Postgraduate Research Opportunities at the Telethon Kids Institute

Student project booklet 2023

Discover. Prevent. Cure.

WELCOME TO THE
TELETHON KIDS INSTITUTE

At Telethon Kids, our vision is simple - HAPPY HEALTHY KIDS.

We bring together community, researchers, practitioners, policy makers and funders, who share our mission to improve the health, development and lives of children and young people through excellence in research. Importantly, we want knowledge applied so it makes a difference.

Telethon Kids Institute is the largest medical research facility in Western Australia. With more than 1200 staff, students and honorary researchers, 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 theone roof to tackle the many complex childhood diseases and issues from a range ofdifferent angles.

In 2018, Telethon Kids moved to brand new premises within the children's hospital building at the QEII Campus in Nedlands. The new building includes state-of-the-art facilities with increased space and improved access to leading edge technology and research equipment.

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 Event**: 4.30pm in The Manda, Level 6 Telethon Kids Institute, in Perth Children's Hospital on Wednesday 31st August. RSVP is essential.

SCHOLARSHIPS

Stan & Jean Perron Top Up Award

A prestigious top up scholarship of $20, 000 p/a for three years to recognise and support exceptional postgraduate students undertaking their research at the Institute.

Stan & Jean Perron Excellence Award

A one year, $20, 000 top up award that recognises exceptional performance by a higher degree by research student over the previous 12 months.

Stan & Jean Perron PhD Career Launching Award

An award of $20, 000 p/a, to support four exceptional final year PhD students or those who have submitted within the previous 6 months to make the transition from student to post doctoral life. The funds will support students to finish papers, journals, manuscripts and attend conferences to build their track record.

Wesfarmers Centre of Vaccines & Infectious Diseases HDR Scholarship

A top-up scholarship of $10,000p/a to support exceptional PhD students undertaking research in the area of infectious diseases.

RESEARCH FOCUS AREAS

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.

ABORIGINAL HEALTH

The Aboriginal Health Research Focus Area integrates the needs of Aboriginal families and children into all relevant areas of our work. Improving the health and wellbeing of Aboriginal children and families is an overarching priority for every program and team at the Institute.

Aboriginal people experience greater disadvantage than the rest of the population on almost all of the determinants of health, social and emotional wellbeing including employment, education and housing.

As there are specific cultural, social and economic contexts that require more specialised investigation in collaboration and consultation with Aboriginal families, this Research Focus Area is unique in that it provides advice, technical and cultural support across the Institute to all programs of research.

BRAIN AND BEHAVIOUR

Brain and 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.

Brain and Behaviour consists of four programs: Development and Disability; International Child Development; Mental Health and Youth; and Population Health.

CHRONIC & SEVERE DISEASES

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.

Chronic and Severe Diseases consists of four programs: Cancer; Diabetes, Metabolism and Clinical Sciences; Precision Health; and Respiratory Health.

EARLY ENVIRONMENT

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.

Early Environment consists of four programs: Immunobiology and Immunotherapeutics; Neonatal and Lifecourse Health; Infection and Vaccines, and END RHD.

Contents

BRAIN & BEHAVIOUR

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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.

The Raine Study: The world's first pregnancy cohort, enabling research into the impact of early environment, genetics and lifestyle on human health and wellbeing

Research Focus Area	Brain & Behaviour Chronic & Severe Diseases Early Environment
Research Group	
Start Date	2023
Chief Supervisor	Professor Ashleigh Lin, A/Prof Rebecca Glauert, Professor Romola Bucks (plus many more dependent upon area of interest)
Other Supervisors	Other supervisors available at TKI, UWA, Murdoch, Notre Dame, Curtin University
Project Outline	The Raine Study is **one of the world's longest-running** pregnancy and birth cohort studies; and the **most extensive and successful** survey of the factors impacting human health from the uterus through to adulthood to be undertaken. **4 GENERATIONS OF PARTICIPANTS**: The Raine Study is a longitudinal cohort study. It relies on the same group of genetically related families originally recruited between 1989 and 1991 to participate in each follow-up. The longer the same people continue to take part in the study, the more valuable their data becomes. Based in Perth, **2,900 pregnant women** (Gen1) were recruited to be part of the Raine Study between 1989 and 1991, giving birth to **2,868 children** (Gen2). Our Gen2 participants have now turned 30, and have taken part in a remarkable **17 follow-up studies** since before they were born until now, each contributing **over 30 million pieces of epigenetic data**. Over 73% of our Gen2 participants are still actively involved in Raine Study assessments. The Raine Study has become a **uniquely multi-generational** study with the additional participation of 109 grandmothers of the original Raine Study babies (Gen0) and more than 500 babies (Gen3) born to our now adult Gen2 participants. **14 AREAS OF RESEARCH FOCUS**: The Raine Study has been helping researchers and policy makers better understand the causes of human health and well-being by sourcing data across research areas including biological resources, cardiometabolic factors, diet, education and work, environmental exposures, genetics, hearing, hormones, immunology, mood and mental health, musculoskeletal, physical activity, psychology, reproductive health, respiratory health, risk-taking behaviour, sleep and vision. Hundreds of researchers in Australia and around the world have utilised data sourced from the Raine Study to power breakthrough discoveries across all aspects of human health. You now have a chance to utilise Raine Study data to conduct ground-breaking research. We accept high quality students for a range of projects, so please contact us to discuss your interests. More details on the data we have available can be viewed at https://rainestudy.org.au/
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in psychology/biology/biostatistics/public health/medicine or related discipline • Excellent communication skills • Good statistical 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:
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Professor Ashleigh Lin: *Ashleigh.Lin@telethonkids.org.au*

NDIS: a new data source for ascertaining intellectual disability in Western Australia

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	March 2023 or sooner
Chief Supervisor	A/Professor Helen Leonard (Telethon Kids Institute)
Other Supervisors	Jenny Bourke (Telethon Kids Institute)
Project Outline	The Intellectual Disability Exploring Answers (IDEA) Database is a population-wide de-identified database on intellectual disability (ID) and autism in WA. Since 2002 ascertainment of individuals with ID or autism born since 1983 has been through notifications from the Disability Services Commission (now Department of Communities) and the Department of Education. In 2021 individuals with intellectual disability or autism registered for services in WA through the National Disability Insurance Scheme (NDIS) were additionally linked to the IDEA database. This project aims to investigate any changes in the number and severity of individuals now eligible for IDEA since the inclusion of those receiving services with the NDIS. Analysis will include estimates of prevalence and distribution of level of intellectual disability.
Suitable For	☐ Honours ☒ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of science/health sciences • Experience and interest in statistical analysis/data management • 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

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BEACHES - Longitudinal data study of built environments and child risk factors for non-communicable disease

Research Focus Area	Brain & Behaviour
Research Group	PLAYCE: Children's Physical Activity, Health and Development & ORIGINS Project Team
Start Date	Flexible: 2022 -2023
Chief Supervisor	Associate Professor Hayley Christian (Telethon Kids Institute & UWA)
Other Supervisors	Dr Bryan Boruff (UWA School of Agriculture & Environment) Dr Andrea Nathan (Telethon Kids Institute)
Project Outline	This research will use longitudinal data from Australian cohort studies as part of the NHMRC funded Built Environments and Child Health in Wales and Australia (BEACHES) project. Population level data will be used to identify and understand the complex factors in the built environment and how they influence modifiable risk factors (physical inactivity, sedentary time, dietary intake, and overweight/obesity) for non- communicable disease across childhood. Findings from this research will inform evidence-based policy planning to prevent the rise of non-communicable diseases across the lifespan as well as inform sustainable ways to prevent modifiable risk factors for non-communicable disease.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative 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, Data Science 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:

A/Professor Hayley Christian
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Impact of Nature on Young Children's Health & Wellbeing

Research Focus Area	Brain & Behaviour
Research Group	Children's Physical Activity, Health and Development
Start Date	Flexible: 2022-2023
Chief Supervisor	A/Professor Hayley Christian (Telethon Kids Institute, UWA School of Population and Global Health)
Other Supervisors	Phoebe George (Telethon Kids Institute)
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. The impact of nature contact has been examined in older children, but there are very few studies in young children. Research on the health benefits of green and blue space is an emerging field of research with most studies conducted in the last 5 years. Overall, studies have shown that blue and green space is associated with several physical and mental health benefits. This project has the scope to examine the role that water systems play in human health looking at variations by geographical location and population and how Western Australians access and use different types of blue spaces in their community and what the health and wellbeing benefits (and potential negative effects) are. 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. There is also scope for this project to examine the impact of *green* and *blue space* on early child health and development. This project's findings have the potential to strengthen sector and transdisciplinary collaboration on water systems and health and advance understanding of the relationship between water systems and health in the local context. In the longer term, the research will inform recommendations to ensure people continue to receive health benefits from blue spaces.
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
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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PLAYCE Cohort: Children's Physical Activity, Health and Development

Research Focus Area	Brain & Behaviour Chronic & Severe Disease
Research Group	PLAYCE: Children's Physical Activity, Health and Development
Start Date	2023
Chief Supervisor	A/Professor Hayley Christian (Telethon Kids Institute, UWA)
Other Supervisors	
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 attending early childhood education and care (ECEC). This research will provide information on how best to create healthy home, neighbourhood and ECEC environments. The project involves qualitative research with children, parents, staff and key stakeholders in the ECEC 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 ECEC physical, policy and social environment. There is scope to evaluate the impact of policy and practice-basedinterventions to improve children's movement behaviours at ECEC. Students have the option to work on the PLAYCE cohort study which details patterns of movement behaviours and the effect movement behaviours have on weight status andsocio-emotional, cognitive, and motor development across childhood (2-9 years).
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative and or 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 group ☐ Full scholarship offered by project group

For more information, please contact:
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PLAYCE: PAWS Intervention - Physical Activity & Dog Walking Study

Research Focus Area	Brain & Behaviour
Research Group	PLAYCE: Children's Physical Activity, Health and Development
Start Date	Flexible: 2023-2024
Chief Supervisor	Associate Professor Hayley Christian (Telethon Kids Institute, UWA)
Other Supervisors	Emma Adams (Telethon Kids Institute)
Project Outline	This research forms part of the PLAYCE program of research – Places Spaces & Environments for Children's Physical Activity. The PLAYCE PAWS Study aims to trial different methods of encouraging more physical activity in children through playing and walking with the family dog. The overall aim of this study is to see whether active play and walking with the family dog facilitates improved developmental outcomes in young children. The project involves intervention scale up research with children, parents and the family dog. There is scope to use the learnings from the pilot study and further investigate the health and developmental benefits of companion animals for young children.
Suitable For	☐ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative research • Excellent writing skills • Statistical analysis (SPSS/SAS) • 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:

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How can we support the mental health of parent caregivers with a child with refractory epilepsy?

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	Jan to March 2023
Chief Supervisor	Dr Jacinta Saldaris (Telethon Kids Institute)
Other Supervisors	A/Professor Jenny Downs (Telethon Kids Institute) Professor Gareth Baynam (UWA, PCH)
Project Outline	Developmental Epileptic Encephalopathies (DEE) are a group of rare and severe epilepsy syndromes, characterised by refractory seizures, usually with early onset, and developmental impairments. They are often genetically caused. Parent caregivers need to implement and manage a complex set of medical and therapy tasks to manage their child's refractory epilepsy, developmental needs and other comorbidities. This is associated with stress and can adversely affect parental mental health. This project will conduct a needs analysis of what parent caregivers with a child with a DEE need to support their mental health, together with stakeholders and consumers. This project will in the first instance include conducting interviews and/or focus groups with parents/caregivers, and stakeholder consultation and/or interviews with community service providers to understand needs and potential support strategies. Ongoing work could include the development and testing of a mental health support intervention, depending on the level of the study.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative research 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:

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How should we measure epilepsy-related quality of life in children with a developmental epileptic encephalopathy?

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	Jan to March 2023
Chief Supervisor	A/Professor Jenny Downs (Telethon Kids Institute)
Other Supervisors	Dr Jacinta Saldaris (Telethon Kids Institute) A/Professor Helen Leonard (Telethon Kids Institute)
Project Outline	Developmental Epileptic Encephalopathies (DEE) are a group of rare and severe epilepsy syndromes, characterised by refractory seizures, usually with early onset, and developmental impairments. They are often genetically caused. Health related quality of life scales have capacity to measure the impacts of epilepsy on the children's lives, but current scales are not scaled appropriately for the effects of disability on this group of children. We have some interview data that explains health related quality of life for children with a DEE, but more are needed to provide data to inform the development of a DEE-specific health related quality of life scale. This project will involve interviews with parents and qualitative analyses. Ongoing work could include the development and testing of a DEE-specific health related quality of life scale, depending on the level of the study.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative research 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:

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Supporting health literacy in parents of children with health- and/or disability-related needs

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	March 2023
Chief Supervisor	A/Professor Jenny Downs (Telethon Kids Institute)
Other Supervisors	Dr Rachel Skoss (Notre Dame University)
Project Outline	Health literacy is a broad term for a range of capacities that are required for people to effectively navigate to, negotiate and engage with health, disability and community services. Importantly, health literacy is not only about the capacity of the family seeking services, but also about the responsiveness and capacity of organisations to effectively respond to the varying needs of their clients. Health literacy is a useful lens to understand how services can be better designed, how families can be better supported throughout the journey, and opportunities to build capacity in both front-line practitioners, and their clients. This project will (1) investigate variation in health literacy profiles of parents of children who experience disability, mental health issues, chronic health conditions, and/or life-limiting illnesses; (2) conduct interviews or focus groups with specific consumer, clinician and service provider groups to understand strategies to address health literacy; and in response, (3) develop capacity building resources and evaluate their effectiveness.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative and quantitative research skills
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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What does better look like for children with Developmental Epileptic Encephalopathies?

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	Jan to March 2023
Chief Supervisor	A/Professor Jenny Downs (Telethon Kids Institute)
Other Supervisors	Dr Jacinta Saldaris (Telethon Kids Institute) A/Professor Helen Leonard (Telethon Kids Institute)
Project Outline	Developmental Epileptic Encephalopathies (DEE) are a group of rare and severe epilepsy syndromes, characterised by refractory seizures, often early onset, and developmental impairments. They are usually genetically caused. New therapeutics are being developed that have potential to reduce seizures. Others are gene therapies that have potential to improve the fundamental aspects of the condition such as developmental impairments. This project will involve interviews with parents and qualitative analyses to understand what differences in functioning that could be achieved with the new therapeutics are important for the child and family. Ongoing work could include further studies that evaluate clinically important change in outcomes.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative research skills
Ethics Approval	☐ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Healthy Environments and Lives

Research Focus Area	Brain & Behaviour
Research Group	Aboriginal Health and Wellbeing – Healthy Environments and Lives (HEAL) Network
Start Date	January 2023 or earlier
Chief Supervisor	Dr. Brad Farrant (Telethon Kids Institute)
Other Supervisors	
Project Outline	The vision of the Healthy Environments and Lives (HEAL) Network is to catalyse research, knowledge exchange and translation into policy and practice that will bring measurable improvements to our health, the Australian health system, and the environment in the face of climate change and other environmental change. HEAL is a large nationally distributed network. The foundational/key principles of the HEAL network are: ● Democratic decision-making based on a polycentric governance system that promotes diversity (including diverse lived experience), collaboration and translation ● Respectful weaving of Aboriginal and Torres Strait Islander wisdom, knowledges and cultures with Western knowledges through co-design with Aboriginal people including the HEAL WA Aboriginal Steering Group ● Strong engagement and co-design with governments, public health and healthcare sectors, not-for-profit organisations, communities, business and industry including via the HEAL WA Communities of Practice ● Dynamic, open and inclusive network structures that nurture future leaders ● Equitable, merit/needs-based distribution of roles, responsibilities and resources ● Strong focus on equitable solutions, through evaluation of policies and interventions in multiple sectors to improve the resilience of communities and the health system ● Multidisciplinary research excellence through involvement of researchers in public/ environmental health, health systems, economics, climate, data and social science This PhD project will be co-designed with the successful candidate to work with and support the HEAL WA Communities of Practice and broader community and stakeholder engagement. This will likely include a focus on evaluating and supporting the HEAL WA priority setting, and research co-design, translation and implementation processes.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Honours degree in a related field • Ability to work with Aboriginal and culturally diverse people • Experience in qualitative research (particularly using participatory or Indigenous research methods) or mixed methods research • Excellent written and communication skills • Commitment to and strong motivation for a PhD 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:
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Parents' work hours and child health, wellbeing and educational outcomes

Research Focus Area	Brain & Behaviour
Research Group	Mental Health and Youth Research
Start Date	January 2023 or earlier
Chief Supervisor	Dr. Brad Farrant (Telethon Kids Institute)
Other Supervisors	Professor Michael Dockery (Curtin University) A/Professor Jianghong Li (Berlin Social Science Center, Germany; Honorary Research Associate, Telethon Kids Institute; Adjunct Associate Professor, Curtin University)
Project Outline	Familial time is an important resource for optimal child development. Research has shown that parents' work time, as a proxy measure of parental time spent with children, is linked to diet quality and risk for overweight and obesity in children and adolescents (e.g., in Western Australia and Germany). However, there is limited research focusing on the impact of parents' work hours on other domains of child development, e.g., mental health and wellbeing and educational outcomes. In particular, longitudinal analysis especially that using longer time spans during child development is rare. This project aims to fill in this gap by 1) investigating the trajectory of both mothers' and fathers' number of work hours per week from infancy to adolescence and the impact that these have on child social/emotional wellbeing and school achievement, using the Longitudinal Study of Australian Children as the primary data source; 2) potential mediators (e.g., parenting stress, work-family conflict, time use, parental mental health and wellbeing) and moderators (parent socioeconomic and child characteristics, work time flexibility) of this impact. The Raine Study data could also be employed to explore the impact of parents' work hours on specific health issues for which the Raine Study offers better measures. The analytical methods will include both random- and fixed-effects models and mediation analysis. The PhD project will be supervised by leading experts in the research field on work-family and work-health interfaces. The findings of the project will be publishable in high quality international journals and have significant implications for work and family policy and service provision in WA and nationally. **The main responsibilities of the PhD candidate are:** Apply for access to the datasets and necessary ethics approvals Conduct literature search and review Conduct data analysis Present research findings at conferences Write up the dissertation We highly recommend that the student develops the dissertation using the paper format and publishes the results as the PhD project is in progress.
Suitable For	☒ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• A Master degree or a minimum 2A honours degree in population health/social epidemiology, labour economics, sociology or psychology • Strong analytical skills for quantitative data analysis (e.g., cohort or panel data) • Excellent written and communication skills • Independence in conducting research • Commitment to and strong motivation for a PhD degree
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Prof Jianghong Li (jianghong.li@wzb.eu)

Compassion and self-compassion in parenting an early childhood

Research Focus Area	Brain & Behaviour
Research Group	Early Neurodevelopment and Mental Health;
Start Date	Jan-March 2022
Chief Supervisor	Dr Amy Finlay-Jones (Telethon Kids Institute; University of Western Australia; Curtin University)
Other Supervisors	Dr Vincent Mancini Dr Wendy Simpson (Edith Cowan University)
Project Outline	Self-compassion refers to the capacity to treat oneself with kindness and understanding during times of difficulty. Interventions that target self-compassion are demonstrated to improve mental health in a range of populations, and there is mounting interest in how self-compassion may support the transition to parenthood and navigating parenting challenges in the early years. Further, little is understood about how children develop compassion for themselves or others during early childhood. There are several options for student projects in this space, including observational and experimental studies to determine antecedents and consequences of parent/child compassion and/or developing and trialling interventions to promote these outcomes. NB Dr Finlay-Jones is a certified instructor of several compassion and self-compassion training programs and can guide interested students on the use of these in the research.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Interest in parenting research and/or infant and early childhood mental health. • Interest in contemplative science
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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Promoting infant and early childhood mental health: the role of parent-child relationships

Research Focus Area	Brain & Behaviour
Research Group	Early Neurodevelopment and Mental Health
Start Date	Jan-March 2022
Chief Supervisor	Dr Amy Finlay-Jones (Telethon Kids Institute)
Other Supervisors	Dr Vincent Mancini (Curtin University) Dr Wendy Simpson (Edith Cowan University)
Project Outline	Early parent-child relationships are a key influence on child mental health risk and resilience across the lifespan. Using data from our existing dataset, this project will allow students to explore critical influences on early childhood mental health, using any of the following variables: parent stress, child sleep, screen exposure, parent-child attachment, parent self-compassion, parent emotion regulation, and parent use of emotion regulation strategies with children. The specific project will be developed in consultation with the supervisors.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Interest in infant/early childhood mental health and parent mental health • Quantitative research 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:

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Supporting co-regulation and self-regulation in infancy and early childhood

Research Focus Area	Brain & Behaviour
Research Group	Early Neurodevelopment and Mental Health
Start Date	Jan-March 2022
Chief Supervisor	Dr Amy Finlay-Jones (Telethon Kids Institute)
Other Supervisors	A/Professor Jenny Downs (Telethon Kids Institute)
Project Outline	Child self-regulatory difficulties (sleeping, settling, and managing emotions and behaviour) are one of the most common reasons parents seeks support. When self-regulatory difficulties persist, it can be detrimental to parent mental health and child outcomes. Understanding the needs and experiences of parents/caregivers who have a child with self-regulatory difficulties is an important step in developed targeted supports. Community service providers can also provide important perspectives on the facilitators and barriers to accessing support. This project may comprise some or all of the following objectives, depending on the level of study: • Conducting interviews and/or focus groups with parents/caregivers • Conducting stakeholder consultation and/or interviews with community service providers • Conducting discrete choice experiments to determine the ideal characteristics of interventions to promote self-regulation • Developing a measure of co-regulation effectiveness This project is part of a broader program of work conducted by the Early Neurodevelopment and Mental Health and Child Disability teams examining self-regulation difficulties in infants and toddlers. There is the potential to develop PhD ideas with the project teams.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent communication skills • Interest in stakeholder engagement and family wellbeing • Qualitative research 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:
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Developing a school-built environment audit tool to improve bullying and mental health

Research Focus Area	Brain & Behaviour
Research Group	School and Community Wellbeing
Start Date	March 2023
Chief Supervisor	Dr Jacinta Francis (Telethon Kids Institute)
Other Supervisors	Dr Julie Saunders (The University of Western Australia)
Project Outline	Peer bullying and aggression are key contributors to mental illness among children, contributing to loneliness, distress, and poor academic performance. Although a number of school-based prevention and intervention approaches to prevent bullying have been developed internationally, many of these cease to be effective after Year 9, with some programs inadvertently increasing bullying behaviour. New approaches to prevent bullying are needed. This project aims to develop and validate primary and secondary school audit tools to measure features of the school indoor and outdoor built environment associated with bullying behaviour and mental health. The audit tool will be developed and informed by a review of existing audit tools used in schools, parks and child-care centres and a Delphi survey sent to stakeholders to confirm, add or delete priority audit items. The audit tools will be assessed to determine and enhance their psychometric properties and once validated, used to scan Western Australian schools.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in psychology, health science, health promotion, education, nursing or similar discipline. • Valid Working with Children Check. • For Masters and PhD: First-class Honours or equivalent.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Does neighbourhood cohesion and physical activity mediate the relationship between green space and mental health?

Research Focus Area	Brain & Behaviour
Research Group	School and Community Wellbeing
Start Date	March 2023
Chief Supervisor	Dr Jacinta Francis (Telethon Kids Institute)
Other Supervisors	Dr Julie Saunders (The University of Western Australia)
Project Outline	Investigations into green space and mental health have gained momentum in recent decades, with numerous studies linking green space attributes to both mental illness and wellbeing. While more research is needed into the pathways between greenspace and mental health, greenspace has the potential to improve mental health by reducing stress, facilitating physical activity and fostering positive social ties. The How Areas in Brisbane Influence healTh And activity (HABITAT) study is a multi-level study of over 8,000 adult participants and 200 neighbourhoods. This project involves the secondary analyses of a longitudinal dataset to explore pathways between neighbourhood greenspace and mental health, specifically the potential mediators of social relations, physical activity, and stressful life events across four timepoints. Objectives include: i) exploring the role of social ties, physical activity, and stressful life events on the relationship between the built environment and mental health; ii) identifying key park attributes that influence mental health by different sub-populations (i.e., age, gender, parents, grandparents, children living at home, and age of children living at home); and iii) identifying thresholds for key park attributes that influence mental health for different sub-populations and socio-economic areas.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in psychology, health science, health promotion, education, nursing or similar discipline. • Experience conducting statistical analyses (SPSS/SAS). • For Masters: First-class Honours or equivalent.
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Improving outcomes in young people exposed to suicide

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health Team
Start Date	January-March 2023
Chief Supervisor	Dr Nicole Hill, Telethon Kids Institute
Other Supervisors	TBD
Project Outline	In Australia, suicide is the leading cause of death in young people aged 10-24. Exposure to suicide is a significant risk factor for adverse physical health and mental health (including self-harm and suicide) that can persist into adulthood. Postvention (interventions that seek to promote recovery and prevent further suicide in those who have lost a loved one or friend to suicide) is a public health priority. Postvention can include psychological interventions, but also social interventions such as peer support to facilitate recovery. This project seeks to improve our understanding of the impact of exposure to suicide in young people and to identify optimal postvention interventions for different youth populations.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in data science, psychology, social work, education, social science • Basic statistical knowledge • Excellent communication and interpersonal skills • Excellent written skills (e.g., essays) • Curiosity and passion for youth mental health research
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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Families experience of sleep disturbances affecting their child with CDKL5 Deficiency Disorder

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	March 2023 or sooner
Chief Supervisor	A/Professor Helen Leonard (Telethon Kids Institute)
Other Supervisors	A/Professor Jenny Downs (Telethon Kids Institute)

Project Outline

CDKL5 Deficiency Disorder (CDD) is a rare but increasingly recognized cause of early onset epilepsy. In 2012 we established the International CDKL5 Database to collect data internationally and to characterise the disorder. The disease hallmarks are early onset refractory seizures and severe developmental impairment with deficits in gross motor, fine motor, language and socialization skills. Gastrointestinal, respiratory and musculoskeletal problems also frequently occur. Although sleep disturbances have also been reported, little is known about their frequency and pattern. Given the likely burden of sleep disturbances on the child and their family there is clearly need for further investigation of the nature and magnitude of this comorbidity so that appropriate therapies can be trialled and initiated for those affected.

This study will use data collected on over 300 cases in the database to explore the frequency and characteristics of sleep disturbances in these children and adults and how this may vary by gender and age group. There will be an opportunity for a qualitative component involving interviews with parent caregivers to provide a more in depth characterisation of issues relating to sleep disturbances, how they affect the child and the family and how parents deal with these.

Suitable For ☒ Honours ☒ MD ☒ Masters ☐ PhD

Essential Skills & Qualifications

- Undergraduate degree in an area of health sciences
- Excellent communication skills
- Interest in disability and family wellbeing
- Interest in qualitative research skills

Ethics Approval ☒ Obtained ☐ Not Obtained

Funding

☐ Top-up scholarship offered by project group

☐ Full scholarship offered by project group

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Seasonality at birth and Association with Intellectual Disability

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	March 2023 or sooner
Chief Supervisor	A/Professor Helen Leonard (Telethon Kids Institute)
Other Supervisors	Jenny Bourke (Telethon Kids Institute) Dr Kingsley Wong (Telethon Kids Institute)
Project Outline	Some studies have suggested that autism spectrum disorder may vary by season of birth, but fewer studies have investigated whether this is also true of other causes of intellectual disability. This study will use a WA population dataset linking to the Intellectual Disability Exploring Answers (IDEA) Database and the WA Midwives Notification System. The student will investigate whether there are any differences in the prevalence of intellectual disability or autism plotted by month of conception, to investigate any seasonal patterns of variation. Variables such as gestational age at delivery, sex, birthweight and maternal factors will be used to adjust the analysis. Some biologically plausible causes of any variation, such as infection and maternal vitamin D levels, would be potentially amendable to intervention.
Suitable For	☒ Honours ☒ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of science/health sciences • Experience and interest in statistical analysis/data management • 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

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Understanding the behavioural profile of individuals with CDKL5 Deficiency Disorder

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	March 2023 or sooner
Chief Supervisor	A/Professor Helen Leonard (Telethon Kids Institute)
Other Supervisors	A/Professor Jenny Downs (Telethon Kids Institute)
Project Outline	CDKL5 Deficiency Disorder (CDD) is a rare but increasingly recognized cause of early onset epilepsy. In 2012 we established the International CDKL5 Database to collect data internationally and to characterise the disorder. The disease hallmarks are early onset refractory seizures and severe developmental impairment with deficits in gross motor, fine motor, language and socialization skills. Gastrointestinal, respiratory and musculoskeletal problems also frequently occur. Yet little is known about the behavioural profile of individuals with this disorder. This study will use baseline data collected on over 300 cases in the database as well as follow up data on approximately half of this group to explore the behavioural characteristics of these children and adults and how this may vary by gender, age group and mutation group.
Suitable For	☒ Honours ☒ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative research skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Predicting outcomes in early-stage mental disorders (PRE-EMPT) – a data driven project

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health
Start Date	February 2023
Chief Supervisor	Prof Ashleigh Lin
Other Supervisors	Prof Stephen Wood
Project Outline	There is an exciting opportunity for students to be part of a NHMRC Centre of Research Excellence (CRE) which is focussed on predicting outcomes in early-stage mental disorders ('PRE-EMPT'). This project aims to use existing databases across Australia, the Netherlands, United Kingdom, and Germany to better understand the predictors and mechanisms associated with onset of a range of mental disorders in young people. Perth is specifically focussed on using birth cohort data (Raine Study and ALSPAC), applying a range of analytical techniques to longitudinal data to develop prediction models of mental health outcomes. However, there are opportunities for working on clinical datasets. This project would suit a student with a strong interest in mental health who has excellent data analytic skills. The student should have a desire to gain experience in epidemiology and learn new predictive modelling techniques. This project will provide excellent opportunities for co-authorship and collaboration across Australia and Europe, with potential for extended visits to European collaborators. The specific project can be tailored to the interest of the student.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	Undergraduate degree in fields related to Psychology, Public Health, or Statistics • Excellent statistical skills • Excellent written and communication skills • Ability to work with, accept and respect diverse peoples
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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Associations between Fathers' Personality and Personal Characteristics with Parenting Behaviours, and Child Development

Research Focus Area	Brain & Behaviour
Research Group	School and Community Wellbeing
Start Date	March 2022
Chief Supervisor	Dr Vincent Mancini
Other Supervisors	TBA
Project Outline	Drawing upon Cabrera's expanded ecological model of father-child relationships (Cabrera et al., 2014), students will have the opportunity to quantitatively test the relationships between attributes of fathers (e.g., personality, mental health, beliefs about parenting, adherence to masculine norms, etc.) with parent-related beliefs and behaviours, and subsequent indicators of child development (cognitive, social, emotional, or educational). Recently, there has been an increased demand to understand the role of fathers and father-figures with diverse/unique elements (e.g., split parent households, parents where mental health difficulties are present, parents of children with disability, culturally and linguistically diverse families, etc.), thus students may be able to examine these associations in a specific context of interest. The proposed method of data collection is an online survey and will involve cross-sectional and correlational research designs (e.g., mediation and/or moderation models). This research is part of Doctor Vincent Mancini's recently formed 'Dads and Development' research group embedded in the School and Community Wellbeing Team at Telethon Kids Institute. The aims of the 'Dads and Development' research group are to understand the unique and important role that fathers (including father figures) play in shaping the development of child health and wellbeing, and to develop actionable strategies that can allow fathers to better support their children. Any students interested in completing research in this area are encouraged to contact Vincent Mancini.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• For Honours Students: An undergraduate degree (or 3+ years of study) in psychology or related field. • For Master's students: A degree in psychology, public health, or related field. • Excellent communication skills. • Excellent writing skills. • Interest in research on fathering and child development. • Interest in quantitative research skills; experience using correlational research methods and relevant software (e.g., SPSS) are desirable. • Ability to cooperate and contribute to the research team. • Willingness to learn. • Motivation to publish the finished work.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Investigating the diet of students living in micro-apartments

Research Focus Area	Brain & Behaviour
Research Group	Food and Nutrition
Start Date	March 2023
Chief Supervisor	Joelie Mandzufas
Other Supervisors	Gina Trapp
Project Outline	This project will investigate the food practices and dietary intake of students living in micro-apartments in Australia. Most capital cities contain apartment buildings solely for the use of students. Although most Australian jurisdictions provide guidelines for the minimum size of new apartment constructions, many of these apartments are very small (less than 25m^2, including kitchen and bathroom facilities). The aim of this project is to investigate the shopping, cooking and eating habits of students living in these micro-apartments and the impact on their dietary health. Methods may include participative mapping and qualitative interviews. This project complements and extends a current PhD project investigating the food practices of apartment residents in Australia.
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 statistical analysis skills • High level organisational and time management skills • Relevant undergraduate degree • Eligible for Honours at a University or enrolled in Masters degree by coursework
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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Early Years Initiative – Evaluation

Research Focus Area	Brain & Behaviour
Research Group	Schools & Communities
Start Date	Flexible: 2022/2023
Chief Supervisor	Dr Lynne Millar (Telethon Kids Institute, Curtin University)
Other Supervisors	Dr Jon Sae-Koew, Dr Kevin Runions, A/Prof Francis Mitrou
Project Outline	Evaluation of the characteristics and role of Community Connectors in successful population-wide, place-based interventions aimed at improving health and education outcomes in the 0- to 4-year-old age group. This mixed-methods evaluation would comprise a comparative case-study methodology across four diverse communities across WA who are implementing the Early Years Initiative. Interviews, focus groups, Social Network Analysis, Group Model Building, and surveys may be used to collect data.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative and qualitative research • Excellent writing skills • Ability to work as part of a team • Good interpersonal and communication skills • Minimum 2A Honours degree
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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LGBTQIA+ Inclusive Practice Training for Medical and Psychology Students

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health
Start Date	February 2023
Chief Supervisor	Dr Yael Perry
Other Supervisors	Prof Ashleigh Lin Dr Penelope Strauss
Project Outline	Lesbian, gay, bisexual, trans, queer or questioning, intersex and asexual (LGBTQIA+) individuals experience significant mental health disparities compared to their heterosexual, cisgender peers. This is largely due to experiences of stigma and discrimination and is compounded by poor access to, and quality of, health services. Health professionals report a lack of knowledge, confidence, and competence in supporting LGBTQIA+ individuals and identify inadequate training on LGBTQIA+ identities, experiences, and health as the core reason for these deficits. The overarching aim of this project is to improve the mental health of LGBTQIA+ individuals through enhanced inclusive practice training for health professionals. This will be achieved through; i) an audit of LGBTQIA+ inclusive practice currently included within tertiary medical and psychology education curricula across Australia ii) collaborative development of tailored LGBTQIA+ curriculum for medical and professional psychology students with partners from LGBTQIA+ organisations, universities, and professional associations and iii) an evaluation of the inclusive practice curriculum in tertiary education programs to assess knowledge, competence, and confidence of students to work with LGBTQIA+ individuals.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	Undergraduate degree in Health Sciences, Psychology, Public Health, Education or a related field • Excellent written and communication skills • Ability to work with, accept and respect diverse peoples
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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Understanding the mental health and wellbeing of parents of trans children and young people

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health
Start Date	Late 2022
Chief Supervisor	Dr Yael Perry
Other Supervisors	Ms Helen Morgan; Dr Penelope Strauss; Professor Ashleigh Lin
Project Outline	There is an opportunity for prospective Honours and/or Masters students to be involved with a national mixed-methods study which aims to better understand the experiences of parents of trans children (0-25 years) regarding aspects such as parental mental health and wellbeing and impact on family and wider relationships. Findings will provide insight into the experiences and needs of parents and will be used to inform service providers and policy makers to aid development of services to better address parental support needs. Prospective students can work within the proposed program of work or develop their own research proposal in line with the research program. There may also be opportunities to become involved in the broader activities of the team who conduct youth mental health research across several marginalised populations.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Public Health or a related field • Excellent written and communication skills • Ability to work with, accept and respect diverse people
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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Suicide prevention in LGBTQA+ young people

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health
Start Date	February, 2023
Chief Supervisor	Dr Penelope Strauss, Telethon Kids Institute
Other Supervisors	Professor Ashleigh Lin, Telethon Kids Institute Dr Yael Perry, Telethon Kids Institute Dr Nicole Hill, Telethon Kids Institute
Project Outline	The Youth Mental Health team at Telethon Kids Institute is working on improving the mental health and wellbeing of LGBTQA+ young people. We have several opportunities to conduct research projects on preventing suicide in LGBTQA+ young people. Potential new projects are: • Creating an intervention to decrease suicide risk in LGBTQA+ young people • Projects with parents or families of LGBTIQA+ young people The project may focus on a specific subgroup of LGBTQA+ young people, or LGBTQA+ young people broadly. Students are also able to work on one of the projects already underway in our team, depending on their degree requirements. The focus of the specific student project will depend on the interest and skills of the student and our projects are flexible based on the student's time frame. There is the opportunity for the student to suggest and develop a new project or to develop an intervention within this study cohort. Prospective students may be involved in recruitment, data management, analysis and/or preparation of publications. There may also be opportunities to become involved in the broader activities of the team who conduct youth mental health research across several marginalised populations.as
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	Undergraduate degree in Health Sciences, Psychology, Public Health or a related field • Excellent written and communication skills • Ability to work with, accept and respect diverse peoples
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Early concerns and experience of diagnosis in MECP2 Duplication Syndrome

Research Focus Area	Brain & Behaviour
Research Group	Child Disability
Start Date	November 2022-March 2023
Chief Supervisor	Mr Daniel Ta (Telethon Kids Institute)
Other Supervisors	A/Professor Jenny Downs (Telethon Kids Institute) A/Professor Helen Leonard (Telethon Kids Institute)
	MECP2 duplication syndrome (MDS) is a relatively newly identified disorder which can affect multiple family members and is associated with duplication of the MECP2 gene. We established the MECP2 Duplication Database (MDBase) in 2020 to collect data internationally and to characterise the disorder. MDS is associated with intellectual disability, epilepsy, respiratory infections, motor impairments and behavioural difficulties. However there has been little documentation in the literature of early symptoms, presentation and experience of diagnosis. This study will use data collected in MDBase to describe characteristics of the neonatal period, first parental concerns, pathway to diagnosis and impact on the family. For students undertaking an MD or Masters degree there could be an opportunity for extension with the inclusion of a qualitative component involving interviews with parents.
Suitable For	☒ Honours ☒ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in an area of health sciences • Excellent communication skills • Interest in disability and family wellbeing • Interest in qualitative research skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Investigating the popularity and use of online food delivery platforms (e.g., Uber Eats, Menu Log, Deliveroo)

Research Focus Area	Brain & Behaviour
Research Group	Food & Nutrition
Start Date	Negotiable
Chief Supervisor	Dr Gina Trapp (Telethon Kids Institute)
Other Supervisors	TBD
Project Outline	Online food delivery platforms, such as Uber Eats, Menu Log and Deliveroo, offer consumers a convenient and fast delivery service of foods and drinks sourced from foodservice partners (e.g. restaurants, quick service restaurants). There is a need to assess the impact of this emergent segment of the foodservice sector on diet and diet-related health. The aim of this student project is to perform a detailed review of the scientific peer-reviewed literature and summarise what research has been done to-date on online food delivery platforms, both within Australia and overseas. A secondary aim is to design and conduct a survey to ascertain the popularity and use of online food delivery platforms among Australian teenagers, young adults and adults. Further work and methodologies could be employed for larger sized research projects (i.e., PhD).
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in nutrition, public health or related field • Excellent interpersonal, written and oral communication skills • Prospective PhD students need to have a First Class Honours Degree or Masters Degree in a suitable discipline related to the project, with a substantial research project component.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full PhD scholarship offered by project group (TBC)

For more information, please contact:

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Killing the buzz: Interventions to reduce energy drink intake in children and adolescents

Research Focus Area	Brain & Behaviour
Research Group	Food and Nutrition
Start Date	Negotiable
Chief Supervisor	Dr Gina Trapp (Telethon Kids Institute)
Other Supervisors	Dr Siobhan Hickling (UWA School of Population and Global Health)
Project Outline	Energy drinks have catapulted to popularity among young people. Whilst they are marketed to improve the body's performance, they pose a significant health risk due to the high levels of caffeine, sugar, sodium and herbal stimulants they contain. Their consumption has been linked to heart palpitations, hypertension, cardiac arrest and even sudden death in individuals with underlying heart conditions. Children and adolescents are at an even greater risk of experiencing adverse health effects from energy drinks due to their smaller body size and lower tolerance to caffeine. Despite growing community concern and evidence of health risks, Australian governments have not enforced age-specific restrictions on the purchasing of energy drinks. Thus, there is a critical need to identify other ways to minimise harm in young people. Interested students are invited to undertake research projects aimed at reducing and preventing energy drink intake in children and adolescents. Potential research topics include: • Development of a parent-based intervention to reduce energy drink intake in children and adolescents • Development of a child-focused intervention to reduce and prevent energy drink intake • Investigating parent, teacher and school principal's knowledge, attitudes, perceptions and experiences related to children's energy drink intake.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent interpersonal, written and oral communication skills • Prospective PhD students need to have a First-Class Honours Degree or Masters Degree in a suitable discipline related to the project, with a substantial research project component.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full PhD scholarship offered by project group

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Making the healthy choice the easy choice: Within-store interventions to increase healthy food purchasing

Research Focus Area	Brain & Behaviour
Research Group	Food & Nutrition
Start Date	Negotiable
Chief Supervisor	Dr Gina Trapp (Telethon Kids Institute)
Other Supervisors	TBD
Project Outline	The daily diets we consume are influenced by the environments in which we live, work and play. While many Australians understand the need to eat a healthy diet, all too often the healthy choice is not the easiest choice. One of the ways we can try to address this issue is by looking at ways we can nudge people towards healthier choices in public settings, such as hospitals and sport and recreation settings. This includes making small changes that improve the availability and promotion of water and healthy food options instead of sugary drinks and junk food. We are looking for interested students to carry out a series of 'nudge' experiments within food outlets located in public settings. A 'nudge' is a small change that alters people's behaviours without forbidding any options. For example, displaying water for sale at eye level within a canteen and limiting the promotion of sugar sweetened beverages by putting them out of sight, such as under a counter. Evaluation of sales and attendance data and customer exit surveys will be used to assess how the changes have impacted the food outlet and people's behaviour (e.g. retail profits, healthy food and drink purchasing, resources required, acceptability among the community).
Suitable For	☐ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in nutrition, public health or related field • Excellent interpersonal, written and oral communication skills • Prospective PhD students need to have a First Class Honours Degree or Masters Degree in a suitable discipline related to the project, with a substantial research project component.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☒ Full PhD scholarship offered by project group (TBC)

For more information, please contact:
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Putting an end to nuggets and chips, burger and chips, fish and chips: How can we make 'Kids' Menus' healthier in cafes & restaurants?

Research Focus Area	Brain & Behaviour
Research Group	Food and Nutrition
Start Date	Negotiable
Chief Supervisor	Dr Gina Trapp (Telethon Kids Institute)
Other Supervisors	Dr Siobhan Hickling (UWA School of Population and Global Health)
Project Outline	Going out to eat was once viewed as an occasional treat, but it is now a common behaviour in many Australian households and accounts for around a third of all food spending. It has been suggested that restaurant tables are turning into the "new generation" of the dinner table where families connect, highlighting the importance of healthy meals to be served within these establishments. However, children's menus or 'kids' meals' (usually targeted at those under 12 years), are noted for their absence of healthy offerings like salads, whole-grain products, and fruit-based desserts. Our Food & Nutrition Team recently completed an audit of 'Kid's Meals' in Perth, WA. Typical fare included foods like chicken nuggets and chips, burger and chips and fish and chips, with sugar-sweetened beverages often bundled in as the default drink option. The aim of this student project is to investigate ways to improve the nutritional quality of Kids Menus in cafes and restaurants and/or ways to nudge parents and children into ordering healthy items from the Kids Menu. A mixed-method design could be employed with quantitative (i.e., surveys) and qualitative (i.e., interviews/focus groups) elements with parents, children and food business owners.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent interpersonal, written and oral communication skills • Undergraduate degree in nutrition, public health, health promotion or related field • Quantitative and qualitative research skills are desirable
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Too amped? Energy drinks, young people and the construction industry

Research Focus Area	Brain & Behaviour
Research Group	Food and Nutrition
Start Date	Negotiable
Chief Supervisor	Dr Gina Trapp (Telethon Kids Institute)
Other Supervisors	Justine Howard (Telethon Kids Institute)
Project Outline	Energy drinks have catapulted to popularity among young people. Whilst they are marketed to improve the body's performance, they pose a significant health risk due to the high levels of caffeine, sugar, sodium and herbal stimulants they contain. Their consumption has been linked to dehydration, inability to concentrate, symptoms of anxiety, heart palpitations, hypertension, cardiac arrest and even sudden death in individuals with underlying heart conditions. Despite growing community concern and evidence of health risks, energy drink intake is highly prevalent in male dominated industries such as construction. Construction workers who over-consume energy drinks are risking health impacts which can affect their ability to safely perform physical tasks, safely operate plant and machinery and increase the risks from other work hazards. Indeed, the Australian construction industry had the third highest number of deaths, fatality rate (per 100,000 workers) and incidence rate (major claims per thousand workers) of work-related injury and disease.[1] Interested students are invited to undertake research projects aimed at reducing and preventing energy drink intake in young people who work in the Construction industry. Potential research topics include: • Investigating Construction industry professionals' knowledge, attitudes, perceptions and experiences related to energy drink intake and young people in the Construction industry. • Investigating the knowledge, attitudes, perceptions and experiences related to energy drink intake of young people working in the Construction industry. • Development of a Construction industry-based intervention to reduce and prevent energy drink intake in young people working in Construction industry.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent interpersonal, written and oral communication skills. • Prospective PhD students need to have a First-Class Honours Degree or Masters Degree in a suitable discipline related to the project, with a substantial research project component.
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 Gina Trapp: gina.trapp@telethonkids.org.au

MRI findings and trauma in children diagnosed with ADHD

Research Focus Area	Brain & Behaviour
Research Group	Youth Mental Health
Start Date	January 2023
Chief Supervisor	Dr Alix Woolard (Telethon Kids Institute)
Other Supervisors	Professor Helen Milroy (Child and Adolescent Mental Health Service / University of Western Australia); Dr Hugo Morandini (Child and Adolescent Mental Health Service); Dr Pradeep Rao (Child and Adolescent Mental Health Service).
Project Outline	The Trauma Team is part of the Youth Mental Health research group. It is an interdisciplinary team with a mission to improve the health and wellbeing of people exposed to traumatic events in childhood. Recently, research has identified an overlap in the symptoms children experience because of trauma and those diagnosed as attention deficit-hyperactivity disorder (ADHD). ADHD is the most common neurodevelopmental disorder in childhood (Visser et al., 2014), and child trauma (e.g. maltreatment, natural disasters, accidents) affects up to 2/3 of Australia's population (Australian Institute of Health and Welfare, 2020). ADHD and trauma both impact brain development, and in particular the functional connectivity in brain areas (i.e., how regions in the brain interact with each other). Studies show an increased likelihood of developmental trauma in children diagnosed with ADHD, although it is unknown whether the diagnosis of ADHD could be a misdiagnosis of trauma symptoms (Brown et al., 2017). To better understand this complex interaction between ADHD and developmental trauma, we need to understand how brain development is impacted when children have both developmental trauma and ADHD diagnoses. We aim to investigate the relationship between MRI data from children diagnosed with ADHD, with high indicators of developmental trauma and those without. We also plan to investigate whether there are differences between children who have experienced trauma and have a diagnosis of ADHD and those who do not have a diagnosis of ADHD.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Honours or Master's degree in Psychology, Public Health or a related field • Ability to conduct quantitative and qualitative research • Excellent writing and communication skills • Ability to work as part of a team • Experience collaborating with community stakeholders and young people
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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Alix.Woolard@telethonkids.org.au

Embrace PhD Scholarship Opportunity

Embrace @ Telethon Kids Institute is Western Australia's first research collaboration devoted to the mental health of children and young people aged 0-25 years old.

Embrace is inviting applications for PhD scholarships. Two scholarships will be awarded, funded at $30,000 per year for three years. Applications will undergo a competitive process and be judged by an independent panel.

Proposed PhD projects must:

- Focus on an area within the field of infant, child or youth mental health (0-25 years)
- Have supervisor/s already associated with the project, with at least one supervisor located at Telethon Kids Institute
- Also be submitted for a Research Training Program (RTP) scholarship or similar. If a project is successful RTP or other full scholarship and Embrace scholarship applications, the Embrace scholarship will be awarded to the next best candidate without an RTP scholarship.

Applications should contain the following information:

- The PhD candidate's CV
- A short statement from the supervisor (this can be emailed) outlining the potential of the PhD candidate and the relevant research experience of all supervisor/s that will be associated with the project
- A brief proposal (2 pages maximum) outlining the supervisory team, proposed project in terms of background, research questions, methodology, timeline, potential impact, and any other key project considerations

The deadline for applications is 5:00pm Friday 30th September. Any questions and applications should be sent to: [Grace.Brown@telethonkids.org.au].

LIFE COURSE CENTRE

ARC Centre of Excellence for Children and Families over the Life Course: PhD Scholarships

Research Focus Area	Brain & Behaviour
Research Group	Life Course Centre
Start Date	Flexible: 2022/2023
Chief Supervisor	A/Professor Hayley Christian (Telethon Kids Institute, UWA)
Other Supervisors	Dr Kevin Runions, A/Prof Francis Mitrou, Dr Lynne Millar
Project Outline	The Life Course Centre is funded by the Australian Research Council and collaborating partner organisations. The LCC has its headquarters at The University of Queensland, with nodes at The University of Western Australia (UWA), and the universities of Melbourne and Sydney. The Life Course Centre aims to produce and empower precision methods and adaptive social interventions to optimise support for disadvantaged children and families, helping them to achieve their full potential. The successful HDR candidate will also be a student member of the Life Course Centre, which qualifies them to apply for travel grants and attend professional development courses. The LCC UWA node has two PhD scholarships available for research projects related to one of these topics - Built environment and child health - Disadvantage in the school and early childhood learning settings - Integrated services in disadvantaged settings - The role of community connectors in place-based interventions Other topics related to deep & persistent disadvantage in Australia will be considered.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	Ability to conduct quantitative and qualitative research Excellent writing skills Ability to work as part of a team Good interpersonal and communication skills Minimum 2A Honours 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:

A/Professor Hayley Christian(08) 6319 1040
Hayley.christian@telethonkids.org.au

Family Friendly Environments: understanding neighbourhood Influences on early child health and development

Research Focus Area	Brain & Behaviour
Research Group	PLAYCE: Children's Physical Activity, Health and Development
Start Date	2023
Chief Supervisor	A/Professor Hayley Christian (Telethon Kids Institute, UWA)
Other Supervisors	Dr Andrea Nathan (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 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 child health and development. The Australian Research Council Centre of Excellence for Children and Families over the Life Course (the Life Course Centre) is an international collaboration of 21 organisations working to identify the drivers of deep and persistent disadvantage and develop innovative solutions to address it. The successful HDR candidate will also be a student member of the Life Course Centre, which qualifies them to apply for travel grants and attend professional development courses.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative and qualitative research • Excellent writing skills • Statistical analysis (SPSS/SAS/STATA/R) • 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, Data Science 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:
A/Professor Hayley Christian
(08) 6319 1040
Hayley.Christian@telethonkids.org.au

Parent Engagement in the Play Active Program

Research Focus Area	Brain & Behaviour
Research Group	Children's Physical Activity, Health and Development
Start Date	2022
Chief Supervisor	Associate Professor Hayley Christian (Telethon Kids Institute)
Other Supervisors	Dr Matthew 'Tepi' Mclaughlin (Telethon Kids Institute)
Project Outline	Play Active is a physical activity policy for early childhood education and care services (ECEC). The primary audience of the Play Active policy is staff at ECEC. Our prior research developed and piloted the policy, with accompanying training, resources and other implementation support strategies for staff working at ECEC services. We are now scaling-up and adapting the program for greater reach. One suggested adaptation by ECEC staff, and our partners, was to try to engage more with parents. Play Active is a part of the PLAYCE program of research – Places Spaces & Environments for Children's Physical Activity. The Play Active program partners include, but are not limited to: Cancer Council WA, Goodstart Australia, Nature Play Australia, the Australian Childcare Alliance, Department of Health and Department of Local Government, Sport and Cultural Industries. Together, we are working together to extend the reach of Play Active with parents. This project will use qualitative and/or mixed-methods research to identify opportunities to engage with parents, perhaps through ECEC staff, to encourage parents to support children to be physically active outside of ECEC.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to conduct quantitative and qualitative research • Excellent writing skills • An interest in knowledge transfer • Good interpersonal, communication and team skills • Desirable: Statistical analysis (SPSS/SAS) 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 group ☐ Full scholarship offered by project group

For more information, please contact:
Associate Professor Hayley Christian & Dr Tepi Mclaughlin
08) 6319 1040
Hayley.Christian@telethonkids.org.au and Tepi.Mclaughlin@telethonkids.org.au

CHRONIC & SEVERE DISEASES

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 understandingof 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.

Immune Resilience: The Final Common Pathway of neonatal sepsis.

Research Focus Area	Chronic & Severe Diseases
Research Group	System Vaccinology
Start Date	As soon as possible
Chief Supervisor	Professor Tobi Kollmann, Telethon Kids Institute
Other Supervisors	Dr Nelly Amenyogbe, Telethon Kids Institute Dr Rym Ben Othman, Telethon Kids Institute
Project Outline	**The Final Common Pathway of neonatal sepsis.** Sepsis arises when the body's response to an infection injures its own tissues and organs. There are many types of infections that can cause sepsis (now including SARS-CoV-2 / COVID-19). We have discovered that we can stop sepsis irrespective of the cause by helping our bodies resist the initial impact and reverse the consequences of an infection. Specifically: Previous research has shown that sepsis causes death by damaging the cells lining our blood vessels (endothelia). We found we can prevent this damage by giving the normal amino acid arginine and the normal fatty acid arachidonic acid by mouth - it works in minutes preventing sepsis irrespective of cause. We also found that administration of the normal growth factor angiopoietin (Angpt1) can treat those already suffering from severe sepsis, reversing any endothelial damage. We discovered these potential mechanisms of action by studying human babies with sepsis and confirmed the intervention does work exceedingly well in mice. To move this to the next stage (clinical trials in humans), we now will advance this work into larger animal models of sepsis such as sheep and non-human primates (NHP) followed by the first-in-human trials. This intervention promises to not only work, but be feasibly for even in disadvantaged settings, such as low-middle income countries. Highly motivated students are sought to join our team to drive this work forward, working in close partnership and supervision with senior scientists in our group. This research will include both wet lab (benchwork and animal models) and dry lab (informatics) work using cutting-edge technology driving intelligent immunity. No previous experience in these fields is required, but a strong work ethic and motivation to learn new things is. You will learn from the best when you join our team and network of collaborators. The candidate will also participate in meetings with collaborators from around the world, present scientific findings and contribute to – if not lead – the writing of manuscripts for publication, in addition to a thesis.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in molecular biology, immunology or related • Basic understanding of immunology • Basic wet lab skills • Willingness to learn essential analytical platforms including flow cytometry • Good problem-solving skills • Ability to effectively plan and implement a research strategy • Willingness to work with mouse models
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 Tobi Kollmann
Tobias.Kollmann@telethonkids.org.au

Immune Resilience: The Power of Pathogen-Agnostic Vaccine Effects

Research Focus Area	Chronic & Severe Diseases
Research Group	System Vaccinology
Start Date	As soon as possible
Chief Supervisor	Professor Tobi Kollmann, Telethon Kids Institute
Other Supervisors	Dr Nelly Amenyogbe, Telethon Kids Institute Dr Rym Ben Othman, Telethon Kids Institute
Project Outline	Vaccines are typically designed to mount a specific adaptive response to one pathogen. Most of our understanding of how vaccines work has focused on measuring these specific adaptive immune responses (antibodies; T cell response). We now know that this picture is far from complete, and that vaccines change how our innate and adaptive immune systems respond as one unit –shaped by millennia of evolution this is intelligent immunity. In fact, every vaccine investigated has shown non-specific or "pathogen-agnostic" effects (i.e. effects far beyond specific adaptive responses to one pathogen), but these have been ignored rather than being explored and harnessed to boost our defences against infectious diseases. Our team, working in close collaboration with experts from around the world, is changing this. For example: we have proven that the BCG vaccine has beneficial pathogen-agnostic effects in newborns providing protection against sepsis. Sepsis is a major cause of neonatal death that can be caused by a wide range of pathogens or other insults. We discovered this by investigating unique human cohorts – from locations in Africa and Papua New Guinea – and mouse models using cutting-edge technology: multi-omics analysis plus machine learning/artificial intelligence. We demonstrated that BCG vaccination of newborns induces a rapid spike in production of neutrophils, a type of white blood cell crucial for the defence against infection. This 'emergency granulopoiesis' mediates a 50% drop in newborn mortality within 3 days of newborns receiving BCG versus placebo. This vaccine response is extraordinary not just because of the mechanism, but also because of its speed and impact: 800,000 newborns die every year, many from infections that BCG could prevent. BCG also reduces the risk for viral upper respiratory infections in adults by > 50%. We are currently testing whether BCG can reduce the risk for COVID-19 in a trial that started in Australia but now spans the globe. This is just one example of the power of the pathogen-agnostic vaccine effects that we focus on. Highly motivated students are sought to join our team to further investigate the power of pathogen-agnostic vaccine effects. This research will include both wet lab (benchwork and animal models) and dry lab (informatics) work using cutting-edge technology driving intelligent immunity. No previous experience in these fields is required, but a strong work ethic and motivation to learn new things is. You will learn from the best when you join our team and network of collaborators. The candidate will also participate in meetings with collaborators from around the world, present scientific findings and contribute to – if not lead – the writing of manuscripts for publication, in addition to a thesis.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in molecular biology, immunology or related • Basic understanding of immunology • Basic wet lab skills • Willingness to learn essential analytical platforms including flow cytometry • Good problem-solving skills • Ability to effectively plan and implement a research strategy • Willingness to work with mouse models
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 Nelly Amenyogbe
Nelly.Amenyogbe@telethonkids.org.au

Using synthetic biology to develop new gene therapies for childhood diseases

Research Focus Area	Chronic & Severe Diseases
Research Group	Mitochondrial Research
Start Date	Honours/Masters: February or March 2022, PhD: flexible
Chief Supervisor	Professor Oliver Rackham (Telethon Kids Institute & Harry Perkins Institute)
Other Supervisors	Doctor Giulia Rossetti (Telethon Kids Institute & Harry Perkins Institute)

Project Outline

The ability to alter the genomes of living cells is key to understanding how genes influence all the functions of organisms and will be critical to modify living systems for useful purposes. However this has long been limited by the technical challenges involved in genetic engineering. Recent advances in gene editing have bypassed some of these challenges but they are still far from ideal. Our laboratory has previously established new protein-based therapies that can target single stranded DNA and RNA in a programmable manner, which are now moving towards clinical trials. In this project the successful applicant will build expertise in synthetic biology and capitalize on the established skills in the laboratory of Professor Oliver Rackham to engineer gene editing systems capable of efficient genetic modifications that are not possible with available systems to date.

Improved gene editing will be vital to basic science laboratories to reveal the genetic basis of molecular, organelle, cellular and organismal function. While in medicine, gene editing is poised to revolutionize pharmaceutical development, xenotransplantation, the development of gene and cell-based therapies, as well as approaches to control of insect-borne diseases and preventing the inheritance of disease-causing mutations. The new gene editing approaches developed in this project will be focused on enabling new gene therapies for childhood neuromuscular diseases.

Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in Biochemistry, Genetics, Bioinformatics, Molecular Biology, Microbiology or a related subject • A passionate student, interested in synthetic biology and the potential of gene editing for health • Willingness to learn new skills • Good problem-solving skills • Ability to work well independently or in 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:
Professor Oliver Rackham
6151 0735
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Exploring the associations between exercise variables and glycaemic variability in children and adolescents with Type 1 Diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Dr Craig Taplin (Telethon Kids Institute, Perth Children's Hospital)
Other Supervisors	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital) Dr Vinutha Shetty (Telethon Kids Institute, Perth Children's Hospital) Dr Shaun Teo (Telethon Kids Institute)
Project Outline	Glycosylated haemoglobin (HbA1c) has generally been an important tool for monitoring glucose control, and its association with physical activity (PA) levels has been investigated widely in the Type 1 Diabetes population. However, HbA1c does not provide information on daily glucose variability, which is crucial in the efforts to improve health outcomes of people with Type 1 Diabetes. Given the fact that PA can result in large blood glucose fluctuations, exercise prescription for Type 1 Diabetes management in adolescents remain a complex and dynamic process. By identifying the associations of the different components of PA and glucose variability, this may assist healthcare professionals in the development of individualised prescriptions that aid increments in physical activity levels safely. Hence, the project aims to observe and explore the associations between PA components (i.e. exercise frequency, intensity and duration) and glucose control in youth with Type 1 Diabetes as measured by triaxial accelerometry (Actigraph GT3x).
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • 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:
Jessica Sheppard
08 6456 4622
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A formative evaluation of healthcare professionals' level of knowledge and confidence relating to physical activity and Type 1 Diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Dr Shaun Teo (Telethon Kids Institute)
Other Supervisors	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital) Dr Vinutha Shetty (Telethon Kids Institute, Perth Children's Hospital)
Project Outline	Despite the key role that exercise plays in both the management of Type 1 Diabetes (T1D) and prevention of T1D associated cardiovascular complications, children and adolescents with T1D are less active than their healthy peers. Healthcare professionals have been identified as playing an important role in promoting exercise in children and adolescents with T1D. However, research has indicated that there is less confidence and consensus among healthcare professionals regarding the promotion of exercise when compared to the level of confidence in prescribing medication, treatment and diet interventions for people with T1D. Thus, the aim of the project is to conduct a formative evaluation of healthcare professionals working with children and adolescent with T1D, around physical activity knowledge and confidence. The evaluation will provide critical information relating to the characteristics, decisions and behaviours of healthcare professionals, to inform and develop future education and training programmes for this group, that will consequently, improve T1D service provision in respect of physical activity and exercise.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • 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:
Jessica Sheppard
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Assessing physical activity levels and patterns of healthcare professionals and parents of children living with Type 1 Diabetes.

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Dr Shaun Teo (Telethon Kids Institute)
Other Supervisors	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital) Dr Craig Taplin (Telethon Kids Institute, Perth Children's Hospital) Dr Vinutha Shetty (Telethon Kids Institute, Perth Children's Hospital)
Project Outline	Healthcare professionals (HCPs) play an important role in promoting a physically active lifestyle by prescribing regular physical activity (PA) to children and adolescents living with Type 1 Diabetes (T1D), to improve their health and intervene in their T1D management. In this regard, HCPs possess the knowledge that puts them in a key position to advise on PA and T1D. Previous research has shown that HCPs lifestyle habits can potentially influence the attitudes and counselling of their patients. Additionally, previous research indicate that parents strongly determine the social and physical environment of their children and this influence may also provide an unexplored, but potentially important link between parents' PA levels and that of their children. As such, the overarching aim of the project is to assess both the HCPs' and parents' physical activity levels as measured by triaxial accelerometry (Actigraph GT3x). In addition, the project will examine the associations between HCPs/parental PA with that of their patient/child living with T1D.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • 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:
Jessica Sheppard
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The impact of early morning exercise performance on acute post-prandial glucose time in range and 24h glycaemic control in youth with Type 1 Diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Dr Craig Taplin (Telethon Kids Institute, Perth Children's Hospital)
Other Supervisors	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital) Dr Vinutha Shetty (Telethon Kids Institute, Perth Children's Hospital) Dr Shaun Teo (Telethon Kids Institute)
Project Outline	Although regular physical activity (PA) is a key recommendation for the management of Type 1 Diabetes (T1D), participation in exercise presents unique challenges for children living with T1D. These challenges result in them having significant barriers towards exercise-related diabetes management, with the most frequently reported barrier being fear of hypoglycaemia. Consequently, previous research has focused on the manipulation of exercise variables such as: i) exercise type; ii) intensity and; iii) duration, to provide the evidence needed to address the concerns relating to PA and T1D management. However, despite the availability of these evidence, PA levels in children remain lower than their non-T1D peers. As such, new contemporary methods of manipulating exercise variables are needed to help improve upon exercise prescription for children and adolescents living with T1D. The diurnal timing of exercise could be an important factor that has started to gain attention in recent times and may play a crucial role in T1D management during exercise performance. Hence, the overarching aim of the project is to explore the effect of a morning exercise session on acute glycaemic control measures when compared to a no-exercise control session in youth with T1D. This study will involve working with the team to recruit participants, supervise participants during in-clinic exercise sessions, and collect and analyse data.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • 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:
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Is the recommendation to decrease basal insulin dose pre-exercise conducive to severe hyperglycaemia during and after exercise?

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity
Start Date	January 2023/ July 2023
Chief Supervisor	Professor Paul Fournier (School of Human Sciences, University of Western Australia)
Other Supervisors	Professor Tim Jones (Telethon Kids Institute, Perth Children's Hospital) Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital)
Project Outline	rrent guidelines recommend that people with type 1 diabetes (T1D) should reduce their basal insulin dose by 25-50% prior to exercise to minimise their risks of hypoglycaemia both during and after exercise. However, these recommendations are challenged by our recent findings that when exercise is performed under basal insulin conditions, with no prior insulin dose adjustments, blood glucose levels remain stable or change little. These findings suggest that reducing basal insulin levels prior to a bout of high intensity exercise might be conducive to a marked increase in blood glucose levels, and thus be detrimental to blood glucose management. For this reason, our aim is to test the hypothesis that the recommendation to reduce basal insulin dose by 25 or 50% prior to engaging in a bout of high intensity exercise is conducive to a high increase in blood glucose levels in people with T1D.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Health Science, Biomedical Science or related degree • Initiative and dedication • High level of written communication skills • High level of organisation and time management skills • Ability to complete projects on time • Willingness to learn new skills • Excellent ability to work independently and as part of a team • Good interpersonal skills • 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:
Jessica Sheppard
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Effect of swimming and head-out water immersion in cold water on the risk of hypoglycaemia in type 1 diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity
Start Date	January 2023/ July 2023
Chief Supervisor	Professor Paul Fournier (School of Human Sciences, University of Western Australia)
Other Supervisors	Professor Tim Jones (Telethon Kids Institute, Perth Children's Hospital) Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital)
Project Outline	Physical activity increases the risk of hypoglycaemia in individuals with Type 1 Diabetes (T1D), with the associated increased fear of hypoglycaemia contributing to their lower participation rates in regular exercise and lower than average fitness levels. For this reason, a number of recommendations have been published to reduce such risks of hypoglycaemia. Unfortunately, one major limitation with these recommendations is that they generally overlook the impact that some environmental conditions may have on blood glucose response to exercise. Since cold water immersion increases glucose oxidation rate and may inhibit the production of glucose by the liver, this raises the issue of whether upright immersion or swimming in cold water increases hypoglycaemia risk in people with T1D. This is a clinically important issue given the increased risk of drowning associated with hypoglycaemia. Since this issue has not been investigated before, the primary aims of this proposed research project are to test the hypotheses that (a) head out of water immersion in cold (20^{o}C) compared to thermoneutral water (32^{o}C) is associated with a faster rate of fall in blood glucose level; and (b) exercising in cold water causes a greater rate of fall in blood glucose level compared to exercising under thermoneutral conditions.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Health Science, Biomedical Science or related degree • Initiative and dedication • High level of written communication skills • High level of organisation and time management skills • Ability to complete projects on time • Willingness to learn new skills • Excellent ability to work independently and as part of a team • Good interpersonal skills • 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:
Jessica Sheppard
08 6456 4622
Jessica.Sheppard@telethonkids.org.au

Using continuous glucose monitoring and a carbohydrate algorithm to manage blood glucose levels during exercise in adolescents with type 1 diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital)
Other Supervisors	Professor Paul Fournier (University of Western Australia)
Project Outline	Physical exercise can cause both low and high blood glucose levels in children and adolescents with Type 1 Diabetes (T1D). Due to the immediate and potentially serious consequences of untreated low blood glucose levels, it is often being regarded as the main barrier to a physically active lifestyle. In recent years, there has been an increase in the use of real-time continuous glucose monitoring (rtCGM) technology to better manage glucose levels. However, studies have not yet demonstrated the optimal use of rtCGM to reduce the time spent with low and high blood glucose levels during physical activity. The aim of this study is to trial a carbohydrate algorithm based on rtCGM readings during 60 minutes of moderate intensity cycling, in 14-16 year old adolescents with T1D. Participants will complete a familiarisation visit with a VO2 peak test followed by two testing sessions. One session will use the carbohydrate algorithm based on the rtCGM and the other will give carbohydrates based on the standard guidelines.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • Excellent communication skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Developing educational resources for sports coaches and teachers to support children and adolescents with type 1 diabetes be physically active

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity Research (Rio Tinto Children's Diabetes Centre)
Start Date	January 2023
Chief Supervisor	Professor Elizabeth Davis (Telethon Kids Institute, Perth Children's Hospital)
Other Supervisors	Dr Vinutha Shetty (Telethon Kids Institute, Perth Children's Hospital) Miss Rachel Lim (Telethon Kids Institute)
Project Outline	Along with insulin and diet, exercise has been recognised as one of the three essential components of managing type 1 diabetes (T1D). A research project conducted through the Children's Diabetes Centre found that a significant challenge experienced by adolescents when physically active was dealing with a lack of T1D knowledge in sports teachers 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. The aim of this project is to develop resources to assist people in the community to support young people with type 1 diabetes to engage in physical activity. The first phase of this study is collected information from coaches, young people with T1D and parents to determine what resources were needed and how they should be presented. This project will use this information to develop the resources which will be a combination of short online learning training modules, handouts, and content on our website in consultation with participants from the first phase.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Psychology, Health Science, Education, Health Promotion or related degree • Excellent communication skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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How is maternal Vitamin D sufficiency during pregnancy associated with the risk of islet autoimmunity development in children at risk of type 1 diabetes?

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	Feb 2023
Chief Supervisor	Dr Aveni Haynes, Children's Diabetes Centre (Telethon Kids Institute)
Other Supervisors	Mr Grant Smith, Children's Diabetes Centre (Telethon Kids Institute) Professor Elizabeth Davis, Diabetes & Endocrinology (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. (www.endia.org.au). Over 1,300 pregnant women who have T1D or where their unborn child has a first degree relative with T1D have been recruited to the study and the children are being followed up from birth to 10 years of age. There are numerous observational epidemiological studies reporting an association between low Vitamin D levels with increased risk of childhood T1D. ENDIA has the unique opportunity to further examine the influence of vitamin D levels on the development of islet autoimmunity by analysing the association between prenatal vitamin D levels and modifiable environmental factors such as dietary intake during pregnancy and infancy, compliance with supplementation or treatment if vitamin D deficiency is diagnosed, and the risk of islet autoimmunity in children at risk of T1D. This study aims to: 1. Determine the prevalence of vitamin D deficiency during pregnancy in the ENDIA study cohort 2. Investigate the association between vitamin D deficiency and antecedent factors being evaluated in the ENDIA study cohort 3. Investigate the association between vitamin D deficiency during pregnancy and the development of persistent islet autoimmunity in the ENDIA study cohort
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Health Science, Public Health or related degree. • Use of SPSS/STATA/R or other statistical package • Good communication and organisational skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Dealing with foods high in fat and protein – A qualitative evaluation of resources to help educate families living with type 1 diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	February 2023
Chief Supervisor	Dr Amelia Harray (Telethon Kids Institute)
Other Supervisors	Naomi Crosby
Project Outline	Emerging research suggests foods high in fat and protein require additional insulin for optimal glycaemic control. These foods have been shown to delay meal rises for more than five hours after eating. Foods high in fat and protein contribute a significant amount of daily energy intake in Australian children, and glycaemic control at Perth Children's Hospital (PCH) remains above the recommended target of an HbA1c <7%. Little is known about how families understand and apply learnings around fat and protein in real-life scenarios and whether the current clinical advice is being translated to patients in a consistent and evidence-based approach. Currently, resources exist for how to deal with foods high in fat and protein for patients using different treatment methods, including boluses for different insulin pumps, or when using multiple daily injections. This study aims to review, update and evaluate patient resources used to educate children with T1D and their families and develop new clinician education plans to aid translation. This study will involve recruiting families who already engage in changes to their diabetes management when dealing with foods high in fat and protein, and families who have not yet received education for dealing with these foods. The clinical team within the diabetes service at PCH will also be engaged to provide qualitative feedback on the patient resources and education plans. Focus groups and a questionnaire will be used to collect data to help explore the complex understanding and behaviours related to this topic, and improve patient centred, evidence-based care provided to children with diabetes in Western Australia. The student project to commence in February 2023 will involve the recruitment of families to education seminars, evaluation of seminar and a 4 week follow up questionnaire regarding use of new knowledge in free-living scenarios. This study provides the opportunity for students to engage with patient education and efficacy of knowledge translation.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Nutrition & Dietetics, Health Science, Health Promotion or a related degree • High level of written communication skills • High level of organisation and time management skills • Excellent ability to work independently and as part of a team • Good interpersonal skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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What is the burden of cardiovascular disease in Western Australian children and adolescents diagnosed with type 1 and type 2 diabetes?

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	February 2023
Chief Supervisor	Dr Aveni Haynes (Telethon Kids Institute)
Other Supervisors	Mr Grant Smith (Telethon Kids Institute) Dr Matthew Cooper (Telethon Kids Institute) Adult Endocrinologist supervisor TBD
Project Outline	Childhood diabetes is associated with significant long term health complications and an average reduced 14-year reduced life expectancy. Major cardiovascular complications including heart disease and strokes are a significant contributor to the high morbidity and mortality associated with childhood diabetes. Previous research from our group, led by Dr Cooper investigated the incidence of hospitalisations and risk factors for vascular complications experienced during early adulthood in children diagnosed with type 1 diabetes in Western Australia between 1992-2012, reporting a higher incidence in women and those with higher average glycaemic control in childhood. This project aims to determine the incidence of major cardiovascular outcomes and premature mortality in children diagnosed with type 1 and type 2 diabetes in Western Australia from 1992 to 2022, including an additional 10 years of new onset cases and follow-up period for those included in the previous study. Children with diabetes will be identified from the Western Australian Children's Diabetes Database (WACDD) maintained at Perth Children's Hospital and record linkage conducted by the Western Australian Data Linkage Unit (https://www.datalinkage-wa.org.au/) to the Hospitalisations and Morbidity Data System (HMDS) and Mortality Register to determine the incidence of cardiovascular outcomes in this cohort (Cooper et al, J Diabetes Complications (2017) 31(5):843-849). The findings of this study will be not only be novel but also make a significant impact on informing future models of care for children diagnosed with diabetes which aim to minimise the risk of long-term adverse effects for individuals affected by this lifelong condition so that they can be prevented in future generations.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Health Science, Epidemiology/Public Health related area • Excellent communication, team work and organisational skills
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Investigating geospatial patterns in the occurrence of childhood onset type 1 diabetes in Western Australia

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	February 2023
Chief Supervisor	Dr Aveni Haynes (Telethon Kids Institute)
Other Supervisors	A/Prof Ewan Cameron (Telethon Kids Institute) Song Zhang (UWA)
Project Outline	Childhood type 1 diabetes remains one of the commonest chronic conditions of childhood, affecting over 600,000 children aged <15 years worldwide. Type 1 diabetes is an autoimmune condition, with a peak age of onset in 10-14 year olds, requiring daily insulin replacement therapy in order to survive. Despite intense efforts, the cause of type 1 diabetes remains unknown. In Western Australia, all children newly diagnosed with type 1 diabetes are admitted to hospital for commencement of insulin therapy and diabetes related education and are then routinely followed by the diabetes team at Perth Children's Hospital in metropolitan and State-wide outpatient clinics every 3 months until the age of 18 years. Data on these children are available from the Western Australian Children's Diabetes Database (WACDD) maintained at Perth Children's Hospital, which has an estimated case ascertainment rate of >99.9%. This population-based complete data provide a unique opportunity for investigating the incidence and trends in type 1 diabetes in Western Australia and identify potential environmental risk factors involved in its cause. This project aims to investigate the association between newly available covariates on from the "digital WA" project led by A/Prof Cameron and the incidence of type 1 diabetes in the State, which has been shown to have spatial and temporal patterns which have yet to be explained. Examples of such area-level covariates now available include traffic flux, number of playgrounds/ovals or fast food outlets, amount of greenspace. These factors have previously been associated with either type 1 diabetes in other populations e.g Finland/Scandinavia or immune-mediated conditions (asthma/atopy), as well as the microbiome and hence there is sufficient rationale for conducting exploratory analyses.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Health Science, Epidemiology/Public Health related area • Excellent communication, team work and organisational skills • Interest in GIS, geo-coding/spatial analysis and data modelling
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Using novel mathematical approaches to analyse continuous glucose monitoring data from children at risk of type 1 diabetes

Research Focus Area	Chronic & Severe Diseases
Research Group	Diabetes and Obesity (Rio Tinto Children's Diabetes Centre)
Start Date	February 2023
Chief Supervisor	Dr Aveni Haynes (Telethon Kids Institute)
Other Supervisors	Dr Lyron Winderbaum (UniSA, STEM)
Project Outline	The cause of type 1 diabetes, one of the commonest chronic conditions of childhood, affecting over 600,000 children aged <15 years worldwide, remains unknown. Prospective, longitudinal studies conducted over the past decades have vastly improved our understanding. Type 1 diabetes is now thought to occur in stages, commencing with Stage 1 type 1 diabetes where blood sugar levels are normal but individuals have >2 detectable islet autoantibodies in their blood which signal that the autoimmune process is underway. Stage 2 is when there is some evidence of dysregulated glucose control (dysglycaemia) but the individual has no symptoms or signs of the condition, and Stage 3 of clinical type 1 diabetes is when individuals have symptoms/signs and the condition is usually diagnosed and insulin replacement therapy started. This project aims to apply novel mathematical approaches to continuous glucose monitoring (CGM) data being collected from a subset of the 1,473 children being followed in the Australian Environmental Determinants of Islet Autoimmunity (ENDIA) study (www.endia.org.au) from pregnancy to 10 years of age. Children with and without islet autoimmunity are invited to undergo serial CGM every 3-6 months from the time autoantibodies are detected until they are diagnosed with type 1 diabetes or withdraw from the study. As of June 2022, 42 children have completed at least one CGM session with some having completed 5 sessions. The Dexcom G6 CGM being used for this study captures sensor glucose values every 5 minutes, 24 hours/day for up to 10 consecutive days, providing very rich data for analysis of trends and patterns. CGM metrics currently being investigated include standard summary measures according to guidelines for individuals with diagnosed type 1 diabetes. We are looking for a mathematics student with an interest in conducting exploratory analyses of time-series data, using novel methods to (a) identify patterns that taken into account the dynamic nature of glucose levels e.g rates of change following meals, day/night time circadian patterns, extended periods of high or low glucose (b) develop metrics to predict worsening metabolic control/progression to clinical type 1 diabetes.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in Mathematics/statistical modelling methods • Excellent communication, team work and organisational skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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TELETHON KIDS CANCER CENTRE

Kids are not small adults, understanding age-dependent immune responses in childhood cancers

Research Focus Area	Chronic & Severe Diseases
Research Group	Brain Tumour Research
Start Date	Feb 2023
Chief Supervisor	Dr Omar Elaskalani, Telethon Kids Institute Cancer Centre
Other Supervisors	Dr Raelene Endersby, A/P Joost Lesterhuis and Pradeep Kumar
Project Outline	There is now an ever-growing number of drugs effective against adult cancers that work by targeting the tumour microenvironment, including blood vessels or immune cells. However, due to differences in the immune system of children, there is an urgent need to understand age-dependent effects to allow doctors to rationally prioritize the right drugs for paediatric clinical trials. This is particularly important as evidence from clinical studies indicates that many oncology drugs that work in adults have not provided meaningful benefits to children. Notable examples include anti-PD-L1 immunotherapy in solid tumours and anti-VEGF in high-grade glioma, which acts on blood vessels but has been proven ineffective in childhood brain cancer. To understand the impact of immune maturation across different ages on response to therapy, our team have established unique paediatric-specific preclinical models of childhood cancers for three of the most common kids' cancers, leukemia, brain tumour and sarcoma. In this project, we will use WA's first FACSymphony™ A5 Cell Analyzer to understand the differences between children and adult cancer immune responses using our advanced paediatric cancer models. This will result in discovering age-specific immunotherapy targets in childhood cancers. The student will be part of a large collaborative project that involves expert cancer biologists, immunologists, oncologists and bioinformaticians and will develop skills in: • Full Spectral Flow Cytometry • Cell sorting • Animal handling and live animal imaging • Tissue culture and molecular biology • Sample preparation for single cell and bulk RNA sequencing
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in biomedical science or related biological discipline • Motivation, and dedication
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Improving the immune response to cancer

Research Focus Area	Chronic & Severe Diseases
Research Group	Telethon Kids Cancer Centre – Cancer Immunotherapy and Neuroblastoma
Start Date	March 2022
Chief Supervisor	Dr Bree Foley, Dr Alison McDonnell, Dr Jesse Armitage and Dr Linda Wijaya
Project Outline	Our research program focusses on understanding and improving the immune response to cancer. Cancer immunotherapy as a discipline is delivering promising and vital alternatives for both adults and children in our efforts to control and cure cancer. However, immunotherapies overall provide vastly diverse outcomes between different patients and cancer types. Several key questions about why this might occur, or how to maximise the potential of immunotherapy, still remain. Our team deliberately seeks to answer the most complex immunological questions to provide meaningful, functional data so the full promise of immunotherapy can be realised. Our team harnesses the power of basic science, molecular biology, and genomics to forge tangible solutions that can dramatically improve the survival for children with cancer predominately leukaemia and neuroblastoma. We are specifically focussing on the following areas: 1. Investigating a treatment method using donated cells as alternatives for patients who cannot receive immunotherapy from their own cells 2. Determining how chemotherapy alters the immune microenvironment and how we can best combine chemotherapy with immune-based therapies. The core values underpinning our team are research excellence and innovation, which we achieve by embracing an entrepreneurial mindset in all our studies and by applying a multi-disciplinary lens on our work with the help of our collaborators. We are applying the latest disruptive technologies, such as single cell sequencing, to challenge existing dogma and assumptions associated to many of the significant problems and frustrations faced in the clinic. Finding solutions to complex issues requires an exceptionally capable team, which we have assembled. While there is no doubt that future obstacles will impede our ability to treat every child successfully – a key goal of our team is to continue to train the next generation of great researchers with the requisite skills to overcome those challenges on the horizon. We encourage all interested students to contact us and discuss specific project options.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Greater than credit average for Hons; BSc (Hons) or equivalent in biological discipline for Masters or PhD • Good organisational skills, motivation and dedication
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Finding new cures for childhood leukaemia

Research Focus Area	Chronic & Severe Diseases
Research Group	Translational Genomics in Leukaemia (TGL)
Start Date	February 2023
Chief Supervisor	Dr Sébastien Malinge Telethon Kids Cancer Centre University of Western Australia
Other Supervisors	Carlos Aya-Bonilla

Project Outline

Leukaemia is the most common type of cancer in children. Remarkable therapeutic advances have been made over the past sixty years. Despite this success, it remains the second cause of death by Cancer in Australia. Current therapeutic approaches have reached their maximum potential and specific subtypes of leukaemia continue to have a poor prognosis due to treatment toxicity and relapses. **This highlights the need for new efficacious treatments.** These poor clinical features are exemplified for Down syndrome children that developed acute lymphoblastic leukaemia (named DS-ALL). Indeed, treatment intensification is limited for these DS children due to a high rate of treatment-related morbidity. As a result, there is a nearly two-fold increased risk of developing relapses in DS-ALL compared to other type of childhood ALL.

Our group is focused on finding **new key vulnerabilities in the leukaemia cells** to develop **novel and less toxic targeted therapies.** To achieve this, we are using primary patient samples from which we developed sophisticated and clinically-relevant models named Patient-derived Xenografts (PDX). Using, our projects are focused on 1- understanding the initial steps of leukaemia development, 2- on dissecting the cellular response to standard of care treatments to identify new molecular biomarkers of treatment resistance those, and 3- on developing new approaches to target key weaknesses of treatment-resistant leukaemia cells (such as immunotherapy approaches).

During this project, the student will be introduced to and will develop expertise in:

- Flow cytometry and cell sorting,
- Animal handling, tissue preparation and drug testing,
- Tissue culture and molecular biology,
- CRISPR/Cas9 technology and screening strategies.
- Single cell approaches.

Ultimately, this project aims to develop new tools and strategies to improve prevention, diagnosis, long-term survival and quality of care for children with leukaemia.

Suitable For	☒ Honours	☒ MD	☒ Masters	☐ PhD
Essential Skills & Qualifications	• BSc (Hons) • Good oral and written communication skills			
Ethics Approval	☒ Obtained		☐ Not Obtained	

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Developing innovative treatment strategies for paediatric neuro-oncology

Research Focus Area	Telethon Kids Cancer Centre Chronic & Severe Diseases
Research Group	Brain Tumour Research
Start Date	Flexible, available immediately
Chief Supervisor	Dr Annabel Short
Other Supervisors	Dr Raelene Endersby
Project Outline	The Brain Tumour Research team at Telethon Kids is co-directed by Drs Nick Gottardo and Dr Raelene Endersby. 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. We currently have a project opportunity 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.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Ability to work in a multi-disciplinary team • Willingness to learn new skills and work with animals • Good organisational skills • Initiative and dedication For Honours/ Masters students • Greater than credit average For PhD candidates • First-Class Honours degree or equivalent (e.g. Masters by Research) in biological discipline
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Local immunotherapies to fight sarcoma

Research Focus Area	Chronic & Severe Diseases
Research Group	Sarcoma Translational Research
Start Date	February/March 2023
Chief Supervisor	Dr. Rachael Zemek / Dr. Ben Wylie / Dr. Tao Wang, Telethon Kids Institute
Other Supervisors	A/Professor Joost Lesterhuis, Telethon Kids Institute

Project Outline	Surgical resection is, and has long been, the front-line approach for treating cancer. However, it is often not possible to remove all cancer cells, with some cells remaining behind. The result is that, in time, these cancer cells can grow out again and cause a recurrence of the tumour, either locally or as metastases in other organs. A cancer particularly prone to relapse is soft-tissue sarcoma; a group of cancers derived from muscle, fat or connective tissues, characterised by local aggressive growth. Sarcoma is the third most common cancer in children and young people.
	
	The Sarcoma Translational Research team believes that all kids with sarcoma should be able to lead happy, healthy lives. To achieve this, we aim to discover and develop safer and more effective treatments, by doing innovative and rigorous research. We focus on addressing high relapse rates using a combination of unique preclinical models, patient samples and systems immunology.
	
	We aim to develop local therapies that can be applied during surgery to prevent relapse of sarcoma. However, to do that, we need to know:
	• How does the wound healing response change the tumour infiltrating immune cells as well as the tumour itself?
	• How do immune stimulants act locally to eradicate tumours?
	• Can we develop biomaterials to release drugs locally?
	• Can we combine new local therapies with current systemic therapies?
	We answer these questions using a range of skills including:
	• Systems biology (bioinformatic analysis of RNA expression)
	• Pre-clinical models (in vivo tumour models of surgical resection)
	• Materials science/chemistry
	• Laboratory techniques including:
	  ○ Histology
	  ○ Cell/tissue culture
	  ○ Molecular techniques such as CRISPR, PCR and cloning
	  ○ Flow cytometry
	We currently have project opportunities for self-motivated and enthusiastic individuals. We invite you to meet with us to discuss specific projects.

Suitable For	☒ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in biomedical science or related biological discipline • 2A+ Honours or equivalent for PhD • Good organisational skills, motivation, and dedication • Excellent communication skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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WAL-YAN RESPIRATORY RESEARCH CENTRE

Join the Wal-yan Respiratory Research Centre

The Wal-yan Respiratory Research Centre is looking for new Higher Degree Research Candidates to join our teams from 2023. We look for the best and brightest to join our world leading experts in children's respiratory research.
We want to make our student training programs as unique as you! ***We will build bespoke research projects with our candidates.*** Plus we are always on the lookout for innovative new ideas that we can add to our Centre.

About us:

The Wal-yan Respiratory Research Centre is made up of collaborative teams who are driven to understand respiratory health over the entire life-course, for example: how the early environment (from pre-pregnancy, birth, infancy and childhood) impacts long term respiratory outcomes.
We integrate our understanding of lifestyles and fundamental biology with interactions in our community and environment to develop novel solutions that protect our kids and change how we deliver care to those who develop respiratory complications.
The Wal-yan Centre aims to achieve international breakthroughs in paediatric respiratory health that will improve, extend and save the lives of children suffering from cystic fibrosis, asthma, the effects of being born premature, respiratory infections and viruses, the consequences of our environment and other chronic respiratory diseases.

Strategic Research Areas:

- Beating Chronic Lung Disease
    - Research examples: antimicrobial resistance and 'phage therapy; early drug discover and fast-tracked drug pipelines
- Early Life Influences
    - Research examples: pregnancy and early life influences on respiratory infections; lung health trajectories of those born premature
- Respiratory Infections and the Immune System
    - Research examples: "First contact" – susceptibility and resilience to viruses; role of the immune system in asthma development
- Lungs and the environment
    - Research examples: climate change and lung health; environmental exposures, toxicology and lung health
- Indigenous Health
    - Research examples: prevalence and management of wet cough and bronchiectasis; lung function testing in Indigenous populations
- Implementation into Clinics
    - Research examples: management of cystic fibrosis; novel device development for drug and medicine delivery

In our day-to-day activities we:

- Use cutting edge platforms, models, cohorts, bioengineering and state of the art technology to solve questions,
- Translate new tools, therapies and artificial intelligence into clinical use for the treatment of respiratory conditions,
- Work side by side with our clinical teams to deliver work where it is needed,
- Strive to develop community partnerships in all the work we do, ensuring that the voices are heard from the people that matter most.

We can give you:

- Access to our cohorts, databases, samples, expertise, training, platforms and equipment,
- Development of your skills both as a scientist and as a professional,
- The opportunity to be a part of a Centre with a 35-year legacy of creating significant, positive outcomes for our kids, our communities and our scientific networks, globally.

For more information on our research focus areas, please visit: walyanrespiratory.telethonkids.org.au

For general enquiries, please contact: Wal-yan.Respiratory@telethonkids.org.au

We will team you up with leaders across our Centre to start talking about your project goals.

Wal-yan
RESPIRATORY RESEARCH CENTRE
Healthy lungs for every child, for life
A Powerhouse Partnership
TELETHON KIDS INSTITUTE
Perth Children's Hospital Foundation
Perth Children's Hospital

Mining the lung virome using shotgun metagenomics data.

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	P4 Respiratory Health for Kids team
Start Date	January/February 2023
Chief Supervisor	Dr. Patricia Agudelo-Romero (Telethon Kids Institute)
Other Supervisors	Dr. Jose Caparros-Martin (Telethon Kids Institute) Prof. Stephen Stick (Telethon Kids Institute)
Project Outline	Although viruses are the most abundant organisms on Earth, they have been poorly characterized. This is a shocking situation considering the great impact that viral infections have in patients with chronic respiratory disorders. Shotgun metagenomics is a high-throughput technique that allows sequencing all the nucleic acids in a sample and, although viruses are present in those type of samples, not many tools are available to retrieve information about which viruses are present. To overcome this limitation, we have generated and validated a pipEline for Viral assEmbly and chaRactEriSaTion (EVEREST) to capture and characterize viral contigs from shotgun metagenomics datasets. This project will focus on implementing EVEREST pipeline to generate a catalogue of viral genomes associated with lung samples from children with chronic respiratory disease.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Have obtained an undergraduate degree in a relevant field (e.g., Public Health, Medical science, Epidemiology, Data science). • Pre-existing bioinformatics and/or data analysis skills are not essential but would be highly valued. • 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

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Dissecting the mechanism of pathogenesis of gut-derived microbial metabolites in chronic lung disease

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	P4 Respiratory Health for Kids
Start Date	2022
Chief Supervisor	Jose A. Caparros-Martin (Telethon Kids Institute)
Other Supervisors	Prof Fergal O'Gara (Telethon Kids Institute) Prof Stephen Stick (Telethon Kids Institute)
Project Outline	Cystic fibrosis starts early in life with an initial damage of the lungs driven by the uncontrolled inflammatory response. Because of their immunomodulatory properties, the bacteria living in the gastrointestinal tract, known as the gut microbiota, has been proposed to influence the progression of Cystic Fibrosis lung disease. Preliminary data from our laboratory have shown that the detection of gut bacteria-derived metabolites in the lungs could contribute to the exaggerated inflammatory response seen in Cystic Fibrosis lungs. This project focuses on understanding the pathological mechanism through which these gut-associated metabolites modulate inflammatory responses in the lungs. For this purpose, the candidate will use state-of-the-art imaging and gene-expression techniques.
Suitable For	☐ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• A genuine interest in host-microbiota interaction. • High level of organizational skills • Excellent communication and interpersonal skills.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Dissecting microbial functional capabilities shaping disease progression trajectories in CF

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	P4 Respiratory Health for Kids
Start Date	2023
Chief Supervisor	Jose A. Caparros-Martin (Telethon Kids Institute)
Other Supervisors	Prof Elaine Holmes (Australia National Phenome Centre) Dr Nicola Gray (Australia National Phenome Centre) Prof Fergal O'Gara (Telethon Kids Institute) Prof Stephen Stick (Telethon Kids Institute)
Project Outline	Cystic fibrosis starts early in life with an initial damage of the lungs driven by the uncontrolled inflammatory response. Secondary to this exacerbated immune response, colonisation of the lower airways by opportunistic pathogens initiates the self-reinforcing cycles of inflammation-infection that mediate the progressive functional deterioration of the CF lung epithelia. Based on this evidence, early childhood interventions should therefore be focused on the key processes governing the deregulated inflammatory responses, and the microbial succession events favouring the establishment of opportunistic bacteria. This project focuses on the systematic analysis of the lung-associated metabolome/microbiome early in life to discover new molecular pathways that could contribute to the progression of CF-associated lung disease. The aim of this project is to identify keystone microorganism activity that could explain which metabolites contribute to the exaggerated inflammatory response seen in early life CF to guide therapeutic intervention.
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• A genuine interest in host-microbiota interaction, integration of "omics" strategies and modelling in precision medicine, and enthusiastic to work on a multidisciplinary project. • Excellent communication and interpersonal skills.
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Anaerobes in the lung: bystanders or contributors to inflammatory lung disease?

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Open to discussion
Chief Supervisor	Dr Luke Garratt (Telethon Kids Institute)
Other Supervisors	Dr Anthony Kicic (Telethon Kids Institute) Complete supervisory team will be determined in agreement with the student and university
Project Outline	The airway epithelium is the surface of your lungs and is the primary initial responder to infectious challenges. Classical infectious pathogens such as Staphylococcus aureus and Pseudomonas aeruginosa have been well studied. There is now a large body of evidence that a microbiome exists in the lung and is composed of a diverse set of genera. Prevalent amongst these are anaerobic bacteria and they form a significant portion of the microbiome. There is growing interest in understanding how anaerobes influence infection and inflammation in chronic respiratory diseases such as cystic fibrosis (CF). However, association studies from clinical cohorts is conflicting as to whether they are beneficial, harmful or irrelevant to disease outcomes. This project is funded by a Research Excellence Award and a NHMRC Synergy grant to systematically study in the laboratory, how the lung epithelium and neutrophils of the immune system respond to anaerobes and other lesser described components of the microbiota. These include Prevotella, Veillonella, Porphyromonas, Rothia and other genera. Skillsets that will be gained include primary epithelial cell culture and differentiation protocols, neutrophil isolation and function assays, flow cytometry, mucin biology and bioinformatics approaches to large datasets (ie BioPlex, gene expression).
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Microbiology background and skills • Basic understanding of cell culture • Excellent communication and motivation • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Can we non-invasively diagnose respiratory infection type in young children?

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Open to discussion
Chief Supervisor	Dr Luke Garratt (Telethon Kids Institute)
Other Supervisors	Complete supervisory team will be determined in agreement with the student and university Collaboration with Erasmus Medical Centre, Rotterdam, Netherlands
Project Outline	Identifying what type of germ is causing a respiratory infection is very important for doctors when deciding what treatment is required. Infections with bacteria typically need antibiotic treatment to help the body fight the infection, particularly for children with chronic diseases. However, antibiotics do not work on viruses and should not be prescribed in these infections. The challenge for doctors is that regardless of whether you have a virus or a bacteria, your symptoms can be very similar – fever, headache, runny nose, cough. Very young children have a lot of virus infections but they are also at high risk of severe illness if a bacterial infection is not treated in time. We need new tests that can be safely performed in young children and provide better information to the doctor about the presence of a virus or bacteria. This research asks the question – can we better diagnose whether a child who is unwell with respiratory illness is sick from a virus or a bacteria? The project will trial two different tests for detecting a respiratory infection and determining the type (virus or bacteria). One is a blood assay that assesses how specific immune cells have been activated, using markers that differ depending upon bacteria and virus. The other is a breath assay that measures the mix of different compounds in the breath, including compounds released by bacteria. We will compare these tests on young children who are undergoing a clinical procedure (bronchoalveolar lavage) to investigate their lungs, which provides very accurate information on their lung infection status. We will also compare both tests to some other clinical tests such as throat/nasal swabs.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Willingness to participate in patient recruitment and study visits • Laboratory experience, handling clinical specimens • Excellent communication and motivation • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Powering automated analysis of clinical lung inflammation through machine learning

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Open to discussion
Chief Supervisor	Dr Luke Garratt (Telethon Kids Institute)
Other Supervisors	Ms Sarada Lee (Perth Machine Learning Group) Complete supervisory team will be determined in agreement with the student and university
Project Outline	Airway secretion samples such as sputum or bronchoalveolar lavage are directly analysed for airway immunophenotyping, providing valuable information for prescribing the right medication(s) to people suffering with chronic lower respiratory diseases. Current analysis requires human expertise and up to 15 minutes to complete, a considerable bottleneck at the pathology service level and is limited to tertiary teaching hospitals. Furthermore, the human analysis is limited to a fraction of the whole sample and only broad descriptions of cell composition. The advent of low-cost digital microscopy and cloud services creates the potential for airway immunophenotyping to be performed in wider healthcare settings and innovate new biomarkers from these samples. This project is to drive further advances in our deep learning immunophenotyping analysis DCNet, which uses a center point based approach to identify the major immune cell types present in brightfield images of airway secretions in a histological preparation (Lee et al., 2021. Sci Reports https://doi.org/10.1038/s41598-021-96067-3). DCNet has the potential to process any digital image of airway secretions, minimizing time and cost to clinical translation. The student will conduct three aims. First, further train DCNet on expanded set of annotated images, as well as build pipeline to conduct inference on images from >115 patient samples and export cropped images of identified cells for feature analysis. Second, quantify effect of area selection on bias and identify minimum imaging requirements in terms of slide area, magnification and resolution. Third, use the exported cropped images to establish whether new cellular metrics beyond cell composition (such as area, morphological patterns) may further differentiate relevant airway immunophenotype and clinical status like infection. To determine these questions, we are imaging samples from a large, international cohort which has extensive clinical and experimental data.
Suitable For	☐ Honours ☒ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Computer Science experience • UNIX/Shell/Linux and Python/PyTorch • Interest in neural networks and data analytics • Excellent communication and motivation • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Characterising the differential effects of interferon types on neutrophil biology

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Open to discussion
Chief Supervisor	Dr Luke Garratt (Telethon Kids Institute)
Other Supervisors	Complete supervisory team will be determined in agreement with the student and university Collaboration with Emory University, Atlanta, USA
Project Outline	Interferons (IFNs) are among the first immune pathways activated upon infection, especially at mucosal surfaces which are key locations for host exposure to pathogens, and are crucial for control of viral replication. Interferons (IFNs) are divided into three families (type I, type II, and type III) on the basis of sequence homology, which corresponds to the receptor usage and functional activity. Recently it has emerged that not only do neutrophil possess receptors for certain interferons, single cell RNA sequencing has highlighted that sub-populations of neutrophils exist in the circulation, one of which is skewed towards interferon dominant signaling genes. The role for these subpopulations in controlling or perpetuating viral diseases is unclear but is important to understanding how interferon-based therapies may be protective or detrimental to viral diseases. Our most recent work is pointing to an association between interferon levels in the lung and pathological activity of lung recruited neutrophils in diseases such as cystic fibrosis (CF). This project has a heavy basic science focus and seeks to describe the mechanism for our observation in clinical respiratory samples, by studying the effect of the different interferon molecules and their associated cytokine families on neutrophil functions. Skillsets that will be gained include primary epithelial cell culture and differentiation protocols, neutrophil isolation and function assays, flow cytometry, bioinformatics approaches to large datasets (ie single cell RNA sequencing, gene expression, BioPlex).
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Basic understanding of cell culture • Inclination to molecular techniques and bioinformatics • Excellent communication and motivation • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Does Trikafta improve innate immune responses by the cystic fibrosis lung epithelium?

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	February 2022
Chief Supervisor	Dr Luke Garratt (Telethon Kids Institute)
Other Supervisors	Dr Emma de Jong (Telethon Kids Institute) Dr Kak-Ming Ling (Telethon Kids Institute) Dr Anthony Kicic (Telethon Kids Institute)
Project Outline	The airway epithelium is the surface of your lungs and is the primary initial responder to infectious challenges. For people with cystic fibrosis (CF), their lung epithelium is affected by a protein mutation which causes airway mucus to be more sticky and more prone to infection. Work by our group and others has shown that the response of CF lung epithelial cells to viral infection is altered from normal responses, contributing to CF lung disease pathology. Recently, a highly effective treatment for CF (Trikafta) has been made available that corrects the protein function. However, it is unclear whether this treatment restores the infection response by CF epithelium. This project will interrogate an existing RNAseq dataset, generated by our laboratory using primary lung airway epithelium cells from children with and without CF. Cells were challenged with 3 types of infection – viral, bacterial and fungal. For CF cells, conditions were performed with or without Trikafta. The research question is to identify for each infection type, which genes are different between CF and non-CF responses and whether Trikafta treatment meaningfully changes the CF response. This project can be tailored to be purely bioinformatics based on existing data or can incorporate additional cell culture experiments for the opportunity to learn/progress cell culture and microbial handling skills.
Suitable For	☐ Honours ☒ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Bioinformatics training and data management skills • Excellent communication and motivation • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Developing a new class of therapeutics to heal airway damage in asthma

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Negotiable
Chief Supervisor(s)	Dr Thomas Iosifidis (Telethon Kids Institute/Curtin University)
Other Supervisors	A/Professor Anthony Kicic (Telethon Kids Institute/Curtin University) Professor Stephen Stick (Telethon Kids Institute/The University of Western Australia)
Project Outline	Asthma is a substantial global health care burden with more than 300 million sufferers worldwide. It is the most common chronic respiratory disorder in children and remains one of the main causes of their hospitalisation. Thus, there is a pressing need for identification of novel therapeutic strategies that target the principal cause of asthma in early life and not just its clinical sequelae. Work by our team and others has established that the airway epithelium of children with asthma has intrinsic abnormalities relating to dysregulated responses to injury, infection and inflammation. Defective airway epithelial repair associates with symptom recurrence and poor respiratory outcomes. Our team is developing novel therapeutics that target the airway epithelial repair with the goal to improve health outcomes for children with asthma. There is now an opportunity for a motivated student/multiple students to contribute towards the assessment of new therapeutics for asthma that enhance airway repair. The project aims to test the efficacy of repurposed and novel therapeutics to enhance airway epithelial repair. Specifically, patient-derived airway epithelial cell cultures will be established to validate drug safety and efficacy in vitro. Some of the experimental techniques involved include: expression of epithelial/mesenchymal cell markers by qPCR, ELISA and immunohistochemistry; cell proliferation, cell differentiation, wound repair and barrier integrity function using 3D differentiated airway mucosal epithelial cell models. This will be the first study to interrogate the role of airway epithelial repair in organ-on-a-chip models of childhood asthma. This project will also determine the efficacy of new medications for childhood asthma targeting the airway epithelium.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent written and oral communication skills • Highly motivated and organized • Able to work independently and as part of a team
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Programming of epithelial progenitors and the origins of respiratory disease

Research Focus Area	Chronic & Severe Diseases; Early environment; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research
Start Date	Negotiable
Chief Supervisor	Dr Thomas Iosifidis (Telethon Kids Institute)
Other Supervisors	Professor Stephen Stick (Telethon Kids Institute) Dr Patricia Agudelo-Romero (Telethon Kids Institute) Dr David Hancock (Telethon Kids Institute) Dr David Martino (Telethon Kids Institute) Professor Jeffrey Keelan (The University of Western Australia) A/Professor Anthony Kicic (Telethon Kids Institute)
Project Outline	Chronic respiratory diseases are a major healthcare burden in Australia with disease development originally thought to start in later life. We now understand that the early life environment, and even conditions during pregnancy such as maternal asthma severity, play an important role in determining risk to develop poor respiratory outcomes, such as wheeze and asthma in the offspring. Studies by our team on the airway epithelium from infants and children have led us to the hypothesis that a "vulnerable epithelium" endotype can contribute to poor clinical respiratory health, such as wheeze and asthma. Importantly, the prenatal environment may be a key modulator of epithelial vulnerability. Altered epithelial states have been identified in fetal-origin epithelial progenitor cells such as amniotic epithelium and characterised by markers of inflammation and impaired repair capacity. It remains to be determined the effect of prenatal exposures on reprogramming of amniotic and airway epithelia of newborns and respiratory disease development. This project combines access to well-characterised clinical phenotypes, biological samples, in vitro mechanistic models and cutting-edge single cell/bulk multi-omic sequencing applications. The project will involve processing of placenta and isolation of amniotic epithelial cells from the AERIAL sub-study within The ORIGINS Project birth cohort. In addition, the student would establish primary amniotic epithelial cell cultures to assess cell morphology, proliferation, barrier integrity, repair rates and production of inflammatory cytokines. Ultimately, this project will compare matched airway and amniotic epithelia and characterise a novel mechanism explaining how exposures during pregnancy affect respiratory disease in the offspring. This project has access to additional biological samples and clinical data in early childhood collected through the AERIAL study to understand susceptibility to respiratory infections and wheeze development. Depending on student interest in this project, there are opportunities to incorporate bioinformatics analysis pipelines, such as integration of multi-omics datasets with clinical datasets.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Bachelor of Science or equivalent • Excellent written and oral communication skills • Ability to work with clinical samples
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Phage therapy for patients with multi-drug resistant bacterial lung infections

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research P4 Respiratory Health for Kids
Start Date	2023
Chief Supervisor	Dr Yuliya Karpievitch (Telethon Kids Institute)
Other Supervisors	Dr Thomas Iosifidis (Telethon Kids Institute) A/Prof Anthony Kicic (Telethon Kids Institute)
Project Outline	Phage therapy is the last resort option for patients with multi-drug resistant bacterial lung infections. Phages are small viruses that affect bacteria, not humans. At the Telethon Kids Institute we are establishing a phage therapy treatment platform to rapidly identify the bacterial species and phages that are able to eradicate those specific bacteria. We are performing comparative experiments to develop the laboratory and computational analysis pipelines for development of personalised patient-specific phage therapy. We will perform phage and bacterial sequencing using three sequencing platforms: Illumina short-short read sequencing, PacBio and Nanopore long-read sequencing to optimise a rapid phage selection platform built only on the Nanopore sequencing. This project has two parts suitable for 2 separate masters projects or one PhD project: 1) Laboratory-based project to prepare samples for sequencing on all three platforms and perform all steps of Nanopore long-read sequencing and identifying optimal protocols. The project involves laboratory and biohazard training and laboratory work. 2) Computational analysis to determine which sequencing platforms provide highest accuracy and how to assure that nanopore sequencing can provide top quality sequencing outcomes. The project involves computational sequence analyses and visual representation of the sequencing data to identify the suitable combination of phages to eradicate the patient-specific bacteria.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	Part 1: laboratory experience preferred or strong desire to work in the lab. Part 2: programming experience in R and interest in medical research. Preferred familiarity with R packages such as dplyr, tydyr and ggplot2. Police Clearance check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group (PhD only) ☐ Full scholarship offered by project group

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Computational mucus and mucus plug detection in lung MRI scans

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research P4 Respiratory Health for Kids
Start Date	2023
Chief Supervisor	Dr Yuliya Karpievitch (Telethon Kids Institute)
Other Supervisors	Dr Thomas Iosifidis (Telethon Kids Institute)
Project Outline	Lung computed tomography (CT) scans are considered the gold standard for pathology detection in the lungs, but CT scans expose patients to small levels of radiation. Thus, using a Magnetic Resonance Imaging (MRI) will provide for a radiation-free picture of the lungs. But MRI images have lower resolution and thus require different computational analyses measures. We obtained matched lung CT and MRI images for patients with cystic fibrosis to develop methods for MRI scans to provide accurate lung pathology information to clinicians. Project goals: 1. Produce training data to improve resolution of the MRI images 2. Determine lung pathologies observed in MRI and CT scans 3. Perform a comprehensive comparison of MRI and CT-based pathologies 4. Train AI system to identify lung pathologies in MRI scans as accurately as in CT scans
Suitable For	☐ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	Programming experience in R or Python and interest in medical research Police Clearance check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group (PhD only) ☐ Full scholarship offered by project group

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AI-enabled analysis of longitudinal epithelial cell mobility

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research P4 Respiratory Health for Kids
Start Date	2023
Chief Supervisor	Dr Yuliya Karpievitch (Telethon Kids Institute)
Other Supervisors	Dr Thomas Iosifidis (Telethon Kids Institute)
Project Outline	Lung Patients with chronic respiratory conditions have slower lung (epithelial) cell wound repair and cell wall integrity is often compromised. We obtain several types of longitudinal cell images of airway cells taken from patients and grown in the lab. The project will develop an artificial intelligence (AI) solution for the automated lung cell image analyses using convolutional neural networks. Biological endpoint of this project are: 1. testing multiple drugs to investigate improvement of the epithelial cell function, 2. rapid prediction of patients whose epithelial cells are not able to repair quickly based on cell mobility images to enable quick feedback to clinicians.
Suitable For	☐ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	Programming experience in Python and interest in medical research Police Clearance check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Epigenetic Lung Atlas in Cystic Fibrosis

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research P4 Respiratory Health for Kids
Start Date	February 2023
Chief Supervisor	Dr Yuliya Karpievitch (Telethon Kids Institute)
Other Supervisors	Dr Thomas Iosifidis (Telethon Kids Institute) A/Prof Anthony Kicic (Telethon Kids Institute)
Project Outline	Lung transcriptomic atlas exists for healthy individuals and some chronic conditions. We will develop an age-specific epigenome atlas for cystic fibrosis (CF) lung disease. The atlas will be built based on the long-read sequencing of DNA and RNA to obtain host and microbiome methylomes and host and microbiome methylomes. Our epigenome atlas will be used to compare how a new treatment affects the epigenome and if the treatment can roll back the epigenetic clock. This project has two parts suitable for 2 separate masters projects or one PhD project: 1) Laboratory-based project to prepare samples for sequencing and perform all steps of Nanopore long-read sequencing. The project involves laboratory and biohazard training and laboratory work. 2) Computational analysis to build the epigenetic atlas/clock based on the methylation and RNA modification data. The project involves computational sequence analyses, age stratification, and visual representation of the sequencing.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	Part 1: laboratory experience preferred or strong desire to work in the lab. Part 2: programming experience in R and/or Python and interest in medical research. Preferred familiarity with R packages such as dplyr, tydyr and ggplot2. Police Clearance check is compulsory
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group (PhD only) ☐ Full scholarship offered by project group

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Compound Repurposing Into novel Therapeutics in COVID at risk Lungs (CRITICAL Studies)

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Cell research Group
Start Date	February 2023
Chief Supervisor	Associate Professor Anthony Kicic (Telethon Kids Institute/Curtin University)
Other Supervisors	Dr Kevin Looi (Telethon Kids Institute/Curtin University) Prof Stephen Stick (Perth Children's Hospital/Telethon Kids Institute/UWA) Dr Erika Sutanto (Telethon Kids Institute/Curtin University) Dr Luke Garratt (Telethon Kids Institute/Curtin University) Dr Thomas Iosifidis (Telethon Kids Institute/Curtin University) Dr Patricia Agudelo-Romero (Telethon Kids Institute) Dr Kak-Ming Ling (Telethon Kids Institute, Curtin University) Dr Daniel Laucirica (Telethon Kids Institute) NOTE: supervisory roles will be refined depending on the study undertaken
Project Outline	The coronavirus disease 2019 (COVID-19), is caused by severe acute respiratory syndrome coronavirus 2 (SARSCoV- 2). Its clinical spectrum is broad – from asymptomatic infection, mild upper respiratory tract illness, to severe viral pneumonia. It targets the lungs causing them to stop working properly which cascades to other types of organ failure and eventually death. Although infection appears indiscriminate occurring in both genders and across all ages (6 weeks - 101 years), certain individuals appear more vulnerable to the effects of infection, in particular, more likely to experience the severe inflammation which results in organ failure. Presently, there is no effective treatment measure that prevents or suppresses (1) community transmission, (2) this aggressive inflammatory response known as the 'cytokine storm' that accompanies infection. It is widely acknowledged that the quickest translational pipeline for new treatment options is to develop or repurpose already approved drugs. In this case, we seek to find treatments which will not only prevent infection, but effectively mitigate the proinflammatory response ("cytokine storm"). We believe the aggressive proinflammatory response from SARS-CoV-2 infection is neutrophilic driven and can be mitigated/prevented by using repurposed drugs. Using our existing expertise and knowledge of three-dimensional (3D) organotypic cell culture technologies, models of the airway will be established from children and adults (2-80yrs) which would then be infected with SARS-CoV-2 variants using different viral doses. We will then treat these 3D models with drugs predicted to mitigate the proinflammatory response. We have identified a number of approved safe compounds with acceptable safety profiles to test and results will be ranked, to identify those most beneficial. Molecular analysis will be performed and reveal host pathways that are stimulated or inhibited by the virus and identify which therapeutics work.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Honours degree in science • Excellent communication and team participation skills • Proficient writing and presentation skills Desired: Laboratory experience and/or proficiency in statistical analysis.
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Exploring the therapeutic potential of phage therapy to treat lung infections

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Cell research Group
Start Date	February 2023
Chief Supervisor	Associate Professor Anthony Kicic (Telethon Kids Institute/Curtin University)
Other Supervisors	Prof Stephen Stick (Perth Children's Hospital/Telethon Kids Institute/UWA) Dr Erika Sutanto (Telethon Kids Institute/Curtin University) Dr Luke Garratt (Telethon Kids Institute/Curtin University) Dr Patricia Agudelo-Romero (Telethon Kids Institute) Dr Kak-Ming Ling (Telethon Kids Institute, Curtin University) Dr Daniel Laucirica (Telethon Kids Institute) Dr Samuel Montgomery (Telethon Kids Institute) Dr Anna Tai (Institute for Respiratory Health, UWA) NOTE: supervisory roles will be refined depending on the study undertaken
Project Outline	Antimicrobial-resistant bacteria are a threat worldwide, and there are now very limited options for treating infections caused by these bacteria. In this proposed project, our assembled team of world-recognized experts will be using a precision medicine approach to develop effective and safe bacteriophage (phage) treatments for first-in human use. Bacteriophages (phages or viruses that infect and kill bacteria) are natural predators of bacteria. They attach to the bacterial wall using specialised molecular keys or receptors, invade the bacterium, take over the cellular machinery, replicate and then burst from the cell, killing the bacterium. Since phages do not invade host cells, they do not cause cell damage nor are they likely to invoke a significant immunological response. Despite recent case reports, there has been no co-ordinated, standardised approach to assess the utility of phage therapy to treat pulmonary infections with multi-resistant organisms in humans. Using chronic lung disease as the initiating platform, specifically those with antimicrobial resistant pulmonary infections, we will isolate and characterise phage (from in-house repositories) specific to these bacteria. In vitro and in vivo safety and efficacy profiles will be established, endotoxins removed, and effects of inhaled delivery determined in preclinical models. With national ethics approval in place, patients experiencing chronic, recurrent lung infection with antimicrobial-resistant Pseudomonas aeruginosa will be identified and recruited. Effective phages will be identified, and formulations tailored to the individual. Participants will then be treated with inhaled phage and safety, tolerance and efficacy will all be monitored post-delivery.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Honours degree in science • Excellent communication and team participation skills • Proficient writing and presentation skills Desired: Laboratory experience and/or proficiency in statistical analysis.
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Unlocking mechanisms of age-relationships in rhinovirus-induced wheezing attacks in children

Research Focus Area	Chronic & Severe Diseases, Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Cell Research Group Children's Respiratory Science Group
Start Date	February 2023
Chief Supervisor	A/Professor Anthony Kicic (Telethon Kids Institute, Curtin University, UWA)
Other Supervisors	Dr Ingrid Laing (Telethon Kids Institute, UWA) Dr Kevin Looi (Telethon Kids Institute/Curtin University) Professor Peter Le Souef (Telethon Kids Institute, PCH, UWA)
Project Outline	From 2004-14 over 36 000 children presented to the former Perth Children's Hospital (Princess Margaret Hospital [PMH]) with a wheezing or asthma exacerbation and around half of those were admitted to hospital. Our research has established that the common cold virus, specifically rhinovirus species C (RV-C), is the most common virus causing acute severe wheezing and asthma in children and that it causes more severe wheezing than any other respiratory virus. Separately, we have shown that the age at which RV-C infection is most common in acutely wheezing children is between 2 and 6 years. Healthy children are much less often infected with RV-C. Collectively therefore, we have established that RV-C is an important pathogen that causes more severe wheezing and is the most common cause of severe wheeze in pre-school children, compared to other respiratory viruses and children from other age groups. We hypothesise that the pathogenicity of RV-C in pre-school wheeze compared to RV infection in children of other ages, is due to its ability to cause the immune response to over-react to its presence in the airway. This project will use a nasal epithelial cell culture model of RV infection to compare the epithelial response from children of different ages who have had acute wheezing. This project will also likely use RNA sequencing to reveal the components of the epithelial response that differ between children of different ages. Techniques involved will/may include but are not limited to: cell culture, ELISAs, protein extraction, immunoblotting, gene expression, next-generation sequencing bioinformatic analysis and confocal microscopy.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in biomedical science, microbiology or similar • Excellent written and oral communication skills • Able to work independently and as part of a team • Highly motivated and organized Desirable • Experience in laboratory work, including culture of human cells
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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Pre-clinical assessment of an anti-RSV therapeutic to combat RSV infections in children.

Research Focus Area	Chronic & Severe Diseases, Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Cell Research; Respiratory Environmental Health
Start Date	March 2023
Chief Supervisor	Dr Kevin Looi, Telethon Kids Institute
Other Supervisors	Dr Katherine Landwehr, Telethon Kids Institute A/Prof Alexander Larcombe, Telethon Kids Institute A/Prof Anthony Kicic, Telethon Kids Institute

Project Outline

Respiratory syncytial virus (RSV) is the leading viral cause of acute lower respiratory infections in infants, often with a disease spectrum ranging from rhinitis and otitis media to bronchitis and pneumonia. Often, RSV is the principal cause of bronchitis in infants and young children, with incidence rates peaking between 2 - 5 months of age and almost all children being exposed to RSV by age 3. Globally, annual incidence of RSV infection is around 33 million episodes, of which, 3.2 million children below the age of 5 being admitted to hospital with RSV-associated disease and ~160,000 resulting in deaths. Despite a study showing that RSV infections occur in ~150,000 infants annually in Australia, with the associated medical healthcare costs and burden estimated to be ~$50 million, there continues to be no low-cost and accessible drugs for treating RSV in children or in the general population. Ribavirin and Palivizumab, the only two licensed drugs, are approved for use in only the highest risk infants due to their high cost. Drug administration is invasive, usually involving intravenous injection which causes associated distress for patients as well as their carers. Although there are several treatments currently in development for children, these remain highly invasive. Clearly, there is an urgent unmet need for clinically effective, safe and cost-effective drugs to combat RSV infections with the most rapid strategy being the re-purposing of drugs already in use for other medical indications.

This project's objective is to **generate key pre-clinical data required to move diferuloylmethane (DFM)-2 into clinical trials as a targeted anti-viral agent.** There is now an opportunity for motivated students to help us validate our initial cell culture findings in an established mouse model of RSV infection. Main responsibilities and techniques involved but are not limited to will include nasal instillation of RSV and DFM-2, lung function assessment, inflammatory cell assessment following blood collection, viral quantification via qPCR, immunohistochemistry and cytokine quantification via ELISA.

Suitable For	☐ Honours	☐ MD	☒ Masters	☐ PhD

Essential Skills & Qualifications

- Undergraduate degree in Molecular Biology, Biomedical Science or similar
- Excellent written and communication skills
- Ability to work independently and 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	

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Epigenetics and the infection prone child.

Research Focus Area	Early Environment, Wal-yan Respiratory Research Centre
Research Group	Clinical Epigenetics
Start Date	March 2023
Chief Supervisor	Dr. David Martino, Telethon Kids Institute.
Other Supervisors	Prof Steven Stick, Telethon Kids Institute. A/Prof Anthony Kicic, Telethon Kids Institute.
Project Outline	Precision medicine is the next frontier that incorporates information about a person's genome to inform their assessments and treatments. This project aims to develop precision medicine approaches for children who are prone to recurrent respiratory infections in infancy. For some children and their families, winter can be a daunting time, as viral infections can result in respiratory symptoms requiring hospitalisation. We're studying an interesting subset of children who suffer from recurrent infections and produce low antibodies to their routine vaccinations. These children exhibit multiple deficits in immune function and end up with high rates of wheezing illness, allergy and asthma. This project will measure epigenetic changes to the genome of low vaccine responder/ high infection prone children and has two broad objectives: 1. To develop new genomic testing modalities for precision healthcare 2. To identify new therapeutic molecules to modify the disease course The skills you will learn include epigenetic profiling at genome-wide scale, bioinformatics, establishing patient-derived respiratory epithelium models for therapeutic testing.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in science/molecular biology/genetics • 1st Class honours award • Experience with coding highly desirable.
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 6319 1635
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Exploring the effects of preterm birth on the airway epithelium

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Research / Children's Lung Health
Start Date	March 2023 (flexible)
Chief Supervisor	A/Professor Anthony Kicic (Telethon Kids Institute, Curtin University, University of Western Australia)
Other Supervisors	A/Professor Shannon Simpson (Telethon Kids Institute, Curtin University); Denby Evans (Telethon Kids Institute)
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, including declining lung function. The mechanisms that drive these symptoms are not well understood, which makes it difficult to provide targeted treatment options. One potential contributing factor is structural and functional changes in 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. Very little research has investigated how preterm birth effects the airway epithelium. However, previous work from our group has found a repair defect in the airway cells of preterm-born infants, which suggests the epithelial barrier is compromised. There is now an opportunity for motivated students to help us further explore and understand the consequences of preterm birth on the airway epithelium, both in infancy and across the life-course. Projects can be tailored to the interest of individual students. Techniques involved may include (but are not limited to): primary cell culture using stringent aseptic technique, viral infection assays, ELISAs, protein extraction, gene expression analysis and immunocytochemistry.
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Excellent written and oral communication skills • Able to work as part of a large team • Highly motivated and organised • Good problem-solving 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:

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0419964673

Preventing serious acute respiratory viral infections (AVRIs) in children

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Children's Respiratory Science Group
Start Date	February 2023
Chief Supervisor	Professor Peter Le Souëf, Telethon Kids Institute, UWA
Other Supervisors	A/Professor Anthony Kicic, Telethon Kids Institute, Curtin University, UWA A/Professor Ingrid Laing, Telethon Kids Institute, UWA Dr Thomas Iosifidis, Telethon Kids Institute, Curtin University A/Professor Guicheng Zhang, Curtin University
Project Outline	**AIM**: To investigate the mechanisms by which an immunologically active agent prevents or reduces the severity of AVRIs in children. **BACKGROUND**: Young children are known to be exceptionally vulnerable to AVRIs. AVRIs are the most common cause of: • death in children < 5 years of age worldwide due to very high death rates in low-income countries (WHO-MCEE 2000-2017). • hospital admission of children in high-income countries mainly due to AVRIs being the dominant cause of acute wheeze and asthma in young children. **PREVENTING AVRIs USING IMMUNOMODULATION**: A promising new way of preventing or reducing the severity of AVRIs is to use an 'immunomodulating agent' to change the immune systems response profile. OM-85 is such an agent and has already been shown to reduce or prevent the severity of acute respiratory viral infections, but its mechanism of action is still poorly understood. OM-85 is made up of a mixture of inactivated, naturally occurring bacteria, so it is essential to discover its mechanism of action. **SIGNIFICANCE**: **Given the central importance of AVRIs in children's medicine, finding new strategies to either reduce or prevent respiratory virus* infection in children is one of the most important goals of children's medical research**. **METHODOLOGY and STUDENT EXPERIENCE**: The PhD project will involve cell culture of cells collected when children present to hospital with an AVRI. Cells will be exposed to OM-85 and rhinovirus to model the interaction of treatment and virus exposure in children who have had an AVRI. In addition, this project will likely progress to analysis of samples collected from a subset of the POWER study, a larger, well-established NHMRC double-blind, randomised OM-85 trial in children presenting to hospital with an AVRI - designed to examine aspects of the mechanism of action of OM-85 in reducing or preventing AVRIs. The subset subjects will be investigated in much greater detail than the POWER subjects, with an intensive systems biology approach using state-of-the-art viral detection, transcriptomics, metabolomics and microbiomics, allied with detailed immunological and physiological assessments. The project will allow the student to gain broad and valuable experience in a variety of the latest laboratory and analysis techniques. A PhD scholarship for this project is already fully funded by the Walyan the Respiratory Centre, targeted to the most competitive students that apply
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Honours degree in science • Excellent communication and team participation skills • Proficient writing and presentation skills Desired: Laboratory experience and/or proficiency in statistical analysis.
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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Western Australian Paediatric Bronchiectasis Cohort: Improving health outcomes for children with bronchiectasis lung disease

Research Focus Area	Wal-yan Respiratory Research Centre, Chronic & Severe Diseases
Research Group	BREATH (Building Respiratory Equity for Aboriginal and Torres Strait Islander Health) Children's Lung Health Airway Epithelial Research P4 Respiratory Health for Kids
Start Date	February 2023
Chief Supervisor	A/Professor André Schultz (Telethon Kids Institute, University of Western Australia)
Other Supervisors	Dr Kathryn Ramsey (Telethon Kids Institute, University of Western Australia) Dr Luke Garratt (Telethon Kids Institute, University of Western Australia) Dr Yuliya Karpievitch (Telethon Kids Institute, University of Western Australia) Professor Mark Nicol (University of Western Australia) NOTE: supervisory roles will be refined depending on the study undertaken
Project Outline	Bronchiectasis is a chronic lung condition where the walls of the airways are damaged and abnormally widened. People with bronchiectasis experience chronic cough, pulmonary exacerbations, and reduced quality and length of life. Despite the increasing prevalence of bronchiectasis, it remains one of the most underdiagnosed and neglected lung diseases in children and adults worldwide. Mild bronchiectasis in childhood may be reversible with early diagnosis and effective treatment. However, there is limited evidence to guide clinicians in the treatment of children with bronchiectasis. We have established the Western Australian Paediatric Bronchiectasis Cohort based at the Perth Children's Hospital and Telethon Kids Institute to understand the clinical and biological predictors of disease progression and identify novel targets for treatment for children with bronchiectasis. This is an opportunity to gain experience at all levels of medical research: from patient participation through to cutting edge laboratory techniques. Your role within this project will include: • Recruitment of children with bronchiectasis • Study visits including lung function, questionnaires, and sputum collection • Laboratory analysis of sputum (airway mucus, inflammation, microbiome) • Database management and analysis • Contributing to research outputs (publications, presentations etc)
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Bachelor of Science with Honours (or equivalent) • Excellent communication, motivation, and organisational skills • Ability to work as part of a team • Police Clearance and Working with Children check is compulsory
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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Kids Infections and Daycare's Effects on the lungs in those born Early – the KINDEE Study

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Children's Lung Health
Start Date	March 2023
Chief Supervisor	A/Professor Shannon Simpson (Telethon Kids Institute, Curtin University
Other Supervisors	Dr Andrew Wilson (Perth Children's Hospital, Curtin University) Dr James Gibbons (Perth Children's Hospital, Curtin University) A/Professor Jenny Downs (Telethon Kids Institute, Curtin University) Dr Elizabeth Smith (Telethon Kids Institute, Curtin University) Note: supervisory roles will be refined depending on the study undertaken
Project Outline	Over the last 30-40 years, medical advances have resulted in more children surviving very early, or preterm, birth than ever before. Children born preterm often have lung health problems throughout life and have a higher chance of being admitted to hospital with respiratory infections in the first years of their life. Consequently, there is some concern that sending children to day care might cause damage to their lungs due to increased exposure to viral respiratory infections. Families of children born preterm commonly ask doctors about the safety of sending children born preterm to day care. Unfortunately, there are no studies to provide any evidence about whether day care or early life viral infections results in further risk to lung health. We have previously followed a group of children born early over the first year of life (PIFCO Study), testing regularly for respiratory viruses and performing detailed health questionnaires. These children are now 6-9 years old. We will invite them to participate in a detailed assessment of lung health to determine if having early life respiratory infections impacts lung health, and if attending day care increases this risk. Research Questions 1. Is day care attendance associated with reduced lung function in mid-childhood? 2. Does having a respiratory infection during the first year of life affect childhood lung function? 3. Do children have signs of ongoing inflammation in their lungs after being exposed to viral infections in early life, which might cause ongoing lung damage? 4. Does poorer lung health in mid-childhood impact quality of life?
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Bachelor of Science or equivalent (with Honours or equivalent for PhD projects) • Excellent written and oral communication skills • Highly motivated with good organisational skills • Ability to work independently and as part of a diverse team
Ethics Approval	☐ Obtained ☒ Not Obtained (in progress)
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group There are a limited number of full and top-up scholarships through the Respiratory Centre for the highest calibre students.

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Protecting future children from the effects of climate change – a global study

Research Focus Area	Wal-yan Respiratory Centre, Chronic & Severe Diseases
Research Group	Children's Respiratory Science Group
Start Date	January 2023
Chief Supervisor	Dr Melinda Judge (University of Western Australia/Telethon Kids Institute)
Other Supervisors	Professor Peter Le Souëf (University of Western Australia/Telethon Kids Institute) Professor Corey Bradshaw (Flinders University) Chitra Saraswati (Telethon Kids Institute)
Project Outline	**The global impact of climate change on child health** Climate change is the greatest threat to human existence. International authorities including the IPCC now recognise that climate change is also the greatest threat to children's health. There is an urgent need to define the relevance and scale of the effect of climate change on child health globally. The effects of climate change on children are most evident in low- and middle-income countries (LMICs) already unable to prevent widespread childhood malnutrition. This problem will worsen as climate change intensifies in LMICs with few resources to protect children from the direct effects of higher temperatures, deteriorating air quality, and reduced freshwater resources. Compounding these problems is that higher population densities themselves compromise environmental integrity. **Work done by our group leading to the proposed student project** We have completed a study in 46 LMICs investigating the potential associations between infant mortality, the availability and quality of family planning services and fertility, while simultaneously considering other potential contributory variables. Only two factors, low infant mortality and access to contraception, were found to explain low fertility rates among countries. Other factors considered to be important in reducing fertility, including community health worker visits, female education, and religion had only weak associations. Our findings suggest that increasing the availability of quality family planning services will be the most effective way to reduce fertility and hence decrease infant and child mortality. **The proposed project** The student will be a team member in our group's main current study. **The main study** will make the first accurate assessments of the effect of universal access to quality family-planning services on reducing increases in population and the effect this will have on reducing child deaths in LMICs with various scenarios of climate change ranging through to the most serious (IPPC RCP 8.5). **The student** will make projections of the influence of these variables on respiratory disease in children in LMICs as climate changes. The study will use available databases and the student will be guided in using the necessary modelling statistical techniques. We anticipate that showing how the death and ill-health of millions of children can be prevented will be the strongest possible evidence to influence governments and health organisations to take strong action to provide universal access to quality family planning services and protect children's health.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in science • 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:
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Using stem cell exosomes to repair the preterm lung

Research Focus Area	Chronic & Severe Diseases; Wal-yan Respiratory Research Centre
Research Group	Airway Epithelial Cell research Group
Start Date	February 2023
Chief Supervisor	Associate Professor Anthony Kicic (Telethon Kids Institute/Curtin University)
Other Supervisors	Dr Padraig Strappe, Curtin Medical School
Project Outline	Bronchopulmonary dysplasia (BPD) is a multifactorial disorder in preterm infants who receive supplemental oxygen and assisted ventilation and is characterised by a significant reduction in lung development and blood vessel development. BPD is associated with significant morbidity and mortality and complications such as pulmonary hypertension persist though childhood to adolescence. This project will develop a novel therapeutic approach using adult mesenchymal stem cell (MSC) derived exosomes to repair the lung vasculature in the 'hyperoxic' mouse model of BPD. The focus of this project is development of a lifesaving and life enhancing therapeutic based on stem cell derived exosome technology to target the underdeveloped lung vasculature in the preterm infant to enhance repair of the damaged lung and reduce potential complications associated with BPD such as pulmonary hypertension. **Objective 1:** In vitro characterisation of exosomes derived from genetically modified adult stem cells. Using our previously published approach to reprogram adult mesenchymal stem cells to endothelial like cells exosomes will be purified using ultracentrifugation techniques and scale up procedures in collaboration with industry. Exosomes will be characterised by (1) measuring exosome size and purity (Nanoparticle tracking and electron microscopy), (2) measuring specific exosome protein markers (TSG101, CD9) and (3) profiling the microRNA species by RNAseq technology). Clinical Translation significance. A comprehensive analysis of the novel cell derived exosomes in terms of structure and content **Objective 2:** In vitro delivery and tracking of exosomes to paediatric lung epithelium and endothelium co-cultures in an air-liquid interface. Purified exosomes will be delivered to in vitro co-cultures of lung epithelium and endothelium in an air-liquid interface simulating a physiologically relevant environment. The efficiency of exosome delivery to lung cell cultures will be assessed using fluorescent labelling and a transcriptional profiling of the target cells. **Clinical Translation significance:** Measurement of the quantity of exosomes needed for efficient uptake into target cells. **Objective 3:** In vivo delivery of aerosolised exosomes to the hyperoxic mouse model of BPD. Purified exosomes will be delivered by aersolisation to neonatal mouse pups in an environment of high oxygen content. Efficacy of exosome therapy will be evaluated through histopathological analysis of lung tissue and survival of mice. **Clinical Translation Significance:** Efficacy of Exosome therapy for BPD in a clinically relevant animal
Suitable For	☐ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Honours degree in science • Excellent communication and team participation skills • Proficient writing and presentation skills Desired: Laboratory experience and/or proficiency in statistical analysis.
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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Vulnerable from the first breath - epithelial dysfunction and respiratory outcomes in children

Research Focus Area	Chronic & Severe Diseases Early environment
Research Group	Airway Epithelial Research
Start Date	Negotiable
Chief Supervisor	Dr Thomas Iosifidis (Telethon Kids Institute)
Other Supervisors	Professor Stephen Stick (Telethon Kids Institute) Dr Patricia Agudelo-Romero (Telethon Kids Institute) Dr David Hancock (Telethon Kids Institute) Dr David Martino (Telethon Kids Institute) A/Professor Anthony Kicic (Telethon Kids Institute)
Project Outline	Our pioneering studies of airway epithelium from infants and children, have led us to the challenging proposal that asthma is an example of a condition arising from an intrinsic epithelial vulnerability to environmental exposures. In order to better understand how the epithelium contributes to the development of respiratory conditions we need to determine its pre-morbid characteristics. This study will allow us to address the following critical questions systematically in a well powered birth cohort study: • Is a vulnerable respiratory epithelium identifiable at birth? • Does a vulnerable respiratory epithelium contribute to respiratory outcomes? • What is the epigenetic topography of the vulnerable epithelium at birth? This project is incorporated within **AERIAL**, a birth cohort study nested under The ORIGINS Project. It combines access to well-characterised clinical phenotypes, biological samples, in vitro mechanistic models and cutting-edge single cell/bulk multi-omic sequencing applications. There are opportunities to incorporate bioinformatics analysis pipelines, such as integration of multi-omics datasets with clinical datasets. In addition, the project will involve processing of clinical samples, establishment of primary epithelial cell cultures to assess epithelial cell morphology, proliferation, barrier integrity, repair rates and production of inflammatory cytokines. Through this project, you would contribute to understanding susceptibility to respiratory infections and wheeze development and identify therapeutic target to module epithelial function in vivo.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Bachelor of Science or equivalent • Excellent written and oral communication skills • Ability to work with clinical samples • Knowledge of, or interest to learn bioinformatics analyses (desirable)
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☒ Full scholarship offered by project group

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Single-cell epigenomics of bromodomain inhibitors in T-cell activation.

Research Focus Area	Early Environment
Research Group	Clinical Epigenetics
Start Date	March 2023
Chief Supervisor	Dr. David Martino, Telethon Kids Institute.
Other Supervisors	Nina Kresoje, Telethon Kids Institute.
Project Outline	Bromodomain inhibitors are a class of epigenetic drug that reversibly bind the bromodomains of BET proteins BRD2, BRD3, BRD4, and BRDT. These BET inhibitors prevent protein-protein interaction between BET proteins and acetylated histones and transcription factors. They are used in the treatment of certain cancers. This project looked at the effect of a bromodomain inhibitor drug I-BET on CD4 T-cells, and important immune cell involved in fighting cancers. T-cells were activated to induce an immune response in the absence/presence of I-BET and we profiled the individual epigenomes of 5000 cells using the latest single cell techniques. This project is about exploring how I-BET has affected the function of T-cell subsets and identifying epigeneticall regulated genes. You will learn cutting edge single cell bioinformatic techniques which will be a highly valued skill set in your future career.
Suitable For	☐ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in science related discipline • 1st Class honours award • Experience with coding highly desirable.
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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Does timing of endogenous circadian rhythm development in preterm infants influence susceptibility to respiratory infection and inflammation?

Research Focus Area	Early Environment
Research Group	Neonatal Cardiorespiratory Health
Start Date	Jan 2023 (earlier possible for PhD)
Chief Supervisor	Prof Jane Pillow (Telethon Kids Institute/UWA)
Other Supervisors	TBA (will depend on final project)
Project Outline	Circadian rhythms are a fundamental part of our existence – the daily rhythmic changes in our physiology that govern normal behaviour and functioning. What many people don't understand, is that circadian rhythms are encoded in our genetic make-up. At least 80 % of cells in the body have at least 20 % of their molecular expression controlled in a circadian manner. Importantly, loss of circadian rhythmicity in gene expression may have significant adverse impacts on function. As an example, we are increasingly aware that disrupted circadian rhythms may increase susceptibility to infection and impair immune responses. Delayed development of endogenous circadian rhythms is a potentially major issue for premature infants, most of whom don't develop their own circadian rhythm until after they have been discharged home from hospital. For some infants, this delay can extend for months and potentially puts the infant at risk of harmful consequences of disrupted circadian rhythm, including increased susceptibility to infection. An NHMRC funded and Telethon Kids Institute sponsored multicentre randomised controlled trial (the CIRCA DIEM study) is aiming to ensure that preterm infants can develop their own circadian rhythms soon after birth, by cycling them through an artificial day and night. This trial gives us a unique opportunity to learn about how circadian rhythms control susceptibility to respiratory infections and immunity in premature infants. Projects on offer vary from studies that explore whether neonatal exposures disrupt circadian rhythmicity in airway epithelial cells, as well as a more comprehensive 3-4 year project conducting a substudy on infants in the CIRCA DIEM study, to evaluate whether early restoration of circadian rhythms after preterm birth reduce risk of hospitalisation for respiratory infection over the first 2 years of life – and the molecular and cellular biological basis for any outcomes.
Suitable For	☐ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in biochemistry, biomedical science or equivalent (for Honours) • Honours/BMedSci or equivalent for PhD – preferably with some prior laboratory experience and experience with data linkage/molecular biology. • Excellent communication skills
Ethics Approval	☒ Obtained (Approval for main study but respiratory substudy awaiting approval) ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group (potentially possible - PhD only) ☒ Full scholarship offered by project group (if funding application successful)

For more information, please contact:
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Does timing of endogenous circadian rhythm development in preterm infants influence maternal and infant sleep behaviours and maternal mental wellbeing during the first year of life?

Research Focus Area	Early Environment
Research Group	Neonatal Cardiorespiratory Health
Start Date	Jan 2023 (earlier possible for PhD)
Chief Supervisor	Prof Jane Pillow (Telethon Kids Institute/UWA)
Other Supervisors	TBA (will depend on final project)
Project Outline	Circadian rhythms are a fundamental part of our existence – the daily rhythmic changes in our physiology that govern normal behaviour and functioning. What many people don't understand, is that circadian rhythms are encoded in our genetic make-up. At least 80 % of cells in the body have at least 20 % of their molecular expression controlled in a circadian manner. Delayed development of endogenous circadian rhythms is a potentially major issue for premature infants, most of whom don't develop their own circadian rhythm until after they have been discharged home from hospital. For some infants, this delay can extend for months and potentially puts the infant at risk of harmful consequences of disrupted circadian rhythm, including delayed or even abnormal neurodevelopment. Sleep disruption is linked to such disrupted circadian rhythms. An NHMRC funded and Telethon Kids Institute sponsored multicentre randomised controlled trial (the CIRCA DIEM study) is aiming to ensure that preterm infants have the opportunity to develop their own circadian rhythms soon after birth, by cycling them through an artificial day and night. This trial gives us a unique opportunity to learn about how circadian rhythms impact maternal and infant sleep patterns and maternal mental well-being after discharge home – and indeed, if the intervention improves infant neurodevelopmental outcomes A postnatal substudy of the CIRCA DIEM study will evaluate whether babies exposed to the artificial night and day have improved sleep behaviours and more cyclic melatonin hormone levels after discharge home from hospital, and how these physiological changes in the infant influence maternal sleep, attachment, anxiety and depression.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Honours/BMedSci or equivalent for PhD – preferably with some physiology and/or psychology or experience in mental health. • Excellent communication skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group (potentially possible - PhD only) ☒ Full scholarship offered by project group (if funding application successful)

For more information, please contact:
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EARLY ENVIRONMENT

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.

The ORIGINS Project: Reduce non-communicable diseases through a 'healthy start to life'.

Research Focus Area	Early Environment
Research Group	The ORIGINS Project
Start Date	Available now
Chief Supervisor	Jackie Davis (Telethon Kids Institute, Curtin University)
Other Supervisors	Prof Desiree Silva (Joondalup Health Campus, Telethon Kids Institute) Dr Nina D'Vaz (Telethon Kids Institute) Dr Lisa Gibson (Telethon Kids Institute, Edith Cowan University)
Project Outline	The ORIGINS Project is a longitudinal, birth cohort study investigating how early environments, maternal health and genetics influence child health outcomes. Detailed information at various time points is being collected via biological samples, questionnaires and routine data, creating a comprehensive databank and biobank. There are currently a number of potential projects available within the areas of nutrition and metabolism; mental health; allergy, inflammation and immunity; environment and lifestyle; infectious disease; oral health; paternal health; reproduction; growth and development; and omics studies. Projects may be observational or interventional, including both quantitative or qualitive data collection and analysis.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in a relevant discipline/or minimum of 2A Honours • Interest in child health and development • Proficient writing skills • Basic statistical analysis skills (SPSS/SAS) • Good interpersonal and communication skills
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Kindy readiness in the ORIGINS cohort

Research Focus Area	Early Environment
Research Group	The ORIGINS Project
Start Date	Available now
Chief Supervisor	Emma Fuller (Telethon Kids Institute)
Other Supervisors	Prof Desiree Silva (Joondalup Health Campus, University of Western Australia, Edith Cowan University, Telethon Kids Institute), Prof Susan Prescott (Telethon Kids Institute, University of Western Australia, Edith Cowan University) Dr Lisa Gibson (Telethon Kids Institute, Edith Cowan University) Jackie Davis (Telethon Kids Institute, Curtin University)
Project Outline	The aim of this study is to review the development, wellbeing and readiness of children prior to commencing Kindergarten and/or an early learning environment. The study will be in partnership with The ORIGINS Project and recruitment occurs when children are close to three years of age. Participants will complete a number of online surveys on child health, development and behaviour. Feedback will be provided on development, wellbeing, and Kindergarten readiness. Follow up will occur as the children turn four.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in a relevant discipline • Knowledge of quantitative and qualitative research methods • Interest in child health and development • Proficient writing skills • Basic statistical analysis skills (SPSS/SAS) • Good interpersonal and communication skills
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☒ Full scholarship offered by project group

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The Flourishing ORIGINS Child

Research Focus Area	Early Environment
Research Group	The ORIGINS Project
Start Date	Available now
Chief Supervisor	Dr Lisa Gibson (Telethon Kids Institute, Edith Cowan University)
Other Supervisors	Professor Desiree Silva (Joondalup Health Campus, Telethon Kids Institute) Professor Susan Prescott (The University of Western Australia, Joondalup Health Campus, Telethon Kids Institute) Jackie Davis (Telethon Kids Institute, Curtin University)
Project Outline	Early life influences set an individual's health and developmental trajectory for the rest of life. Children who enter school developmentally vulnerable – physically, mentally and cognitively - will have generally poorer educational and health outcomes, and diminished quality of life. Our vision is to understand how we support and nurture a child's environment to place them on a flourishing trajectory, equipped with the necessary facets to fulfill their full potential. The project extends on the work of The ORIGINS Project (a longitudinal, birth cohort study investigating how early environments, maternal health and genetics influence child health outcomes). We propose undertaking a program of work in five phases from stakeholder engagement to cross-sectional and longitudinal analysis. We will build a program of research centered around different critical health domains, such as neurodevelopment, mental health, metabolism/obesity and atopic disease. Additionally, this program of work will assess the cost-effectiveness for investing in early childhood. Student projects nested with the Flourishing ORIGINS Child Project may be observational or interventional, including both quantitative or qualitive data collection and analysis.
Suitable For	☒ Honours ☐ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	• Undergraduate degree in a relevant discipline/or minimum of 2A Honours • Interest in child health and development • Proficient writing skills • Basic statistical analysis skills (SPSS/SAS) • Good interpersonal and communication skills
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☒ Full scholarship offered by project group

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The Impact of Oral Immunotherapy on granulocytes in Peanut Allergic Children

Research Focus Area	Early Environment
Research Group	PREGNANCY AND EARLY LIFE IMMUNOLOGY
Start Date	Feb/March 2023
Chief Supervisor	Jonatan Leffler, Telethon Kids Institute
Other Supervisors	Deborah Strickland, Telethon Kids Institute
Project Outline	**Background:** Every year, approximately 1000 children are diagnosed with a peanut allergy in WA. Peanut allergy causes severe and potentially life-threatening allergic reactions, and the risk of accidental exposure leads to anxiety and reduced quality of life for children and their families. Peanut allergy is often life-long, and there is no cure and no treatment available in Australia. Oral immunotherapy (OIT) is a promising treatment, leading to tolerance in about half of children. Whilst OIT has life-changing effects in many children, some will instead experience ongoing adverse reactions during treatment, resulting in reduced quality of life and no long-term benefit. This is a major barrier to widespread clinical uptake, which could be mitigated through the ability to identify which children are most likely to respond beneficially to treatment. **The objective of this study is to: Identify children who are likely to benefit from OIT treatment.** **Approach:** Granulocytes, including basophils and mast cells bind allergen specific IgE and respond to allergen exposure by releasing histamines and other inflammatory mediators. In this project, activation of granulocyte populations will be assessed in fresh blood from participants of an ongoing OIT trial at Perth Children's Hospital. During 2022, samples are collected for baseline and 12 weeks follow-up, during 2023 (the proposed project), samples will be collected for the 1 year follow-up. This project will compare granulocyte phenotypes and activation status in individuals who received OIT compared to controls as well as in individual who received OIT treatment but experienced differential treatment outcomes. **Role of Student** As a student on this project, you will assist in processing fresh blood samples to be able to analyse granulocyte populations. Samples will be stained for flow cytometry assisted cell sorting and conventional flow cytometry. A considerable part of the project will consist of data (flow cytometry) analysis with potential to learn advanced analytical skills of flow cytometry data using statistical programs such as R.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in biomedical science, immunology, microbiology or similar • Theoretical foundation of flow cytometry • Excellent communication skills Desirable • Experience in laboratory work, including isolation of human cells, basic flow cytometry • Experience in using the statistical program R
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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WESFARMERS CENTRE OF VACCINES & INFECTIOUS DISEASES

Characterisation of a cell invasion pathway exploited by serotype M1 Group A Streptococcus

Research Focus Area	Early Environment
Research Group	Strep A Pathogenesis & Diagnostics, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Negotiable (can start immediately pending approval)
Chief Supervisor	Dr Tim Barnett (Telethon Kids Institute)
Other Supervisors	Dr Jua Iwasaki (Telethon Kids Institute)
Project Outline	Streptococcus pyogenes (Group A Streptococcus, Strep A) 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 "flesh-eating disease" and streptococcal toxic shock syndrome. A single GAS clone (M1T1) has disseminated globally as a prevalent cause of pharyngitis and invasive disease. 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: • Examine the requirement of individual GAS surface proteins to invade epithelial cells using a panel of M1T1 mutant strains. • Examine the role of a candidate cell endocytosis pathway using a combination of siRNA and 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

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Host-dependent antibiotic resistance

Research Focus Area	Early Environment
Research Group	Strep A Pathogenesis & Diagnostics, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Negotiable (can start immediately pending approval)
Chief Supervisor	Dr Tim Barnett (Telethon Kids Institute)
Other Supervisors	Dr Jua Iwasaki (Telethon Kids Institute) Kalindu Rodrigo (Telethon Kids Institute)
Project Outline	Antimicrobial resistance (AMR) is a major global health challenge of our time. Known AMR mechanisms are detected by antibiotic susceptibility testing or direct detection of AMR genes. However, not all antibiotic-resistant infections are explained by known AMR mechanisms, which complicates surveillance and antibiotic treatment. Our research group has identified evidence of new AMR mechanisms that are entirely host-dependent. That is, a resistant organism will test sensitive to the antibiotic in a pathology laboratory, yet be highly resistant during an infection (e.g., https://doi.org/10.21203/rs.3.rs-1390946/v1). Research in our laboratory is focused on defining these additional mechanisms of AMR, developing molecular tests to identify resistant pathogens, and understanding how the complex interactions between a bacterial pathogen and its host affects the progression of disease. We primarily work on the Gram-positive pathogen Group A Streptococcus and related pathogens (e.g. Staphylococcus aureus). Examples of available projects include: 1. Identification and characterisation of AMR associated with cellular infection. 2. Identification and characterisation of AMR associated with changes in metabolism and nutrient availability. 3. Development of molecular point-of-care tests to detect AMR genes.
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 (PhD only)

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Tropism of Group A Streptococcus to host tissues

Research Focus Area	Early Environment
Research Group	Strep A Pathogenesis & Diagnostics, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Negotiable (can start immediately pending approval)
Chief Supervisor	Dr Tim Barnett (Telethon Kids Institute)
Other Supervisors	Alisha Wilson (Telethon Kids Institute)
Project Outline	Streptococcus pyogenes (Group A Streptococcus, Strep A) 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 "flesh-eating disease" and streptococcal toxic shock syndrome. We have recently identified the Strep A surface molecules that mediate attachment to the tonsil epithelium. However, Strep A can also attach to other tissues (e.g., skin, endothelium). This project will investigate Strep A strains for their ability to attach to different host cell types, and the role of different surface molecules in this process. Precisely understanding how Strep A attaches to the host will be needed for design vaccines to prevent this stage of disease. This project will examine attachment of Strep A to the tonsils using a combination of bacterial genetics and cell biology: • Examine attachment of the major strep throat-associated Strep A serotypes to epithelial and endothelial cells. • Examine the role of a major Strep A surface protein in tonsil attachment.
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

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The Missing Piece Study: A prospective surveillance study for Strep A pharyngitis and impetigo in the Kimberley WA

Research Focus Area	Early Environment
Research Group	Healthy Skin & ARF Prevention, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Semester 1, 2023
Chief Supervisor	A/Professor Asha Bowen (Telethon Kids Institute)
Other Supervisors	Dr Janessa Pickering (Telethon Kids Institute)
Project Outline	The Missing Piece Study focuses on enhancing the primary prevention of Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD) through recognition and early treatment of sore throat and skin sore infections caused by the Strep A bacteria. There are a few unanswered questions (missing pieces of evidence) that we aim to address in this study. This study is a prospective epidemiological surveillance study which utilises validated surveillance tools to collect clinical, microbiological and epidemiological data on Strep A infections in two school cohorts. The objectives of this work are to: (1) determine the burden of Strep A pharyngitis and impetigo infections, (2) better understand how these infections interact with each other, and (3) determine the molecular epidemiology of the Strep A strains causing these infections. In addition, we will also implement and evaluate point of care diagnostic tests to enhance recognition and treatment of Strep A and thus prevent downstream complications. Another component to this study is to determine if Strep A can be found in the environment. This will provide light around which mechanisms of transmission may be involved in the spread of infection. This objective involves obtaining environmental swabs from various surfaces in schools. This project would be suitable for an honours student who is keen to be involved in laboratory research or analysis of epidemiological data.
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in health science • Have strong data analysis skills and writing skills • Excellent communication skills • Interested in Aboriginal health
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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See, Treat and Prevent Skin Sores and Scabies: The SToP Trial

Research Focus Area	Early Environment
Research Group	Healthy Skin & ARF Prevention, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Semester 1, 2023
Chief Supervisor	A/Professor Asha Bowen (Telethon Kids Institute)
Other Supervisors	Dr Hannah Thomas (Telethon Kids Institute)
Project Outline	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 See, Treat and Prevent skin sores and scabies (SToP) Trial is 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 in the Kimberley, WA. Clinician training, community health promotion and culturally appropriate environmental health activities are also embedded within the SToP Trial. The SToP Trial 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). Projects for Honours and Masters and are achievable within the SToP Trial. These include analysis of data collected to date to better understand the burden of specific skin infections (such as tinea), and projects to determine the potential for antibacterial resistance through assessment of microbiological specimen reports.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in a health care field e.g. nursing, medicine or allied health. • Excellent communication skills. • Interest in healthy skin in Aboriginal families. • Become part of a highly innovative team with extensive support and mentorship. • Be willing to work in partnership with communities. • Be willing to travel to remote communities in the Kimberley and participate in skin health surveillance. • Have strong data analysis skills, writing skills and clinical experience. • Aboriginal people are strongly 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:
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SNAP-PY: Staphylococcus aureus Network Adaptive Platform trial: Paediatrics and Youth

Research Focus Area	Early Environment
Research Group	Healthy Skin & ARF Prevention, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Semester 1, 2023
Chief Supervisor	A/Professor Asha Bowen (Telethon Kids Institute)
Other Supervisors	Dr Anita Campbell (Telethon Kids Institute)
Project Outline	Staphylococcus aureus bacteraemia (SAB) is common, is not vaccine-preventable and optimal treatment has not been determined for children or adults. Each year, approximately 400 Australian children are hospitalised with SAB, remaining for an average of 2 weeks for treatment. This means time away from family, school and sometimes travelling a long way from home to hospital. Aboriginal children have double the rate of SAB compared to non-Aboriginal children (Campbell et al 2021). Treatment of Staphylococcus aureus bloodstream infection requires hospitalisation, prolonged antibiotics through an intravenous line, and frequently surgical management. Many different antibiotics are used to treat S. aureus infections, and currently doctors rely on guidelines or personal preference to decide which antibiotic to treat with, rather than evidence from clinical trials. The S. aureus Network Adaptive Platform (SNAP) is the most ambitious clinical trial for bloodstream infection globally to date, involving 11 countries, 58 sites and 7000 patients. SNAP aims to identify which antibiotic treatment options result in the least patients dying and improved outcomes. In contrast to a traditional clinical trial, the SNAP trial will examine multiple different antibiotic treatment options at the same time. By using an innovative, adaptive platform trial design, we hope to find treatments that save lives, reduce morbidity, are cost-effective and for the first time include newborns to the elderly in the same study. By including children, this will inform best practice treatment of S. aureus bloodstream infection across the life-course. There are currently limited Aboriginal and Torres Strait Islander triallists working directly in infectious diseases research at present in Australia. SNAP-PY has a range of projects for an Aboriginal clinician to undertake a PhD within the team. A scholarship to support an Aboriginal or Torres Strait Islander PhD student is available.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• MBBS/MD. qualification. • Excellent communication skills. • Become part of a highly innovative team with extensive support and mentorship. • Have strong data analysis skills, writing skills and clinical experience.
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☒ Full scholarship offered by project group

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STopping Acute Rheumatic Fever Infections to Strengthen Health (STARFISH)

Research Focus Area	Early Environment
Research Group	Healthy Skin & ARF Prevention, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Semester 1, 2023
Chief Supervisor	A/Professor Asha Bowen
Other Supervisors	TBC
Project Outline	Rheumatic heart disease (RHD) is the leading cause of cardiovascular inequality between Indigenous and non-Indigenous Australians. It occurs as an autoimmune complication of acute rheumatic fever (ARF), triggered by preventable group A streptococcal (Strep A) infections. There is a critical evidence gap about how to prevent repeated or chronic recurrences of ARF, which lead to RHD. The key question of the STARFISH program is 'What are the most effective environmental health initiatives to reduce Strep A infections and prevent ARF among communities with the greatest risk?' Thus, the focus of the STARFISH program is on Strep A transmission and environmental risk factors. STARFISH comprehensively integrates a complementary and diverse team with skills in • research with Indigenous communities • infectious diseases • molecular microbiology • public and environmental health • housing; architecture • anthropology • primary health care • modelling • clinical trials • spatial demography • data linkage
Suitable For	☒ Honours ☒ MD ☒ Masters ☒ PhD
Essential Skills & Qualifications	As a comprehensive multidisciplinary team STARFISH is looking for candidates from across various science disciplines and fields (including social sciences). • Undergraduate degree in areas as listed above. • Excellent communication skills. • Become part of a highly innovative team with extensive support and mentorship. • Be willing to work in partnership with communities. • Have strong data analysis skills, writing skills and clinical experience. • Aboriginal people are strongly 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:

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Automating quantification of confocal microscopy images

Research Focus Area	Early Environment, Strep A Pathogenesis and Diagnostics
Research Group	Strep A Pathogenesis & Diagnostics, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Negotiable
Chief Supervisor	Dr Guillaume Drouart (Telethon Kids Institute)
Other Supervisors	Dr Tim Barnet (Telethon Kids Institute) Alisha Wilson (Telethon Kids Institute) Dr Jasreen Kular (Telethon Kids Institute)
Project Outline	Streptococcus pyogenes (Group A Streptococcus, Strep A) is a human-adapted pathogen responsible for a wide spectrum of disease. GAS can cause relatively mild illness, such as "strep throat" or impetigo, and less frequent but severe life-threatening diseases such as "flesh-eating disease" and streptococcal toxic shock syndrome. Some GAS strains are able to evade antibiotic treatment resulting in recurrent infection. Using confocal microscopy as a tool to visualise the invasion of bacteria into the cell and the formation of GAS communities within the cell, our team is trying to identify the molecular pathways GAS uses to evade treatment. Quantification of the colocalization of GAS with proteins of interest is essential in determining which pathways may be involved. Currently this involves manually counting events which is time consuming. The aim of this project is to develop processes to automate the quantification of the confocal images. This project aims: - to design a procedure to automatise the colocalization of GAS with proteins of interest - implement it on a training set to estimate efficiency and accuracy
Suitable For	☒ Honours ☐ MD ☐ Masters ☐ PhD
Essential Skills & Qualifications	- Understanding in molecular biology and cell biology - Familiar with image processing concepts and microscopy - At ease with coding, or strongly willing to learn In short: We are looking for a motivated candidate with a biology background and strong interests in computing/informatics or vice-versa.
Ethics Approval	☐ Obtained ☒ Not Obtained (Not required)
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

For more information, please contact:
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Long term impact of vaccines receipt in early childhood

Research Focus Area	Early Environment
Research Group	Infectious Disease Epidemiology, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Second half 2022 (Date negotiable)
Chief Supervisor	Dr Huong Le (Telethon Kids Institute)
Other Supervisors	A/Prof Hannah Moore (Telethon Kids Institute) Prof Chris Blyth (Telethon Kids Institute/Perth Children's Hospital)
Project Outline	Viral and bacterial infections in early life can have substantial long-lasting effects on children's health and development in later life. Previous studies have shown that the impacts of early childhood respiratory viral infections, especially from Respiratory Syncytial Virus, can last beyond the initial infection and have negative impact on adult lung health. Bacterial infection with Streptococcus pneumoniae, Bordetella pertussis or Haemophilus influenzae type-b in infants and young children can result in long-lasting damage to children's lungs, brain, and hearing, and thus worsen children's life quality, hinder their learning capability, and have significant impacts on health systems and the community. Vaccines targeting the above pathogens have been shown to be effective in protecting infants and young children against a wide range of diseases. However, little is known about the long-term impact of the vaccines on children's health, their development, and cost-saving for public budget. We are seeking enthusiastic students with interest in vaccines, infectious diseases epidemiology, child health and development to join our multidisciplinary team within the Wesfarmers Centre for Vaccines and Infectious Diseases. This project will investigate the association between vaccines receipt in early life and children's health and development focusing on ear health, lung health, academic performance, psychological development, and the need for welfare supports. In this project, the student will analyse nationally representative longitudinal survey data linked with the Australian Immunisation Records, Medicare Benefits, Pharmaceutical Benefits, Centrelink Supports, Australian Early Development Census and National Assessment Program Literacy and Numeracy.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in a relevant field (e.g. Epidemiology, Medical Science, Public Health, Statistics, Economics or Data Science) • Interest in vaccines, infectious diseases epidemiology, child health and development. • Good data analysis and writing skills. Prior experience with statistical software (e.g. STATA or R) is not essential but would be highly valued.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Immune-microbial priming in early life: implications in neonatal infections

Research Focus Area	Early Environment
Research Group	Neonatal Infections & Immunity, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	February 2023
Chief Supervisor	Dr Archita Mishra (Telethon Kids Institute)
Other Supervisors	Co-supervisors: Clin Prof Tobias Strunk (Telethon Kids Institute) Dr Ankur Sharma (Harry Perkins Institute)
Project Outline	Bacterial exposure in early life provides immunity against infections. Any disruption in this process may lead to weak immune system, thereby causing spread of infections in the new-born. Early-life microbiome is highly plastic and provides a unique window of opportunity for introducing safe preventive measures to treat pre-term infections. Our previous work demonstrates that human body encounters bacteria early in development, during 2nd trimester of gestation (Mishra et al. 2021, Cell). This bacterial exposure primes the immune cells, thereby maintaining a 'microbial-memory' for early life microbes. However, the implications of this microbial-immune priming on pre-term infections are not clear yet. In this project we will build from on our understanding of early-life microbiome and investigate the microbial and immune diversity in pre-term birth and neonatal infections like Necrotising Enterocolitis (NEC) and pre-term Sepsis. We aim to identify longitudinally, the microbial colonisers in pre-term babies, their interaction with the neonatal immune system and the implications of this priming on the neonatal infection outcomes. We hypothesize that the deferential microbes present during pre-term and term birth could be key players in the educational priming of the immune system. By integrating state-of-art techniques like Multiparametric Flow Cytometry, Microbial Genomics, Spatial Transcriptomics and RNAScope Imaging in our approach, we will explore the missing link between early-life exposure to healthy microbes and its effect on priming of new-born immunity. Better understanding of neonatal microbiome will provide safe treatment avenues especially in a neonatal intensive care unit (NICU) setting. The project will be carried out in the laboratory of Dr. Archita Mishra at Telethon Kids Institute. The student will be leading the project, conducting microbial genomics, flow-cytometry and Imaging experiments and data analysis. Bioinformatic support will be provided from experts however the student should be willing to learn and perform data analysis with guidance and support.
Suitable For	☒ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Microbial culturing, Basic Molecular Biology techniques • Mammalian Cell culture techniques • Some exposure to bioinformatics desirable
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☒ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Epidemiological investigations of off-target effects of respiratory vaccines

Research Focus Area	Early Environment
Research Group	Infectious Disease Epidemiology, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Second half 2022 (Date negotiable)
Chief Supervisor	A/Prof Hannah Moore (Telethon Kids Institute/Curtin University)
Other Supervisors	Potential co-supervisors include: Dr Huong Le (Telethon Kids Institute) Dr Minda Sarna (Telethon Kids Institute) Prof Chris Blyth (Telethon Kids Institute/Perth Children's Hospital)
Project Outline	Respiratory Syncytial Virus (RSV) is the leading cause of acute lower respiratory infection in children worldwide and represents a burden up to 4-times higher than childhood influenza but is not yet vaccine-preventable. RSV is a vaccine-priority target by the World Health Organization and several candidate vaccines are in late-stage clinical trials. RSV typically co-circulates with other respiratory viruses, in particular influenza, which is vaccine preventable. Some vaccines can have non-specific or "off-target" effects on other pathogens not directly targeted by the vaccine. Using linked administrative data, our team has indicated a potential relationship between pneumococcal conjugate vaccine and RSV and between childhood influenza vaccine and RSV. In particular, the relationship between influenza vaccine (also including maternal influenza vaccine) and RSV-confirmed infection warrants investigation using contemporary data. We are seeking an enthusiastic student with an interest in epidemiology and infectious diseases to join our multidisciplinary team within the Wesfarmers Centre for Vaccines and Infectious Diseases. In this project the student will conduct a systematic review and meta-analysis to explore current knowledge and evidence of non-specific effects from influenza and other respiratory vaccines on respiratory infections in young children. The project will also involve data analysis using a population-based longitudinal set of linked data including maternal vaccination, laboratory detections, hospitalisations and perinatal data and will progress plans to link further with childhood immunisation data. Other opportunities and research questions around RSV epidemiology within our population-based data platform can be explored.
Suitable For	☐ Honours ☐ MD ☐ Masters ☒ PhD
Essential Skills & Qualifications	• Have achieved a First Class Honours (or equivalent) or a Masters in a relevant field (e.g., Public Health, Epidemiology, Medicine, Data Science or another relevant degree). • Eligible to enrol in a PhD at Curtin University • Pre-existing data analysis skills and/or knowledge of population-based linked data is not essential but would be highly valued
Ethics Approval	☒ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☒ Full scholarship offered by project group

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Infection Transmission in Early Childhood Education and Care: a mixed methods study to inform future interventions

Research Focus Area	Early Environment
Research Group	Infectious Diseases Epidemiology, Wesfarmers Centre of Vaccines & Infectious Diseases
Start Date	Second half 2022 (date negotiable)
Chief Supervisor	Dr Rebecca Pavlos (Telethon Kids Institute)
Other Supervisors	Prof Christopher Blyth (Telethon Kids Institute/Perth Children's Hospital) Carla Puca (Telethon Kids Institute) Dr Samantha Carlson (Telethon Kids Institute)
Project Outline	The COVID-19 pandemic has exposed many uncertainties and incorrect assumptions about respiratory pathogen transmission. These factors are likely to influence transmission in the home, workplace and for children in out-of-home settings including schools and early childhood education and care (ECEC). Our research focuses on finding implementable solutions to prevent infection, particularly respiratory infections. With approximately 20% of West Australian children aged 0-12 years attending out-of-home care, including nearly half of those aged 2-3 years, we will expand our largely hospital-based research program into the ECEC setting. This mixed-methods study will provide the essential first step of community and stakeholder engagement as well as generate baseline evidence on the knowledge, attitudes and practices of providers, staff, and parents on infections in the post COVID-19, ECEC environment. We are seeking an enthusiastic student with an interest in epidemiology and infectious diseases to join our multidisciplinary team within the Wesfarmers Centre for Vaccines and Infectious Diseases. In this project, the student will assess the knowledge, attitudes, and practices of ECEC providers, staff, and parents on infections in ECEC centres. This will involve conducting a review of current published literature to design and implement semi-structured interviews and a short survey for ECEC owners/managers, ECEC educators/staff and parents/carers of children attending ECEC. The interview and survey questions will focus on key areas including participant knowledge of infection transmission and prevention measures, and the impact of infections on the daily business of ECEC centres and daily life of households. The project will involve social science research methodology and qualitative and quantitative data analysis skills.
Suitable For	☒ Honours ☐ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in a relevant field (e.g., Population Health, Epidemiology, Social Science, Psychology, or another relevant degree). • High level of interpersonal, verbal, and written communication skills • Good organisational skills and high personal motivation.
Ethics Approval	☐ Obtained ☒ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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Developing tools to characterise antibody responses induced by natural infection or Strep A vaccines.

Research Focus Area	Early Environment
Research Group	Strep A Vaccines | END RHD Program | Vaccines and Infectious Diseases
Start Date	Negotiable (or Semester 1 2023)
Chief Supervisor	Dr Alma Fulurija (Telethon Kids Institute)
Other Supervisors	Michael Morici (Telethon Kids Institute) Dr Hannah Frost (Murdoch Children's Research Institute)
Project Outline	*Streptococcus pyogenes* (group A *Streptococcus*, Strep A), a Gram-positive bacterium, is among the deadliest infections on the planet and is one of the most neglected infections in terms of burden of disease. Strep A infections cause a wide range of diseases and significant morbidity and mortality globally, estimated at 0.5 million deaths annually. Disease ranges from mild superficial infections such as throat and skin infections to severe disease including acute rheumatic fever (ARF), rheumatic heart disease (RHD) and acute post-streptococcal glomerulonephritis. Australia has some of the highest rates of ARF and RHD in the world disproportionately affecting young Aboriginal and Torres Strait Islander populations. There is a clear unmet need for more effective disease prevention strategies. Despite the large global burden of disease, there is still no safe and effective vaccine against Strep A. The Australian Strep A Vaccine Initiative (ASAVI) seeks to address this by contributing to the development of safe and effective Strep A vaccines. This laboratory-based project will involve developing fit-for-purpose serology assays to accurately measure and characterise immune responses to natural infection, and to Strep A vaccines during clinical trials to determine their efficacy. Leveraging a robust assay platform (Meso Scale Discovery), the project will develop methods to quantify Ig isotypes and subclasses of antibodies to Strep A antigens after natural infection or in response to vaccines. The student will be part of the ASAVI lab team at Telethon Kids Institute, and will gain experience in planning and executing experiments, biospecimen preparation and handling, developing and performing immunoassays, analysing and interpreting results, and preparing documentation and reporting according to industry standard. Additional training in other techniques such as protein analysis and molecular methods will be provided as required during the project.
Suitable For	☒ Honours ☒ MD ☒ Masters ☐ PhD
Essential Skills & Qualifications	• Undergraduate degree in medical or biological sciences (immunology, cell biology) • Excellent organisational skills, motivation, and dedication • Interest in vaccines and vaccine development
Ethics Approval	☐ Obtained ☐ Not Obtained
Funding	☐ Top-up scholarship offered by project group ☐ Full scholarship offered by project group

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