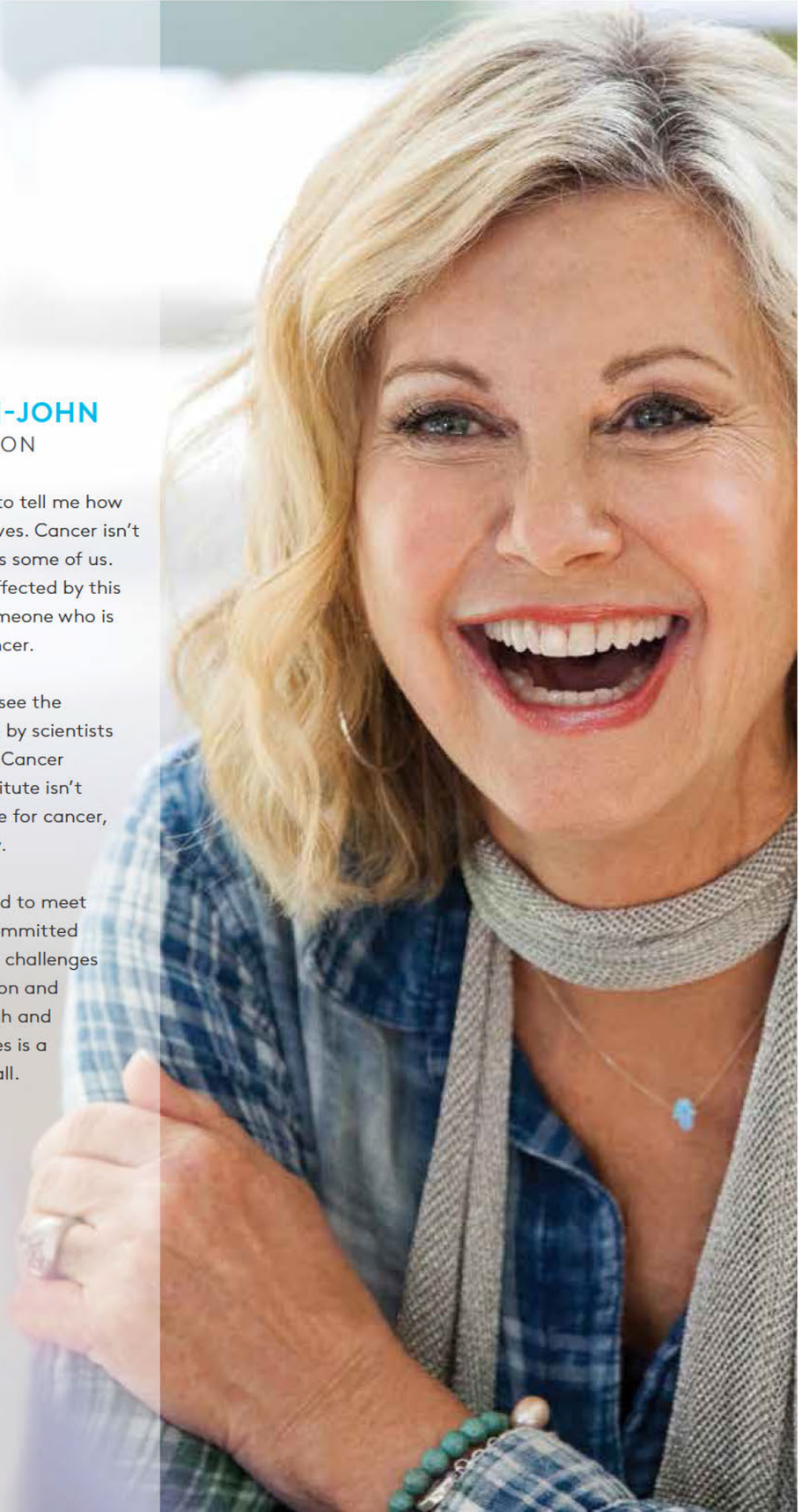
LOOKING TO THE FUTURE OF CANCER RESEARCH

Annual Report 2016

Olivia Newton-John Cancer Research Institute



OLIVIA NEWTON-JOHN
FOUNDING CHAMPION

Wherever I go people stop to tell me how cancer has touched their lives. Cancer isn't something that only affects some of us. In some way all of us are affected by this terrible disease or know someone who is facing the challenge of cancer.

That's why I'm so proud to see the wonderful work being done by scientists at the Olivia Newton-John Cancer Research Institute. The Institute isn't just thinking about the cure for cancer, it is working on it right now.

Each time I visit I am thrilled to meet brilliant young scientists committed to solving one of the major challenges of our times. Their dedication and commitment shines through and the hope their work provides is a real beacon of light for us all.

Please read their stories in these pages and join me in congratulating ONJCRI on a brilliant year of work.
Love and Light,

Olivia

CONTENTS

Front cover image: Medical oncologist Dr Belinda Yeo is part of the Institute's push towards more tailored treatments for cancer patients. In addition to her patient responsibilities, she is a clinician scientist in the Translational Breast Cancer Program (full story page 11).

CHAIRMAN'S REPORT

THE HON JOHN BRUMBY AO
CHAIRMAN OF THE BOARD

One of the rewards of chairing the Olivia Newton-John Cancer Research Institute (ONJCRI) has been the opportunity to see, first hand, the way that clinicians from the hospital and scientists from the Institute are able to integrate their activities and work together to develop better outcomes for patients with cancer. It has been my longstanding belief that medical research can best find its true value through clinical collaboration and translation so I am particularly delighted to see this model working so well at the ONJ Centre.

Although a very new institute, the ONJCRI has been built on the legacy of the respected Ludwig Institute for Cancer Research and is furthering its achievements of producing high-quality scientific publications and taking new therapeutics into clinical trials. This year alone Institute researchers put their names to more than 100 scientific publications.

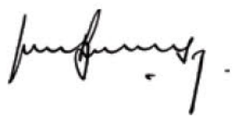
In the short time since the Institute's establishment we have seen impressive growth with the recruitment of new laboratory teams and the development of exciting new initiatives such as the establishment of our Translational Breast Cancer research program and the development of the liquid biopsy blood test for cancer diagnosis by the Translational Genomics and Epigenomics laboratory. This blood sample test is already saving the lives of patients.

As Board Chairman I am proud to see the quality and strength of the Institute's research prosper and grow. The work of the Institute's laboratory teams is exemplified within this report, alongside that of our clinician scientists, who continue to develop more effective treatments to improve the quality of life through their clinical trials.

I thank the members of the ONJCRI Board, who freely donate their time and expertise to guide ONJCRI. I warmly thank the directors who retired in 2016, namely, Ms Jane Martino, Professor Brendan Murphy and Mr George Raitt for their contributions in establishing a solid foundation for the Institute to build on. I convey the Board's gratitude to the Executive Officers who play an important role in overseeing the day-to-day business of the Institute.

We are committed to ensuring that the Institute's work continues to thrive, and are grateful for the role played by donors and supporters in our quest to defeat cancer.

I trust that you will enjoy reading about this work in this report.



THE HON JOHN BRUMBY AO

YEAR AT A GLANCE

86 STAFF

34 STUDENTS

62 CLINICAL TRIALS LED BY INSTITUTE INVESTIGATORS

84 INVITED PRESENTATIONS BY ONJCRI RESEARCHERS

113 ONJCRI SCIENTIFIC PAPERS PUBLISHED

125 RESEARCH COLLABORATIONS

$20.6M SECURED EXTERNAL FUNDING

JOINT DIRECTORS' REPORT

PROF JONATHAN CEBON
MEDICAL DIRECTOR

PROF MATTHIAS ERNST
SCIENTIFIC DIRECTOR

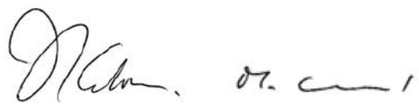
"Punching consistently above our weight" has been a determined commitment of the founding scientists and clinicians who undertook the bold challenge of creating the Olivia Newton-John Cancer Research Institute in 2014. Only two years on, the Institute has grown significantly and is firmly delivering on this vision to our stakeholders, patients and the community.

2016 has been a highly successful one for ONJCRI in terms of scientific discoveries, clinical trial outcomes and success with government and private funding agencies who entrust scarce research dollars to only the best and brightest. However, the key ingredient to ONJCRI's progress remains the skills, passion and diversity of our scientists, clinicians, support staff and students, and their collective imagination to tackle cancer from the bench to the clinic and build the best multi-disciplinary teams to collaboratively face the next big questions. This enables ONJCRI as the School of Cancer Medicine to build further synergies with complementary research conducted at our affiliate, La Trobe University.

The Institute's strong linkages within the comprehensive cancer centre of our host institution, Austin Health, were enhanced during 2016 through new dual roles held by Institute clinician researchers. These include Professor Andrew Scott appointed Director, Department of Molecular Imaging and Therapy, Associate Professor Hui Gan appointed Director of the Cancer Clinical Trials Centre, and Professor Niall Tebbutt appointed Director, Medical Oncology Unit.

With diligent support from the Board of Directors and the Scientific Advisory Committee, the Institute has made critical new appointments and strategic investments, including the formation of our Translational Breast Cancer Program headed by Professor Robin Anderson. With this, as for any of ONJCRI's other research programs, our clinician scientists provide the vital link between the treatment needs of cancer patients and the discoveries made in the laboratory.

It is exciting to see that clinical translation is recognised as one of the priority funding areas for the Medical Research Future Fund, Australia's world-leading health investment into the future. ONJCRI is well positioned and looking forward to our future research pursuits and contributions towards the international efforts to better understand and control cancer.



PROF JONATHAN CEBON / PROF MATTHIAS ERNST

OUR HIGHLIGHTS

The Tumour Targeting Laboratory reports promising results from international clinical trials it has led into a drug designed to counter aggressive brain cancer.

The highlight of 2016 for our laboratory was the completion of a multi-centre, multi-national clinical trial, led by Associate Professor Hui Gan, investigating the antibody-drug conjugate ABT-414 in patients with glioblastoma multiforme (GBM). GBM is an aggressive form of brain cancer to which patients typically succumb within 18 months of the diagnosis. GBM tumours often have elevated levels of and/or mutations in the epidermal growth factor receptor (EGFR), which ABT-414 targets.

Previously, Professor Andrew Scott, Head of the Tumour Targeting Laboratory, successfully developed and conducted the first-in-human clinical study of anti-EGFR antibody mAb806 with the mAb806 patent portfolio licensed to pharmaceutical company AbbVie. Professor Scott and Associate Professor Gan, both clinical researchers, have continued strong collaborative involvement in the development of this novel cancer therapeutic. Over the past three years Associate Professor Gan has provided leadership in Australian and International multi-centre trials with the humanised antibody construct ABT-806, and the antibody-drug conjugate (ADC) ABT-414. ADCs are a rapidly growing class of anti-cancer agents, sometimes referred to as "magic bullets". They combine the tumour-targeting properties of monoclonal antibodies with the anti-tumour effects of potent cytotoxic drugs.

The study into ABT-414 showed impressive clinical responses. On the basis of these results we are continuing to work with AbbVie evaluating ABT-414 in newly diagnosed and recurrent GBM in additional Phase II/III clinical trials. Further research into biomarkers of response is continuing in our laboratory, and we aim to extend this success into clinical trials in patients with other EGFR-expressing cancers with new trials scheduled for 2017.

CRACKING THE COLON CANCER CODE

FOR MORE THAN 20 YEARS PROFESSOR JOHN MARIADASON, HEAD of the Oncogenic Transcription Lab, has concentrated his career on studying and attempting to battle colon cancer. John decided on colon cancer as a focus during his time as a predoctoral student, and has never wavered.

"Some people want to branch out and get broader but I didn't," John said. "There was so much that needed to be addressed in that particular disease alone, I just wanted to stay in that field – I'm glad I did because it's complex."

It takes years of training and reading to accumulate the knowledge to get on top of such a complicated subject and to be able to make a contribution. "I think I have a good understanding of the disease and the holes in our knowledge," he said. "I certainly have a good sense of where we can make a contribution. I know what has been achieved or failed. So we know what not to revisit."

John believes his team is close to cracking a major part of the colon cancer equation. Following 15 years investigation his lab appears on the brink of conclusively proving that certain types of HDAC (Histone

'I CERTAINLY HAVE A GOOD SENSE OF WHERE WE CAN MAKE A CONTRIBUTION.'

deacetylases) enzymes are ''pro-tumourogenic'' (i.e. colon cancer causing). This is significant; the work could allow oncologists to use very targeted existing drugs to block these enzymes, rather than 'bombing' all patients with non-specific drugs.

Since the human genome was sequenced 13 years ago, scientists such as John have been able to pinpoint the exact genetic change that mutates a normal colon cell into a cancer cell and are tantalisingly close to perfecting drugs that will only slot into, and counter, those specifically mutated cells.

But there are many cancer cells, and some will mutate more than once or, within a day of drugs being administered, change their shape again to compensate. It's a constant battle against a tricky foe with many faces.

The Oncogenic Transcription lab, comprising scientists, students and clinicians doing PhDs to better understand the science behind their work with patients, is a perfect example of the Institute's boutique brand of collaborative science.

As pharmaceutical companies develop new drugs, John's team conducts pre-clinical work, testing each drug on 80 genetic versions of colon cancer nurtured in the lab. "They're our babies and our research tools."

By identifying which colon cancer cell lines greatly respond to a proposed drug, John hopes to inform oncologists which drug may provide benefits to an individual patient. After two decades, he is heartened by the successes but pushes on, working methodically and intently, to get colon cancer on the run.

GLOBAL AWARD FOR IMMUNE RESEARCH

WHEN DR KATHERINE WOODS RECEIVED THE EMAIL from the Society for Immunotherapy of Cancer informing her that her article had been chosen as the Best Basic Science Paper in its journal that year, her first thought was that it was spam. Receiving such an award came as a huge surprise.

Katherine is honoured by the endorsement and the international recognition it brings – not only to her research into the effects of inflammation on the immune system's ability to fight cancer but also to the work conducted across the ONJ Centre.

'EVERYTHING I DO IS GEARED TOWARDS AN END RESULT WHICH IS HELPING PEOPLE AND TRYING TO IMPROVE CANCER OUTCOMES.'

Katherine is a basic scientist, working to improve our understanding of how cancer works, (as distinct from translational cancer researchers, who use clinical trials to develop and improve treatments). Understanding the mechanisms behind cancer is an important part of research, informing the development of more effective prevention, diagnosis and treatment methods.

Having completed her PhD on African sleeping sickness in Ireland, Katherine turned her attention to cancer because "there is not a lot of African sleeping sickness in Ireland, as the name would suggest. I never saw a patient, or felt like there was any direct relevance to my research."

In her current position as a postdoctoral research fellow she works alongside clinicians and hears directly about the patients she is trying to help. "Everything I do is geared towards an end result, which is helping people and trying to improve cancer outcomes. I think

we do it well here because the oncologists and the researchers work so well together."

Katherine's research focuses on inflammation in melanoma and how cancer cells evade the immune system, particularly T cells, the 'killer' white blood cells that recognise infections as foreign, rapidly propagate and then clear the infection. Cancer, however, is made up of the body's own cells so it is harder for the immune system to recognise it as hostile.

In some cases, the immune system is able to identify and then destroy cancer cells, the mechanism immunotherapy makes use of. Katherine's research has demonstrated that inflammation in the tumour results in changes to the molecules that the T cells target on cancer cells, blinding the T cell to recognising the cancer cell as hostile and killing it. Currently, about 20% of melanoma patients are cured using immunotherapies. The knowledge that inflammation can impact anti-cancer immune responses, and the increased understanding Katherine has provided of why and how this happens, will contribute to the ongoing increase in the success of immunotherapy.

Joining forces **to tackle** a common foe

Oncologist Dr Belinda Yeo is passionate about her work with patients and also about being part of a laboratory team seeking better, more personalised, treatments for them.

DR BELINDA YEO, CLINICIAN SCIENTIST, has a foe too small to be seen, even by the most up-to-date and sophisticated scanning technology. Belinda treats cancer patients but she is also part of a team of research scientists in the Translational Breast Cancer Program investigating infinitesimally small tumours.

Program Head Professor Robin Anderson said, "Belinda brings a clinical perspective to us. We bring the pre-clinical perspective of game-changing laboratory science to her."

Belinda's foe can lie dormant in a patient's body after treatment – often for 10 or more years – before coming to life again as secondary recurrence. Many of her patients are suffering from breast cancer, fed by female hormones, in particular oestrogen. If their cancer is caught early, the vast majority of women will survive and not endure the cancer again. The 'cures' that allow this are often achieved with drug therapies that prevent the mysterious micro-tumours from re-emerging.

"Most women I see are fit and well, and don't have any other medical problems, apart from their breast cancer, which is the biggest threat to their life," Belinda said. "But, shocked by this glance at mortality, many patients push for ongoing post-surgery treatment to definitely beat the disease, no matter the consequences."

Belinda, like many oncologists, wonders whether the fairly low risk of secondary recurrence of breast cancer in some patients justifies the potential harmful side effects of 'insurance' chemotherapy toxicity. "I don't want to deny women treatment. But I'd like to be in an era where we target our treatments more precisely to those women who have the most to gain from them, and spare women who have little to gain" she said.

"Five or even 10 years of anti-oestrogen therapy can ruin sleep, wither a woman's libido, bring on early menopause, affect fertility, and make bones brittle."

Her quest is to find better tests to "personalise" treatments, to predict who needs what drugs, and to work out if a specific treatment is going to make a difference. More technically, this means investigating better ways to estimate recurrence risk in patients diagnosed with oestrogen receptor positive early breast cancer. "Ultimately, we want to maximise survival and minimise toxicity," Belinda said. "Of course we want to cure our patients but we don't want to cause them harm for the rest of their lives, and remember, many of these women have many years to live."

Robin Anderson, who recently joined the ONJCRI from the Peter MacCallum Cancer Centre, is enthusiastic about Belinda's role in her group and the institute's longstanding tradition of embedding researchers and clinicians in teams. "When I built my breast cancer research team 20 years ago, I started from a very basic biochemical molecular background, and conducted research with much ignorance about the potential clinical ramifications of my discoveries," Robin said.

"The current model of multidisciplinary teams provides a wonderful two-way dialogue to inform us about the clinical relevance and significance of our laboratory work," she said. "And it also exposes clinicians to the breath of tools and technologies available in the laboratory for our quest to find new and better drugs for the treatments of our cancer patients."

> 'I WOULD LIKE TO BE IN AN ERA WHERE WE TARGET OUR TREATMENTS MORE PRECISELY TO THOSE WOMEN WHO HAVE THE MOST TO GAIN FROM THEM.'

Belinda likes to also include her patients too in the process of translating laboratory findings into clinical practice. Raised in Sydney in a family of doctors, she originally planned to become a journalist before finding her way into medicine and then oncology, including over four years at the renowned Royal Marsden Hospital in London. The urge to be a communicator proved a strength as Belinda became a go-between for the scientists in her lab and patients, actively involving them in exploring their cancer and potential treatments.

CANCER IMMUNO-BIOLOGY LABORATORY

PROF JONATHAN CEBON

Medical Director and Laboratory Head

Medical Director of Cancer & Neurosciences CSU, Austin Health

Drugs that boost immunity are having unprecedented impact as new anti-cancer treatments. We seek to understand the intricate interactions and crosstalk between cancer cells and immune cells to improve responses to anti-cancer treatments. We are developing blood tests to obtain clinically relevant information about tumours.

NEW PROTEIN ARRAY MEASURES CANCER-SPECIFIC ANTIBODIES

Highly effective immunotherapies such as antibodies that target Programmed Death 1 (anti-PD-1) have put immunology into the spotlight of translational cancer research, and highlighted the importance of being able to identify and measure the immune system's interaction with cancer cells. To do this, and to relate it to patient outcomes, we have developed a protein array designed to measure more than 100 antibodies against cancer-specific proteins in a single drop of patient's blood. This easy-to-use and cost-effective assay has been created through a collaboration with the Victorian Cancer Agency funded Melbourne Melanoma Project and collaborators in South Africa (*Int J Cancer*. 2014; 135(8):1842-51).

ANALYSING TUMOUR CELLS AS THEY CIRCULATE

In collaboration with colleagues from the University of Queensland, we developed a method to enumerate and analyse circulating tumour cells in the blood of melanoma patients. Blood samples contain numerous other non-target cells and molecules, most of which have a tendency to adhere to solid surfaces via nonspecific interactions. Our approach utilises a recently discovered alternating current electrohydrodynamic (AC-EHD) induced surface shear force, referred to as nanoshearing. A key feature of nanoshearing is the unique ability to agitate fluid to encourage contact with surface-bound melanoma-specific antibody for cell capture whilst removing non-specific cells from the surface. This platform achieved an average recovery of 84.7% from biological samples (*Sci Rep*. 2016; 6:19709).

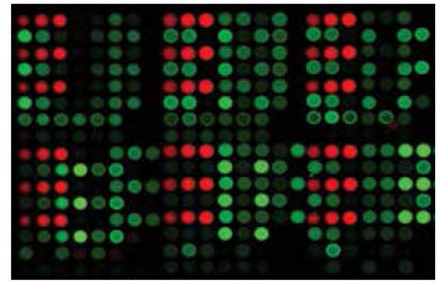
COMPUTING TOOL IDENTIFIES MICRORNA/GENE INTERACTION

Very short pieces of RNA, called microRNA or miRNAs, are key regulators of cancer cell behaviour through their interaction with messenger RNA (mRNA). However, until recently there were no accurate tools to predict which genes they interact with and the biological consequences of these interactions. To address this problem, we developed a computing method to identify novel potential interactions between these molecules and to then assess the functional significance. (*Mol Cancer*. 2016 Nov 16;15(1):72; script workflow:http://github.com/uomsystemsbiology/LMMEL-miR-miner). We showed that miRNA identified by this method plays a key role in regulating the spreading or outgrowth of cancer cells from an artificial tumour mass.

RESEARCH HIGHLIGHT

The proteasome complex inside each cell breaks proteins down into short peptide "epitopes" which are then displayed to the immune system. This allows diseased cells to be distinguished from normal cells and targeted for destruction. During infection or inflammation, an alternative form known as the immunoproteasome is formed and this assists the control of infections. Dr Katherine Woods has studied the impact on cancer immunity when the proteasome complex switches between these two main forms. This dramatically changes cancer recognition by the immune system and so can have profound effects on the immune destruction of the cancer. The paper describing this work was awarded best basic science paper of 2016 from the Journal for ImmunoTherapy of Cancer (Woods et al. Mismatch in epitope specificities between IFN-gamma inflamed and uninflamed conditions leads to escape from T lymphocyte killing in melanoma. *J Immunother Cancer*. 2016;4:10). (See page 9 for more.)

Opposite: *A melanoma tumour nest, (in yellow), is infiltrated by immune cells (in magenta). The tumour expresses the protein PD-L1, (periphery, in red). Studies have shown that cancer cells use PD-L1 to evade killing by immune cells. Drugs targeting such protein are now in clinical trial.* ***Below:*** *Custom array showing cancer antigens bound to a glass surface, and visualized with a detection antibody.*



RESEARCH TEAM

Miles Andrews, Andreas Behren, Marissa Blume, Jonathan Cebon, Jessica Duarte, Liliana Endo-Munoz, Thomas John, Oliver Klein, Simone Ostrouska, Anupama Pasam, Prashanth Prithviraj, Gareth Rivalland, Bibhusal Thapa, Candani Tutuka, Marzena Walkiewicz, Katherine Woods

CANCER & INFLAMMATION LABORATORY

PROF MATTHIAS ERNST

Scientific Director and Laboratory Head
Head of School of Cancer Medicine, La Trobe University

Cancer cells live and thrive in an environment of a large array of normal cells with tumours often corrupting these normal cells for their own advantage. The laboratory is striving to better understand how these interactions can be exploited to enhance anti-cancer treatments.

INVESTIGATING THE INTERLEUKIN-11/GP130/JAK/STAT3 PATHWAY

We have previously shown that this pathway facilitates the growth of gastrointestinal tumours that are driven by various bona fide oncogenic mutations (i.e. Apc, PI3K etc). We are genetically delineating the source and mechanism that results in excessive production of IL-11 and related cytokines as well as the exact nature of the Jak kinase(s) involved in signaling. These insights will help us devise therapeutic strategies, including exploiting already approved clinical compounds that cause minimal side effects on non-tumour tissues.

KINASE IDENTIFIED IN MYELOID CELL REGULATION

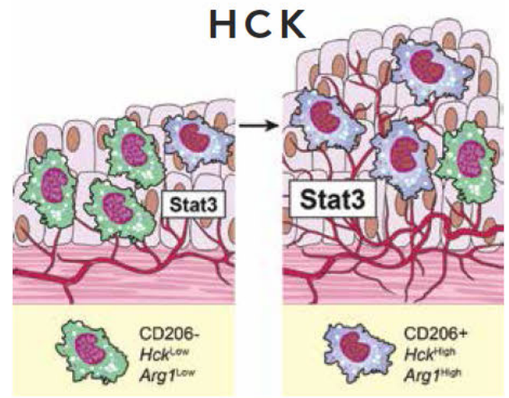
We have identified Hck as a Src-family tyrosine kinase that plays an important role in regulating the phenotype of macrophages and myeloid immune cells. As depicted in the diagram when aberrantly activated, Hck not only causes spontaneous consolidation of the lung with inflammatory cells, but also promotes the growth of colonic tumours. This observation amounts to the first example of a Src-family kinase expressed in normal cells affecting the growth of a solid malignancy.

CYTOKINE ROLE PROBED IN INFLAMMATORY BREAST CANCER

This relatively uncommon form of disease amounts to the most aggressive form of breast cancer with limited treatment options. We are exploring the role of inflammatory cytokines as local mediators, possibly between genetically distinct, individual tumour subclones that collectively amount to the cancer cell heterogeneity observed in any one human malignancy.

PURSUING DCLK1 IN STEM CELL RESEARCH

Cancer stem cells contribute to tumour growth and promotion, including metastatic spread and acquisition of resistance to therapy, through their capacity to self-renew as well as to differentiate. Recently it has become clear that inflammatory processes promote the transition of a Dclk1 protein-expressing subset of terminally differentiated cells of the intestinal epithelium can acquire cancer stem cell potential. Accordingly, we are investigating the molecular contribution of serine/threonine Dclk1 to this process and are pursuing the suitability of Dclk1 as a therapeutic target.



Above: *Myeloid-specific HCK activity regulates tumor-associated macrophage polarization from a phagocytic endotype (green cells, CD206-) to a wound-healing endotype (purple cells, CD206+) and promotes the growth of colon cancer. (Adapted from Cancer Cell 31:563).*

RESEARCH HIGHLIGHT

Preclinical in vivo models provide an opportunity to understand and replicate the complex interactions between cancer cells and their normal counterparts. We have established new models that carry molecular switches allowing us to turn on and off in the gastrointestinal epithelium the faulty genes (either as oncogenes or tumour suppressor genes), or the gene or genes that encode protein(s) that we can ultimately therapeutically target with new drugs. These models will help us gain better insights to understand how current therapies work for gastrointestinal cancers and how we can design better treatment for the future. (Thiem et al., 2016 *Cancer Research* 76:2777; Thiem et al., 2016 *Genesis* 54:626)

RESEARCH TEAM

Shoukat Afshar-Sterle, Mariah Alorro, David Baloyan, Jamina Brunnberg, Michael Buchert, Giulia Buchmann, Andrew Carey, Annalisa Carli, Ashwini Chand, Christine Dijkstra, Belinda Duscio, Moritz Eissmann, Matthias Ernst, Nima Etemadi, Jennifer Huynh, Cameron Johnstone, Rowena Lord, Frederic Masson, Riley Morrow, Megan O'Brien, Robert O'Donoghue, Alex Owen, Ashleigh Poh, Pathum Thilakasiri

TUMOUR TARGETING LABORATORY

PROF ANDREW SCOTT

Laboratory Head

Director, Department of Molecular Imaging and Therapy, Austin Health

Our laboratory aims to develop improved ways to diagnose and treat cancer through imaging technologies and targeted therapies. We develop novel antibodies that inhibit tumour growth and translate these discoveries into clinical trials in cancer patients, striving to improve patient survival and quality of life.

NOVEL ANTIBODIES AMONG PROGRESS MADE DURING YEAR

In the past 12 months we have continued to identify novel targets for cancer drug development. We have identified structural changes in tumours that are well suited to targeted therapy and have created novel antibodies against these, several of which have shown preliminary success in inhibiting tumour growth in our lab. We have also made progress in identifying signaling pathways responsible for therapy resistance to such drugs in colorectal cancer and brain tumours such as glioblastoma.

Our research is developing improved techniques to deliver cytotoxic payloads directly into cancer cells. This work includes both preclinical model work and human trials, with impressive results in brain tumour patients with glioblastoma. Lastly, our research into novel imaging probes for cancer detection and characterisation has also been highly successful, particularly for intracellular signaling pathways, lipid moieties responsible for therapy resistance, and growth factor/ hormone receptors.

TARGETED THERAPY TO EPIDERMAL GROWTH FACTOR RECEPTOR

Our laboratory has developed an antibody (mAb806) which binds to a tumour-specific form of the Epidermal Growth Factor Receptor (EGFR) expressed on cancer cells. Over the last few years, we have taken this laboratory research into human trials, as detailed in the highlight section of this annual report. We are also exploring in our laboratory how, despite the clinical successess, tumour sensitivity and resistance to the potent 806 antibody-drug conjugate ABT-414 occurs, aiming to identify predictive biomarkers for patient selection, and optimal treatment approach. In addition to the ongoing clinical trials in glioblastoma, we are investigating in preclinical models this treatment approach to target other EGFR expressing cancers, (including cancer of the colon, breast and mesothelioma) with new trials planned to commence in 2017. We are also pivotally involved in designing trials of a next generation version of these antibody-drug conjugates for Phase 1 testing in 2017.

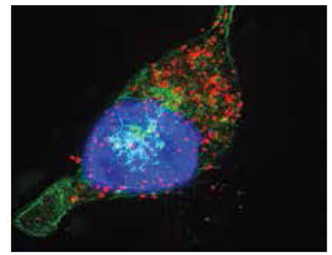
TREATMENT PREVENTS AND REVERSES CACHEXIA

Cachexia is a syndrome of weight loss which is seen in more than 50% of patients with advanced cancer, as well as other significant medical conditions (e.g. heart disease, diabetes, HIV). Over the past 12 months, in collaboration with Professor Nick Hoogenraad and Dr Amelia Johnston at La Trobe University, we have developed a humanised antibody which, in the laboratory, prevents and reverses cachexia. This research also involves identifying blood and imaging biomarkers of cachexia, which we will use for optimising treatment with our humanised antibody. We aim to develop this antibody for clinical trials, which we expect to commence within three years.

MOLECULAR IMAGING OF CANCER

Using sophisticated chemistry techniques, we have been working on developing imaging probes that can identify patients suited to treatment with hormone therapies against ER-positive and AR-positive breast cancer cells, certain key oncogenic signaling pathways, and immunotherapy. Projects underway include: a novel PET (positron emission tomography) probe that can identify lipid signatures in prostate cancer predictive of anti-androgen therapy response; evaluation of hypoxia in tumours; identification of a cell surface molecule responsible for breast cancer response to therapy; clinical trials of ^{89}Zr labelled antibodies aimed at validating targets and identifying optimal dose and patient selection for therapy; and drugs to image sensitivity and response to drugs targeting the PI3K/Akt and Ras/Raf/Mek pathway.

Below: *A cancer cell showing the effective targeting and internalisation of an anti-EGFR antibody (red) with cellular cytoskeleton (green) and cell nucleus (blue).*



RESEARCH HIGHLIGHT

See page 7 for more.

RESEARCH TEAM

Uwe Ackermann, Laura Allan, Ingrid Burvenich, Diana Cao, Puey Ling Chia, Farshad Foroudi, Hui Gan, Benjamin Gloria, Nancy Guo, Eliza Hawkes, Dylan King, Nathan Lawrentschuk, Fook Thean Lee, Sze Ting Lee, Daryl Lim Joon, Zhanqi Liu, Carmel Murone, Sagun Parakh, Adam Parslow, Angela Rigopoulos, Andrew Scott

ONCOGENIC TRANSCRIPTION LABORATORY

PROF JOHN MARIADASON

Laboratory Head

Our laboratory is seeking to identify new drug treatments for colorectal, gastric and biliary tract (bile duct) cancers, and is aiming to develop strategies to use existing drugs more effectively. We have a longstanding interest in the role certain proteins play in the progression of colorectal cancer.

EPIGENETIC THERAPY: PROGRESS IN UNDERSTANDING COLON CANCER DRUGS

We are interested in epigenetic therapy; the non-genetic influences on gene expression and how they can be used therapeutically. We have shown that two families of proteins – histone deacetylases (HDACs) and bromodomain-containing proteins – are required for colon cancer growth, and demonstrated that drugs targeting these proteins block the growth and cause death of colon cancer cells. We advanced understanding into why these drugs work more effectively in some cancers, using this to develop drug combinations that can enhance their activity.

KEY TRANSCRIPTION FACTORS IDENTIFIED IN COLON CANCER CELL DIFFERENTIATION

Our laboratory investigates the molecular basis for why cellular and tissue differentiation is perturbed during colorectal tumourigenesis. Loss of cellular and tissue differentiation is a hallmark of colorectal tumourigenesis and is associated with increased propensity for cancers to metastasise and be resistant to conventional chemotherapy. We have identified a number of key transcription factors that are deregulated during this process, using this information to investigate mechanisms by which differentiation can be reprogrammed in tumour cells. We have developed mouse models in which these genes are inactivated specifically in the colon to study the impact on differentiation of both the normal gut and colon cancers.

EXPLORING DIFFERENTIATION TO COUNTER CANCER CELL SPREAD

The laboratory is also investigating therapeutic strategies aimed at reversing the loss of cellular and tissue differentiation in colorectal tumourigenesis. In particular, we are exploring the potential of combining inhibitors of the MAPK signaling pathway, which is commonly perturbed in poorly differentiated cancers with HDAC inhibitors. The re-induction of differentiation has the potential to reduce the likelihood of cancer cell spread and metastasis, and increase response to conventional chemotherapy.

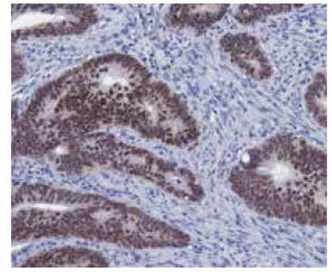
DISCOVERY OF BIOMARKERS TO TARGETED THERAPIES

Through access to clinical trial samples provided by our long term collaborator Associate Professor Niall Tebbutt, our laboratory has an active translational research program aimed at discovering "biomarkers" that can predict a patient's likelihood of responding to a specific therapy. The treatments we are currently investigating include: anti-angiogenic therapeutics (avastin), multi-kinase inhibitors (regorafenib), BRAF inhibitors and mTOR inhibitors, in colorectal cancer, gastric cancer and cholangiocarcinoma. Recent findings have also shown that colorectal cancers can be divided into specific "molecular subgroups". We are applying the classification criteria to clinical trial samples we have collected to assess whether these distinct molecular subgroups respond differentially to therapy.

RESEARCH HIGHLIGHT

We made a key discovery about the basis for why different tumours respond differently to HDAC inhibitor drugs. Based on this discovery we designed and successfully tested a novel drug combination that can overcome resistance to these drugs in preclinical models.

The laboratory also identified two molecular determinants of the response by biliary tract cancers to the drug Everolimus. Clinical trials have previously shown that a subset of patients with biliary tract cancer respond to treatment with this drug and our discovery will enable subsequent clinical testing of it to be undertaken only in patients likely to gain benefit.



Above: *Colorectal cancer expression of CDX2 (brown nuclear staining), a marker of epithelial differentiation and improved prognosis.*

RESEARCH TEAM

Fiona Chionh, Mercedes Davalos-Salas, Amardeep Dhillon, Laura Jenkins, David Lau, Austen Lavis, Analia Lesmana, Ian Luk, John Mariadason, Jennifer Mooi, Eka Moseshvili, Rebecca Nightingale, Camilla Reehorst, Niall Tebbutt, Lars Togel, Janson Tse, Andrew Weickhardt

CELL DEATH AND SURVIVAL LABORATORY

DR DOUG FAIRLIE

Laboratory Head

Our laboratory studies the mechanisms by which cells either kill themselves (a process called apoptosis) or which help them survive in response to various stresses. It is important to understand how these processes are regulated to learn more about how cancer develops, and ultimately develop better treatments.

NOVEL REAGENTS DEVELOPED TO ACT ON BCL-2 PROTEINS IN MELANOMA

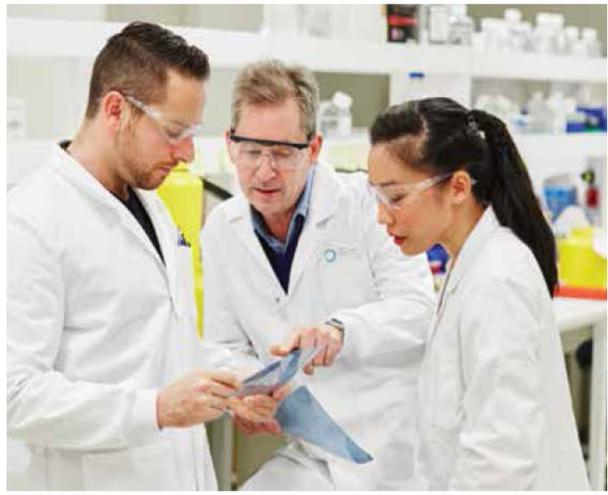
Proteins of the Bcl-2 family are essential for determining the survival of all cells. However, when their expression is deregulated they can also contribute to the development of cancer. Work in the Cell Death and Survival Laboratory is examining the role of Bcl-2 proteins in melanoma. Using several approaches, we have developed novel reagents that can specifically target certain family members and neutralise their pro-survival activity in cells. We have now shown that inactivation of two Bcl-2 family members is most critical for effective melanoma cell killing in vitro and in animal models. Future work will focus on developing drugs against these proteins for potential clinical applications.

TARGETING MYC IN CANCER

Myc is another gene that is often deregulated in cancer leading to uncontrolled cell growth. It therefore also represents an attractive drug target. However, this has proven challenging and no effective drugs directly targeting Myc have yet to emerge. We are collaborating with a leading Australian biotechnology company, Phylogica, to characterise novel peptide-based reagents they have developed that potently inhibit Myc. Our studies have shown that these are highly effective in some blood cancers, especially when combined with Bcl-2 protein inhibitors. Ongoing work will focus on understanding the precise mechanism-of-action of these unique reagents and examine strategies by which we can make them more potent.

UNDERSTANDING CROSSTALK BETWEEN CELL DEATH AND CELL SURVIVAL

Autophagy is a process used by cells to recycle contents that are damaged or defective in order to generate energy. Like apoptosis, deregulated autophagy is implicated in cancer development and progression. There is also evidence that this cell survival process is interconnected with the apoptosis pathway controlled by the Bcl-2 family of proteins, though this has been controversial. We are using a variety of techniques including biochemical, cellular and structural studies, combined with novel mouse models we have developed, to better understand how the apoptotic and autophagy



pathways talk to each other. We will also examine how induction or suppression of autophagy can influence the effectiveness of drugs used in cancer treatment.

RESEARCH HIGHLIGHT

All cells possess the ability to kill themselves by a genetically programmed form of cell death called apoptosis. This process is deregulated in most cancers, allowing damaged cells that should otherwise be removed to grow uncontrollably. Collaborating with Professor Ben Kile's laboratory (Walter and Eliza Hall Institute), we characterised a novel mouse model to provide critical new insights into how apoptosis regulation occurs in an animal. These studies showed that an interaction between two key proteins (Bcl-xL and Bak) is essential for the survival of certain cells of the immune system. It also dictates the effectiveness of some chemotherapies, representing a target for new drugs. (Lee et al., 2016; *Genes and Development* 30:1240-50)

RESEARCH TEAM

Marco Evangelista, Doug Fairlie, Chethana Galketiya, Tiffany Harris, Erinna Lee, Celeste Ramnac, Geoffrey Vernon Thompson, Sharon Tran

TRANSLATIONAL GENOMICS & EPIGENOMICS LABORATORY

A/PROF ALEXANDER DOBROVIC

Group Leader

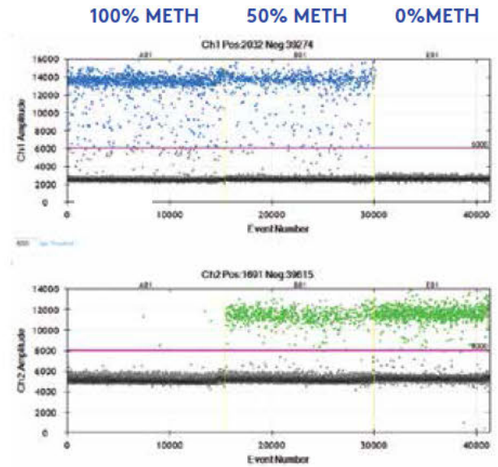
The Translational Genomics and Epigenomics (TGEG) Laboratory undertakes gene-based and genomics-based research into cancer diagnostics with a focus on collaborative research, aiming for the optimum treatment of cancer patients. Our laboratory operates at the interface of translational investigations, being active in both research and diagnostics.

LIQUID BIOPSIES OPTIMISE PATIENT MANAGEMENT

Circulating tumour DNA is a direct measure of the amount of tumour in the patient. Assays to detect circulating tumour DNA would meet a real clinical need in the management of cancers as an efficient way of monitoring success of the therapy and the detection of relapse. Monitoring circulating tumour DNA is dependent on the identification of cancer specific mutations. We are developing these assays so that they can be applied to each cancer patient.

PURSUING METHYLATION AS A MECHANISM OF CANCER PREDISPOSITION

Up to now, the emphasis has been on identifying individuals with a family history of breast cancer. Our new approach to understanding non-familial breast cancer risk is based on epigenetics, which is the study of how our genetic machinery is programmed. Mutations in the BRCA1 gene, which is involved in the repair of DNA damage, underlie much familial breast cancer. Our previous studies indicate that an epigenetic modification called DNA methylation, which can inactivate the BRCA1 gene, might be a novel mechanism of breast cancer predisposition. We are examining normal tissues for evidence of DNA methylation of the BRCA1 gene to identify individuals who may be at increased risk of developing breast cancer – a novel approach. Studies of methylation as a mechanism of cancer predisposition represent a frontier area in cancer research. Once it is understood how such methylation arises, it may be possible for dietary or other interventions to reduce it, and decrease the risk of developing cancer.



Detection of methylated BRAC1 alleles using droplet digital PCR.

MINIMISING SEQUENCE ARTIFACTS IN DNA FROM FORMALIN-FIXED TISSUES

Cancer patients are increasingly treated with molecularly targeted therapies that require molecular diagnostic testing. Formalin-fixed tissue is the primary material used for diagnosis of molecular targets, but it is challenging to test. A serious problem in using this tissue for molecular testing is the presence of sequence artifacts, which are not readily distinguished from true mutations and increase the risk of false positive results. This project aims to solve the problems of formalin-fixed tissues to improve the current molecular diagnostics for accurate delivery of precision medicine in cancer.

RESEARCH HIGHLIGHT

In 2016, our laboratory became accredited by the National Association of Testing Authorities (NATA) for compliance with ISO/IEC 17025 and ISO 15189 (Medical Laboratories-Requirements for Quality and Competence) through the NATA's research and development program. All research including that undertaken by students and trainees is carried out according to the standard ISO/IEC 17025. In addition, we gained specific accreditation to perform droplet digital PCR testing of liquid biopsies from cancer patients and DNA methylation analysis of tumours. As a result, we were engaged by AstraZeneca to perform EGFR testing for the T790M mutation in lung cancer patients to help identify the most suitable therapy options for these patients.

RESEARCH TEAM

Hongdo Do, Alexander Dobrovic, Basant Ebaid, Su Ka Goh, Anh Le, Thomas Mikeska, Ramyar Molania, Ashan Musafer, Thomas Witkowski, Giada Zapparoli

METASTASIS RESEARCH LABORATORY

PROF ROBIN ANDERSON

Head of Translational Breast Cancer Program and Laboratory Head

The Translational Breast CancerProgram is composed of the Metastasis Research Laboratory and the Matrix Microenvironment & Metastasis Laboratory. The program seeks to identify the genes that control the spread of breast cancer, a process called metastasis.

METASTASIS RESEARCH LABORATORY

Our research is focused on developing improved therapies for patients with recurrent or progressive breast cancer. Whilst therapies for early breast cancer are very effective, treating patients in whom the cancer recurs is more challenging as the secondary cancer is often resistant to the therapies that initially were effective.

BMP4 IDENTIFIED AS A POTENT SUPPRESSOR OF BREAST CANCER METASTASIS

Using preclinical models, where the primary tumours have varying capacity to spread to other organs (typically bone, lung and lymph nodes), we discovered that BMP4 is a protein that is expressed only in tumours that are non-metastatic or poorly metastatic. This was confirmed in breast cancer in patients, where patients with high levels of BMP4 have a better overall survival than those with low levels of BMP4. In these models, therapy with recombinant BMP4 protein can prolong the survival of the mice by preventing the development of secondary tumours.

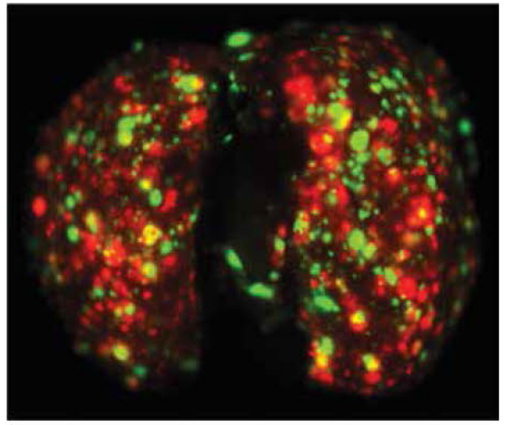
We have demonstrated that BMP4 can reduce metastasis by blocking the production of a protein called G-CSF (granulocyte colony stimulating factor). By reducing the production of G-CSF and the consequential reduction in the number of neutrophils in the bloodstream, BMP4 can reduce the spread of the tumour cells.

Our current research focuses on how BMP4 alters G-CSF levels and determining which human cancers would benefit from a treatment that mimics it's actions.

THERAPY TARGETING MACROPHAGES INCREASES CANCER SPREAD

More than 20 clinical trials are underway globally assessing whether the inhibition of macrophages by blocking a receptor on their cell surface called CSF-1R will block tumour growth. We investigated whether a similar treatment would block the metastasis of breast cancer using our preclinical models. To our surprise, we found that inhibiting CSF-1R actually increased the spread of the cancer to the lung and bone, but had no effect on the growth of the primary tumours. To understand why metastasis is increased, we measured the numbers of macrophages and neutrophils in the tumours and discovered that the neutrophils were increased in number. We then looked in the blood for proteins that had changed after the macrophage-inhibiting treatment and found high levels of G-CSF, the factor that increases the blood levels of neutrophils. By using another treatment that blocks the activity of G-CSF, we were able to reverse the induction of metastasis caused by inhibiting macrophages. We concluded that patients receiving a therapy that inhibits macrophages should be monitored carefully for increases in G-CSF and tumour-promoting neutrophils. We are now analysing G-CSF use in the clinic and looking for any possible detrimental effects of this.

Below: *Image of mouse lung with widespread metastatic cancer nodules derived from a primary breast cancer growing in the mammary gland. The nodules are made visible by red and green fluorescence from reporter genes present in the tumour cells.*



RESEARCH HIGHLIGHT

Using our preclinical models of metastatic disease, we have discovered that some tumours can release G-CSF that promotes metastasis by recruiting tumour-promoting neutrophils. We have shown that neutrophils, normally thought to be protective against cancer, can actually promote cancer spread. By using an antibody therapy that blocks the activity of G-CSF and hence the recruitment of neutrophils from the bone marrow, we can prevent the development of metastasis.

RESEARCH TEAM

Robin Anderson, Stefan Bader, Allan Burrows, Kellie Mouchemore, Rick Redvers, Bill Tang, Kathryn Visser, Belinda Yeo

MATRIX MICROENVIRONMENT & METASTASIS LAB

DR NORMAND POULIOT

Laboratory Head

We aim to identify proteins produced by cancer cells that can be used to identify patients at higher risk of developing metastases early, and to block the action of these proteins to prevent the cancer from taking hold in the lung, liver, bone or brain.

TARGETING TUMOUR-VASCULAR ADHESIVE INTERACTIONS TO COUNTER BRAIN-METASTATIC BREAST CANCER

Breast cancer patients are increasingly being diagnosed with recurrence of the cancer in the brain (metastases). This typically occurs late in the disease's progression and is incurable. The mechanisms by which circulating breast cancer cells reach the brain, and overcome the protective function of the blood barrier to colonise the brain remain poorly understood. We have identified multiple cell adhesion receptors involved and aim to understand how these receptors cooperate to facilitate attachment and transmigration of breast cancer cells through the blood-brain barrier. Specific inhibitors of adhesion receptors are being evaluated or developed as novel therapeutics to prevent or delay the progression of brain metastases.

NEW THERAPIES FOR BRAIN-METASTATIC HER2-POSITIVE BREAST CANCER

Patients diagnosed with the "HER2" subtype of breast cancer are at higher risk of developing incurable brain metastases. However, the patients who develop brain metastases cannot be identified beforehand. This project makes use of unique animal models that mimic the spread of HER2 breast cancer to the brain to define a predictive HER2 brain metastasis gene signature that can be used to identify high-risk patients. Using these models of breast cancer brain metastasis, we are testing the efficacy of novel therapies targeting adhesion receptors in combination with HER2 inhibitors to block HER2 breast cancer spread and prevent resistance to HER2 inhibitors.

CONVERTING TRIPLE NEGATIVE INTO ANTI-OESTROGEN-RESPONSIVE BREAST CANCER

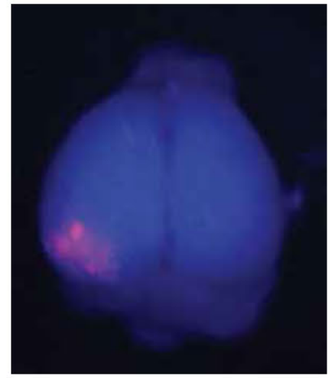
The triple negative breast cancer (TNBC) subtype rapidly progresses to metastasis and does not respond to endocrine therapy due to the absence of oestrogen receptors. Moreover, which TNBC patients will develop metastases cannot be predicted. The overall goals of this project is to validate new biomarkers to identify TNBC patients at high risk of metastasis and to test a novel approach to make metastatic TNBC amenable to endocrine therapy.

We have found that specific matrix proteins and their receptors contribute directly to TNBC metastasis and resistance to anti-oestrogens. Accordingly, we are investigating whether co-expression of matrix proteins and cognate receptors in tumour biopsies can be used as early predictors of patients with a higher risk of metastatic recurrence and poorer clinical outcome. We are also testing novel inhibitors targeting the function of matrix proteins to convert metastatic TNBC into anti-oestrogens responsive tumours.

Our hope is that this research project will lead to improved clinical management of TNBC patients by enabling the use of anti-oestrogens already used successfully in the clinic but normally ineffective against this tumour subtype. Co-expression of matrix/receptors in TNBC tumour biopsies could identify high-risk patients most likely to respond to endocrine therapies.

RESEARCH HIGHLIGHT

We use mouse models to identify gene signatures to predict patients likely to develop metastases in the brain and other sites and to test the efficacy of synthetic inhibitors and natural compounds against bone and brain metastasis. We have developed unique pre-clinical models of spontaneous breast cancer brain metastasis closely mimicking the spread of HER2+ve and Triple Negative breast cancer to the brain in patients – powerful tools to identify and validate the function of novel prognostic or therapeutic target genes and to test novel therapies against metastatic breast cancer.



Above: *Fluorescence imaging of a brain metastasis (pink) in a preclinical model of breast cancer.*

RESEARCH TEAM

Katie McIntyre, Normand Pouliot, Vyvien Wong

FIRST-CLASS TECHNOLOGY ACCELERATES RESEARCH AND DEVELOPMENT

Our research and development drive is underpinned, enhanced and advanced by outstanding platform technologies, facilities, technical expertise and support services that operate within 5,500 square-metre state-of-the-art laboratories.

Our facilities include multi-modality imaging, flow cytometry and protein production facilities (detailed below), bioservices, radiation and instrumentation, radiochemistry, histology as well as centralised cell bank and maintenance services.

ACRF CENTRE FOR TRANSLATIONAL CANCER THERAPEUTICS AND IMAGING

The ACRF Centre was established for medical research and preclinical investigations through a $2 million grant from the Australian Cancer Research Foundation. The Centre specialises in: PET MRI Imaging, SPECT CT Imaging and IVIS Spectrum Bioluminescent and Fluorescence Imaging. Supported by radiochemistry and medical physics expertise, these sophisticated molecular imaging capabilities facilitate our research into novel cancer therapies and mechanisms of cancer, including exploring the immune response and processes of metastasis.

VECTRA MULTI-SPECTRAL IMAGING PLATFORM

The first of its kind in Australia, the Vectra Imaging platform was established in 2016 through a grant from the Ian Potter Foundation. This automated, high-throughput quantitative pathology imaging system allows researchers to gain a deeper level of understanding of cancer mechanisms through insight into the role of immune cells within solid tumours and the tumour microenvironment. It utilises seven-colour multiplexing and visualisation capabilities enabling the accurate detection and measurement of weakly expressing and overlapping biomarkers within a single tissue section.

Opposite: *Image captured by Vectra Imaging Platform – A snapshot of the tumour microenvironment shows an intricate and complex interaction between the tumour cells (blue) and the cells in the tumour-stroma interphase (pink, yellow, and white).*

MAMMALIAN PROTEIN EXPRESSION, PRODUCTION AND PURIFICATION FACILITY (MPEF)

The MPEF is a dedicated facility that can produce small to large amounts of high-quality recombinant proteins and antibodies for use in medical research. The MPEF specialises in cell line development, biologics production, protein purification, protein analysis and protein characterisation. These products include novel cancer targeting monoclonal antibodies that our researchers have generated and are characterising through preclinical cancer models for clinical translation.

MOLECULAR DIAGNOSTICS

The Translational Genomics and Epigenomics Laboratory is the first lab in Australia to have an NATA accredited test using tumour DNA to detect tumour growth. This innovative blood test makes it possible to diagnose and monitor a patient's cancer treatment progress without invasive tests and worryingly lengthy waiting times to get results. The testing services include:

- Plasma BRAF V600E/K mutation melanoma testing using droplet digital PCR (melanoma)
- Plasma EGFR T790M mutation testing using droplet digital PCR (lung and colorectal cancer)
- MGMT methylation testing (brain cancers)
- MLH1 methylation testing (colorectal and endometrial cancers) and,
- BRCA1 methylation testing (breast and ovarian cancers).

FLOW CYTOMETRY CORE FACILITY

Flow cytometry is a powerful laser-based technology used to rapidly analyse the properties of single cells. This facility provides analytical cytometry and high-speed cell sorting services to the research community of ONJCRI, affiliates and external users. Flow cytometry can also be applied to prepared cellular components in basic cancer cell biology, preclinical, or translational analyses such as examining patient blood cell populations and immune cell changes with therapy.

PATIENT STORIES

In 2016, the ONJCRI became accredited by the National Association of Testing by the National Association of Testing Authorities (NATA) for a breakthrough technology to perform blood tests for melanoma and lung cancer patients to detect and analyse cancer genes. This new approach is already helping to save lives . . .

IN 2016, NATASHA STORK, 34 YEARS OLD AND WHO HAD given birth to a baby daughter only months before, came to the ONJ Centre complaining of pain in her abdomen.

A CT scan revealed a number of cancerous tumours throughout her body. Natasha's doctors needed to find out what type of cancer they were dealing with and fast. In such cases, a tissue sample is usually collected during surgery or a similar invasive procedure, and laboratory tests conducted over two to three weeks before any clear answers emerge. Natasha was not able to wait several weeks.

'WHEN I WAS 34, I GAVE BIRTH TO MY DAUGHTER MARLEY, AND MONTHS LATER I WAS DIAGNOSED WITH STAGE 4 MELANOMA. IT WAS A YEAR OF ENORMOUS HIGHS AND CRUSHING LOWS.'

Fortunately, Tom Witkowski, a research scientist at the ONJCRI laboratory, could enlist a new blood test to fast-track the process and circumvent the need for more invasive surgery.

Called a liquid biopsy, the test helps researchers identify whether a cancer patient will respond to a specific treatment, and to learn when a treatment stops working and new options are needed.

Tom took a blood sample and used the tumour DNA blood test to identify the type of tumours growing in Natasha's body. Within six hours of taking her blood sample, doctors knew Natasha had Stage 4 metastatic melanoma, a serious and life-threatening diagnosis.

Natasha was put onto a specific treatment for such tumour DNA mutations, which stopped the tumour cells multiplying: any existing tumour cells soon died off naturally. Another blood test six weeks later detected no tumour DNA in Natasha's blood.

Natasha comes in for regular tests, safe in the knowledge that should such harmful cells reappear her doctor can act immediately.

Ian Gelling

'I had achieved a 30-year career in senior management roles and our children were grown up. My life was challenging, diverse and interesting. In January 2015, my world was turned on its head – or face – when I suffered a major seizure and collapsed face first on the floor. My partner Jane and I had a long and fraught night of waiting and wondering, our contemplations interrupted by looking at scans of what looked like a small apple in my brain.

Following an awake craniotomy, post-operative recovery and the wait for pathology results, I was introduced to the world of gliomas (brain cancers). Mine is an Oligodendroglioma. Luckily it was low grade – incurable but with the wonders of modern medicine, I had at least been blessed with the gift of time.

I hadn't expected months of combined chemotherapy and radiation or the lack of emotional control that I experienced. Through a great deal of rehabilitation however, most side effects were at least partially overcome.

Jane and I also benefitted from a much needed network of support through world-class physicians, caring staff and researchers at the ONJ Centre and an array of programs, particularly the Brain Cancer Support Group and the Carers' Support Group- these caring and compassionate peers who know better than anyone what you're going through. From the bone-crushing fatigue to the nausea, from the inexplicable spontaneous tears to the financial and legal fears, they get it.

My recovery has come so much further than I would have believed possible, thanks to this amazing place and the superheroes that reside in it.'

OUR LEADERSHIP IN CLINICAL TRIALS

Clinical trials have the power to save lives and one day find a cure

A MAJOR SUCCESS STORY OF ONJCRI HAS BEEN THE development of our Translational Clinical Trials Program. This program commenced in 1990 when our predecessor the Ludwig Institute for Cancer Research initiated a number early phase clinical trials to develop and evaluate new therapies for cancer treatment. Since that time we have established a long track-record of bringing discoveries to the clinic, with over 10 recombinant antibodies and vaccines developed by our research laboratories entering first-in-man trials. As a result we have successfully licensed seven molecules to Biotech/Pharma, and our clinician scientists are highly sought by local and International companies for collaborative research and the development of further novel therapeutics.

In addition to these licensed discoveries, ONJCRI scientists have recently identified a series of novel targets and potential therapeutic strategies to treat cancer, and are working on developing drugs that can potently treat a range of tumours including colon, gastric, breast, prostate and brain cancer.

Further to preclinical development through its laboratory programs, ONJCRI is sponsoring and conducting its own first-in-human and early Phase clinical trials in cancer patients. Of note, the emphasis on early phase trials has a substantial translational focus linking back to the laboratory programs of the ONJCRI.

During 2016, ONJCRI investigators were involved in 62 human research ethics committee (HREC) approved cancer clinical trial protocols undertaken at Austin Health and 2 ONJCRI sponsored clinical studies were approved for commencement in early 2017 investigating novel immunotherapies in lung cancer and rare gastrointestinal, neuroendocrine and gynaecological cancers.

GLOBAL NETWORK

Our network of international collaborative organisations, clinicians and researchers enables us to deliver high impact translational research.

THE POWER OF **PARTNERSHIPS**

Working with others strengthens our ability to deliver our mission through education, research and patient care.

The Institute is affiliated with **La Trobe University**, sharing knowledge, skills, research, training of medical researchers and translating research into clinical practice to ultimately improve health outcomes. We established the **School of Cancer Medicine**, headed by Scientific Director Professor Matthias Ernst, as an academic department of the University to conduct collaborative research and research training.

Operating as an independent research institute, the Institute is embedded within the **Olivia Newton-John Cancer Wellness and Research Centre** operated by **Austin Health**, the largest metropolitan health service in Victoria. Occupying three floors of dedicated research space within the purpose built comprehensive cancer centre, the Institute is actively engaged in integrating clinical medicine with clinical and laboratory research.

As a reflection of the Institute's relationships with Austin Health and La Trobe University, each entity has a representative member on the Institute's Board of Directors.

As successor to the Australian operations of the **Ludwig Institute for Cancer Research** (LICR), our founding laboratory heads have continued appointments and collaborative links with the global LICR research community.

The Austin Health research precinct, **Austin LifeSciences**, comprises eight research institutes and Melbourne University Departments of Medicine and Surgery on campus. This corpus of over 800 researchers in a clinical setting provides a stimulating research and training environment.

The depth and impact of our research is enhanced through these partnerships as well as the many national and international collaborations with researchers, clinicians and industry.

THE NEXT GENERATION

The talent and enthusiasm of our young scientists is boosting the work of the Institute's laboratories and benefiting cancer research globally.

JANSON TSE PATIENTS' WELLBEING THE FOCUS

Janson has been at the ONJCRI for six years and is currently completing his doctorate in the field of HDAC inhibitors in Professor John Mariadason's laboratory. Specifically, he's investigating the mechanisms of HDAC inhibitor induced anti-tumour activity and then the identification of novel therapeutic combinations involving these inhibitors.

The lab is identifying specific HDAC inhibitor drugs to target a range of cancers: Janson is excited by the possible ramifications of its findings.

"Chemotherapy and other therapies can come with a lot of side effects," he said. "With precision drugs, we can limit that and let patients have a healthier treatment option, with less side effects, while knowing that they will respond better to these exact drugs. The overall wellbeing of the patient means a lot."

Janson loves working with clinicians so he can witness his lab's scientific research pushing all the way through to patients, making the ONJCRI the perfect home for his research.

"I hope in my time we will see a cure for cancer but we are part of the wellness centre, so if we can find an extra six or 12 months for a patient, the things they could do with that time is immense."

DR MILES ANDREW AIMING FOR GREAT SCIENCE

Dr Miles Andrews spent five years at the Olivia Newton John Cancer Research Institute as a clinician and researcher. Having finished a fellowship in 2012, the oncologist went on to complete his PhD at the Institute.

Now he's a 'lab rat' in the highly regarded M.D. Anderson Cancer Center in Houston, Texas, part of the massive Texas Medical Center precinct.

Miles' plan is to do some great science, achieve some notable publications and forge important contacts with such resident 'rock star' cancer researchers as immunologist Professor James Allison, whose discoveries have led to new treatments for cancers, including the first drug to extend survival in patients with advanced melanoma.

International 'street cred' established, Miles then plans to return to Australia, hopefully to run his own research laboratory while resuming clinical work. Miles' research focus is on cancer immunotherapy, developing and perfecting drugs that block T-cell inhibitory molecules or, put more simply, stop cancers from blocking the body's immune system. Miles admits that while being in such a big facility as the M.D. Anderson has its advantages, he misses the easy collaboration and ability to have 'both sides of the fence' conversations with clinicians and researchers at the ONJCRI.

STUDENTS

PHD STUDENTS

Alorro, Mariah
Andrews, Miles
Bader, Stefan
Blume, Marissa
Chia, Puey Ling,
Chionh, Fiona
Jenkins, Laura
King, Dylan
Lau, David
Luk, Ian
Molania, Ramyar
Owen, Alex
Parakh, Sagun
Prithviraj, Prashanth
Reehorst, Camilla
Thapa, Bibhusal
Tse, Jansen

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Liew, Mun Sem
Mooi, Jennifer
Koon, Yee
Moseshvili, Eka
Yeung, Yvonne

MSC STUDENTS

Galketiya, Chethana

BSC (HONS) STUDENTS

Batey, Daniel
Lavis, Austen
Ramnac, Celeste
Thilakasiri, Pathum

DONORS AND SUPPORTERS

The Olivia Newton-John Cancer Research Institute is grateful to the individuals and organisations who supported our research in 2016.

INDIVIDUALS AND ORGANISATIONS

The Hon John Brumby AO
Cancer Research Advocates Bikers
The Circle
Eltham Town Club Inc
Garden City Zonta Club
Gary John Kenny
Eva Kenwood and Friends
Kinglake Pub
Laneway Expresso Dromana
Loyal Orange Institution of Victoria
Macedonia Senior Citizens Group
MFLB Association Inc
Yvonne Moon OAM (RoCan)
Linda Bardo Nicholls AO
Vicki Rippon
Anastasia Savas
Jeremy Tan and Paul Curran
Nikolas Vassiliou
Peter and Heather Wood
Katherine Woodthorpe

Anonymous (3)

TRUSTS, FOUNDATIONS, INDUSTRY GRANTS AND GOVERNMENT FUNDING

ANZUP Cancer Trials Group
Austin Medical Research Foundation
Australian Government- Department of Industry, Innovation and Science
Australasian Gastro-Intestinal Trials Group (AGITG)
Bell Charitable Fund
Bendix Family Charitable Endowment
Harold and Cora Brennan Benevolent Trust (Equity Trustees)
Brian Smith Endowment (Equity Trustees)
Bristol Myers Squibb
Cancer Australia Priority Driven Cancer Research Scheme
Cancer Council Victoria
Collier Charitable Foundation
Count Charitable Foundation
Cure Brain Cancer Foundation
Eddy Dunn Endowment
Freemasons Foundation Limited
Glaxo Smith Kline Biologicals S.A.
Harold Mitchell Foundation
Ian Potter Foundation
International Association for the Study of Lung Cancer (IASLC)
Ivan Maurice Jones Endowment
John T Reid Charitable Trusts
La Trobe University
Ludwig Cancer Research
Movember Foundation
National Breast Cancer Foundation
National Health and Medical Research Council
Pancare Foundation
Pfizer Australia
The Royal Australian and New Zealand College of Radiologists
Slater and Gordon Health Projects and Research Fund
The CASS Foundation
The Collie Foundation
Tom Mathias Memorial Endowment
Victorian Cancer Agency
Victorian State Government Operational Infrastructure Support Program
Wellcome Trust
Worldwide Cancer Research

OUR SPECIAL THANKS TO FAMILY AND FRIENDS WHO MADE GENEROUS GIFTS IN MEMORY OF

Zoi Bagios
Peter Billings
Leonie Patricia Borg
Thorna Carne
Robyn Heather Hay
Steven Kirkopoulos
Christopher Nikolaou
Mary Bradford Nee Pyers
Graham Webb
Margaret Young

GIFTS IN WILLS

Estate of the late Ron Stone
Estate of the late Teresa Mary Wardell

***From left**: Marjorie Watts, Stella and Sandra Harbison, Lyall Watt.*

Patient's urge to find answers leads to **ultimate donation**

Vale Lyall Henry Watts
15.1.1951 - 15.11.2014

IN 2004, LYALL HENRY WATTS NOTICED A SWELLING IN HIS abdomen. After four years and many visits to doctors and specialists, Lyall was diagnosed with incurable peritonealmesothelioma, a cancer of the tissue that lines the lungs, stomach, heart and other organs. This insidious disease takes many years to develop and is caused by exposure to asbestos.

Lyall was most likely exposed to asbestos when young, visiting building sites where members of his family worked. By unknowingly breathing or ingesting asbestos particles which lodged in his organs, peritoneal mesothelioma developed slowly until diagnosed more than 30 years later. Australia has one of the highest rates of mesothelioma in the world with 726 Australians diagnosed each year. It remains one of the deadliestcancers, with a 5-year survival rate of just 7%.

Upon diagnosis, Lyall was determined to do whatever he could to help find better treatments and a cure for the disease. In addition to actively promoting education and awareness aimed at reducing future exposure to asbestos dust, Lyall was passionately interested in furthering research into the disease and donated money to ONJCRI's research efforts and wished that more funds were available to help scientists find a cure.

Lyall died on 15th November 2014 of asbestosis and pleural mesothelioma, at the age of 63. Yet even in death he helped the cause, donating his body to science. He felt that anything the medical profession could learn from him would be of benefit to others. His partner Gary was somewhat perturbed when Lyall mentioned this. "What about me and a funeral to say goodbye?" he asked. Lyall said, "it's not about you, it's about what I can do for medical science".

What Lyall didn't tell Gary was that he would receive his ashes after research on his body was completed. When someone from the University of Melbourne called to confirm this, Gary asked, "Did Lyall know this?" They said he was well aware. It was a lovely surprise.

In honour of Lyall, his partner Gary Kenny and Lyall's mother Marjorie Watts and sister Sandra Harbison established The Lyall Watts Mesothelioma Research Grant with Cancer Council Victoria who awarded $700,000 for two new research projects in 2016. Our clinician researchers, Associate Professor Tom John and Professor Andrew Scott have received funding to continue their work into targeted antibody therapies for malignant mesothelioma. Our thanks to Gary, Sandra and Marjory for honouring Lyall's memory in this special way.

HELP FIND A CURE FOR CANCER

With your support our researchers and clinicians can continue to work together to help people live better with cancer and defeat it.

For further information or to make your gift today, please call **+61 3 9496 5726** or contact **philanthropy@onjcri.org.au**

BOARD OF DIRECTORS

ONJCRI is an independent medical research institute goverened by a Board of Directors including representatives from stakeholders Austin Health and La Trobe University.

From left: Sally Capp, Prof Brendan Murphy (until September), Dr George Raitt (until May), The Hon John Brumby, Olivia Newton-John, Jane Martino (until March), Morry Schwartz, Prof John Dewar, Richard Balderstone.

THE HON JOHN BRUMBY AO, CHAIRMAN

The former Premier of Victoria, Mr Brumby served for more than 10 years as State Treasurer, six years as Leader of the Victorian Opposition and seven as Federal MHR for Bendigo. Since retiring from politics, he has accepted a number of board positions, a joint appointment as a Professorial Fellow at the University of Melbourne and Monash University, and is active in a range of community and not-for-profit organisations.

RICHARD BALDERSTONE

Richard Balderstone has worked in the financial and investment markets for more than 35 years. He was a founding partner of JCP Investment Partners, a specialist investment management organisation with more than $5 billion in funds under management, and remains a non-executive director. A director of ABN AMRO (and BZW) and the Australian Rail Track Corporation, he is also a Trustee Director of the Commonwealth Public Service Superannuation Schemes (CSS/PSS) and several charitable organisations.

SALLY CAPP

Sally Capp has extensive experience in executive leadership roles including at the Victorian Chamber of Commerce, KPMG and ANZ Bank, and represented the Victorian Government as Agent General across Europe and Israel. She has acted on a number of boards including for private and public companies, and not-for-profit organisations, was the first female director of the Collingwood Football Club and is currently state Executive Director for the Property Council of Australia.

PROF JOHN DEWAR

Prof Dewar is the Vice-Chancellor and President of La Trobe University. An internationally-known family law specialist and researcher, he has held senior leadership positions at Griffith University and the University of Melbourne as Provost, and has served on a number of higher education and legal bodies, groups and committees, including for the State and Federal Governments. He is a director of Universities Australia and Adjunct Professor in both the Melbourne, and La Trobe Law Schools.

PROF ASHLEY DUNN

Prof Dunn became Head of the Molecular Biology Program at the Ludwig Institute for Cancer Research (Melbourne) in 1982. Two years later he and colleagues molecularly cloned GM-CSF, a cytokine used to aid recovery of bone marrow in cancer patients following chemotherapy treatment. He served as Associate Director of the Institute until 2004, is currently a Professorial Fellow of the Department of Surgery at the University of Melbourne, and serves on several scientific advisory boards.

LINDA BARDO NICHOLLS AO

Linda Bardo Nicholls AO is a corporate advisor and director of a number of leading Australian companies and organisations, including Fairfax Media, Inghams, and Medibank Private, and is Japara Healthcare's Chairman. Previously, she was a director of Pacific Brands and Sigma Pharmaceuticals, and of the Walter and Eliza Hall Institute of Medical Research, Chairman of Healthscope, and a trustee and Vice President of the Harvard Business School Alumni Board. Her executive career was in banking and financial services.

MORRY SCHWARTZ

Morry Schwartz is a publisher and property developer. He is the Chairman and major stakeholder of the property development company Pan Urban, which has a portfolio including the refurbishment of Melbourne's GPO. Morry Schwartz is the owner of publishing company Black Inc, which is responsible for publishing the influential Quarterly Essay, The Saturday Paper and The Monthly. He was appointed Adjunct Professor of Journalism at RMIT in 2014.

DR KATHERINE WOODTHORPE

Dr Woodthorpe is currently Chair of the Antarctic Climate and Ecosystems CRC, Chair of The HEARing CRC, and of Fishburners, a not-for-profit charity dedicated to assisting Australian technology startups. She is also non-Executive Director of Sirtex Medical Ltd, an ASX 200 company, ARENA, the renewable energy agency and a member of the NSW Council of the AICD. Previously she served as Chief Executive of AVCAL, the Australian Private Equity and Venture Capital Association.

PROF BRENDAN MURPHY

Prof Brendan Murphy was CEO of Austin Health from 2005 to 2016. He held previous posts as Chief Medical Officer, Director of Nephrology at St Vincent's Health. He is a Professorial Fellow with the title of Professor at Melbourne University, a Fellow of the Royal Australian College of Physicians and a Fellow of the Australian Institute of Company Directors. He is currently a board member of the Florey Institute of Neuroscience.

JANE MARTINO

Jane Martino is co-founder and CEO of the fundraising platform Shout for Good. She founded Undertow Media in 2002 and has gained a reputation as an entrepreneur with an ability to build dynamic organisations in both the commercial and not-for-profit space. Her entrepreneurial spirit was recognised in a nomination for 2006 Telstra Young Business Woman of the Year. She was a co-founder of Smiling Mind and is a board member of LaunchVic.

DR GEORGE RAITT

A consultant at the national law firm Piper Alderman, Dr George Raitt has more than 20 years' experience practising in most areas of corporate and commercial law as a partner in national law firms, with a particular focus on the science and technology sector and medical research institutes. This focus has included the Burnet and Murdoch Institutes and the Walter and Eliza Hall Institute of Medical Research. He was a founding director of the ONJCRI.

SCIENTIFIC ADVISORY COMMITTEE

The ONJCRI Scientific Advisory Committee provides guidance and expertise to the Executive about the strategic directions for the Institute.

From left: Prof David Bowtell, Prof Nick Hoogenraad AO, Dr Eugene Maraskovsky, Prof Michelle Haber, Prof Ashley Dunn, Dr George Morstyn, Prof Robert Pike.

PROF ASHLEY DUNN, CHAIRMAN

Prof Ashley Dunn became Head of the Molecular Biology Program at the Ludwig Institute for Cancer Research (Melbourne) in 1982. Two years later he and colleagues molecularly cloned GM-CSF, a cytokine used to aid recovery of bone marrow in cancer patients following chemotherapy treatment. He is a Fellow of the Australian Academy of Science and served as Associate Director of the Ludwig Institute until 2004. He is a Professorial Fellow of the Department of Surgery, University of Melbourne, and a science consultant on a number of scientific advisory boards.

PROF DAVID BOWTELL

An NHMRC Senior Principal Research Fellow, Prof Bowtell heads the Cancer Genomics and Genetics Program at the Peter MacCallum Cancer Centre, where he was Director of Research for a decade. He holds a joint appointment as Group Leader at the Garvan Institute and is Visiting Prof at Dana Farber Cancer Institute, Boston. Professor Bowtell is an internationally regarded expert in ovarian cancer and leads the Australian Ovarian Cancer Study, one of the largest of its type in the world. He has made significant contributions to furthering knowledge in this field.

PROF MICHELLE HABER

Prof Haber is Executive Director of the Children's Cancer Institute, and Head of the Institute's Experimental Therapeutics Program. She is internationally recognised for her research into the treatment of neuroblastoma and acute lymphoblastic leukaemia in children, receiving numerous awards for this, particularly for translating her research findings into the clinic. In 2015, she was appointed an inaugural Fellow of the Australian Academy of Health and Medical Sciences. Prof Haber has a long and continuous record of competitive grant funding and has published more than 170 peer reviewed research articles.

PROF NICK HOOGENRAAD AO

Prof Hoogenraad was appointed Head of the School of Molecular Sciences at La Trobe University in 1998. He helped establish the La Trobe Institute for Molecular Science and became its Executive Director. In 2010 he was awarded a Charles La Trobe Distinguished chair in Biochemistry. He is internationally known for his work on mitochondrial biogenesis, discovering a new mitochondrial stress response, and has won many major awards for research. He has been active in translational research in the Cooperative Research Centres for Diagnostic Technologies, the CRC for Diagnostics and the CRC for Biomarker Translation.

DR EUGENE MARASKOVSKY

Dr Maraskovsky was Senior Scientist and Project Leader working on cytokine discovery and translational research at the Immunex Corporation in Seattle. He joined the Ludwig Institute for Cancer Research in 1998 as Joint Head of the Cancer Vaccine Laboratory. In 2002 he became a Principal Scientist and Group Leader at CSL Limited establishing a key capacity to measure immune responses in patients receiving ISCOMATRIX® vaccines. He is currently Department Head of Cell Biology and Physiology within CSL Research at the Bio21 Institute, and Associate Prof at the University of Melbourne. He co-invented 29 patents.

DR GEORGE MORSTYN

Dr Morstyn has extensive experience in drug development and biotechnology and managing change. He headed the clinical program at the Ludwig Institute and was Principal Investigator on the earliest clinical studies of haematopoietic growth factors. From 1991 to 2002, Dr Morstyn worked for Amgen, becoming Senior Vice President of Development and Chief Medical Officer in 1999. He is a member of GBS Bioventures investment advisory committee, Board Member and Chair of the Scientific Advisory Board of Symbio, Chairman of BioMedVic, a member of the Commercialisation Committee at the Walter and Eliza Hall Institute and on the ANZBCTG Board.

PROF ROBERT PIKE

Biochemist Prof Pike headed the Department of Biochemistry & Molecular Biology, Faculty of Medicine, Nursing and Health Sciences at Monash University from 2006 to 2011, then the School of Biological Sciences in the Faculty of Science. He was Deputy Dean (Academic Planning) in the Faculty of Medicine, Nursing and Health Sciences at Monash from 2013 to 2014. In 2015, he became both Director of the La Trobe Institute of Molecular Science and Head of the School of Molecular Science. He is now Pro Vice-Chancellor of the College of Science, Health and Engineering at La Trobe University.

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COO FINANCIAL REPORT

KIM TSAI
CHIEF OPERATING AND FINANCIAL OFFICER

As we celebrate our achievements over the past year, we are also firmly focused on the future and on ensuring that the Institute is in the best financial position possible to allow the work of our cancer researchers to thrive. We are ever vigilant that the government, institutional and philanthropic funding we source, and are accorded, is used to maximum effect.

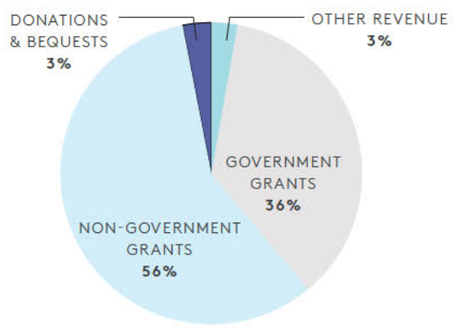
This funding is testimony to both the goodwill of our supporters and to the high quality of work being carried out by the Institute's scientists and clinicians. Across our many laboratories, researchers have continued to receive highly sought-after peer-reviewed grants, resulting in $20.6m secured grant funding over the next four years. At the end of 2016, the Institute had $13.5 million in cash, and trade, and other receivables of $1.6 million. Deferred income, representing funding received for projects in advance was $11.7 million, an increase of 17% from the previous year. Overall, the Institute finished in a financially sound position at the close of 2016 with retained earnings of $3.1 million.

On behalf of all the researchers and support staff, my heartfelt thanks to our supporters and key stakeholders including the Australian Government (Department of Health), Victorian Government (Department of Health and Human Services), Ludwig Cancer Research, La Trobe University and Austin Health.

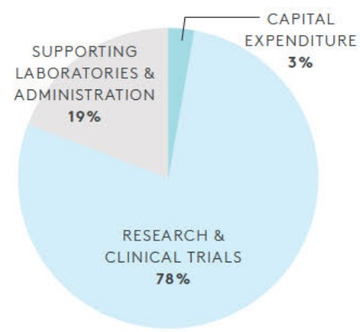
I would like to acknowledge the efforts of our small team of highly skilled and dedicated administration and research support staff whose main goal every day is to ensure that the researchers spend more time at the bench instead of in administration.

KIM TSAI

TOTAL REVENUE



TOTAL EXPENDITURE



FINANCIAL HIGHLIGHTS

Statement of financial position as at 31 December 2016

Profit and Loss Statement

REVENUE	2016 ($'000)	2015 ($'000)
Research Activities		
Government grants	4,954	3,197
Non-government grants	7,914	8,025
Donations and bequests	352	1,144
Other revenue	345	1,416
TOTAL REVENUE	**13,565**	**13,782**

EXPENDITURE		
Research laboratories		
Salary and employee benefits	6,997	5,745
Consumable supplies	2,660	1,912
Other expenses	856	696
Total research laboratories	**10,513**	**8,353**
Support laboratories and administration		
Salary and employee benefits	1,535	1,431
Consumable supplies	365	493
Other expenses	707	517
Total support laboratories and administration	**2,607**	**2,441**
TOTAL EXPENDITURE	**13,120**	**10,794**
Operating surplus from research activities	**445**	**2,988**
Depreciation and amortisation expense	335	261
TOTAL COMPREHENSIVE INCOME	**110**	**2,727**

Balance Sheet

ASSETS	2016 ($'000)	2015 ($'000)
Current assets		
Cash and cash equivalents	13,542	11,714
Trade and other receivables	1,591	1,130
Total current assets	**15,133**	**12,844**
Non-current assets		
Property, plant and equipment	1,592	1,478
Total non-current assets	**1,592**	**1,478**
TOTAL ASSETS	**16,725**	**14,322**

LIABILITIES		
Current liabilities		
Trade and other payables	1,147	834
Employee entitlements	672	439
Unearned grants and fellowships	11,689	9,960
Total current liabilities	**13,508**	**11,233**
Non-current liabilities		
Employee entitlements	94	76
Total non-current liabilities	**94**	**76**
TOTAL LIABILITIES	**13,602**	**11,309**
NET ASSETS	**3,123**	**3,013**

EQUITY		
Accumulated surplus	3,123	3,013
TOTAL EQUITY	**3,123**	**3,013**

The Financial Statements provided above have been extracted from the audited general purpose financial statements of Olivia Newton-John Cancer Research Institute (ACN 167 192 752). The summary financial information does not include all the information and notes normally included in a statutory financial report. The audited general purpose financial report can be obtained upon request to the Chief Financial Officer. The statutory financial report (from which the summary financial information has been extracted) has been prepared in accordance with the requirements of the Corporation Act 2001, Australian Charities and Not-for-profits Commission Act 2012 and Regulations 2013, Australian Accounting Standards and other authoritative pronouncements of the Australian Accounting Standards Board.

PUBLICATIONS

1. Ackermann, U., Lewis, J. S., Young, K., Morris, M. J., Weickhardt, A., Davis, I. D. and Scott, A. M. Fully automated synthesis of [(18) F]fluoro-dihydrotestosterone ([(18) F] FDHT) using the FlexLab module. *J Labelled Comp Radiopharm* 59(10): 424-428. (2016)

2. Ameratunga, M., Asadi, K., Lin, X., Walkiewicz, M., Murone, C., Knight, S., Mitchell, P., Boutros, P. and John, T. PD-L1 and Tumor Infiltrating Lymphocytes as Prognostic Markers in Resected NSCLC. *PLoS One* 11(4): e0153954. (2016)

3. Andrews, M. C., Cursons, J., Hurley, D. G., Anaka, M., Cebon, J. S., Behren, A. and Crampin, E. J. Systems analysis identifies miR-29b regulation of invasiveness in melanoma. *Mol Cancer* 15(1): 72. (2016)

4. Atapattu, L., Saha, N., Chheang, C., Eissman, M. F., Xu, K., Vail, M. E., Hii, L., Llerena, C., Liu, Z., Horvay, K., Abud, H. E., Kusebauch, U., Moritz, R. L., Ding, B. S., Cao, Z., Rafii, S., Ernst, M., Scott, A. M., Nikolov, D. B., Lackmann, M. and Janes, P. W. An activated form of ADAM10 is tumor selective and regulates cancer stem-like cells and tumor growth. *J Exp Med* 213(9): 1741-1757. (2016)

5. Atkinson, V. O., Long, G. V., Menzies, A. M., McArthur, G., Carlino, M. S., Millward, M., Roberts-Thomson, R., Brady, B., Kefford, R., Haydon, A. and Cebon, J. Optimizing combination dabrafenib and trametinib therapy in BRAF mutation-positive advanced melanoma patients: Guidelines from Australian melanoma medical oncologists. Asia Pac J *Clin Oncol* 12 Suppl 7: 5-12. (2016)

6. Berger, S., Procko, E., Margineantu, D., Lee, E. F., Shen, B. W., Zelter, A., Silva, D. A., Chawla, K., Herold, M. J., Garnier, J. M., Johnson, R., MacCoss, M. J., Lessene, G., Davis, T. N., Stayton, P. S., Stoddard, B. L., Fairlie, W. D., Hockenbery, D. M. and Baker, D. Computationally designed high specificity inhibitors delineate the roles of BCL2 family proteins in cancer. *Elife* 5. (2016)

7. Bowyer, S., Prithviraj, P., Lorigan, P., Larkin, J., McArthur, G., Atkinson, V., Millward, M., Khou, M., Diem, S., Ramanujam, S., Kong, B., Liniker, E., Guminski, A., Parente, P., Andrews, M. C., Parakh, S., Cebon, J., Long, G. V., Carlino, M. S. and Klein, O. Efficacy and toxicity of treatment with the anti-CTLA-4 antibody ipilimumab in patients with metastatic melanoma after prior anti-PD-1 therapy. *Br J Cancer* 114(10): 1084-1089. (2016)

8. Buchert, M., Burns, C. J. and Ernst, M. Targeting JAK kinase in solid tumors: emerging opportunities and challenges. *Oncogene* 35(8): 939-951. (2016)

9. Burvenich, I. J., Farrugia, W., Lee, F. T., Catimel, B., Liu, Z., Makris, D., Cao, D., O'Keefe, G. J., Brechbiel, M. W., King, D., Spirkoska, V., Allan, L. C., Ramsland, P. A. and Scott, A. M. Cross-species analysis of Fc engineered anti-Lewis-Y human IgG1 variants in human neonatal receptor transgenic mice reveal importance of S254 and Y436 in binding human neonatal Fc receptor. *MAbs* 8(4): 775-786. (2016)

10. Burvenich, I. J., Lee, F. T., Guo, N., Gan, H. K., Rigopoulos, A., Parslow, A. C., O'Keefe, G. J., Gong, S. J., Tochon-Danguy, H., Rudd, S. E., Donnelly, P. S., Kotsuma, M., Ohtsuka, T., Senaldi, G. and Scott, A. M. In Vitro and In Vivo Evaluation of 89Zr-DS-8273a as a Theranostic for Anti-Death Receptor 5 Therapy. *Theranostics* 6(12): 2225-2234. (2016)

11. Burvenich, I. J., Lee, F. T., O'Keefe, G. J., Makris, D., Cao, D., Gong, S., Rigopoulos, A., Allan, L. C., Brechbiel, M. W., Liu, Z., Ramsland, P. A. and Scott, A. M. Engineering anti-Lewis-Y hu3S193 antibodies with improved therapeutic ratio for radioimmunotherapy of epithelial cancers. *EJNMMI Res* 6(1): 26. (2016)

12. Burvenich, I. J., Parakh, S., Gan, H. K., Lee, F. T., Guo, N., Rigopoulos, A., Lee, S. T., Gong, S., O'Keefe, G. J., Tochon-Danguy, H., Kotsuma, M., Hasegawa, J., Senaldi, G. and Scott, A. M. Molecular Imaging and Quantitation of EphA2 Expression in Xenograft Models with 89Zr-DS-8895a. *J Nucl Med* 57(6): 974-980. (2016)

13. Charmsaz, S., Al-Ejeh, F., Yeadon, T., Miller, K. J., Smith, F., Stringer, B., Moore, A. S., Lee, F. T., Cooper, L. T., Stylianou, C., Yarranton, G. T., Woronicz, J., Scott, A. M., Lackmann, M. and Boyd, A. W. EphA3 as a target for antibody immunotherapy in acute lymphoblastic leukemia. *Leukemia*. doi: 10.1038/leu.2016 371. (2016)

14. Chen, E. C., Papa, N., Lawrentschuk, N., Bolton, D. and Sengupta, S. Incidence and risk factors of venous thromboembolism after pelvic uro-oncologic surgery - a single center experience. *BJU Int* 117 Suppl 4: 50-53. (2016)

15. Chia, P. L., Do, H., Morey, A., Mitchell, P., Dobrovic, A. and John, T. Temporal changes of EGFR mutations and T790M levels in tumour and plasma DNA following AZD9291 treatment. *Lung Cancer* 98: 29-32. (2016)

16. Chia, P. L., Gedye, C., Boutros, P. C., Wheatley-Price, P. and John, T. Current and Evolving Methods to Visualize Biological Data in Cancer Research. *J Natl Cancer Inst* 108(8). (2016)

17. Chia, P. L. and John, T. Severe Psoriasis Flare After Anti-Programmed Death Ligand 1 (PD-L1) Therapy for Metastatic Non-Small Cell Lung Cancer (NSCLC). *J Immunother* 39(5): 202-204. (2016)

18. Chia, P. L., Russell, P. A., Scott, A. M. and John, T. Targeting the vasculature: anti-angiogenic agents for malignant mesothelioma. *Expert Rev Anticancer Ther* 16(12): 1235-1245. (2016)

19. Chisanga, D., Keerthikumar, S., Pathan, M., Ariyaratne, D., Kalra, H., Boukouris, S., Mathew, N. A., Saffar, H. A., Gangoda, L., Ang, C. S., Sieber, O. M., Mariadason, J. M., Dasgupta, R., Chilamkurti, N. and Mathivanan, S. Colorectal cancer atlas: An integrative resource for genomic and proteomic annotations from colorectal cancer cell lines and tissues. *Nucleic Acids Res* 44(D1): D969-974. (2016)

20. Clay, T. D., Russell, P. A., Do, H., Sundararajan, V., Conron, M., Wright, G. M., Dobrovic, A., Moore, M. M. and McLachlan, S. A. Associations between the IASLC/ATS/ERS lung adenocarcinoma classification and EGFR and KRAS mutations. *Pathology* 48(1): 17-24. (2016)

21. Colebatch, A. J., Di Stefano, L., Wong, S. Q., Hannan, R. D., Waring, P. M., Dobrovic, A., McArthur, G. A. and Papenfuss, A. T. Clustered somatic mutations are frequent in transcription factor binding motifs within proximal promoter regions in melanoma and other cutaneous malignancies. *Oncotarget* 7(41): 66569-66585. (2016)

22. Crozier, J., Hennessey, D., Sengupta, S., Bolton, D. and Lawrentschuk, N. A Systematic Review of Ileal Conduit and Neobladder Outcomes in Primary Bladder Cancer. *Urology* 96: 74-79. (2016)

23. Day, D., Kanjanapan, Y., Kwan, E., Yip, D., Lawrentschuk, N., Davis, I. D., Azad, A. A., Wong, S., Rosenthal, M., Gibbs, P. and Tran, B. Benefit from cytoreductive nephrectomy and the prognostic role of neutrophil-to-lymphocyte ratio in patients with metastatic renal cell carcinoma. *Intern Med J* 46(11): 1291-1297. (2016)

24. Dienstmann, R. A., Lassen, U., Cebon, J., Desai, J., Brown, M. P., Evers, S., Su, F., Zhang, W., Boisserie, F., Lestini, B., Schostack, K., Meresse, V. and Tabernero, J. First-in-Man Dose-Escalation Study of the Selective BRAF Inhibitor RG7256 in Patients with BRAF V600-Mutated Advanced Solid Tumors. *Target Oncol* 11(2): 149-156. (2016)

25. Do, H., Cameron, D., Molania, R., Thapa, B., Rivalland, G., Mitchell, P. L., Murone, C., John, T., Papenfuss, A. and Dobrovic, A. Digital PCR of Genomic Rearrangements for Monitoring Circulating Tumour DNA. *Adv Exp Med Biol* 924: 139-146. (2016)

26. Doble, B., John, T., Thomas, D., Fellowes, A., Fox, S. and Lorgelly, P. Cost-effectiveness of precision medicine in the fourth-line treatment of metastatic lung adenocarcinoma: An early decision analytic model of multiplex targeted sequencing. *Lung Cancer*. (2016)

27. Dobrovic, A. (2016). Analysis of DNA Methylation in Clinical Samples: Methods and Applications. Molecular Pathology in Cancer Research. S.R. Lakhani and S. B. Fox. *New York, Springer-Verlag*: 261-273.

28. Fahey, F. H., Bom, H. H., Chiti, A., Choi, Y. Y., Huang, G., Lassmann, M., Laurin, N., Mut, F., Nunez-Miller, R., O'Keeffe, D., Pradhan, P., Scott, A., Song, S., Soni, N., Uchiyama, M. and Vargas, L. Standardization of Administered Activities in Pediatric Nuclear Medicine Part 2: A Report of the First Nuclear Medicine Global Initiative. *J Nucl Med* 57(7): 1148-1157. (2016)

29. Gan, H. K., Burgess, A. W., Parslow, A. C. and Scott, A. M. Dual targeting of EGFR: ready for prime time? *Transl Cancer Res* 5 (Suppli 1): S18-S21. (2016)

30. Gedye, C., Cardwell, T., Dimopoulos, N., Tan, B. S., Jackson, H., Svobodova, S., Anaka, M., Behren, A., Maher, C., Hofmann, O., Hide, W., Caballero, O., Davis, I. D. and Cebon, J. Mycoplasma Infection Alters Cancer Stem Cell Properties in Vitro. *Stem Cell Rev* 12(1): 156-161. (2016)

31. Ghisi, M., Kats, L., Masson, F., Li, J., Kratina, T., Vidacs, E., Gilan, O., Doyle, M. A., Newbold, A., Bolden, J. E., Fairfax, K. A., de Graaf, C. A., Firth, M., Zuber, J., Dickins, R. A., Corcoran, L. M., Dawson, M. A., Belz, G. T. and Johnstone, R. W. Id2 and E Proteins Orchestrate the Initiation and Maintenance of MLL-Rearranged Acute Myeloid Leukemia. *Cancer Cell* 30(1): 59-74. (2016)

32. Goh, S. K., Musafer, A., Witkowski, T., Muralidharan, V., Christophi, C., Do, H. and Dobrovic, A. Comparison of 3 Methodologies for Genotyping of Small Deletion and Insertion Polymorphisms. *Clin Chem* 62(7): 1012-1019. (2016)

33. Grasso, C., Anaka, M., Hofmann, O., Sompallae, R., Broadley, K., Hide, W., Berridge, M. V., Cebon, J., Behren, A. and McConnell, M. J. Iterative sorting reveals CD133+ and CD133- melanoma cells as phenotypically distinct populations. *BMC Cancer* 16(1): 726. (2016)

34. Ha, F. J. and Parakh, S. Novel Approaches To Undergraduate Oncology Education. J *Cancer Educ*. (2016)

35. Higginbotham, J. N., Zhang, Q., Jeppesen, D. K., Scott, A. M., Manning, H. C., Ochieng, J., Franklin, J. L. and Coffey, R. J. Identification and characterization of EGF receptor in individual exosomes by fluorescence-activated vesicle sorting. J *Extracell Vesicles* 5: 29254. (2016)

36. Jahani-Asl, A., Yin, H., Soleimani, V. D., Haque, T., Luchman, H. A., Chang, N. C., Sincennes, M. C., Puram, S. V., Scott, A. M., Lorimer, I. A., Perkins, T. J., Ligon, K. L., Weiss, S., Rudnicki, M. A. and Bonni, A. Control of glioblastoma tumorigenesis by feed-forward cytokine signaling. *Nat Neurosci* 19(6): 798-806. (2016)

37. Jayachandran, A., Lo, P. H., Chueh, A. C., Prithviraj, P., Molania, R., Davalos-Salas, M., Anaka, M., Walkiewicz, M., Cebon, J. and Behren, A. Transketolase-like 1 ectopic expression is associated with DNA hypomethylation and induces the Warburg effect in melanoma cells. *BMC Cancer* 16(1): 134. (2016)

38. Jayachandran, A., Prithviraj, P., Lo, P. H., Walkiewicz, M., Anaka, M., Woods, B. L., Tan, B., Behren, A., Cebon, J. and McKeown, S J. Identifying and targeting determinants of melanoma cellular invasion. *Oncotarget*. (2016)

39. Johnson, S. L., Clayton, J., Butow, P. N., Silvester, W., Detering, K., Hall, J., Kiely, B. E., Cebon, J., Clarke, S., Bell, M. L., Stockler, M., Beale, P. and Tattersall, M. H. Advance care planning in patients with incurable cancer: study protocol for a randomised controlled trial. *BMJ Open* 6(12): e012387. (2016)

40. Katelaris, N., Murphy, D., Lawrentschuk, N., Katelaris, A. and Moon, D. Cytoreductive surgery for men with metastatic prostate cancer. *Prostate Int* 4(3): 103-106. (2016)

41. Klionsky, D. J. E., Abdelmohsen, K., Abe, A., Abedin, M. J., Abeliovich, H., Acevedo Arozena, A...Fairlie W.D...Lee, E., et al. Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition). *Autophagy* 12(1): 1-222. (2016)

42. Krishnananthan, N. and Lawrentschuk, N. Active surveillance in intermediate risk prostate cancer: is it safe? *Opinion: No. Int Braz J Urol* 42(3): 418-421. (2016)

43. Lau, L. F., Murone, C., Williams, D. S., Standish, R., Lee, S. T., Christophi, C., Scott, A. M. and Muralidharan, V. Metabolic response evaluation for colorectal liver metastases and correlation to pathologic response and tumour markers. *ANZ J Surg*. (2016)

44. Laurens, E., Yeoh, S. D., Rigopoulos, A., O'Keefe, G. J., Tochon-Danguy, H. J., Chong, L. W., White, J. M., Scott, A. M. and Ackermann, U. Fluorine-18 radiolabeling of a nitrophenyl sulfoxide and its evaluation in an SK-RC-52 model of tumor hypoxia. *J Labelled Comp Radiopharm* 59(10): 416-423. (2016)

PUBLICATIONS CONTINUED

45. Lawrentschuk, N. Collaboration is the key for urology. *BJU Int* 118 Suppl 3: 5. (2016)

46. Lawrentschuk, N. PSA testing and early management of test-detected prostate cancer- consensus at last. *BJU Int* 117 Suppl 4: 5-6. (2016)

47. Lawrentschuk, N. and Walsh, P. C. Reply to Filippo Alongi, Rosario Mazzola, Sergio Fersino Letter to the Editor re: Patrick C. Walsh, Nathan Lawrentschuk. Immediate Adjuvant Radiation Therapy Following Radical Prostatectomy Should Not Be Advised for Men with Extraprostatic Extension Who Have Negative Surgical Margins. *Eur Urol*;69:191-2. (2016)

48. Le Saux, O., Falandry, C., Gan, H. K., You, B., Freyer, G. and Peron, J. Inclusion of elderly patients in oncology clinical trials. *Ann Oncol* 27(9): 1799-1804. (2016)

49. Lee, E. F., Grabow, S., Chappaz, S., Dewson, G., Hockings, C., Kluck, R. M., Debrincat, M. A., Gray, D. H., Witkowski, M. T., Evangelista, M., Pettikiriarachchi, A., Bouillet, P., Lane, R. M., Czabotar, P. E., Colman, P. M., Smith, B. J., Kile, B. T. and Fairlie, W. D. Physiological restraint of Bak by Bcl-xL is essential for cell survival. *Genes Dev* 30(10): 1240-1250. (2016)

50. Lee, E. F., Perugini, M. A., Pettikiriarachchi, A., Evangelista, M., Keizer, D. W., Yao, S. and Fairlie, W. D. The BECN1 N-terminal domain is intrinsically disordered. *Autophagy* 12(3): 460-471. (2016)

51. Lee, F. T., Burvenich, I. J., Guo, N., Kocovski, P., Tochon-Danguy, H., Ackermann, U., O'Keefe, G. J., Gong, S., Rigopoulos, A., Liu, Z., Gan, H. K. and Scott, A. M. I-Tyrosine Confers Residualizing Properties to a d-Amino Acid-Rich Residualizing Peptide for Radioiodination of Internalizing Antibodies. *Mol Imaging* 15. (2016)

52. Leveridge, M., D'Arcy, F. T., O'Kane, D., Ischia, J. J., Webb, D. R., Bolton, D. M. and Lawrentschuk, N. Renal colic: current protocols for emergency presentations. *Eur J Emerg Med* 23(1): 2-7. (2016)

53. Lim, A. M., Wong, N. C., Pidsley, R., Zotenko, E., Corry, J., Dobrovic, A., Clark, S. J., Rischin, D. and Solomon, B. Genome-scale methylation assessment did not identify prognostic biomarkers in oral tongue carcinomas. *Clin Epigenetics* 8: 74. (2016)

54. Liu, G., Tu, D., Lewis, M., Cheng, D., Sullivan, L. A., Chen, Z., Morgen, E., Simes, J., Price, T. J., Tebbutt, N. C., Shapiro, J. D., Jeffery, G. M., Mellor, J. D., Mikeska, T., Virk, S., Shepherd, L. E., Jonker, D. J., O'Callaghan, C. J., Zalcberg, J. R., Karapetis, C. S. and Dobrovic, A. Fc-gamma Receptor Polymorphisms, Cetuximab Therapy, and Survival in the NCIC CTG CO.17 Trial of Colorectal Cancer. *Clin Cancer Res* 22(10): 2435-2444. (2016)

55. Lo, J., Papa, N., Bolton, D. M., Murphy, D. and Lawrentschuk, N. Australian patterns of prostate cancer care: Are they evolving? *Prostate Int* 4(1): 20-24. (2016)

56. Long, G. V. A., Weber, J. S., Infante, J. R., Kim, K. B., Daud, A., Gonzalez, R., Sosman, J. A., Hamid, O., Schuchter, L., Cebon, J., Kefford, R. F., Lawrence, D., Kudchadkar, R., Burris, H. A., 3rd, Falchook, G. S., Algazi, A., Lewis, K., Puzanov, I., Ibrahim, N., Sun, P., Cunningham, E., Kline, A. S., Del Buono, H., McDowell, D. O., Patel, K. and Flaherty, K. T. Overall Survival and Durable Responses in Patients With BRAF V600-Mutant Metastatic Melanoma Receiving Dabrafenib Combined With Trametinib. *J Clin Oncol* 34(8): 871-878. (2016)

57. Lu, M. E., Breyssens, H., Salter, V., Zhong, S., Hu, Y., Baer, C., Ratnayaka, I., Sullivan, A., Brown, N. R., Endicott, J., Knapp, S., Kessler, B. M., Middleton, M. R., Siebold, C., Jones, E. Y., Sviderskaya, E. V., Cebon, J., John, T., Caballero, O. L., Goding, C. R. and Lu, X. Restoring p53 Function in Human Melanoma Cells by Inhibiting MDM2 and Cyclin B1/CDK1-Phosphorylated Nuclear iASPP. *Cancer Cell* 30(5): 822-823. (2016)

58. Maillet, D., Blay, J. Y., You, B., Rachdi, A., Gan, H. K. and Peron, J. The reporting of adverse events in oncology phase III trials: a comparison of the current status versus the expectations of the EORTC members. *Ann Oncol* 27: 192-198. (2016)

59. Maillet, D., Gan, H. K., Blay, J. Y., You, B. and Peron, J. Aggregated adverse-events outcomes in oncology phase III reports: A systematic review. *Eur J Cancer* 52: 26-32. (2016)

60. Manning, T. G., Christidis, D., Zotov, P. and Lawrentschuk, N. Collaboration Through Communication: The Young Urology Researchers Organisation (YURO). *BJU Int* 118 Suppl 3: 6-7. (2016)

61. Mitchell, P. L. and John, T. Lung cancer in 2016: immunotherapy comes of age. *Lancet Respir Med* 4(12): 947-949. (2016)

62. Morgen, E. K., Lenz, H. J., Jonker, D. J., Tu, D., Milano, G., Graziano, F., Zalcberg, J., Karapetis, C. S., Dobrovic, A., O'Callaghan, C. J. and Liu, G. Germline polymorphisms as biomarkers of tumor response in colorectal cancer patients treated with anti-EGFR monoclonal antibodies: a systematic review and meta-analysis. *Pharmacogenomics J*. (2016)

63. Murphy, C., Hawkes, E., Chionh, F. and Chong, G. Durable remission of both multicentric Castleman's disease and Kaposi's sarcoma with valganciclovir, rituximab and liposomal doxorubicin in an HHV-8-positive, HIV-negative patient. *J Clin Pharm Ther*. (2016)

64. O'Kane, D., Papa, N., Lawrentschuk, N., Syme, R., Giles, G. and Bolton, D. Supervisor volume affects oncological outcomes of trainees performing open radical prostatectomy. *ANZ J Surg* 86(4): 249-254. (2016)

65. Parakh, S., Goh, M. and Andrews, M. C. Non-HIV-associated Kaposi sarcoma in an immunosuppressed melanoma patient treated with dabrafenib. *J Clin Pharm Ther* 41: 354-356. (2016)

66. Parakh, S., Hamid, A., Cher, L. and Gan, H. K. Temozolomide-Associated Liver Fibrosis. *J Clin Pharmacol* 56(11): 1448-1449. (2016)

67. Parakh, S., Mbbs, A. H., Cher, L. and Gan, H. Temozolomide-Associated Liver Fibrosis. *J Clin Pharmacol*. (2016)

68. Parakh, S., Nguyen, R., Opie, J. M. and Andrews, M. C. Late presentation of generalised bullous pemphigoid-like reaction in a patient treated with pembrolizumab for metastatic melanoma. *Australas J Dermatol*. (2016)

69. Parakh, S., Parslow, A. C., Gan, H. K. and Scott, A. M. Antibody-mediated delivery of therapeutics for cancer therapy. *Expert Opin Drug Deliv* 13(3): 401-419. (2016)

70. Parakh, S., Thursfield, V., Cher, L., Dally, M., Drummond, K., Murphy, M., Rosenthal, M. A. and Gan, H. K. Recurrent glioblastoma: Current patterns of care in an Australian population. *J Clin Neurosci* 24: 78-82. (2016)

71. Parslow, A., Parakh, S., Lee, F.-T., Gan, H. and Scott, A. Antibody–Drug Conjugates for Cancer Therapy. *Biomedicines* 4(3): 14. (2016)

72. Patel, M. I., Yuminaga, Y., Bang, A., Lawrentschuk, N., Skyring, T. and Smith, D. P. Volume-outcome relationship in penile cancer treatment: a population based patterns of care and outcomes study from Australia. *BJU Int* 118 Suppl 3: 35-42. (2016)

73. Patel, O., Dai, W., Mentzel, M., Griffin, M. D., Serindoux, J., Gay, Y., Fischer, S., Sterle, S., Kropp, A., Burns, C. J., Ernst, M., Buchert, M. and Lucet, I. S. Biochemical and Structural Insights into Doublecortin-like Kinase Domain 1. *Structure* 24(9): 1550-1561. (2016)

74. Patnaik, S., George, S. P., Pham, E., Roy, S., Singh, K., Mariadason, J. M. and Khurana, S. By moonlighting in the nucleus, villin regulates epithelial plasticity. *Mol Biol Cell* 27(3): 535-548. (2016)

75. Perera, M., Katelaris, N., Murphy, D., McGrath, S. and Lawrentschuk, N. PI-RADS 4 or more: Active Surveillance no more. *BJU Int*. (2016)

76. Perera, M., Katelaris, N., Murphy, D. G., McGrath, S. and Lawrentschuk, N. Prostate Imaging Reporting and Data System score of four or more: active surveillance no more. *BJU Int*. (2016)

77. Perera, M., Krishnananthan, N., Lindner, U. and Lawrentschuk, N. An update on focal therapy for prostate cancer. *Nat Rev Urol* 13(11): 641-653. (2016)

78. Perera, M., Papa, N., Kinnear, N., Wetherell, D., Lawrentschuk, N., Webb, D. and Bolton, D. Urolithiasis Treatment in Australia: The Age of Ureteroscopic Intervention. *J Endourol* 30(11): 1194-1199. (2016)

79. Pham, D., Hardcastle, N., Foroudi, F., Kron, T., Bressel, M., Hilder, B., Chesson, B., Oates, R., Montgomery, R., Ball, D. and Siva, S. A Multidisciplinary Evaluation of a Web-based eLearning Training Programme for SAFRON II (TROG 13.01): a Multicentre Randomised Study of Stereotactic Radiotherapy for Lung Metastases. *Clin Oncol (R Coll Radiol)* 28(9): e101-108. (2016)

80. Poh, A. R., O'Donoghue, R. J., Ernst, M. and Putoczki, T. L. Mouse models for gastric cancer: Matching models to biological questions. *J Gastroenterol Hepatol* 31(7): 1257-1272. (2016)

81. Ramalingam, S., Yang, J. C., Lee, C. K., Kurata, T., Kim, D. W., John, T., Nogami, N., Ohe, Y. and Janne, P. A. LBA1_PR: Osimertinib as first-line treatment for EGFR mutation-positive advanced NSCLC: updated efficacy and safety results from two Phase I expansion cohorts. *J Thorac Oncol* 11(4 Suppl): S152. (2016)

82. Reljic, B., Conos, S., Lee, E. F., Garnier, J. M., Dong, L., Lessene, G., Fairlie, W. D., Vaux, D. L. and Lindqvist, L. M. BAX-BAK1-independent LC3B lipidation by BH3 mimetics is unrelated to BH3 mimetic activity and has only minimal effects on autophagic flux. *Autophagy*: 1-11. (2016)

83. Rohrbeck, L., Gong, J. N., Lee, E. F., Kueh, A. J., Behren, A., Tai, L., Lessene, G., Huang, D. C., Fairlie, W. D., Strasser, A. and Herold, M. J. Hepatocyte growth factor renders BRAF mutant human melanoma cell lines resistant to PLX4032 by downregulating the pro-apoptotic BH3-only proteins PUMA and BIM. *Cell Death Differ* 23(12): 2054-2062. (2016)

84. Saraswat, I., Abouassaly, R., Dwyer, P., Bolton, D. M. and Lawrentschuk, N. Female urinary incontinence health information quality on the Internet: a multilingual evaluation. *Int Urogynecol J* 27(1): 69-76. (2016)

85. Sathianathen, N. J., Murphy, D. G., van den Bergh, R. C. and Lawrentschuk, N. Gleason pattern 4: active surveillance no more. *BJU Int* 117(6): 856-857. (2016)

86. Sax, M. J., Gasch, C., Athota, V. R., Freeman, R., Rasighaemi, P., Westcott, D. E., Day, C. J., Nikolic, I., Elsworth, B., Wei, M., Rogers, K., Swarbrick, A., Mittal, V., Pouliot, N. and Mellick, A. S. Cancer cell CCL5 mediates bone marrow independent angiogenesis in breast cancer. *Oncotarget*. (2016)

87. Soria, J. C., Gan, H. K., Blagden, S. P., Plummer, R., Arkenau, H. T., Ranson, M., Evans, T. R., Zalcman, G., Bahleda, R., Hollebecque, A., Lemech, C., Dean, E., Brown, J., Gibson, D., Peddareddigari, V., Murray, S., Nebot, N., Mazumdar, J., Swartz, L., Auger, K. R., Fleming, R. A., Singh, R. and Millward, M. A phase I, pharmacokinetic and pharmacodynamic study of GSK2256098, a focal adhesion kinase inhibitor, in patients with advanced solid tumors. *Ann Oncol*. (2016)

88. Thapa, B., Walkiewicz, M., Murone, C., Asadi, K., Deb, S., Barnett, S., Knight, S., Mitchell, P., Liew, D., Watkins, D. N. and John, T. Calretinin but not caveolin-1 correlates with tumour histology and survival in malignant mesothelioma. *Pathology* 48(7): 660-665. (2016)

89. Thapa, B., Watkins, D. N. and John, T. Immunotherapy for malignant mesothelioma: reality check. Expert Rev *Anticancer Ther*: 1-10. (2016)

90. Thiem, S., Eissmann, M. F., Elzer, J., Jonas, A., Putoczki, T. L., Poh, A., Nguyen, P., Preaudet, A., Flanagan, D., Waring, P., Buchert, M., Jarnicki, A. and Ernst, M. Stomach-specific activation of oncogenic KRAS and STAT3-dependent inflammation cooperatively promote gastric tumorigenesis in a preclinical model. *Cancer Res* 76(8): 2277-2287. (2016)

91. Thiem, S., Eissmann, M. F., Stuart, E., Elzer, J., Jonas, A., Buchert, M. and Ernst, M. Inducible gene modification in the gastric epithelium of Tff1-CreERT2, Tff2-rtTA, Tff3-luc mice. *Genesis* 54(12): 626-635. (2016)

92. Togel, L., Nightingale, R., Chueh, A. C., Jayachandran, A., Tran, H., Phesse, T., Wu, R., Sieber, O. M., Arango, D., Dhillon, A. S., Dawson, M. A., Diez-Dacal, B., Gahman, T. C., Filippakopoulos, P., Shiau, A. K. and Mariadason, J. M. Dual targeting of bromodomain and extra-terminal domain proteins, and WNT or MAPK signaling, inhibits c-MYC expression and proliferation of colorectal cancer cells. *Mol Cancer Ther*. (2016)

93. Toner, L., Bolton, D. M. and Lawrentschuk, N. Prevention of sepsis prior to prostate biopsy. *Investig Clin Urol* 57(2): 94-99. (2016)

PUBLICATIONS CONTINUED

94. Toner, L., Papa, N., Aliyu, S. H., Dev, H., Lawrentschuk, N. and Al-Hayek, S. Candida growth in urine cultures: a contemporary analysis of species and antifungal susceptibility profiles. *QJM* 109(5): 325-329. (2016)

95. Toner, L., Papa, N., Aliyu, S. H., Dev, H., Lawrentschuk, N. and Al-Hayek, S. Extended-spectrum beta-lactamase-producing Enterobacteriaceae in hospital urinary tract infections: incidence and antibiotic susceptibility profile over 9 years. *World J Urol* 34(7): 1031-1037. (2016)

96. Toner, L., Papa, N., Aliyu, S. H., Dev, H., Lawrentschuk, N. and Al-Hayek, S. Vancomycin resistant enterococci in urine cultures: Antibiotic susceptibility trends over a decade at a tertiary hospital in the United Kingdom. *Investig Clin Urol*. 57(2): 129-134. (2016)

97. Toner, L., Papa, N., Perera, M., Katelaris, N., Weerakoon, M., Chin, K., Harewood, L., Bolton, D. M. and Lawrentschuk, N. Multiparametric magnetic resonance imaging for prostate cancer-a comparative study including radical prostatectomy specimens. *World J Urol*. (2016)

98. Tsao, M. S., Wu, L., Allo, G., John, T., Li, M., Tagawa, T., Opitz, I., Anraku, M., Yun, Z., Pintilie, M., Liu, G., Pitcher, B., Feld, R., Johnston, M. R. and de Perrot, M. Patient-derived xenograft establishment from human malignant pleural mesothelioma. *Clin Cancer Res*. (2016)

99. Tsao, S. C., Vaidyanathan, R., Dey, S., Carrascosa, L. G., Christophi, C., Cebon, J., Shiddiky, M. J., Behren, A. and Trau, M. Capture and On-chip analysis of Melanoma Cells Using Tunable Surface Shear forces. *Sci Rep* 6: 19709. (2016)

100. van den Bent, M., Gan, H., Reardon, D. A., Papadopoulos, K. P., Merrell, R., Kumthekar, P., Roberts-Rapp, L., Holen, K., Ansell, P. and Lassman, A. B. Transcriptional Profiling to Identify Determinants Associated with Response to Abt-414 in Patients with Glioblastoma. *Neuro-Oncology* 18: 27-28. (2016)

101. van den Bent, M., Gan, H. K., Lassman, A. B., Kumthekar, P., Butowski, N., Lwin, Z., Nabors, L. B., Simes, J., Holen, K. and Reardon, D. A. Efficacy of a Novel Antibody-Drug Conjugate (Adc), Abt-414, as Monotherapy in Epidermal Growth Factor Receptor (Egfr) Amplified, Recurrent Glioblastoma (Gbm). *Neuro-Oncology* 18: 44-44. (2016)

102. Voskoboynik, M., Mar, V., Mailer, S., Colebatch, A., Fennessy, A., Logan, A., Hewitt, C., Cebon, J., Kelly, J. and McArthur, G. Clinicopathological characteristics associated with BRAF and BRAF mutations in melanoma. *Pigment Cell Melanoma Res* 29(2): 222-228. (2016)

103. Walsh, P. C. and Lawrentschuk, N. Immediate Adjuvant Radiation Therapy Following Radical Prostatectomy Should Not Be Advised for Men with Extraprostatic Extension Who Have Negative Surgical Margins. *Eur Urol* 69(2): 191-192. (2016)

104. Williamson, T. J., Pearson, J. R., Ischia, J., Bolton, D. M. and Lawrentschuk, N. Guideline of guidelines: follow-up after nephrectomy for renal cell carcinoma. *BJU Int* 117(4): 555-562. (2016)

105. Wong, N. C., Pope, B. J., Candiloro, I. L., Korbie, D., Trau, M., Wong, S. Q., Mikeska, T., Zhang, X., Pitman, M., Eggers, S., Doyle, S. R. and Dobrovic, A. MethPat: a tool for the analysis and visualisation of complex methylation patterns obtained by massively parallel sequencing. *BMC Bioinformatics* 17(1): 98. (2016)

106. Woods, K., Knights, A. J., Anaka, M., Schittenhelm, R. B., Purcell, A. W., Behren, A. and Cebon, J. Mismatch in epitope specificities between IFNgamma inflamed and uninflamed conditions leads to escape from T lymphocyte killing in melanoma. *J Immunother Cancer* 4: 10. (2016)

107. Xin, A., Masson, F., Liao, Y., Preston, S., Guan, T., Gloury, R., Olshansky, M., Lin, J. X., Li, P., Speed, T. P., Smyth, G. K., Ernst, M., Leonard, W. J., Pellegrini, M., Kaech, S. M., Nutt, S. L., Shi, W., Belz, G. T. and Kallies, A. A molecular threshold for effector CD8(+) T cell differentiation controlled by transcription factors Blimp-1 and T-bet. *Nat Immunol* 17(4): 422-432. (2016)

108. Yao, J., Caballero, O. L., Huang, Y., Lin, C., Rimoldi, D., Behren, A., Cebon, J. S., Hung, M. C., Weinstein, J. N., Strausberg, R. L. and Zhao, Q. Altered expression and splicing of ESRP1 in malignant melanoma correlates with epithelial-mesenchymal status and tumor-associated immune cytolytic activity. *Cancer Immunol Res* 4(6): 552-561. (2016)

109. Yao, S., Lee, E. F., Pettikiriarachchi, A., Evangelista, M., Keizer, D. W. and Fairlie, W. D. Characterisation of the conformational preference and dynamics of the intrinsically disordered N-terminal region of Beclin 1 by NMR spectroscopy. *Biochim Biophys Acta* 1864: 1128–1137. (2016)

110. Yin, M. X. L., Catimel, B., Gregory, M., Condron, M., Kapp, E., Holmes, A. B. and Burgess, A. W. Synthesis of an inositol hexakisphosphate (IP6) affinity probe to study the interactome from a colon cancer cell line. *Integr Biol* (Camb) 8(3): 309-318. (2016)

111. Young, A. I., Law, A. M., Castillo, L., Chong, S., Cullen, H. D., Koehler, M., Herzog, S., Brummer, T., Lee, E. F., Fairlie, W. D., Lucas, M. C., Herrmann, D., Allam, A., Timpson, P., Watkins, D. N., Millar, E. K., O'Toole, S. A., Gallego-Ortega, D., Ormandy, C. J. and Oakes, S. R. MCL-1 inhibition provides a new way to suppress breast cancer metastasis and increase sensitivity to dasatinib. *Breast Cancer Res* 18(1): 125. (2016)

112. Zargar-Shoshtari, K., Lawrentschuk, N. and Zargar, H. Robotic Prostatectomy Delivers on the Promise of Minimally Invasive Surgery. *Urology*. (2016)

113. Zargar, H., van den Bergh, R., Moon, D., Lawrentschuk, N., Costello, A. and Murphy, D. The impact of the United States Preventive Services Task Force (USPTSTF) recommendations against prostate-specific antigen (PSA) testing on PSA testing in Australia. *BJU Int*. (2016)

INVITED INTERNATIONAL PRESENTATIONS

A/Prof Uwe Ackermann
Tumour Targeting Laboratory
Gordon Conference on Tissue Transglutaminase in Human Disease Processes, Girona, Spain
Imaging of TG2 activity in breast cancer using radiolabelled Hitomi peptide.

Prof Jonathan Cebon
Cancer Immunobiology Laboratory
CTIO Meeting, Seoul, South Korea
Scientific advances in immunology: a clinical perspective.

52nd Annual Meeting of American Society of Clinical Oncology (ASCO), Chicago, USA
T-cell stimulation: step it up.

A/Prof Alexander Dobrovic
Translational Genomics and Epigenomics Group
1st Asia Pacific Droplet Digital PCR Symposium, Bangkok, Thailand
Droplet digital PCR in clinical diagnostics.

Japanese Cancer Association, Yokohama, Japan
Getting digital with liquid biopsies from solid tumours.

Department of Epigenomics, Nagoya City University, Nagoya, Japan
Digital PCR of liquid biopsies.

14th meeting of the Asia-Pacific Federation for Clinical Biochemistry, Taipei, Taiwan
Clinical applications of droplet digital PCR.

Prof Matthias Ernst
Cancer and Inflammation Laboratory
ISREC-SCCL Symposium, Lausanne, Switzerland.
Excessive HCK kinase activity in the tumor stroma polarizes macrophages and promotes solid malignancies malignancies.

Institute for Research in Biomedicine (IRB), Barcelona, Spain
The gp130/Stat3 signaling cascade in health and disease.

International Cytokine and Interferon Society, San Francisco, USA
A "rheostat" function for the GP130/Stat3 signaling cascade for gastrointestinal wound-healing and tumourigenesis.

A/Prof Sze-Ting Lee
Tumour Targeting Laboratory
17th Biennial Congress of the South African Society of Nuclear Medicine, Pretoria, South Africa
PET in genitourinary carcinoma.

11th International Conference on Radionuclide Therapy, Cochin, India
PET in radiotherapy planning.

Established and Evolving Practices 48th Annual Conference of the Association (SNMICON2016), Ahmadebad, India
PET/CT in radiotherapy planning.

Dr Kellie Mouchemore
Translational Breast Cancer Program – Metastasis Research Laboratory
Metastasis Research Society Young Investigator Meeting, Chengdu, China
Neutrophils as therapeutic targets in metastatic breast cancer.

Dr Ashleigh Poh
Cancer and Inflammation Laboratory
Trinity College, Dublin, Ireland
Haematopoietic cell kinase activity in myeloid cells promotes colon cancer progression.

Dr Normand Pouliot
Translational Breast Cancer Program – Matrix Microenvironment & Metastasis Laboratory
Metastasis Research Society Congress, Chengdu, China
Development and validation of a clinically relevant mouse model of breast cancer brain metastasis.

Prof Robin Anderson
Translational Breast Cancer Program – Metastasis Research Laboratory
Southern Medical University, Guangzhou, China
Blockade of G-CSF signalling by BMP4 inhibits breast cancer metastasis.

13th Robert F. Kallman Memorial Lecture, Stanford University, California, USA
International Symposium of Reproduction and Metabolism, Taipei, Taiwan

Prof Andrew Scott
Tumour Targeting Laboratory
ANZSNM Scientific Conference, Rotorua, New Zealand
Engineering anti-Lewis Y hu3S193 antibodies with improved therapeutic ratio for radioimmunotherapy of epithelial cancers.

Molecular imaging and theranostics in oncology.
Asian Nuclear Medicine Academic Forum, Shanghai, China

Nuclear medicine global initiative – radiopharmaceuticals access and availability.
Society of Nuclear Medicine and Molecular Imaging conference, San Diego, USA

International Nuclear Medicine and Molecular Imaging Forum, Linyi, China
Imaging metabolic and signalling pathways in cancer.

European Association of Nuclear Medicine Annual Meeting, Barcelona, Spain
Australian multicentre evaluation of clinical management intent utilising 68Ga-PSMA PET scans in patients with prostate cancer.

American Association of Pharmaceutical Scientists Conference, Denver, USA
In-vivo PET imaging for receptor occupancy by therapeutic antibodies and applications for efficacy prediction and dose selection.

International Conference on Innovation and Entrepreneurship, Kunshan, China
Development of a novel antibody to EGFR as a cancer therapy.

Dr Belinda Yeo
Translational Breast Cancer Program – Metastasis Research Laboratory
UCD Clinical DSS for Breast & Prostate Cancer, Dublin, Ireland
Predicting the risk of breast cancer recurrence.

ONJCRI SEMINARS

Dr Jeff Babon
Walter and Eliza Hall Institute
of Medical Research
Physiological inhibition of inflammatory JAK/STAT signalling.

Dr Nikola Baschuk
La Trobe Institute for Molecular Science
The characters of bone metastatic prostate cancer - getting to know the enemy.

A/Prof Stuart Berzins
Fiona Elsey Cancer Research Institute
The involvement of unconventional T cells in human cancers.

Dr Maté Biro
University of New South Wales
The actin cytoskeleton at the interface of cancer and immunity: assembly, migration and cytotoxic interactions.

Dr Michael Chopin
Walter and Eliza Hall Institute of
Medical Research
Building the "Immune Wall": molecular insights and costs....

Dr Suzi Cutts
La Trobe Institute for Molecular Science
Anthracyclines and related anticancer drugs; more than just topoisomerase II poisons.

A/Prof Phil Darcy
Peter MacCallum Cancer Centre
Cancer immunotherapy utilizing gene-modified T cells: from the bench to the clinic.

Dr Sarah-Jane Dawson
Peter MacCallum Cancer Centre
Liquid biopsies: monitoring the cancer genome in blood.

A/Prof Ross Dickins
Australian Centre for Blood Diseases/
Monash University
Releasing the differentiation block in acute leukemia.

A/Prof Eva Dimitriadis
Hudson Institute of Medical Research
Targeting IL11 receptor a as a treatment for endometrial cancer that preserves fertility.

Dr Sergei Grivennikov
Fox Chase Cancer Center, Philadelphia, USA
Tumour elicited inflammation: microbe and cytokine drivers of colorectal cancer.

Dr Christine J Hawkins
La Trobe Institute for Molecular Science
Direct apoptosis inducers as anti-cancer drugs: safer and more effective than chemotherapy?

Prof Phil Hodgkin
Walter and Eliza Hall Institute of
Medical Research
How T and B cells calculate their response has lessons for immunotherapy.

Dr Gemma Kelly
Walter and Eliza Hall Institute
of Medical Research
Targeting pro-survival BCL-2 proteins for cancer therapy.

Prof Benjamin Kile
Walter and Eliza Hall Institute
of Medical Research
Death without a fuss: apoptotic caspases and the suppression of DAMP signaling.

Dr Kyren Lazarus
University of Cambridge, UK
Understanding the role of BCL11A in triple-negative breast cancer.

Dr Willem Joost Lesterhuis
University of Western Australia
Something old, something new: marrying cancer immunotherapy with other drugs.

Prof Charles Manning
Vanderbilt University Institute
of Imaging Science, USA
Precision imaging diagnostics of cancer.

Dr Theo Mantamadiotis
University of Melbourne
Decoding clinically relevant signalling and transcription networks in brain cancer.

Dr Suresh Mathivanan
La Trobe Institute for Molecular Science
Functional role of exosomes in cancer and its therapeutic applications.

Prof Stephen Nutt
Walter and Eliza Hall Institute
of Medical Research
Programming the immune system.

A/Prof Tony Papenfuss
Peter MacCallum Cancer Centre
Dissecting the evolution of cancer.

Prof Fiona Pixley
School of Medicine and Pharmacology,
University of Western Australia
Targeting macrophage motility to prevent breast cancer invasion.

Dr Ivan Poon
La Trobe Institute for Molecular Science
Disassembly of the dying: mechanisms and functions.

Prof Rob Ramsay
Peter MacCallum Cancer Centre
Identifying actionable areas of research translation for patients with GI cancer: from surgery to immunotherapy.

Prof John Rasko AO
Centenary Institute of Cancer Medicine
& Cell Biology, University of Sydney
Intronic nonsense: from gene expression to cancer.

A/Prof Helena Richardson
La Trobe Institute for Molecular Science
Modelling cancer using the vinegar fly, Drosophila - cell polarity regulation of tissue growth and tumourigenesis.

Dr Michael Samuel
Centre for Cancer Biology, South Australia
Mechano-reciprocity in tissue homeostasis – from cancer to wound healing and back.

A/Prof Clare Scott
Walter and Eliza Hall Institute
of Medical Research
Trunks and branches: targeting epithelial ovarian cancer.

Dr Richard Tothill
Peter MacCallum Cancer Centre
Life in the orphanage: rare neuroendocrine tumours.

Prof Jane Visvader
Walter and Eliza Hall Institute
of Medical Research
Getting abreast of the mammary hierarchy and cancer.

Dr Vicki Whitehall
QIMR Berghofer Medical Research
Institute, Queensland
Serrated neoplasia of the colorectum – from models to medicine.

Prof Alpha Yap
University of Queensland
Adherens junctions, force-sensing, and epithelial homeostasis.

THE WELLNESS WALK AND RESEARCH RUN

The Wellness Walk has attracted more than 6,000 participants and raised more than $400,000 since its inception three years ago. 2016 marked an exciting year of growth for the Wellness Walk with the introduction of the Research Run and the event moving to the new location of La Trobe University. About 3,000 participants joined Olivia and Bindi Irwin in the Wellness Walk and Steve Moneghetti led more than 200 runners in the 5-kilometre and 10-kilometre runs in the beautiful grounds of the University. Each laboratory within the Institute participated in the event with the Cell Death and Survival Laboratory topping the Institute's fundraising efforts by raising more than $5,500.

The 2017 Wellness Walk & Research Run will again be held at La Trobe University on 17th September.

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