



Telethon Institute for
Child Health
Research



Celebrating 20 years
ANNUAL REPORT 2010



PRINCIPAL PARTNER



Telethon Institute for
Child Health Research

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Throughout the past year, the Telethon Institute for Child Health Research has celebrated 20 years of service to improve and promote the health and wellbeing of all children through the unique application of multidisciplinary research.

From humble beginnings in the renovated nursing school at Princess Margaret Hospital, it is now the largest medical research facility in Western Australia, and one of the most significant in the nation.

Independent and not-for-profit, the Institute is home to more than 500 staff and postgraduate students and in the past year generated more than \$30 million in research funding.

This report not only outlines the highlights from the past year, but achievements over the 20 year period. It shows how Institute researchers have made significant discoveries and influenced policy to bring about substantial improvements in health and wellbeing for children in Australia and around the world.

Our Mission

To improve and to promote the health and wellbeing of all children through the unique application of multidisciplinary research.

Our Aims

- to conduct high quality research
- to apply research findings to improve the health of children, adolescents and families
- to teach the next generation of health researchers
- to be an advocate for research and for children



It was the mid '80s when we had a wild idea. Wouldn't it be great to set up a child health research institute in Perth?

Never mind that Perth is so isolated or that Western Australia was in the grips of the 'WA Inc' scandal or that a recession was biting hard.

In 1986 we invited a group of Australia's leading researchers to Perth and asked them to make an assessment. To our surprise, the committee felt we had the right ingredients and encouraged us to go ahead. With the support of the Princess Margaret Hospital Board, and particularly of the new Professor of Paediatrics, Lou Landau, the proposal was developed further and after much hard work and fundraising, the Institute was born.

So now, just over 20 years on, it's timely to reflect on those early days, to look at some of the defining elements of this Institute, and to forecast a little of the path ahead.

An important learning for us is the value of long term relationships. The most significant for us has been Channel 7's Telethon. It was fundamental to helping us get off the ground – and has been with us ever since. It is not an overstatement to say this Institute has flourished because of Telethon.

Another element that any leader will agree with is that good people are the basis of any good business. We have been very fortunate in building a core group

who wanted to work together and shared a vision to do it differently. Some of those founding scientists - Professors Pat Holt, Wayne Thomas and Ursula Kees - are still research leaders at the Institute today as is one of my closest colleagues Carol Bower.

We made some important strategic recruitments. Peter Sly came from Melbourne to lead clinical research and enhance our respiratory disease and asthma research. Steve Zubrick and Sven

Silburn established our formidable capacity in population mental health.

With this core group, the dream of a multidisciplinary approach to tackling the big issues in child health had become a reality. It's a model we pioneered and now many follow.

Having good people on board is not just limited to our research staff. We have been blessed with an outstanding research support team. When Bob



Ginbey was appointed in the mid 1990s he really organised our corporate structure. Bruce McHarrie's appointment to head financial and strategic activities then took us to another level. The team of Bruce and Bob (and now Sash Tomson) meant that we had the best corporate organisation of any research institute in the country. In 2010 we then secured Professor Moira Clay, and all Institute staff would acknowledge that this was a coup! She is now setting us on the road to research and academic excellence across all areas.

The Institute also has been fortunate to have received support from the universities. In particular, the retiring Vice Chancellor of the University of Western Australia, Professor Alan Robson, has been a valued mentor and advocate for the Institute.

Working with government is crucial. Most of that happens outside the public spotlight. Our philosophy has been an open door and positive approach and advice has flowed both ways. In practical terms, the state and federal governments have provided much needed building and infrastructure funding, in addition to research grants and contracts. At times it has been challenging to demonstrate the need for funding of the less visible parts of good research, such as IT, HR and administrative support. However, these

are areas where we have gained traction from governments, albeit at variable levels over the years.

Our research successes have been many. The highlights over our first 20 years are detailed on page 22 of this report, so what elements will see us well placed for the future?

One is undoubtedly the strength of our databases. For example, the midwives notification database has captured vital information on every birth in WA since the mid 1970's. We now have the capacity to link this with other data sets – subject to strict privacy provisions – to generate a comprehensive picture of child health and wellbeing outcomes from birth to adulthood. Add to this our Raine, asthma and language cohorts, registers on birth defects, twins and a range of disabilities and disorders, then we have a goldmine of data waiting for the next wave of researchers to mine.

I am particularly proud of the story of our Aboriginal health research. Indeed it is worthy of being documented separately. We can claim to have set the bar with the first employment of Aboriginal researchers in Australia and the establishment of our Kulunga Research Network (a joint venture with all the Aboriginal controlled health services state wide). Our unique Kalgoorlie

project (NTP) established in 1992 is now an effective maternal and child health service throughout the Eastern Goldfields and supports our research in otitis media and other projects. The WA Aboriginal Child Health Survey produced an outstanding set of recommendations to close the gap in outcomes. Our swimming pool study in the Jigalong and Burringurrah communities has now led to swimming pools being installed in many more remote communities because of their proven benefits to health and wellbeing. The circle is complete with the success of several indigenous PhD students now all post-doctorate researchers with their own grants.

Another of our great strengths is our engagement with the community which I consider to be unique amongst research institutes nationally. This is demonstrated in a number of ways. Firstly, there are the tens of thousands of Western Australian families who have participated in our cohort studies, clinical trials and surveys. Secondly, our leadership in embedding consumer and community participation in all of our research – led by our wonderful advocate, Anne McKenzie. Finally, our ability to engage and influence politicians and policy makers, who use the research that we generate to develop better services for Australian families.



The challenges ahead for the Institute continue around a recurring theme that has been with us from day one – funding. Good researchers attract good grants, but grants never cover the full cost of employment or the support services they require. If we are to continue to be innovative and at the leading edge of child health research, then our focus must continue to be on recruiting and retaining the brightest minds. That means we have to have the capacity to offer competitive remuneration, provide quality support services and to fund start-up research to simply see where it might lead.

These types of discretionary funds are dependent on the philanthropic dollar. I am so grateful to Kerry Stokes, Stan Perron and those other generous

individuals who continue to support our work. The Institute's ability to strategically recruit and move into new fields of emerging research will depend on our effectiveness in raising significantly more funds from the philanthropic and corporate sectors.

And so, after 21 fabulous years as Director, I know that the Institute is on a very solid footing and it is time to retire. I will be stepping down from this role at the end of the year. I will be continuing my research program – I have NHMRC and ARC funded grants until at least 2014 and it will be wonderful to focus on those and mentoring some of the wonderful colleagues working with me on those projects.

I am honoured to accept the position of Patron of the Institute. In that capacity, I will continue to advocate for Australia's children and families, based on the best scientific evidence. I will also continue to work to convince others of the rewards of philanthropy by investing in child health research.

My sincere thanks go to the staff, students, and volunteers who have built this institute to be such a success and who inspire me through their enthusiasm and professionalism. Many I count as more than colleagues, rather they are my friends.

I thank our outstanding Board, chaired by John Langoulant, and prior Board members and Chairs, for their unwavering support and sage advice over the years. I know they will find an outstanding scientific leader to take on the Director's role. I'm also confident that our wonderful new Director of Academic and Research Services, Professor Moira Clay, will be a great asset in keeping the ship on a steady course in this transition period.

What excites me most now is the prospect of spending more time in my relatively new role of Grandmother. My family have been wonderfully supportive throughout my busy career and now I look forward to sharing with them the joys that flow from their important roles as parents.

My final thanks is to my husband Geoff who has been my most solid supporter and advisor throughout my career. We are so looking forward to the many adventures and travels that we now have planned.



Fiona Stanley
Director



FIONA WITH GRANDCHILDREN LUCIANA AND JUNIPER

*“Hope is the thing with feathers
- that perches in the soul - and
sings the tune without words -
and never stops, at all.”*

Emily Elizabeth Dickinson



A major priority of the Institute is to ensure translation of research into action that makes a real difference to the lives of children and families. In 2010, Institute researchers were recognised for their research outputs, their high-level advocacy and their impact on policy.

National grant success

In November, the Telethon Institute was awarded nearly \$6 million from the National Health and Medical Research Council to undertake cutting edge research into a range of diseases and disabilities.

- Professor Pat Holt and Dr Debbie Strickland will explore how respiratory virus infections provoke asthma attacks in allergic children that are so severe that they can lead to emergency hospitalisation.
- Dr Andrew Whitehouse will look at prenatal and early postnatal risk factors for autism spectrum disorders, with a focus on fetal growth and the hormone environment to which the fetus is exposed.
- Prof Ursula Kees' research will focus on targeting drug-resistance in paediatric Acute Lymphoblastic Leukaemia.
- Associate Professor Helen Leonard will look at a research model to inform the management of rare disorders such as Rett syndrome.

Western diet link to ADHD

Research published in the international *Journal of Attention Disorders* showed an association between ADHD and a 'Western-style' diet in adolescents.

The study looked at the dietary patterns of 1800 adolescents from the long-term Raine Study and classified diets into 'Healthy' or 'Western' patterns. A diet high in the Western pattern of foods was associated with more than double the risk of having an ADHD diagnosis compared with a diet low in the Western pattern, after adjusting for numerous other social and family influences. A 'healthy' diet is high in fresh fruit and vegetables, whole grains and fish and tends to be higher in omega-3 fatty acids, folate and fibre. A 'Western' diet has a trend towards takeaway foods, confectionary, processed, fried and refined foods. These diets tend to be higher in total fat, saturated fat, refined sugar and sodium with a less optimal fatty acid profile and not enough essential micronutrients.

More research is needed to determine whether a poor diet leads to ADHD or whether ADHD leads to poor dietary choices and cravings. ADHD is the most commonly diagnosed childhood mental health disorder and has a prevalence of approximately 5 per cent.

Needle-less vaccine to prevent bronchiolitis

Our Vaccine Trials Group was part of an international study testing a potential vaccine against two of the most common causes of bronchiolitis - respiratory syncytial virus (RSV) and parainfluenza 3 (PIV). Both cause bronchiolitis (inflammation of the small airways in the lungs) and pneumonia in babies and young children and are a leading cause of hospitalisation of young children in Australia during the winter months. With no vaccine currently available to prevent RSV or PIV, this needle-less vaccine, given in the nose, was tested for safety, effectiveness, the child's immune response, and the required dosage for future trials.

Effective reporting of child abuse

Research published in the *Medical Journal of Australia* found that most cases of child abuse or neglect that are identified in hospital are later substantiated. The study was the first in Australia to cross match anonymised hospital and child protection records. Study leader Dr Melissa O'Donnell said the findings show that the hospital protocols for reporting



child maltreatment were working, with 90 per cent of children admitted to hospital where concerns of maltreatment were identified having had contact with the Department of Child Protection (DCP). More than 80 per cent of these children were notified to the DCP with a specific allegation and 68 per cent had substantiated allegations.

Vitamin D deficiency affects lung growth and function

Researchers from the Telethon Institute discovered the first concrete evidence linking Vitamin D deficiency with poorer lung function and changes in lung growth. Headed by Research Fellow Dr Graeme Zosky, the study has important implications for the potential prevention of lung diseases such as asthma and chronic obstructive pulmonary disease.

As many more Australian pregnant women are Vitamin D deficient than previously thought this work is of considerable importance.

Breastfeeding boosts brain power

We found that children who are mainly breastfed for the first six months (or longer) score significantly higher academically at 10 years of age, especially boys. The findings were published in the leading international journal *Pediatrics*, drawn from data from the Raine Study. Academic data was collected for 1,038 eligible children at 10 years of age. After adjusting for gender, family income, and maternal verbal interaction, boys were found to have improved academic scores in math, reading and spelling if they were breastfed for six months or longer. There was a small benefit for reading in girls.

Golden Staph vaccine trial

Our Vaccine Trial Group was part of a national study testing a vaccine against *Staphylococcus aureus*, or golden staph, a bacteria which lives on the skin and mucosal membranes of more than 20 per cent of the population. Golden staph is a leading cause of infection worldwide, particularly in healthcare settings and is responsible for a large proportion of post-operative infections that can range from mild to severe. There is no vaccine currently available.



DR PETER RICHMOND AND MURRAY BROWN WITH THE GOLDEN STAPH VACCINE.

Photo courtesy The West Australian.

National Centres of Research Excellence

The Telethon Institute was awarded two prestigious Centres of Research Excellence awards. One will tackle the tough issue of why many programs have failed to deliver improved health for Aboriginal people and the other will focus on the treatment of cystic fibrosis.

The National Health and Medical Research Council's (NHMRC) Centre of Research Excellence grant 'From marginalised to empowered: transformative methods for Aboriginal health and wellbeing' will provide \$2.5 million funding over five years for an innovative research program that would generate vital information to help close the gap.

The NHMRC will also provide almost \$2.5 million funding over five years for the collaborative project Australian

Respiratory Early Surveillance Team for Cystic Fibrosis (AREST CF) that brings together leading respiratory researchers across three states.

Urgent action needed to reduce ear infections

The Institute's Professor Deborah Lehmann and some of Australia's leading experts in ear disease called for an ear and hearing taskforce to be formed, led by Indigenous researchers and community leaders, to tackle the huge impact of ear infections on child development and learning, particularly in Indigenous communities. This call was made in the *Medical Journal of Australia* following a workshop held earlier in 2010 which aimed to enhance collaborations nationally and provide up to date information on ear health research in Australia - with a focus on ways to reduce the burden of ear disease in Australia. Over 80 per cent of Indigenous children have middle ear infections by one year of age - a rate that is among the highest in the world. The rate of ear drum rupture from persistent ear infection in Indigenous children is 15 per cent - well above the World Health Organization threshold of 4 per cent, indicating a massive public health problem.



Continuing the cancer fight

The Institute's Division of Children's Leukaemia and Cancer Research received three research grants from the Cancer Council of WA. Division Head Professor Ursula Kees was awarded \$140,000 over two years to investigate the role of a growth factor called CTGF in acute lymphoblastic leukaemia (ALL). This protein is a potential new target for treatments of patients with the devastating disease. Researchers Dr Amy Samuels and Dr Katherine Thompson were awarded Suzanne Cavanagh Early Career Investigator Grants which specifically support the work of promising young researchers in WA.



Fetal head size could link to autism

Institute researchers found a link between children with larger head measurements in-utero and a subsequent diagnosis of Autism Spectrum Disorder (ASD) as toddlers. Published in the *Journal of Autism and Developmental Disorders*, the data for this research came from the Western Australian Pregnancy Cohort (Raine) Study in which 14 children have been diagnosed with an Autism Spectrum condition. The research team examined measures of prenatal growth taken from these children during their mothers' pregnancy, and compared these with 56 children who did not develop autism.

New vaccine against dengue fever

Healthy adults took part in a dengue fever vaccine trial that could protect against all four strains of the potentially devastating disease. This mosquito-borne viral disease is now present in all tropical and sub-tropical regions of the world, including Far North Queensland. In severe cases it can be fatal, particularly in children. There is no licensed vaccine available to prevent dengue fever which would be of great value to Australian travellers.

Apache Energy cancer research partnership

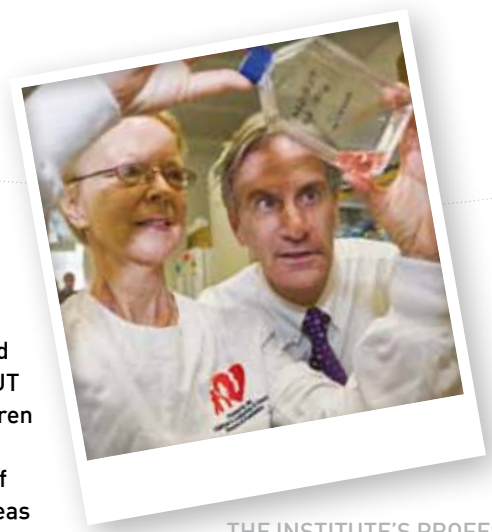
Apache Energy joined the Institute to support research to investigate a rare and very aggressive form of tumour called NUT midline carcinoma that affects both children and adults, and is almost invariably fatal. Very little is known about the pathology of NUT midline carcinomas, which affect areas such as the thorax and nose. The two-year Apache Energy Research Fellowship, consisting of \$300,000 in funding from the company, adds great value to the Institute's cancer research group.

\$2 million boost to child development research

Researchers at the Telethon Institute were awarded a prestigious Australian Research Council linkage grant to examine child, family and community factors affecting child development. The grant, worth more than \$2 million, will provide funding for the Developmental Pathways in WA Children project over the next five years.

Fiona Stanley honoured at prestigious science awards

Institute Director Professor Fiona Stanley was inducted into the Science Hall of Fame at the Western Australian Science Awards on 1 December.



THE INSTITUTE'S PROFESSOR URSULA KEES WITH APACHE'S THOMAS MAHER.

Language and stress in pregnancy

New findings from the Institute showed relatively common stressful events during pregnancy do not have a long term impact on a child's language development. The language ability of 1,309 children was assessed in middle childhood, between nine and 11 years of age, with data coming from the Western Australian Pregnancy Cohort (Raine) Study. The findings may provide reassurance for expecting mothers that these negative but relatively common experiences do not have a detrimental influence on the language development of their child. The study found that the largest contribution to language development was the amount of time parents spent reading to their child during the first three years of life.

Mental health benefits from breastfeeding

Children who are breastfed for longer than six months have a lower risk of mental health problems as they enter their teen years. The research, published in *Journal of Pediatrics*, analysed data from more than 2,000 children involved in Western Australia's Raine Study. At each of the mental health assessments, conducted at two, five, eight, 10 and 14 years of age, the team found a link between breastfeeding duration and behaviour. For each additional month of breastfeeding, the behaviour score improved. This remained valid after adjustment for socio-economic, social and other factors impacting on parenting.

New imaging equipment

A cutting-edge cancer imaging facility, funded by a \$2.4 million grant from the Australian Cancer Research Foundation (ACRF), will help specialist children's cancer researchers at the Telethon Institute to better understand how tumours grow. The PET scanner will enable researchers to investigate tumour progression in pre-clinical laboratory models. In addition to researchers at the Telethon Institute, the facility will be used by cancer researchers at the Western Australian Institute for Medical Research, University of WA, QEII Medical Centre, Royal Perth Hospital, Princess Margaret Hospital, the Lions Eye Institute and PathWest.

Institute researcher in nation's top ten

The head of nutrition research at the Telethon Institute, Associate Professor Wendy Oddy, was named in the nation's top 10 health and medical researchers for 2010. Dr Oddy's research investigating the links between child nutrition and physical and mental health was recognised at the National Health and Medical Research Council's Excellence Awards, presented to the top 10 of almost 5,000 researchers nationally who applied for NHMRC funding.

Birth Rates Rise After Baby Bonus Payments

Researchers from the Telethon Institute found fertility rates increased following the introduction of the Federal government's "Baby Bonus" payments. While fertility rates went up across the board between 2004 and 2006, the most significant increases were among women from the highest socio-economic areas. The findings contradict popular perception that the payments would increase pregnancies in teenagers and disadvantaged groups.

Deciphering genetic pattern that predicts leukaemia relapse

Cancer researchers at the Telethon Institute discovered a genetic pattern that predicts the likelihood of relapse in patients with one of the most aggressive forms of childhood leukaemia. The results show a consistent pattern in five genes that has the potential to enable doctors to identify which patients would benefit from more aggressive treatment when first diagnosed with T-cell acute lymphoblastic leukaemia (T-ALL). While up to 80 per cent of children with T-ALL achieve complete remission, there are around 20 per cent who relapse and whose prognosis can be very poor and this discovery has significant potential to improve outcomes for patients at high risk of relapse.



Parental fear leads to inactive 'cottonwool' kids

Professor Steve Zubrick co-authored a report commissioned by VicHealth which showed that children's development and wellbeing are under threat because their parents are fearful of strangers. The report reviewed evidence of parental anxiety as a barrier to children's physical activity such as walking or cycling to school and playing at parks. Recommendations included strategies in building social cohesion, creating environments to promote active engagement, transport initiatives to promote walking and cycling, and empowering parents to be less fearful.



ASSOCIATE PROFESSOR WENDY ODDY WITH PROFESSOR MICHAEL GOOD AO AND PROFESSOR WARWICK ANDERSON FROM THE NHMRC.

Chairman's report

When the Institute began operations, it was housed in the old nursing school that had been renovated and fitted out to accommodate around 90 staff.

Not surprisingly, the Institute quickly outgrew its first home. In 2000, our current purpose built facility was opened with significant support from the Commonwealth and State governments. Designed for around 250 people, the Institute's rapid success and expansion meant that it too was quickly outgrown.

Therefore, the State Government's announcement in 2008 that it would build a new children's hospital on the QEII site presented both opportunities and challenges.

The Board is continually reminded of the importance of the links between research and clinical medicine – as some put it, from bench to bedside and vice versa. The Institute's strong relationship with Princess Margaret Hospital is a critical aspect of its success.

So after more than 18 months of discussions and negotiations, I am very pleased to report that we are on track in our ambition to make the move with the children's hospital in late 2015.

In-principle agreement has been reached between the major parties and preliminary planning for our needs is well underway.

I am confident that once final funding arrangements are secured, the West Australian community can look forward to a state-of-the-art research facility that will be integrated with the children's hospital. This will ensure that our research is responsive to emerging trends and issues, and that the hospital receives the latest research information and technology. It is a model that is considered best practice around the world.

The Institute will retain its independence and identity and will

enjoy high visibility in the new site on the corner of Monash and Winthrop Avenues. In addition we will be retaining ownership of our current building which we will put to use in meeting the operating costs of the new building.

We are entering a new era in more ways than one. Our founding Director, Professor Fiona Stanley, has indicated her intention to retire as Director at the end of 2011.

Much will be said over the next few months about her extraordinary contribution to the Institute, to science and medical research, and indeed to helping every family in Australia through her passionate advocacy.

Professor Stanley will continue to lead major research projects at the Institute, and has graciously agreed to take on the role of Patron.

An international recruitment process has already begun, and we are committed to ensuring that the very high scientific and personal standards set by Professor Stanley are reflected in her successor.

This year I have taken on a national role with the Association of Australian Medical Research Institutes (AAMRI), the medical research industry's peak body. As a non-executive Director of AAMRI, I am increasingly aware that the funding issues faced by the Institute are common across the sector. Our biggest challenge remains the engagement of state and federal governments in the need for increased research support. In an internationally competitive environment, Australia is at real risk of losing its brightest rising stars unless we are better able to offer competitive salaries, support services and career paths.

However, I am gratified that the Federal Government has responded positively to community concern about funding of medical research and protected the budget of the National Health and Medical Research Council from cuts. The Institute is well positioned and keen to participate in the proposed



national road mapping exercise for the sector.

Finally on funding we continue to place great emphasis on raising funds from our generous supporters. That need is as great today as it was 21 years ago and we are taking steps to increase our efforts to encourage giving to the Institute. The on-going support of Telethon is also most appreciated in this regard.

As Institute Chairman I would like to personally thank all of our staff for their continuing high levels of performance over the past year. It is reflected in the major competitive grants that the Institute receives. As always, our gratitude and respect goes to Professor Stanley for her inspirational and visionary leadership.

I would also like to thank my fellow Board Members. Their strategic input on issues such as the new building project and fundraising is highly valued.

John Langoulant
Chairman

Board of Directors

The Board of Directors governs the overall business of the Institute and meets six times annually. Board members serve on a voluntary basis. In order to carry out business effectively, various committees support the Board by offering advice in specific areas.



JOHN LANGOULANT



JEFF DOWLING



ANNE KELSO



MICHAEL MANFORD



RHONDA MARRIOTT



JIM MCGINTY



MARGARET SEARES



FIONA STANLEY

JOHN LANGOULANT AO Chair, Telethon Institute for Child Health Research; Chief Executive, Oakajee Port and Rail; Chair, Government Employees' Superannuation Board; Chair, Leadership WA; Deputy Chair, Western Australian Ballet; Member, Senate of The University of Western Australia; Board Member, Council of Australian Governments' Reform Council; Board Member, Chamber of Commerce and Industry WA; Board Member, Committee for Perth.

JEFF DOWLING Managing Partner, Ernst & Young Western Region; Member, Australian Institute of Company Directors; Member, Institute of Chartered Accountants Australia; Associate Member, Financial Services Institute of Australasia; Member, National Management Committee for Ernst & Young; Member of Board of Trustees, United Way.

ANNE KELSO AO Director, World Health Organization Collaborating Centre for Reference and Research on Influenza; Honorary Professorial Fellow, The University of Melbourne; Honorary Senior Principal Research Fellow, Queensland Institute of Medical Research; Member, Council of Queensland University of Technology; Member of Board of Trustees, International Society for Influenza and other Respiratory Diseases; Board Member, Florey Neuroscience Institutes.

MICHAEL MANFORD Executive Chairman, Patersons Securities Limited; Councillor, Australian Business Arts Foundation; Board Member, St Hilda's Anglican School for Girls.

RHONDA MARRIOTT Director, Kulbardi Aboriginal Centre, Murdoch University; Chair, Aboriginal Collaboration Committee for Applied Research and Evaluation; Board Member, Public Health Advocacy Institute of Western Australia.

JIM MCGINTY Chairman, Health Workforce Australia; Board Member, Australian General Practice Network; Former WA State Health Minister; Former WA Attorney General.

MARGARET SEARES AO Former Senior Deputy Vice-Chancellor, The University of Western Australia; Board Member, Synergy; Board Member, Perth International Arts Festival; Board Member, The Creative Industries Innovation Centre; Board Member, Chamber of Arts and Commerce; Board Member, Education Investment Fund; Board Member, National Research Infrastructure Council; Fellow, Australian Institute of Company Directors.

FIONA STANLEY AC Director, Telethon Institute for Child Health Research; Chair, Australian Research Alliance for Children and Youth; Professor, School of Paediatrics and Child Health, The University of Western Australia; Member, Prime Minister's Science, Engineering and Innovation Council; Member, Australian Social Inclusion Board; Member, WA State Government Indigenous Implementation Board; Australian of the Year 2003.



Making an impact

Each year, we rely on the generous philanthropic support of the Western Australian community who continue to make an impact on the lives of our children through generous donations to the Institute – we couldn't do it without your support – thank you so much.

Thank you Telethon

Through our principal partner, Telethon, hundreds of thousands of West Australians contribute to the pioneering work undertaken by our researchers.

We express our sincere thanks to the people of this State and to the Trustees and management of Telethon who make it possible for us to continue our vital research.

In 2010, we received additional support through Telethon from the Federal Government to fund research into Aboriginal health and environmental health.



Malcolm McCusker QC AO and Tonya McCusker made a generous donation through the McCusker Charitable Foundation



Our major corporate partners

We thank our major corporate partners for their visionary support of cutting edge research into the health and wellbeing of children and young people. Their outstanding commitment and generosity provides indispensable funding for ground-breaking research projects and the translation of that research into action that makes a real difference to the lives of children and families.

Shell Australia



BHP Billiton Australia Ltd



Apache Energy Limited



Our generous community

Of great importance to us is the wonderful support we receive from thousands of individuals, families, schools, community organisations, clubs and from corporate sector in WA and interstate. We thank each one of them and list them below. We also thank those donors who wish to remain anonymous.

A particular thanks to the "Friends of the Institute". This group of generous women raise funds each year through a golf day and other activities to support the work of researchers.

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Telethon

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STAN AND JEAN PERRON WITH PAST SCHOLARSHIP RECIPIENTS SERENA O'NEILL (LEFT) AND SARAH JOHNSON (RIGHT)

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No limits to cancer battle

What would you do to fight against children's cancers?

It seems there are no limits to the passion and determination of some special West Australians to support researchers in their battle to beat this terrible disease.

Led by Rick Parish and Peter Wilson, the Telethon Adventurers were inspired by Rick's four-year-old son Elliot, who sadly lost his battle with medulloblastoma (brain cancer) in February 2011.

In 2010, The Adventurers climbed Mont Blanc to raise money for research, and easily achieved their aim to fund a state-of-the-art 3D molecular imager for the Telethon Institute.

Named in honour of Elliot, the imager gives researchers a much more detailed view of how brain tumours grow and react to potential new drugs.

The Telethon Adventurers have set a bigger fundraising target of \$2 million for 2011. To support them or find out about their next adventures, go to: www.theadventurers.com.au.



Police ride for research

WA Police Commissioner Karl O'Callaghan led a group of 37 motorcyclists and support crew on the Wall to Wall Ride from Joondalup to Canberra in 2010 to raise money to help kids with cancer.

The group of officers all took annual leave and paid their own way to participate.

The funds helped to purchase Elliot's machine with the Telethon Adventurers.

The Commissioner has now formed his own foundation Bright Blue, the Commissioner's Fund for Sick Kids and in 2011 they will ride again to buy equipment for children's cancer researchers at the Telethon Institute.

www.brightblue.org.au



FIONA STANLEY CHATS WITH DONNA KARAN WHILE RUSSELL JAMES LOOKS AT CANCER CELLS

NOMAD Two Worlds

The Institute is proud to be the global philanthropic partner of NOMAD Two Worlds, a unique collaborative art project of international photographer Russell James and Aboriginal artist Clifton Bieundurry and others.

'NOMAD Two Worlds' is a powerful visualisation of reconciliation in action. Funds raised support the Institute's community-initiated health research and the training of outstanding Aboriginal students in health research.

Raised in WA, Russell James now spends most of his time in the USA. While his photographs of some of the world's most celebrated supermodels are in high demand, he retains strong links to his home state.

In November he showcased the Kimberley to fashion design icon Donna Karan. Professor Fiona Stanley was delighted when Russell brought Donna into the Institute for a tour of our research facility.



RICK PARISH AND DR NICK GOTTARDO WITH ELLIOT'S MACHINE



ELLIOT PARISH



COMMISSIONER KARL O'CALLAGHAN WITH CHARLIE (3), WHO HAS A BRAIN TUMOUR, AND HIS MUM SAM

*"You must be the change you
wish to see in the world."*

Mohandas Karamchand Gandhi



Jenny Mountain

Raine Study Manager

If the thought of managing a dozen 20-year-olds is a daunting prospect, imagine what it's like to manage over 2,000 of them on a weekly basis. That's exactly the challenge faced by Jenny Mountain, Manager of the Institute's Raine Study (the Western Australian Pregnancy Cohort Study).

Over the past 20 years, the Raine Study has amassed one of the most unique and important collections of data in the world and has amalgamated an extensive database on demographic, developmental, psychological, physical and other factors around the life of children and families.

"The Raine Study is an amazing project and a phenomenal resource, and a massive challenge from a management perspective," Jenny says.

The Raine Study is a unique source of information for identifying and testing theories regarding the complex causes behind childhood disease and disability.

Jenny's average day involves strategies to retain the more than 2,000 20-year-old participants, overseeing a team of 12 Raine Study staff who conduct the follow-up assessments, as well as recruitment, data collection and data management.

Because the Raine Study attracts 20 independent research groups involved in different projects surrounding the Raine Study, Jenny's role also includes coordinating all their needs and requests.

"The Raine Study has local, national and international collaborators requiring

communication and collaboration between more than 150 researchers," she explains.

No wonder Jenny is always the last to leave the building at night! On top of her work commitments, Jenny also has two children who remain her focus after hours and has managed to renovate a house in the time that she has left.

Jenny finds much of her motivation and inspiration comes from the young participants that make up the Raine Study.

"They are a group of amazing people. It would be fantastic if the study could continue into the future with greater resources and certainty to allow for long-term planning," Jenny explains.

The participants themselves have bonded over the experience of being part of one of the world's longest running studies - Raine study participants have their own Facebook page and are very involved in the direction of the research. The 'Teen Team' represent the larger group of participants and provide input on issues that are relevant to teenagers and their lives, along with advice for newsletters, information sheets, questionnaires and all communication with the study members.

While the arts and sciences are not a usual combination, Jenny qualified with a Bachelor of Arts Degree from the University of Cape Town (1981) and worked as a graphic designer, both in South Africa and in the UK.

After completing a Master of Business

Administration from the University of Edinburgh in 1993, Jenny managed a hospital-based project evaluating the treatment and rehabilitation of hip and other fracture patients in Scotland and Europe. She then emigrated to Western Australia and worked on a national safety and quality of surgical care project, both for UWA and the College of Surgeons. After four years, Jenny joined the Institute and the Raine Study in September 2007.

An avid traveller, Jenny has lived in the US, Scotland and South Africa, but loves calling Perth home. Drawing, art classes, cooking, yoga and spending time with friends keep Jenny relaxed enough to produce the energy required for her stressful day job.

This year Jenny has completed a Master of Clinical Epidemiology through UWA and before the year is out hopes to complete the 20-year follow-up with participants, looking at, among other things, eye health in partnership with the Lions Eye Institute.

"There is very little information available on eye health in young people and the Raine Study will collect unique and valuable information on how many 20-year-olds have eye diseases or require glasses," Jenny says.

Jenny hopes that the information produced by the Raine Study will be of lifelong value to those involved as well as the community.

"I would also like to translate the Raine information into something tangible and useful for the Raine Cohort Participants."





*“Hope sees the invisible,
feels the intangible and
achieves the impossible.”*
Unknown

At the Telethon Institute for Child Health Research, more than 500 staff, post-graduate students and visiting scholars are working to improve the health and wellbeing of children and their families.

Our priority in every area is on prevention – of disease, disability and disadvantage.

Our research is focussed around eight major streams:

- Aboriginal child health
- Asthma, allergy and respiratory disease
- Children's cancers
- Healthy development
- Infectious disease
- Social and emotional wellbeing
- The early years
- Understanding disability.

In the following pages we provide a snapshot of 20 of the major projects and studies undertaken at the Institute over the past 20 years. This is just a taste of the more than 200 studies currently underway. Full reports for all projects can be found on our website and in our scientific annual report, available at

www.childhealthresearch.org.au



20 years of research achievements

The Raine Study

Around 20 years ago, our Raine Study participants were born. Since making their entrance into the world, our researchers have been tracking the development of over 2,300 children, focusing on a range of health issues including cardiovascular health, asthma and allergies, physical activity and diet, maternal breastfeeding, language development, behaviour, back pain, non-alcoholic fatty liver disease, stress and mental health.

Over the years, the Raine Study has amassed one of the most unique and important collections of data in the world and is one of only a few studies where information was collected on the pregnant mother and subsequently the child!

Information collected over this time will allow us to provide a better understanding of how events during pregnancy, as well as childhood and adolescence, affect later health and development.

The study now has an extensive database of information on genetic, demographic, developmental, psychological, physical and many other factors around the life of children and families. We have collected blood, saliva and even baby teeth to help us develop the most comprehensive picture of the health and development of children.



Major findings from the Raine Study include:

Babies that were breastfed for longer than six months had better outcomes in terms of mental health at ages two, six and eight years of age. By age ten there was still an indication that children who had been breastfed for longer were less depressed, anxious or withdrawn.

Eating a variety of foods at breakfast is linked to better mental health in teens. A high quality breakfast, with foods from at least three different healthy food groups, was linked with better mental health in 14 year old boys and girls. For every extra food group eaten at breakfast, the associated mental health score improved. More than 800 teenagers from the Raine Study were asked what they ate for breakfast, and this was scored based on their intake of the core food groups. Only one in four teens ate a high quality breakfast, and the two most common core food groups eaten at breakfast were breads/cereals and dairy products.

Almost 30 per cent of 14-year-olds were in a group identified as being at increased risk of having heart disease, type-2 diabetes or stroke later in life. These children were identified as having some or all of the risk factors of 'metabolic syndrome' which includes being overweight, having increased waist circumference, cholesterol or glucose tests outside of normal

levels and increased blood pressure. At eight years of age 25 per cent of the cohort were at increased risk of having diabetes, obesity and heart disease later in life.

Children whose mothers were stressed during pregnancy were found to have higher risk of developing behavioural and emotional problems. An analysis of data from more than 1,700 children in the Raine Study, found that maternal smoking, low income during pregnancy, multiple 'baby blues' symptoms after birth and stress were each associated with poorer behavioural and emotional outcomes in preschool children. The findings highlight the importance of early intervention, family support and parental education, particularly for mothers who have lower levels of education, who are socially isolated or otherwise disadvantaged.

Now at around 20 to 21 years of age, the young Raine Study adults are participating in the next phase of the study looking at eye health, body composition, thinking styles and male fertility.



Language development

Studies of children with Specific Language Impairment, or SLI, date back to the 1800's and while the condition is not fully understood, important scientific discoveries are continually being made.

SLI is a disorder where children struggle with language acquisition for no apparent reason. These children do not have a hearing or intellectual problem, they have a specific problem with language.

Our LOOKING at Language (LAL) study has been following both single-born children and twins to tease out the genetic and environmental factors which may contribute to language acquisition.

The initial five-year study, funded by the prestigious USA National Institutes of Health (NIH), began in 2002 looking at language development in children two to six years of age. In 2007, the study received further five-year funding from the NIH allowing us to continue our study into the vital early years of school and to begin molecular genetic studies of language, speech and reading disorders.

The project conducts in-depth and comprehensive assessments of language development at two, four, six and nine years and literacy skills at six and nine years. These ages are benchmarked to the critical early learning years between kindergarten and Year 3.

Results for single-born children, point toward characteristics of the child as important predictors of language delay at two years and away from characteristics of the child's family environment, such as the mother's level of education, income or parenting style. We analysed the language development of 1,766 WA children from infancy to seven years of age and showed that 13 per cent of children at two years of age were late talking. Boys were three times more likely to have delayed speech development, while a child with siblings was at double the risk, as were children with a family history of late talkers.

Our results show that most children (80 per cent) with early language delay catch up by school age. However, 20 per cent of the children we studied did not. The ultimate aim of our research is to help explain why some children struggle with language development and later with reading.

Autism

Around 20 years ago, the movie *Rain Man* introduced many of us to a condition called autism. Dustin Hoffman's award-winning performance as Raymond, a man living with autism, helped to dispell a number of misconceptions about autism and improve public awareness of the condition.

Today, Autism Spectrum Disorder (ASD) is the commonly used umbrella term which refers to a range of conditions that share some common characteristics, and includes autistic disorder and Asperger's disorder. The causes of ASD are unclear, but its characteristics include difficulties with communicating, problem-solving and social skills.

Our research is exploring a range of factors associated with ASD including a link with prenatal testosterone exposure. The research team has examined the relationship between autism-like behaviours in early childhood among otherwise typically developing girls and the timing of their first period. The results found that girls with autism-like symptoms such as poor

eye contact and repetitive behaviours were older at the time of their first period. This finding suggests that there may be a common developmental mechanism underlying both autism and the later onset of puberty with one possible explanation relating to levels of testosterone in the womb. Previous findings by the Autism research team have shown a positive association between concentrations of testosterone taken from umbilical cord blood and autism-like symptoms in 10 year old children. We are now following up these findings with an NHMRC-funded study investigating pregnancies and fetuses at high risk for autism.

Our research has also found that the rapid increase in the number of children diagnosed with ASD in Western Australia reflects changes to diagnostic practices and services. While a true increase in ASD can't be ruled out, there is a very definite pattern that shows the increase coincides with changes to the way autism was diagnosed and the provision of funding for early intervention services. In 1983, 1.7 in every 10,000 children born in WA were diagnosed with ASD by age eight compared with 53.4 per 10,000 children born in 1997, representing a 16.6% increase per annum. However, from the late 1980s, there was a parent-initiated drive towards more proactive early intervention services. In 1991, a new panel was set up to determine the eligibility of children for services, and in 1994, the diagnosis of Asperger's disorder was introduced. In 1997, new funding was made available for early intervention for pre-school children.



DR ANDREW WHITEHOUSE WITH COOPER WHO HAS AUTISM

Other autism research has shown a link between children with larger head measurements in-utero and a subsequent diagnosis of ASD as toddlers. Using data from the Raine Study, the results showed that the children with the largest head circumference measurements at 18 weeks gestation were at increased risk of Autism Spectrum Disorder. The findings may provide insights into the mechanisms underlying atypical brain development in ASD. Larger head circumference may be an early indicator of children at risk of ASD so that it can be diagnosed earlier in life and the child can benefit from intensive early intervention therapies.



20 years of research achievements

Leukaemia

Twenty years ago, a child with leukaemia had a low chance of survival. Today, survival rates are more than 80%. But we still don't know why some children get leukaemia and others don't. This is a major focus of our research, from looking at patterns of the disease within populations, to comparing cancerous and normal cells, and testing new chemotherapy drugs.



Since 2003, we've been leading a national study investigating diet, chemical exposure and genetic factors in a new bid to unravel the causes of childhood acute lymphoblastic leukaemia (ALL). Clues thrown up by previous research, including the role of folate in the diet, provided some strong leads for further research into the causes of ALL, the most common childhood cancer affecting one in every 2000 children in Australia. We collected information on occupations, diet and environmental exposures as well as DNA samples from children in remission from ALL, and their families, and families without a child with ALL. We have found that taking folic acid or other vitamins during pregnancy did not change the child's risk of ALL but there was some evidence that taking folic acid before pregnancy may slightly reduce the risk of the child getting ALL. When we combined our results with those of other studies around the world, there was evidence that taking multi-vitamins during pregnancy may reduce children's risk of getting ALL but we could not determine whether a specific vitamin was responsible for this association.

Another major cause of relapse is drug resistance. We are trying to understand why some patients become resistant to chemotherapy drugs and how that happens. If these patients can be identified earlier, they can be treated in a different way, which ultimately improves their prospects of survival.

DAISY HAS RECEIVED TREATMENT FOR LEUKAEMIA

Rett syndrome

Twenty years ago, Rett syndrome was a relatively unknown disorder. And it wasn't until just over 10 years ago that mutations in the *MECP2* gene were discovered as a cause of Rett syndrome.

Rett syndrome is a rare neurological disorder that affects around one in every 10,000 girls born. There is no known cure. Until it was clinically defined, girls with Rett syndrome were often misdiagnosed as having a physical disability such as cerebral palsy or with a developmental disorder like autism.

Whilst Rett syndrome is associated with genes on the X-chromosome, our research has shown that boys can develop the disorder. The common thinking in the past had been that Rett syndrome only affected girls and that the genetic flaw would be so serious in boys that they would die before birth. Worldwide there have only been 11 previously established cases in boys who have presented early in life with a severe clinical picture of progressive neurological decline and breathing abnormalities starting soon after birth. All but two had a family history of a girl in the family with Rett syndrome. Our study has confirmed a further four cases with no family history.

Our Rett syndrome research team manages not only a national database of Rett syndrome, but also an international database, tracking the health, daily living and service provision information of girls and women with Rett syndrome.



JESSICA, WHO HAS RETT SYNDROME, AND SISTER KATIE HAVING FUN AT THE FAIR

Our researchers have also developed comprehensive guidelines for the clinical management of scoliosis, one of the most significant issues faced by girls with Rett syndrome. Scoliosis is a common orthopaedic complication of Rett syndrome with about three quarters affected by the age of 13 years.

In a research collaboration with Israel, we identified a genetic variation that influences the severity of symptoms in Rett syndrome. Clinical information and DNA samples gathered from 125 patients from the Australian Rett Syndrome Database and an Israeli cohort led to the discovery of a correlation between the severity of clinical symptoms and a common brain-derived neurotrophic factor (BDNF) polymorphism. The finding identifies a potential new target for treatment of Rett syndrome and will help in predicting the clinical progression.

Aboriginal child health

The number of Aboriginal babies born with a low birthweight is more than double that of non-Indigenous babies. A baby's birthweight is a key indicator of health status and babies with a low birthweight are at greater risk of poor health and death, require longer periods of hospitalisation after birth, and are more likely to develop significant disabilities.

But Aboriginal babies are also more likely to be born pre-term and will suffer higher rates of SIDS, infectious diseases and emotional and behavioural problems. We've been working in partnership with Aboriginal researchers and communities to better understand and address the complex factors affecting the health and wellbeing of Aboriginal children.

We conducted the WA Aboriginal Child Health Survey, the most comprehensive survey of Aboriginal children ever undertaken. Information was collected on more than 5,200 Aboriginal children, from metropolitan Perth to the most remote communities in the State. The survey provides a 'snapshot' of the health, development and wellbeing of Aboriginal children as well as family, education and community influences. The findings have been disseminated back to the communities as well as to government to help improve the current circumstances in Aboriginal child health.

More than 80% of Aboriginal children have middle ear infections (otitis media) by one year of age, a rate that is among the highest in the world. And the rate of ear drum rupture from persistent ear infection in Indigenous children is 15%, well above the World Health Organization threshold of 4%, indicating a massive public health problem. Ear infections can cause serious damage to hearing which can impact on future education, employment and quality of life. Therefore, ear health is an important focus if we are to close the gap in a range of outcomes for Aboriginal children. The cost of treating otitis media in Australia is in excess of \$100 million per year.

One area where the gap is closing is in hospitalisations for pneumonia across Western Australia, where rates have declined in Aboriginal children while rates for non-Aboriginal children have remained the same. The 2001 introduction of a free pneumococcal vaccine program for Aboriginal children has seen the disparity between Aboriginal and non-Aboriginal children decline by a third. Other factors likely to have contributed to the decline include changes in

socioeconomics such as education, income, treatment of water supplies and household crowding. Pneumonia is a serious illness and a common reason for children to be admitted to hospital. Around one-fifth of childhood deaths globally - approximately two million per year - are due to pneumonia.

We've also looked at the impact of swimming pools in remote Aboriginal communities and found significant health and social benefits for children. Children from Jigalong, Burringurrah and Mugarinya Aboriginal communities were followed since 2000 when

the pools were first opened. The study results showed a big drop in ear and skin disease when children are swimming for sustained periods of time. During the period 2001 to 2005 at Jigalong clinic, there were reductions of 41% in antibiotic prescriptions, 44% in ear disease, 51% in skin disease and 63% in respiratory disease when compared with the pre-pool rates. The reduction in skin sores was important as they are associated with rheumatic heart disease and kidney disease, while ear disease causes hearing loss which disrupts education and increases the level of disadvantage.

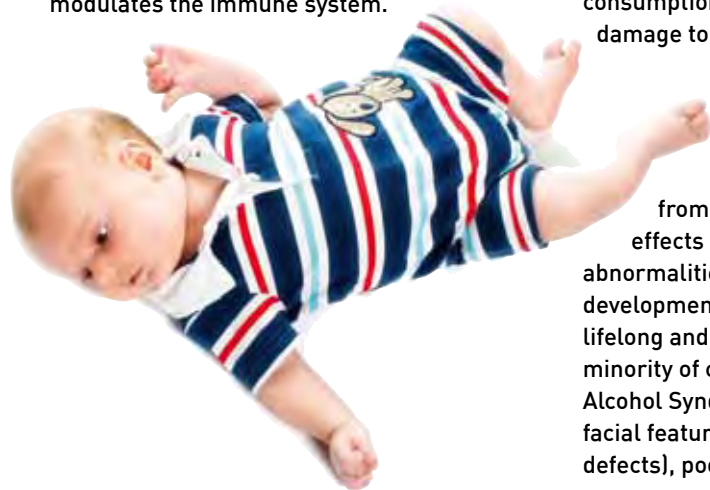


20 years of research achievements

UV and Inflammation

In one of the sunniest cities in the world, it's not surprising that the Institute is home to one of the leading groups investigating the complex relationship between UV, Vitamin D and inflammatory disease. Vitamin D deficiency has been implicated in a range of diseases including asthma, multiple sclerosis, and some cancers. Humans obtain more than 80 per cent of their vitamin D from skin exposure to the sun.

Headed by Professor Prue Hart, the group has shown UV exposure of the skin causes a systemic suppression of immune responses. This effect was seen after a single exposure of the time equivalent to about 20 minutes in noon in summer in Perth. The group has also shown that UVB light can suppress allergic airways disease in mice. This suggested that UV-induced changes in the skin could signal downstream systemic responses to allergens in respiratory tissues. In 2010, they further detailed the mechanisms by which UVB light modulates the immune system.



Respiratory researcher Dr Graeme Zosky showed that a deficiency in Vitamin D altered lung growth resulting in lower lung volume and decreased lung function in mice. This study provided the first direct mechanistic evidence showing that vitamin D deficiency alters lung development which might explain the association between obstructive lung disease and levels of Vitamin D.

If Vitamin D is to be used therapeutically, one of the major questions is how much is needed to have an effect. The Institute team is now investigating the impact of too much and too little Vitamin D in animal models, and whether there is any difference in whether it is delivered via UV or through diet

Alcohol and pregnancy

Around half of pregnancies in Australia are unplanned and our research has shown that more than 50 per cent of Australian women drink alcohol during their pregnancy. Alcohol consumption during pregnancy can result in damage to the unborn baby.

Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term used to describe a range of potential effects resulting from fetal alcohol exposure. These effects include physical defects, facial abnormalities and problems with growth, development and learning. The effects are lifelong and may not be seen at birth. A minority of children with FASD have Fetal Alcohol Syndrome – identified by abnormal facial features (with or without other birth defects), poor growth and abnormalities of

the brain or neurological problems. Many more children with a FASD will look normal but will have learning or behavioural problems.

We have developed a range of resources for health professionals to support their knowledge and advice to pregnant women and women of child-bearing age about alcohol use during pregnancy. These resources have been distributed around Australia.

Our research has found evidence that the amount and timing of alcohol consumption in pregnancy affects child behaviour in different ways. Mothers who reported heavy drinking (more than a bottle of wine per week) in the first trimester of pregnancy were nearly three times as likely to report that their child suffered with anxiety and/or depression or somatic complaints. Those who drank moderately (three to four standard drinks per occasion - about two normal glasses of wine - and no more than a bottle of wine drunk over a week) during that first trimester were twice as likely to report those types of behavioural issues for their child.

We have investigated the relationship between prenatal exposure to alcohol and the effects on fetal growth and preterm birth. Pregnant women who drink more than one to two standard drinks per occasion and more than six standard drinks per week increase their risk of having a premature baby, even if they stop drinking before the second trimester. The risk of preterm birth is highest for pregnant women who drink heavily or at binge levels - drinking more than seven standard drinks per week, or more than five drinks on any one occasion.

We've also shown that women who drink heavily in the first trimester of pregnancy are four times more likely to have a child with certain types of birth defects.

We are currently working on developing a screening and diagnostic instrument for FASD which would facilitate health professional training, enable planning of service development and prevention programs, ensure that data collected were comparable throughout Australia and improve the quality of life for those with FASD and their families. No such tool currently exists nor do national guidelines for screening or diagnosis of FASD or a nationally accepted diagnostic or screening instrument.

Nutrition

Good nutrition starts early, with breastmilk proving to be the best food for babies. Breast milk is packed full of nutrients that help with the rapid brain development that occurs in the early years. But good nutrition is important at all ages and stages of life.

Our research has shown an association between ADHD and a 'Western-style' diet following the analysis of the dietary patterns of 1,800 adolescents from the Raine Study. A diet high in the Western pattern of foods was associated with more than double the risk of having an ADHD diagnosis compared with a diet low in the Western pattern. A "Western" pattern is a diet with a trend towards takeaway foods, confectionary, processed, fried and refined foods. These diets tend to be higher in total fat, saturated fat, refined sugar and sodium. A "healthy" pattern is a diet high

in fresh fruit and vegetables, whole grains and fish. It tends to be higher in omega-3 fatty acids, folate and fibre. More research is needed to determine the nature of the relationship - does a poor diet lead to ADHD or does ADHD lead to poor dietary choices and cravings? ADHD is the most commonly diagnosed childhood mental health disorder and has a prevalence of approximately 5%. ADHD is known to be more common in boys.

These findings support our previous research which showed a link between Western-style diets and more mental health problems in teenagers. This analysis found that higher levels of behaviour and emotional problems were associated with a more Western-style way of eating, namely a diet high in takeaway foods, red meat, confectionary, soft drinks, white bread and unrefined cereals. These

problems were less among teens with a more healthier style of eating, specifically those who ate more fruit and vegetables.



Children who are breastfed for longer than six months have a lower risk of mental health problems as they enter their teen years. The research team analysed data from more than 2,000 children involved in Western Australia's Raine Study. Just over half were breastfed for six months or longer, 38 per cent were breastfed for less than six months, eleven percent were not breastfed. The participants underwent a mental health assessment when they were two, five, eight, 10, and 14 years old. At each of the assessments, the team found a link between breastfeeding duration and behaviour. For each additional month of breastfeeding, the behaviour score improved. This remained valid after adjustment for socio-economic, social and other factors impacting on parenting.

Eating a variety of foods at breakfast can boost mental health in teenagers. Our research has shown that a high quality breakfast, with foods from at least three different healthy food groups, was linked with better mental health in 14 year old boys and girls. Just one in four teens ate a high quality breakfast, and the two most common core food groups eaten at breakfast were breads/cereals and dairy products. A small proportion of teens did not eat any items from the healthy core food groups for breakfast over the three day study period. Improving the quality of breakfast is as simple as adding a spoonful of sunflower seeds to cereal, topping toast with a sliced banana or sprinkling diced dried or canned fruit over cereal.

Our Nutrition and Genome Health in Children Study is looking at the key nutritional and

genetic factors that may be associated with DNA damage in children. We know that, in adults, poor DNA health may be linked to serious diseases like cancer and previous studies have shown that adults who have poor DNA health often lack vital micronutrients. Four hundred and fifty West Australian children aged three, six or nine years are taking part in our study. The study assesses the child's diet and macro- and micro-nutrient intake and a blood sample is taken to assess micronutrient levels and specific biomarkers of DNA damage. Saliva samples from the child are used to measure cortisol and cotinine levels, as indicators of psychological stress and exposure to environmental tobacco smoke. Parents are provided with feedback on their child's diet, and dietary advice is provided by a dietitian if needed. Recruitment will continue into 2011.

Meningitis

Around 20 years ago, haemophilus influenza type B (Hib) was the most common cause of bacterial meningitis in children. Following the introduction of a Hib vaccine in the early 1990s, there has been a reduction in cases of more than 90 per cent so that today, only around 15 cases are recorded in Australia each year.

Similar success has occurred in recent years with meningococcal C and streptococcus pneumoniae (which causes pneumococcal meningitis), where vaccines have significantly reduced the number of cases across the country.

Bacterial meningitis still remains a threat and

THE LANGOULANT FAMILY ARE ADVOCATES FOR MENINGITIS RESEARCH AND VACCINES AFTER ASHLEIGH (SECOND FROM RIGHT) WAS LEFT PERMANENTLY DISABLED AFTER CONTRACTING PNEUMOCOCCAL AS AN INFANT



meningococcal B is the biggest killer today accounting for the large majority of cases. But a vaccine for the B strain still remains beyond our reach. We have been involved in ongoing trials of a meningococcal B vaccine in young adults, toddlers and adolescents.

Our Meningitis Centre continues to provide the community and health professionals with the latest information on the signs and symptoms of meningitis as early detection of the disease gives the best chance of a positive recovery. The Meningitis Centre has also led the formation of the international Confederation of Meningitis Organisations whose members support the fight against meningitis by emphasising the global burden of the disease and supporting the establishment of new meningitis organisations and patient groups in countries around the world.



EMILY, WHO HAS RECEIVED TREATMENT FOR A BRAIN TUMOUR, WITH HER BROTHER SAMUEL

Brain tumours

In the last 20 years, survival rates for children with brain tumours have remained at around 50 to 70 per cent. Brain tumours are the second most common cancer in children and children with brain tumours face the possibility of brain damage and disability associated with surgery, radiotherapy and chemotherapy.

We've been leading a national case-control study into the causes of childhood brain tumours with a focus on genetic, dietary and environmental risk factors. The study has been recruiting case and control families since 2006 and recruitment and data collection will finish in June 2011. We collect information through exposure and food frequency questionnaires, telephone interviews regarding occupational and other exposures and DNA samples from either blood or saliva.

In the laboratory, we are trying to develop a better understanding of the underlying genetic abnormalities that lead to the development of a brain tumour cell from a normal brain cell. We grow our brain tumour cells in the laboratory to use for this research as well as test new chemotherapy drugs to determine sensitivity and resistance. The aim is to develop more effective and less toxic therapies for children with brain tumours.

Developmental Pathways

In 1990, the idea of linking data from a range of government departments was just a dream. Today it is a reality.

There are a range of datasets the Health Department routinely link, such as births, deaths, midwives and emergency. Researchers at the Institute can use the de-identified data to look at patterns and trends of disease and health within the WA population.

A new development in recent years has been the linking of this database with information held within government departments. This linking of information allows us to view the bigger picture and determine whether changes at the child, family and community level increase or reduce vulnerability to poor outcomes in health, school, maltreatment, and juvenile offending. We can then use this knowledge to identify areas of prevention and intervention across the different government sectors, as well as evaluate existing government initiatives and determine their impact on these outcomes.

We've been able to look at the impact on fertility rates of the introduction of the Federal government's "Baby Bonus" payments. While fertility rates went up across the board between 2004 and 2006, the most significant increases were among women aged 20 to 29 years, and primarily living in areas of highest socioeconomic advantage, characterised by a higher proportion of individuals with higher educational qualifications or in highly skilled occupations. The findings contradict popular perception that the payments would increase pregnancies in teenagers and disadvantaged groups.

The first study in Australia to link de-identified hospital and child protection records found that most

cases of child abuse and neglect that are identified in hospital are later substantiated by Child Protection Services. Some 90 per cent of children admitted to hospital where concerns of maltreatment were identified had contact with the Department of Child Protection (DCP). More than 80 per cent of these children were notified to the DCP with a specific allegation and 68 per cent had substantiated allegations. Specific injuries and conditions were associated with children who had greater contact with the DCP, including retinal haemorrhage, rib fractures, multiple injuries and malnourishment.

By linking the de-identified midwife records and standardised educational results (WALNA) results from more than 55,000 children, our research showed a link between healthy growth in the womb and improved numeracy and literacy skills in early primary school. Healthy fetal growth not only helps to improve a child's performance at school, but it may contribute towards closing the achievement gap for children from disadvantaged socioeconomic backgrounds. The findings reinforce the need for better integration of health and education policy and services as well as improving the health of pregnant women, particularly in disadvantaged areas, and providing information about drugs like alcohol and tobacco which restrict a baby's growth in the womb.

The linking of health and welfare records has allowed us to show that the number of newborns suffering serious drug withdrawal

symptoms is more than 40 times higher than in 1980 and that these babies were at greater risk of neglect and of being taken into care.

Vaccine trials

Who would have thought that cancer could be prevented with a vaccine. That's exactly what's happened in the past few years when Queensland's Professor Ian Frazer developed a vaccine against Human Papilloma Virus (or HPV) which causes the majority of cases of cervical cancer in women. Through prevention of this infectious disease, a deadly cancer can be prevented. Our Vaccine Trials Group was part of international trials of HPV vaccines in young women, older women and adolescents. Perth women joined others around the world to test the vaccine against the common types of HPV which not causes cervical cancer and other genital cancers.

We've also been part of other major vaccine studies covering a range of infectious diseases including dengue fever, influenza and golden staph. Most recently, we've started a trial of a vaccine against Ross River Virus.

More than half of the world's population live in areas of high risk of infection from dengue fever. This mosquito-borne virus has made news headlines in recent years with outbreaks in South East Asia and even in Australia's far north. No vaccine currently exists, however, we've been part of world-first trials of a vaccine that could provide protection against this deadly disease.



HAMISH, WITH MUM PATRICIA AND DR PETER RICHMOND, IS PART OF OUR RSV NASAL VACCINE STUDY



TRACEY PULLEN'S DAUGHTERS HAVE BOTH BEEN INVOLVED IN OUR VACCINE RESEARCH - ASHLIN IN THE COMBINED MENINGITIS STUDY AND KIARA IN THE SWINE FLU TRIAL

Golden staph, or staphylococcus aureus, is a leading cause of post-operative infections. Adding to the difficult treatment of the disease, is the rapid rise of antibiotic resistant strains of the bacteria. National trials of a vaccine for golden staph began in 2010.

While most people consider influenza to be a mild infection, new strains have emerged in recent years which have killed many people. In particular, swine flu caused worldwide alarm resulting in a vaccine being developed to deal with the pandemic. The illness is mild in most cases but can cause severe symptoms in some groups like young children, pregnant women and people with certain medical conditions. Our Vaccine Trials Group was part of an international trial of the swine flu vaccine.

Respiratory syncytial virus (RSV) and parainfluenza 3 (PIV) cause bronchiolitis (inflammation of the small airways in the lungs) and pneumonia in babies and young children. RSV and PIV3 are a leading cause of hospitalisation of young children in Australia during the winter months. Some infants and



LACHLAN AND JAMES WERE PART OF OUR MENINGOCOCCAL B VACCINE STUDY

children suffering RSV and PIV3 may require intensive care and may be hospitalised for many weeks. With no vaccine currently available to prevent RSV and PIV, we were part of a trial for a new vaccine that is given via the nostrils, making it needle-free.

20 years of research achievements

Cerebral palsy

Cerebral palsy rates have dropped in recent years but it still remains the most common physical disability in Australian children. For every child under the age of 18 years who is diagnosed with cancer, there are three with cerebral palsy.

Cerebral palsy (CP) is a chronic neurological condition affecting movement and posture, ranging in severity from barely noticeable to severely disabling. For most, the cause is unknown. CP results in life-long disability, and as there is no cure, prevention and effective management are top priorities.

The Institute's cerebral palsy register was the first in Australia and one of the longest-standing CP registers in the world. Analysis of this information has changed the thinking on what causes CP. Contrary to traditional thought, only a small minority of cases are caused by trauma at birth with the majority of cases linked to problems much earlier in the pregnancy. Information from the WA register now forms part of the nationwide Australian CP Register which monitors the occurrence of CP and allows research to investigate causes and evaluate treatment strategies.

The cerebral palsies include a wide range of motor impairments across the spectrum of severities, and research depends on consistency in classifying CP subgroups. International attention has been focused on the challenge of standardising the recording of motor impairments for several decades, and WA has long been at the forefront in developing a reliable system of



FIONA STANLEY WITH DAVID NASO, WHO HAS CEREBRAL PALSY, BACK IN 1999. DAVID IS NOW A HAPPY, HEALTHY YOUNG MAN.

describing the clinical features of CP. We are continuing to introduce and trial an innovative diagrammatic limb-by-limb CP Description Form which incorporates the Australian Spasticity Assessment Scale (ASAS). A booklet which defines every aspect of the form is currently being compiled along with a training and reference video demonstrating the use of the ASAS as well as the features of different forms of CP.

Cystic fibrosis

In the last 20 years, due to advancements in treatments, the life expectancy for those with cystic fibrosis has increased significantly from the late teens to around 40 years of age.

Cystic fibrosis (CF) is the most common genetic disease in Australia with around one in every 25 people carrying the CF gene. The condition affects a number of organs in the

body (especially the lungs and pancreas) by clogging them with thick, sticky mucus. In the lungs, this mucus clogs the tiny airways and traps bacteria. Repeated infections and blockages can cause irreversible lung damage and death. In the pancreas, mucus can prevent the release of enzymes needed for the digestion of food, resulting in people with CF having problems with nutrition.

Our Early Disease Surveillance program began in 1996 in partnership with Princess Margaret Hospital for Children to initially investigate the role of inflammation in the lungs of children with cystic fibrosis. Now known as AREST CF, the program has grown into a comprehensive assessment of early disease in cystic fibrosis, expanding to include Melbourne's Royal Children's Hospital in 2005.

Newborn babies diagnosed with cystic fibrosis have a comprehensive assessment at diagnosis and are followed annually close to the child's birthday, until the age of six. We collect a range of information including measurements of inflammation and infection in the lung, lung function in infants and preschoolers, and chest scans that show us detailed lung structure.

This information has shown us that inflammation begins early in life and may be present even though we can't detect an infection. Babies can have lung damage and infections even though they have no apparent respiratory symptoms. Lung damage is also more common than first thought in young children with 67% of children having gas trapping in the first year of life and 40% of

children will have bronchiectasis by the age of four.

The measurements we will make in the first few years of life will allow us to better understand which factors predict lung damage by school-age and which tests best reflect the progress of lung disease early in life. This information will greatly facilitate intervention studies and aid disease monitoring by providing valid clinical endpoints that can be used to determine change in clinical status.

Drug Discovery

Translating our research into action is a key aim of the Institute. Commercialisation is one of the most effective ways to ensure that discoveries are delivered to the bedside.

Having incubated the early development on a novel drug discovery platform, the Institute's first spin out company Phylogica was publicly listed on the Australian Stock Exchange in 2005.

External investment has allowed the company to move rapidly ahead with its technology development while the Institute remains a substantial shareholder.

Phylogica's current peptide libraries are the most structurally diverse biologic drug discovery libraries available with billions of compounds from thousands of distinct structural families. This vast diversity of molecular shapes means more hits can be obtained against a wider variety of disease



PHYLOGICA'S UNIQUE PHYLOMER® PEPTIDE LIBRARIES UNDERPIN THEIR RESEARCH PROGRAM

Phylogica and Cambridge University has been created. Called Phenomica, it is focussed on disease target discovery and validation using Phylomer peptides.

The Drug Discovery Technology Unit is now in discussion with Roche to expand their collaboration to include Phylomer peptides for blood-brain delivery. These peptides have the potential to target neurological disease processes in novel ways.

Asthma

More than two million Australians suffer with asthma. Through their work over the past 20 years, our internationally renowned asthma researchers, headed by Professor Pat Holt, have transformed thinking about the origins and development of this complex disease.

The core theme of the research stems from the group's earlier findings that risk for development of allergy, respiratory infections and asthma is determined primarily by factors which control the maturing of the immune system during early childhood. In particular, they showed that a variety of the immune system mechanisms are suppressed in the womb in order to protect the placenta. However these mechanisms are vital for protection against both infections and allergy during early childhood, and the speed of their development during the preschool years is retarded in children from families with a history of allergic diseases.

Allergic sensitisation most commonly occurs in early childhood when the immune system

is still maturing. The Institute is leading an international trial to see if it is possible to speed up the education of the immune system of high risk children to ignore common allergens, before they become sensitised.

Through another study which tracked asthma development in a group of 2,500 children over 10 years, the research team found that the most crucial factor in the development of childhood asthma is airway inflammation caused by virus infections, acting in combination with allergy.

The team's current research focuses on the mechanisms that determine susceptibility versus resistance to respiratory infections and allergic diseases during childhood, and in particular how these mechanisms interact to drive asthma development.

The long-term goal is to use this information to guide the development and testing of preventative treatments for asthma in early childhood, before the disease consolidates into its persistent form.

In addition, the researchers are investigating the mechanisms underlying acute severe asthma attacks in children with established asthma, in particular how viral

and bacterial infections harness allergic responses to aid them in escaping attack by the body's antimicrobial defences.



targets.

Phylogica has established contractual relationships with multinational pharmaceutical and biotechnology companies including Roche, Medimmune and Pfizer.

In August 2010 a discovery contract was signed between Phylogica and Medimmune, the biologics arm of AstraZeneca, to discover new antimicrobials against the superbug *Pseudomonas aeruginosa*, an important cause of hospital acquired multi-resistant infections.

In December 2010, Phylogica entered a collaboration with Pfizer to discover novel peptide vaccines derived from Phylogica's Phylomer technology; and in October 2010, Phylogica announced the completion of the first stage of its collaboration with Roche, focused on the discovery of novel cell-penetrating peptides.

Phylogica's strategic collaboration with Cambridge University to use the company's exclusive Phylomer peptide libraries to discover new disease targets was so successful that a joint spin-off between

20 years of research achievements

Allergy

You might think that if you're allergic to cats, then there's a single culprit responsible for your discomfort. In fact, there are a range of cat allergens that could be triggering your attack. You might be sensitive to one or all of them!

Why does that matter? It's important to identify and characterise the specific allergen if desensitisation treatments are to be effective.

The Institute's allergy researchers can claim credit for discovering two of the major cat allergens and have also identified the important dust mite allergens. Together these cat and mite allergens are the major causes of allergy and asthma in Australia. The researchers have shown that while the final outcome from the allergens may be the same, the sensitisation process for cat allergy is quite different to that of the house dust mite.

Investigations of the role of infection in allergic disease conducted elsewhere have focused on viruses and atypical bacteria. The Institute's studies of the most common bacteria found in the respiratory tract of children, *Haemophilus influenzae* and *Streptococcus pneumoniae*, show that more attention should be paid to these ever-present organisms. Children who develop house dust mite allergy have a defect in the development of the protective antibodies to both bacteria that precedes the development of allergy. In an unanticipated discovery, it was shown that children who develop asthma

produce less antibodies to these bacteria. This provides a new avenue to investigate the underlying differences in the immune system of children who become allergic and asthmatic.

Birth defects

It was just over 20 years ago, when research led by Professor Carol Bower showed that maternal dietary folate intake could reduce neural tube defects such as spina bifida. Today, all wheat flour for bread-making in Australia is fortified with folate following the introduction of mandatory fortification on September 13, 2009. The addition of this B group vitamin to a staple food product will allow women to receive some folate in the crucial three months before conception and the first three months of the pregnancy. Around 50% of pregnancies are unplanned meaning it isn't always possible for mothers to take folate supplements to help prevent birth defects. The folate story highlights the way many years of research can be translated into direct benefits for the community.

The second most common birth defect affecting West Australian children is hypospadias. Around one in every 130 boys in WA is born with the condition which affects the penis, causing problems urinating and fertility issues as adults. It can be corrected with surgery. We are trying to determine whether any genes are involved in the development of hypospadias by looking at patterns, or variations, in specific genes

IN 2007, INSTITUTE PROFESSORS CAROL BOWER AND FIONA STANLEY (ALONG WITH LYALL THURSTON) RECEIVED NATIONAL LEADERSHIP AWARDS FROM THE FLOUR FORTIFICATION INITIATIVE



to see which genes are important. We are collecting DNA samples from boys having corrective surgery, and their parents, as well as families of boys without the defect. Other research has shown a possible association between parental occupations and hypospadias. Mothers exposed to heavy metals at work (such as those working in the dental industry, defence forces, laboratories and in petrol stations) were two and a half times more likely to have a son diagnosed with hypospadias. Women exposed to phthalates (chemicals used in products like plastics, detergents, deodorants, fragrances nail polish and hairspray) were also at higher risk. The results are preliminary and require further investigation.

About 3% of children in Australia are born as a result of assisted reproductive technology (ART) such as intracytoplasmic sperm injection (ICSI) and in-vitro fertilisation (IVF). We have shown that children conceived through ICSI and IVF are more than twice as likely as naturally conceived babies to be diagnosed with major birth defects in their first year of life (9% rate of birth defects for ICSI and IVF babies and 4.2% for naturally conceived babies). We've also found that singleton twins born as a result of ART

are more likely to be admitted to neonatal intensive care and to be hospitalised in their first three years of life than spontaneously conceived twins. Babies conceived following ART treatment also had a greater risk of preterm birth, low birthweight and death compared with spontaneously conceived infants. While there are increased risks, it must also be remembered that most babies are born healthy with no significant problems.

Environmental health

Children are at particular risk of environmental hazards due to their smaller body size, immature organ systems and increased breathing rate relative to body size. Children also have different activity patterns and are closer to the ground compared to adults, which means they are likely to have different exposures.

The Institute is committed to conducting high quality research aimed at understanding the mechanisms underlying the development of

“Hope is the companion of power, and mother of success; for who so hopes strongly has within him the gift of miracles.”

Samuel Smiles

diseases of environmental origin in children, with special emphasis on respiratory disease such as respiratory infections, asthma and allergies.

Part of this commitment has included building research capacity in developing nations, such as a training workshop in Nanning in China to teach environmental scientists and medical doctors how to appropriately measure lung function and carry out neurodevelopmental assessments.

The Institute also has a commitment to community environmental health research. For example, in discussion with the WA Department of Health, as well as community and industry representatives, the Institute has coordinated the Kwinana Children's

Respiratory Health Study in response to community concern.

Information on respiratory history and environmental data has been collected for almost 600 children. The analysis will include comparing the results to similar studies around Australia, to see if variations in lung function, air quality and other risk factors related to respiratory health can be identified.

The Institute's environmental researchers are also assessing the impact of prenatal environmental exposures on lung function in infancy. This includes indoor and outdoor air pollution, as well as tobacco smoke.

Other exposures being investigated in relation to respiratory health include arsenic, mining dust and diesel exhaust.



Senior staff



JENEFER BLACKWELL BSc(Hons) PhD FMedSci HonDSc (U. Khartoum) DSc (Cantab)

Genetics and Health Laboratory

Originally from Perth, Professor Blackwell has held positions at the London School of Hygiene and Tropical Medicine (1975-1991) and the University of Cambridge (1991-2007) in the UK. She established, and was the Founding Director of, the Cambridge Institute for Medical Research. In 2007, she joined the Telethon Institute and established the Genetics and Health Laboratory. Professor Blackwell has a long-standing interest in complex disease genetics. Current projects include genome-wide studies of visceral leishmaniasis from India, Brazil and Sudan, otitis media and metabolic diseases in Indigenous Australians, and type 2 diabetes as a risk factor for sepsis in Thailand. Professor Blackwell holds a Winthrop Professorship at The University of Western Australia, and is currently Interim Director for the University's Centre for Genetic Epidemiology and Biostatistics. She is also an Affiliated Principal Investigator at the Cambridge Institute for Medical Research and Honorary Senior Scientist in the Department of Medicine, University of Cambridge School of Clinical Medicine, UK.



CAROL BOWER MBBS MSc PhD FAFPHM DLSHTM FPHAA

Epidemiology

As one of the Institute's founding senior researchers, Professor Bower has been a driving force behind its epidemiological research program, in particular in birth defects. In the 1980's and 1990's, Professor Bower was part of the international team that showed the link between folate intake during pregnancy and the reduction in neural tube defects and in 2007 was awarded a Leadership Award from the Flour Fortification Initiative for her folate advocacy role. In addition to folate, Professor Bower is also leading research projects into other factors that can influence health outcomes of newborn babies including alcohol consumption, prescription medication and *in-vitro* fertility treatment.



MOIRA CLAY BSc(Hons) PhD

Director of Academic and Research Services

Professor Clay's background is in biomedical research on high density lipoproteins – the 'good cholesterol'. Since 2000, she has worked in senior research management roles at the National Heart Foundation of Australia, the Murdoch Childrens Research Institute and Children's Cancer Institute Australia based in both Melbourne and Sydney. Professor Clay was the President of the Australian Society for Medical Research in 2003, the peak professional body representing health and medical researcher's in Australia. Recently, she has been elected to the National Executive of the Australasian Research Management Society. Professor Clay took up her role at the Telethon Institute in August 2010 after relocating to Perth from Sydney and is an Adjunct Professor at The University of Western Australia. She is responsible for fostering and enhancing the Institute's research capacity with a major focus on development and mentoring of future research leaders and managing critical stakeholder relationships.



NICK DE KLERK BSc MSc PhD

Bioinformatics

An Adjunct Professor at The University of Western Australia, Professor de Klerk was originally trained in the United Kingdom. He was Head of the Occupational Respiratory Epidemiology Group in the Department of Public Health at UWA before joining the Institute in 2000. Professor de Klerk's knowledge and expertise in statistically analysing scientific data sees him collaborating with the majority of the research groups within the Institute. In 2010, he co-authored 20 research papers with Institute staff and has continued to oversee the success of the Developmental Pathways in WA Children Project which is looking at the pathways to health and wellbeing, education and juvenile delinquency outcomes among WA children and youth.

GRAHAM HALL BAppSci, PhD, CRFS, FANZSRS

Paediatric Respiratory Physiology

Associate Professor Hall completed his PhD at the Telethon Institute for Child Health Research before working in the University Children's Hospitals in Zurich and Bern in Switzerland. In 2003, he was appointed as Senior Respiratory Scientist of the Respiratory Laboratory at Princess Margaret Hospital in Perth before joining the Telethon Institute in mid 2010 as the Head of the Paediatric Respiratory Physiology. A/Prof Hall's research interests include the lung growth and development in early life and the impact of respiratory disease on lung health. Current research includes investigating markers of early lung damage in infants and young children with cystic fibrosis as part of the AREST CF group and studies assessing the long term impacts of preterm birth. A/Prof Hall holds adjunct titles with the University of Western Australia and Curtin University.

PRUE HART BSc(Hons) MSc PhD

Inflammation Laboratory

Professor Hart joined the Institute in 2003, following positions at The University of Queensland, Rigshospitalet in Copenhagen, The University of Melbourne and Flinders University. At the Institute, Professor Hart's team focuses on the effects of ultraviolet radiation and vitamin D3 on the immune system with their ground-breaking work showing that UV irradiation of mice, with doses equivalent to a short period in the midday sun, can be protective against developing asthmatic symptoms. The research is now looking at teasing out the protective mechanisms with the goal of one day being able to use UV light in safe doses or vitamin D3 to prevent and/or treat asthma. Professor Hart also has a research programme examining the mechanisms by which interleukin 4 may limit the activity of the immune cells driving chronic inflammation. Professor Hart is a NHMRC Principal Research Fellow and an Adjunct Professor at UWA.

PAT HOLT PhD FRCPATH(UK) DSc FAA

Deputy Director, Cell Biology

Professor Holt established the Division of Cell Biology at the Institute's inception in 1990 with his research group's main focus being on the functioning of the paediatric immune system in relation to asthma and allergy. He has established collaborations both locally and internationally and is recognised as a world leader in this field. In 1999, Professor Holt was awarded the King Faisal Foundation International Prize for Medicine, one of the world's pre-eminent scientific awards, in recognition of his significant contribution to the improved understanding of asthmatic disease, and a Scientific Achievement Award from the World Allergy Organization in 2003, and was elected to Fellowship of the Australian Academy of Science in 2001. He is a Senior Principal Research Fellow of the NHMRC and Professor at The University of Western Australia.

URSULA KEES Dip Phil II PhD

Leukaemia and Cancer Research

Professor Kees was one of the founding research leaders of the Institute, establishing the Division of Leukaemia and Cancer Research in 1990. Prior to this, the Swiss-born scientist was recruited from the German Cancer Research Centre in 1984 to head up the Children's Leukaemia & Cancer Research Laboratory at Princess Margaret Hospital. Focusing on molecular genetic changes that lead to cancers in children, Professor Kees' team has developed unique approaches to diagnose different cancers in collaborative studies with hospital patients and oncologists and a number of overseas groups. Professor Kees holds an Adjunct Professorship at The University of Western Australia.



Senior staff



DEBORAH LEHMANN MBBS, MSc
Infectious Disease Epidemiology

Professor Lehmann joined the Institute in 1998 following 18 years at the Papua New Guinea Institute of Medical Research leading studies into pneumonia. Today, she maintains strong ties with Papua New Guinea, in particular through a vaccine trial looking at the safety and immunogenicity of pneumococcal vaccines in newborn infants in Papua New Guinea. Professor Lehmann is also leading research on respiratory infections in Australian children, including investigation of causal pathways to lower respiratory infections, monitoring of pneumococcal carriage, and evaluating an otitis media prevention program for Aboriginal children. In 2007, Professor Lehmann received a WA Public Health Association of Australia Award for her outstanding contribution to public health. She is a Clinical Associate Professor at The University of Western Australia and an Adjunct Professor at Curtin University.



BRUCE MCHARRIE BCom FCA
Director of Finance and Business Development

Mr McHarrie oversees the financial and executive management of the Institute, including the development of public relations and fundraising activities. He is also responsible for the commercialisation opportunities arising from the Institute's research program and holds the position of Non-Executive Director of Phylogica Limited and Advanced Diagnostic Systems Pty Ltd, being two Institute spin-out companies. He joined the Institute in 1999 after returning from the UK where he was with Rothschild Asset Management as an Assistant Director in the Bioscience Unit, which focused on investing in early stage biotechnology and healthcare companies. Prior to joining Rothschilds, Mr McHarrie was with Coopers & Lybrand in London servicing a client base primarily in the financial services sector. He holds a Bachelor of Commerce Degree from the University of Western Australia and qualified as a Chartered Accountant with Deloitte.



GLENN PEARSON B Art (Education)
Kulunga Research Network

Mr Pearson has been with the Institute's Kulunga Research Network for five years having worked within the Australian and State Governments in the areas of health, education and child protection. He brings with him 15 years experience in strategic policy, program development and service delivery. He is currently completing a PhD through the School of Paediatrics and Child Health at The University of Western Australia. His project is one of six research projects undertaken as part of the Developmental Pathways for WA Children Project and will explore the delivery of community health, education and child protection services by the WA State Government to Aboriginal people in the Perth Metropolitan and Geraldton regions. His work within the Institute has included a number of Kulunga's key research projects such as the WA Aboriginal Child Health Survey.



WAYNE THOMAS BSc (Hons) PhD
Molecular Biotechnology

Professor Thomas, who currently holds a Senior Principal Research Fellowship from the NHMRC, joined the Institute at its inception in 1990 and established the Division of Molecular Biotechnology. Research in Professor Thomas' laboratory is focussed upon the mechanisms of inflammation and allergy and the development of methods to treat or prevent diseases resulting from these processes. Professor Thomas has a particular interest in using molecular biology techniques to identify and characterise allergens from house dust mites and cats. These are then used in further laboratory research into allergy and may one day be useful in desensitisation therapy for allergic individuals.

SASH TOMSON BCom CPA FAIM
Chief Administrative Officer

Mr Sash Tomson joined the Institute in 2009. He was previously an Executive Director with the Queensland Department of Education and Training and held senior executive positions with the Departments of Communities and Emergency Services, Queensland. In January 2004 he received an Australia Day Medal for his work with the Queensland Ambulance Service, and later that year was admitted as a Fellow of the Australian Institute of Management. Prior to his role in the public sector he was Senior Manager, Assurance and Advisory Services with KPMG, Brisbane. His career has involved providing corporate and strategic services to clients within the public and private sectors. Sash has responsibilities for corporate, strategic and company administrative support.

PAUL WATT BSc (Hons) D.Phil
Drug Discovery Technology Unit

An Adjunct Professor at The University of Western Australia, Professor Watt obtained his PhD at Oxford University before completing post-doctoral training at Oxford and Harvard. Upon returning to WA, he joined the Institute's Division of Leukaemia and Cancer Research and now heads the Drug Discovery Technology Unit. In 2001, Professor Watt was a driving force in establishing the Institute's spin-off company, Phylogica Ltd (www.phylogica.com), where he is now the CEO. Professor Watt has led his research team in the development of Phylomer® peptides, molecules designed to target proteins and block their interactions. The Phylomer® libraries he has developed constitute the most structurally diverse set of peptides available, resulting in the highest quality and quantity of peptide hits. Phylogica has recently entered into discovery alliances with Europe's largest pharmaceutical company Roche, with MedImmune, the Biologics arm of AstraZeneca and with Pfizer around access to Phylomer® technology.

STEPHEN ZUBRICK MSc AM PhD
Population Sciences

A Winthrop Professor at the University of Western Australia, Professor Zubrick completed his doctoral and postdoctoral work in psychology at The University of Michigan and worked in mental health settings for many years before starting at the Institute in 1991. His research interests include the social determinants of health and mental health in children, systematic studies of youth suicide, and large scale psychosocial survey work in non-Indigenous and Indigenous populations. Professor Zubrick is considered a leading Australian authority in the epidemiology of child and adolescent mental health and in public health approaches to promotion and prevention of emotional and behavioural problems in children. He chairs the Consortium Advisory Group of the Longitudinal Study of Australian Children and featured in the ABC TV's 'Life' documentary series.





*“Learn from yesterday,
live for today,
hope for tomorrow.
The important thing is
to not stop questioning.”*

Albert Einstein

Consumer and Community Participation

The consumer and community engagement program at the Institute has continued to expand and develop during 2010. The level of success and achievement from this program, which is jointly operated with The University of Western Australia's School of Population Health, is a testament to the long-term commitment and support from a wide range of researchers, consumers and community members.

NHMRC Program Grant and ARC Developmental Pathways Project

The Consumer and Community Advisory Council, working in collaboration with Chief Investigators, developed a set of minimum standards for consumer and community participation activities in all projects in the two grants which included:

- A series of workshops on writing plain language summaries which culminated with seven researchers presenting their summaries to a 'master class' judging panel which provided feedback. The best plain language summary was delivered by statistician Matt Cooper.
- Two training workshops for researchers on implementing consumer and community participation. The workshops were attended by 40 participants.
- Development of resources to support researchers undertaking participation activities in their research project. This will include web-based resources, use

of social networking and templates for planning and reporting participation activities.

This collaborative work with the Consumer and Community Advisory Council is considered to be setting a benchmark for future participation activities throughout all research areas at the Institute.

Community Conversations

The 'Community Conversations' were established to inform consumer and community members about current research projects and to seek input in identifying any perceived gaps and priorities for future research.

The Infectious Diseases conversation was held at the Institute in September and attended by 23 people from the community. Deborah Lehmann gave an overview of infectious diseases research, followed by a workshop session where people answered four questions:

- What are the gaps / priorities for future research projects on infectious diseases?
- How can we feedback information and results about infectious disease research to the community?
- What are your priorities for future research on vaccines?
- How can we increase community input / involvement in infectious disease research at the Institute?

Whilst vaccine related topics were the most significant topic raised, there were many other important issues discussed such as ideas for disseminating information to the wider community about infectious diseases. The evaluation of the community conversation was very positive, with 17 people saying they would be interested in attending similar activities.

Two Fetal Alcohol Spectrum Disorders community conversations will be held in Perth and Cairns to seek feedback from women about how they would like health professionals to discuss alcohol consumption during pregnancy. This is part of a national project, funded by the Department of Health and Ageing and led by Carol Bower, to develop a screening tool for Fetal Alcohol Spectrum Disorders. The feedback from the conversations will then be considered during the development of the screening tool.

Training workshops for researchers

More than 150 researchers, students, administrators and community members have participated in training workshops on implementing consumer and community participation. Conducted at the Institute and the UWA School of Population Health, the workshops were facilitated by Anne McKenzie and Bec Hanley (a consumer advocate from the UK).

As these workshops are unique in Australia,



INSTITUTE RESEARCHERS TANIA GAVIDIA, ADELEH SHIRANGI AND MARYAM MOZOONI AT THE RESEARCHER TRAINING WORKSHOP

a project will be conducted in 2011 to survey 100 people who attended the workshops to evaluate the impact of the training.

UK trip and INVOLVE conference

At the bi-annual INVOLVE conference in Nottingham UK, our consumer advocate Anne McKenzie joined a panel of senior researchers and clinicians to discuss implementing an organisational strategy to increase participation.

Anne's presentation was about the use of training to promote a culture of involvement based on our experience of the development of training workshops for researchers at the Institute and UWA School of Population Health. Anne also co-facilitated two other workshop sessions on what to do when things go wrong and international perspectives on consumer and community participation.

Whilst in the UK, Anne also gave presentations at Sheffield University, the INVOLVE support unit in Southampton and the National Cancer Research Institute Consumer Group.

Aboriginal Collaborative Council Advising on Research and Evaluation

The Aboriginal Collaborative Council Advising on Research and Evaluation (ACCARE) was formed in 2008 to guide and support Aboriginal health research at the Institute.

The goal and over-arching principles for the work of ACCARE is to ensure the facilitation, translation and application of research findings into policy and practice to improve health and wellbeing outcomes for Aboriginal families.

Chaired by Professor Rhonda Marriott, membership of the Council is comprised of Aboriginal and non-Aboriginal people who are involved in the health sector and/or are representatives of the Aboriginal Community throughout Western Australia.

A key role is to provide a peak body for advocacy and discussions for Aboriginal research at the Institute in collaboration with appropriate external organisations and to actively identify, support and foster new research opportunities for Aboriginal research and Aboriginal researchers.

This also includes monitoring the effective implementation of Aboriginal research at TICHHR using a range of existing and new mechanisms and agreed criteria and priorities and performs an advisory council function for the Kulunga Research Network and is a conduit to ensure Aboriginal community research priorities are conveyed to Kulunga/TICHHR and key relevant external bodies such as the Indigenous Implementation Board.

Major activities in 2010 to build capacity in Aboriginal health research included:

- establishing a priorities working group sub-committee
- develop a Winter School Training Program
- progress the Reconciliation Action Statement
- hosting the launch of "The Breakfast Story Book" on behalf of the Warburton Breakfast Ladies; and
- raising the profile of ACCARE by developing a Vision and Mission Statement; creating a webpage detailing the role of ACCARE and all Aboriginal Health Research milestones; maintaining a display board to highlight Aboriginal Health Research at TICHHR; and, publishing articles in the TICHHR Annual Report and the TICHHR quarterly news, and the internal newsletter for staff and students.

ACCARE meets for a half day 7-8 times a year. A two day planning retreat was held in November to review progress and undertake planning for 2011 as priority areas in closing the gap in Aboriginal health outcomes.

The members of ACCARE are working towards the "Equality of health and

wellbeing for Aboriginal people within a generation" and truly believe that it can achieve this vision by being '...the Aboriginal "lens" to guide, support and provide Aboriginal knowledge and wisdom to ensure the integrity of Aboriginal philosophies and way of life is embraced by researchers to improve Aboriginal health and wellbeing.'



Dr Wendy Oddy

In July 2010, when Associate Professor Wendy Oddy's research showing a link between a western style diet and ADHD was released globally, it caused a media frenzy. Wendy was excited and surprised to see media coverage coming in from India, Russia and the Middle East.

"It is really quite amazing to see how quickly research results can be spread around the world when it's something of universal interest," Wendy says.

Leader of Nutrition studies at the Institute, Wendy is extremely passionate about childhood nutrition and the benefits of extended breastfeeding.

"There are a number of ways extended breastfeeding can assist child development. We know that breast milk is packed full of nutrients that help with the rapid brain development that occurs in the early years. It also signals a strong mother-child attachment and these benefits may last," Wendy explains.

Wendy and her colleagues are currently looking at the link between breastfeeding as well as childhood dietary patterns and mental health using data collected from the ground-breaking Raine Study (Western Australian Pregnancy Cohort Study).

The study is the largest and most comprehensive of its kind in the world.

"Our hypothesis is that dietary patterns such as longer duration of breastfeeding, higher intake of omega-3 fatty acids, regularly eating breakfast and reduced

consumption of junk food and soft drinks are linked to better mental health in adolescence," says Wendy.

"We hope to find concrete evidence that simple changes to a child's diet can decrease the risk of them developing depression, anxiety and other mental health issues in their teens."

Born in the UK, Wendy immigrated with her family to Canada when she was 8 years old. Growing up near Toronto, Wendy stayed in Toronto to finish a Bachelor of Applied Science in Nutrition in 1979.

A ski instructor at university with an adventurous spirit, Wendy made the big move to Australia in 1981 and went on to complete a Masters in Public Health (1994) and a PhD in nutritional epidemiology (2000) at the University of Western Australia.

"I love it here. I do miss the snow sometimes but I take every opportunity to get back to the northern hemisphere and the snow when I can!" Wendy says.

Wendy appreciates the great lifestyle Perth has to offer.

"I like to sit on my lounge chair in my backyard under the lemon tree where I read and edit much of my work! I do like to go out for coffee and walk my two poodles - Louis and Pierrot - and I go to the gym at 6am most mornings," Wendy says.

In December 2010, Wendy was invited to Canberra for the National Health and Medical Research Council (NHMRC)

Nutrition researcher

Excellence Awards dinner, to receive an Achievement Award as one of 10 top-ranked researchers in Australia.

"Receiving this Award was a highlight because it acknowledged recognition of my work and that of my team," Wendy says.

Wendy has received recognition from the NHMRC previously, as one of the Ten of the Best projects completed in 2006. She has had more than 90 papers published and been invited on numerous occasions to speak at overseas conferences about her research.

Wendy believes in nurturing young talent and is especially keen to have successful Honours, Masters and PhD students who go on to have great careers of their own.

"I have supervised two PhD students to completion, who are now gaining flourishing careers of their own, as well as Masters, Bachelor of Medical Science and Honours students, all passing with success," Wendy says.

Driven by the desire to see all babies given the opportunity to be breastfed and to improve the lives of children and their families through better nutrition and awareness, Wendy is very keen to continue building on the success of the long-running Raine Study.

"I would love to continue following up the Raine children into their 20s and 30s, and to start looking at the children of the Raine study participants for long-term tracking of nutritional behaviours."



Researchers at the Telethon Institute have forged strategic collaborations with researchers in their fields at major universities and institutes around the world. Some of our key collaborations are listed below.

[UWA Centre for Child Health Research \(a joint venture between the Telethon Institute and The University of Western Australia\)](#)

Established in 2001, the UWA Centre for Child Health Research facilitates closer collaboration with the University of Western Australia, providing access for staff in the Centre to relevant university services including administrative and research services and postgraduate student administration. The Centre for Child Health Research is located within the Faculty of Medicine, Dentistry and Health Sciences, and is closely linked with the School of Paediatrics and Child Health.

[UWA School of Paediatrics and Child Health \(SPACH\)](#)

Based at the Children's Hospital Medical Centre, which includes PMH and the Telethon Institute for Child Health Research, the school is firmly focussed on delivering first-class paediatric graduate and postgraduate students as well as undertaking intensive research into all issues affecting the health of children. It also provides clinical services at Princess Margaret Hospital for Children. The School is responsible for the teaching of paediatrics to undergraduate medical students and for postgraduate training in paediatrics and related sciences. Many of the Institute's PhD students are enrolled through SPACH and we collaborate closely in many research endeavours (such as the Vaccine Trials Group, asthma and allergy research and others).

[Princess Margaret Hospital for Children](#)

The Institute continues to have a close working relationship with the state's children's hospital. With the planned relocation of PMH within the coming decade, the Institute and PMH have been developing the concept of a contiguous research and education facility. The close working relationship between medical research, clinical practice and teaching is exemplified in the important areas of children's cancer and leukaemia, infectious diseases, respiratory medicine, diabetes and obesity.

[Curtin Centre for Developmental Health](#)

The Centre for Developmental Health is a joint venture between the Telethon Institute and Curtin University. This multidisciplinary centre brings together researchers in child and life-course human development with the aim of improving population outcomes in health, education and social wellbeing.

[Edith Cowan University](#)

The Institute has a number of collaborative studies with Edith Cowan University, mainly in the area of Population Sciences which has been formalised through the signing of a Memorandum of Understanding addressing joint research and postgraduate teaching opportunities.

[Murdoch University](#)

The Institute hosts several Honours and postgraduate research students from Murdoch University, principally in the Division of Molecular Biotechnology. New collaborations in Biomedical and Clinical Sciences as well as Population Sciences are being developed. The relationship between the Institute and Murdoch was formalised in a Collaboration Agreement in 2008.

[Notre Dame University](#)

Researchers at Notre Dame University Australia have a collaboration with Institute staff on the WA Pregnancy Cohort (Raine) Study.

[Phylogica](#)

Drug discovery company Phylogica (ASX:PYC) is the first commercial spin-out from the Telethon Institute for Child Health Research. Phylogica's innovative Phylomer® technology targets and blocks disease protein interactions, constituting a drug discovery engine designed to produce cost-effective therapies with fewer side effects than existing treatments.

Papua New Guinea Buttressing Coalition

The Institute is proud to be a member of the Buttressing Coalition of the Papua New Guinea Institute of Medical Research (PNGIMR). Members share a common interest - to sustain and to strengthen the PNGIMR without jeopardising its integrity. Our Director, Fiona Stanley, is the current Chair of the Buttressing Coalition. We are involved in the Papua New Guinea pneumococcal conjugate vaccine project, co-supervise PhD students and host PNGIMR staff and students for exchange visits.

Children's Oncology Group

The Institute, through its Children's Cancer and Leukaemia Laboratory, is a member of the Children's Oncology Group, the world's largest children's cancer research collaborative which focuses on translating research from laboratory to bedside. With a network of more than 5,000 physicians, nurses, and scientists, their collective collaboration, research and care have turned childhood cancer from a virtually incurable disease to one with an overall 78 per cent cure rate.

UCL Institute of Child Health

The University College London Institute of Child Health pursues an integrated, multidisciplinary approach to enhance understanding, diagnosis, therapy and prevention of childhood disease. A broad range of paediatric issues is covered, from molecular genetics to population health sciences. Our collaborations result from our common interest in population data sets and using epidemiological data to influence preventive policy. Our major current collaboration is with Professor Ruth Gilbert on an international study of child maltreatment.

Cambridge Institute for Medical Research

CIMR is a modern research facility in Cambridge UK, where clinical and basic science converge in the study of the molecular mechanisms of disease. The Telethon Institute's Professor Jenefer Blackwell set up this institute and continues her research there by being an affiliated Principal Investigator.

University of British Columbia, Vancouver, Canada

Our researchers in early child development including the Australian Early Development index activities, collaborate closely with Professor Clyde Hertzman and his team. They work on similar early developmental pathways and share methodologies.

Mailman School of Public Health, Columbia University, New York City, USA

Our studies on autism, mental health and Aboriginal health collaborate with Professor Ezra Susser and colleagues in NYC. This includes post-doctoral placements, sharing data and conducting analyses on studies together.

International Rett's Syndrome Data Base

Professor Helen Leonard and her team here in the Institute work with many countries to collect information on girls with Rett Syndrome. These data are collected online and form part of important international research on diagnosis, prognosis, treatment and genetic aspects of the disease.

International Clearing House of Birth Defects

Many countries participate in sharing their data from Birth Defects Registries to enable international monitoring and research. In addition to our data and research from the WA registry being involved, Professor Carol Bower is the current President of this important international activity.

International Network of Childhood Cancer Epidemiology

Dr Liz Milne is the Australian representative on this network which was formed to encourage and enhance research into the causes of these cancers, many of which are too rare to be studied in one country alone.

Manitoba Centre for Health Policy and the International Data Linkage Consortium

Due to our considerable experience over many years of linking population level data and analysing it to inform policy and conduct research, we are part of the international group recently set up. The collaborations with Manitoba have been ongoing for several years and closely link into our Developmental Pathways Project.





Dr Anthony Bosco

Asthma researcher

The desert of Tucson, Arizona - boasting an average 350 sunny days a year and warm dry air - is not the first place you would expect to find one of the world's best respiratory research centres.

Recently returning to Perth, after spending two years at the Arizona Respiratory Centre and BIO5 Institute at the University of Arizona, asthma specialist Dr Anthony Bosco has his sights set on the big picture, inspired by supervisors such as Center Director Professor Fernando D Martinez.

"Professor Martinez is a world authority on the genetic and environmental risk factors associated with the development of asthma and other respiratory disorders and we are now involved in ongoing collaborations to characterise the inflammatory gene networks that underpin asthma in children," Anthony says.

Boasting Nobel and Pulitzer Prize winners, members of esteemed national academies and world-renowned experts in dozens of disciplines, the University of Arizona provided the perfect backdrop to Anthony's postdoctoral research.

Graduating with a Bachelor of Science (Honours) from Murdoch University in 2000, Anthony joined the Telethon Institute the same year as a Research Assistant. In 2002, he commenced his PhD in immunology and genomics under the supervision of Professor Pat Holt at the University of Western Australia.

Driven by a desire to understand how

biological systems function on a molecular level and in holistic terms, Anthony is determined to unlock the mechanisms that lead to the development of asthma in children.

"Decades of intensive research into the mechanistic underpinnings of allergic diseases such as asthma has failed to deliver new and effective treatments," Anthony explains.

"The problem is that drugs are designed to target individual genes, but genes do not exist nor function in isolation, they work together in networks.

"The short-term objective of my research program is to further our understanding of the gene networks that cause allergic inflammation and asthma."

While in Arizona, Anthony was also able to appreciate the mountainous terrain and outdoor lifestyle on offer.

"Although Tucson is in the desert, it snows in other parts of Arizona and you can go skiing. I really enjoyed my stay in Tucson - the place and people are very different to Perth. The University of Arizona is huge, with 40,000 students and the college sporting events are really exciting."

Tucson is set in a desert valley surrounded by five mountain ranges. Cruising the landscape in classic American cars was also a highlight of Anthony's time in the US.

"I owned two American muscle cars - a Pontiac Trans-Am and a Ford Mustang

GT - and managed to see quite a bit of the country including Boston, New York, Las Vegas, Chicago, New Orleans, Los Angeles, The White Mountains, and Flagstaff.

"The landscape is very different - they have rattle snakes, coyotes, mountain lions, bob cats, road runners and javelinas," he says.

But in the world of research, the road to results is not always smooth, as Anthony has discovered.

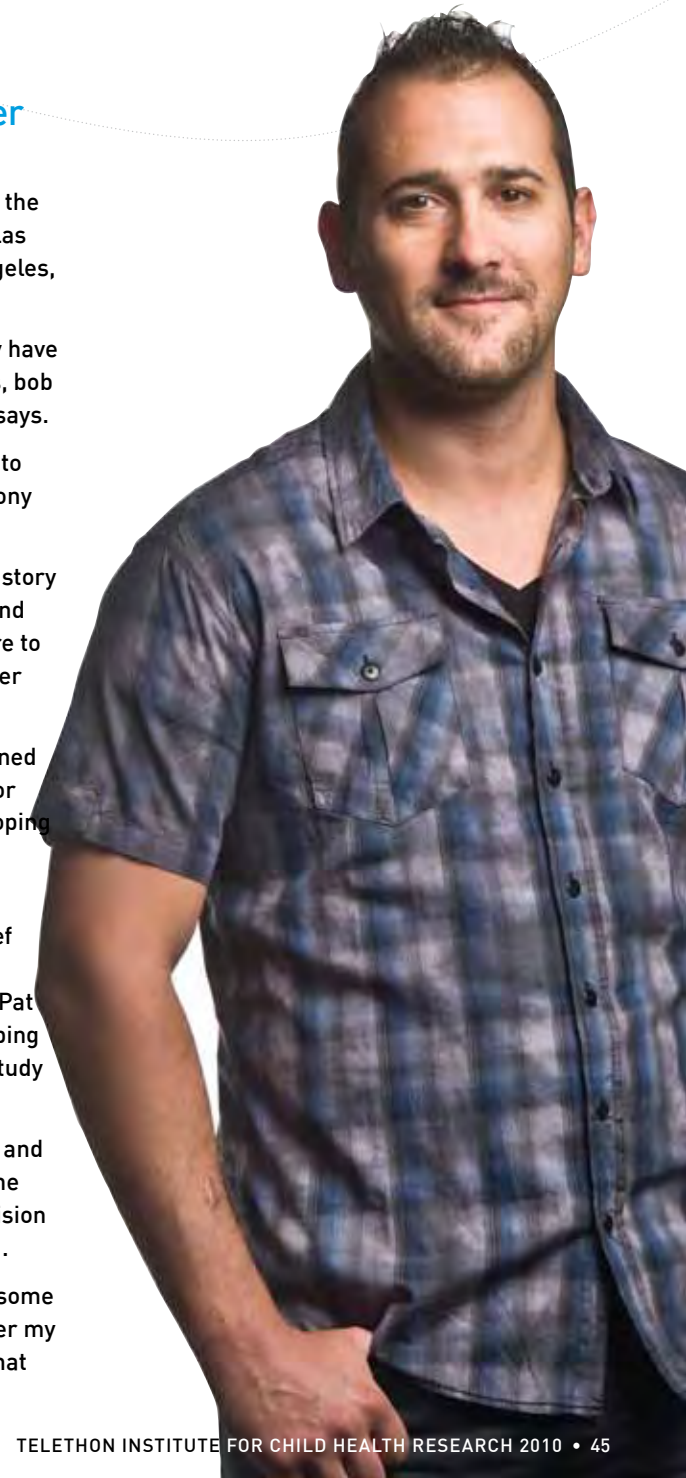
"Generating a powerful and complete story for publication can take a lot of time and effort and sometimes there is pressure to publish research findings sooner rather than later," says Anthony.

"During my training in America, I learned very quickly that it is very important for every scientist to work towards developing their own paradigm," he says.

Anthony has returned to the Institute earlier than anticipated, with the belief that the environment and calibre of asthma researchers under Professor Pat Holt will allow him to focus on developing his own approaches and methods to study the immune mechanisms in asthma.

"Through my research at the Institute and the University of Arizona, I have had the opportunity to work under the supervision of the very best scientists in the world.

"I have also been fortunate to secure some funding which will enable me to further my research in the molecular networks that cause asthma," Anthony says.



Dr Amy Samuels

Cancer researcher

Of the trillions of molecules that work together to sustain the human body, precisely how most of them function is still largely unknown. Leukaemia researcher Dr Amy Samuels has solved one small part of the mystery and left her place in the history books by discovering a new molecule.

Prior to joining the Institute in 2008, Amy's research focused on the development of red blood cells and leukaemia.

"During my PhD studies I identified and characterised a new molecule which I called 'Liar' - lyn interacting ankyrin repeat protein - the function of which has significant impacts on blood and leukaemia cell development and survival," says Amy.

A highly awarded young researcher, Amy is a Senior Research Officer within the Division of Leukaemia and Cancer Research at the Institute, working on several research projects that focus on the development of drug resistance in acute lymphoblastic leukaemia.

While the treatment of childhood leukaemia remains one of the success stories of modern cancer research - survival rates are now upwards of 80% - young patients are treated with a harsh cocktail of up to ten different drugs over two to three years. These drugs successfully treat the majority of patients, however resistance to therapy does occur.

"I want to gain a better understanding of how these drugs work and the molecular mechanisms that can drive

drug resistance. Ultimately we would like to tailor drug treatment programs to individual patients and curtail the extensive drug use," Amy explains.

Qualifying with distinction in Molecular Genetics from Curtin University in 1999, Amy was awarded first class honours in Microbiology at UWA the following year, where she worked with nobel laureate Professor Barry Marshall.

Amy then received an Australian Postgraduate Award to undertake her PhD studies but decided to take a year off first and work in the Clinical Immunology Department at Royal Perth Hospital as a medical scientist. This position confirmed her interest in medical research.

In 2001, Amy began her PhD with Professor Peter Klinken at the WA Institute for Medical Research and UWA, where she identified the molecule 'Liar'. This research was published in internationally renowned journal *Blood* and also received a UWA best publication award for 2009.

Extremely passionate about her research, Amy is an advocate for the importance of medical research and has been on the Australian Society for Medical Research committee since 2008.

"I think you need to be very passionate. Research is not a 9 to 5 job and you need to be constantly reading the literature and thinking about new experiments and approaches to answer the continuous number of questions that you come up

with. But when you make discoveries that have never been reported and have the potential to make a difference to people's lives, particularly children, it is so rewarding," Amy says.

After completing her PhD, in 2007 Amy took up a position in a small biotechnology company in Perth. Despite gaining valuable project management experience, Amy was keen to get back to research.

"I found it extremely difficult being outside of academic research and I could not wait to get back into this dynamic and exciting environment".

A recent recipient of two early career investigator grants - from the Cancer Council WA and The University of Western Australia - Amy is currently using this funding to apply new, innovative approaches to better understand drug resistance in childhood leukaemia.

In 2010, Amy received early career investigator awards at the Lorne Cancer Conference in Victoria and the Lowy Symposium in Sydney. These awards have generated valuable exposure for Amy's research across national and international cancer research networks.

This year, a challenge of a whole new variety is on the cards for Amy, who is expecting her first child in June.

"My husband and I are currently renovating our house and hoping we can complete the interior before our exciting arrival in June," says Amy.

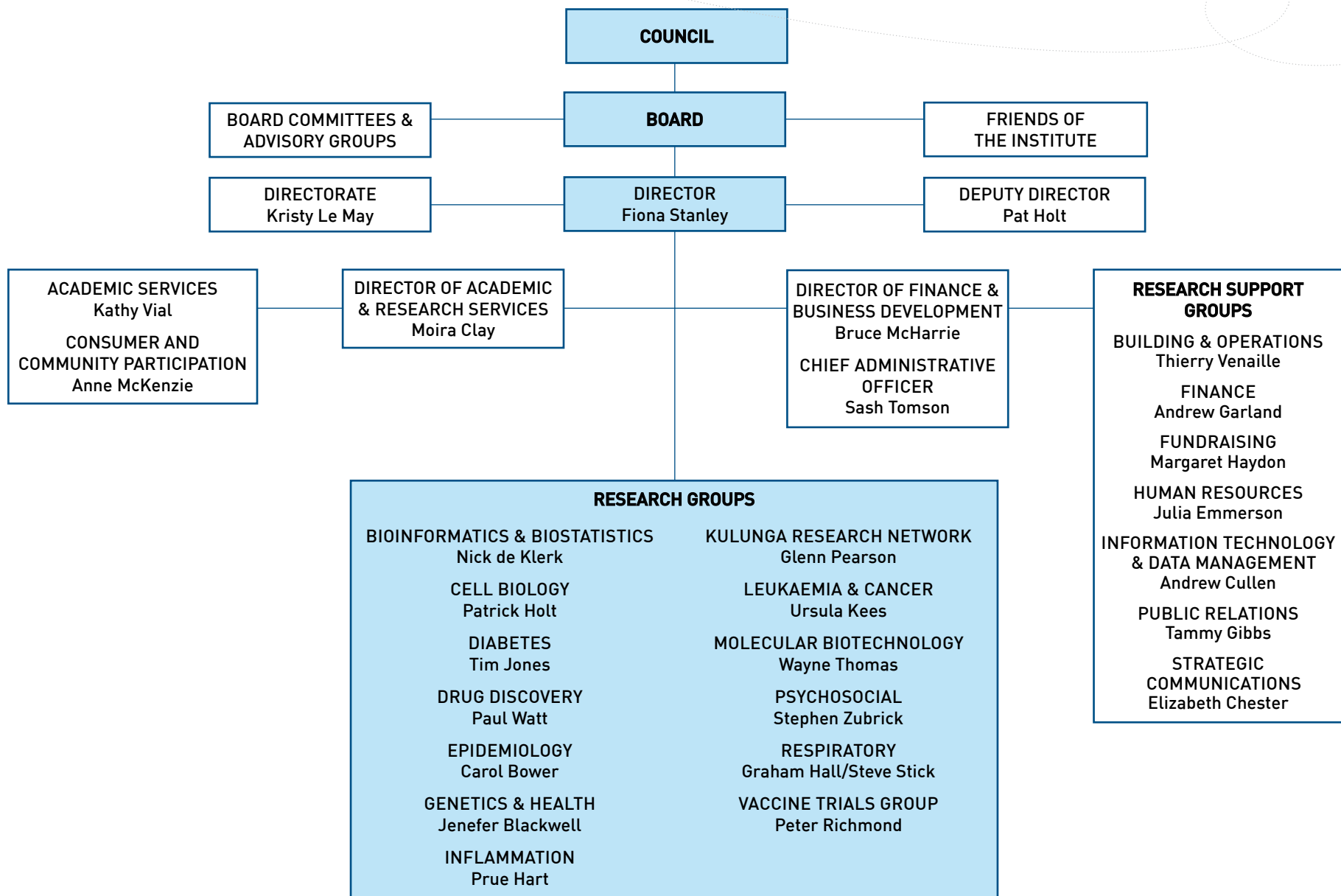


*“All kids need is a little help, a little hope
and somebody who believes in them.”*

Earvin Johnson



Management/Operating structure



Dr Richard Hopkins

Drug discovery researcher

Driven by a desire to pioneer new and less invasive drug therapies, Dr Richard Hopkins is part of the Institute's first spin-out company, Phylogica.

Sitting within the Drug Discovery Group, Richard oversees and coordinates the activities of 18 scientists, working on a diverse range of commercial and in-house projects, which all fall under the umbrella of 'translational research', aiming to bring discoveries from the bench to the bedside.

Joining the Institute in 2000, Richard was initially employed as a Postdoctoral Fellow in Professor Paul Watt's group – a project that led to the development of the first peptide libraries that now form the core of Phylogica's intellectual property portfolio.

"I'm passionate about the field of drug discovery, which provides a wonderful opportunity to explore new concepts in drug design. In the case of the Phylomer® platform, it has been 10 years of hard work but we're now well positioned to contribute to the development of a new class of peptide-based therapeutics for treating a range of diseases," Richard explains.

Richard finds it particularly rewarding that the ideas underlying the Phylomer® concept were initially conceived at the Institute.

"These ideas have subsequently been developed and validated in-house to the point they're now attracting interest from large pharmaceutical companies – a significant feat given Perth's relative

isolation," Richard says.

Over the past 10 years, Richard has learned a great deal about people management and the value of good teamwork to ensure that important goals are reached. He enjoys the dynamic of the Phylogica team, with many of the original team still onboard.

"Together we've had to wrestle with the transition from basic science to translational research, which has required the rapid acquisition of new skill-sets and work practises," says Richard.

Richard qualified with a Bachelor of Science (Honours) from The University of Western Australia in 1987. After finishing his honours degree, Richard joined the Molecular Parasitology group at Murdoch University where he completed his PhD before joining the Institute's cancer lab.

In 2005, Phylogica became the first spin-out from the Institute to be listed on the Australian Stock Exchange. Given Richard's involvement from the outset, this achievement was particularly rewarding.

"More recently, we have entered into strategic alliances with three of the world's largest pharmaceutical companies, which is an important recognition of the cutting-edge nature of the Phylomer® platform."

Despite so much success, Richard still finds the most challenging part of science is having to deal with frequent failure and learning how to use it constructively.

"It's very easy to become despondent when experiments are not going your way and so determination and critical thinking are two of the important qualities a good scientist must have in abundance," he says.

Richard also finds that commercial research can bring high stress levels, with strict milestones and timelines, so unwinding away from work is important.

"Wherever possible, I enjoy spending time with family and friends. We have two young children and find that they very happily consume most of our weekends."

A keen runner, Richard finds this activity does not come as easily as it once used to.

"In recent years this has become more of a shuffle. I also once attempted the Rottneest swim, although this only served to remind me that I really don't like this activity – something my long-suffering teammates (Institute researchers Peter Dallas, Graham Hall and Peter Franklin) would confirm," Richard explains.

Looking into the future, Richard would like to see an expansion of the translational research capabilities at the Institute and in the WA scientific community as a whole.

"I believe this field naturally complements the high standard of basic scientific research undertaken in WA by providing a capability to translate research undertaken at the bench into the clinic. It would also provide scientists with a unique opportunity to pursue a career in commercial research".



2010 - The year in brief

INCOME	Amount	%
Australian competitive grants	6,315,919	20.6
International competitive grants	1,489,123	4.9
Other competitive grants	1,346,427	4.4
Government Contracts	5,505,692	18.0
Commercial income	4,413,967	14.4
Other grants	2,505,635	8.2
Miscellaneous income	508,720	1.7
Donations, fundraising, bequests & sponsorship	3,874,923	12.7
Investment income	1,697,788	5.5
Research support	2,944,544	9.6
Gross income	30,602,738	100
Deferred income	413,406	
Net Income	31,016,144	

EXPENSES	Amount	%
Scientific research	20,949,109	67.9
Research administrative and building services	7,628,396	24.7
Investment and foreign exchange losses	46,461	0.2
Depreciation and provisions	2,236,028	7.2
Total	30,859,993	100

PROFIT 156,151

Staff and students

Total number of staff as at December 31 (paid and seconded) - 343

Total number of postgraduate students during the year - 98

Total staff and students in 2010 - 441

Total number of honorary and visiting scientists during the year - 116

Research income

Australian Competitive Grants			
Australian Research Council	188,181		
Australian Rotary Health Research Fund	21,169		
Cystic Fibrosis Association	45,953		
National Health and Medical Research Council	5,927,478		
National Heart Foundation Australia	133,138		
	6,315,919		
International Competitive Grants			
Autism Speaks Inc	128,581		
British Heart Foundation	13,144		
Canadian Institute for Health Research	3,190		
Cystic Fibrosis Foundation Therapeutics	247,092		
International Rett Syndrome Association	68,969		
Juvenile Diabetes Research Foundation	209,821		
Miscellaneous Overseas Grants	19,273		
National Institutes of Health	696,368		
Offord Centre for Child Studies	1,861		
Wellcome Trust UK	97,401		
World Health Organization	3,423		
	1,489,123		
Other Competitive Grants			
Cancer Foundation of Western Australia	224,359		
Child Health Research Foundation	73,161		
Children's Leukaemia and Cancer Research Foundation	582,415		
Foundation for Children	35,083		
Healthway	321,009		
Melbourne Health	20,690		
Raine Foundation	75,000		
Lotterywest	14,710		
	1,346,427		
Government Contracts			
Western Australia			
Department of Child Protection	101,486		
Department of Commerce	498,500		
Department of Education	21,846		
Department of Health	2,089,286		
Department of Indigenous Affairs	3,000		
Department of the Attorney General	25,000		
Disability Services Commission	51,475		
Office of Science and Innovation	109,634		
Miscellaneous	5,742		
Federal			
Australian Agency for International Development	197,500		
Department of Education, Employment and Workplace Relations	205,469		
Department of Families, Housing, Community Services and Indigenous Affairs	44		
Department of Health and Ageing	1,165,031		
Department of Innovation, Industry, Science and Research	1,014,834		
Other			
Miscellaneous - Non-WA State Governments	16,845		
	5,505,692		
Commercial Income			
Apache Energy Limited	125,000		
Baxter Healthcare Pty Ltd	35,000		
BHP Billiton Australia Limited	176,425		
CSL Limited	67,671		
GlaxoSmithKline Australia Pty Ltd	272,032		
Hawaiian Investments Pty Ltd (The Healing Tree Foundation)	25,000		
Merck Sharpe & Dohme (Australia) Pty Ltd	10,460		
Phylogica Limited	2,511,746		
PPD Development	61,110		
Quintiles (Australia) Pty Ltd	38,695		
Sanofi Pasteur	113,372		
Shell Australia Pty Ltd	300,000		
Wyeth Australia Pty Ltd	677,457		
	4,413,967		
Other Grants			
Australian Paediatric Surveillance Unit	17,928		
Confederation of Meningitis Organisations (CoMO)	148,988		
Curtin University	296,343		
Edith Cowan University	7,575		
Friends of the Institute for Child Health Research	1,305		
Miscellaneous	28,138		
Murdoch University	4,000		
Murdoch Childrens Research Institute	11,967		
PMH/Women & Children's Health Service	219,549		
The Royal Children's Hospital	85,685		
University of Cambridge	13,403		
University of Notre Dame	2,500		
The University of Western Australia	1,668,256		
	2,505,635		
Miscellaneous income	508,720		
TOTAL		22,085,483	

Dr Melissa O'Donnell

Child abuse researcher

A love of the great outdoors, an adventurous spirit and a big heart has led Dr Melissa O'Donnell around the world in her quest to prevent child abuse and neglect and to improve mental health outcomes for children everywhere.

Melissa is a NHMRC Post-Doctoral Research Fellow on the Institute's Developmental Pathways Project, a landmark project investigating the pathways to health and wellbeing, education and juvenile delinquency outcomes in Western Australian children and young people.

"I am excited about the research that I will be conducting over the next four years looking at mental health and juvenile justice outcomes for children who have experienced abuse and neglect," she says.

"We were also lucky enough to get an Australian Research Council Discovery Grant which will assist in our international comparison work on hospital admissions for maltreatment-related injuries."

Winner of the Qantas New Investigator Award in 2010, Melissa is one of the rising stars of the Institute, and through her research, tackles some of the more confronting issues facing children today.

"This area of research can sometimes be quite emotionally challenging due to the nature of the abuse cases," Melissa says.

Showing great strength of character herself, Melissa has also beaten cancer, going on to hike up the Inca Trail in Peru to prove she was fit and healthy.

After completing a Bachelor of Psychology with Honours at the University of Western Australia in 1997, Melissa worked as a Psychologist in the Bunbury region.

"I met a lot of children and families in the country doing it tough and felt like I was only providing band-aid solutions to crisis situations and that what was required was a focus on prevention and early intervention to really make a difference," Melissa explains.

After completing a Masters degree in 1999 and becoming a Psychologist, Melissa decided to travel, basing herself in London for a year, while she worked in both mainstream and special needs schools throughout the London area.

Melissa then returned to Australia working as a Psychologist within the education and medical sectors. But the urge to travel was hard to resist and in 2002 Melissa set off for Vancouver, Canada, where she worked in various organisations including the University of British Columbia.

Melissa's international experience and understanding of different cultures proved extremely valuable on her return to Perth, where she found herself working to support Curtin University PhD students, including international AusAID students, grieving for lost family members after the devastation of the 2004 tsunami.

Continuing her work with an international focus, Melissa currently volunteers her time to support young refugees coming to Australia.

Joining the Institute in 2005, Melissa completed a PhD in Paediatrics and Child Health at UWA in 2009.

Working with Professor Fiona Stanley and Professor Dorothy Scott on a research paper about a public health approach to child abuse and neglect was a real highlight for Melissa. The paper was included in the review of the response to child protection in Australia and was referenced in the National Child Protection Framework.

"I think knowing that your research can be translated into policy and practice and doesn't become something that sits on a shelf is important," Melissa says.


Having lived in some of the world's most beautiful cities, Melissa appreciates the great climate Perth has to offer and having a close-knit group of friends and family to share her life.

"I love the Australian summer and enjoy spending time at the beach with friends, watching my husband play competitive beach volleyball, and visiting my Nonna every week to enjoy her Italian cooking," she says.

Looking ahead, Melissa is keen to continue translating her research to contribute to evidence-based policy and practice in the areas of child abuse and mental health.

"I also want to continue my international research collaborations as it broadens my thinking and improves the way I do research, and I want to continue to supervise PhD students in their research, as their enthusiasm is infectious!"





*...because nothing is
more important than our
children's future.*

For further information about donating to the Institute, including the Institute in your Will or other gifting opportunities, please contact us on:

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