Postgraduate Research Opportunities at the Telethon Kids Institute

Student project booklet 2019
Telethon Kids Institute is the largest medical research facility in Western Australia. With more than 500 staff and students, we are also one of Australia’s largest research facilities dedicated to child health. Our multidisciplinary approach brings together clinical researchers, laboratory scientists and epidemiologists all under the one roof to tackle the many complex childhood diseases and issues from a range of different angles.

2018 is a significant year for the Telethon Kids Institute with a move to brand new premises within the new children’s hospital building at the QEII Campus in Nedlands. The new building will see the Telethon Kids Institute co-located with the new Perth Children’s Hospital and housed in state-of-the-art premises with increased space and improved access to leading edge technology and research facilities.

The Institute has a proven track record of translating research findings into actions that make a real difference to the lives of children everywhere. Telethon Kids has strong affiliations with The University of Western Australia and Curtin University, as well as wide-reaching collaborations with leading research organisations around the world.

You can find out more about our current projects, Research Teams, and being a student with us by:

- Visiting our website: www.telethonkids.org.au
- Contacting our researchers listed within this booklet
- Contacting our Student Team at study@telethonkids.org.au
- Attending the Prospective Student Evening: Thursday 28th June 2018
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About Our Research

Our Research Focus Areas are hubs that will facilitate the development, delivery and translation of high quality collaborative projects that make a difference to child health. Each Research Focus Area is designed to attract a diversity of expertise and a range of disciplines, in a coalescence of activity and creativity.
Scholarships and Awards

Telethon Kids Institute has several different scholarships on offer for potential students. For detailed scholarship requirements and application details, please visit our scholarships webpage.

Stan and Jean Perron Top-Up Scholarship

For new, full-time PhD students principally located at Telethon Kids Institute

With the support of the Stan Perron Charitable Foundation, since 2005 Telethon Kids Institute has established several prestigious awards aimed at supporting exceptional postgraduate research students who are undertaking their research at the Telethon Kids Institute.

These Top-Up Scholarships accompany PhD scholarships won by the recipients through their enrolling universities in a separate application process.

Successful applicants will receive:

- A top-up of $5,000 per year, paid in conjunction with the main university scholarship for the duration of the scholarship.
- $10,000 to be used towards the candidate’s studies. This can include training opportunities, travel to and attendance of conferences, visiting other Research Teams, or PhD course fees.

Closing date: Wednesday 31st October 2018, 5:00pm
Peter and Anne Hector Award

For new students conducting translational research into Aboriginal health and wellbeing

As the parents of two children and grandparents to five, Anne and Peter Hector are exceptionally grateful for the health and privilege that their family experience. Whilst on the Board of Homeswest, Anne travelled to many remote Aboriginal communities and saw first-hand the health problems experienced by Western Australia’s indigenous population. This scholarship is a way for the Hector family to support Indigenous health specialists to gain a better education and deliver healthy outcomes for Aboriginal children.

The Awards are established as a scheme to support translational research in Aboriginal children’s health and wellbeing in areas that will most likely effect positive and lasting change. The Awards can be made to both indigenous and non-indigenous researchers, with a preference for the former.

Successful applicants will receive:

- A top-up of $5,000 per year, paid in conjunction with the main university scholarship for the duration of the scholarship

**Closing date:** Wednesday 31st October 2018, 5:00pm
Wesfarmers Centre of Vaccines & Infectious Diseases PhD Top-Up Scholarship

For new PhD students conducting research into infectious diseases

The Telethon Kids Institute’s Wesfarmers Centre of Vaccines & Infectious Diseases is committed to advanced research that reduces the burden of serious infectious diseases experienced by children in Western Australia and around the world by improving prevention, diagnosis, treatment and disease management. Bringing health solutions to indigenous children is a major focus area.

The Wesfarmers Centre believes teamwork maximizes problem solving and outputs. Successful applicants are therefore expected to work on a project with clear collaborative activities and encouraged to actively engage with fellow PhD students and the Institute’s Research Focus Areas.

Successful applicants will receive:

- A top-up of $10,000 per year, paid in conjunction with the main university scholarship for the duration of the scholarship.

Closing date: Wednesday 31st October 2018, 5:00pm
Telethon Kids Institute Vacation Scholarship

*For undergraduate students conducting research into paediatric and child health*

Vacation scholarships are open to all Western Australian-based tertiary students in their second year of study who are interested in conducting research in child health. These scholarships enable students to carry out a short summer research project within the Telethon Kids Institute. Vacation scholarships provide students with an exciting opportunity to learn valuable research skills associated with paediatric and child health research and are particularly valuable for students considering postgraduate research degrees.

Successful applicants will receive:
- A scholarship of $1,200, with $600 paid at the start and end of the project respectively

It is expected that the projects will last for at least 6-8 weeks and be supervised by Early-Mid Career Researchers at the Telethon Kids Institute.

**Closing date:** Wednesday 31st October 2018, 5:00pm
Children’s Diabetes Centre Scholarships: Expressions of Interest

For new Honours, Masters, and PhD students conducting research into diabetes

The Children’s Diabetes Centre was established in 2015 by a Centre for Research Excellence grant from the National Health and Medical Research Council and the Juvenile Diabetes Research Foundation. It is an integrated clinical and research-based centre at Perth Children’s Hospital (PCH) that includes researchers from the Telethon Kids Diabetes Research Team and the Diabetes Services at PCH. The Centre conducts research into Type 1 Diabetes and childhood onset Type 2 Diabetes.

The Centre is seeking candidates with backgrounds in science, medicine, public health, statistics, health economics, dietetics/nutrition, nursing, psychology, or exercise physiology.

The following scholarships are available for successful PhD students:

- A full scholarship valued at $27,028 per annum for up to 3 years
- A top-up scholarship valued at $5,000 per annum for up to 3 years

The following scholarship is available for successful Honours students:

- A stipend valued at $5,000 per annum for up to 1 year

This scholarship does not have a set closing date; applications will be reviewed on a first-come first-serve basis until funding is exhausted.
Brain & Behaviour is a Research Focus Area which focuses on the core of many issues affecting the ongoing health and wellbeing of children and young people.

Our research investigates the developmental, genetic, family and environmental determinants of child wellbeing, and how clinical, educational and community practices can provide every child with the best opportunity for optimal health and development.

At the Telethon Kids Institute, this research encompasses a child's learning, development and mental health - and the impact of conditions like cerebral palsy, autism and intellectual disability.

Research Programs & Teams listed:

**Development & Education**
- Health Promotion and Education
- Linked Analytics and Social Policy

**Disability**
- Alcohol and Pregnancy & FASD Research
- Child Disability

**Mental Health & Youth**
- Human Capability
- Youth Mental Health
**CoLab – Child and Parent Centres Research Project**

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Health Promotion and Education</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>TBC</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Professor Donna Cross (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Kim Clark (Edith Cowan University)</td>
</tr>
</tbody>
</table>

**Project Outline**

A child’s early years set the foundation for his or her future wellbeing and success. With this understanding, CoLab was launched through a partnership between the Telethon Kids Institute and the Minderoo Foundation. CoLab is focused on bringing together the expertise of families, clinicians, educators, policy makers, other practitioners and researchers to work together to improve the development and learning of Australian children.

CoLab has three main areas of focus:
- The economic understanding of early childhood, with a focus on where the best early investments can be made;
- Providing better support to families experiencing adversity; and
- Place-based approaches to improve the ways that families, services and communities work together.

This project will work with Children and Parent Centres operated by Ngala in Western Australia to review existing measurement frameworks and census to provide better information on child development and learning outcomes. In particular, a focus will be given to developing new measurement metrics to assess the impact Children and Parent Centres have on the capacity of families to enhance the development and learning of their children.

**Suitable For**

- ☐ Honours
- ☐ MD
- ☐ Masters
- ☒ PhD

**Essential Skills & Qualifications**

- Excellent communication skills
- Ability to work autonomously, with some direction
- High level written and oral communication skills
- High level organisation and time management skills
- Have achieved a First-Class Honours (or equivalent) and/or a research Masters in Health, Community and Social Services, Education, or another relevant degree including a clear research component
- Eligible to enrol in a PhD or a Masters at a University

**Ethics Approval**

- ☐ Obtained
- ☒ Not Obtained

**Funding**

- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

*For more information, please contact:*
Samantha Baker
(08) 9489 7604
Samantha.Baker@telethonkids.org.au
Alcohol-Related Harm in Young People

Research Team: Linked Analytics and Social Policy

Start Date: June 2018

Chief Supervisor: Dr Melissa O’Donnell (Telethon Kids Institute, The University of Western Australia)

Supporting Supervisor: Dr Gavin Pereira (Telethon Kids Institute, Curtin University)

Project Outline:
Alcohol-related harm is a priority public health issue in Australia with research showing there is rising alcohol-related harm in young people. This research aims to inform alcohol-related harm prevention and early intervention strategies for young people using longitudinal individual, family and community level data. This is a cohort study of all young people residing in WA and their longitudinal linked health data and police data. We also utilise data from the Office Racing, Gaming and Liquor which provides data on liquor outlets locations and sales volume by alcohol strength and type.

The aims of this project are to identify pathways through the health system for youth presenting with alcohol-relating harm, or impacted upon by alcohol-related violence with a focus on:

1. Episodes of care, prognostic outcomes and points for early intervention. Investigating individuals’ full episode of care related to alcohol-related harm, including their Emergency Department presentation, hospital admissions, and outcomes (death or subsequent re-admissions). Individual, family and community characteristics associated with young people who have alcohol-related harm to determine whether there is a sub-group of at-risk group requiring targeted prevention and early intervention.

2. Mental health comorbidities and outcomes. Given the high comorbidity of alcohol-related harm and mental health issues we will investigate mental health issues diagnosed at the same episode with alcohol-related harm, as well as pre-existing mental health issues and outcomes.

3. Aboriginal youth. There has been no population level study of Aboriginal youth and alcohol-related harm and so this research will provide crucial evidence regarding level of harm, onset age, causes of harm, recurrence, mental health comorbidities and outcomes.

Suitable For
☐ Honours ☐ MD ☐ Masters ☒ PhD

Essential Skills & Qualifications

- A minimum 2A Honours degree or Masters degree in a related field (e.g. Psychology, Public Health, Biostatistics)
- Knowledge of quantitative data analyses
- Demonstrated ability to perform independent research and a commitment to interdisciplinary research
- Capacity to communicate research concepts to a variety of audiences
- Excellent interpersonal skills, including an ability to interact with internal and external stakeholders.
- Excellent written and verbal communication skills
- Demonstrated ability to work both independently and as a member of a team
- Willingness to travel inter-state and/or internationally
- Applicants should apply for an RTP or other relevant scholarship

Ethics Approval ☒ Obtained ☐ Not Obtained

Funding ☒ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Melissa O’Donnell
(08) 9489 7778
Melissa.O’Donnell@telethonkids.org.au
### Vulnerable Mothers and their Children’s Outcomes

**Research Team**  
Linked Analytics and Social Policy

**Start Date**  
June 2018

**Chief Supervisor**  
Dr Melissa O’Donnell (Telethon Kids Institute, The University of Western Australia)

**Supporting Supervisors**  
Dr Megan Bell (Telethon Kids Institute)  
Dr Miriam Maclean (Telethon Kids Institute)  
Dr Rebecca Glauert (Telethon Kids Institute)

**Project Outline**  
The Developmental Pathways in WA Children Project (DPP) built the capacity for researchers to undertake interdisciplinary research by linking cross-jurisdictional data held by a number of State government departments, including the WA Departments of Health, Child Protection and Family Support, Education, Justice, the School Curriculum and Standards Authority, and the Disability Services Commission. The linking of population level data across these government agencies offers researchers an unparalleled opportunity to take an integrated and holistic approach to answering important questions concerning health, development and wellbeing across the life span.

This proposed research study focuses on vulnerable mothers (e.g. mothers aged <21 years and/or previously involved in child protection/juvenile justice) and their children’s outcomes across a range of indicators including morbidity, mortality, disability, Australian Early Development Census, and child protection. This work will inform government agencies who are involved in the DPP and the development of strategies to target support for vulnerable mothers and their children.

**Suitable For**  
☐ Honours  
☐ MD  
☐ Masters  
☒ PhD

**Essential Skills & Qualifications**  
- A minimum 2A Honours degree or Masters degree in a related field (e.g. Psychology, Public Health, Biostatistics)
- Knowledge of quantitative data analyses
- Demonstrated ability to perform independent research and a commitment to interdisciplinary research
- Capacity to communicate research concepts to technical and non-technical audiences
- Excellent interpersonal skills, including an ability to interact with internal and external stakeholders (academic, government, NGOs), in a courteous and effective manner
- Excellent written and verbal communication skills, demonstrated by presentation of research results and through manuscript submissions
- Demonstrated ability to work both independently and as a member of a team
- Willingness to travel inter-state and/or internationally
- Applicants should apply for an RTP or other relevant scholarship

**Ethics Approval**  
☒ Obtained  
☐ Not Obtained

**Funding**  
☒ Top-up scholarship offered by project group

For more information, please contact:  
Dr Melissa O’Donnell  
(08) 9489 7778  
Melissa.O’Donnell@telethonkids.org.au
A Knowledge, Attitudes and Practices Survey about Alcohol Use in Pregnancy and FASD in the Fitzroy Valley: Analysing and Reporting on Qualitative Questions

Research Teams

Alcohol and Pregnancy & FASD Research
Aboriginal Health and Wellbeing
Health Promotion and Education Research

Start Date
Any time

Chief Supervisor
TBC

Supporting Supervisor
Dr Martyn Symons (Telethon Kids Institute)

Project Outline
This project will involve analysing and reporting on qualitative data collected from 400 people using a knowledge, attitudes and practices survey about alcohol use in pregnancy and FASD, conducted with over 400 people in the remote Fitzroy Valley area of the Kimberley region in North-western Australia in 2015.

Fetal Alcohol Spectrum Disorder (FASD) are lifelong disabilities caused by exposure of the fetus to alcohol during pregnancy. This causes a wide range of potential impairments but neurodevelopmental disorders such as poor memory and impaired executive functioning are common. These often lead to secondary disabilities such as contact with the justice system and difficulty in finding employment.

The Lililwan FASD prevalence study found that around 20% of children were born with FASD in the Fitzroy Valley. The Marulu FASD Prevention Strategy is a multi-pronged FASD prevention strategy that has been in place in the Valley for over five years. The survey was conducted to analyse aspects of the strategy and the reach of a mass media campaign aimed at reducing prenatal alcohol exposure. There is an opportunity to further analyse and report on qualitative data collected by that survey including, but not limited to questions such as: What problems has drinking caused in your community? What are some things that you think cause a woman to drink alcohol when pregnant? How can FASD be prevented or stopped? What would you do or say if you saw a woman drinking during pregnancy?

Suitable For
☒ Honours
☐ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications
• Undergraduate degree in a relevant discipline
• Some knowledge of qualitative evaluation

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
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(08) 9489 7632
Martyn.Symons@telethonkids.org.au
Automating FASD Screening with Eye-Tracking and Machine Learning

Research Team
Alcohol and Pregnancy & FASD Research

Start Date
August 2019

Chief Supervisor
TBC

Supporting Supervisors
Dr Martyn Symons (Telethon Kids Institute)
Dr Tracey Tsang (University of Sydney)

Project Outline

Summary
Fetal Alcohol Spectrum Disorders (FASD) are lifelong disabilities caused by exposure of the fetus to alcohol during pregnancy. This causes a wide range of potential impairments but neurodevelopmental disorders such as poor memory and impaired executive functioning are common. These often lead to secondary disabilities such as contact with the justice system and difficulty in finding employment.

Under-diagnosis and delayed diagnosis of FASD is a challenge for patient care and for the epidemiological data that underpins the systems to plan and deliver prevention and treatment. FASD diagnosis is costly (~$4,000-$6,000), time consuming (6 hours), and resource intensive requiring professionals who are in short supply (Physiotherapists, Speech Pathologists, Neuropsychologists, Paediatricians), especially in some remote regional areas. In the face of increasing health system demands, new screening tools that rapidly and objectively identify brain injury in young children, and that are scalable, transportable and non-invasive, will be required to support timely and sustainable solutions. This project will pilot an innovative approach that couples eye-tracking data with machine learning data processing. This precision screening tool could refine the pipeline to diagnostic assessment.

Machine learning (ML) is a set of non-linear statistical algorithms which can ‘learn’ to find patterns in complex data. ML is currently being deployed in the USA and Canada to analyse data recorded by eye-tracking cameras for high throughput, low cost screening for the likely presence of FASD. These models have good accuracy for distinguishing between children with FASD, ADHD and typically developing controls (P. H. Tseng et al., 2013).

Aims
This project will first establish a foundation of normative reference standards for Aboriginal and non-Aboriginal children with FASD or other neurodevelopmental disorders or developing “normally”. This data will form a basis for insights and further investigations including the development of machine learning models to create high-throughput, low cost screening tools for FASD. Further work will look at expanding the screening tool to encompass children with Autism and ADHD, reduce the testing time, and reducing the age at which the screening can be used.

This project will require the candidate to have had some previous experience with mathematics, statistics or computer science, and to have a willingness to learn machine learning methodology.

Suitable For
☐ Honours  ☐ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications
- Undergraduate degree in a relevant discipline
- First-Class Honours
- Ability to prioritise tasks and complete projects on time
- Proficient communication skills and interpersonal working relations

Ethics Approval
☐ Obtained  ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Narelle Mullan
(08) 9489 7619
Narelle.Mullan@telethonkids.org.au
Can Providing Best-Practice Referral and Family Planning Advice Help Reduce Risk of Alcohol Exposed Pregnancies?

Research Team | Alcohol and Pregnancy & FASD Research
Start Date | August 2019
Chief Supervisor | TBC
Supporting Supervisor | Dr Martyn Symons (Telethon Kids Institute)

Project Outline

Summary

Fetal Alcohol Spectrum Disorders (FASD) are lifelong disabilities caused by exposure of the fetus to alcohol during pregnancy. This causes a wide range of potential impairments but neurodevelopmental disorders such as poor memory and impaired executive functioning are common. These often lead to secondary disabilities such as contact with the justice system and difficulty in finding employment.

One main approach to the prevention of FASD has aimed to reduce the consumption of alcohol during pregnancy. This is supported by official Government advice in Australia that “No alcohol in pregnancy is the safest choice.” Given that if no alcohol is consumed during pregnancy, a child will not be born with FASD, logically FASD is 100% preventable. However, for women who are alcohol dependent it is not always possible to immediately stop alcohol consumption upon recognition of pregnancy. Furthermore, fetal alcohol exposure can occur before knowledge of pregnancy. Therefore, another potential approach to preventing alcohol exposed pregnancies is to assist women who are in alcohol dependence treatment to make informed choices about contraception and family planning.

Aims

To determine if the provision of best-practice referral and family planning advice to women currently undertaking treatment for alcohol dependence can reduce the risk of alcohol exposed pregnancies. This will require multiple steps including, but not limited to: determining what family planning training is undertaken by workers treating alcohol dependence, determining from the literature what is current best-practice in these areas, developing resources and training packages if required, and evaluating any reduction in alcohol exposed pregnancies in a sample group when best practices are implemented.

This PhD would ideally suit a student with good initiative, a background in Public Health or Psychology or an interest in implementation science, a willingness to work with clinical staff with different backgrounds and the empathy, compassion and insight required to work in this sensitive area.

Suitable For | ☒ Masters ☒ PhD
Essential Skills & Qualifications
- Undergraduate degree in a relevant discipline
- First-Class Honours
- Ability to prioritise tasks and complete projects on time
- Proficient communication skills and interpersonal working relations

Ethics Approval | ☒ Not Obtained
Funding | ☐ Top-up scholarship offered by project
□ Full scholarship offered by project

For more information, please contact:
Narelle Mullan
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Narelle.Mullan@telethonkids.org.au
Economic Burden of FASD and/or Economic Evaluation of Screening, Diagnosis and Support

Research Team  
**Alcohol and Pregnancy & FASD Research**

**Start Date**  
August 2018 onwards

**Chief Supervisors**  
Dr Rochelle Watkins (Telethon Kids Institute)  
Dr Amy Finlay-Jones (Telethon Kids Institute)

**Supporting Supervisors**  
TBC

**Project Outline**  
The aim of this project is to examine the economic impact of Fetal Alcohol Spectrum Disorders (FASD) in Australia. A key objective is to estimate the per-person economic burden of FASD in Western Australia using linked data from the WA Data Linkage Branch, including costs across health, education, justice, and productivity. It is anticipated that this will be used to estimate annual economic costs in Australia based on low- and high-prevalence estimates. A second key objective is to evaluate the cost-benefit of early screening, diagnosis, and intervention for FASD. This project will be undertaken as part of the FASD Research Australia Centre of Research Excellence. The scope of the project will depend on the nature of the degree; students are required to have skills in economic evaluation and economic modelling.

**Suitable For**  
☐ Honours  
☐ MD  
☐ Masters  
☒ PhD

**Essential Skills & Qualifications**  
- Undergraduate degree in Economics or Health Economics  
- Ability to prioritise tasks and complete projects on time  
- Proficient communication skills and interpersonal working relations

**Ethics Approval**  
☒ Obtained  
☒ Not Obtained

**Funding**  
☐ Top-up scholarship offered by project group  
☒ Full scholarship offered by project group

*For more information, please contact:*  
Narelle Mullan  
(08) 9389 7619  
Narelle.Mullan@telethonkids.org.au
# Engaging Families in Early Intervention for Infants with Developmental Delay – a Systematic Review of Best Practices

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Alcohol and Pregnancy &amp; FASD Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>August 2018 onwards</td>
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</tbody>
</table>
| Chief Supervisors      | Dr Amy Finlay-Jones (Telethon Kids Institute)  
                         | A/Professor Jenny Downs (Telethon Kids Institute) |
| Supporting Supervisors | TBC                                   |

## Project Outline

The aim of this project is to review the literature pertaining to the engagement of families in early interventions for interventions with developmental delay or who are “at-risk” of neurodevelopmental disorder. The review aims to answer the following questions:

- What are evidence-informed practices for engaging families in early intervention for infants and very young children with neurodevelopmental delays?
- What does the literature describe as core principles for meaningfully engaging families?
- What family engagement metrics can be captured?

## Suitable For

- [☐] Honours  
- [☐] MD  
- [☒] Masters  
- [☐] PhD

## Essential Skills & Qualifications

- Undergraduate degree in Psychology, Social Work, Medicine or a related field
- Ability to prioritise tasks and complete projects on time
- Previous training or experience with systematic reviews advantageous
- Proficient communication skills and interpersonal working relations

## Ethics Approval

- [☐] Obtained  
- [☒] Not Obtained

## Funding

- [☐] Top-up scholarship offered by project group
- [☐] Full scholarship offered by project group

*For more information, please contact:*  
Dr Amy Finlay-Jones  
(08) 9489 7609  
Amy.Finlay-Jones@telethonkids.org.au
# Systematic Review of Interventions for Infants and Very Young Children at Risk of Neurodevelopmental Disorder

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Alcohol and Pregnancy &amp; FASD Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>August 2018 onwards</td>
</tr>
</tbody>
</table>
| Chief Supervisors             | Dr Amy Finlay-Jones (Telethon Kids Institute)  
A/Professor Jenny Downs (Telethon Kids Institute) |
| Supporting Supervisors        | TBC                                  |
| Project Outline               | The aim of this project is to systematically review the literature pertaining to early intervention for infants and young children who are considered “at-risk” of developing a neurodevelopmental disorder. The review will take a transdiagnostic approach (i.e. consider risk for more than one neurodevelopmental disorder), and there is scope for the student to work with the supervisors to determine the types of risk and the types of intervention included in the review. |

<table>
<thead>
<tr>
<th>Suitable For</th>
<th>☐ Honours  ☐ MD  ☒ Masters  ☐ PhD</th>
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</table>
| Essential Skills & Qualifications | - Undergraduate degree in Psychology, Social Work, Medicine or a related field  
- Ability to prioritise tasks and complete projects on time  
- Previous training or experience with systematic reviews advantageous  
- Proficient communication skills and interpersonal working relations |

<table>
<thead>
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<th>Ethics Approval</th>
<th>☐ Obtained  ☒ Not Obtained</th>
</tr>
</thead>
</table>
| Funding                       | ☐ Top-up scholarship offered by project group  
☐ Full scholarship offered by project group |

For more information, please contact:  
Dr Amy Finlay-Jones  
(08) 9489 7609  
Amy.Finlay-Jones@telethonkids.org.au
## The Quality of Life for Children Living with FASD in Australia

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Alcohol and Pregnancy &amp; FASD Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>August 2018 onwards</td>
</tr>
</tbody>
</table>
| Chief Supervisors | Dr Amy Finlay-Jones (Telethon Kids Institute)  
|                | A/Professor Jenny Downs (Telethon Kids Institute) |
| Supporting Supervisors | TBC |

### Project Outline

This project involves conducting a survey that includes a new parent-report measure, the Quality of Life Inventory—Disability, QI-Disability, with the families of children living with FASD. Quality of life refers to satisfaction with a composite of life experiences and includes domains that are universal, e.g. physical and mental wellbeing with additional domains for the FASD population. QI-Disability has developed specifically for children with intellectual disability where options are currently extremely limited. Derived from qualitative data, the items in QI-Disability described caregiver observations of behaviours. The aim of the project is to understand the factors related to quality of life for children living with FASD and identify appropriate support needs. It will also explore the use of the QI-Disability measure as a measure of responsiveness for FASD interventions.

This project will be undertaken as part of the FASD Research Australia Centre of Research Excellence.

### Suitable For

- ☒ Honours
- ☐ MD
- ☒ Masters
- ☐ PhD

### Essential Skills & Qualifications

- Undergraduate degree in Epidemiology, Public Health or Psychology
- Ability to prioritise tasks and complete projects on time
- Proficient communication skills and interpersonal working relations

### Ethics Approval

- ☐ Obtained
- ☒ Not Obtained

### Funding

- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

**For more information, please contact:**

Narelle Mullan  
(08) 9489 7619  
Narelle.Mullan@telethonkids.org.au
Are the Effects of an Early Environmental Enrichment Program Sustained in Young Girls with Rett Syndrome?

Research Team
Child Disability

Start Date
January 2019

Chief Supervisor
A/Professor Jenny Downs (Telethon Kids Institute)

Supporting Supervisor
A/Professor Helen Leonard (Telethon Kids Institute)

Project Outline
Rett Syndrome is a rare genetic disorder that mainly affects girls and is associated with severe physical and intellectual disability. Animal studies in Rett Syndrome and other disorders suggest that the early environment is associated with improved motor skills and improved levels of BDNF, a neurotrophic factor important for neuronal growth and synapses. We have recently completed a randomised stepped wedge design trial where we tested the benefits of an early environmental enrichment program for 12 young girls with Rett Syndrome. Each of the families was from China and registered with the international Rett Syndrome database InterRett that is housed and managed here at Telethon Kids Institute. The enriched environment intervention was conducted at a therapy centre in Shenzhen, completed around October 2016, and was associated with improved gross motor skills and increased levels of blood BDNF.

The current study will conduct follow up with these 12 families approximately 2 years after the girls participated in the intervention. Video data will be collected to assess gross motor skills, questionnaires will be administered to assess other aspects of phenotype, and interviews with each family will be conducted to determine how families have been able to enrich their daughter’s environment since the study.

Suitable For
☒ Honours ☐ MD ☐ Masters ☐ PhD

Essential Skills & Qualifications
• Bachelor’s degree in Science, Health Science or other health-related area including genetics
• Interest in Chinese culture and ability to speak Mandarin
• Excellent communication skills
• Computer and basic statistical skills

Ethics Approval
☐ Obtained ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Jenny Downs
(08) 9489 7774
Jenny.Downs@telethonkids.org.au
Characterising Balance and its Determinants in Rett Syndrome

Research Team

Child Disability

Start Date

January 2019

Chief Supervisor

A/Professor Jenny Downs (Telethon Kids Institute)

Supporting Supervisors

A/Professor Helen Leonard (Telethon Kids Institute)
Michelle Stahlhut (Kennedy Centre for Rett Syndrome, Copenhagen)

Project Outline

Rett Syndrome is a rare genetic disorder that mainly affects girls and is associated with severe physical and intellectual disability. Impaired gait is one of the main criteria for Rett Syndrome, accompanied by neurological impairments such as truncal ataxia and dyspraxia. Poor balance has been observed during early childhood and could also contribute to later motor deterioration. However, no balance measures have been validated for Rett Syndrome, balance has not been described and strategies to improve balance have not been evaluated.

This project will:

1. Examine the psychometric properties of measures of balance in Rett Syndrome;
2. Measure balance in a larger sample and explore relationships with age, genotype and comorbidities such as scoliosis and epilepsy; and
3. Pilot an intervention to improve balance.

Suitable For

☐ Honours  ☐ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications

• Bachelor’s degree in Science, Health Science or therapy areas
• Excellent communication skills
• Basic computer and statistical skills

Ethics Approval

☐ Obtained  ☒ Not Obtained

Funding

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Jenny Downs
(08) 9489 7774
Jenny.Downs@telethonkids.org.au
Exploring the Natural History of CDKL5 Disorder - A Novel International Project

**Research Team**

**Child Disability**

**Start Date**
Available now

**Chief Supervisors**
A/Professor Helen Leonard (Telethon Kids Institute)
A/Professor Jenny Downs (Telethon Kids Institute)

**Supporting Supervisor**
Dr Kingsley Wong (Telethon Kids Institute)

**Project Outline**

The CDKL5 disorder is caused by mutations within the Cyclin-dependent Kinase-like 5 (CDKL5) gene. Key clinical features include seizure onset in the majority before 3 months of age, global developmental delay and impaired gross motor abilities, gastrointestinal and sleep issues, impaired muscle tone and bruxism.

The International CDKL5 Disorder Database was established in 2012 in collaboration with the International Foundation for CDKL5 Research to further develop our understanding of the clinical features of this disorder. The database aims to collect information from families and clinicians on individuals with the CDKL5 disorder. It also aims to become a resource so that researchers from across the world can conduct meaningful and collaborative research into the CDKL5 disorder.

This project will aim to define aspects of the natural history of this disorder by analysing data using the initial and follow-up questionnaires with a focus on epilepsy and sleep disturbances. The project also maintains good collaborations with the CDKL5 centres of Excellence in the USA to potentially collect clinician data.

<table>
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<tr>
<th>Suitable For</th>
<th>☐ Honours</th>
<th>☒ MD</th>
<th>☒ Masters</th>
<th>☒ PhD</th>
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**Essential Skills & Qualifications**

- Bachelor’s degree in Science, Health Science or other health-related areas
- First-Class or 2A Honours
- Computer and basic statistical skills
- Background in genetics beneficial

**Ethics Approval**

☒ Obtained  ☐ Not Obtained

**Funding**

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

*For more information, please contact:*

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(08) 9489 7774
Jenny.Down@telethonkids.org.au

A/Professor Helen Leonard
(08) 9489 7790
Helen.Leonard@telethonkids.org.au
Health and Wellbeing in Prader-Willi Syndrome

Research Team
Child Disability

Start Date
January 2019

Chief Supervisor
A/Professor Jenny Downs (Telethon Kids Institute)

Supporting Supervisors
A/Professor Helen Leonard (Telethon Kids Institute)
Professor Catherine Choong (Perth Children’s Hospital)

Project Outline
Prader-Willi Syndrome (PWS) is a neurogenetic condition estimated to occur in approximately 1 in 16,000 births. It is associated with early hypotonia and failure to thrive; delay in speech development; characteristic facial features and hypogonadism. Approximately two thirds have intellectual disability. The children have a deficiency of growth hormone (GH) and are of short stature. For many, the typical behavioural phenotype includes sleep abnormalities as well as temper tantrums, autistic tendencies and skin picking. With time, hyperphagia results in obesity and comorbidities such as diabetes mellitus and obstructive sleep apnea are common.

PWS is the most common genetic cause of life-threatening childhood obesity and life expectancy may be shortened, particularly in association with obesity. There is limited natural history data for comorbidities, aspects of functioning and wellbeing, and how deficits in health and daily functioning are associated with workplace employment and quality of life. The mental health of the primary caregivers is placed under substantial strain when raising a child with PWS. Food seeking behaviours and anxiety are challenging and unpredictable and require constant vigilance. There is even less information on the wellbeing of primary caregivers.

This proposal will address this gap in the literature by developing and administering a family questionnaire to a nationwide sample of families with a child with PWS. Data collected will be used to characterise variations in phenotype and examine the predictors of child and family wellbeing.

Suitable For
☒ Honours  ☒ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications
- Bachelor’s degree in Science, Health Science or therapy areas
- Excellent communication skills
- Basic computer and statistical skills

Ethics Approval
☐ Obtained  ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Jenny Downs
(08) 9489 7774
Jenny.Downs@telethonkids.org.au
**MECP2 Duplication Syndrome: A New Cause of Intellectual Disability**

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Child Disability</th>
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<tr>
<td>Start Date</td>
<td>Available now</td>
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</tbody>
</table>
| Chief Supervisors | A/Professor Helen Leonard (Telethon Kids Institute)  
|                | A/Professor Jenny Downs (Telethon Kids Institute)  |
| Supporting Supervisor | Dr Kingsley Wong (Telethon Kids Institute)  |

**Project Outline**

Individuals who have two or more copies of the Methyl CpG Binding Protein 2 (MECP2) gene, located on the Xq28 chromosome, have been found to share a distinct clinical phenotype known as MECP2 duplication syndrome. Loss or mutation of the protein produced by this gene is associated with the rare disorder Rett Syndrome which mostly affects females and is well described in the literature. By contrast, the clinical outcomes arising from excess dosage of MECP2 are less well understood and cases of MECP2 duplication reported to date are predominantly male. The incidence and prevalence of the syndrome are totally unknown, as there have been no population-based studies undertaken. However, we have recently published a description of 56 individuals with a MECP2 Duplication who were registered with the InterRett database that is housed at the Telethon Kids Institute.

The aim of the current project will be to develop a family questionnaire specific for the new MECP2 Duplication Disorder Database in order to collect phenotype information at a deeper level from both national and international group of families affected by MECP2 Duplication. Thereafter, the goals will be to estimate the birth prevalence of the disorder in Australia; describe the natural history of MECP2 duplication syndrome and investigate associations between the phenotype and underlying genetic anomalies.

**Suitable For**

- ☐ Honours
- ☐ MD
- ☒ Masters
- ☒ PhD

**Essential Skills & Qualifications**

- Bachelor’s degree in Science, Health Science or other health-related area including genetics
- Computer and basic statistical skills

**Ethics Approval**

- ☐ Obtained
- ☒ Not Obtained

**Funding**

- ☐ Top-up scholarship offered by project
- ☐ Full scholarship offered by project

For more information, please contact:

A/Professor Jenny Downs  
(08) 9489 7774  
Jenny.Downs@telethonkids.org.au

A/Professor Helen Leonard  
(08) 9489 7790  
Helen.Leonard@telethonkids.org.au
Self-Reported Quality of Life in Children with Intellectual Disability

Research Team | Child Disability
Start Date | January 2019
Chief Supervisor | A/Professor Jenny Downs (Telethon Kids Institute)
Supporting Supervisors | A/Professor Helen Leonard (Telethon Kids Institute)
Simone Flavelle (DADAA)
Project Outline | Approximately 2% of children are born with intellectual disability. They often experience poor health and wellbeing but understanding quality of life is hampered by the difficulty in measuring quality of life in these children. Based on qualitative data collected from the parents of children with Down syndrome, Rett Syndrome, autism spectrum disorder and cerebral palsy, we recently developed a parent-report measure of quality of life called the Quality of Life Inventory – Disability (QI-Disability). We have established that it has satisfactory reliability and validity and we are currently using it to identify determinants of quality of life. However, many children with intellectual disability will be able to self-report quality of life but a suitable measure is not available.

This project aims to develop a valid measure of quality of life for children with intellectual disability using the framework developed for the proxy-reported quality of life measure. To develop a valid measure, qualitative data will be collected from children with intellectual disability, including those with Down syndrome, autism spectrum disorder and cerebral palsy, during interviews/focus groups, and from children's participation in art-related activities such as drama and drawing. These data will be developed into a measure and its psychometric properties will be pilot tested. This new measure will build capacity to determine individual care plans for children with intellectual disability.

Suitable For | ☑ Honours  ☑ MD  ☑ Masters  ☑ PhD
Essential Skills & Qualifications | • Bachelor’s degree in Science, Health Science or therapy areas
• Excellent communication skills
• Basic computer and statistical skills
Ethics Approval | ☑ Obtained  ☑ Not Obtained
Funding | ☑ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Jenny Downs
(08) 9489 7774
Jenny.Downs@telethonkids.org.au
Validating the Rett Syndrome Behaviour Scale in Rett Syndrome

Research Team

Child Disability

Start Date

January 2019

Chief Supervisor

A/Professor Jenny Downs (Telethon Kids Institute)

Supporting Supervisor

A/Professor Helen Leonard (Telethon Kids Institute)

Project Outline

Rett Syndrome is a rare genetic disorder that mainly affects girls and is associated with severe physical and intellectual disability. The Rett Syndrome Behaviour Scale (RSBQ) was developed to describe behaviours typically observed in Rett Syndrome and to distinguish children with Rett Syndrome from children with other intellectual disabilities. The RSBQ is being used in current clinical trials but its validity is extremely limited.

Our group has established the Australian Rett Syndrome Database which includes population and longitudinal data collected since 1993. The dataset also includes longitudinal RSBQ data since 2000. This project will involve qualitative and / or quantitative validation studies.

- Explore the meaning of the RSBQ items for Rett Syndrome using the “think aloud” technique and further explore behaviours in Rett Syndrome that are not captured in the RSBQ measure.
- Examine the reliability and validity of the RSBQ, including factor analysis, cross sectional relationships with other variables including quality of life and the longitudinal trajectories of the measured behaviours.

Suitable For

☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications

- Bachelor’s degree in Science, Health Science or other health-related area including genetics
- Excellent communication skills
- Computer and basic statistical skills

Ethics Approval

☐ Obtained ☒ Not Obtained

Funding

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Jenny Downs
(08) 9489 7774
Jenny.Downs@telethonkids.org.au
Environmental Influences on Early Health Behaviours

Research Team

Human Capability

Start Date
Flexible: 2018-2019

Chief Supervisor
A/Professor Hayley Christian (Telethon Kids Institute, UWA School of Population and Global Health)

Supporting Supervisor
Dr Gina Trapp (Telethon Kids Institute, UWA School of Population and Global Health)

Project Outline
This research forms part of the PLAYCE program of research – Places Spaces & Environments for Children’s Physical Activity. PLAYCE examines the influence of the physical, social and policy environment on young children’s physical activity, sedentary behaviour, eating behaviour, weight status, sun exposure and development at home, around the neighbourhood and whilst at childcare. This project will provide information on how best to create healthy childcare environments. The project involves qualitative research with children, parents, staff and key stakeholders in the childcare setting, as well as quantitative research measuring young children’s movement behaviours (physical activity, sedentary time and sleep), overweight/obesity, development and the influence of the childcare physical, policy and social environment. There is scope to investigate the influence of the home and neighbourhood environment on young children’s health behaviours as well as evaluate the impact of interventions to improve the childcare environment.

There is growing interest in interventions aimed at increasing children’s physical activity because of their potential reach and impact on the health and well-being of future generations. In the last decade there has been a 20% increase in the number of 0-4 year olds in WA with 63% of WA 2-3 year olds attending some type of child care. The child care setting is where children spend a considerable portion of their time, thus this is an important setting in which children should have the opportunity to accumulate physical activity and other forms of unstructured physical play to facilitate their health and development.

Suitable For
☒ Honours
☒ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications
• Ability to conduct quantitative and qualitative research
• Excellent writing skills
• Statistical analysis (SPSS/SAS)
• Ability to work as part of a team
• Good interpersonal and communication skills

For PhD candidates:
• Minimum 2A Honours degree

For Masters candidates:
• Degree in Public Health, Epidemiology, or related

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☒ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Hayley Christian
(08) 6488 8501
Hayley.Christian@uwa.edu.au
Impact of Nature Contact on Young Children’s Health & Wellbeing

Research Team | Human Capability
--- | ---
Start Date | Flexible: 2018-2019
Chief Supervisor | A/Professor Hayley Christian (Telethon Kids Institute, UWA School of Population and Global Health)
Supporting Supervisor | Dr Gina Trapp (Telethon Kids Institute, UWA School of Population and Global Health)

Project Outline
Contact with nature (plants and animals) is associated with children developing a sense of identity, autonomy, psychological resilience, self-regulation, gross motor skills and learning healthy behaviours. However, while the pathways through which contact with nature facilitates child health and development have been examined in older children, studies to date have not examined the effect of nature contact on young children’s health and development. Natural experiments of changes to the outdoor play environment in childcare centres and primary schools provide a unique opportunity to evaluate the impact of increased nature contact on the amount of time children spend in these environments, the types of play they engage in, their risk-taking assessment ability, social interactions and their physical health.

This research forms part of the PLAYCE program of research – Places Spaces & Environments for Children’s Physical Activity, and involves collaborating with industry partner Nature Based Play and Nature Play Australia. The project will evaluate the impact of Nature Based Play’s renovations to primary school and childcare centre outdoor spaces. The student will conduct a literature review on the effects of nature contact on children’s play, risk-taking behaviour, and social and physical health and wellbeing. The physical environment as well as educator, teacher and child behaviour and interactions with the outdoor play space will be examined both before and after the renovation. The amount of time children spend in these environments, the types of play they engage in, their risk-taking assessment ability, social interactions and physical health will be examined. The student will contribute to data collection, analysis and write up and communication of the findings.

Suitable For
☒ Honours
☒ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications
- Ability to conduct quantitative and qualitative research
- Excellent writing skills
- Statistical analysis (SPSS/SAS)
- Ability to work as part of a team
- Good interpersonal and communication skills

For PhD candidates:
- Minimum 2A Honours degree

For Masters candidates:
- Degree in Public Health, Epidemiology, or related

Ethics Approval | ☒ Obtained
Funding | ☒ Top-up scholarship offered by project

For more information, please contact:
A/Professor Hayley Christian
(08) 6488 8501
Hayley.Christian@uwa.edu.au
Influence of the Built Environment on Early Child Health and Development

Research Team

Human Capability

Start Date
Flexible: 2018-2019

Chief Supervisor
A/Professor Hayley Christian (Telethon Kids Institute, UWA School of Population and Global Health)

Supporting Supervisors
A/Professor Sally Brinkman (Telethon Kids Institute)
Dr Megan Bell (Telethon Kids Institute)

Project Outline
Developmental delays in physical health and wellbeing, social competence, emotional maturity, language, cognitive, and communication skills have significant health, social and economic consequences for later life. Across Australian suburbs there are inequalities in the proportion of children developmentally at risk. A significant amount of this inequality in developmental vulnerability remains unexplained. This project will examine the influence of the neighbourhood and home physical environment on early child health and development. It will provide evidence to inform the design of urban areas that are supportive of child health and development. The built environment incorporates land use patterns, transportation systems, building design, access to shops and services and social infrastructure, and creates conditions that are optimal (or detrimental) for early child health and development.

This research will use data from the Australian Early Development Census (AEDC) to examine neighbourhood attributes (e.g., access to child education and health services) associated with early child health and development outcomes. It will provide evidence to determine what are child-friendly environments in the context of neighbourhoods and what are optimal levels of built environmental features for early child health and development?

Suitable For
☒ Honours
☒ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications
• Ability to conduct quantitative and qualitative research
• Excellent writing skills
• Statistical analysis (SPSS/SAS)
• Ability to work as part of a team
• Good interpersonal and communication skills

For PhD candidates:
• Minimum 2A Honours degree

For Masters candidates:
• Degree in Public Health, Epidemiology, or related

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☒ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Hayley Christian
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Altitudes East West – a National Trial of an Online Intervention to Reduce Stress in Carers of Young People with Early Psychosis

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Youth Mental Health</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>Second semester 2018 or beginning 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Yael Perry (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Ashleigh Lin (Telethon Kids Institute, The University of Western Australia)</td>
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<tr>
<td>Project Outline</td>
<td>Carers of young people with first episode psychosis endure high levels of stress and depression, and eroded social networks. Family cognitive behaviour therapy (CBT) leads to significantly improved perceived stress, but there are well-known barriers to dissemination. To address this, we have developed a novel online intervention (‘Altitudes’) that integrates social networking, expert and peer moderation, and evidence-based psychoeducation. The Altitudes East West Trial is a multicentre clinical trial which will test the effectiveness of Altitudes on stress, depression, coping, and self-efficacy in carers of young people with early psychosis. The trial is currently funded until the end of 2019, and is a collaboration between researchers at Telethon Kids Institute, Australian Catholic University, Orygen, The National Centre for Excellence in Youth Mental Health, Melbourne University and Alfred Health. There is an opportunity for Honours or Masters students to become involved in the implementation of the trial, and to access and analyse data obtained during the course of the trial.</td>
</tr>
</tbody>
</table>

| Suitable For | ☒ Honours | ☐ MD | ☒ Masters | ☐ PhD |
| Essential Skills & Qualifications | | | | |
| | • An undergraduate degree in Psychology, Behavioural Science, or a related discipline |
| | • Experience working with young people with mental health difficulties and/or their families |
| | • Excellent communication skills |

| Ethics Approval | ☒ Obtained | ☐ Not Obtained |
| Funding | ☐ Top-up scholarship offered by project group | ☐ Full scholarship offered by project group |

For more information, please contact:
Dr Yael Perry
(08) 9489 7720
Yael.Perry@telethonkids.org.au
Improving Mental Health and Reducing the Suicide Risk for LGBTIQ Young People

Research Team | Youth Mental Health
---|---
Start Date | To be confirmed based on student’s needs: second semester 2018 and beginning in 2019 are available

Chief Supervisor | Dr Ashleigh Lin (Telethon Kids Institute, The University of Western Australia)
Supporting Supervisors | Depending on specific project:
Dr Yael Perry (Telethon Kids Institute)
Penelope Strauss (Telethon Kids Institute)
Dylan Gilbey (Telethon Kids Institute)

Project Outline | The Youth Mental Health team at Telethon Kids Institute is working on improving the mental health and wellbeing of LGBTIQ young people. We have several opportunities to conduct research and translation projects on the mental health of and suicide prevention for trans and gender diverse young people and/or same-sex attracted young people.

Potential new projects include:
- Creating an intervention to decrease suicide risk in this vulnerable group;
- Interventions to increase support and understanding in families of LGBTIQ young people;
- Translating research findings into the real world through advocacy; or,
- Working on one of a number of LGBTIQ-focused projects already underway in our team.

The specific project will depend on the interest and skills of the student and our projects are flexible based on the student’s time frame.

Suitable For | ☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications | • Undergraduate in Health Sciences
• Ability to work with young people and passion for the mental health of young people
• Appreciation and acceptance of diversity and equality of all people, regardless of age, gender, sexuality, race or religion

Ethics Approval | ☒ Obtained ☐ Not Obtained

Funding | ☐ Top-up scholarship offered by project group
☑ Full scholarship offered by project group

For more information, please contact:
Dr Ashleigh Lin
(08) 9489 7772
Ashleigh.Lin@telethonkids.org.au
LifeCycle: Combining International Pregnancy and Child Cohorts to Explore Cardiovascular, Respiratory, and Mental Health Outcomes

Research Team

Youth Mental Health: LifeCycle Project

Start Date

Flexible start date

Chief Supervisors

Supervisors will depend on the area of interest of the student:

- **Mental Health:**
  - Dr Ashleigh Lin (Telethon Kids Institute, The University of Western Australia)
  - A/Professor Rae-Chi Huang (Telethon Kids Institute)
  - Dr Sebastian Rauschert (Telethon Kids Institute)

- **Cardiovascular and Epigenetics:**
  - Dr Rachel Foong (Telethon Kids Institute)

- **Respiratory:**
  - A/Professor Graham Hall (Telethon Kids Institute, Curtin University)

Supporting Supervisors

TBC

Project Outline

The LifeCycle Project is a large project bringing together European, UK and Australian pregnancy and child cohort study researchers into a new network, the EU CHILD Cohort Network. This provides a unique opportunity to combine and compare cohorts from around the world. The ambitious project combines data on over 250,000 children and their parents from Europe and Australia to provide robust scientific evidence on the early life stresses which may affect health trajectories throughout life – primarily cardiovascular, respiratory and mental health. The WA Raine Study is part of the LifeCycle Project. We will identify early-life environmental stressors using an exposome model developed in LifeCycle.

We are looking for students to join our WA team. Students should be interested in any of the 3 primary outcome areas (cardiovascular, mental health and respiratory) or environmental health, or have highly advanced statistical skills that could be used to explore these large data sets in novel ways (e.g. machine learning, network analyses).

Suitable For

☒ Honours
☒ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications

- Undergraduate degree or experience in relevant area
- Strong statistical skills
- Interest in early determinants of health and epidemiology

Ethics Approval

☒ Obtained
☐ Not Obtained

Funding

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr Ashleigh Lin
(08) 9489 7772
Ashleigh.Lin@telethonkids.org.au
**Understanding the Physical and Mental Health Outcomes of Trans and Gender Diverse Young People Accessing Care at the Gender Diversity Service at Perth Children’s Hospital**

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Youth Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>Beginning 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Ashleigh Lin (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>Dr Julie Moore (Perth Children’s Hospital)</td>
</tr>
<tr>
<td></td>
<td>Dr Aris Siafarikas (Perth Children’s Hospital)</td>
</tr>
<tr>
<td></td>
<td>Simone Mahfouda (Telethon Kids Institute)</td>
</tr>
</tbody>
</table>

**Project Outline**

The Youth Mental Health team at Telethon Kids Institute is working on improving the mental health and wellbeing of trans and gender diverse young people. The GENTLE cohort is a longitudinal cohort of trans and gender diverse young people seeking support and hormonal intervention at the Gender Diversity Service at Perth Children’s Hospital. We consent young people at the service to be able to use their clinical physical and mental health information to answer important questions about the medium and long-term outcome of the clients seen at the service.

We are looking for students to join our committed and passionate team to provide the best outcome for trans and gender diverse young people. This project would suit students in Psychology, Social Work, Public Health or Medicine (with an interest in endocrinology, psychiatry, or adolescent medicine).

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<th>☒ Masters</th>
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<td>Essential Skills &amp; Qualifications</td>
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<tr>
<td></td>
<td>• Undergraduate in health sciences (e.g. Psychology, Social Work, Public Health), or those undertaking a Medical Degree)</td>
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<td></td>
<td>• Ability to work with young people and passion for the mental health of young people</td>
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<td></td>
<td>• Appreciation and acceptance of diversity and equality of all people, regardless of age, gender, sexuality, race or religion</td>
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<td></td>
<td>• Organised, conscientious, meticulous, and with an appreciation of the importance of confidentiality and research ethics</td>
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<tr>
<th>Ethics Approval</th>
<th>☒ Obtained</th>
<th>☐ Not Obtained</th>
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<tbody>
<tr>
<td>Funding</td>
<td>☐ Top-up scholarship offered by project group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Full scholarship offered by project group</td>
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</tbody>
</table>

*For more information, please contact:*
Dr Ashleigh Lin
(08) 9489 7772
Ashleigh.Lin@telethonkids.org.au
Chronic and Severe Diseases is a Research Focus Area (RFA) which focuses on diseases in children that require a very different investigation and treatment to similar conditions in adults.

Childhood cancers, diabetes, respiratory conditions and rare diseases can be debilitating and often life threatening. Effective intervention and prevention requires an understanding of the complex interactions between genetic and environmental factors, as well as a focus on better ways of diagnosing, treating and controlling disease at the individual and population level.

Research Programs & Teams listed:

**Cancer**
- Brain Tumour Research
- Leukaemia and Cancer Genetics
- Leukaemia Genomics
- Oncogenic Signalling

**Diabetes & Obesity**
- Cardiometabolic Sunhealth
- Diabetes and Obesity Research

**Respiratory Health**
- Airway Epithelial Research
- Children’s Lung Health
- P4 Respiratory Health for Kids
- Respiratory Environmental Health
Paediatric Brain Tumour Model Development and Preclinical Assessment of Novel Therapies

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Brain Tumour Research</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>Flexible, available immediately</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Raelene Endersby (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Nick Gottardo (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Project Outline</td>
<td>The Brain Tumour Research team at Telethon Kids is co-directed by Drs Nick and Raelene. The overarching goals of our group are to define the poorly understood basic biology of several types of childhood brain tumours and improve therapies. We achieve this in the following ways: • Elucidate the molecular basis of different brain tumour types, including medulloblastoma and ependymoma among others, through the analysis of primary patient specimens. • Improve understanding of the molecular events contributing to these diseases, by analysing the impact of altered signaling pathways on survival, proliferation, invasiveness and tumorigenicity of brain tumour cells. • Develop novel preclinical models of paediatric brain tumours in which to test new treatments. We utilise transplantable xenograft, patient derived xenograft, and genetically engineered tumour models representative of paediatric brain tumour in our translational research. • Obtain and test new therapies in combination with standard clinical chemotherapy and radiation protocols in appropriate brain tumour models. We acquired Australia’s first X-RAD SmART platform to model clinical radiation treatment and are currently investigating new therapies that can enhance its efficacy to hopefully reduce the harmful radiation dose. • Translate our findings into improved therapies through clinical collaborations.</td>
</tr>
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</table>

We currently have project opportunities for a self-motivated and enthusiastic individual. We invite you to meet with us to discuss specific projects. The student will develop expertise in a wide range of technologies including: • Animal techniques • Histology such as paraffin sectioning and immunohistochemistry • Cell/tissue culture from mouse and human specimens • Molecular techniques including DNA/RNA analysis, PCR and cloning • Biochemical techniques such as protein extraction, western blotting and IP Students are expected to have or develop excellent writing and oral presentation skills.

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<tr>
<th>Suitable For</th>
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<tr>
<td>Essential Skills &amp; Qualifications</td>
<td>• Ability to work in a multi-disciplinary team • Willingness to learn new skills and work with animals • Good organisational skills • Initiative and dedication</td>
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For Honours/Masters candidates: • Greater than credit average

For PhD candidates: • First-Class Honours degree or equivalent (e.g. Masters by Research) in biological discipline

Medical undergraduates wishing to undertake a BMedSci are also suitable

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<tbody>
<tr>
<td>Funding</td>
<td>☐ Top-up scholarship offered by project group</td>
<td>☐ Full scholarship offered by project group</td>
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For more information, please contact: Dr Raelene Endersby Raelene.Endersby@telethonkids.org.au (08) 9489 7851
The Bone Marrow Microenvironment during Leukaemogenesis

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Leukaemia and Cancer Genetics</th>
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</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>February 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Laurence Cheung (Telethon Kids Institute, Curtin University)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Rishi Kotecha (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
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</table>

**Project Outline**

The tumour microenvironment is well documented to be a key factor in multiple stages of cancer progression. It plays a particularly important role in resistance to therapy, relapse, and metastasis. While the tumour microenvironment in solid tumours has been intensely investigated, the importance of the leukaemia microenvironment has only recently been appreciated. Novel studies have demonstrated that the leukaemia microenvironment confers resistance in leukaemia, and that leukaemia cells usurp the normal haematopoietic microenvironment and are capable of altering the bone marrow microenvironment. However, the underlying mechanisms are not fully understood, and the bone marrow microenvironment of the most common childhood leukaemia has not been studied. With respect to children with this disease, bone marrow fibrosis correlates with worse survival, suggesting the importance of the bone marrow microenvironment in leukaemia progression.

We have developed a model that enables the comprehensive investigation of the architecture of bone marrow microenvironment during leukaemia progression. This project will define in detail the changes of the bone marrow microenvironment during leukaemogenesis and this is the first step towards the goal of identifying novel therapeutic targets in the leukaemia microenvironment. To perform the project, the student will develop expertise in

- Animal handling and tissue preparation;
- Tissue culture;
- Immunohistochemistry;
- Flow cytometry and cell sorting; and
- Gene expression analysis.

**Reference:**

Laurence Cheung, Jennifer Tickner...Charles Mullighan, Rishi Kotecha, Ursula Kees. New therapeutic opportunities from dissecting the pre-B leukemia bone marrow microenvironment. Leukemia 2018 (accepted)

<table>
<thead>
<tr>
<th>Suitable For</th>
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<th>☐ MD</th>
<th>☒ Masters</th>
<th>☒ PhD</th>
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<tr>
<td>Essential Skills &amp; Qualifications</td>
<td>• BSc (Hons)</td>
<td>• Good oral and written communication skills</td>
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<tr>
<td>Ethics Approval</td>
<td>☒ Obtained</td>
<td>☐ Not Obtained</td>
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<td></td>
</tr>
<tr>
<td>Funding</td>
<td>☐ Top-up scholarship offered by project group</td>
<td>☐ Full scholarship offered by project group</td>
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</tbody>
</table>

For more information, please contact:

Dr Laurence Cheung  
(08) 9489 7705  
Laurence.Cheung@telethonkids.org.au
Identification of Novel Drug Combinations to Cure High-Risk Infant Leukaemia

Research Team  Leukaemia and Cancer Genetics
Start Date  February 2019
Chief Supervisors  Dr Laurence Cheung (Telethon Kids Institute, Curtin University)
Dr Rishi Kotecha (Telethon Kids Institute, Perth Children’s Hospital)
Supporting Supervisors  N/A
Project Outline  Leukaemia is the most common type of cancer in children, and most patients have a disease called acute lymphoblastic leukaemia or ALL. Improvement in therapy over the past 50 years has seen a dramatic increase in the survival rate of children with ALL, and modern therapies for children achieve cure rates in more than 90% of patients. This is in sharp contrast to infants, who are defined as being less than one year old at the time they are diagnosed. For those with a particular genetic aberration, called MLLr, in their leukaemia and less than 3 months of age at diagnosis, outcome is dismal with 5-year survival of less than 40% and 16% respectively. Patients are treated with up to twelve potent chemotherapeutic drugs, yet more intensified therapy does not improve outcome for these babies due to an increase in toxic deaths, as demonstrated in international trials. Novel therapies are desperately needed.

We have established a preclinical drug testing pipeline aiming to discover novel drugs to treat infant with ALL. This project will involve high-throughput in vitro drug efficacy assessment as well as evaluation of the drug combination therapy using xenograft models.

To perform the project, the student will develop expertise in

- Animal handling and tissue preparation;
- Tissue culture;
- In vitro drug testing assays;
- Flow cytometry; and
- RNA and protein extraction.

References:
2. Laurence Cheung, Mark Cruickshank…Richard Lock, Ursula Kees, Rishi Kotecha. Romidepsin enhances the efficacy of cytarabine in vivo, revealing histone deacetylase inhibition as a promising therapeutic strategy for KMT2A-rearranged infant acute lymphoblastic leukemia (submitted)

Suitable For  ☒ Honours  ☐ MD  ☒ Masters  ☒ PhD
Essential Skills & Qualifications  □ BSc (Hons)
□ Good oral and written communication skills
Ethics Approval  ☒ Obtained  ☐ Not Obtained
Funding  □ Top-up scholarship offered by project group
□ Full scholarship offered by project group

For more information, please contact:
Dr Laurence Cheung
(08) 9489 7705
Laurence.Cheung@telethonkids.org.au
To Target Gain of Chromosome 21 in Paediatric Acute Leukaemia

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Leukaemia and Cancer Genetics</th>
</tr>
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<tbody>
<tr>
<td>Start Date</td>
<td>February 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Sébastien Malinge (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>N/A</td>
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</table>

**Project Outline**

Leukaemia is the most common type of cancer in children. Remarkable therapeutic advances have been made over the past sixty years, but specific types of acute leukaemia still have a poor prognosis and today, death from leukaemia still accounts for 22% of all cancer-related deaths for children in Australia. Current therapeutic approaches have now reached their maximum potential, highlighting the need for new efficacious treatments.

Chromosomal abnormalities are a hallmark of cancer. In paediatric acute leukaemia, gains of chromosome 21 is one of the most common alterations occurring in up to 40% of cases in B-cell leukaemia (B-ALL) and acute megakaryoblastic leukaemia (AMKL). Strikingly, children with Down syndrome (constitutive trisomy 21) have increased risk of developing B-ALL and AMKL, highlighting the link between chromosome 21 and both B-cell and megakaryocytic lineages.

In this project, we aim to develop new in vitro and in vivo models of leukaemia with gain of chromosome 21 to better understand its role in leukaemia predisposition and development. These models will represent useful tools to:

1. Identify the chromosome 21 genes implicated leukaemia development; and
2. Test new pharmacological agents targeting the related altered mechanisms.

Over the course of this project, the student will develop expertise in:

- Next generation sequencing (WES/WGS, RNAseq);
- Flow cytometry and cell sorting;
- Animal handling, tissue preparation and drug testing;
- Tissue culture and molecular biology; and
- CRISPR/Cas9 technology and screening strategies.

Since gains of chromosome 21 is frequent in paediatric leukaemia, this project will identify novel targets and provide alternative therapies to improve outcome of this children.

**Reference:**

Paola Rivera-Munoz, Anouchka Laurent, Aurelie Siret... Thomas Mercher, Sébastien Malinge. Partial trisomy 21 contributes to T cell malignancies induced by JAK3 activating mutations in murine models. (in revision)

**Suitable For**

☐ Honours  ☐ MD  ☒ Masters  ☒ PhD

**Essential Skills & Qualifications**

- BSc (Hons)
- Good oral and written communication skills

**Ethics Approval**

☒ Obtained  ☐ Not Obtained

**Funding**

☐ Top-up scholarship offered by project group  ☐ Full scholarship offered by project group

*For more information, please contact:*

Dr Sébastien Malinge  
(08) 9489 7854  
Sebastien.Malinge@telethonkids.org.au
Understand the Clonal Heterogeneity in Paediatric B-Cell Leukaemia

Research Team | Leukaemia and Cancer Genetics
--- | ---
Start Date | February 2019
Chief Supervisor | Dr Sébastien Malinge (Telethon Kids Institute, The University of Western Australia)
Supporting Supervisors | N/A

Project Outline

B-Cell acute lymphoblastic leukaemia (B-ALL) is the most common type of cancer during childhood. While the five-year overall survival currently exceeds 90% with modern protocols, there is a dismal prognosis for patients who relapse, with an overall survival of only 30%. Treatment options for these patients are limited and current therapeutic approaches have now reached their maximum potential, highlighting the need for new efficacious treatments.

In most cases, relapses arise from minor clones that already exist at the time of diagnosis. Therefore, characterizing these clones will:

1. Improve strategy to monitor response to current chemotherapy;
2. Better predict risk of relapse; and
3. Provide molecular and functional bases to test new pharmacological agents.

Using primary patient samples, we are combining cutting-edge technologies to characterize the clonal heterogeneity of B-ALL samples at the genetic, transcriptomic and proteomic level. In parallel, we are building a cohort of animal models named Patient-derived Xenografts (PDX) to better understand clonal architecture and evolution under the selective pressure of chemotherapy in vivo.

Over the course of this project, the student will develop expertise in:

- Next generation sequencing (WES/WGS, RNAseq, MiSeq);
- Single cell proteomic (CyTOF);
- Flow cytometry and cell sorting;
- Animal handling, tissue preparation and drug testing; and
- Tissue culture and molecular biology.

Combining these approaches, we aim to identify new molecular biomarkers of the therapy-resistant clones and find new therapies to target them.


Suitable For

| ☐ Honours | ☐ MD | ☒ Masters | ☒ PhD |

Essential Skills & Qualifications

- BSc (Hons)
- Good oral and written communication skills

Ethics Approval

☑ Obtained

Funding

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:

Dr Sébastien Malinge
(08) 9489 7854
Sebastien.Malinge@telethonkids.org.au
The Role of Germline Variants and Somatic Mutations in Leukaemia

Research Team | Leukaemia Genomics
--- | ---
Start Date | March 2019
Chief Supervisor | Dr Mark Cruickshank (Telethon Kids Institute)
Supporting Supervisor | Dr Jason Waithman (Telethon Kids Institute)

Project Outline

Acute lymphoblastic leukaemia (ALL) is the most common cancer in children. The overall cure rates for ALL has improved significantly with time and currently exceeds 90%, however, there are still high risk sub-types with poor prognosis. Infants diagnosed with ALL less than one year of age with a mixed lineage leukemia (MLL) gene rearrangement are a high-risk group with five-year event-free survival at less than 40%.

We are studying gene mutations and gene expression patterns that could trigger leukaemia; and exploring ways to target these aberrations with precision therapy. This is achieved through:

1. Genome- and transcriptome-sequencing cohorts of patients;
2. Generating in vitro and in vivo models for testing therapies; and
3. Testing the functional impact of these alterations.

This knowledge sheds light on the cancer genome and how it can be targeted providing better treatment.

The project is designed to elucidate the role of alterations to histone-modifying enzymes in infant ALL and to determine if they serve as therapeutic targets. The student will be part of the leukaemia genomics team, performing mechanistic studies. To perform the project, the student will develop expertise in:

- Molecular biology;
- Epigenetics;
- Tissue culture;
- Drug dose response analysis;
- RNA and protein extraction;
- Q-PCR and western blotting; and
- Immunohistochemistry.

Suitable For

☒ Honours ☐ MD ☐ Masters ☐ PhD

Essential Skills & Qualifications

- Bachelors in appropriate subject; eligibility to enrol in Honours
- Excellent organisational skills
- Competence in computing and at the laboratory bench
- Familiarity with basic molecular techniques

Ethics Approval

☒ Obtained ☐ Not Obtained

Funding

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Mark Cruickshank
(08) 9489 7859
Mark.Cruickshank@telethonkids.org.au
A First in Class Drug that Targets the Transcription Factor OLIG2 for the Treatment of Aggressive Childhood Brain Tumours

Research Team

Oncogenic Signalling

Start Date
February 2019

Chief Supervisor
Professor Terrance Johns (Telethon Kids Institute)

Supporting Supervisor
Dr Naomi Alexander (Telethon Kids Institute)

Project Outline
Childhood brain tumours kill more children than any other type of cancer. Diffuse intrinsic pontine glioma (DIPG), which has a peak incidence around 6-7 years of age, is almost always fatal with most children dying within one year of diagnosis. DIPG develops in the brain stem, a region comprising highly specialised nerve nuclei that are critical for life. Damage to the brain stem from tumour infiltration disrupts nerve communication and is ultimately fatal. The sensitivity of the brain stem rules out surgical tumour removal as an option. Moreover, despite several decades of radiotherapy, chemotherapy and numerous clinical trials, no effective treatment exists, thus new therapeutic options are urgently needed to improve survival outcomes for DIPG.

Abnormal transcription (the processes by which all cells turn their genes on and off) has been identified as a central defect in most types of cancers, including DIPG. Therefore, targeting transcription is a rational approach for treating cancer. Through our industry collaborator, Curtana Pharmaceuticals, we have access to CT179: the first and only biologically available drug that targets an important component of transcription known as OLIG2. OLIG2 is abnormally expressed in DIPG, where it is important for tumour growth. Thus, OLIG2 is a potential therapeutic target.

Targeting OLIG2 with CT179 represents a new therapeutic approach that needs to be evaluated in both patient-derived cell lines and appropriate mouse models to guide its clinical development. In this project, we will discover how CT179 kills DIPG cells in vitro and in mice. Through this work we will identify those children with the best chance of responding to CT179 and spare those who are unlikely to benefit from receiving a futile treatment. Overall, this project will lead to new therapeutic strategies that will have the genuine potential to extend the lives of children DIPG.

For a PhD candidate holding a Government or University Scholarship the Isabella and Marcus Fund would consider providing an additional stipend of $21,000.

Suitable For
☒ Honours
☐ MD
☐ Masters
☒ PhD

Essential Skills & Qualifications
• A relevant undergraduate degree

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☒ Top-up scholarship offered by project group
☒ Full scholarship offered by project group

For more information, please contact:
Professor Terrance Johns
(08) 9489 7852 or 0402 490 131
Terrance.Johns@telethonkids.org.au
Early Life Exposure, Maternal Obesity and their Effects on Respiratory Function in Childhood

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Cardiometabolic Sunhealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>July 2018</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Shelley Gorman (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>A/Professor Alex Larcombe (Telethon Kids Institute, Curtin University)</td>
</tr>
<tr>
<td>Project Outline</td>
<td>The in utero and neonatal times of early life are critical developmental periods that can shape an individual’s predisposition for asthma. Indeed, the effects of maternal obesity may have irreversible or exacerbating effects on the development of respiratory dysfunction and asthma in offspring. Epidemiological studies support this notion, but we are yet to determine if maternal obesity causes respiratory dysfunction/asthma. Moreover, the effects of early life environmental factors like sun exposure or infection are unknown. In this project we will use a mouse model of maternal obesity to examine lung function and asthma pathogenesis in offspring, testing the effects of insults (like viral infection) or possible interventions (like exposure to low dose (and safe) ultraviolet radiation) administered during and/or beyond the early developmental window. These studies provide us with an opportunity to explore potential mechanisms that may contribute towards the development of obesity-induced asthma. Please note: the availability of this project is dependent on the research team obtaining further funding.</td>
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| Essential Skills & Qualifications | • Undergraduate degree in Bachelor of (Medical) Science or related degree  
• Excellent written and oral communication skills  
• Very good organisational skills, motivation and dedication  
• Some statistical knowledge |

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<th>Ethics Approval</th>
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</table>

| Funding | ☐ Top-up scholarship offered by project  
☐ Full scholarship offered by project |

For more information, please contact:  
Dr Shelley Gorman  
(08) 9489 7884 or 0409 114 452  
Shelley.Gorman@telethonkids.org.au
Exploring how Ongoing Exposure to Low Dose Ultraviolet Radiation Prevents Weight Gain and Suppresses the Development of Type-2 Diabetes

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Cardiometabolic Sunhealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>July 2018</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Shelley Gorman (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Vance Matthews (UWA School of Medicine and Pharmacology)</td>
</tr>
</tbody>
</table>

**Project Outline**

Skin exposure to the ultraviolet radiation (UVR) component of sunlight results in the production of biological mediators, like vitamin D and nitric oxide that can modulate disease development.

Our novel studies have shown that chronic skin exposure to low dose UVR suppressed weight gain and signs of type-2 diabetes in adult mice fed a high fat diet through a nitric oxide-dependent mechanism.

In this project, we will use our animal modelling approach to explore mechanisms by which ongoing exposure to low dose (and safe) UVR curbs weight gain and the development of type-2 diabetes in mice fed a high fat diet.

These mechanisms may include examining the effects of UVR on:
- Metabolic processes and circadian rhythm in brown adipose tissue;
- Regulating appetite and/or activity; and
- IL-6-dependent processes that affect metabolism.

These studies may have important ramifications for the development of health policies and therapies that consider both the beneficial and detrimental effects of ongoing exposure to sunlight in early life and beyond.

*Please note: the availability of this project is dependent on the research team obtaining further funding.*

**Suitable For**

- ☒ Honours
- ☐ MD
- ☒ Masters
- ☒ PhD

**Essential Skills & Qualifications**

- Undergraduate degree in Bachelor of (Medical) Science or related degree (with First-Class or very good Second-Class Honours for PhD)
- Excellent written and oral communication skills
- Very good organisational skills, motivation and dedication
- Some statistical knowledge

**Ethics Approval**

- ☒ Obtained
- ☐ Not Obtained

**Funding**

- ☒ Top-up scholarship offered by project
- ☐ Full scholarship offered by project

*For more information, please contact:*

Dr Shelley Gorman
(08) 9489 7884 or 0409 114 452
Shelley.Gorman@telethonkids.org.au
Testing the Capacity of an Online Tool to Promote Safe Sun Behaviours in Teenagers

Research Team | Cardiometabolic Sunhealth
Start Date | July 2018
Chief Supervisor | Dr Shelley Gorman (Telethon Kids Institute)
Supporting Supervisors | TBC

Project Outline
In this project, we will test a prototype online tool that has recently been developed, with the goal of helping adolescents better balance their health needs for sun protection and sun exposure. Sun protection is important for this age group, as intermittent excessive exposure (causing sunburn) in childhood and adolescence is a major risk factor for melanoma, and other skin cancers. Melanoma is the most common cancer of young adults in Australia (15-29 year-olds). Recent research in WA youth has identified that sun protection messages need to target adolescents who are less likely to engage in the most effective sun protection behaviours, and are at increased risk of sunburn. Some safe sun exposure is necessary for health benefits, such as vitamin D. However, it is not easy to frame health messages that provide sun safety for protection from sunburn but allow sufficient sun exposure for optimal vitamin D. To our knowledge there is no online tool or App that specifically promotes better sun health behaviours, which has also been shown to subsequently improve sun behaviours by adolescents.

Summary
In this project, we will test a newly developed online tool, designed for and with adolescents, on its capacity to actively engage the target audience in an entertaining and age-appropriate way to deliver rigorously vetted health information around optimal sun protection and exposure.

Project Aim
To develop and pilot test a prototype online tool that aims to improve the knowledge and behaviours that young adolescents have around safe sun protection and exposure practices for vitamin D.

Research Objective
Obtain end-user responses (‘process’, including: engagement, functionality, aesthetics and information quality) and pilot test the capacity of the developed online tool to improve the sunhealth knowledge and behaviours in an independent cohort of young adolescents (aged 12-13).

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<td>• Undergraduate degree in Bachelor of (Medical) Science or related degree</td>
<td>• Excellent 2A Honours (if PhD)</td>
<td>• Statistical skills</td>
<td>• Excellent written and oral communication skills</td>
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<td>• Very good organisation</td>
<td>• Motivation and dedication</td>
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<tbody>
<tr>
<td></td>
<td>☐ Full scholarship offered by project group</td>
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</tbody>
</table>

For more information, please contact:
Dr Shelley Gorman
(08) 9489 7884 or 0409 114 452
Shelley.Gorman@telethonkids.org.au
**Co-Developing and Trialling an Intervention to Help Teachers and Coaches Support Children and Adolescents with Type 1 Diabetes when Physically Active**

**Research Team**  
Diabetes and Obesity Research

**Start Date**  
After August 2018

**Chief Supervisor**  
Dr Leanne Fried (Telethon Kids Institute, Perth Children’s Hospital)

**Supporting Supervisors**  
Professor Donna Cross (Telethon Kids Institute)  
Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)

**Project Outline**  
The physical and psychological benefits of physical activity are well recognized for people with type 1 diabetes (T1D). However, the challenges associated with managing T1D while physically active can be a barrier to a physically active life-style. A recent research project conducted through the Children’s Diabetes Research Centre found that a significant challenge experienced by adolescents when physically active was dealing with a lack of knowledge of T1D of teachers at school and coaches in the community. This not only meant that they didn’t receive the support they needed to be physically active but ‘wrong’ knowledge and lack of trust caused frustration and stress.

This project involves using adolescents and young adults with T1D as co-researchers to develop and trial an intervention that will enable teachers and coaches to support children and adolescents with T1D when physically active.

The specific aims of the project are:
- To co-develop an intervention that will support children and adolescents with T1D when physically active at school and in the community (targeted at teachers and coaches);
- To document the co-design process; and
- To trial the intervention and determine its feasibility and acceptability.

The project can be conducted as a qualitative study using a Participatory Action and Reflection methodology. Workshops will enable intervention co-design to occur and data can be collected using field notes, video recording and tasks. Appropriate analysis will be a qualitative content analysis approach. The project will be conducted through the Children’s Diabetes Centre with support from the Health Promotion and Education Research Team at Telethon Kids.

**Suitable For**  
☒ Honours  ☐ MD  ☒ Masters  ☐ PhD

**Essential Skills & Qualifications**  
- Undergraduate degree in Psychology, Health Science, Education or related degree  
- Excellent communication skills

**Ethics Approval**  
☐ Obtained  ☒ Not Obtained

**Funding**  
☐ Top-up scholarship offered by project  
☐ Full scholarship offered by project

*For more information, please contact:*  
Dr Leanne Fried  
(08) 9489 7614  
Leanne.Fried@telethonkids.org.au
### Continuous Glucose Monitoring Project

#### Research Team
**Diabetes and Obesity Research**

<table>
<thead>
<tr>
<th>Start Date</th>
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<tbody>
<tr>
<td>Chief Supervisor</td>
<td>Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Project Outline

The Children’s Diabetes Centre is an integrated clinical and research centre conducting research into Type 1 Diabetes (T1D) and childhood onset Type 2 Diabetes.

Continuous glucose monitoring is a technological method of monitoring blood glucose levels in individuals with T1D. The Centre conducts research using CGM, and currently holds a large repository of CGM data on a range of individuals with T1D. Many children and adolescents use CGM and there is a need to assist clinicians to help families interpret CGM information.

This project seeks to understand how this data can be used more effectively in management of T1D. This mixed method project will involve interviews/focus groups with clinicians in the Diabetes Clinic and other stakeholders including individuals with T1D and their families. This will collect data on how CGM data can be used to assist clinicians to help patients to better manage their condition. This could include recommendations for the development of resources that assist patients and their families in interpreting CGM data.

Further, this project will include the design and conduct of an analysis of the existing CGM data. The Centre offers Honours scholarships to competitive students.

#### Suitable For

| ☒ Honours | ☐ MD | ☐ Masters | ☐ PhD |

#### Essential Skills & Qualifications

- Outstanding undergraduate in Health Sciences, Public Health
- Interest in the impact and management chronic diseases such as Type 1 Diabetes in children and young people
- Good communication skills

#### Ethics Approval

| ☐ Obtained | ☒ Not Obtained |

#### Funding

| ☐ Top-up scholarship offered by project |
| ☐ Full scholarship offered by project |

*For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au*
Developing and Trialling a Peer Support Program for Students with Type 1 Diabetes in Schools

Research Team  Diabetes and Obesity Research
Start Date  No fixed start date
Chief Supervisor  Dr Leanne Fried (Telethon Kids Institute, Perth Children’s Hospital)
Supporting Supervisors  Professor Donna Cross (Telethon Kids Institute)
                        Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)

Project Outline  Adolescents with diabetes can experience physical, emotional, and social stress due to the demands of a complicated medical regimen. These demands can sometimes result in non-compliance. As adolescents decrease their dependence on their parents, they often rely on peers for support. Although at times peers may be negative influences they can also be important sources of constructive support. For example, peers are more likely than family members to provide companionship and emotional support in relation to diabetes care. A recent study found that more general positive relations with peers at one point in time predicted less diabetes distress a year later.

This project involves developing a group-based peer support program for adolescents with T1D and trialing this program in a school. The peer-support program will be developed with the help of adolescents with T1D.

The specific aims of the project are:
- To develop a group-based peer-support program for adolescents with T1D; and
- To determine the effects of this program on the adolescent’s diabetes management, diabetes distress and social functioning.

The project will be conducted as a mixed methods study. Quantitative data will measure the effects of the intervention on diabetes management and social functioning while qualitative data will help to shape the intervention and also determine its feasibility and adaptability. The project will be conducted through the Children’s Diabetes Centre with support from the Health Promotion and Education Research Team. The two main phases of this project: developing and trialling the intervention could be suitable as separate student projects.

Suitable For
☒ Honours  ☐ MD  ☒ Masters  ☐ PhD

Essential Skills & Qualifications
- Undergraduate degree in Psychology, Health Science, Education or related degree
- Excellent communication skills

Ethics Approval  ☐ Obtained  ☒ Not Obtained
Funding  ☐ Top-up scholarship offered by project  ☐ Full scholarship offered by project

For more information, please contact:
Dr Leanne Fried
(08) 9489 7614
Leanne.Fried@telethonkids.org.au
LifeCycle is a European Union funded project, combining multiple birth-cohort studies with an overall sample size of >250000 children. Overall, the goal is to develop the so-called EU CHILD Cohort Network, which combines developmental origins of health and disease research from Europe, the UK and Australia. The field of epigenetics, including heritable DNA methylation changes in the genome, has shown and replicated associations between methylation in cytosine-guanine sites (CpG-sites) and obesity outcomes, biological age and maternal smoking during pregnancy.

In the field of developmental origins of health and diseases, our goal is to find early predictive scores based on DNA methylation for the development of later cardiovascular health and disease related phenotypes. This would provide health professionals with a helpful screening tool for patients at risk for later adverse health outcomes.

For this exciting opportunity, we are looking for a highly motivated student to join our team at UWA. Students should be interested in epigenetics research, cardiovascular health and developmental origins of health and disease. Advanced statistical/bioinformatical or data analysis skills, preferably in R would be invaluable, including regression analysis, cluster analysis, pathway analysis or machine learning.

For more information, please contact:
A/Professor Rae-Chi Huang
(08) 9489 7753
Rae-Chi.Huang@telethonkids.org.au
Dr Sebastian Rauschert
(08) 9489 7924
Sebastian.Rauschert@telethonkids.org.au
**Glycaemic Responses to Varying Macronutrients in Type 1 Diabetes**

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<thead>
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<th>Diabetes and Obesity Research</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>No set start date</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Barbara Keating (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
<tr>
<td>Project Outline</td>
<td>Blood glucose is affected by what and when a person eats. The prevailing evidence shows carbohydrate having the greatest effect on these levels however, other macronutrients including fat and protein also play a role. Our diet studies looks closely at the relationship between the amount of carbohydrate and insulin required to maintain healthy blood glucose levels; as well as the impact of other factors such as gastric emptying and the proportion of macronutrients (fat, protein and carbohydrate) on blood glucose levels. Using data from existing trials, the project would involve interpreting blood glucose profiles following meals of varying macronutrients (that is, fat, protein and carbohydrate). This project using data on continuous glucose monitoring, will look at patterns and insulin requirements of various meals at various times containing varying proportions of macronutrients to determine appropriate quantity and delivery pattern of insulin with the aim of determining optimal glycaemic control for different meal types. This study attempts to look at real world conditions.</td>
</tr>
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</table>

| Suitable For | ☒ Honours ☐ MD ☐ Masters ☐ PhD |
| Essential Skills & Qualifications | |
| • Outstanding undergraduate in Dietetics, Public Health, Biostatistics |
| • Quantitative analysis skills |
| • Good communication skills |
| Ethics Approval | ☐ Obtained ☒ Not Obtained |
| Funding | ☐ Top-up scholarship offered by project |
| ☐ Full scholarship offered by project |

*For more information, please contact:*
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
### Impact of Food on Glycaemic Control in Individuals with Type 1 Diabetes

<table>
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<th>Research Team</th>
<th>Diabetes and Obesity Research</th>
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<tbody>
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<td>Start Date</td>
<td>No fixed start date</td>
</tr>
<tr>
<td>Chief Supervisors</td>
<td>Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)  Barbara Keating (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>TBC</td>
</tr>
<tr>
<td>Project Outline</td>
<td>The Children’s Diabetes Centre is an integrated clinical and research centre conducting research into Type 1 Diabetes and childhood onset Type 2 Diabetes. The Children’s Diabetes Centre includes researchers at the Telethon Kids Institute’s Diabetes Research Team and researchers and clinicians within the Diabetes Service at Perth Children’s Hospital as part of the Western Australian Department of Health.</td>
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Type 1 Diabetes is a 24/7 disease that requires constant management and vigilance. Blood glucose is affected by every mouthful of food and exercise — even sleeping, stress, fatigue, puberty, time of the day, time of the year, illness and temperature can affect blood glucose levels.

The goal of the Children’s Diabetes Centre is to improve the lives of children, adolescents and young adults living with diabetes and their families by improving outcomes, both now and into the future. Our primary objective is to generate significant new knowledge that will lead to tangible improvements in care. We do this by focused research studies across 6 research themes including food and nutrition and our research involves clinical investigations, clinical trials, epidemiological studies and qualitative research projects and we translate the results of these studies into the clinic and the community.

Our food and nutrition theme aims to better understand the impact of food on glycaemic control – that will be progressively translated into clinical practice and guidelines.

Specific studies are dependent on the interest of the prospective student. The Centre offers PhD and Honours scholarships to competitive students.

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<td>Essential Skills &amp; Qualifications</td>
<td>• Outstanding academic record in relevant discipline • First-Class Honours in a relevant discipline • Interest in clinical dietetics/nutrition • Good communication skills</td>
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<td>Funding</td>
<td>☐ Top-up scholarship offered by project</td>
<td>☐ Full scholarship offered by project</td>
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For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
LifeCycle: Combining International Pregnancy and Child Cohorts to Explore Cardiovascular, Respiratory, and Mental Health Outcomes

Research Team

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<tr>
<td>Supervisors will depend on the area of interest of the student:</td>
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<tr>
<td>Cardiovascular and Epigenetics:</td>
</tr>
<tr>
<td>A/Professor Rae-Chi Huang (Telethon Kids Institute)</td>
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<tr>
<td>Dr Sebastian Rauschert (Telethon Kids Institute)</td>
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<tr>
<td>Mental Health:</td>
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<tr>
<td>Dr Ashleigh Lin (Telethon Kids Institute)</td>
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<tr>
<td>Respiratory:</td>
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<tr>
<td>A/Professor Graham Hall (Telethon Kids Institute, Curtin University)</td>
</tr>
<tr>
<td>Dr Rachel Foong (Telethon Kids Institute)</td>
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</table>

Supporting Supervisors

| N/A |

Project Outline

The LifeCycle Project is a large project bringing together European, UK and Australian pregnancy and child cohort study researchers into a new network, the EU CHILD Cohort Network. This provides a unique opportunity to combine and compare cohorts from around the world. The ambitious project combines data on over 250,000 children and their parents from Europe and Australia to provide robust scientific evidence on the early life stresses which may affect health trajectories throughout life – primarily cardiovascular, respiratory and mental health. The WA Raine Study is part of the LifeCycle Project. We will identify early-life environmental stressors using an exposome model developed in LifeCycle.

We are looking for students to join our WA team. Students should be interested in any of the 3 primary outcome areas (cardiovascular, mental health and respiratory) or environmental health or have highly advanced statistical skills that could be used to explore these large data sets in novel ways (e.g. machine learning, network analyses).

Suitable For

☒ Honours ☒ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications

- Undergraduate degree or experience in relevant area
- Strong statistical skills
- Interest in early determinants of health and epidemiology

Ethics Approval

☒ Obtained ☐ Not Obtained

Funding

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Rae-Chi Huang
(08) 9489 7753
Rae-Chi.Huang@telethonkids.org.au
Managing Type 1 Diabetes during Exercise – A Descriptive Study of Competitive Athletes with Type 1 Diabetes

Research Team
Diabetes and Obesity Research

Start Date
No fixed start date

Chief Supervisor
Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors
TBC

Project Outline
Type 1 Diabetes Mellitus (T1DM) is a chronic auto-immune disease affecting the pancreas's insulin production, causing high-blood sugar levels (hyper-glycaemia). Its primary age of onset is in childhood and adolescence. The primary intervention for T1DM is insulin therapy, strongly supported by healthy diet and regular exercise and physical activity (P-A). The benefits of P-A and exercise for all people are extensive, and is associated with greater cardiovascular health, muscle and bone strength, improved mood and self-esteem, and reducing the risk of cardiovascular disease, depression, osteoporosis and other chronic diseases. This is particularly relevant to individuals with T1DM, as disease complications are associated with poorer diabetic control and management. Although exercise is a mainstay of T1DM management, children and, in particular adolescents, with T1DM have been shown to spend less time being physically active than their non-diabetic peers. This is often due to difficulties faced in managing their condition including:

- Variability of blood glucose levels before, after and during exercise
- Planning and consumption of appropriate foods
- Practical difficulties associated with the testing of blood glucose levels
- Utilising new technologies in diabetes care
- Understanding social or community perceptions about exercising with T1DM, as well as managing their own self-confidence

Historically, athletes with T1DM are highly proficient at managing their condition independently and are their own ‘expert’ or ‘physician’. Therefore, clinicians can often learn valuable lessons from this patient cohort.

The aim of this study to describe the strategies used by young (13-30 years of age) competitive athletes with T1DM to manage their condition while performing. This information will be used to inform in clinic and community interventions to improve physical activity rates in young people with T1DM.

This survey research project will collect information from young (13-30 years of age) competitive athletes with T1DM across a variety of sports and athletic pursuits. This descriptive study is also expected to reveal areas of future research regarding T1DM and physical activity.

Suitable For
☒ Honours ☐ MD ☐ Masters ☐ PhD

Essential Skills & Qualifications
- Undergraduate in Health Sciences, Public Health, Exercise Science or other relevant area
- Interest in survey and qualitative research
- Good communication skills

Ethics Approval
☐ Obtained ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
Mental Health and Wellbeing in Type 1 Diabetes

<table>
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<th>Research Teams</th>
<th>Diabetes and Obesity Research</th>
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<table>
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<tr>
<th>Chief Supervisor</th>
<th>Dr Ashleigh Lin (Telethon Kids Institute)</th>
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<tr>
<th>Supporting Supervisors</th>
<th>N/A</th>
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| Project Outline | The Children’s Diabetes Centre is an integrated clinical and research centre conducting research into Type 1 Diabetes (T1D) and childhood onset Type 2 Diabetes. The Children’s Diabetes Centre Mental Wellbeing Strategy was designed with the aim of improving the lives of children and adolescents living with T1D and their families by reducing the psychosocial impact of T1D. The burden of having diabetes is enormous and we are conducting several studies trying to understand how we can help relieve diabetes-related distress that can lead to mental health issues, not only of those living with a chronic condition but also their families. We are interested in understanding how changes in blood glucose levels affect anxiety and mental wellbeing for children and young people with T1D and we will use this information to design and trial interventions that help people with T1D and their families. We are also planning studies that will examine mental health and stress in young people with T1D, and how these are related to diabetes-related behaviours (e.g. checking blood glucose) and physical health. Because the Children’s Diabetes Centre is a world leader in the use of diabetes technology, we are also conducting projects related to the impact of technology on the wellbeing of young people with T1D and their families. Specific studies are dependent on the interest of the student. This is an opportunity to join a large and successful team of researchers in T1D. The Centre offers PhD scholarships and Honours scholarships to competitive students. |

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<th>Essential Skills &amp; Qualifications</th>
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<tbody>
<tr>
<td>• Undergraduate in Psychology, Health Sciences, or currently completing a Medical Degree with an interest in mental health</td>
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<tr>
<td>• Interest in the mental health and wellbeing of children and young people and their families</td>
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<td>• Good communication skills</td>
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For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
LifeCycle is a European Union funded project, combining multiple birth-cohort studies with an overall sample size of >250000 children. Overall, the goal is to develop the so-called EU CHILD Cohort Network, which combines developmental origins of health and disease research from Europe, the UK and Australia. Multiple so called “Oomics” fields have emerged in the past decade, including metabolomics and epigenetics. These two fields are both used to find biomarker for the early detection of later disease outcomes.

Metabolomics has shown in several studies, that there are associations between molecules involved in the amino acid and lipid metabolism with cardiometabolic outcomes such as obesity. Epigenetics changes in CpG methylation have been associated with genes relevant to the development of obesity. The aim of this “multi-omics” project is to find associations between early life events, epigenetic changes and metabolomic outcomes in association with cardiometabolic risk.

For this cutting-edge project, we are looking for a highly motivated student with advanced statistical/bioinformatical/data analysis skills, preferably in R. The applicant should have experience in regression analysis, cluster analysis, predictive modelling or machine learning.
Negotiating the Path to Self-Management of T1D – Adolescents’ and Parents’ Perspectives

Research Team: Diabetes and Obesity Research

Start Date: After August 2018

Chief Supervisor: Dr Leanne Fried (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors: Professor Donna Cross (Telethon Kids Institute)
Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)

Project Outline: Many adolescents with type 1 diabetes (T1D) and their parents struggle through the adolescent period with sharing of responsibility for diabetes management and movement towards adolescent self-management. Research has shown that these struggles can result in poor blood glucose control for the adolescent with T1D and raised levels of anxiety for both the adolescent and the parent. To help adolescents with T1D and their parents through this transition it is useful to better understand how the transfer of responsibility is negotiated, what conflicts can occur during this period and what works to help the adolescent, parents and family as a whole. This study will aim therefore to better understand the transition to self-management from the perspectives of both the adolescent with T1D and their parents. This project will be conducted as a mixed method study. Quantitative data will be collected to measure self-management, quality of life and child-parent conflicts while qualitative data will be used to explore in depth how adolescents and parents negotiate this transition and what they need to help with this.

This study will be conducted through the Children’s Diabetes Centre with support from the Health Promotion and Education Research Team at Telethon Kids Institute. As a student project, the student will be involved in all aspects of this project including conceptualisation, data collection, data analysis and translation.

Suitable For: ☒ Honours ☐ MD ☒ Masters ☐ PhD

Essential Skills & Qualifications:
- Undergraduate degree in Psychology, Health Science, Education or related degree
- Excellent communication skills

Ethics Approval: ☐ Obtained ☒ Not Obtained

Funding: ☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr Leanne Fried
(08) 9489 7614
Leanne.Fried@telethonkids.org.au
Trial of Exercise Guidelines for Individuals with Type 1 Diabetes

Research Team  Diabetes and Obesity Research
Start Date  August 2018 (or as soon as possible)
Chief Supervisor  Professor Elizabeth Davis ((Telethon Kids Institute, Perth Children’s Hospital)
Supporting Supervisor  Dr Vinutha Shetty (Telethon Kids Institute, Perth Children’s Hospital)
Project Outline  Regular exercise has numerous health benefits for people with Type 1 Diabetes (T1D). Despite these benefits, many young people with T1D find participating in exercise challenging, and these challenges can act as barriers to engaging in a physically active lifestyle. Barriers to exercise include the difficulty of maintaining normal blood glucose level during and after exercise and the fear of immediate and delayed hypoglycaemia, especially hypoglycaemia during sleep. Although there are many exercise guidelines, they are inadequate in consistently helping in preventing fluctuations in glucose levels and decreasing the fear of hypoglycaemia. This is due to lack of knowledge on the various factors that affect blood glucose levels during exercise.

These gaps in knowledge related to exercising with T1D have been identified by our research team and we have completed studies designed to address these gaps. The lack of good educational resources for exercise advice and the inconsistency of messages from different health care professionals have resulted in lack of confidence in young people with diabetes about exercising safely. As a result, our Centre is involved in developing evidence-based exercise guidelines for individuals with T1D.

This project involves a trial of these guidelines in the community through the conduct of a randomised controlled trial with the primary outcome measure as incidence of hypoglycaemic events. The control group will be assigned to usual care/current guidelines and the test group will use the new guidelines. There is a potential for other related projects in this area that may include studies that result in the translation of these guidelines into clinical practice.

Suitable For  ☒ PhD
Essential Skills & Qualifications  • First-Class Honours in Health Sciences, Public Health, Exercise Science or other relevant area
  • Interest in translation
  • Good communication skills
Ethics Approval  ☒ Not Obtained
Funding  ☐ Top-up scholarship offered by project
  ☐ Full scholarship offered by project

For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
Vitamin D and Type 1 Diabetes

Research Team
Diabetes and Obesity Research

Start Date
No fixed start date

Chief Supervisor
Dr Aveni Haynes (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors
Professor Elizabeth Davis (Telethon Kids Institute, Perth Children’s Hospital)

Project Outline
Early environmental determinants of pancreatic islet autoimmunity: a pregnancy to early life cohort study (ENDIA) in children at risk of type 1 diabetes (T1D) is a multi-centre study involving researchers in South Australia, Victoria, New South Wales, Western Australia and Queensland. This prospective cohort follows children who are at risk of developing T1D from the gestational period into the first 3 years of life. Pregnant women who have T1D or where their unborn child has a first degree relative with T1D are being recruited to the study.

This study is looking for the causes of T1D, so that we can find ways to prevent it. T1D in children is twice as common as it was 20 years ago. It is proposed that this is because the environment we live in has changed and this has made it more likely for a child at risk to develop T1D. The study will follow many women around Australia during pregnancy until early childhood, looking at the child’s birth, environment and genes.

This student project using ENDIA data will look at the possible impact of Vitamin D in the development of T1D. It will involve quantitative data analysis to determine the proportion of infants born to mothers with Vitamin D deficiency to assess whether there is a difference in this proportion between infants at risk of T1D compared with infants in the general population (sourced from another dataset).

The study will also look at the impact of other variables including maternal ethnicity, maternal age, socioeconomic status, latitude of birth, Vitamin D supplementation status, season of birth, and other relevant variables. The Children’s Diabetes Centre offers competitive Honours scholarships to outstanding students.

Suitable For
☒ Honours ☐ MD ☐ Masters ☐ PhD

Essential Skills & Qualifications
• Outstanding undergraduate in Health Science, Public Health
• Biostatistical experience
• Good communication skills

Ethics Approval
☐ Obtained ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Tanyana Jackiewicz
Tanyana.Jackiewicz@telethonkids.org.au
Determining the Effect of Experimental Human Rhinoviral Evolution in Children with Cystic Fibrosis

Research Team

Airway Epithelial Research

Start Date
February 2019

Chief Supervisor
Dr Patricia Agudelo-Romero (Telethon Kids Institute)

Supporting Supervisors
Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)
A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)
Dr Luke Garratt (Telethon Kids Institute)
Dr Erika Sutanto (Telethon Kids Institute)
Dr Kevin Looi (Telethon Kids Institute)

Project Outline
The emergence of new viral pathogens is a global health issue that mainly affects children, immunocompromised adults and the elderly. Cystic fibrosis (CF) is a common genetically inherited disease affecting mostly Caucasians. Lung infections in those with CF by rhinovirus (RV) typically result in bronchial inflammation especially during pulmonary exacerbations. RV belongs to the family Picornaviridae and are non-enveloped viruses with single-stranded positive sense RNA genomes. The viral genome is translated as a single, long polypeptide, which is proteolytically cleaved to produce 11 proteins. These include four structural proteins (VP1 to 4) which are used as targeted regions for; RV detection, assessment of species diversity, and serotype identification of RV variants in diagnostic procedures.

Since it is important to determine the genetic and evolutionary factors involved in the emergence of new viruses in vulnerable populations, we propose to perform an experimental evolution in epithelial cells derived from different CF backgrounds (mild-, intermedia-, strong- CFTR gene effects) and healthy controls. From the host perspective, we will explore gene expression profiles of RV-evolved through different CF-backgrounds in comparison with the ancestor and non-CF controls. Additionally, we will also study how these different CF-backgrounds shape the virus population exploring its phenotype and genotype. Both aims will be performed using a Dual RNA-seq approach.

This research will determine the relationship between changes in the viral genome and the gene expression signature of CF patients. Data will identify potential pathways for the designing of new therapeutic approaches, as well as to ascertaining changes in the viral genome with potential application in vaccine design.

Suitable For
☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications
• Above average written and oral communications skills
• Motivation and organisational skills
• Able to work as a part of a team

Ethics Approval
☒ Obtained ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Patricia Agudelo-Romero
(08) 6151 1082
Patricia.AgudeloRomero@telethonkids.org.au
Establishing the Lung Virome Profiles in Children with and Without Cystic Fibrosis

Research Team
Airway Epithelial Research

Start Date
February 2019

Chief Supervisor
Dr Patricia Agudelo-Romero (Telethon Kids Institute)

Supporting Supervisors
Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)
A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)
Dr Luke Garratt (Telethon Kids Institute)
Dr Erika Sutanto (Telethon Kids Institute)
Dr Kevin Looi (Telethon Kids Institute)

Project Outline
Cystic fibrosis (CF) is a genetic disease caused by mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. The lungs and digestive systems of individuals with CF function abnormally producing an excessive amount of thick and sticky mucus. Respiratory illnesses produced by viral infections could play a pivotal role in the decline of lung functions in CF patients, since the prevalence of these infections is higher in CF patients than in the normal population. Therefore, exploring the lung human virome is a key priority in order to evaluate the significance of this component of the lung microbiota in the progression of CF.

Our main objective is to study the host-virome interaction in epithelial cells derived from CF patients and healthy controls. With this end, enrichment of RNA and DNA viruses will be performed followed by next generation sequencing analysis. Bioinformatic pipelines will be used to explore viral population dynamics in CF and control cells, as well as the analysis of virus polymorphisms and potentially the identification of new viral species.

Outcome from this study will give us to a better understanding about how the CF-associated lung environment influence in shaping the virome population.

Suitable For
☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications
• Above average written and oral communications skills
• Motivation and organisational skills
• Able to work as a part of a team

Ethics Approval
☒ Obtained ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Patricia Agudelo-Romero
(08) 6151 1082
Patricia.AgudeloRomero@telethonkids.org.au
Exploring the Effects of Repeated Infections on Airway Epithelial Junctions in Childhood Asthma

Research Team
Airway Epithelial Research

Start Date
February 2019

Chief Supervisor
A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)

Supporting Supervisors
Dr Kevin Looi (Telethon Kids Institute)
Dr Ingrid Laing (Telethon Kids Institute)
Dr Thomas Iosifidis (Telethon Kids Institute)
Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)

Project Outline
Asthma is a lifelong illness affecting the respiratory airways and poses a significant burden in Australia. The airway epithelium lines the respiratory tract to create a protective barrier from foreign pathogens, such as viruses, and plays an essential role in the state of health or disease. Research from our group has shown that these airway epithelial cells are inherently altered in children with asthma compared to non-asthmatic and that the protective barrier provided by these cells are further affected after a common-cold infection. Given that there is a relationship between the cell lining and the reaction to virus infection in asthma, we hypothesize that repeated viral infections in early life in susceptible individuals augments the expression of vital junctional proteins towards a more asthmatic phenotype.

To investigate this, we aim to assess the associations and changes in epithelial junction responses after virus infection and through next-generation sequencing, identify new areas to improve and strengthen the barrier provided by the airway cells in young children with asthma. There is now an opportunity for motivated students to help us explore and understand the consequences of repeated viral infections on the airway epithelium using a variety of downstream analytical techniques. Techniques involved may include, but are not limited to: primary cell culture using stringent aseptic techniques, ELISAs, protein extraction, In-Cell Westerns, gene expression, next-generation sequencing analysis and confocal microscopy.

Suitable For
☒ Honours
☐ MD
☐ Masters
☒ PhD

Essential Skills & Qualifications
• Excellent written and oral communication skills
• Able to work as part of a team
• Highly motivated and organized

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Kevin Looi
(08) 6151 1082
Kevin.Looi@telethonkids.org.au
# Exploring the Therapeutic Potential of Phage Therapy to Treat Pseudomonas Aeruginosa Infection in Children with Cystic Fibrosis

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Airway Epithelial Research</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>February 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)</td>
</tr>
</tbody>
</table>
| Supporting Supervisors | Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)  
Dr Luke Garratt (Telethon Kids Institute)  
Dr Erika Sutanto (Telethon Kids Institute) |

## Project Outline

Cystic fibrosis (CF) is a genetically inherited disease affecting mostly the Caucasian population. There are over 300 individuals with CF in WA and 12-15 newborns are diagnosed each year following newborn screening. As part of the Australian Respiratory Early Surveillance Team for CF, we have demonstrated that early lung damage present early in life and that the lungs of children with CF are prone to inflammation from birth.

Cystic fibrosis is caused by mutations in the CFTR gene. Loss of its function leads to abnormal amounts of excessively thick and sticky mucus within the lungs which then traps bacteria including Pseudomonas. Recurrent infections of this kind over time leads to irreversible lung damage and death due to lung failure. Intravenous and inhaled antibiotic therapies remain the current treatment strategy for bacterial lung infections. However, antibiotic resistant bacterial strains have emerged as major causes of mortality in hospitals worldwide and antibiotic resistance by Pseudomonas remains a serious problem in children with CF. This study will investigate the use of Bacteriophages (viruses that infect and kill bacteria, ‘phages’) as a novel therapeutic approach to treat Pseudomonas and other biofilm causing infection. Being more specific and with less side effects, phage therapy is an exciting alternative that is much cheaper, less toxic, and more effective than current strategies.

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<thead>
<tr>
<th>Suitable For</th>
<th>☒ Honours</th>
<th>☐ MD</th>
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</table>
| Essential Skills & Qualifications | • Bachelor of Science or equivalent  
• Above average written and oral communication skills  
• Motivation and organisational skills  
• Able to work as part of a team |
| Ethics Approval | ☒ Obtained | ☐ Not Obtained |
| Funding | ☐ Top-up scholarship offered by project group  
☐ Full scholarship offered by project group |

For more information, please contact:  
A/Professor Anthony Kicic  
6151 1082  
Anthony.Kicic@telethonkids.org.au
Identifying and Targeting the Cellular Pathobiology Underlying Defective Airway Repair in Childhood Asthma

**Research Team**

<table>
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<tr>
<th>Airway Epithelial Research</th>
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</thead>
</table>

**Start Date**

February 2019

**Chief Supervisor**

A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)

**Supporting Supervisors**

Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)
Dr Thomas Iosifidis (Telethon Kids Institute)

**Project Outline**

Our Research Team has made significant advances in understanding the intrinsic abnormalities of the airway epithelium of asthmatic children having demonstrated that asthmatic epithelia are compromised in the ability to repair following injury. Specifically, epithelial cells from asthmatics have a dysregulated migration process that results in a failure to reconstitute a healthy epithelial barrier when damaged. This project will identify the regulatory mechanisms that are involved in defective cell migration, using an integrative systems approach.

Our transcriptomics analyses of a unique population of airway epithelial cells (AEC) actively engaged in repair, or ‘leading edge cells’, has already revealed two gene networks of interest that converge at α5β1 integrin. Expanding on this already revealing result, we will engage multi-omic technologies to further dissect this network and its links to cell migration. Each of the gene networks will be characterized in the AEC, using a systems level approach of computational and mathematical modeling of the regulatory pathways in AECs. Both networks are already known to be therapeutically targetable, such that this substantial program of work will contribute significantly to global initiatives to identify novel therapies for asthmatics.

**Hypothesis:** Dysregulated epithelial repair in asthmatics is due to defective migration and the underlying cellular pathobiology is therapeutically targetable.

This project will focus on 2 identified independent but interrelated gene networks of interest that appear to regulate repair and interact with α5β1 integrin pathways; (1) **Erb-B2 Receptor Tyrosine Kinase 2 signalling (ErbB2)**, (2) **Erb-B1 Receptor Tyrosine Kinase 1 signalling (ErbB1)**. We aim to identify in vitro, how each signalling gene network affects integrin expression and resultant cell migration in response to injury.

**Suitable For**

☒ Honours ☐ MD ☒ Masters ☒ PhD

**Essential Skills & Qualifications**

- Bachelor of Science or equivalent
- Above average written and oral communication skills
- Motivation and organisational skills
- Able to work as part of a team

**Ethics Approval**

☒ Obtained ☐ Not Obtained

**Funding**

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Anthony Kicic
(08) 6151 1082
Anthony.Kicic@telethonkids.org.au
Testing the Unified Airway Hypothesis in the Setting of Asthma

Research Team

Airway Epithelial Research

Start Date
February 2019

Chief Supervisor
A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)

Supporting Supervisors
Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)
Dr Emma de Jong (Telethon Kids Institute)
Dr Kevin Looi (Telethon Kids Institute)
Dr Anthony Bosco (Telethon Kids Institute)
Dr Thomas Iosifidis (Telethon Kids Institute)

Project Outline
In recent years our group has led a paradigm shift in understanding with regard to the pathobiology of asthma revealing the epithelium as an important contributor to disease pathogenesis. The functional evidence that the epithelium can play a primary role in asthma has accumulated relatively slowly due to the difficulty obtaining airway tissue from patients with asthma & crucially, from healthy controls. The paucity of airway tissue has particularly limited our ability to investigate the roles of the epithelium in childhood asthma. We aim to better understand the role of the epithelium in asthma and to determine whether there is a unified signature pattern and cellular response between the upper (nasal) and lower (tracheal) airway in children and adults. We believe that the approach we have taken will result in new therapeutic targets and a means to better understand the development of asthma from childhood.

Aims:
1. To analyse global gene expression in nasal and tracheal AEC from children with and without asthma;
2. To characterise expression patterns between the upper and lower airways; and
3. To validate similar and regionally distinct expression patterns at the functional level.

Suitable For
☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications
• Bachelor of Science or equivalent
• Above average written and oral communication skills
• Motivation and organisational skills
• Able to work as part of a team

Ethics Approval
☒ Obtained ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Anthony Kicic
(08) 6151 1082
Anthony.Kicic@telethonkids.org.au
Advanced Analysis of CT Scans of Lung Disease

Research Teams

**Children’s Lung Health**
- P4 Respiratory Health for Kids
- Respiratory Environmental Health

Start Date
Flexible

Chief Supervisor
A/Professor Peter Noble (The University of Western Australia)

Supporting Supervisors
- Dr Tim Rosenow (Telethon Kids Institute)
- Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)
- Professor Alan James (Sir Charles Gairdner Hospital)

Project Outline
Medical imaging technologies such as Computed Tomography (CT) scans are critical tools for the diagnosis and management of lung disease. However, current methods of analysis and reporting of CT scans are crude, lacking objectivity and reproducibility. Advanced techniques in development have the potential to provide more sensitive and accurate outcome measures, but need further optimisation and testing in patient groups before they can become part of routine clinical use.

In this project, you will use a number of newly developed image analysis techniques to compare CT scan outcomes between patients across several clinical cohorts. These techniques include both automated and manual 3D analysis of scans taken from children and adults with a range of diseases, including cystic fibrosis, bronchopulmonary dysplasia (preterm birth), COPD, and asthma. The results from this project will be used to develop new tools for use in the clinic.

Suitable For
☒ Honours  ☐ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications
- Undergraduate degree in Physiology, Medical or Health Science, Biomedical Engineering, or Biomedical Physics

Ethics Approval
☒ Obtained  ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Tim Rosenow
(08) 9489 7809
Tim.Rosenow@telethonkids.org.au
Aetiology of Childhood Acute Asthma

Research Teams

Children’s Lung Health
Infectious Diseases Epidemiology

Start Date
March 2019

Chief Supervisor
Dr Ingrid Laing (Telethon Kids Institute, The University of Western Australia)

Supporting Supervisors
A/Professor Guicheng Zhang (Curtin University)
Professor Peter Le Seouf (The University of Western Australia)

Project Outline

Background
Asthma is one of the most common reasons children need emergency medical treatment in Western Australia. Our research program involves studying young children during the peak of their acute asthma attack. Studying children at this time with a follow-up on recovery is the best way to discover the underlying causes of asthma. Most attacks are due to viruses and we use the latest and most powerful biological technologies to discover how viruses cause serious wheeze. These technologies include assessing viruses, genetic susceptibility, immune system responses, metabolic responses, changes in the microbiome and the effect of treatment on each of these. These data are compared with the same variables from healthy children so we can understand just how stressed the systems are during acute asthma and how much they recover afterwards. We also characterise each child’s clinical status including their lifetime history of recurrent exacerbations to identify their tendency to develop persistent asthma. Further research is being conducted on each of these clinical and biological aspects of the study.

Aim of the Project
The aim is to elucidate the biological mechanisms that contribute to the susceptibility to, and severity of wheezing and asthma exacerbations in children. Honours and PhD projects are available in each area of our research and we would be pleased to discuss tailoring a project to a student’s area of interest.

Methodology and Student Experience
Each project is likely to use a variety of the latest laboratory and analysis techniques to further the applicants’ skills. Students will also have the opportunity to gain experience with recruitment and follow-up of children and with sample processing if appropriate.

Suitable For
☒ Honours  ☒ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications

- Undergraduate degree in Science
- Excellent communication and team participation skills
- Some laboratory experience if relevant to the proposed project
- Proficient writing and presentation skills

Ethics Approval
☒ Obtained  ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr Ingrid Laing
(08) 9489 7706
Ingrid.Laing@telethonkids.org.au
### Analysis of Genetic Susceptibility To, and Severity of Viral-Induced Wheezing Exacerbations in Children

<table>
<thead>
<tr>
<th>Research Teams</th>
<th><strong>Children’s Lung Health</strong>&lt;br&gt;Allergy and Infectious Diseases</th>
</tr>
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<tbody>
<tr>
<td><strong>Start Date</strong></td>
<td>March 2019</td>
</tr>
<tr>
<td><strong>Chief Supervisor</strong></td>
<td>Dr Ingrid Laing (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
<tr>
<td><strong>Supporting Supervisors</strong></td>
<td>A/Professor Guicheng Zhang (Curtin University)  &lt;br&gt;Professor Peter Le Seouf (The University of Western Australia)</td>
</tr>
</tbody>
</table>

#### Project Outline

**Background**

Asthma is one of the most common reasons children need emergency medical treatment in Western Australia. We have recruited and studied over 800 children on presentation to hospital at the peak of their acute wheezing and/or asthma attack. We have discovered that respiratory virus infections cause most of these attacks, yet not why those who get these infections are more susceptible to severe wheezing than other children and why some of them respond poorly to treatment. We have also characterised each child’s clinical status including their lifetime history of recurrent exacerbations to identify their tendency to develop persistent exacerbations of asthma. We know that genetic susceptibility plays a role in determining the susceptibility and severity of asthma in children. We have genotyped polymorphisms in a large number of immune genes in our asthma cohort and in healthy children and these data are now available for an honours project.

#### Aim of the Project

The aim is to systematically analyse potential associations between these immune function gene variants and clinical outcomes to determine how these genes and polymorphisms contribute to acute wheezing and asthma.

#### Methodology

Multivariate Regression will be employed for the data analysis. Cox and Negative Binomial Regression will investigate the risk factors for recurrent hospital presentations/admissions. Generalized Estimating Equations may also be used for data analysis in the longitudinal cohort.

#### Student Experience

The student would gain experience in handling data from large cohorts and the use of SPSS, STATA and other statistical programs. Students will also have the opportunity to gain experience with recruitment and follow-up of children and with sample processing if appropriate.

#### Suitable For

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#### Essential Skills & Qualifications

- Undergraduate degree in Science or Maths
- Excellent communication and team participation skills
- Proficient writing and presentation skills

#### Ethics Approval

<table>
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<th>☒ Obtained</th>
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</table>

#### Funding

- ☐ Top-up scholarship offered by project
- ☐ Full scholarship offered by project

*For more information, please contact:*

Dr Ingrid Laing  
(08) 9489 7706  
Ingrid.Laing@telethonkids.org.au
Developing a Metabolomics Method for Exhaled Breath Condensate (EBC)

Research Team
Children’s Lung Health

Start Date
February 2019

Chief Supervisor
Dr Stacey Reinke (Edith Cowan University)

Supporting Supervisors
Dr Shannon Simpson (Telethon Kids Institute, Curtin University)
A/Professor Mary Boyce (Edith Cowan University)

Project Outline
Metabolomics is the systematic study of small molecules (biochemicals) in a given biological system. As the metabolome represents the intersection between gene expression, environmental stimuli, and the microbiome, it offers huge potential diagnosing and understanding disease. Exhaled breath condensate (EBC) is an ideal biofluid for investigating respiratory disease as it is localised to the airway and, importantly for children, it can be collected non-invasively. The aim of this project is to develop an analytical method for EBC metabolomics.

This project will be joint between the Children’s Lung Health Research Team at the Telethon Kids Institute and the Centre for Integrative Metabolomics and Computational Biology at Edith Cowan University (Joondalup Campus). Techniques involved in this project include LC-MS and/or GC-MS. Students will also have the opportunity to learn about bioinformatics and data analysis in metabolomics.

Suitable For
☒ Honours
☐ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications
• Excellent written and oral communication skills
• Able to work as part of a team
• Highly motivated and organised
• The position will be highly suited to students with a chemistry background

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Shannon Simpson
(08) 9489 7794
Shannon.Simpson@telethonkids.org.au

Dr Stacey Reinke
Stacey.N.Reinke@ecu.edu.au
Developing Clinical Predictors of Disease Progression in Children with Neuromuscular Disorders to Prevent Future Respiratory Failure (Honours)

Research Team | Children’s Lung Health
Start Date | January 2019
Chief Supervisors | A/Professor Jenny Downs (Telethon Kids Institute)
A/Professor Graham Hall (Telethon Kids Institute, Curtin University)
Supporting Supervisors | Dr Andrew Wilson (Telethon Kids Institute, Perth Children’s Hospital)
Dr Adelaide Withers (Telethon Kids Institute, Perth Children’s Hospital)
Project Outline | Neuromuscular conditions affect people of all ages with the incidence estimated to be approximately 1 in 3000. Respiratory failure is the leading cause of morbidity and death due to impaired gas exchange (hypoventilation). High respiratory morbidity is accompanied by other challenges to daily wellbeing afforded by poor sleep, pain, fatigue and poor mental health.

This project will be a qualitative study and will involve conducting interviews with both affected children and their primary caregivers to explore the impacts of respiratory health on other aspects of health, behaviour functioning and participation. Using directed content analysis, data will be cross referenced with the structure of available patient-reported outcome measures to guide understanding of how specific scale or subscale scores best complement respiratory testing.

Suitable For | ☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications | • Well-developed interpersonal and communication skills
• Ability to work in a multidisciplinary team
• Motivated and dedicated
• Good organisational skills
• Able to work as part of a team
Ethics Approval | ☒ Obtained ☐ Not Obtained
Funding | ☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Jenny Downs
Jenny.Downs@telethonkids.org.au
(08) 9489 7774
Developing Clinical Predictors of Disease Progression in Children with Neuromuscular Disorders to Prevent Future Respiratory Failure

Research Team | Children’s Lung Health
---|---
Start Date | January 2019
Chief Supervisor | A/Professor Graham Hall (Telethon Kids Institute, Curtin University)
Supporting Supervisors | A/Professor Jenny Downs (Telethon Kids Institute)
Dr Andrew Wilson (Telethon Kids Institute, Perth Children’s Hospital)
Dr Adelaide Withers (Telethon Kids Institute, Perth Children’s Hospital)

Project Outline

Neuromuscular conditions affect people of all ages with the incidence estimated to be approximately 1 in 3000. Respiratory failure is the leading cause of morbidity and death due to impaired gas exchange (hypoventilation). Despite knowledge that hypoventilation is associated with high respiratory morbidity, and that respiratory failure is the leading cause of morbidity and death in this group of patients, identifying hypoventilation can be problematic. This is because symptoms can be non-specific, misleading and easily misunderstood with symptoms of the underlying condition. With a combination of clinical features and pulmonary function testing, it is likely these measures will be the most predictive of the onset of hypoventilation.

This project will provide insight for the onset of hypoventilation in children and adolescents with neuromuscular conditions. Outcomes from this study will help us better understand the most accurate method of determining when the onset of hypoventilation has occurred in asymptomatic children.

Suitable For | ☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications | • Excellent written and oral communication skills
• Able to work as part of a team
• Highly motivated and organised
• The position will be highly suited to students with a chemistry background

Ethics Approval | ☒ Obtained ☐ Not Obtained
Funding | ☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Graham Hall
Graham.Hall@telethonkids.org.au
(08) 9489 7777
### Exploring the Effects of Preterm Birth on the Airway Epithelium

<table>
<thead>
<tr>
<th>Research Teams</th>
<th>Children’s Lung Health</th>
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<tbody>
<tr>
<td></td>
<td>Airway Epithelial Research</td>
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<table>
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<tr>
<th>Start Date</th>
<th>Early 2019</th>
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<table>
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<tr>
<th>Chief Supervisor</th>
<th>A/Professor Anthony Kicic (Telethon Kids Institute, Curtin University, The University of Western Australia)</th>
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<table>
<thead>
<tr>
<th>Supporting Supervisors</th>
<th>Dr Shannon Simpson (Telethon Kids Institute, Curtin University)</th>
</tr>
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<tr>
<td></td>
<td>Dr Kevin Looi (Telethon Kids Institute)</td>
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</table>

| Project Outline | On a global scale, over 2 million babies are delivered very preterm (<32 weeks gestation) every year. Many of these infants display significant respiratory symptoms that persist throughout childhood, a result of being born before lung development is complete. The long-term consequences of interrupted lung development are not well understood, particularly for the airway epithelium. The airway epithelium lines the respiratory tract to create a protective barrier from foreign pathogens, such as bacteria, and plays an essential role in the state of health or disease. Given the persistent respiratory symptoms and interrupted development associated with preterm birth, we believe that abnormalities exist in the airway epithelium of children born prematurely. |

To investigate this hypothesis, we have successfully established a primary cell culture model of the preterm airway epithelium. There is now an opportunity for motivated students to help us explore and understand the consequences of preterm birth on the airway epithelium using a variety of downstream analytical techniques.

Techniques involved may include, but are not limited to:
- Primary cell culture using stringent aseptic technique;
- ELISAs;
- Protein extraction;
- Gene expression analysis; and
- Immunocytochemistry.

### Suitable For

| ☐ Honours | ☐ MD | ☐ Masters | ☒ PhD |

### Essential Skills & Qualifications

- Excellent oral and written communication skills
- Able to work as part of a team
- Highly motivated and organised

### Ethics Approval

| ☐ Obtained | ☒ Not Obtained (pending) |

### Funding

| ☐ Top-up scholarship offered by project group | ☐ Full scholarship offered by project group |

*For more information, please contact:*

Dr Shannon Simpson  
(08) 9489 7794  
Shannon.Simpson@telethonkids.org.au
Forced Oscillation Technique: Clinical Utility of Within-Breath Analysis

Research Team
Children’s Lung Health

Start Date
Early 2018

Chief Supervisor
A/Professor Graham Hall (Telethon Kids Institute, Curtin University)

Supporting Supervisors
Dr Shannon Simpson (Telethon Kids Institute, Curtin University)

Project Outline
The forced oscillation technique (FOT) utilises soundwaves to study the structural and mechanical properties of the lungs. The test is non-invasive and requires minimal patient cooperation, making it ideal for use in pre-schoolers and young children. However, routine integration of FOT into clinical practice has been slowed by a lack of clear guidelines and uncertainty regarding the relevant reportable outcomes. The traditional method for reporting FOT outcomes has been to record the data over several breaths and report a single value encompassing both the inspiratory and expiratory components of breathing. However, it is possible that analysing the inspiratory and expiratory components separately could provide valuable information about the airway, which may be helpful in the clinical monitoring of paediatric lung disease.

This project will therefore provide a student the opportunity to examine the clinical relevance of separating the inspiratory and expiratory components of FOT data. Data will be collected across multiple paediatric respiratory conditions, including cystic fibrosis, asthma, neuromuscular disease and chronic lung disease of prematurity.

Suitable For
☒ Honours ☐ MD ☒ Masters ☐ PhD

Essential Skills & Qualifications
• Excellent oral and written communication skills
• Able to work as part of a team
• Highly motivated and organised

Ethics Approval
☒ Obtained ☐ Not Obtained (pending)

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Graham Hall
(08) 9489 7777
Graham.Hall@telethonkids.org.au

Research Team  
Children’s Lung Health

Start Date  
January 2019

Chief Supervisor  
A/Professor Graham Hall (Telethon Kids Institute, Curtin University)

Supporting Supervisors  
Dr Sanja Stanojevic (The Hospital for Sick Children, Toronto)

Project Outline

Background

Pulmonary Function Tests (PFT) are important for assessing the health of the lungs and for medical diagnoses of respiratory and related diseases. Interpretation of these tests rely on the availability of appropriate reference data to distinguish between health and disease and to assess the severity and nature of any functional impairment. However, there is no consensus on suitable reference data for many common PFTs and default reference equations commonly used in clinics may not be suitable across the entire age range or in non-Caucasian populations.

Objectives

The Global Lung Function Initiative (GLI) is a collaboration of international clinicians and researchers with an overall objective to establish improved, multi-ethnic, all–age, lung function reference data that are representative of the population or individuals under study irrespective of their age, ethnic group or equipment used. The GLI has been successful in developing all-age, multi ethnic reference equations for spirometry - the most common PFT, carbon monoxide transfer factor for Caucasians and currently collecting data for lung volumes reference equations.

This project presents an opportunity to participate in retrospective or prospective GLI studies to develop similar reference equations in other ethnic groups (especially in Asia and Sub Saharan Africa populations) and for other commonly used PFTs. Reference equations will be generated and disseminated for use by researchers, clinicians and equipment manufacturers.

Method

The GLI requests for anonymized data from individuals, groups or manufacturers who have collected PFT data from healthy population and that meets established GLI criteria. For example, the data must have been collected on a minimum of 100 participants, must contain essential background information for each subject (age, sex, height, ethnic group, health status, etc), and appropriate consent must have been sought for data collection and sharing. The collated data is then analysed using established statistical analysis used by the GLI.

Suitable For

☒ Honours  ☐ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications

- Excellent written and oral communication skills
- Able to work as part of a multidisciplinary team
- Highly motivated and organised
- The opportunity will be highly suited to students with a background in Respiratory Physiology, Biostatistics, Epidemiology or Public Health

Ethics Approval

☒ Obtained  ☐ Not Obtained

Funding

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Graham Hall
(08) 9489 7777
Graham.Hall@telethonkids.org.au
Imaging the Long-Term Effects of Preterm Birth on the Lung

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Children’s Lung Health</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>Flexible</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>A/Professor Graham Hall (Telethon Kids Institute, Curtin University)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>Dr Tim Rosenow (Telethon Kids Institute)</td>
</tr>
<tr>
<td></td>
<td>Dr Shannon Simpson (Telethon Kids Institute, Curtin University)</td>
</tr>
<tr>
<td></td>
<td>Dr Andrew Wilson (Telethon Kids Institute, Perth Children’s Hospital)</td>
</tr>
<tr>
<td></td>
<td>Professor Harm Tiddens (Sophia Children’s Hospital [Netherlands])</td>
</tr>
</tbody>
</table>

**Project Outline**

Preterm birth leads to a range of health consequences, with chronic lung disease being the most common. Despite this, little is known about the long-term effects of prematurity on the lung. Children who were born preterm have a high rate of respiratory morbidity, but often have little to no clinical follow-up after infancy. Earlier work in the West Australian Lung Health In Prematurity (WALHIP) study suggests that there are significant structural lung abnormalities present in children born preterm, and that these are associated with ongoing respiratory symptoms.

With the advent of advanced lung imaging techniques such as low-dose computed tomography (CT) and magnetic resonance imaging (MRI), we can now assess in detail the structure and function of the lung. We will use these techniques to follow up the WALHIP cohort, now in early adulthood, to determine if there is still significant ongoing structural lung disease. For this project, you will be responsible for retrieving and analysing these scans, for comparison against a range of clinical and physiological measures. You will additionally compare their scans to that of a healthy control group. By characterising the lung disease seen in this cohort, we can develop new ways to treat and monitor the respiratory health of children and adults who were born preterm.

As part of this project, there is the opportunity to spend up to 12 months in Rotterdam, The Netherlands with our collaborator, Professor Harm Tiddens at the Sophia Children’s Hospital. Here you will learn how to analyse CT and MRI scans and interpret them in a clinical context.

**Suitable For**

☐ Honours  ☐ MD  ☐ Masters  ☒ PhD

**Essential Skills & Qualifications**

- Undergraduate degree in Physiology, Medical or Health Science, Biomedical Engineering, or Biophysics
- Eligibility for enrolment into a PhD programme

**Ethics Approval**

☐ Obtained  ☒ Not Obtained (pending)

**Funding**

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

*For more information, please contact:*
Dr Tim Rosenow
(08) 9489 7809
Tim.Rosenow@telethonkids.org.au
Predicting Long-Term Health Outcomes in Young Adults Born Very Preterm (WALHIP 19-Year Follow-Up)

Research Team | Children’s Lung Health
---|---
Start Date | February 2019
Chief Supervisor | A/Professor Graham Hall (Telethon Kids Institute, Curtin University)
Supporting Supervisors | Dr Shannon Simpson (Telethon Kids Institute, Curtin University)
| Dr Andrew Wilson (Telethon Kids Institute, Perth Children’s Hospital, The University of Western Australia, Curtin University)
Project Outline | Nearly 11% of global births are preterm, with the largest health burden in those born <32 weeks gestational age. Bronchopulmonary dysplasia (BPD), a neonatal chronic lung disease, is the most common chronic condition in preterm infants. Significant improvements in neonatal care have profoundly changed the clinical and pathological characteristics of very preterm infants and BPD, such that the term “new” BPD has been coined. Survivors of very preterm birth (irrespective of BPD status) go on to have a high burden of lung disease with cross-sectional studies reporting reduced lung function, increased respiratory symptoms and structural lung damage.

There are only limited longitudinal respiratory health studies that have followed preterm individuals throughout childhood and into early adult life. As such, the natural history and outcomes of these individuals into adulthood are largely unknown. Our earlier work following the West Australian Lung Health in Prematurity (WALHIP) cohort has suggested that preterm children have increased respiratory symptoms and declining lung function.

Our primary objective, therefore, is to identify the respiratory outcomes that persist into early adulthood in a 19 year follow-up of the WALHIP cohort both with and without BPD and establish a baseline for the continuing study of chronic lung disease in later life in individuals born preterm.

This objective will be achieved by:
- Undertaking a comprehensive respiratory assessment
- Identifying within the 6 and 11 year follow-up data, the characteristics which predict the persistence and/or progression of respiratory morbidity to 19 years of age

The transition between the child and adult forms of chronic lung disease is a crucial research issue and this NHMRC funded project offers a range of opportunities to students.

Suitable For | ☒ Honours | ☐ MD | ☒ Masters | ☒ PhD
---|---|---|---|---
Essential Skills & Qualifications | | | • Above average oral and written communication skills
| | | • Motivation and organisation skills
| | | • Able to work as part of a team
Ethics Approval | ☐ Obtained | ☒ Not Obtained (pending)
Funding | ☐ Top-up scholarship offered by project group
| ☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Graham Hall
(08) 9489 7777
Graham.Hall@telethonkids.org.au
Validation of Lung MRI as a Clinical Endpoint in Cystic Fibrosis

Research Teams

Children’s Lung Health
P4 Respiratory Health for Kids
Respiratory Environmental Health

Start Date
Flexible

Chief Supervisor
Professor Stephen Stick (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors
Dr Tim Rosenow (Telethon Kids Institute)
Professor Harm Tiddens (Sophia Children’s Hospital [Netherlands])

Project Outline
Cystic fibrosis (CF) is a genetic disorder that causes progressive, fatal lung disease. The primary manifestation of this is structural lung damage, which is best diagnosed and monitored using computed tomography (CT). However, because CT uses ionising radiation it cannot be performed frequently, making it unsuitable for short-term monitoring of disease progression. This is particularly problematic when treating pulmonary exacerbations – short periods involving a rapid increase in symptoms and an acceleration of lung disease, generally due to lung infection. Magnetic resonance imaging (MRI) is a radiation-free alternative to CT that has recently gained traction as a means to detect CF-related structural lung damage. Although promising, little validation has been performed on its sensitivity to detect the subtle abnormalities seen in children.

In this project, you will work within AREST CF: an integrated clinical and scientific team with a strong international reputation as leaders in paediatric CF research. You will be involved in the DEFEND-CF study, collecting lung CT, MRI, and a number of clinical and research measures in children with CF during, before, and after a pulmonary exacerbation. The aim of this project is to compare the sensitivity of MRI to detect lung disease in comparison to the gold standard (CT), and to determine whether MRI can be used to monitor changes to lung disease status during a pulmonary exacerbation and following treatment.

As part of this project, there is the opportunity to spend up to 12 months in Rotterdam, The Netherlands with our collaborator, Professor Harm Tiddens at the Sophia Children’s Hospital. Here you will learn how to analyse CT and MRI scans and interpret them in a clinical context.

Suitable For
☐ Honours  ☐ MD  ☐ Masters  ☒ PhD

Essential Skills & Qualifications
• Undergraduate degree in Physiology, Medical or Health Science, Biomedical Engineering, or Biophysics
• Eligibility for enrolment into a PhD programme

Ethics Approval
☒ Obtained  ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Tim Rosenow
(08) 9489 7809
Tim.Rosenow@telethonkids.org.au
**Risk Prediction of Worse Outcomes in Children with Cystic Fibrosis using Supervised Machine Learning**

**Research Team**  
**P4 Respiratory Health for Kids**  
Academic Biostatistics

**Start Date**  
As soon as possible

**Chief Supervisor**  
Dr Lidija Turkovic (Telethon Kids Institute)

**Supporting Supervisors**  
Dr Matthew Cooper (Telethon Kids Institute, The University of Western Australia)  
Professor Stephen Stick (Telethon Kids Institute, The University of Western Australia, Perth Children’s Hospital)

**Project Outline**

**Summary**

Cystic fibrosis (CF) is the most common life shortening genetic disease today. It is marked with large heterogeneity even in children with the same cystic fibrosis transmembrane regulator (CFTR) genotype. Identifying which infants and pre-school children are at highest risk of developing lung function decline or other poor clinical outcomes would facilitate the development of personalised prevention and treatment management programs. If a reliable and accurate predictive model were available at an early age, a precision medicine approach would help to optimise individual clinical care and minimise costly and time consuming treatments in children that are identified to be at a relatively low risk.

The proposed project will use data collected as part of the comprehensive early disease surveillance program established in the paediatric CF clinics in Perth and Melbourne under the auspices of the Australian Respiratory Early Surveillance Team for CF (AREST CF, www.arestcf.org). AREST CF follows children annually from the age of 3-months to 6-years and is one of the largest longitudinal studies of childhood CF in the world. Annual spirometry and nutritional status measurements are also available from age 6-to 18-years for some of the AREST CF cohort through linkage with the Australian CF data registry.

**Aims**

Main aim of this project is to identify early life predictors (in children under 6-years) of lung function and body mass index decline and therefore build a reliable risk prediction model. Building a prediction model using different supervised machine learning algorithms and traditional statistical approaches will be explored in both simulation data sets and actual data.

**Essential Skills & Qualifications**

- Undergraduate degree with a large quantitative component, ideally completed second or third year statistics subjects
- First or Second-Class Honours if applying for a PhD
- Excellent communication and interpersonal skills (oral and written)
- Ability to prioritize tasks and meet deadlines

**Ethics Approval**

☒ Obtained  ☐ Not Obtained

**Funding**

☐ Top-up scholarship offered by project group  
☐ Full scholarship offered by project group

For more information, please contact:  
Dr Lidija Turkovic  
(08) 9489 7796  
Lidija.Turkovic@telethonkids.org.au
Exploring the Effects of E-Cigarette Aerosol Exposure in Health and Disease using In Vitro Exposure

Research Team | Respiratory Environmental Health
---|---
Start Date | February 2018
Chief Supervisor | A/Professor Alexander Larcombe (Telethon Kids Institute, Curtin University)
Supporting Supervisor | A/Professor Anthony Kicic (Telethon Kids Institute, UWA Paediatrics and Child Health, Curtin University)

**Project Outline**

Electronic cigarettes (“e-cigarettes”) heat and aerosolise a liquid solution (“e-juice”) producing an aerosol which is inhaled. They are a new technology and their use is widespread and increasing rapidly in many countries. Despite this, the potential for e-cigarette use to impact health is virtually unknown.

We are undertaking a range of studies investigating the effects of electronic cigarette use on health and an opportunity exists for a student to explore these effects using in vitro exposure methods. This project is designed to explore the comparative health effects of e-cigarette aerosols on healthy, asthmatic and cystic fibrosis cells. Our hypothesis is that e-cigarette aerosols will have more severe effects on cells with existing disease.

**Suitable For**

- ☒ Honours
- ☐ MD
- ☐ Masters
- ☐ PhD

**Essential Skills & Qualifications**

- Above average written and oral communication skills;
- Motivation and organisational skills;
- Able to work as part of a team.

**Ethics Approval**

- ☐ Obtained
- ☒ Not Obtained

**Funding**

- ☐ Top-up scholarship offered by project
- ☐ Full scholarship offered by project

*For more information, please contact:*

A/Professor Alexander Larcombe
(08) 9489 7814
Alexander.Larcombe@telethonkids.org.au
The Global Asthma Network: Understanding Asthma in Western Australia

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<tr>
<th>Research Team</th>
<th>Respiratory Environmental Health</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>Available now</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Rachel Foong (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>A/Professor Graham Hall (Telethon Kids Institute, Curtin University) Professor Nick de Klerk (Telethon Kids Institute, The University of Western Australia)</td>
</tr>
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### Project Outline

Asthma is a chronic respiratory disease which affects 2.5 million Australians. In Western Australia, nearly 9% of children report having a doctor diagnosis of asthma. Asthma has a significant impact on both children and their families’ quality of life. Unfortunately, we still don’t completely understand why some children with a family history do not develop asthma, while many children with asthma have no family history. This suggest that other external, non-genetic (environmental) factors play a significant role in asthma development.

This project seeks to provide a better understanding of asthma prevalence, severity and management in children and adolescents in urban Western Australia, and also identify environmental factors that lead to increased risk of asthma. To achieve this, children and adolescents aged 6-7 and 13-14 years, respectively, in Perth, together with their parents, will be invited to complete a detailed questionnaire of respiratory and allergy symptoms, asthma management and information about environmental factors. This project forms part of an international collaborative study, the Global Asthma Network Global Surveillance Project, which aims to globally prevent asthma and improve asthma care.

This project would ideally suit a student with good initiative and a willingness to work in a community setting with schools, families and children. The student must be able to travel to different school locations within the Perth metropolitan area.

### Suitable For
- ☒ Honours
- ☐ MD
- ☐ Masters
- ☐ PhD

### Essential Skills & Qualifications
- Bachelor’s degree in Science, Health Science, Public Health or other health-related area
- Excellent communication and interpersonal skills
- Motivation and organisational skills
- Able to work as part of a team

### Ethics Approval
- ☐ Obtained
- ☒ Not Obtained (pending)

### Funding
- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

*For more information, please contact:*
Dr Rachel Foong  
(08) 9489 7817  
Rachel.Foong@telethonkids.org.au
Using an Obese Mouse Model to Evaluate the Impact of Different Vehicle Fuel Emissions on Health

Project Outline
Childhood obesity is an important health issue in Australia, with approximately one quarter of Australian children aged 5-17 years being overweight or obese. This has significant health, social and economic impacts. The combined contributions of environmental contaminants and obesity have yet to be explored in this population and represent a significant public health challenge.

Existing evidence indicates associations between obesity, air pollution and the increasing risk of developing Type II Diabetes (T2DM).

The link between exposures to air pollution and chronic diseases is possibly mediated by systemic oxidative stress and inflammation. The same mechanisms seem to be relevant for the promotion of insulin resistance and eventually the development of T2DM.

Certain populations with pre-existing diseases, including those with T2DM, are known to be at increased risk for air pollution-related health effects, especially those pollutants emitted by traffic.

By using an in vivo obese and normal mouse model it will be possible to assess the impacts of exposures to different fuel emissions. The team have experience conducting such exposure models and the student will be responsible for conducting the experimental phase of the research along with interpreting the data.

Suitable For
☒ Honours ☐ MD ☒ Masters ☐ PhD

Essential Skills & Qualifications
- Undergraduate degree in Bachelor of (Medical) Science or related degree
- Excellent written and oral communication skills
- Very good organisational skills, motivation and dedication
- Some statistical knowledge
- Ability to work as part of a team

Ethics Approval ☒ Obtained ☐ Not Obtained

Funding ☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
A/Professor Alexander Larcombe
(08) 9489 7814
Alexander.Larcombe@telethonkids.org.au
Early Environment is a Research Focus Area (RFA) which focuses on the ways that environments early in life can affect a child’s life-long health and development.

Factors ranging from infection and climatic conditions to pollutants, housing and our complex microbiome all have an impact. Understanding these exposures and their impact on early growth and development is key to preventing and treating a number of common childhood conditions.

At the Telethon Kids Institute, this research encompasses the development of the immune system, infectious diseases, maternal health and the developmental origins of disease and health.

Research Programs & Teams listed:

**Immunity and Inflammation**
- Child Allergy and Immunology Research
- Clinical Epigenetics

**Infection & Vaccines**
- Ear Health
- Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

**Developmental Origins of Child Health**
- The ORIGINS Team
- Aboriginal Maternal Health and Child Development
The Maternal Diet, Breast Milk Composition and Allergies Study

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<th>Research Team</th>
<th>Child Allergy and Immunology Research</th>
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<td>From February 2019</td>
</tr>
<tr>
<td>Chief Supervisor</td>
<td>Dr Debbie Palmer (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>Dr Roslyn Giglia (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>Dr Donna Geddes (The University of Western Australia)</td>
</tr>
</tbody>
</table>

**Project Outline**
One in ten young children now have a food allergy and one in five have eczema. These same children often also develop asthma and hay fever prior to adulthood.

This project will investigate the relationships between maternal diet, breast milk composition and the development of early life allergic disease.

We will collect detailed dietary intake data from women at multiple time points during pregnancy and lactation. Breast milk samples will be collected at multiple time points during the first 4 months of lactation and analysed with a focus on micronutrient and trace element composition. Allergic disease development in the children will be examined until 12 months of age. This study will add to our evidence base regarding the influence of maternal diet on breast milk composition, as well as potentially be translated into maternal diet recommendations for allergy prevention guidelines.

**Suitable For**

- ☐ Honours
- ☐ MD
- ☒ Masters
- ☒ PhD

**Essential Skills & Qualifications**
- Ability to work as part of a team
- Good interpersonal and communication skills

*For PhD candidates:*
- Minimum of 2A Honours degree

*For Masters candidates:*
- Degree in Science and/or Nutrition

**Ethics Approval**

- ☐ Obtained
- ☒ Not Obtained

**Funding**

- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

*For more information, please contact:*
Dr Debbie Palmer
(08) 9489 7777
Debbie.Palmer@telethonkids.org.au
Epigenetic Programming of Immune Function

Research Team
Clinical Epigenetics

Start Date
June 2018

Chief Supervisor
Dr David Martino (Telethon Kids Institute)

Supporting Supervisors
A/Professor Deborah Strickland (Telethon Kids Institute)
A/Professor Andrew Whitehouse (Telethon Kids Institute, The University of Western Australia)

Project Outline
Microbial signals are known to be one of the most potent ‘programmers’ of immune development and function in early life. Sufficient exposure to microbial ligands during the first few months of life is critical for healthy immune development, and the protection from allergy and asthma. This study investigates the epigenetic effects of a therapeutic agent OM85 administered during pregnancy, and how it reprograms immune function in the offspring, mediating protection from asthma.

Our team is engaged in understanding how early experiences shape development through epigenetic changes. We have a particular focus on factors that program immune function in health and disease.

This project will involve generating large-scale epigenetic data sets on mouse tissues to determine links between the therapeutic effects of OM85 and the molecular hallmarks of epigenetic control. You will also compare these data sets to human data sets and determine how ‘conserved’ the mechanisms are likely to be.

Techniques used will include cell culture, next generation sequencing and bioinformatics. The vision of this work is to contribute toward developing a safe and effective oral therapeutic strategy to protect newborn infants from developing childhood asthma.

Suitable For
☐ Honours  ☐ MD  ☐ Masters  ☒ PhD

Essential Skills & Qualifications
• Bachelor of Science undergraduate degree
• Basic molecular biology knowledge
• Experience in cell culture, molecular techniques and sequencing desirable
• Experience with command line-based computer programming desirable

Ethics Approval
☒ Obtained  ☐ Not Obtained

Funding
☒ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr David Martino
(08) 9489 7777
David.Martino@telethonkids.org.au
# The Epigenetics of Nutrition and Prenatal Alcohol Exposure

<table>
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<tr>
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<th>Clinical Epigenetics</th>
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<tbody>
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<td>January 2019</td>
</tr>
<tr>
<td><strong>Chief Supervisor</strong></td>
<td>Dr David Martino (Telethon Kids Institute)</td>
</tr>
</tbody>
</table>
| **Supporting Supervisors** | Dr Parwinder Kaur (Telethon Kids Institute)  
Dr Martyn Symons (Telethon Kids Institute) |
| **Project Outline** | The clinical epigenetics team is engaged in understanding how early experiences shape development through epigenetic changes. Our vision is to improve the health and wellbeing of children through studying the molecular hallmarks of epigenetic control. Prenatal alcohol exposure (PAE) can cause major disruptions to epigenetic marks during fetal development. PAE is a major preventable cause of lifelong intellectual and growth disabilities collectively termed FASD. Folic acid, a water-soluble vitamin, has been identified as an essential nutrient that participates in epigenetic gene regulation, and may provide a protective effect against gestational ethanol exposure. This study will explore the links between folic acid levels in pregnancy, prenatal alcohol exposure and the development of FASD. You will use cutting-edge DNA sequencing of mouse tissues from a model of PAE, and work with collaborators to validate molecular changes in human cohorts. The goal is to determine whether folate supplementation protects against molecular changes caused by PAE, and whether this information can be used to develop novel DNA-based diagnostics for early detection of children at risk. |
| **Suitable For** | ☑ Honours  
☐ MD  
☐ Masters  
☒ PhD |
| **Essential Skills & Qualifications** | Bachelor of Science undergraduate degree  
Basic molecular biology knowledge  
Experience with mouse work desirable  
Experience in molecular techniques and sequencing desirable  
Experience with command line-based computer programming desirable |
| **Ethics Approval** | ☑ Obtained  
☐ Not Obtained |
| **Funding** | ☑ Top-up scholarship offered by project  
☐ Full scholarship offered by project |

For more information, please contact:  
Dr David Martino  
(08) 9489 7777  
David.Martino@telethonkids.org.au
A Cohort Study of Otitis Media and Hearing Loss in Young Urban Aboriginal Children with an Integrated Ear and Hearing Telehealth Program

Research Team

Ear Health

Start Date

February 2019

Chief Supervisor

Dr Chris Brennan-Jones (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors

Professor Peter Richmond (Telethon Kids Institute, Perth Children’s Hospital)

Clinical A/Professor Deborah Lehmann (Telethon Kids Institute)

Project Outline

Aboriginal Australian children suffer high rates of ear disease (known as otitis media or OM) within weeks of birth. The disease is often asymptomatic but can result in significant hearing loss. To assist in preventing the long-term consequences of early OM in urban Aboriginal children, we have established the Urban Aboriginal Otitis media (UAOM) cohort that will follow children from 2 months of age to determine prevalence of and risk factors for OM and hearing loss in Aboriginal children aged ≤12 months. Through established relationships with Aboriginal organisations and programs, we will recruit pregnant Aboriginal women in Kwinana, Rockingham and Armadale Districts to enrol 252 babies and collect risk factor information. Nurse/Aboriginal Health Workers will perform otoscopy, video-otoscopy and multifrequency tympanometry at ages 2, 6 and 12 months and measure otoacoustic emissions at 2 months.

Despite the potential impacts of otitis media on development, access to specialist care within public hospitals is poor, with many children waiting over 2 years to be seen by specialists at PCH. Formal audiology assessments will be conducted twice in the first 12 months and a telehealth ear and hearing health surveillance program will be developed to fast-track specialist assessment at PCH. Outcome measures include prevalence of OM, severe OM and hearing loss, accuracy of telehealth measures and improvements in time-to-assessment and time-to-treatment for children in the program.

The study will provide essential information to develop a culturally appropriate ear health program for urban Aboriginal children/families, facilitate culturally valid communication and language skills and assist in 'Closing The Gap' in health and education.

We are seeking a student interested in assisting with the recruitment and clinical assessment of participants, data analysis and development of health, development of IT platforms, language/communication and education resources to support families in the cohort. This is a unique opportunity for exceptional individuals wishing to undertake study with the Ear Health team in Perth.

Suitable For

☒ Honours ☐ MD ☒ Masters ☒ PhD

Essential Skills & Qualifications

For Post-Grad candidates:

• Have achieved a First-Class Honours (or equivalent) or a Masters in a relevant field (e.g. Psychology, Education, Health Promotion, Medicine, Nursing, Audiology, Speech Pathology, Public Health, ICT) or another relevant degree
• Eligible to enrol in a PhD or a Masters at UWA (or other WA institution)

For Honours candidates:

• A 65% course weighted average in a relevant field is desirable

Aboriginal/Torres Strait Islander students are particularly encouraged to apply

Ethics Approval

☒ Obtained ☐ Not Obtained

Funding

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Chris Brennan-Jones
(08) 9489 7785
Chris.Brennan-Jones@telethonkids.org.au
Characterisation of a Cell Invasion Pathway Exploited by the Globally-Disseminated Group A Streptococcus M1T1 Clone

Research Team

Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

Start Date
Negotiable (can start immediately pending approval)

Chief Supervisor
Dr Tim Barnett (Telethon Kids Institute)

Supporting Supervisors
A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)

Project Outline

Streptococcus pyogenes (group A Streptococcus, GAS) is a human-adapted pathogen responsible for a wide spectrum of disease. GAS can cause relatively mild illnesses, such as “strep throat” or impetigo, and less frequent but severe life-threatening diseases such as necrotizing fasciitis and streptococcal toxic shock syndrome. A single GAS clone (M1T1) has disseminated globally as the predominant cause of pharyngitis and invasive disease in industrialised society. M1T1 strains have evolved multiple mechanisms to evade the immune system and replicate within host cells (see Barnett et al. 2013 Cell Host Microbe 14: 675-682).

We have uncovered evidence that M1T1 strains exploit a novel pathway to invade epithelial cells. This project will characterise this pathway, using a combination of bacterial genetics and cell biology:

- Measure the invasion of M1T1 and other GAS strains into different epithelial cell lines.
- Examine the requirement of individual GAS surface proteins to invade epithelial cells using a panel of M1T1 mutant strains.
- Examine the role of individual host cell endocytosis pathways using a combination of siRNA and/or pharmacological inhibitors.

Suitable For

☒ Honours ☐ MD ☐ Masters ☒ PhD

Essential Skills & Qualifications

- Cell culture
- Culturing bacteria
- Good understanding of molecular biology and cell biology

Ethics Approval

☐ Obtained ☒ Not Obtained (Not Required)

Funding

☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr Tim Barnett
(08) 9489 7922
Timothy.Barnett@telethonkids.org.au
**Genetic Determinants of Group A Streptococcus Host Cell Tropism**

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Wesfarmers Centre of Vaccines &amp; Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)</th>
</tr>
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<tbody>
<tr>
<td>Start Date</td>
<td>Negotiable (can start immediately pending approval)</td>
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<tr>
<td>Chief Supervisor</td>
<td>Dr Tim Barnett (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisors</td>
<td>A/Professor Anthony Kicic (Telethon Kids Institute, The University of Western Australia, Curtin University)</td>
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**Project Outline**

*Streptococcus pyogenes* (group *A Streptococcus*, GAS) is a human-adapted pathogen responsible for a wide spectrum of disease. GAS can cause relatively mild illnesses, such as “strep throat” or impetigo, and less frequent but severe life-threatening diseases such as necrotizing fasciitis and streptococcal toxic shock syndrome. The first step in the infection process requires the successful colonisation of the epithelial tissues of the skin or oropharynx. While the upper respiratory tract and skin are major reservoirs for primary GAS infection, different bacterial strains often display a site preference (i.e. there are skin-tropic and throat-tropic strains), and the mechanisms that mediate colonisation of these different sites are poorly understood, particularly for skin tropic strains.

This project has 2 complementary aims, that will investigate the role of GAS proteins in adherence and invasion of epithelial cells of the skin and throat, using a combination of bacterial genetics and cell biology:

- Measure the adherence, invasion and intracellular survival of a throat-tropic GAS strain, and a panel of already-constructed mutants defective in individual surface proteins, using epithelial cells derived from the throat and skin.
- Construct defined mutations in 3 key surface proteins in a skin-tropic GAS strain, and measure their adherence, invasion and intracellular in epithelial cells derived from the throat and skin.

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<td>• Culturing bacteria</td>
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<td>• Good understanding of molecular biology and cell biology</td>
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*For more information, please contact:*
Dr Tim Barnett  
(08) 9489 7922  
Timothy.Barnett@telethonkids.org.au
Genetic Determinants of Group A \textit{Streptococcus} Resistance to Cotrimoxazole

<table>
<thead>
<tr>
<th>Research Team</th>
<th>Wesfarmers Centre of Vaccines &amp; Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)</th>
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<tr>
<td>Chief Supervisor</td>
<td>Dr Tim Barnett (Telethon Kids Institute)</td>
</tr>
<tr>
<td>Supporting Supervisor</td>
<td>Dr Asha Bowen (Telethon Kids Institute, Perth Children's Hospital)</td>
</tr>
<tr>
<td>Project Outline</td>
<td>\textit{Streptococcus pyogenes} (group A \textit{Streptococcus}, GAS) is a human-adapted pathogen responsible for a wide spectrum of disease. GAS can cause relatively mild illnesses, such as “strep throat” or impetigo, and less frequent but severe life-threatening diseases such as necrotizing fasciitis and streptococcal toxic shock syndrome. GAS skin infections are particularly prevalent in Indigenous populations in Northern Australia, with \textasciitilde{}1 in 2 Indigenous children having impetigo at any given time.</td>
</tr>
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</table>

The antibiotic cotrimoxazole (a combination of trimethoprim and sulfamethoxazole), has recently been implemented for the treatment of GAS skin infections, with several advantages over existing treatments. However, resistance to cotrimoxazole has been documented clinically.

This project will characterise the genetic determinants of cotrimoxazole resistance in GAS, using a combination of biochemistry and bacterial genetics:
- Measurement of the in vitro susceptibility of GAS strains to cotrimoxazole and component antibiotics.
- Examine the requirement of individual genes for cotrimoxazole resistance using GAS mutant and heterologous gene expression approaches.

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<td>Essential Skills &amp; Qualifications</td>
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<td>• Good understanding of microbiology and biochemistry</td>
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</table>

\textit{For more information, please contact:}
Dr Tim Barnett
(08) 9489 7922
Timothy.Barnett@telethonkids.org.au
# Quantifying the Cost of Benzathine Penicillin G through Hospital in the Home

**Research Team**

Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

**Start Date**

March 2019

**Chief Supervisor**

Professor Jonathan Carapetis (Telethon Kids Institute, The University of Western Australia)

**Supporting Supervisors**

Dr Joseph Kado (Telethon Kids Institute)
Dr Robert Hand (Telethon Kids Institute, The University of Western Australia)

**Project Outline**

Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD) affect approximately 33.4 people million worldwide. In Australia, this preventable disease affects Indigenous children disproportionally. Patients with ARF/RHD require an injection of benzathine penicillin G (BPG) at minimum every 28 days for 10 years, called secondary prophylaxis. Injections are provided by the Hospital in the Home (HITH) service Perth Children’s Hospital.

To date, there has been no data on the true cost of delivery. This project aims to evaluate this cost to the health system for the delivery of secondary prophylaxis. This valuable data will allow for improved economic modelling and assist in establishing the true cost of this preventable disease.

Student responsibilities include:

- Formulation of ethics proposal and submission;
- Development of research tools; and
- Collection of data and write up of results for publication.

**Suitable For**

- Honours
- MD
- Masters
- PhD

**Essential Skills & Qualifications**

- Excellent communication skills
- Attention to detail

**Ethics Approval**

- Obtained
- Not Obtained

**Funding**

- Top-up scholarship offered by project group
- Full scholarship offered by project group

*For more information, please contact:*

Dr Joseph Kado  
(08) 9489 7793  
Joseph.Kado@telethonkids.org.au
Quantifying the Cost of Rheumatic Heart Disease in Australia

Research Team  Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

Start Date  March 2019

Chief Supervisor  Professor Jonathan Carapetis (Telethon Kids Institute, The University of Western Australia)

Supporting Supervisors  Dr Joseph Kado (Telethon Kids Institute)
  Dr Robert Hand (Telethon Kids Institute, The University of Western Australia)

Project Outline  Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD) affect approximately 33.4 million people worldwide. In Australia, this preventable disease affects Indigenous children disproportionally often in remote settings.

This project aims to assess the cost of transport for treatments in Perth of patients with suspected ARF or RHD by The Royal Flying Doctors Service.

This valuable data will allow for improved service planning and establishing the true cost of this preventable disease.

Student responsibilities include:
  - Formulation of ethics proposal and submission;
  - Development of research tools; and
  - Collection of data and write up of results for publication.

Suitable For  ☒ Honours  ☐ MD  ☐ Masters  ☐ PhD

Essential Skills & Qualifications  • Excellent communication skills
  • Attention to detail

Ethics Approval  ☑ Obtained  ☐ Not Obtained

Funding  ☑ Top-up scholarship offered by project group
  ☑ Full scholarship offered by project group

For more information, please contact:
Dr Joseph Kado
(08) 9489 7793
Joseph.Kado@telethonkids.org.au
**Research Team**

Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

**Start Date**

July - September 2018

**Chief Supervisor**

Dr Asha Bowen (Telethon Kids Institute, Perth Children's Hospital)

**Supporting Supervisors**

N/A

**Project Outline**

This project is funded by the National Health and Medical Research Council Australia and Department of Health, Western Australia. The project is being led by researchers from the Telethon Kids Institute, in partnership with Kimberley Aboriginal Medical Services Council (KAMS) and Western Australia Country Health Service (WACHS).

The PhD student would be involved in a skin disease control program in the Kimberley. In remote Australian Aboriginal communities, skin infections (scabies and impetigo) are common. At any one time, 45% of children have impetigo. Untreated skin infections can lead to secondary lifelong conditions, including chronic kidney disease and possibly Rheumatic Heart Disease, all of which occur at among the highest rates in the world in Aboriginal people. The study involves evaluation of a stepped wedge cluster randomised controlled trial assessing whether streamlined, evidence-based treatment of impetigo with cotrimoxazole and scabies with ivermectin will have an impact on reducing the burden of skin infections in Aboriginal school children.

**Suitable For**

- ☐ Honours
- ☐ MD
- ☐ Masters
- ☒ PhD

**Essential Skills & Qualifications**

The PhD student will:

- Become part of a highly innovative team with extensive support and mentorship
- Be willing to work in partnership with communities
- Complete regular travel to remote communities in the Kimberley
- Apply for an RTP or equivalent
- Receive a PhD scholarship top up
- Have a high-level pass in Honours degree or equivalent, data analysis skills, writing skills and clinical experience

*Aboriginal/Torres Strait Islander students are particularly encouraged to apply*

*Applicants based in Broome are encouraged to apply*

**Ethics Approval**

- ☒ Obtained
- ☐ Not Obtained

**Funding**

- ☒ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

*For more information, please contact:*

Dr Asha Bowen  
0412 608 003  
Asha.Bowen@telethonkids.org.au
Understanding Contribution of GAS Pharyngitis in the Context of High Impetigo Prevalence

Research Team
Wesfarmers Centre of Vaccines & Infectious Diseases (Group A Streptococcal and Rheumatic Heart Diseases)

Start Date
July-September 2018

Chief Supervisor
Dr Asha Bowen (Telethon Kids Institute, Perth Children's Hospital)

Supporting Supervisors
N/A

Project Outline
This project falls within the scope of the END RHD CRE Centre of Research Excellence funded by the National Health and Medical Research Council Australia. The END RHD CRE brings together 20 investigators from 16 institutions to develop a strategy for how Australia can eliminate RHD as a public health problem. The END RHD CRE will undertake a number of projects across several disciplines of research including epidemiology, biomedical sciences; implementation and translation; and understanding the RHD community with a special focus on documenting the experiences of those living with the disease.

Primary prevention of Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD) begins with early treatment of Group A streptococcal (GAS) infections. Unfortunately, in remote northern Australia where the burden of ARF/RHD is the highest amongst Aboriginal children, it remains unclear whether GAS pharyngitis or GAS impetigo is the primary driver of ARF/RHD. The burden of GAS pharyngitis is anecdotally low in this population. The burden of GAS impetigo is well documented and highly prevalent. It is critical for END RHD to determine whether either or both GAS diseases are contributing to ARF/RHD in order to effectively target and prioritise primary prevention activities. This project will evaluate simple, robust tools for GAS surveillance to better inform treatment algorithms, public health priorities and ultimately GAS vaccine development.

Suitable For
☐ Honours  ☐ MD  ☐ Masters  ☒ PhD

Essential Skills & Qualifications
The PhD student will:
• Lead a GAS pharyngitis and impetigo prospective surveillance study in 2 sites in remote Western Australia and the Northern Territory
• Become part of a highly innovative team with extensive support and mentorship
• Be willing to work in partnership with communities
• Complete regular travel to remote communities
• Apply for an RTP or equivalent
• Receive a PhD scholarship top up
• Have a high-level pass in Honours degree or equivalent

Aboriginal/Torres Strait Islander students are particularly encouraged to apply

Ethics Approval
☐ Obtained  ☒ Not Obtained

Funding
☒ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr Asha Bowen
0412 608 003
Asha.Bowen@telethonkids.org.au
The Baby Bath Project

Research Team

The ORIGINS Team

Start Date

February 2019

Chief Supervisor

Professor Susan Prescott (Telethon Kids Institute, Perth Children’s Hospital)

Supporting Supervisors

Professor Desiree Silva (Telethon Kids Institute, Joondalup Health Campus)
Dr Helen Wright (Rural Clinical School of Western Australia, UWA Medical School)
Professor Dianne Campbell (Children’s Hospital Westmead)

Project Outline

Childhood eczema affects 30% of Australian infants, with significant impact on quality of life. Bathing infants at risk of eczema with detergents impairs skin barrier function, alters the usual bacteria on skin, increases risk of eczema and allergies to foods and airborne allergens. We will compare a control group of newborns (no intervention, standard bathing) to an intervention group (bathing infants with water only in the first 3 months of life) to see if there is a change in eczema and allergen sensitisation in infants at high risk of eczema and allergy. The infants will be part of the ORIGINS Project, which collects detailed information about eczema, skin barrier function, allergies and the microbiome.

Suitable For

☒ Honours
☐ MD
☒ Masters
☒ PhD

Essential Skills & Qualifications

• Ability to conduct quantitative and qualitative research
• Excellent writing skills; Statistical analysis (SPSS/SAS)
• Ability to work as part of a team
• Good interpersonal and communication skills

For PhD candidates:

• Minimum of 2A Honours degree

For Masters candidates:

• Degree in Science, Immunology, Public Health, Epidemiology, or related

Ethics Approval

☐ Obtained
☒ Not Obtained

Funding

☐ Top-up scholarship offered by project group
☐ Full scholarship offered by project group

For more information, please contact:
Dr Erika Hagemann
(08) 9489 7657
Erika.Hagemann@telethonkids.org.au
A Longitudinal Study of Family Physical Activity and Young Children’s Physical Activity, Play and Development

Research Teams

The ORIGINS Team
Human Capability

Start Date
Flexible: 2018-2019

Chief Supervisor
A/Professor Hayley Christian (Telethon Kids Institute & UWA School of Population and Global Health)

Supporting Supervisors
Dr Gina Trapp (Telethon Kids Institute, UWA School of Population and Global Health)
Professor Leon Straker (Curtin University)
Dr Juliana Zabatiero (Curtin University)

Project Outline
Daily physical activity is critical during the early years of life. Physical inactivity and sedentary behaviours have been shown to track from early childhood into adolescence and adulthood, negatively influencing health throughout the life course. Regular physical activity provides children with health and developmental benefits, including healthy weight, improved bone health, cardiovascular fitness, and enhanced cognitive, emotional and psychosocial development. More than one fifth of Australian children aged 2-4 are overweight or obese. Physical activity is a critical strategy for combating rising levels of obesity. Objective measures of physical activity show less than a third of Australian 2-5 year olds achieve the recommended three hours of physical activity per day required for their health and development.

This research will use longitudinal data collected as part of the ORIGINS project to examine parent’s physical activity levels pre-pregnancy, during pregnancy, and at 6 and 12 months after childbirth. Relationships with children’s time spent playing can also be examined at 9 and 12 months. Findings from this research will provide evidence of the role of prenatal, antenatal and postnatal parent physical activity habits on young children’s physical activity, play and development. It will provide evidence to inform intervention strategies to facilitate the development of healthy physical activity behaviours in young children.

Suitable For
☒ Honours  ☒ MD  ☒ Masters  ☒ PhD

Essential Skills & Qualifications
• Ability to conduct quantitative and qualitative research
• Excellent writing skills
• Statistical analysis (SPSS/SAS)
• Ability to work as part of a team
• Good interpersonal and communication skills

For PhD candidates:
• Minimum of 2A Honours degree

For Masters candidates:
• Degree in public health, epidemiology, or related

Ethics Approval
☐ Obtained  ☒ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
A/Professor Hayley Christian
(08) 6488 8501
Hayley.Christian@uwa.edu.au

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# A Longitudinal Study of Family Technology Use and Child Outcomes

<table>
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<th>Research Teams</th>
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<tr>
<th>Chief Supervisor</th>
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<tr>
<th>Supporting Supervisors</th>
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<td></td>
<td>Professor Desiree Silva (Telethon Kids Institute)</td>
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</table>

## Project Outline

A longitudinal study of family technology use and child outcomes.

This project will use data being collected as part of the ORIGINS Project. The supervisors have a number of projects focussed on parent and child use of technology, especially mobile touch screen devices such as smart phones and tablet computers, and impacts on child health and development. Parents are reporting on their own technology use, and that of their child and the patterns of use will be tracked from during pregnancy through to when the child begins school. Associations with child health, well-being and development outcomes will be examined, along with family interactions.

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<tr>
<td>• Undergraduate degree in relevant area</td>
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<td>• Clear thinking</td>
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For more information, please contact:
Professor Leon Straker
(08) 9266 4644
L.Straker@curtin.edu.au
Positive Emotional Assets in Families

Research Team | The ORIGINS Team
--- | ---
Start Date | February 2019
Chief Supervisor | Dr Lisa Gibson (Telethon Kids Institute, The University of Western Australia, Edith Cowan University)

Supporting Supervisors:
- Professor Susan Prescott (Telethon Kids Institute, CAHS – Perth Children’s Hospital)
- Professor Desiree Silva (Joondalup Health Campus, Telethon Kids Institute)
- Dr Erika Hagemann (Telethon Kids Institute, Edith Cowan University)
- Jackie Davis (Telethon Kids Institute, Curtin University)

Project Outline:
One of the main aims of the ORIGINS Project is to improve the health of the next generation through a better understanding of how to optimise the early environment. The early environment in pregnancy and early childhood determine physiological, structural, immune, metabolic, and behavioral development, and influence susceptibility to both early and later onset diseases. This project will look at strategies, such as mindfulness, to increase positive emotional assets in parents and their young children, to optimise the early environment. This will be a sub project within ORIGINS, and will recruit a subset of families participating in this longitudinal birth cohort.

Suitable For:
- ☐ Honours
- ☐ MD
- ☐ Masters
- ☒ PhD

Essential Skills & Qualifications:
- Minimum of 2A Honours degree in psychology, public health, or related
- Ability to conduct quantitative and qualitative research
- Excellent writing skills
- Strong statistical analysis (SPSS/SAS) skills
- Ability to work as part of a team
- Good interpersonal and communication skills

Ethics Approval:
- ☐ Obtained
- ☒ Not Obtained

Funding:
- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

For more information, please contact:
Dr Lisa Gibson
(08) 9489 7940
Lisa.Gibson@telethonkids.org.au
## Promoting Nature Connectedness in Children

### Research Team
**The ORIGINS Team**

### Start Date
February 2019

### Chief Supervisor
Dr Lisa Gibson (Telethon Kids Institute, The University of Western Australia, Edith Cowan University)

### Supporting Supervisors
- Professor Susan Prescott (Telethon Kids Institute, Child and Adolescent Health Service Perth Children’s Hospital)
- Professor Desiree Silva (Joondalup Health Campus, Telethon Kids Institute)
- Dr Alan Logan (New York), Dr Tanja Sobko (University of Hong Kong)
- Dr Erika Hagemann (Telethon Kids Institute, Edith Cowan University)
- Jackie Davis (Telethon Kids Institute, Curtin University)
- Dr Nina D’Vaz (Telethon Kids Institute)

### Project Outline
Research has shown that nature related activities enhance general wellbeing as well as physical activity, diet and sleep. This proposed project aims to develop and test the effectiveness of an intervention to promote connectedness to nature. The project will evaluate a number of short and long-term outcome measures related to lifestyle behaviours and emotional wellbeing. It will be a sub project within ORIGINS, and will recruit a subset of children participating in this longitudinal birth cohort.

### Suitable For
- ☐ Honours
- ☐ MD
- ☐ Masters
- ☒ PhD

### Essential Skills & Qualifications
- Minimum of 2A Honours degree in Psychology, Public Health, or related
- Ability to conduct quantitative and qualitative research
- Excellent writing skills
- Strong statistical analysis (SPSS/SAS) skills
- Ability to work as part of a team
- Good interpersonal and communication skills

### Ethics Approval
- ☐ Obtained
- ☒ Not Obtained

### Funding
- ☐ Top-up scholarship offered by project group
- ☐ Full scholarship offered by project group

---

*For more information, please contact:*
Dr Lisa Gibson
(08) 9489 7940
Lisa.Gibson@telethonkids.org.au
Airborne Particulates, Ambient Temperature Extremes, and Adverse Pregnancy Outcomes

Research Team
Aboriginal Maternal Health and Child Development

Start Date
Available Now

Chief Supervisor
Dr. Gavin Pereira (Telethon Kids Institute, Curtin University)

Supporting Supervisors
A/Professor Helen Leonard (Telethon Kids Institute)
Dr. Annette Regan (Telethon Kids Institute, Curtin University)

Project Outline
There is accumulating evidence that ambient levels of fine particulate matter are harmful to health. More recently we have identified adverse associations between fine particulate matter exposure among pregnant women and adverse pregnancy outcomes such as preterm delivery and pre-labour rupture of membranes. Due to the seasonality of exposure, ambient temperature is a potential confounder as well as an independent putative risk factor. This project will use existing secondary data from health registries in WA, and already developed models for exposure (based on satellite imagery) to investigate the association between environmental exposures and risk of adverse pregnancy outcomes in WA.

PhD students will receive support of $1400 per year for project costs plus $2500 to attend a conference. Research Masters students also receive some funding. For PhD (and Research Masters) projects, students are to apply for a RTP.

Suitable For
☐ Honours
☐ MD
☐ Masters
☒ PhD

Essential Skills & Qualifications
- A complete or near complete degree in Statistics, Public Health or a health science; or MD project
- First-Class Honours, or Master degree (by research), or Master degree (by coursework with at least 50% research) in Statistics, Public Health or a health science

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
Dr. Gavin Pereira
(08) 9266 3940
Gavin.Pereira@telethonkids.org.au
Identifying New Populations at Risk of Stillbirth and Pregnancy Morbidity

Research Team
Aboriginal Maternal Health and Child Development

Start Date
Available Now

Chief Supervisor
Dr Gavin Pereira (Telethon Kids Institute, Curtin University)

Supporting Supervisors
A/Professor Helen Leonard (Telethon Kids Institute)
Dr Annette Regan (Telethon Kids Institute, Curtin University)

Project Outline
Complications and outcomes of pregnancy recur in subsequent pregnancies or within families. Only a fraction of this has been explained by genetic studies. This project will identify whether pregnancy outcomes cluster in families and possibly propose a design to ascertain the contribution of socioeconomic/environmental exposures. Use of secondary data i.e. information in health registries that has already been collected i.e. no fieldwork is necessary. The student will learn to use leading open source software for data analysis used in many settings beyond health e.g., finance, marketing, other basic/applied sciences, in various industries and government.

PhD students will receive support of $1400 per year for project costs plus $2500 to attend a conference. Research Masters students also receive some funding. For PhD (and Research Masters) projects, students are to apply for a RTP.

Suitable For
☐ Honours ☐ MD ☐ Masters ☒ PhD

Essential Skills & Qualifications
• A complete or near-complete degree in Statistics, Public Health or a health science; or MD project
• First-Class Honours, or Masters degree (by research), or Masters degree (by coursework with at least 50% research) in Statistics, Public Health or a health science

Ethics Approval
☒ Obtained ☐ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
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Gavin.Pereira@telethonkids.org.au
The Impact of Interval between Pregnancies on the Risk of Autism and Intellectual Disability

Research Team
Aboriginal Maternal Health and Child Development

Start Date
Available Now

Chief Supervisor
Dr Annette Regan (Telethon Kids Institute, Curtin University)

Supporting Supervisors
A/Professor Helen Leonard (Telethon Kids Institute)
Dr Gavin Pereira (Telethon Kids Institute, Curtin University)
Dr Kingsley Wong (Telethon Kids Institute)

Project Outline
Interpregnancy interval is the time from the birth of one infant to conception of the next. Short and long intervals between pregnancies have been linked to poor maternal and child health outcomes. Several recent studies have shown there may be an increase in the risk of autism spectrum disorder (ASD) associated with interpregnancy interval. However, well-controlled, epidemiological studies are needed to better evaluate this association. The interval between pregnancies is a potentially modifiable factor and results from this study will be important for informing parents who are planning their next pregnancy and clinicians who may be counselling these parents.

This project will use available MINERvA data to compare the incidence of ASD and intellectual disability by different interpregnancy intervals. MINERvA is a multinational project which aims to investigate familial and environmental factors influencing the risk of ASD. Currently, the project includes data from the US, Australia, Denmark, Finland, Israel, Norway and Sweden. The student will be responsible for preparing the study dataset and analysing the data to address this research question.

Suitable For
☐ Honours
☐ MD
☒ Masters
☐ PhD

Essential Skills & Qualifications
- An undergraduate degree in Statistics, Health Science or related field
- Completion of a statistics unit at third (preferably fourth) year level
- Excellent organisational skills
- Ability to (or interest in learning to) analyse data using statistical software packages

Ethics Approval
☒ Obtained
☐ Not Obtained

Funding
☐ Top-up scholarship offered by project
☐ Full scholarship offered by project

For more information, please contact:
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