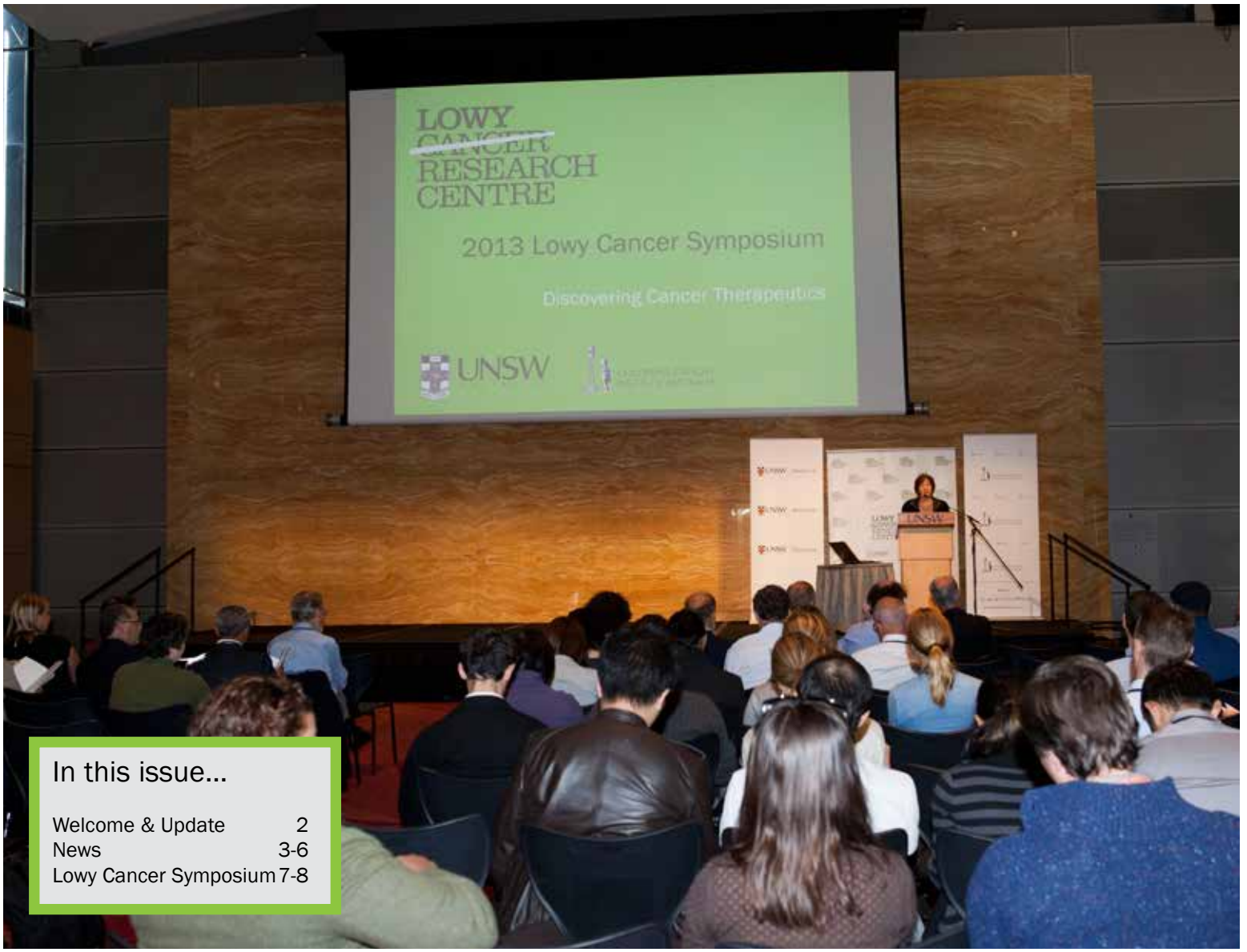
Issue 4, Winter 2013

CONNECT

Newsletter of the Lowy Cancer Research Centre

LOWY CANCER RESEARCH CENTRE



In this issue...

UNSW AUSTRALIA

CHILDREN'S CANCER INSTITUTE AUSTRALIA

Message from the Director

Welcome to the winter 2013 issue of the Lowy Cancer Research Centre internal newsletter - CONNECT.

This issue welcomes three new established research groups to the Lowy Cancer Research Centre, led by A/Prof Karen Canfell, Prof's Kerry-Anne Rye and Philip Barter and Dr Phoebe Phillips. Also highlighted are our research, grant and prize successes over the last year, and the Flow Cytometry and Biological Resources Imaging laboratories. In particular, the new MRI is now up and running and producing some stunning images. The newsletter finishes with a wrap-up of the Lowy Cancer Symposium, complete with pictures. I would like to personally thank all of those involved in making this symposium a success. This event is a significant undertaking but is important for helping establish our identity and research on the national and international stage.

We are now in our fourth year in the Lowy Cancer Research Centre. Thank you all for your efforts. Onwards and upwards.

Prof Philip Hogg
Director, Lowy Cancer Research Centre

Message from CCIA Executive Director

Welcome to the first edition of CONNECT for 2013. Our dedicated teams of scientists have achieved remarkable things in the past six months and I am thrilled with the progress being made towards our vision of saving the lives of all children with cancer.

Most recently, the results of our decade-long collaboration with The Sydney Children's Hospital Network have been published in the prestigious journal, Leukemia. An international clinical trial led in Australia by our clinical colleagues at Sydney Children's Hospital Randwick and The Children's Hospital at Westmead, and incorporating patients from New Zealand and also the Netherlands, was based on a test developed by Children's Cancer Institute Australia (CCIA) that detects residual leukaemia cells in a child's bone marrow. The Study resulted in the survival rate for children with high-risk acute lymphoblastic leukaemia, the most common childhood cancer, increasing from 35 to 70 percent. We've also had some remarkable developments in our neuroblastoma research, including reducing neuroblastoma metastasis by up to 71 percent in a laboratory model of the disease, and we are very excited about promising early findings, which could potentially lead to prevention of neuroblastoma.

We have had a flying start to the year, and I am absolutely confident this momentum will continue throughout 2013 and we will see great things to come. I hope you find this latest update of news across all levels of the Lowy Cancer Research Centre informative and rewarding.

Prof Michelle Haber AM
Executive Director, CCIA

Operations Update

The first half of this year marks the opening of stage 1 of the Wallace Wurth refurbishment. School of Medical Sciences staff have now moved into the first new office and lab spaces. Stage 2 is due for completion in 2014. Thanks to all staff who have worked tirelessly to ensure the relocation went smoothly.

Ongoing improvements in the Biological Resources Animal Facility will result in better operations for the Biomedical precinct. Malcolm French has joined the team to assist with these improvements. Again we thank staff for their input and look forward to working with you all going forward.

Dr David Coomber
Operations Manager

Editors: Cristina Kennett, UNSW
Catherine Blake, CCIA

Design: UNSW Marketing

Would you like to contribute to 'Connect'? Email your comments and story ideas to c.kennett@unsw.edu.au

Next Edition: Summer 2013

Facility Update: BRIL Flow cytometry

Since it's inception in 2012, the Flow Cytometry Facility celebrated many sucessors. Since its inception in January 2012, we have developed collaborations with scientists from UoW, UTS and Australian Institute of Marine Science and now manage the BD FACS Aria II™ from School of BABS and ACP BD FACS Canto II™,. This brings the total number of analysers to 4 (BD LSRFortessa™, BD FACS Canto II™ x 2 and a BC Qanta SC). The Facility has executed cell sorting on BD Influx™ and FACS Jazz™ cell sorting systems and implemented sterility monitoring procedures for bacteria and yeast free culture of cells pos sorting in antibiotic-free media. Our cost recovery model assists in facility advancements, replacement and repairs on current systems

As of the end of May 2013, the Facilty has 106 registered and trained users included training for casual staff (thanks Vitri Dewi & Saghar Eslami).

With our expertise we are a working toward being a world-class, reliable Flow facility that assists researchers to achieve results. We look forward to another prosperous and productive year.

Chris Brownlee
Manager, Flow Cytometry

UNSW Receives Highest NHMRC Funding

Groundbreaking work on cardiovascular disease and HIV are among the major University of New South Wales research programs to be awarded funding by the National Health and Medical Research Council.

UNSW was awarded more than $52 million for 15 grants; the best result in the country (41 percent of total grants). The Federal Minster for Health, Tanya Plibersek, made the announcement at the Lowy Cancer Research Centre last December.

Minister Tanya Plibersek

Significantly, UNSW received 6 prestigious Program Grants, representing a 100% success rate in the funding round due to commence in 2014. Researcher groups led by Profs Levon Khachigian and Miles Davenport at the Lowy Cancer Research Centre are specifically involved in two of these programs: "Novel Mechanisms, Molecular Targets and Therapies in Cardiovascular Disease" and "HIV latency, pathogenesis and immunity". UNSW also received a Development Grant and 8 postgraduate scholarships.

"The Gillard Government is very pleased to be supporting Australia's best and brightest medical researchers as they undertake their vital work," Ms Plibersek said. "Continued government investment in research enables development of effective new treatments and new policy solutions in our health system."

UNSW DVC (Research) Prof Les Field, said: "This is a fantastic outcome – to be successful in so many Program Grants is yet another endorsement for the world-leading medical research underway at UNSW."

"The Program Grants are particularly important because they provide long-term support to tackle significant research problems and they let us bring together teams of our best researchers. UNSW has been more actively fostering collaborations between our strongest research groups and this has aligned well with the aims of the NHMRC Program Grant scheme," Prof Field said.

Super Supervisors

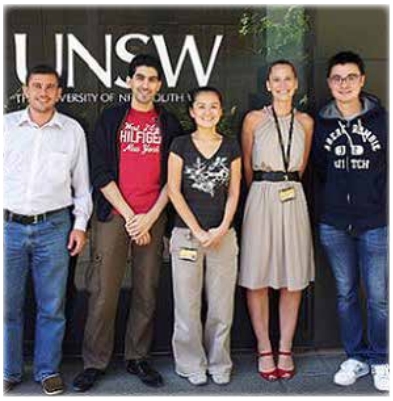
Two Lowy Cancer Research Centre supervisors have received ARC@ UNSW Postgraduate Council Supervisor Awards for their service in supporting research students.

Dr Kerrie McDonald, Head of the Cure for Life Neuro-oncology group in the Adult Cancer Program was one of three outstanding supervisor award recipients for 2012.

PhD students within the Neuro Oncology lab said, "Throughout the years in her lab, it is self-evident to us all that Kerrie has our best interests at heart. She's supportive in our endeavours, and guides us throughout, while giving us the opportunity to try new ideas and be creative. Her support doesn't end at the completion of our thesis, but extends on such that we continue to succeed beyond our graduation and publications. When we saw the posting for nominating supervisors for this award, we unanimously agreed – Kerrie!"

Dr Till Böcking, who leads the Molecular Machines Group in the Centre for Vascular Research was also recognised by the Council with a Supervisor award.

The PGC Supervisor Awards were established to recognise those UNSW research supervisors who exceed the requirements expected of a supervisor.



Kerrie and team (Photo: James Wood)

MRI Facilty Opens

The Pre-clinical MRI facility at the Biological Resources Imaging Laboratory (BRIL), Mark Wainwright Analytical Centre, UNSW was officially opened on 21 May. A scientific symposium, showcasing MR research taking place in the facility and around Australia, was held in conjunction with the opening.

Officially opened by Prof Les Field AM, UNSW Vice President & DVC (Research), the event was attended by representatives from the Commonwealth & NSW government, National Imaging Facility (NIF), & research centres across Australia.

The symposium included UNSW speakers from SoMS, Lowy Cancer Research Centre, NeuRA and Faculty of Science, and speakers from Universities of Western Sydney, Queensland, Melbourne, Monash and Minnesota (USA). UNSW scientist Dr Andre Bongers showcased some of the facility's new imaging projects and invited international speaker Dr Ivan Tkac (University of Minnesota) gave an engaging talk on "Potentials & challenges of MR spectroscopy at high magnetic fields".

Dr Carl Power, Head of BRIL said, "This state-of-the-art instrument is already contributing to research productivity and new research directions. The support of UNSW was key to the project which establishes UNSW as a leader in high-field pre-clinical MR research in Australia."

The facility, located in the Lowy Cancer Research Centre, operates closely with the UNSW Biological Resources Animal Facility. BRIL is focused on providing multi-modality *in vivo* imaging for small research animals and the facility forms part of the UNSW node of NIF. Node Director Prof Lindy Rae leads the NeuRa Imaging Centre which houses a 3T MRI clinical scanner for research.

BRIL offers researchers with access to a number of imaging systems including micro-computed tomography (microCT), positron emission tomography (PET), ultrasound imaging, optical imaging systems for detection of bioluminescence and fluorescence, x ray imaging, endoscopy and intravital microscopy. The vision is to be the best-equipped facility of its kind in Australia and competitive with any in the world, placing UNSW at the forefront of biomedical imaging.

Bruker 9.4 Tesla BioSpec Pre-Clinical MRI

Super-resolution microscope shows how human T-cells make life or death decisions

Using a super-resolution fluorescent microscope, scientists are a step closer to understanding why and how human immune cells decide to activate or not, thus enabling or preventing disease taking hold in the body. Prof Katharina Gaus and her team in the Centre for Vascular Research (CVR) used some of the most advanced super-resolution optical microscope technology available anywhere in the world to see changes in individual proteins in T-cells – the workhorse of our immune system. "Every day, every second, our immune cells make decisions to activate or not activate," Kat says. "Every time they make a decision, the outcome is life or death." In a paper published in Nature Immunology, the team show, for the first time, how a protein kinase is distributed across membranes – opening and closing like Pacman in the 1980s computer game. "The kinase we examined is called Lck and is essential for the activation of T-cells but is also involved in many other cell signalling processes. Understanding how kinase activity is controlled is the key to knowing what goes wrong in many diseases including immune disorders and cancer." The super-resolution microscope has allowed the researchers to watch this dynamic opening and closing process. There are only six of the super-resolution microscopes in use around the world, (one at UNSW). The technology allows the researchers to light up particular molecules and proteins to pinpoint their precise localisation. The process highlights the proteins' position and function, enabling a super-resolution image of the activity to be captured. "The link between intra-molecular rearrangements to surface patterning of signalling molecules is important because it can explain how engagement of a few receptors can trigger an activation response,"

Grants and Awards

NHMRC Project Grants

John Pimanda, Bertie Gottgens, Oleg Igoshin, Karen MacKenzie, Jason Wong "Reconstructing Transcriptional Networks in Leukaemic Cells"

Philip Hogg "Mechanism of action and targeting of hexokinase II in glioblastomas"

Philip Hogg "Mechanism of action and targeting of RAGE in inflammation"

Philip Hogg, Patrick McNeil "Control of mast cell tryptase function in inflammation"

Jenny Wang "Studying the novel role for G protein-coupled receptor signalling in leukaemia development"

Richard Lock, William Wilson, Hernan Carol "AKR1C3 as a potential biomarker for sensitivity of T-lineage acute lymphoblastic leukaemia to the pre-prodrug PR-104"

Tao Liu, Yi Zhang, Christopher Scarlett "Targeting the histone methyltransferase DOT1L for the therapy of Myc-induced malignancies"

Early Career Fellowship

Maarit Laaksonen, "The burden of cancer - prevention, treatments, costs, & related diseases"

ARC Grants

Dylan Owen, ECR Award – "Biophysical mechanisms regulating early T cell signalling events"

Till Boecking, Discovery Project - "Single-molecule view of actin-tropomyosin filament dynamics"

Kat Gaus (with Geraldine O'Neill) - Discovery Project - Nano-scale organisation of cellular adhesions

Christopher Parish, Philip Board, Levon Khachigian (Administered by ANU), LIEF - In-vivo, high-resolution, whole animal imaging

Awards

Donya Moradi, 2012, Tow Research Award Open Senior Division

New research reduces tumour metastasis

Researchers at CCIA have found a potential new way to reduce neuroblastoma tumour metastasis.

The findings, published in Oncogene in February this year, may lead to the development of more targeted treatments for neuroblastoma and may potentially contribute to saving the lives of more children with cancer.

Neuroblastoma, the most common cancer in infancy, accounts for 6-10% of all childhood cancers and 15% of all paediatric cancer deaths in Australia.

"We already knew that a protein, called stathmin, is abundant in neuroblastoma cells, but we didn't properly understand the role it played," says Prof Maria Kavallaris, Program Head of Tumour Biology and Targeting at CCIA.

"In our research we posed the question: if we take stathmin away, will it diminish neuroblastoma metastasis? Our early data has found that by 'switching off' the protein, it significantly reduces the spread of neuroblastoma by 71%."

The team focused on lung metastasis, found in some of the most advanced cases of neuroblastoma. Although this is early research, Maria is optimistic the discovery will lead to better treatments and ultimately, improved survival rates for children with metastatic disease.

"Our study has provided the first direct evidence that suppressing stathmin expression in neuroblastoma influences cell signalling and reduces metastasis," says Maria. "It's still not clearly understood why neuroblastoma is so aggressive and can spread so rapidly. Our aim is to build upon this initial data and develop a new targeted therapy to combat this. "We are very excited by the findings and we are now exploring stathmin as a potential therapeutic target for neuroblastoma,"

Professor Maria Kavallaris

Three new research groups join the Lowy Cancer Research Centre in 2013

The Lowy Cancer Research Centre welcomed three groups to the Centre in the first quarter of 2013.

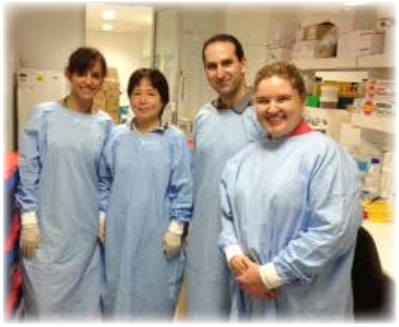
In January, the Cancer Modelling Group (CMG), led by Associate Professor Karen Canfell, joined the Adult Cancer Program from Cancer Council NSW. Their work is designed to assist policy decision-makers in deciding how best to incorporate new technologies into cancer prevention programs. Their research primarily concerns the interplay between HPV vaccination and cervical screening in both developed countries and in lower resource settings, and incorporates projects involving modelling, observational epidemiology and clinical trials. The group is involved in evaluations of new cervical screening technologies for government agencies in Australia, New Zealand and England and collaborate with the Cancer Institute of the Chinese Academy of Medical Sciences to evaluate options for cervical cancer prevention in rural and urban China. The CMG are also the provider of Independent Monitoring Reports for the National Cervical Screening Program in New Zealand. In collaboration with the Victorian Cytology Service, they have initiated Compass, a major new trial of HPV-based cervical screening in Australia. The team are coordinating a number of other projects in cervical cancer epidemiology including the New Zealand Women and HPV study, studies of cervical cancer patterns of care in Australia and Canada, cervical screening behavior in migrant women in NSW and collaborating with researchers at the VU University Medical Center in The Netherlands to develop models of colorectal cancer screening.

A/Prof Karen Canfell

Also in January, the Lipid Research Group, led by Profs Philip Barter and Kerry Anne Rye joined the Centre for Vascular Research (CVR). The group are working towards understanding how high-density lipoproteins protect against heart disease, inflammation in blood vessels and diabetes. Kerry has pioneered the use of unique model systems for studying the metabolism and anti-inflammatory properties of high-density lipoproteins and Philip is equally internationally recognised for his groundbreaking work in the area of plasma lipids and lipoproteins, specifically HDL and his leadership of major clinical trials in cardiovascular disease. Their appointments coincide with the commencement of a new 5 year NHMRC Program Grant of which Phil is CIA. Profs Wendy Jessup and Len Kritharides, both chief investigators in the Program, moved to Concord Repatriation General Hospital/ANZACRI in December 2012 after a decade at UNSW. Wendy and Len made an enormous contribution to the growth and success of CVR during this time.

Profs Kerry-Anne Rye & Philip Barter

In March, the Pancreatic Cancer Translational Research Group joined the Adult Cancer Program from UNSW School of Medical Sciences. Led by Dr Phoebe Phillips, the group focuses on identifying novel therapeutic approaches for pancreatic cancer including targeting the extensive scarring (fibrosis) which enhances pancreatic cancer progression.



Pancreatic Cancer Translational Research Group

Collaboration to accelerate new treatments for brain cancer

March saw the launch of the Brain Cancer Discovery Collaborative (BCDC) and the announcement of $1 million in funding from Cure For Life Foundation (CFLF) that aims to spearhead exponential growth in discovery and speed to clinical trials via the collaborative effort. The BCDC is led by Director A/Prof Terrance Johns from Monash Institute of Medical Research, Victoria and Deputy Directors Prof Andrew Boyd (Clinical) from the Brain Cancer Research Unit at Queensland Institute of Medical Research and Dr Kerrie McDonald (Translational Science) from the Cure for Life Neuro-oncology Group at the Lowy Cancer Research Centre. The collaboration brings together a diverse group of researchers from all across Australia with the aim of working together to change the outcome for adults and children with brain cancer. The BCDC is based on the highly successful UCLA collaborative model and will focus on developing new treatments, accelerating research, sharing core resources and establish mentoring networks to encourage young researchers into the area.

Do you know your colleagues?

Join us for the Lowy Cancer Research Centre staff get- together on the last day of each month from 4:30pm in the Cancer Research lounge on Level 4.

Drop in for a quick chat or stay and challenge your workmates to a game of ping pong!

We are always looking for volunteers to help out with staff social events. If you are interested, please email

lowyservices@unsw.edu.au

World-first clinical trial increases survival rate for most common childhood cancer

Profs Michelle Haber AM, Glenn Marshall and Murray Norris

A decade-long international clinical trial has doubled the survival rate from 35 per cent to 70 per cent for high-risk acute lymphoblastic leukaemia (ALL).

The pioneering clinical trial was initiated at the Sydney Children's Hospital Randwick and The Children's Hospital at Westmead and was conducted across Australia, New Zealand and the Netherlands. The results were published in 'Leukemia' in March.

Children with ALL at the highest risk of relapse were identified early in their treatment plan using a novel test developed by CCIA reseachers. This test detects Minimal Residual Disease (MRD) in the bone marrow of children with ALL, who would otherwise appear to be responding well to treatment.

Children with high risk ALL were then treated with a new intensive chemotherapy protocol, and in many cases allogeneic bone marrow transplant.

The trial represents a major step toward personalised cancer care. It is also one of the first studies to show that, by identifying high risk patients early in the treatment plan, consequent changes in treatment can improve the chance of cure.

"The MRD test can detect one leukaemia cell among 100,000 healthy cells in the bone marrow, and this allows clinicians to tailor a child's treatment. When a child is classified as high-risk through the MRD test, their therapy is intensified in order to improve the chance of survival," says Prof Glenn Marshall, Director of the Kids Cancer Centre, Sydney Children's Hospital Randwick, and, Head, Translational Research at CCIA.

Glenn says the trial has dramatically changed treatment approaches for ALL. "As our studies have shown so impressively, being able to tailor a specific therapy regimen for high-risk children shortly after diagnosis, based on the results of our MRD test, provides children at high risk of relapse with a much better chance of survival," says Glenn.

In another first, MRD levels were used to assess the response to individual chemotherapy drugs in high risk patients, informing future ALL trials.

Prof Murray Norris, Deputy Director, CCIA, led the research team and says its success is due largely to the partnership between CCIA and The Sydney Children's Hospitals Network.

"MRD testing is now considered part of the Standard of Care, and our test results are routinely used to guide treatment decisions in clinics across the country," says Murray.

2013 Seminar Series

Lowy Cancer Research Centre Seminar Series is held at 11:00am in the Lowy Cancer Research Centre Seminar space.

It showcases the research of some of the best Australian and International speakers

July
10 - Vincent Hascall (USA)
24 - Samuel Stupp (USA)

August
14 - Sue Clark
21 - Nick Hayward

September
18 - Angel Lopez

October
16 - Robert Parton

November
13 - *Speaker to be advised*

December
04 - Grant McArthur

To join the mailing list, email c.kennett@unsw.edu.au

Staff Profile: Anne Johnston

Anne joined CCIA last year as Head of Fundraising after leading the marketing and fundraising teams at Starlight Children's Foundation Australia.

Why did you decide to join CCIA?

I decided to join CCIA because of this amazing cause. When I hear the stories of children and families affected I just want to change this. When I first met the team here, I was blown away by their work, their achievements and the shared vision that we will make significant progress in curing childhood cancer in the next decade. The opportunity and privilege to be part of that and change the future for these kids is just fantastic

What do you do in a day?

No day is the same. On any one day, I could be working with a corporate partner, or planning a direct marketing campaign and figuring out how to communicate a family's story in order to engage people, or thank people who have contributed to us because they are helping us do our work.

Why is fundraising so important?

Changes in grant structures and an increasing number of applications for grants means we won't be able to fund 100 percent of our research through grant income alone. We need to generate at least $1 through fundraising for every dollar that is raised through grants.

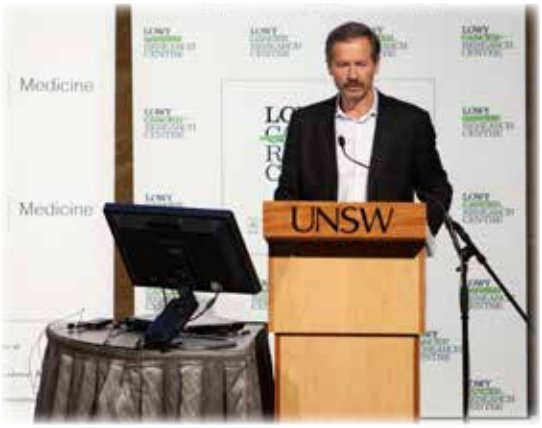
How does it feel to be a part of CCIA?

I am fortunate to be joining CCIA at a time where the speed of discoveries around the world is escalating. At CCIA we've recently had quite a few research discoveries that have a real potential to change the future prognosis for children with cancer.

- Lowy Cancer Symposium -

Second Cancer Symposium a sucess

In May, the Lowy Cancer Research Centre hosted the 2nd Lowy Cancer Symposium: Discovering Cancer Therapeutics, highlighting Australasia's cancer research breakthroughs and showcasing some of the best international cancer research.



Plenary Speaker: Dr Lewis Cantley

Designed for basic research scientists, oncologists and other healthcare professionals, this biennial cancer symposium is Australia's only Cancer Drug Discovery Symposium and focuses on the three key phases of cancer therapeutic development: discovery, pre-clinical and clinical. Officially opened by Prof Mary O'Kane NSW Chief Scientist and Engineer, the symposium attracted around 200 Australian and international delegates. One of the symposium highlights was the address by Dr Lewis Cantley, Director of the Cancer Center at Weill Cornell Medical College in New York. Dr Cantley recently won the inaugural Breakthrough Prize in Life Sciences, the world's richest academic prize for medicine and biology, for his discovery of a family of enzymes fundamental to cancer.

Prof Philip Hogg, Director of the Lowy Cancer Research Centre and Symposium convenor, said "At this year's symposium, we heard about recent developments in personalised pancreatic cancer therapy and hypoxia-activated cancer drugs from Australasia's best cancer researchers and cutting edge developments from some of the international leaders in the field."

A special thank you to the organising and scientific committees of the 2013 Lowy Cancer Symposium for your contribution to making the meeting a sucess.

For the full list of speakers and abstracts, visit www.lowycancersymposium.org. The next symposium will be held in 2015.

(Symposium Photo Credit: Jessica Koach, CCIA)

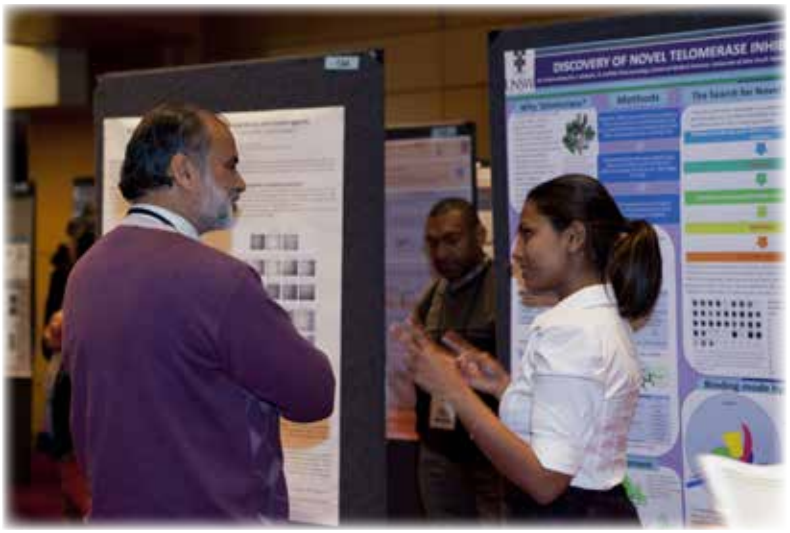
Delegates at welcome drinks

2013 Lowy Cancer Symposium: Prize Winners

ASBMB Prize for Best Post-Doc Presentation:
Dr Eddy Pasquier, CCIA

New South Innovations Prize for Best Student Poster:
Melissa Desouza, UNSW

TCRN Prize for Best Translational Research Presentation:
Dr Liz Caldon, Kinghorne Cancer Centre



UNSW student Melissa Desouza, winner of the NSi Prize for Best Student Poster, explains her research during the Symposium poster session.

Delegates discuss research during the Symposium poster session

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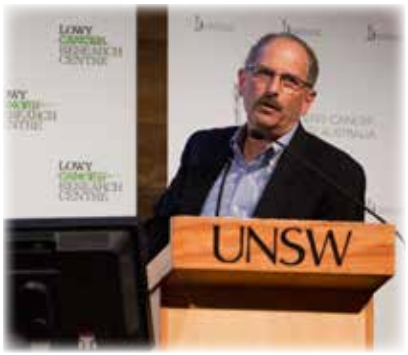
CHILDREN'S CANCER INSTITUTE AUSTRALIA

- Lowy Cancer Symposium 15-17 May 2013 -

Prof Mary O'Kane NSW Chief Scientist & Engineer

Prof Adrian Harris, Oxford University



Dr Lee Helman, National Cancer Institute

Prof Peter Gunning, UNSW

Dr Chand Khanna, Center for Cancer Research & Dr Jamie Fletcher, CCIA

Delegates enjoy the welcome function

Welcome function

Welcome function

Speakers Alexandra Filopovska, Chris Parish & delegates

Welcome function

Welcome function

Lee Helman, Michelle Haber, Phil Hogg & Maria Kavallaris

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CHILDREN'S CANCER INSTITUTE AUSTRALIA