We’re here.
Hello, from our CEO and Director of Cancer Research

Our highlights of 2017

How we fund research

Reversing chemo-resistance in lung cancer

Improving outcomes for patients with acute leukaemia

New approaches to aggressive breast cancers

Calculating the impact of bowel cancer screening

How obesity affects liver cancer

Investigating the link between melanoma and prostate cancer

Finding a targeted treatment for melanoma

Studying the link between physical activity, body fat and cancer risk

Looking ahead to the elimination of cervical cancer

Tracking kilojoule content in Australian fast foods

A new treatment for triple negative breast cancers

Studying genetics and cancer cell behaviour

Stopping breast cancer treatment resistance and relapse

Investigating the rise in vulvar cancer in young women

Killing neuroblastoma cells by turning off a gene

Understanding patterns of care and treatment inequities in lung cancer

Grants awarded by Cancer Council NSW in 2017

Grants awarded to Cancer Council NSW researchers in 2017

Publications 2017

Board and committees
OUR VISION
A cancer free future

OUR PURPOSE
We are Australia’s leading cancer charity, uniting the community, providing support, investing in research and saving lives

OUR VALUES
Our values influence the work that we do, and the way we work with our colleagues and with our community

INNOVATION
Seek and embrace the best

RESPONSIBILITY
Be accountable for our results and resources

COURAGE
Speak out and step up

COLLABORATION
Work together to achieve our goals
HELLO,
from our CEO and

At Cancer Council, we’re here every minute, every hour, every day for Australians affected by cancer. Every day, we are working towards a cancer free future and cancer research is a key priority in this journey. We know we need to find out more about cancer to unlock the answers and find solutions.

Cancer Council funds more research than any other non-government organisation in Australia. Here in New South Wales, we invest about $15 million each year into research, across the whole cancer journey. This is only possible thanks to the incredible generosity of our community. We are more than 95% community funded and our volunteers, donors, partners and supporters get behind our cause and enable us to do this life-changing work.

Our knowledge about cancer has come a long way. Based on our understanding of how cancers behave and thrive, there are many new and more targeted treatments in the pipeline. These bring hope for better patient outcomes with fewer side effects.

Survival rates have improved significantly in the last 20–30 years. The five-year survival rate for two of our most common cancers, breast and prostate, is now over 90% in Australia.

We know there is still a long way to go. Every year in New South Wales alone, 48,000 new cases of cancer are expected to be diagnosed and the impact on families, carers and communities is significant. It’s vital that we continue to push forward. This year’s Research Highlights Report is a celebration of our most recent achievements.

Jeff Mitchell
Chief Executive Officer
Cancer Council is proud of our footprint in cancer research. Every day, our researchers are focused on finding ways to reduce the impact of cancer.

Over the last 10 years, we have invested $148 million in world-class cancer research conducted right here in New South Wales, across a large number of institutions.

The community plays a pivotal role in selecting which projects we fund. Before we invest in a new research project, it is reviewed by both scientific experts and our panel of cancer survivors and carers, who help make sure we fund research that is of most benefit to the cancer community, while meeting the highest scientific standards.

At Cancer Council NSW, we support the best ideas and the best people in cancer research by funding external research teams. We provide significant funding to cancer research in institutions across the state who are making significant breakthroughs in cancer prevention, diagnosis and treatment. Progress on several of the exciting externally-funded projects are detailed in this report.

We work hard to maximise the impact and value of our research. Our internal team’s program is called Pathways to a Cancer Free Future – the work aims to identify where we can have the greatest impact on reducing the burden of cancer. Some of the recent findings from our bowel, prostate, cervical and lung cancer teams are also summarised throughout this report.

And it is thanks to generous support from the community that we’re able to fund ground-breaking research, like the projects showcased in this Research Highlights Report.

Adjunct Professor Karen Canfell
Director, Cancer Research Division
Cancer Council NSW conducts and funds world-class research that reduces the impact of cancer.

We contributed $15.2 million towards cancer research this year*

We fund a program of grants to researchers across NSW as well as supporting our own dedicated team of researchers.

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Research Spend</th>
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<tr>
<td>Neuroblastoma</td>
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<td>Women’s cancers</td>
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<tr>
<td>Research on all cancers</td>
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WHO SELECTS THE RESEARCH GRANTS WE FUND?
As a charity with limited funding, Cancer Council NSW can support only a fraction of the many excellent applications for research funding. Research experts, people with cancer, survivors and carers help us decide which research to fund by assessing applications on their scientific merit and potential impact on the community.

WHAT WE FUNDED

49.8% Treatment
6.5% Prevention
22.9% Early detection
20.8% Cancer control and survivorship

256 Researchers
70 Projects
16 Institutions

WHERE OUR FUNDING WENT**
Asbestos Diseases Research Institute
Centenary Institute
Children’s Cancer Institute
Children’s Medical Research Institute
Garvan Institute of Medical Research
James Cook University
Kirby Institute
Kolling Institute
Melbourne Health
Menzies School of Health Research
Peter MacCallum Cancer Centre
The University of Newcastle
University of Wollongong
UNSW Sydney
The University of Sydney
Westmead Millennium Institute

*2016/17 financial year; includes research we fund and grants we win.
**Active grants during 2016/17 financial year; includes administering and facilitating institutions.
How we fund research

Cancer Council NSW is one of Australia’s largest non-government supporters of cancer research. We fund world-class research that reduces the impact of cancer. Each year, we receive many excellent and worthy applications for funding. Experts in research and members of the community help us decide which projects we should fund.

Why include the community?
Community members work hard all year to raise the money we use to support research. That gives them the right to a voice in deciding where it goes. Survivors and carers understand the lived experience of cancer in a way that other people may not. That’s why the World Health Organization promotes community involvement in research. It’s also why we are committed to seeking community input into our funding decisions through our long-term partnership with Cancer Voices NSW.

Our Consumer Review Panel
The Consumer Review Panel consists of men and women from across metropolitan and regional NSW, representing a range of cancer experiences, including survivors and carers.

We are indebted to the members of our panel for grants commencing in 2017. See page 37 for membership details.

HOW DOES THIS PROCESS WORK?

1. Researchers submit their funding applications (research proposals) to us.

2. These proposals are assessed by independent panels of expert scientists. The panels assign each proposal a score, based on the quality of the science, the significance and innovative aspects of the research, and the expertise of the research team.

3. In the next stage, only the research proposals deemed to be among Australia’s best are assessed by our Consumer Review Panel. The panel is a group of specially trained cancer survivors, carers and family members, who judge each proposal according to its value to the community. This panel gives each proposal a score based on its likely benefits and impact.

4. The scores assigned to each proposal by the scientific and consumer panels are combined to create a final ranking. We lead Australian cancer charities by giving the cancer community a voice in all our research funding decisions.

5. The Cancer Research Committee, a committee of independent cancer research leaders, oversees this process to ensure rigorous transparency, governance and the best use of community donations.

6. The Cancer Council NSW Board awards the grants.
Reversing chemo-resistance in lung cancer

Professor David Watkins and his team have discovered a previously unknown reason for treatment resistance in lung cancer. The team have also discovered a naturally occurring hormone that could be used to reverse this treatment resistance and improve the effectiveness of chemotherapy.

BACKGROUND

Lung cancer is the leading cause of cancer death in NSW. Lung adenocarcinoma is the most common form of the disease, and most patients with this cancer will be treated with combination chemotherapy that includes the agent cis-platinum. However, despite best efforts, less than 20% of patients will respond to this treatment because lung adenocarcinoma is very resistant to cis-platinum.

In this project, Professor Watkins and his team have used the results of a whole-genome screen to identify new therapeutic targets that can dramatically increase the effectiveness of cis-platinum in lung cancer.

THE RESEARCH

By conducting a whole-genome screen of lung cancer cells, the research team has discovered a previously unknown reason for cis-platinum resistance. Lung cancer cells can resist the treatment using a hormone-like molecule called activin. The purpose of activin is to regulate the lung’s response to injury – essentially acting as a survival signal. The team’s data suggests that this mechanism is very common in lung adenocarcinoma.

By blocking activin, the survival signal in the lung would be silenced. Follistatin is a naturally occurring hormone in the body that can block the function of activin. Professor Watkins has now shown that follistatin can reverse resistance to cis-platinum chemotherapy in the lab.

THE IMPACT

Based on their findings, the team has formed a partnership with the researchers who discovered follistatin and a biotechnology company that is already developing the hormone as an anti-inflammatory drug. Through this new collaboration, Professor Watkins and his team have the opportunity to develop follistatin for clinical trials in lung cancer. Improving the effectiveness of cis-platinum chemotherapy has the potential to significantly improve outcomes for the many patients with lung cancer.
Improving outcomes for patients with acute leukaemia

A team of researchers led by Professor David Gottlieb has discovered that the treatment of using enhanced white blood cells to fight infection and leukemia can reduce side effects in bone marrow transplant recipients.

BACKGROUND

Acute leukaemia is a devastating disease, which frequently recurs even after treatment with chemotherapy. A bone marrow transplant can cure acute leukaemia, but it can also cause significant complications and side effects including vulnerability to infections. In this pilot clinical trial, Professor Gottlieb and his team are combining the best techniques in stem cell transplantation to reduce these complications.

THE RESEARCH

New transplant techniques involve administering white blood cells that have been enhanced to fight infection and leukemia. Professor Gottlieb is determining the best combination of all these available transplant methods, which can be used to improve patient outcomes.

In the first phase of this project, the team successfully produced the optimised T cells – the first locally produced T cells of their kind in Australia – and received approval to be used in patients for clinical trials.

The team are now testing this new transplant technique in the clinic. Three patients with relapsed acute leukaemia have received genetically modified cells in bone marrow transplants and have shown excellent responses to the treatment. The team are now recruiting more patients to the pilot. In addition, the team have open trials that test the combination of leukaemia and infection-fighting cells after transplant.

THE IMPACT

If these trials are successful, patients with acute leukaemia who have a bone marrow transplant will have a better chance of survival and a much lower risk of complications and side effects, which can reduce quality of life. If this approach is shown to be safe and effective, transplantation could be also brought forward to earlier stages of cancer progression, when the potential to cure patients is greater.

This new technique of bone marrow transplant may also be effective in treating other blood cancers including lymphoma and myeloma. Professor Gottlieb’s research offers new hope for better treatment outcomes for more than 11,000 Australians diagnosed with blood cancers every year.
He is a cancer researcher.

“...My research career arose out of a desire to overcome poor outcomes in clinical practice. As a clinician, I wanted to understand and uncover issues, then develop better treatments that can have direct and clear benefits for patients.

Research is about constantly identifying new questions to answer. A combination of curiosity, academic activity and caring for people in a real and meaningful way really drives me forward with my research. I am continually motivated by the fact that my day-to-day work can, and does, improve patient outcomes.

I specialise in cellular therapies, which is the use of cells as treatment as opposed to traditional drugs. I look at how cells can be utilised to combat infections in cancer, particularly in cancers of the blood.

Cancer Council NSW has funded a number of my projects, helping me to continue various linked pieces of research. These projects have formed a significant part of the overall strategy that my team and I use in the development of cellular therapies. Importantly, these individual projects have also addressed the need for variation in approach to target specific types of cancer and infections.

I hope my research will contribute to improving treatment of blood cancers, especially making them simpler, more effective and more tolerable for patients. Seeing the rate of complications reduced and improvements in outcomes in stem cell transplantation would be reflective of significant progress.”
New approaches to aggressive breast cancers

A team of researchers led by Dr Nicole Verrills has been investigating if a new ‘gene marker’ can predict which breast cancer patients may have poorer treatment outcomes. They have also identified a potential new treatment option for these patients.

Breast cancer is the number one cancer affecting Australian women, with around 3,000 people dying from the disease each year. Survival rates have increased dramatically over the last two decades, but the 5-year survival of patients whose breast cancer has metastasised, or spread, is only 23%.

A big challenge with breast cancer is that it is not just one disease – in fact there are several different subtypes of breast cancer. ‘Luminal B’ breast cancer accounts for around 21% of all breast cancers and is linked to treatment resistance and poor survival. There is no accurate way of identifying which women have this type of breast cancer.

Dr Verrills and her team have discovered a key mechanism that makes some breast cancers more aggressive and resistant to standard treatments. In particular, her research has been exploring the association between the gene PPP2R2A and Luminal B breast cancer. The team has discovered that breast cancer cells become more aggressive when this gene is missing. The cells also become resistant to standard therapies. This suggests patients who have lost this gene will have a worse outcome from their cancer compared to those with an intact PPP2R2A gene.

Importantly, Dr Verrills has discovered that breast cancer cells with this gene marker are sensitive to a drug that is already in clinical use for other diseases. These drugs can not only effectively kill these cells, but can also re-sensitize the tumour to standard treatment. The team is now working towards validating their findings in preclinical testing.

Dr Verrills and her team are now looking at how testing for the PPP2R2A gene could be used as a diagnostic tool. When a woman is first diagnosed with breast cancer, she could be tested for this gene. If found to be missing the PPP2R2A gene, this would indicate she is likely to be resistant to traditional therapies and needs an alternative treatment.

The team has also found that breast cancers with low PPP2R2A levels could be highly sensitive to a certain type of chemotherapy. If more preclinical testing confirms these results, this chemotherapy could be introduced into clinical trials for patients who have low PPP2R2A levels offering hope for patients with treatment resistant breast cancer.
“In 2000, I was diagnosed with breast cancer. It took me by complete surprise (an experience I think I share with a lot of people who get diagnosed). Because the cancer was aggressive, it was all very touch and go, and I had to go through 10 months of chemotherapy, radiation therapy and surgery.

When my treatment finished, I realised that survivorship comes with its own set of challenges. Suddenly, you don't have the help of your team of specialists, and you look and feel very different.

I definitely think that the experience gave me a different outlook on life. I feel stronger, and while that may sound strange, I feel like I've emerged at the other end as a different person. I have a new-found appreciation for life – every day matters.

After the experience of cancer, I also realised I wanted to give back. I got involved with Cancer Council NSW, first by doing their wonderful advocacy training in conjunction with Cancer Voices NSW, which really ignited my passion for consumer advocacy. I then completed the consumer review panel training and was invited to become a consumer reviewer of the research that the organisation funds.

Cancer Council NSW has an extremely robust review process in place – it ensures that projects get reviewed both based on their scientific merit and according to their relevance to the community.

Our panel of consumer reviewers is very diverse – we come from all sorts of backgrounds. We are really passionate about having a voice in the selection of the best projects. We debate all applications, because we really want to ensure that we choose projects with real-world impact and benefits. We all have enormous respect for the researchers behind the projects.”
Australia has one of the highest rates of bowel cancer in the world. The lifetime risk of developing bowel cancer before the age of 75 is around 1 in 21 for men and 1 in 30 for women. This makes bowel – or colorectal – cancer the third most common cancer in Australia and the second most common cause of cancer death.

Finding bowel cancer early can substantially improve a person’s chance of surviving the disease. Australia’s National Bowel Cancer Screening Program was introduced in 2006. The program aims to reduce deaths from bowel cancer through prevention and early detection of the disease by providing free biennial screening using the immunochemical faecal occult blood test (iFOBT) for people aged 50–74 years. However, only 40% of Australians who are eligible for bowel screening currently participate in the national program.

The team evaluated the impact of the National Bowel Cancer Screening Program over the next 40 years. The findings showed the program would prevent 92,200 cancer cases and 59,000 deaths between now and 2040 at current participation levels.

The team further examined the potential benefits of improved participation rates. They found that an additional 24,300 cases of bowel cancer and 16,800 deaths could be prevented if participation in the program increased to 50%. If participation increased to 60%, they calculated an additional 37,300 cases and 24,800 deaths would be prevented. This means that if just 20% more Australians completed the free test sent by the National Bowel Cancer Screening Program, 83,800 lives could be saved between now and 2040.

They also found the program is highly cost-effective, predicting overall cost savings within a decade of full roll out due to reduced number bowel cancer incidences.

Researchers at Cancer Council NSW have conducted an Australian-first study that estimated future bowel cancer rates and deaths.

These findings highlight the importance of the continuing and increasing participation of Australians in the National Bowel Cancer Screening Program. It is important that all individuals aged 50–74 years take part in the program, as 90% of bowel cancers can be cured if detected early.

The team’s research was used to support major statewide advertising campaigns by Cancer Institute NSW and Cancer Council Victoria to encourage eligible people to participate in the national screening program.
How obesity affects liver cancer

An individual’s risk of liver cancer increases if they are overweight. Dr Lionel Hebbard and his team conducted a long-range study that aimed to quantify the exact impact of metabolic drivers, particularly obesity, on liver cancer prognosis and progression in patients.

Cancer that starts in the liver is relatively rare, but in Australia the rates are rising steeply. In the last two decades, the incidence rate of liver cancer has increased threefold. Survival rates have improved very little over the same period. In Australia, a person diagnosed with liver cancer today has only a 17% chance of surviving for five years or longer.

Added to this picture, it is estimated that at least a third of future liver cancer cases will be due to fatty liver disease, but how obesity and a fatty liver promote cancer growth is unknown. Dr Hebbard and his team suspected that reduced production of a fat-derived hormone (adiponectin) and increased consumption of fructose (sugar from fruit and corn syrup) could be to blame.

Dr Hebbard and his team investigated the role of hormones and sugars in the development and progression of liver cancer to identify new and better ways to prevent and treat liver cancer.

In the laboratory, the team tested a combination of two anti-cancer drugs, rapamycin and dasatinib, on liver tumours. They found that these two drugs used together are much more effective at restricting cancer growth than each drug on its own. Importantly, they found this combination could shrink tumour size by as much as 80%.

In other experiments, the team discovered that fructose promotes the growth of liver cancer and can make it even more aggressive. They also found that when a particular growth hormone is absent from the liver, fructose has the ability to stop tumour growth. Together, these findings show that fructose has the ability to regulate liver tumour growth.

Dr Hebbard and his team have increased scientific knowledge about the role of obesity, and particularly fructose, in tumour growth. The team have identified a number of genes they hope to target in future studies. The team hope their work will result in the development of new targeted treatments that will be effective in treating liver cancer.
Investigating the link between melanoma and prostate cancer

Researchers at Cancer Council NSW found that compared to the general population, men who survived melanoma have a higher risk of being diagnosed with prostate cancer later in life.

**BACKGROUND**

In Australia, rates of melanoma and prostate cancer are among the highest in the world. For Australian men, prostate cancer is the most common cancer, and melanoma is the third. Sun exposure is the leading environmental cause of melanoma causing over 95% of cases. However, the few established risk factors for prostate cancer are generally considered non-modifiable, including family history and advanced age. Several studies have suggested that sun exposure may also be a potential risk factor for prostate cancer, but the link is not well understood.

**THE RESEARCH**

The researchers looked at all prostate cancer and melanoma diagnoses in NSW between 1972 and 2008. During this period, nearly 144,000 men were diagnosed with either cancer. Significantly, of the men first diagnosed with melanoma, 2,114 were subsequently diagnosed with prostate cancer.

These findings show that compared to men with no previous diagnosis of melanoma men with a previous diagnosis are at a 25% increased risk of being diagnosed with prostate cancer later. The results suggest that sun exposure may also play a role in prostate cancer, and that protecting yourself from the sun is therefore all the more important. The team also observed the risk of prostate cancer was highest in Australian born men, and in men’s first year of melanoma diagnosis.

**THE IMPACT**

This study has reinforced the importance of sun protection, as results suggest that sun exposure may play a role in the development of both melanoma and prostate cancer. Further investigations of the relationship between melanoma and prostate cancer are needed, but these results suggest GPs discuss future prostate cancer risk with men newly diagnosed with melanoma.

Men with a previous melanoma diagnosis are more likely to have more regular interactions with their GP and therefore may be more vigilant about their health – this may consequently increase the likelihood of detecting other diseases, including prostate cancer.
“Health has always been an area of interest for me. My research career began in the lab as a basic scientist investigating muscle development diseases in children. During this time, I developed an interest in public health and my career made a natural progression into epidemiology and population research. I became involved in a research project that examined the relationship between personal sun exposure behaviour, circulating vitamin D levels and prostate cancer risk. This project attracted me as I was interested in understanding the interactions between each of these factors from a molecular perspective. This has remained a strong focus of mine and continues to drive me in my current research.

My research is focused on identifying environmental, lifestyle and molecular risk factors of prostate cancer, including sun exposure, using various population-based datasets such as the NSW 45 and Up Study. Prostate cancer is one of those unique cancers where there are a few known risk factors, but they are all non-modifiable, like getting older or family history of this disease. So, one of my main aims is to find out what environmental and lifestyle factors might be associated with prostate cancer risk, with a particular interest in sun exposure. As part of my research, I am part of a team leading a randomised controlled trial testing if vitamin D supplementation can be used to prevent the spread of prostate cancer after diagnosis.

I hope my work will contribute to a comprehensive picture of the risk factors for cancer and uncover more ways that people can lower their individual risk.”
Finding a targeted treatment for melanoma

Professor Xu Dong Zhang and his team investigated the role a particular protein plays in melanoma cell survival. The results of this research are hoped to provide the basis for improved treatment benefits from existing drugs and new drug development.

**BACKGROUND**

Melanoma is a major health problem in Australia, being one of the most common cancers in both men and women. When a melanoma is caught and treated early, the survival rate is high. However, once melanoma has spread to other parts of the body, the outlook for a person is poor.

Despite the advances being made in using targeted therapies for other types of cancer, a cure for advanced melanoma remains an unmet healthcare need in Australia.

**THE RESEARCH**

Melanoma tumours are driven by a molecular network that helps the cancer cells to survive and grow. Professor Zhang and his team have shown that a key component of this network, protein (RIP1), is often increased in melanoma cells and acts as a driver for tumour growth and spreading of the cancer.

Using melanoma samples and preclinical testing, the team found that by inhibiting this protein they can slow down tumour growth. The team has also been able to define what causes the increase of RIP1 in melanoma cells, and how the protein protects cancer cells from chemotherapy.

The results suggest RIP1 could be an effective treatment target, particularly in combination with existing chemotherapy drugs.

**THE IMPACT**

The results of this study show that by blocking the pro-cancer powers of RIP1, it is possible to stop the growth of melanoma cells. This represents an exciting new way of treating advanced melanoma by targeting the disease at the molecular level.
Studying the link between physical activity, body fat and cancer risk

A team of Cancer Council researchers has shown that physical activity is an important factor in preventing cancer, particularly cancer of the colon, irrespective of body weight.

Background

Bowel cancer (which includes cancer of the colon or rectum) is one of the most common cancers in Australia. Almost 17,000 new cases are diagnosed each year. The risk factors for bowel cancer include older age, colonic polyps, bowel diseases, strong family history and rare genetic disorders. Lifestyle factors such as being overweight or obese, having a diet high in red meat, drinking alcohol and smoking also put people at higher risk of bowel cancer.

Prolonged sitting is also emerging as a potential risk factor for these cancers, but little is known about the interactive effects of obesity, physical activity and prolonged sitting on cancer risk. This analysis assessed independent and interactive effects of physical activity, body mass index (BMI), as a proxy for body fat, and sitting time on bowel cancer risk.

Research

The researchers looked at data of more than 200,000 people in NSW with the aim to find out if physical activity, obesity and prolonged sitting influenced someone’s risk of colon and rectal cancer. The team found that any amount of vigorous physical activity, even just over 10 minutes a day, reduced study participants’ risk of colon cancer by 22%. They also found that being obese increased individual’s risk of developing colon cancer by 32%.

Since physical activity can also contribute to weight loss, which can help people manage the cancer risk that comes from being overweight or obese, the study also examined if the risks of being obese were offset by the benefits of physical activity, or vice versa. The team discovered that the two risk factors, physical activity and obesity, appear to be independent of each other. This means that anyone can benefit from physical activity, regardless of their body weight, and this can effectively reduce their risk of colon cancer.

Impact

The findings show that everyone can lower their risk of cancer by making changes to daily routine such as being more physically active, regardless of their body weight. It is known that 1 in 3 cancer cases in Australia can be prevented by living a healthy lifestyle, so people should be encouraged to be physically active, as well as achieve and maintain a healthy weight. It is a simple and effective strategy everyone should seek to implement to reduce their risk of bowel cancer.
Looking ahead to the elimination of cervical cancer

The World Health Organization has called for coordinated action to eliminate cervical cancer globally. Our researchers are providing crucial evidence to support prevention strategies both in Australia and around the world.

BACKGROUND

Australia has been at the forefront of cervical cancer prevention for decades, and continues to take the lead – having led the world in successful implementation of HPV vaccination, we are now one of the first nations in the world to implement large-scale changes to cervical screening. Australia renewed its National Cervical Screening Program in December 2017, transitioning to a new program that tests for HPV, the human papillomavirus – a virus that causes almost all cervical cancers.

Researchers at Cancer Council NSW played a big role in informing these changes, confirming that they are safe, and that they will provide even better outcomes for Australian women. Since then the team has continued to lead efforts to support cervical cancer prevention, in Australia and around the world.

THE RESEARCH

Our researchers have evaluated both the short-term transitional effects and long-term implications of the renewed program. They discovered that switching to HPV screening is expected to avert over 2,000 cases of invasive cervical cancer between 2018 and 2035, saving 587 women’s lives. They also found that in the first few years of the new program, the number of new cases of cervical cancer will rise. This is because the improved test leads to earlier detection.

The team also reported on initial findings from Australia’s largest ever clinical trial, Compass. Results show HPV testing is more effective at detecting high-grade abnormalities than the Pap test. This was the first real-life demonstration of how HPV screening in HPV-vaccinated women can work in practice.

In another study, the team predicted HPV screening and vaccination should also decrease a woman’s lifetime risk of cervical surgery, compared to the previous Pap test. As a result, they predict pregnancy complications that can arise from such surgery will decrease.

THE IMPACT

Beyond Australia, our researchers are working with collaborators in New Zealand, USA, China, Vietnam and Papua New Guinea on optimising cervical cancer prevention around the world. For example our researchers directly informed policy in New Zealand around the appropriate age to start cervical screening.

This research reinforces the importance of the continued support and commitment to cervical cancer prevention through the HPV screening and vaccination program. It also provides further reassurance that the new cervical screening program will be a significant and timely step in Australia’s journey towards completely eliminating cervical cancer. Australia’s experience also demonstrates the potential to eliminate one of the world’s major cancers in women globally.
She is a cervical cancer survivor and peer support volunteer. This is KIRSTY BROWNE

“When I was 26, I went to see my GP for a prescription and asked for a Pap test as well. I was lucky I did this. A few days and several tests later, doctors confirmed I had cervical adenocarcinoma, which is rare and more aggressive than 80% of cases of cervical cancer.

I was warned that the treatment I needed could leave me infertile, and this was a frightening and devastating concept at 26 years of age. My oncologist organised a quick IVF treatment to harvest and store my eggs before my cancer treatment.

Everything went quite fast – there was a real sense of urgency. About eight weeks after I had the Pap test, I was in hospital having major surgery. Because I still wanted to try to have children, I had a trachelectomy, instead of a full hysterectomy. This means the majority of my uterus wasn’t removed and I was told I may be able to get pregnant in the future if my cancer doesn’t return.

Two years after surgery, my fertility was assessed and my husband Murray and I fell pregnant naturally. My son Baxter was born in November 2017, making me one of the first women in Australia to have a successful pregnancy and birth without a cervix.

Though I had fantastic support from family and friends, there comes a point where all you really want is to talk to someone who’d been through something similar – I felt incredibly alone. That’s why I became a peer-support volunteer with Cancer Council.

One of the greatest things about Cancer Connect is that I’m able to make others laugh. When I went through treatment, I really valued people who helped me make light of the situation, rather than keeping it so serious all the time. I really enjoy lending support to women going through the same thing now.”
Menu labelling legislation was introduced in NSW in 2012 to help reduce the impact of fast food on population health by providing people with clear information so they can make healthier choices based on the energy (kilojoules) in their food. The legislation, which has since been adopted in four other states and territories, requires any fast-food restaurant with 20 or more stores across NSW or 50 or more nationally to show kilojoule information on menu boards and displays in their restaurants. In this study, the researchers set out to determine what impact, if any, the legislation has had on the kilojoule content of Australian fast foods.

The team looked at the energy content of foods at Hungry Jack’s, KFC, McDonald’s, Oporto and Red Rooster restaurants across a 7-year period. The kilojoule content of all menu items were recorded every year, both prior to and after the introduction of the NSW fast-food menu labelling legislation. Tracking these fast-food outlets, it was found that overall, there has been no significant or systematic reduction in kilojoule content since the introduction of menu labelling. It was hoped that fast-food chains would see enforced menu labelling as an incentive to reformulate menu items across their product range and introduce new healthier items to provide healthier options. This has the potential to significantly improve fast food consumer’s energy intake across the population. Disappointingly, this study shows Australian fast foods are just as unhealthy as they were before the introduction of menu labelling.

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An Australian-first study led by Cancer Council NSW has revealed that, despite rising obesity rates, the kilojoule content of foods at some of the nation’s biggest fast food chains hasn’t changed since compulsory labelling was introduced.

Poor eating habits are strongly linked to weight gain, which increases the risk of 12 cancers. Menu labelling is a strategy to empower people to make healthier fast food choices. While there is evidence to suggest customers are opting for lower kilojoule options, the government and the fast food industry should be actively working to adopt reformulation targets and adjusting their menus to provide overall healthier options to their customers.
In Australia, over 18,000 women are diagnosed with breast cancer every year. Among them, around 15% will have triple negative breast cancer (TNBC), a subtype of the disease that is currently difficult to treat. Triple negative breast cancers lack the key proteins that would make them responsive to traditional breast cancer drugs, such as Tamoxifen and Herceptin.

Chemotherapy is the most common treatment for women with this type of breast cancer, but even if there is an initial response, the disease often comes back. New therapies that can effectively treat triple negative breast cancers and keep them from spreading are urgently needed.

Professor Baxter and his team have focused their research on targeting a protein called IGFBP-3. When present in high levels, this protein drives cancer growth and contributes to treatment resistance. The researchers have found that one way IGFBP-3 does this is by activating two other proteins that act as cancer-stimulators.

The team has developed a new drug therapy that could be used to treat TNBC. The new approach involves combining two currently available drugs to target the effects of the IGFBP-3 protein. This combined drug therapy was effective in stopping the growth of cancer cells in the laboratory and in pre-clinical testing using active TNBC tumours. Their results indicate that this therapy could be an effective alternative to chemotherapy for some women with TNBC.

This work is laying the foundation for clinical trials of this treatment for TNBC, where the team hope to be able to reproduce their promising results. Ultimately, it is hoped that this research will open the door to a whole new way of managing and treating these aggressive breast cancers and improving the outlook for all women affected.
Studying genetics and cancer cell behaviour

Professor John Mattick and his team are using cutting-edge sequencing technologies to uncover various components of DNA and how they differ in cancer cells.

BACKGROUND

The number of Australians living with or beyond cancer is expected to increase by a staggering 72% by 2040. Standard cancer treatments take a heavy toll on patients as they don’t account for the many unique characteristics of individual cancers. Personalised treatment approaches offer new hope for improving treatment effectiveness while minimising side effects.

THE RESEARCH

In this project, the researchers have been using cutting edge next-generation sequencing technologies to reveal the genetic structures underlying the development and progression of cancer. Cancer is a complex disease characterised by abnormal gene behaviours and unstable DNA.

The team have focussed on characterising a subset of genes called non-protein coding RNAs, the most diverse class of molecules in cells, which have abnormal activity in cancer. Since a large amount of RNAs have no known function, discovering their molecular features and how these are linked to certain biological functions is essential to further our understanding of the molecular transactions underlying cancer development.

Specifically, the group aimed to systematically investigate the structure and function of non-coding RNA molecules, which interfere with chromosome organisation in breast cancer cells.

THE IMPACT

The team’s work produced new methods to study RNA molecules through the structures they form in a cell. The group developed a way to link biological functions to specific RNA molecules by identifying structural patterns in the RNAs that bind to proteins with known functions in the cell. These RNA structures can then be mapped in the human genome to provide a function to regions of previously unknown function.

The findings from this provide a toolkit to accurately classify and assess the genetic mutations that can lead to cancer. With the ability to identify these unique genetic abnormalities and link them to biological functions, researchers and clinicians will be able to develop personalised treatment approaches to optimise patient outcomes.
“I was diagnosed with advanced prostate cancer at the age of 57. This came as a huge shock as I had not displayed any symptoms. Shortly after I underwent surgery to remove the prostate, but this wasn’t the simple fix I had hoped for. I had to accept that this would be an ongoing process.

Over the past 15 years since my diagnosis, I have undergone continuous hormone therapy treatment to slow the cancer growth. My wife and four children have continued to support me and allowed me to maintain a positive outlook and continue to live my life as normally as possible.

Being involved with a cancer support group was important for me. It’s enabled me to connect with other men going through a similar experience – all of us are living with advanced prostate cancer. It has provided me a great feeling of reassurance, that I wasn’t alone but supported and understood.

Being a part of a cancer support network led to my involvement with Cancer Council and gave me the opportunity to be a consumer representative for research. Last year I was a member of the consumer review panel that looks at all the grant applications. Having the chance to give to my opinion on which cancer research projects get funded is important to me. I come from a scientific background too, so I also find it all really interesting.

Research provides a great deal of hope to people with cancer, especially for individuals like me whose journey with the disease is continual. I think changes are effectively achieved when people who have been affected communicate with researchers and clinicians, so their work can have a real and meaningful impact.”
In Australia, breast cancer will affect 1 in 8 women by the time they are 85. About 70% of breast cancers are what is known as estrogen-receptor (ESR1) positive. The majority of women with this type of breast cancer will have endocrine therapy at some stage during their treatment. Endocrine therapy reduces the risk of breast cancer recurring. However, about a third of patients develop resistance to this therapy and relapse within 15 years of first receiving treatment.

In a previous study, Professor Clark and her team identified changes in the chemical modifications of DNA of ESR1 positive breast cancers that cause them to be resistant to endocrine therapy.

In this project, the team has been investigating the DNA chemical or epigenetic changes further. The new data they have gathered about endocrine resistant breast cancer will enable the researchers to develop biomarkers to identify which patients are at high risk of relapse.

Professor Clark and her team have also been investigating ways of reversing the epigenetic DNA changes to restore treatment sensitivity. They have discovered that a drug called Decitabine, commonly used to treat blood born cancers, can reverse the epigenetic changes and stop the growth of tumours. Their laboratory testing will determine if this drug also has the ability to restore sensitivity to endocrine therapy. Their hope is to show that Decitabine in combination with endocrine therapy could be an effective treatment approach for relapsed breast cancer.

Endocrine resistant cancer currently represents the most significant challenge in breast cancer treatment. This research has significantly improved knowledge of how and why endocrine resistance occurs, and importantly, how to identify those at highest risk. The findings point to a promising new treatment approach for patients who currently have limited options.
Investigating the rise in vulvar cancer in young women

A study by Cancer Council NSW has found that rates of vulvar cancer have been increasing significantly from the late 1980s to the mid-2000s.

BACKGROUND

About 280 Australian women are diagnosed with vulvar cancer each year. Up to 40% of all vulvar cancer cases are caused by the human papillomavirus (HPV), a common sexually transmitted infection.

Vulvar cancer is more common in women aged 60 and over, but the incidence is increasing in younger women, with over 30% of cases being diagnosed in women under 60. The findings suggest that HPV has become more prevalent in women born around or after 1950 – a trend that is associated with changing sexual behaviours in men and women, and therefore increasing levels of exposure to HPV.

THE RESEARCH

The researchers looked at vulvar cancer incidence data across 13 high-income countries, and found that the overall increase was driven by a substantial rise of cases in women under 60 years of age.

In Australia, there was a 54% increase of vulvar cancer cases in women under 60, and a 20% increase in women of all ages. Across all 13 countries there was a 38% increase in women under 60 years and a 14% increase in the overall incidence of vulvar cancer.

The study found that a total of 1,755 women under the age of 60 were diagnosed with vulvar cancer from 1982–2009, representing a 2.5% average percentage increase in rates in this age group every year.

The research concluded that the number of cases of vulvar cancer is expected to further increase in the future in several countries due to population growth and ageing. However, HPV vaccination is likely to counteract the increase to some extent, particularly in younger women.

THE IMPACT

With cases of vulvar cancer on the rise it is very important that women are aware of the signs and symptoms. Particularly as with early diagnosis and appropriate treatment women have an excellent chance of survival.

This research also reinforces the importance of HPV prevention. Children that receive the HPV vaccination when they are 12–13 years old are protected against up to 40% of vulvar cancers. They are also protected against a range of other HPV-related cancers – at least 70% of cervical cancers and up to 60% of oropharyngeal cancers.

TEAM

RESEARCH TEAM
Dr Yoon Jung Kang
Cancer Council NSW
Dr Megan Smith
Ellen Barlow
Kate Coffey
Professor Neville Hacker
Professor Karen Canfell

RESEARCH DURATION
2016–2017
Killing neuroblastoma cells by turning off a gene

This research has provided a groundbreaking insight into the relationship between the protein dyskerin and neuroblastoma, a deadly childhood cancer.

**BACKGROUND**

Neuroblastoma accounts for around 15% of deaths from cancer in children. The outlook for those diagnosed with aggressive neuroblastoma is particularly poor, with the chance of long term survival less than 40%. The treatment of high-risk neuroblastoma would be vastly improved by new therapies that can specifically target the molecular pathways involved in the progression of this cancer. This has been the focus of Dr MacKenzie’s research.

**THE RESEARCH**

Previous studies have shown that a protein called dyskerin is present in elevated levels in neuroblastomas, and Dr MacKenzie and her team investigated whether this link could be used to improve neuroblastoma treatment. As dyskerin appears to be required for the growth of neuroblastoma cells, the researchers have tested how well the protein works as a drug target.

Dr MacKenzie and her team have found that blocking production of the dyskerin protein not only halts the replication of neuroblastoma cells, but can actually kill the cells too.

Based on their findings, the team proposed that blocking dyskerin may also be an effective way to stop the growth of other aggressive cancers that feature similar genetic abnormalities as neuroblastoma, including lymphoma and breast cancer.

**THE IMPACT**

In discovering that blocking the dyskerin protein can stop and kill neuroblastoma cells, the team have identified a promising new target for developing new therapeutic strategies to improve survival outcomes for children with neuroblastoma. The next phase of this work is to identify which drugs can block dyskerin effectively. Once the drugs have been identified, this new treatment approach can be tested in preclinical trials for neuroblastoma and potentially other aggressive cancers with similar genetic abnormalities.

Dr MacKenzie’s work offers new hope for much-needed targeted treatments for the devastating childhood cancer, neuroblastoma, and other aggressive and hard-to-treat cancers.

**TEAM**

**PROJECT LEAD**

Dr Karen MacKenzie
UNSW Sydney

**RESEARCH TEAM**

Associate Professor Preethi Gunaratne
Dr Jamie Fletcher
Dr Bing Liu
Associate Professor Tracy Bryan

**RESEARCH DURATION**

2015–2018
Understanding patterns of care and treatment inequities in lung cancer

A study by Cancer Council NSW has revealed that over 1 in 3 lung cancer patients seek emergency care around the time of diagnosis, highlighting the need for more research into early detection of lung cancer.

Each year, over 12,000 Australians are diagnosed with lung cancer and 9,000 die from it. It is the fifth most common cancer in Australia and the leading cause of cancer death. More men than women develop lung cancer. The risk of being diagnosed before the age of 85 is 1 in 13 for men and 1 in 22 for women.

Lung cancer also has the highest burden of disease – this means that lung cancer patients’ overall health is poorer than for those with any other cancer and survival is low. Our researchers are focussed on identifying the most effective ways to reduce the impact of lung cancer. In this study, the team examined the patterns of care for lung cancer patients in NSW.

Analysing data from the Sax Institute’s 45 and Up Study, the study included 647 newly diagnosed non-small cell lung cancer patients, which is the most common form of the disease.

The team found that 35% of patients presented to an emergency department up to one month before or in the month of diagnosis. These patients had poorer health characteristics, including a high comorbidity score (i.e. other illnesses occurring in parallel to lung cancer). They were also more likely to be a recent ex-smoker, and they were more likely to be diagnosed with advanced stage disease.

The study also showed 92% of lung cancer patients had visited their GP at least three times in the six months prior to diagnosis, suggesting people who present to emergency are not using the emergency department as their primary point of contact but were also using other healthcare channels prior to diagnosis.

Importantly, nearly 1 in 3 patients did not receive any anti-cancer treatment up to one year after diagnosis. The team found potential inequities in treatment, with older patients or patients who had no private health insurance less likely to receive treatment.

The study shows that the pathways to a lung cancer diagnosis are complex. Often, patients have a number of other illnesses and non-specific symptoms, which leads to diagnostic difficulty and delays in diagnosis. For many lung cancer patients, poor survival is attributable to being diagnosed at an advanced stage.

The findings highlight the need to identify opportunities to diagnose lung cancer earlier and to optimise treatment pathways for all patients to achieve improvements in outcomes.
## Grants awarded by Cancer Council NSW in 2017

### New Project Grants

<table>
<thead>
<tr>
<th>Lead researcher</th>
<th>Institution</th>
<th>Funding period and amount</th>
<th>Study</th>
<th>Cancer type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Stephen Ackland</td>
<td>The University of Sydney</td>
<td>$449,488 2017–2019</td>
<td>Testing whether statins can improve the response rate of rectal cancer treatment</td>
<td>Colorectal</td>
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<tr>
<td>Prof Gregory Dore</td>
<td>UNSW Sydney</td>
<td>$441,492 2017–2019</td>
<td>Evaluating the impact of improving hepatitis C treatment on liver cancer rates</td>
<td>Liver</td>
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<tr>
<td>Prof Katharina Gaus</td>
<td>UNSW Sydney</td>
<td>$450,000 2017–2019</td>
<td>Boosting the immune system to help it find and kill lymphoma cells</td>
<td>Lymphoma</td>
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<tr>
<td>A/Prof Jeff Holst</td>
<td>The University of Sydney - Centenary Institute of Cancer Medicine and Cell Biology</td>
<td>$449,174 2017–2019</td>
<td>Manipulating melanoma cells into using biological pathways that will trigger their own death</td>
<td>Melanoma</td>
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<tr>
<td>Dr Elizabeth Hovey</td>
<td>The University of Sydney</td>
<td>$186,540 2017–2019</td>
<td>Testing a less toxic treatment for a type of glioma brain cancer</td>
<td>Brain</td>
</tr>
<tr>
<td>Dr Maya Kansara</td>
<td>Garvan Institute of Medical Research</td>
<td>$440,391 2017–2019</td>
<td>Identifying new ways of targeting the immune system to treat bone cancer</td>
<td>Bone</td>
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<tr>
<td>A/Prof Maija Kohonen-Corish</td>
<td>Garvan Institute of Medical Research</td>
<td>$450,000 2017–2019</td>
<td>Identifying the molecular drivers of colorectal cancer so that targeted therapies can be developed</td>
<td>Colorectal</td>
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<tr>
<td>A/Prof Elgene Lim</td>
<td>Garvan Institute of Medical Research</td>
<td>$450,000 2017–2019</td>
<td>Investigating if a new treatment combination can stop breast cancer growth</td>
<td>Breast</td>
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<tr>
<td>Prof Peter Metcalfe</td>
<td>University of Wollongong</td>
<td>$427,195 2017–2019</td>
<td>Developing a world first radiation system to ensure the safe delivery of radiation doses to patients</td>
<td>All cancers</td>
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<tr>
<td>Dr Kenneth Micklethwaite</td>
<td>The University of Sydney</td>
<td>$360,000 2015–2017</td>
<td>Testing new therapies that block the growth of triple negative breast cancer – a type of breast cancer that is currently difficult to treat</td>
<td>Breast</td>
</tr>
<tr>
<td>A/Prof Graham Neely</td>
<td>The University of Sydney</td>
<td>$213,459 2017–2019</td>
<td>Investigating whether microRNAs can be targeted to improve breast cancer treatment</td>
<td>Breast</td>
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<tr>
<td>Dr David Ziegler</td>
<td>UNSW Sydney</td>
<td>$200,000 2017–2019</td>
<td>Testing a new therapy to treat DIPGs, the most aggressive of all childhood brain cancers</td>
<td>Brain</td>
</tr>
</tbody>
</table>

### Continuing Project Grants

<table>
<thead>
<tr>
<th>Lead researcher</th>
<th>Institution</th>
<th>Funding period and amount</th>
<th>Study</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Prof Robert Baxter</td>
<td>The University of Sydney</td>
<td>$360,000 2015–2017</td>
<td>Testing new therapies that block the growth of triple negative breast cancer – a type of breast cancer that is currently difficult to treat</td>
<td>Breast cancer</td>
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<tr>
<td>Dr Catherine Caldon</td>
<td>Garvan Institute of Medical Research</td>
<td>$360,000 2015–2017</td>
<td>Determining the causes of treatment resistance in breast cancer so that new therapies, which prevent this resistance, can be developed</td>
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<tr>
<td>Name</td>
<td>Institution</td>
<td>Funding Amount</td>
<td>Years</td>
<td>Research Focus</td>
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<tr>
<td>Dr Anthony Cesare</td>
<td>Children's Medical Research Institute</td>
<td>$360,000</td>
<td>2015–2017</td>
<td>Improving our understanding of how cells age and behave when stressed</td>
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<tr>
<td>Prof Christine Clarke</td>
<td>The University of Sydney</td>
<td>$359,577</td>
<td>2015–2017</td>
<td>Looking at how hormones affect cells in the normal breast, which will help identify better treatment options for women with breast cancer</td>
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<tr>
<td>Prof Susan Clark</td>
<td>Garvan Institute of Medical Research</td>
<td>$353,633</td>
<td>2016–2019</td>
<td>The Kay Stubbs Research Grant: Identifying breast cancers that will be resistant to treatment and finding ways to reduce this resistance</td>
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<tr>
<td>Prof Peter Croucher</td>
<td>Garvan Institute of Medical Research</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>The Kay Stubbs Research Grant: Exploring whether an osteoporosis drug can encourage myeloma cells to 'hibernate' and not grow</td>
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<tr>
<td>Prof Anna DeFazio</td>
<td>The University of Sydney</td>
<td>$358,715</td>
<td>2015–2017</td>
<td>Identifying the genes involved in a poorly understood sub-type of ovarian cancer to develop better, targeted treatment strategies</td>
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<tr>
<td>Prof David Gottlieb</td>
<td>The University of Sydney</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>Testing bone marrow transplant methods to improve outcomes for patients with acute leukaemia</td>
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<tr>
<td>Prof Philip Hansbro</td>
<td>The University of Newcastle</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>Identifying the genetic mutations that cause lung cancer, which will help create early detection tests</td>
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<tr>
<td>Dr Jeffrey Holst</td>
<td>The University of Sydney</td>
<td>$360,000</td>
<td>2015–2017</td>
<td>The Robyn Trinder Research Grant: Developing new drugs to stop cancer cells from absorbing nutrients, thus starving them</td>
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<tr>
<td>A/Prof Marcel Dinger</td>
<td>Garvan Institute of Medical Research</td>
<td>$360,000</td>
<td>2015–2017</td>
<td>Finding new diagnostic tools and treatment targets for head and neck cancers</td>
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<tr>
<td>Prof Jacob George</td>
<td>The University of Sydney</td>
<td>$523,358</td>
<td>2015–2018</td>
<td>Preventing liver cancer by helping communities at high risk to be screened and to access treatment</td>
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<tr>
<td>Prof David Gottleib</td>
<td>The University of Sydney</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>Testing bone marrow transplant methods to improve outcomes for patients with acute leukaemia</td>
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<td>$360,000</td>
<td>2015–2017</td>
<td>The Robyn Trinder Research Grant: Developing new drugs to stop cancer cells from absorbing nutrients, thus starving them</td>
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<tr>
<td>Dr Ian Johnston</td>
<td>The University of Sydney</td>
<td>$356,021</td>
<td>2015–2017</td>
<td>Testing if a new drug can help reduce common cancer treatment side effects, including poor memory and nerve damage</td>
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<tr>
<td>A/Prof Mustafa Khasraw</td>
<td>The University of Sydney</td>
<td>$359,460</td>
<td>2016–2019</td>
<td>Adding a drug glioblastoma treatment that makes chemotherapy more effective</td>
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<tr>
<td>Dr Karen Mackenzie</td>
<td>UNSW Sydney</td>
<td>$342,077</td>
<td>2016–2019</td>
<td>Studying whether targeting a specific protein can make cancer cells more sensitive to chemotherapy</td>
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<tr>
<td>Prof Finlay Macrae</td>
<td>Melbourne Health</td>
<td>$290,340</td>
<td>2016–2019</td>
<td>CaPP3: a randomized double blind dose inferiority trial of aspirin in Lynch Syndrome</td>
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<tr>
<td>A/Prof Bettina Meiser</td>
<td>UNSW Sydney</td>
<td>$353,608</td>
<td>2015–2017</td>
<td>Assessing the impact (psychologically and behaviourally) of inviting women with a strong family history of breast cancer to undergo genetic testing</td>
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<td>Dr Kenneth Micklethwaite</td>
<td>The University of Sydney</td>
<td>$332,077</td>
<td>2015–2017</td>
<td>Helping the immune system to target and destroy multiple myeloma cells</td>
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<tr>
<td>A/Prof Manish Patel</td>
<td>The University of Sydney</td>
<td>$240,658</td>
<td>2016–2019</td>
<td>Developing a patient-reported symptom index for non–muscle invasive bladder cancer</td>
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<tr>
<td>Dr Phoebe Phillips</td>
<td>UNSW Sydney</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>Reducing the scar tissue around pancreatic cancers to improve drug delivery and prevent tumour growth</td>
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<td>A/Prof Hilda Pickett</td>
<td>Children's Medical Research Institute</td>
<td>$357,012</td>
<td>2016–2019</td>
<td>Creating drugs to block the parts of chromosomes that help cancers grow</td>
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<tr>
<td>Prof Roger Reddel</td>
<td>Children's Medical Research Institute</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>Testing drugs that block a source of cancer immortality</td>
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<td>A/Prof Andrew Spillane</td>
<td>The University of Sydney</td>
<td>$360,000</td>
<td>2015–2017</td>
<td>Determining the best type of surgery for melanoma that has spread to the groin lymph nodes</td>
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<td>Prof Stuart Tongye</td>
<td>Garvan Institute of Medical Research</td>
<td>$360,000</td>
<td>2016–2019</td>
<td>The Susan and John Freeman Research Grant: Looking at how errors in genes cripple the immune system and lead to lymphoma</td>
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<tr>
<td>Dr Nicole Verrills</td>
<td>The University of Newcastle</td>
<td>$359,577</td>
<td>2015–2017</td>
<td>Using a protein to predict which women will respond poorly to traditional breast cancer treatment so that they can be offered new therapies</td>
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<tr>
<td>Dr Jenny Wang</td>
<td>UNSW Sydney</td>
<td>$359,400</td>
<td>2015–2017</td>
<td>Finding a new way to target the cells that lead to relapse from leukaemia</td>
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<tr>
<td>Prof David (Neil) Watkins</td>
<td>Garvan Institute of Medical Research</td>
<td>$300,077</td>
<td>2015–2017</td>
<td>Understanding why lung cancers are resistant to certain treatments and finding ways to overcome this resistance</td>
</tr>
<tr>
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<td>Cancer type</td>
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<tr>
<td>Prof David (Neil) Watkins</td>
<td>Garvan Institute of Medical Research</td>
<td>$360,000 2015–2017</td>
<td>Treating bone sarcoma by blocking a certain biological pathway</td>
<td>Bone cancer</td>
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<tr>
<td>Prof Xu Dong Zhang</td>
<td>The University of Newcastle</td>
<td>$330,363 2015–2017</td>
<td>The Clement Saxton Research Grant: Investigating if a particular protein helps melanoma cells survive, leading to new treatments</td>
<td>Melanoma</td>
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<tr>
<td>Prof Xu Dong Zhang</td>
<td>The University of Newcastle</td>
<td>$343,987 2015–2017</td>
<td>The Valerie Enid Legge Research Grant: Identifying new avenues for the treatment of bowel cancer by targeting a specific protein</td>
<td>Colorectal cancer</td>
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<tr>
<td>Prof Xu Dong Zhang</td>
<td>The University of Newcastle</td>
<td>$351,787 2016–2019</td>
<td>Improving melanoma treatments by helping the immune system to destroy cancer cells</td>
<td>Melanoma</td>
</tr>
</tbody>
</table>

**Continuing Infrastructure Grants**

<table>
<thead>
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<tbody>
<tr>
<td>Prof Sally Redman</td>
<td>Sax Institute</td>
<td>$400,000 pa 2015–2019</td>
<td>45 and Up Study - the largest cohort study in the southern hemisphere, looking at the health and lifestyle of people over 45</td>
<td>All cancers</td>
</tr>
</tbody>
</table>

**Continuing Program Grants**

<table>
<thead>
<tr>
<th>Lead researcher</th>
<th>Institution</th>
<th>Funding period and amount</th>
<th>Study</th>
<th>Cancer type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Murray Norris AM</td>
<td>UNSW Sydney</td>
<td>$2,249,946 2016–2020</td>
<td>Improving outcomes for children with leukaemia through molecular targeted therapies</td>
<td>Leukaemia</td>
</tr>
<tr>
<td>A/Prof Claire Wakefield</td>
<td>UNSW Sydney</td>
<td>$2,245,746 2016–2020</td>
<td>The Harry McPaul Research Grant: Testing interventions that provide support for childhood cancer survivors and their families</td>
<td>Childhood cancer</td>
</tr>
<tr>
<td>Prof John Wiggers</td>
<td>The University of Newcastle</td>
<td>$2,203,986 2016–2020</td>
<td>Assessing community programs and services that help reduce cancer risk factors</td>
<td>All cancers</td>
</tr>
<tr>
<td>Laureate Prof Rob Sanson-Fisher AO</td>
<td>The University of Newcastle</td>
<td>$2,234,525 2016–2020</td>
<td>Rolling out a new system of patient-centred care across cancer units to improve patient outcomes</td>
<td>All cancers</td>
</tr>
</tbody>
</table>

**Continuing Strategic Research Partnership (STREP) Grants**

<table>
<thead>
<tr>
<th>Lead researcher</th>
<th>Institution</th>
<th>Funding period and amount</th>
<th>Study</th>
<th>Cancer type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/Prof Gail Garvey</td>
<td>Menzies School of Health Research</td>
<td>$1,934,430 2013–2017</td>
<td>Making the health system work better for Indigenous patients</td>
<td>All cancers</td>
</tr>
<tr>
<td>A/Prof Gillian Mitchell</td>
<td>University of Melbourne</td>
<td>$1,959,761 2013–2017</td>
<td>Investigating the genetic changes that lead to high risk of getting cancer</td>
<td>All cancers</td>
</tr>
<tr>
<td>Prof Andrew Grulich</td>
<td>UNSW Sydney</td>
<td>$1,982,544 2013–2017</td>
<td>Researching if oral cancer screening will reduce illness and death cost-effectively</td>
<td>Anal cancer</td>
</tr>
<tr>
<td>Laureate Prof Rob Sanson-Fisher AO</td>
<td>The University of Newcastle</td>
<td>$1,200,000 2011–2017</td>
<td>How to prevent people from getting cancer and provide care to cancer patients that takes into account their needs and values</td>
<td>All cancers</td>
</tr>
</tbody>
</table>

*2017 calendar year*
# Grants awarded to Cancer Council NSW researchers in 2017*

## New Grants

<table>
<thead>
<tr>
<th>Research team*</th>
<th>Project</th>
<th>Funding body</th>
<th>Funding amount and period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atkinson J-A, Veerman JL</td>
<td>Dynamic simulation modelling for smoking reduction in QLD</td>
<td>Sax Institute**</td>
<td>$20,000 2017</td>
</tr>
<tr>
<td>Braithwaite J, Taylor N, Gaff C</td>
<td>Implementation of genomic sequencing into clinical practice</td>
<td>Australian Genomics Health Alliance**</td>
<td>$240,000 2017-2019</td>
</tr>
<tr>
<td>Canfell K</td>
<td>Pathways project for bowel and lung cancer</td>
<td>Cancer Institute NSW</td>
<td>$200,000 2017-2018</td>
</tr>
<tr>
<td>Canfell K, Lew JB</td>
<td>National Bowel Cancer Screening Program modelling</td>
<td>South Australian Medical Research Institute</td>
<td>$40,000 2017-2018</td>
</tr>
<tr>
<td>Hammond D, Jones AC, Kirkpatrick S, Veerman JL, Horton S</td>
<td>Sugar-sweetened beverage consumption in Canada: consumption patterns over time and estimated health care costs</td>
<td>Canadian Institutes of Health Research**</td>
<td>$92,821 2017-2018</td>
</tr>
<tr>
<td>He E</td>
<td>Churchill Fellowship: Exploring the next generation of colorectal cancer screening tests</td>
<td>Winston Churchill Memorial Trust</td>
<td>$20,000 2017</td>
</tr>
<tr>
<td>Knight C, King, E, Elliott N</td>
<td>Development of a toolkit to support SunSmart schools to implement the sun safe hat recommendation</td>
<td>Cancer Institute NSW</td>
<td>$100,000 2017-2019</td>
</tr>
<tr>
<td>Taylor N</td>
<td>Hide and seek with hereditary cancer: Improving detection of colorectal cancer patients with a high risk of Lynch syndrome NSW</td>
<td>Cancer Institute NSW</td>
<td>$599,873 2017-2020</td>
</tr>
<tr>
<td>Veerman JL</td>
<td>Estimating the impact of taxing sugared drinks on health in Estonia: a modelling study</td>
<td>World Health Organization</td>
<td>$13,100 2017</td>
</tr>
</tbody>
</table>
### Research team

- **Bonevski B, Shakeshaft A, Farell M, Telepts F, Walserberge S**
- **Confell K**
- **Canfell K, Smith M**
- **Canfell K, Ward R, Frayling I, Kong Y J, Caruana M, Coupe V**
- **Gurney H, Nair-Shalliker V, Smith D, Gebski V, Patet M, Frydenberg M**
- **Kim J, Canfell K, Kulasingam S, Barnabas R, van Ballegooijen M**
- **Laaksonen M, Canfell K, Vajdic C, MacInnis R**
- **Miller A, Mills J, Lim B**

### Project

- **Quantifying intake of food prepared outside home during emerging adulthood**
- **Cost-effectiveness of a systems change intervention for smoking cessation in drug and alcohol treatment centres**
- **Evaluation of new screening strategies for prevention of cancer**
- **Effectiveness and cost-effectiveness of HPV vaccination and HPV-Based cervical cancer screening strategies in China**
- **HPV testing modelling, analysis and review of NCSP Data**
- **Effectiveness and cost-effectiveness of systematic screening for Lynch Syndrome (LS) in Australia**
- **Healthy Living after Cancer – A Partnership Project between the NSW, WA, VIC and SA Cancer Councils and the Cancer Prevention Research Centre, The University of Queensland**
- **Strategic research partnership to improve cancer control for indigenous Australians (STREP Ca-CIndA)**
- **A phase II randomised controlled trial of high dose Vitamin D in localised prostate cancer cases with intermediate risk of progression (Pros-D)**
- **Comparative modelling to inform cervical cancer control policies – CISNET Cervix**
- **Population-level relevance of risk factors for cancer**
- **Supporting people with cancer**
- **Cancer Information and Support Webinar Series for the Chinese community**

### Funding body

- **Australian Research Council Linkage Grant with The University of Sydney**
- **NHMRC**
- **Centre for Research Excellence in Prostate Cancer Survivorship (CRE-PCS)**
- **NHMRC Partnership Grant with The University of Queensland**
- **Cancer Council NSW**
- **NHMRC**
- **NHMRC**
- **NHMRC**
- **Prostate Cancer Foundation of Australia**
- **NHMRC**
- **NHMRC**
- **Australian Research Council Linkage Grant with the University of Wollongong**
- **US National Cancer Institute, National Institutes of Health**
- **NHMRC**
- **Cancer Australia with Aboriginal Health and Medical Research Council**
- **Cancer Australia**

### Funding amount and period

- **$202,044** 2015–2017
- **$1,060,523** 2013–2017
- **$455,452** 2015–2018
- **$420,692** 2016–2018
- **$662,000** 2016–2019
- **$470,554** 2015–2017
- **$2,498,842** 2016–2020
- **$1,267,111** 2014–2018
- **$1,934,430** 2013–2018
- **$689,723** 2016–2020
- **$192,035** 2014–2017
- **$310,292** 2016–2017
- **$120,000** 2015–2017
- **$111,000** 2015–2018

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32 | Every minute, every hour, every day.
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>King E, Knight C</td>
<td>Improve your long game. A sun protection program in NSW golf clubs</td>
<td>Cancer Institute NSW</td>
<td>$450,000</td>
<td>2015–2018</td>
</tr>
<tr>
<td>Smith D</td>
<td>Fifteen year quality of life, survivorship and survival outcomes for prostate cancer: The NSW Prostate Cancer Care and Outcomes Study</td>
<td>Cancer Institute NSW</td>
<td>$569,128</td>
<td>2016–2018</td>
</tr>
<tr>
<td>Walsberger S, Ireland R, Twyman L</td>
<td>Tackling Tobacco Mental Health Project</td>
<td>NSW Ministry of Health</td>
<td>$495,900</td>
<td>2016–2018</td>
</tr>
<tr>
<td>Walsberger S, Sobhan A</td>
<td>An e-learning program in smoking cessation for health and community sector professionals who work with high-prevalence groups</td>
<td>Cancer Institute NSW</td>
<td>$130,800</td>
<td>2015–2017</td>
</tr>
</tbody>
</table>

*Names in bold are Cancer Council NSW staff
**2017 calendar year
***Cancer Council NSW is a collaborating institution on this grant

NHMRC: National Health and Medical Research Council
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James Butler
Dr Toby Heap
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Professor Lisa Jackson Pulver
(from December 2017)
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Associate Professor Joe McGirr
Melanie Trethowan
Professor Jane Young

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Director, Hunter Cancer Research Alliance
(untill 13 Sept 2017)

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Consumer Representative

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Dez Maule
Consumer Representative

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Laboratory Head, Garvan Institute of Medical Research Conjoint Senior Lecturer, UNSW Sydney

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Allied Health Professional

Dr Alison McLean
Professional Carer

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Lawyer

Sheila Pham
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Tim Read
Layperson

Dr Claudia Rutherford
Experienced Researcher

Associate Professor David Smith
Experienced Researcher

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Jane Bennett
Robyn Bransby
Phillip Burge
Kathryn Leaney
Abd Malak
Dez Maule
Tony Maxwell
John Morris
Serafina Salucci

*2017 calendar year

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