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The Cancer Institute NSW is Australia’s first statewide, government-supported cancer control agency. We are committed to lessening the impact of cancer in NSW through promoting the best cancer research, prevention, early-detection, treatment and education initiatives.

Our goals are to:

- reduce the incidence of cancer in the community
- increase the survival rate of cancer patients
- improve quality of life for cancer patients and their carers
- operate as a source of expertise on cancer control for the government.

Cancer touches us all. The current lifetime risk of being diagnosed with cancer in NSW is one in two for men and one in three for women.

Cancer is now the largest single cause of disease in Australia, surpassing cardiovascular disease. In 2008, more than 35,000 people were diagnosed with cancer in NSW. Cancer incidence has increased by around 10 per cent in males and 7 per cent in females over the past decade.

This report details the achievements and progress of cancer researchers in NSW and our goal to find a cure for the many cancers that affect the NSW community.
Foreword From the Minister

Since 2004, the Cancer Institute has invested more than $170 million in new cancer research in NSW. This has supported 127 research fellowships, including 61 career development fellowships, 41 early career fellowships and 21 dedicated clinical fellowships to support clinicians in developing research careers.

It is also pleasing to note that this funding has gone towards supporting the next generation of researchers. More than 115 cancer research scholarships have been supported and 36 scholars have completed their PhDs under this funding program.

The NSW Government is a great supporter of medical research, and has already opened the State’s first Office of Medical Research. We believe that, in order to ensure the continual development of new treatments and technologies for many generations ahead, researchers must be supported – because I know we all hope that a cure for cancer is found in our lifetimes.

Cancer is still the single biggest cause of premature death in our community. It is a pervasive disease, which touches everyone, either directly or indirectly, at some point in their lives.

The importance of continuing to expand cancer research in NSW has never been more evident than it is today.

I am proud to be associated with such achievements and I look forward to helping our researchers to continue to make inroads against cancer.

The Hon. Jillian Skinner, MP
Minister for Health, Minister for Medical Research
Our five-year cancer survival rate is now at 64 per cent, up from 61 per cent in 2001 and while this may not seem like a huge increase, it means there are now thousands of people across NSW who are beating cancer and living healthy lives.

At the heart of this progress is a solid foundation of research in NSW. As a State, we are home to several researchers at the cutting-edge of understanding cancer. These dedicated clinicians are discovering new things about cancer all the time, leading us towards better diagnosis, treatment and care for people affected by this disease.

I feel extremely proud each year to review some of the fine cancer research being undertaken across the State and I am proud that, as an organisation, the Cancer Institute NSW is able to invest heavily to support this important work.

This report reflects just a small part of this work. The researchers featured within have excelled and achieved fantastic things but they are joined by many others who are all helping to drive improvements in cancer control.

I have no doubt that in the next decade we will have made some significant leaps ahead in limiting the impact of cancer in the community and a large part of this success will be thanks to the ongoing work of these talented researchers.

Professor David Currow
Chief Cancer Officer and CEO
Cancer Institute NSW

It really is an exciting time to be working in cancer control. The recent International Benchmarking Project (published in British journal The Lancet) highlighted that in NSW our cancer outcomes are on par, if not better than comparable nations.
This funding has been directed towards building research capacity and facilitating the rapid translation of findings into clinical practice. Our evaluation of this funding indicates that excellent progress has been made towards achieving these objectives with key indicators for workforce, research income and clinical trials participation all showing significant increases since we started funding research in NSW.

A NEW CANCER PLAN FOR NSW

As encouraging as these results are, past growth rates that have driven the rapid expansion of our research support program are not sustainable and we need to put measures in place to ensure a more consolidated, targeted approach to direct research investment into priority areas. The development of the NSW Cancer Plan 2011–15 gives us the opportunity to build on our past achievements and align these efforts closely with the core objectives identified for our new plan: to reduce incidence of cancer, increase survival from cancer, and improve the quality of life for people with cancer and their carers.

CREATE CENTRES WHERE CLINICIANS AND RESEARCHERS WORK TOGETHER

Since our establishment, the Cancer Institute NSW has initiated a range of research and clinical service support mechanisms, which, in their own right, have had significant impact on their respective fields. However, these programs were largely developed in isolation from each other and did not fully exploit the benefits of a vibrant translational enterprise to improve cancer outcomes.

One of our key objectives from the new Cancer Plan is to breakdown the traditional boundaries that separate the roles of the researcher and clinician through the establishment of Translational Cancer Research Centres (TCRC). By providing professional development and training within a framework of academic clinical practice, the TCRC program aims to not only drive the generation of practice improving research but also ensuring rapid adoption of findings for improved patient outcomes. The TCRC program will be built around the hubs of our State’s research strengths, which have emerged as the centres of cancer research activity over the past decade.

The TCRC program will help widen the impact of research investment and align health service delivery more closely to translational capacity, using the latest research to personalise patient care.

The Cancer Institute NSW views research as a critical factor for influencing innovation in our health system and, ultimately, for improving health outcomes for the people of NSW.

Over the past decade we have established an ambitious research support program, which has included an investment of more than $170 million since 2004.

CANCER INSTITUTE NSW RESEARCH PROGRAMS
The number of full-time equivalent (FTE) staff employed in cancer research groups showed a 16 per cent increase from 1,313.9 FTE identified in 2004–06 to 1,529.1 FTE in 2007–09. This amounts to a 75 per cent increase from the 2001–03 baseline data.

The NSW share of National Health and Medical Research Council project funding proportion is up from 19 per cent in 2005 to 32 per cent in 2008.

A 75 per cent increase in the total amount of cancer research funding for NSW researchers between the 2004–06 and 2007–09 periods, with $236m of cancer research funding reported for 2007–09.

The number of patients in follow up on clinical trials has almost doubled from 4,559 in 2004 to 8,194 in 2009.

The number of patients enrolled to trials increased by 109 per cent, from 1,054 in 2004 to 2,207 in 2009.

The number of cancer trials conducted in NSW increased from 190 actively recruiting in 2004 to 283 actively recruiting in 2009.

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CONTRIBUTING TO THE QUALITY OF RESEARCH IN NEW SOUTH WALES

In 2010, we saw a record number of applications to our research program, which makes clear that the Cancer Institute NSW has become a key player within the sector in NSW; in fact, our investment in cancer research in NSW is second only to that of the National Health and Medical Research Council.

We are proud to be associated with some of the best cancer researchers in Australia. Many of them are featured in this report and celebrated at the Cancer Institute NSW Premier’s Awards for Outstanding Cancer Research. One of the results our researchers have achieved over the past year include:

Professors Michelle Haber AM, Glenn Marshall and Murray Norris from Children’s Cancer Institute Australia (CCIA) were awarded an NHMRC Program Grant worth $6 million over five years and starting in 2012. The Program Grant will fund further research into childhood cancer, and specifically neuroblastoma, the most common solid tumour in children and one of the most aggressive forms of childhood cancer.

Cancer Institute NSW-funded researchers have been recognised as leaders in their fields with the announcement of the latest round of Fellowship grants from the National Health and Medical Research Council (NHMRC). The highly competitive and sought after Fellowships, allow the nation’s foremost health and medical research professionals to develop and further their careers. Eleven researchers supported by the Cancer Institute NSW have received NHMRC funding in this round, which is an outstanding achievement and testament of the high calibre of cancer researchers in NSW.

In the 2010 calendar year, we awarded more than $36 million in research funding across 11 funding categories including:

- 14 Innovation Grants
- 3 Clinical Research Fellows
- 12 Career Development Fellows
- 16 Infrastructure Equipment Grants
- 17 Scholar Awards
- 3 Translational Health Service Research Grants
- 4 Translational Program Grants
- 1 Future Research Leader Grant
- 9 Early Career Fellows
- 3 Epidemiology Linkage Grants
- 1 Epidemiology Innovation Grant.
CELEBRATING OUTSTANDING CONTRIBUTIONS TO CANCER RESEARCH IN NSW

The Cancer Institute NSW Premier’s Awards for Outstanding Cancer Research were established in 2006 to acknowledge the achievements and commitment of NSW cancer researchers at all levels. There are four categories awarded each year:

1. Outstanding Cancer Researcher.
2. Outstanding Cancer Research Fellow.
4. Innovation in Cancer Clinical Trials.

The award for Outstanding Cancer Researcher honours an individual who has made significant and fundamental contributions to any field of cancer research in NSW. These contributions must have had a lasting impact on the cancer field and must have demonstrated sustained progress against cancer.

The Fellow and Scholar honours are awarded to a Cancer Institute NSW-supported Fellow and Scholar who have demonstrated significant achievements and progress in their research over the previous year.

The Premier’s Award for Innovation in Cancer Clinical Trials recognises the achievements or activities undertaken by staff within a clinical trial unit under the umbrella of the NSW Cancer Clinical Trials Network, which demonstrates innovation in relation to the conduct of clinical trials.

Areas of innovation may include: increasing access to clinical trials, strategies to address underrepresented groups (tumour groups, populations), promoting a research culture, collaboration, developing training opportunities and community involvement.
It’s not often you come across a plant biologist working in cancer research for human melanoma, but for Dr Helen Rizos, it was the realisation of a dream.

“I knew I wanted to be a research scientist from a very young age and although I was keen to try different research areas, I always hoped to work in cancer research,” she says. “I remember being told that my expectations may not be realised, but I was naïve and enthusiastic so I only applied for postdoctoral positions in cancer research.

“I’m still not sure why Profs Graham Mann and Rick Kefford chose a plant molecular biologist, but I remain grateful for the opportunity to work in melanoma research at Westmead Hospital.”

Helen says it was reading about a 2002 study by a research group from the UK, which fuelled her passion for cancer research.

“The group carried out a screen for pathways that were altered in human cancer,” she says. “In this screen, they discovered that a particular gene, known as B-RAF, was frequently mutated and activated in over 50 per cent of melanomas.

“Eight years later, the first clinical trial of a highly specific B-RAF inhibitor showed a dramatic anti-tumour response in 81 per cent of patients with melanoma. This means that we are on the way to adding a new complement of drugs that offers real hope for patients with melanoma,” explains Helen.

Helen’s team is currently working on defining the mechanisms of melanoma resistance to B-RAF inhibition, and she is particularly impressed with the work of one of her colleagues, Dr Kavitha Gowrishankar.

“She has generated many melanoma cells that are now resistant to B-RAF inhibitors, and is analysing how these cells became resistant. What she has found is that a single cancer cell can develop multiple mechanisms of resistance, but that many if not all of these mechanisms reactivate a single downstream pathway,” says Helen.

Helen’s team are also about to embark on a large screen looking at combinations of cancer drugs that can effectively combine with B-RAF inhibitors to kill resistant subclones.

“This work is highly competitive but addresses the most important emerging problem in melanoma therapy: resistance to specific B-RAF inhibitors,” she explains.

“Patients receiving B-RAF inhibitors develop resistance after initial responses that ranged from two to 18 months.

“We now need to identify the most optimal combinations of targeted agents for distinct mechanisms of acquired resistance. The ultimate goal is to treat patients with a cocktail that can inhibit B-RAF and simultaneously bypass resistance mechanisms.”

Helen says she finds working in research brings a real team spirit and a genuine sense of excitement when the group discovers something for the first time.

“Currently I am part of a team of dedicated and talented researchers, including postgraduate students, postdoctoral fellows and research assistants,” she says.

“Our laboratory can now predict melanoma cell responses to therapy; determine the mechanisms of these responses; and optimise treatment strategies to target melanomas based on their genetic profile.”
“I believe that a stronger commitment to our researchers is required if we want to ensure that cancer research in this country remains the best in the world.”

Dr Helen Rizos
Deborah Marsh enjoyed her degree in agricultural science and the practical work in the country this entailed. However, “as a city girl, my time on farms was not without amusement… for the farmers!” she says.

After her degree she turned her focus from animals to humans when she specialised in genetics.

“What I learnt in the study of animal and plant genetics had direct relevance to human genetics, an area I decided to move into for my PhD that began with the goal of mapping a gene for an endocrine cancer syndrome,” Deborah explains. “From there, I undertook my postdoctoral studies at the Dana Farber Cancer Institute, a teaching hospital of Harvard University, in Boston, where I was lucky enough to be involved in the very early days of identifying and characterising the now well known tumour suppressor PTEN.”

Now Deborah has her own research group at the Kolling Institute of Medical Research in the Hormones and Cancer Division and is focusing her expertise in a number of areas. These include studying ovarian cancer.

“We’re trying to understand the molecular nature of ovarian cancer, with the longer-term goals of developing improved diagnostic tests for early stage disease and better therapies to improve patient survival,” she says.

“We are investigating the observation that postmenopausal women, the age group at highest risk of developing ovarian cancer, have high levels of certain hormones that may influence the development of this malignancy.

“In cell line models of ovarian cancer, we have shown that these hormones influence growth and movement of cells. We are identifying key proteins and the pathways in which they function as being influenced by these hormones,” says Deborah.

With ovarian cancer having such low survival because it isn’t detected early enough, Deborah hopes her work will help improve outcomes for patients.

Deborah’s team is also investigating a tumour suppressor protein, known as CDC73, in cancer.

“This is significant as this protein seems to control the expression of genes and key processes involved in cancer,” Deborah explains. “We are now able to offer a genetic diagnosis for families who have the inherited syndrome Hyperparathyroidism Jaw Tumour syndrome or sporadic parathyroid cancer where this tumour suppressor is mutated.

“This work has led to changes in best practice for the diagnosis of parathyroid cancer,” she says.

Deborah’s work is driven by a curiosity about the biology of cancer cells and their uniqueness in each person and tumour.

“Cancer, even when it affects the same organ, is not necessarily the same disease in all people. Cancer biology affords you the opportunities to research many aspects of cancer in model systems to optimise the chance of success once discoveries are translated to patients,” she explains.

“We hope, through these discoveries, we can identify new, more directed treatment options for people with cancer based on the actual molecular events occurring in their tumour.”
“It’s always at the forefront of your mind that this disease can cut short young lives and take people too early from their families and the community.”

Associate Professor Deborah Marsh
In recent years, the media exposure of solaria use causing melanoma in young people has captured most people’s attention. Several high-profile cases have led to governments throughout Australia, and internationally, reviewing their policies for solaria use in young adults. But, it is researchers such as Anne Cust that the policy makers turn to when planning these reforms.

Anne is an epidemiologist at the School of Public Health, part of the University of Sydney, and is dedicated to finding out more about the causes of cancer so that we can improve prevention and treatment, as well as improving outcomes for cancer survivors.

One of Anne’s studies into finding out the causes of melanoma in young people recently led to an important discovery.

“One of the main studies that I am working on is looking at the genetic and environmental causes of melanoma, especially in young people diagnosed with melanoma (under 40 years of age),” says Anne. “We have found that using tanning beds (solaria) strongly increases the risk of melanoma for young people. This research has stimulated policy reform on solaria regulations in NSW and overseas, aimed at reducing the incidence of melanoma, particularly in young adults.

I am also studying gene variations that are associated with an increased risk of melanoma,” she says. “Testing for these variations may be a good way of identifying people who are at increased risk of melanoma and need to be very careful to protect themselves when out in the sun.”

Anne’s research into the causes of cancer doesn’t stop there, as her mentor, Professor Bruce Armstrong, explains:

“Anne is also looking at the role of physical exercise in preventing cancer,” he says. “There is growing evidence that behaviours or characteristics that increase risk of cancer – smoking, lack of exercise, being overweight or obese – can also increase the likelihood that people with cancer will die from their cancer or develop another cancer.

“Thus, a lot of what we find out about preventing cancer in people who have never had cancer may be important in helping to maximise the length and quality of life of people who have had cancer,” explains Bruce. “People diagnosed with cancer are now living much longer than they used to, thanks to better treatment. The longer they live, the more they have to gain from research into keeping them healthy after a diagnosis of cancer; the kind of research that Anne does.

“Anne hopes to follow up this work with research that will demonstrate that by increasing their physical activity, people can reduce their risk of cancer.”

As with many researchers, Anne’s dedication comes from seeing many of her family and friends succumb to the disease and wanting to make a contribution to our understanding about what can be done to prevent cancer and improve people’s outcomes.

“Improving our understanding of the causes of cancer has the potential to make a huge impact in reducing the burden of cancer in the community,” she says.

“Research into the causes of cancer can empower people to make positive changes to their lifestyle and behaviours to reduce their risk of getting cancer in the first place, or to make sure that cancer is detected at an early stage when the prognosis is better, as well as improving their health outcomes after cancer.”
“Improving our understanding of the causes of cancer has the potential to make a huge impact in reducing the burden of cancer in the community.”

Dr Anne Cust
As a gastroenterologist/hepatologist, Liang Qiao encountered many patients with gastrointestinal cancers who were diagnosed at very advanced stages and left with no effective treatment options. “Because of this, I was determined to devote myself to research on gastrointestinal and liver cancers, hoping to find new ways of treatment,” he says.

“I believe that novel therapies with fewer side effects are needed. The development of new therapeutic approaches for cancer is possible only through active research.”

Liang’s research couldn’t have come at a more crucial time, as the incidence of liver cancer has trebled in Australia in the past three decades, and will continue to increase over the next 20 years.

“Although the risk factors for liver cancer (HBV infection, HCV infection, chronic alcohol abuse, and other chronic liver diseases) have been well established, the molecular mechanisms underlying these risk factors are far from understood,” he says.

Liang’s mentor is Jacob George, Professor of Gastroenterology and Hepatic Medicine at the Storr Liver Unit, Westmead Millennium Institute, University of Sydney and Westmead Hospital, who believes we need more researchers like Liang to help combat the growing number of cases of liver cancer each year.

“While Australia is internationally competitive in cancer research overall, liver cancer research is in its infancy in Australia,” he says. “At the bedside, clinicians like myself are treating an ever increasing number of cases of primary liver cancer and it is the fastest growing cancer in terms of incidence in NSW.

“The key to establishing a cutting-edge research program for the ultimate benefit of patients is to identify, recruit and support highly trained, motivated and passionate cancer researchers.

“Liang is one of these individuals.

“His research has already identified potential new pathways of liver cancer growth,” explains Jacob. “His recent findings also suggest a major role for stem cells in the development of liver cancer.

“Supporting his research endeavours is one significant way in which liver cancer research is enhanced in Australia. As a corollary, his work will increase our understanding of liver cancer biology and ultimately lead to new and more effective therapies.”

Jacob believes that unless we understand, at the molecular and cellular level, how and why cancers develop and how to detect and treat them, we will be unable to cure this disease.

“Liang’s work does precisely this and will help ultimately in our efforts to develop new therapies that can treat and hopefully cure cancer,” Jacob says.

Liang agrees that to be able to treat cancer effectively, we need to understand the causes.

“In order to develop novel therapies for cancer, we need to have a clear understanding of several important aspects of cancer biology,” he says. “For example: how cancers are initiated; how do cancer cells proliferate and expand; why do cancer cells generally resist conventional therapies; how cancer cells spread (metastasize); and so on.

“Only when we have a good understanding of the mechanisms that are responsible for cancer formation and growth can we find potential targets for therapy.”
“The key to establishing a cutting-edge research program for the ultimate benefit of patients is to identify, recruit and support highly trained, motivated and passionate cancer researchers.”

Professor Jacob George
When dermatology student Diona Damian chose a cancer research project as an elective term, she didn’t realise this decision would set her on a course towards an unexpected career path.

“I focussed on the suppressive effects of ultraviolet radiation on the skin’s anti-tumour immune defences during my PhD at Sydney University,” she says. “This started me looking at ways to prevent sunlight-induced immune suppression, and hopefully prevent skin cancer.”

After completing her dermatology fellowship training, she returned to Sydney University and Royal Prince Alfred Hospital to combine dermatology clinical practice with skin cancer research.

“Together with Professor Gary Halliday, we began searching for safe and inexpensive compounds that were effective in preventing skin cancer,” she says.

“Our main research streams focus on harnessing the skin’s immunity to prevent and better treat skin cancers,” says Diona.

In recent studies, Diona’s team found that nicotinamide (vitamin B3) is highly protective against the cancer-promoting effects of sunlight on human skin.

“After sun exposure, cellular energy levels are depleted at a time when the skin actually needs increased amounts of energy to repair sun-damaged DNA,” she says.

“Nicotinamide provides the energy necessary for efficient skin repair.”

“Recently we completed clinical trials in heavily sun-damaged people, showing that nicotinamide tablets significantly reduce numbers of premalignant actinic keratoses (AKs) within a few months.

“In randomised, placebo-controlled trials we found that nicotinamide reduced AKs by a third compared to the placebo,” says Diona. “We have a large trial planned for 2012 to test whether nicotinamide can also reduce skin cancers in 400 of our most sun-damaged, skin cancer-prone patients.

“We are also investigating topical immunotherapy to treat advanced recurrent melanoma in the skin, with more than 60 per cent of treated patients so far showing complete clearance of their otherwise untreatable tumours.”

Ultimately, Diona’s goal is to find safe, inexpensive and easily accessible approaches that could substantially improve quality of life for people with skin cancer.

“The idea of finding simple ways of effecting large changes in outcomes is very attractive,” she says, “especially when the agents we use are inexpensive, patent-free and already widely available to the community.”
“In terms of the economic and quality of life costs of skin cancer, prevention is the most cost-effective approach we have for reducing the burden of this disease.”

Associate Professor Diona Damian
Clinician and laboratory researcher Dr David Chang is well placed to ensure that two key areas essential to the future of cancer service delivery – the lab and the clinic – do not remain worlds apart.

David’s work is a pioneering shift away from the ‘one size fits all’ approach to cancer prognosis and treatment, toward individually targeted therapies based on a patient’s specific underlying biology. His research recognises that cancer is a heterogeneous disease – that is, different patients can have different outcomes, despite presenting the same clinical grade and stage of a particular cancer.

This direct investigation of a patient’s unique biological make-up has led to David’s groundbreaking work with molecular biomarkers and genetic sequencing – both of which have great potential for improving patient prognosis and more accurately predicting an individual’s response to a particular course of therapy.

“What attracted me to cancer research was the possibility that the underlying biology of cancer may directly influence the care of patients that surgical oncologists like myself face on a daily basis,” says David.

Immigrating to Australia from Taiwan with his family when he was only 14, David’s career began with a degree in Medicine at the University of Sydney. Late 2006, after surgical training, he became a fellow of the Royal Australasian College of Surgeons (FRACS) and in 2007, was awarded a Cancer Institute NSW Clinical Training Fellowship.

In the same year, David also completed a Masters of Surgery through the University of Sydney, with a dissertation studying the patterns of care in pancreatic and upper gastrointestinal cancer in NSW. During this time, he was exposed to various aspects of cancer research through one of his supervisors, Professor Andrew Blankin.

It was at this pivotal point in his career that David, increasingly fascinated by the potential benefits of research for patients, decided to embark on four years of doctoral studies in cancer research at the Garvan Institute. Some notable achievements marked this period: he established that a surgical resection margin of more than 1.5 mm is important for the long-term survival of patients with pancreatic cancer – a finding that was presented at various national and international conferences and published in Journal of Clinical Oncology, the highest ranking clinical oncology journal.

David also recently received the ASCO Cancer Foundation Merit Award at the 2011 GI Cancers Symposium in San Francisco for his oral presentation on how biomarkers could be used to predict outcome before surgery. Further recognition came when he was presented the Young Investigator Award for showing how biologically related biomarkers can be used for better prognostication and stratification of patients for chemotherapy.

“As a laboratory researcher as well as a clinician I have frontline exposure to both aspects,” explains David. “My research work aims to improve the understanding of tumour biology with the aim of subsequently translating this to better management of patients in the clinic.”

Cancer is primarily a disease of the genome. As such, efforts by the international scientific community to sequence the most common cancers offers great potential for understanding the genetic aberrations which characterise the disease. The Australian Pancreatic Cancer Genome Consortium (APCG, which David is a part of) for instance, is contributing to this initiative by sequencing 400 pancreatic cancer genomes.

“I envisage that with the explosion of data in this genomic era, we may start to reclassify cancers based on their underlying genomic differences, rather than their tissue of origin. This will allow us to better match drugs that are designed to attack a particular genetic abnormality, rather than where the cancer starts, and have a much greater chance of being effective.”

For the future, David envisions specialised cancer centres will form a closer, and better integrated interface between research and clinical care. In such centres, the molecular and genetic characteristics of both the patient and the tumour would be comprehensively identified using the latest technologies such as Next Generation Sequencing. The result would be individualised therapies that adapt and evolve based on the treatment responses over time.

“This will facilitate rapid implementation of discoveries and change the very architecture of health service delivery for cancer, since the trial itself is part of the cancer care,” he says.
“What attracted me to cancer research was the possibility that the underlying biology of cancer may directly influence the care of patients that surgical oncologists like myself face on a daily basis.”

Dr David Chang
Asbestos is responsible for an increasing number of deaths in NSW. In 2008, more than 200 people were diagnosed with mesothelioma (a cancer directly related to asbestos) and almost the same amount died from the disease.

Australia has historically been one of the biggest users of asbestos in the world and there is a large amount of asbestos in Australian buildings and other infrastructure. As a consequence, we have one of the world’s highest rates of mesothelioma and it is estimated that this is yet to peak.

Figures like these prompted the establishment of the Asbestos Diseases Research Institute in January 2009 at the Bernie Banton Centre. The institute has quickly become recognised as leading the world in the investigation of how asbestos fibres cause malignant growth, and ways of fighting diseases such as mesothelioma, largely due to the expert leadership of Professor Nico van Zandwijk.

Growing up in Amsterdam, Nico had already many achievements under his belt – including founding the department of Thoracic Oncology of the Netherlands Cancer Institute – when he took up the position of director of the Institute. He was initially prompted to work in thoracic oncology (a group that includes mesothelioma, lung cancer and mediastinal tumours) because he considered it an area that needed considerably more research input.

“Little attention has been paid to asbestos-induced cancers in comparison with other cancers,” says Nico. “Through translational research our staff aim to improve the diagnosis and treatment of asbestos-related diseases.

“Quality of life of asbestos victims and the development of effective preventive measures for people exposed to asbestos are extremely important to our work.”

Nico is certain that the future of treating cancer; including malignant mesothelioma, is in optimising individualised treatment approaches.

“We need to obtain an accurate profile of disease and to tailor treatment accordingly,” he says. “In this way, we will be able to avoid the unnecessary toxicity that sometimes accompanies cancer therapy today.

“We can get better results if treatment can be started when the tumour is in an early stage,” explains Nico. “At the same time, it is vital to be informed about the exact characteristics of this specific cancer and to individualise treatment accordingly.”

His group at the Asbestos Diseases Research Institute is already making headway in identifying a protein-based prognostic profile, which is specific for malignant mesothelioma.

“We are also looking for factors that are able to predict the sensitivity of an individual tumour to certain medication,” he says. “This would be a significant step forward towards better treatment selection for patients.

“Even in mesothelioma, a disease characterised by poor survival figures, there are great differences in prognosis: there are patients who are surviving a very short amount of time and there are patients who are surviving much longer,” Nico explains. “A so-called prognostic marker helps to identify to which group a patient belongs and will help to tailor treatment according to that profile.”

This research, Nico believes, will be imperative for the future as the number of people succumbing to asbestos-related diseases, including mesothelioma, grows in Australia.

“In the coming years, we expect an increase of this disease and that is directly related to the tremendous amounts of asbestos around in the Australian environment,” he says.

“Awareness of the dangers of asbestos today is very, very important. We should be careful if we are to prevent a second or third wave of this disease.”
“I saw research as the only way to contribute to a better future.”

Professor Nico van Zandwijk
As a staff specialist medical oncologist who works with cancer patients every day, Dr Lorraine Chantrill is in an ideal position to be able to develop and test new treatments to help find a cure for cancer.

“This is an area that most medical oncologists embrace,” she says. “It gives our patients the opportunity of trying new treatments that are not routinely available.”

The first way she became involved in treatment was through clinical trials, both as an investigator and as a director. But then, Lorraine was given the opportunity to work with Professor Andrew Biankin’s team at the Garvan Institute of Medical Research, where she has been part of an international group of researchers working on treatments for pancreatic cancer; and is now studying in his lab for her PhD.

“I am particularly interested in pancreatic cancer because our standard treatments have mediocre efficacy and we are all looking for something better for our patients,” says Lorraine. “One of the projects I am working on at the moment is as part of a large group of researchers in pancreatic cancer where we are using genetic information from tumour sequencing to tailor treatments for patients with metastatic disease.

“We hope this will change the landscape for pancreatic cancer.”

Even though her work will give new hope to thousands of current cancer patients, Lorraine hopes that in the future new treatments will be available to everyone who needs it.

“Patients are often asking about the availability of new treatments, and in a perfect world, all of them would have access to these trials, regardless of geography or demography,” explains Lorraine. “As we move towards a personalised treatment paradigm, we will need to find new ways of proving our treatment efficacy.

“I would like to see a streamlined process, where trials are more accessible to more people, especially those in rural areas.

“It would be great if we could develop a mechanism to offer all patients enrolment on a clinical trial somewhere in NSW.”

Lorraine is adamant that it is only through careful research that we can improve outcomes for cancer patients, and is lucky enough to see the results in her work with people with cancer, even if the effect is not immediate.

“One of the best aspects of medical oncology is the extent to which research is involved in our working lives,” she says. “My scientific background has made me very keen to pursue research as part of my work.

“But, at the end of the day, it’s my patients who inspire me most to work as hard as I can to achieve changes to improve outcomes and care for people with cancer.”
“Research enriches my working life to such an extent that I think I am a better doctor for it.”

Dr Lorraine Chantrill
As a leading national and international figure in the field of gynaecological oncology for the past 30 years, Professor Michael Friedlander credits his passion for research to his university mentor, as well as good mentors while he was training in medical oncology.

“I was very fortunate to have had Professor Michael Gelfand as a mentor from very early in my training at the University of Rhodesia, as it was then called. He was a legendary and highly respected chief of medicine and firmly believed in the importance of research and that you couldn’t be a good clinician without also being committed to and constantly involved in research.

“I can clearly recall him telling me on many occasions to always have an ongoing research project,” says Michael. “He led through example and I credit him for instilling in me at a formative stage of my training how intrinsic research is to a fulfilling and successful clinical career.”

Now, Michael is a medical oncologist with a very busy clinical practice, focusing on treating women with breast and gynaecological cancers, but he is still committed to his research in improving understanding about cancer and developing more effective treatments for the patients he cares for.

“I cannot envisage not being involved in research as it’s such an important and integral part of my life and clinical practice,” he says. “Research provides a counterbalance to the constant demands and responsibility of caring for patients.”

Michael has a range of research interests and is particularly involved in clinical trials testing new cancer treatments for his patients. One of his current research studies is attempting to develop better tools to measure the benefit of palliative chemotherapy in women with recurrent ovarian cancer.

“The main aim of treatment in these patients is to improve quality of life and control symptoms as well as delay the time to progression, but we still are unable to know whether our treatments achieve these objectives,” he explains. “We have traditionally measured benefit by measuring response to chemotherapy, i.e. how much a tumour shrinks with a particular treatment. However, this is a very crude measure and doesn’t reflect the potential impact of treatments on improving symptom control without necessarily shrinking the cancer.

“It is particularly important for clinical trial design that we do have better ways to measure benefit of palliative chemotherapy,” he says.

“I am leading a large international research study and collaborating with many very talented co-investigators and expect that we will soon have a better tool to measure benefit. While this may not appear at first glance to be an important question, it opens the way for us to objectively measure the benefit of our treatments, which is essential when the primary aim of treatment is to improve quality of life and control cancer-related symptoms as this is what most of us do every day in clinical practice.”

Michael believes the future success of innovative cancer research in NSW lies in strengthening the collaboration across research institutions and actively mentoring the emerging new talent in NSW.

“We are fortunate in NSW as well as Australia to have a very collaborative and collegial approach to research,” he says. “We are small enough to know most researchers personally and large enough to be able to carry out important research in Australia, as well as to collaborate on an equal footing with researchers in other countries.

“I believe that one of the major reasons for the success of research in NSW has been the spirit of collaboration that exists across different hospitals and research laboratories and this is one of the major strengths of cancer research in NSW,” he says.

“I hope that this continues to be nurtured and encouraged and my hope is that we focus more on our human capital and make it easier for researchers to collaborate.”
“Research keeps me enthusiastic and excited about all the possibilities to make progress and I am always thinking of new studies and potential projects.”

Professor Michael Friedlander
Having grown up in Rheinhessen, one of the main wine regions in Germany, Bettina Meiser always thought her future lay in wine making; following in the footsteps of the generations before her. When she completed an apprenticeship and degree in oenology and viticulture, she was well on her way to fulfilling her family legacy.

It was only when she migrated to Australia in the late 1980s that she decided to retrain and pursue her lifelong passion in the psychological aspects of medicine.

“I completed an honours degree in psychology at Macquarie University,” she says. “My honours supervisor encouraged me to pursue a career in research.”

Now, Bettina’s research program helps families affected by the psychosocial impact of hereditary cancer through education and decision support strategies.

“Many families with hereditary cancer have witnessed multiple diagnoses of, and sometimes deaths resulting from, cancer, which can result in chronic grief reactions and high levels of distress,” she says.

Her latest research includes a new randomised controlled trial that compares the efficacy of educational materials for treatment-focused genetic testing (TFGT) to that of standard pre-test genetic counselling in preparing women newly diagnosed with breast cancer for decision-making about TFGT.

“As part of this study, women under the age of 50 with additional risk features who have been newly diagnosed with breast cancer will be offered treatment-focused genetic testing,” says Bettina. “This is a genetic test done around the time a woman is diagnosed with breast cancer, to help her and her doctor decide the type of surgery that is performed.”

“The study will identify the best ways in which to educate women about genetic testing following a new diagnosis of breast cancer,” she explains. “It will lead to the development of alternative models to provide genetic information during the acute cancer presentation, to develop effective and safe pathways of care to meet the already increasing – and likely future – demand for genetic information to guide therapeutic choices.”

Since changing her focus, Bettina has never looked back knowing that her new career brings the sorts of rewards wine making never could.

“Cancer is a life-threatening illness that universally arouses strong emotions of fear and, in many cultures, stigma as well,” she says. “Studying the psychological aspects of adaption to being at high risk for cancer or having been diagnosed with cancer seems vitally important.”

“My greatest achievement is to have contributed to the development and evaluation of evidenced-based educational resources, including decision aids, for families with hereditary cancer,” she says. “We have produced several decision aids for people at high genetic risk for breast, ovarian, colorectal and prostate cancer and disseminated them to familial cancer clinics around the country, with support from the Cancer Council NSW and the Centre for Genetics Education.

“I believe that many families with hereditary cancer have benefited from our research.”
“My research addresses the psychosocial impact of hereditary cancer and aims to provide affected families with patient education and decision support strategies.”

Associate Professor Bettina Meiser
Professor John Rasko has had one ambition in life and, so far, has not deviated from it: making a long-term contribution to medicine through research.

Having been accepted straight from school to study medicine at the University of Sydney, John was drawn to the fields of haematology and oncology. He specialised in the former and soon obtained Fellowships in both The Royal Australasian College of Physicians and The Royal College of Pathologists of Australasia.

But, it was during a year of supervised research for a BSc (Med) that he found his true calling.

“I was very lucky to work in the laboratory of Professor Gerry Wake in the Department of Biochemistry at the University of Sydney where I studied how DNA is copied when a bacteria divides,” says John. “From that point on I was smitten with the idea of undertaking research and so, on completion of my specialist training, I went to Melbourne to complete a PhD under the supervision of Professor Don Metcalf.”

After that, it was an easy decision to travel to the birthplace of bone marrow transplantation at the Fred Hutchinson Cancer Research Centre in Seattle. He completed three years of postdoctoral training before returning to NSW for a once-in-a-lifetime opportunity.

“At the ripe old age of 38 – without having taken a gap year or any other diversions – I was offered my first professional appointment to establish a new department of cell and molecular therapies at Royal Prince Alfred Hospital,” he says. “I’m still there!”

John’s team now specialises in gene and stem cell therapy, experimental haematology and molecular biology. Although they have made many breakthroughs, he believes Australia has a long way to go if we are to compete with Europe and the USA in cancer research.

“We appear to be way behind in terms of institutional and individual philanthropy compared to countries like the USA and the UK,” he says. “So, this means that if we do compete on an international scale, we need to be very clever, agile and anticipate the most important trends in medical research.

“By doing so, we can not only provide a competitive edge to our research, but also make ourselves familiar with new techniques and therapeutics for the benefit of our patients.”

John is currently working towards the manufacture of human cells for anti-cancer therapeutics.

“In order to meet the strictest national and international guidelines for safety and sterility, we have designed and built a suite of laboratories at Royal Prince Alfred Hospital to manufacture human cells so they can be reinfused into cancer patients,” he explains.

“Australia perhaps has a handful of facilities capable of manufacturing human cells at this strict level of quality and regulatory compliance.

“We are considerably under-served in this country for these advanced cellular technologies – increasingly being demanded by our patients.”

Even though John is committed to a lifetime of research, his passion is grounded in a desire to make a difference to the care of people who are suffering with ill health.

“During my early years as a medical registrar I realised that no matter how hard I worked and how many patients I could see, it would never be enough,” he says.

“The idea then came to me that research could make the biggest difference to patients now and in the future. So, I have committed myself to a career with a large component of medical research underpinning it.

“I still skip to work every day knowing that the work undertaken by my team may one day improve the well-being or at least reduce the suffering of people in need of our help,” says John.

“I have been privileged to witness the impact of some of these discoveries in my career.”
“The opportunity to make a scientific discovery that could improve our understanding of cancer or its treatment is truly a great privilege.”

Professor John Rasko
Geneticist Dr Maija Kohonen-Corish’s long-term vision for cancer research in NSW recognises that tissue banking of tumours after surgery and the associated clinical data collection are essential components of routine health care.

“While there is a lot of goodwill and generosity from the surgeons and pathologists towards research scientists and the work we are doing, collection of cancer specimens and patient follow-up data for even small research projects requires vast resources and coordination,” she observes.

“It would benefit the community enormously to have a fully integrated system of tumour banking, enabling senior scientists to make long-term plans and focus on the research.”

For Maija, her early work in colon cancer genetics was rewarding because discoveries could be readily translated to the clinic. After being awarded a PhD in 1988 for developing a molecular genetic method of HLA tissue typing in transplantation, Maija took up the opportunity of establishing a new colon cancer genetics laboratory at Canberra’s John Curtin School of Medical Research. This led to her discovery of unique gene mutations in individuals predisposed to colon cancer. This discovery enabled diagnostic testing of other family members to determine if they had inherited a cancer susceptibility gene.

Once this type of research became part of routine healthcare through familial cancer clinics, Maija shifted her focus to cancer biomarker discovery and development. Cancer biomarkers are altered genes or proteins that are only found in the tumour and are used to determine the patient’s prognosis and the most suitable treatment. This is another area with great potential for translation to the clinic, with many applications ranging from early diagnosis to personalised cancer medicine.

Maija joined the Garvan Institute of Medical Research in 2002 where she established the Colorectal and Lung Cancer Research Group. Maija’s translational research projects have led to the discovery of new candidate tumour suppressor genes, which help explain how cancer develops from normal tissue to tumours. For example, her innovative work with the ‘Mutated in Colorectal Cancer’ (MCC) gene, demonstrates that the MCC gene is epigenetically silenced in colorectal cancer and that this defect occurs in early premalignant polyps. MCC is a protective gene in the normal colon and therefore its silencing removes a brake that helped cells to maintain their normal function. As a result of alterations in several key genes in the same cells, cancer develops.

“We have developed a biomarker test for MCC silencing and discovered that this defect is found in about 50 per cent of colon cancers and 30 per cent of rectal cancers. We have also shown that it is involved in the cellular pathway controlling the DNA damage response.”

These findings predict that MCC deficient tumours have an altered DNA damage response, which is potentially important for radiotherapy responsiveness. Maija is hoping that this would help explain why some patients respond to radiotherapy while some others don’t respond, and she is currently testing these hypotheses in mouse models of colorectal cancer. She is a firm believer in the value of experimental animal and cell culture models for understanding how cancer develops and how it might be better treated; while acknowledging that ultimately these discoveries need to be validated in actual cancer specimens and in real patients before they can be translated to practice.

Alongside her landmark work in MCC gene silencing, Maija is also driving important investigations into the molecular genetics of lung cancer, where her team has discovered new prognostic biomarkers based on defective tumour suppressor genes. Here she hopes to follow the same approach as in colon cancer, from the “bedside to bench and back again”.

“Ultimately, I hope to determine how these gene defects cause cancer and how they could be exploited for finding better treatments.”

Canberra’s John Curtin School and the Garvan Institute of Medical Research in Sydney are a long way from Finland where Maija spent her childhood and began her university studies. She studied biology at the University of Helsinki and finished up with a Masters degree in Genetics in 1983.

“I grew up in a small town in eastern Finland with cold winters and lots of snow and the most beautiful green summers. In my teens I spent a couple of summers in Sweden doing odd jobs at a large university hospital. I was very impressed by the people in white coats in the laboratories and wondered what they were doing.”

For Maija and her groundbreaking cancer research, now well-established here in Australia, the journey of discovery continues.
“Ultimately, I hope to determine how these gene defects cause cancer and how they could be exploited for finding better treatments.”

Dr Maija Kohonen-Corish
OUTSTANDING CANCER RESEARCHER:

Professor Rob Sutherland (Garvan Institute of Medical Research)

Rob Sutherland is internationally recognised for his research into cancers that are dependent on hormones for their development and progression - including breast, prostate and ovary. He is a pioneer in the development of anti-breast cancer agents.

Hormone-dependent cancers account for around a third of all newly diagnosed cancers in western societies but Rob’s research has led to significant breakthroughs in treatment, and therefore survival.

His research has had a major impact on our understanding of the molecular basis of breast cancer development and progression and will have long-term ramifications for understanding the molecular basis of endocrine-resistant disease and potential ways to identify and treat it.

With the recruitment of multidisciplinary teams, acquisition of unique tissue resources and the development of a significant capacity in translational research, Rob and his colleagues have targeted identification of biomarkers and therapeutic targets more directly e.g. by genome-wide transcript profiling, deep sequencing (the ICGC pancreatic project) and functional genetic screens (in the first instance identifying new mediators of anti-estrogen resistance in a genome wide screen).

This has already identified a number of new molecular markers of disease progression and therapeutic responsiveness including endocrine resistance, which are being validated in independent cohorts. Highlights include the identification of tissue markers and gene signatures as predictors of metastatic disease in prostate and pancreatic cancer and the identification of novel therapeutic targets. Several of these findings are in prospective clinical testing.

OUTSTANDING RESEARCH SCHOLAR:

Ms Elizabeth Tindall (University of NSW, Children’s Cancer Institute Australia for Medical Research University of Sydney)

Elizabeth Tindall’s research focuses on the genetics of prostatic inflammation and their relationship with prostate cancer.

Recent reports have shown an association between symptoms of prostatitis (prostatic inflammation) and sexually transmitted disease with an increased prostate cancer risk. The major focus of this research is to identify variants in genes involved in the body’s inflammatory response that may be associated with prostate cancer predisposition and or development, assisting in early diagnosis and treatment.

INNOVATION IN CANCER CLINICAL TRIALS:

South West Sydney Cancer Services Research Group

Awarded for their commitment to providing access to clinical trials to every patient treated in the Sydney South West Area Health Service.

EXCELLENCE IN TRANSLATIONAL CANCER RESEARCH:

University of NSW, led by Professor Levon Khachigian

Awarded for their groundbreaking research into alternative therapies for skin cancer, the most costly cancer across our community. The research will develop novel, genespecific inhibitors of Basal Cell Carcinoma (BCC), using an extensive and unique range of in vitro and in vivo model systems, for pre-clinical and clinical evaluation toward improving therapeutic outcomes in BCC patients.

Pictured from left to right: Professor Rob Sutherland, Dr Claire Vajdic, Elizabeth Tindall, Lorraine Chantrill from South West Sydney Cancer Services Research Group and Professor Levon Khachigian.

OUTSTANDING CANCER RESEARCH FELLOW:

Dr Claire Vajdic (University of NSW)

Claire Vajdic’s research focuses on the cancer risk in immunodeficient people (such as organ transplant recipients and people with HIV/AIDS). The findings of this program of research will advance our understanding of the role of the immune system in carcinogenesis, and may identify modifiable risk factors for cancer; enabling cancer prevention. This research will lead to answers about cancer risk that will impact cancer prevention in the wider population.